



**STANDARD DIE COMPONENTS
STANDART KALIP ELEMENLARI
STANDARD WEKZEUG TEILE**

GSD[®]
OILLESS



Factory
Fabrika
Fabrik



Production
Üretim
Produktion



Production
Üretim
Produktion



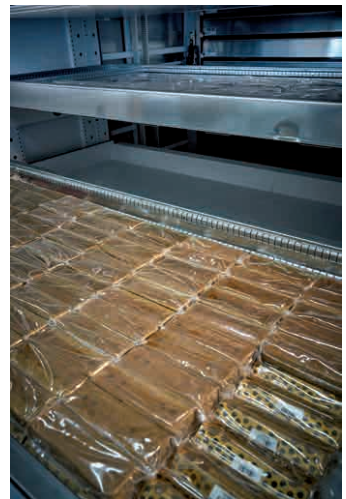
Technical Office
Teknik Ofis
Technisches Büro



Quality
Kalite
Qualität



Warehouse
Depo
Lagerung



Warehouse
Depo
Lagerung

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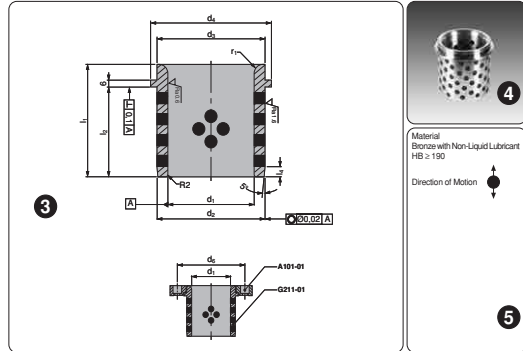
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6 GSB CODE:G211-01

Code	d1	d2	d3	d4	d5	l1	l2	l3	r1
G211-01-025-040	25	32	32	40	58	40	30	4	3
G211-01-032-050	32	40	40	50	68	50	40	4	3
G211-01-040-063	40	50	50	63	79	63	50	5	3
G211-01-050-071	50	63	63	71	89	71	56	6	5
G211-01-063-080	63	80	80	90	123	80	63	8	6
G211-01-080-100	80	100	100	112	143	100	80	10	8
G211-01-100-125	100	125	125	140	168	125	106	12	10
G211-01-125-160	125	160	160	180	203	160	132	12	12

9 Order Example:

d1=80 and l1=100
Order Code G211-01-080-100

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13.34-13.35	R	Strong Load Springs Dikdörtgen Kesitli Ağır Yük Yayları Federn für hohe Spannung
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14.5	Z000166439	Stainless Steel Embossed Sheet Kabartmalı Çapak Kaydırma Plakası Geprägt Scheibe
14.6	BW 100	Milling Machine for Model Making Mills Rigid Foams Strafor İşleme Pah Kırma Seti Fräsmaschinen Set
14.7	BW 500	Hollow Cutter Strafor İşleme Takımı Fräser
14.8	D901-01-745	Dressing Paste For Surface Control Kalıp Alıştırma Boyası Retuschierfarbe
14.9	A103-01	Dowel Pin with Thread DIN EN ISO 8735 Çektirmeli Pimler DIN EN ISO 8735 Führungssaulen DIN EN ISO 8735
14.9	A103-02	Dowel Pin with Thread DIN EN ISO 8735 Çektirmeli Pimler DIN EN ISO 8735 Führungssaulen DIN EN ISO 8735
14.10	A103-03	Dowel Pin Parallel DIN EN ISO 8734 Düz Tespit Pimleri DIN EN ISO 8734 Führungssaulen DIN EN ISO 8734
14.10	A103-04	Dowel Pin Parallel DIN EN ISO 8734 Düz Tespit Pimleri DIN EN ISO 8734 Führungssaulen DIN EN ISO 8734



Lifting Elements
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Tragelemente

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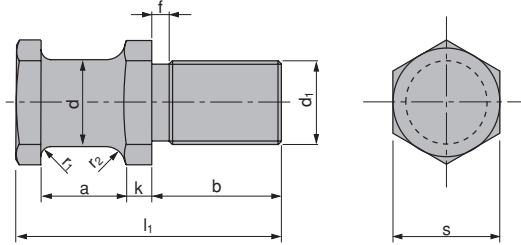
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Material :
CK45
700 ÷ 800 N/mm²

GSB CODE:C101-02

Code	Max. Load (Kg)	Max. Die Weight (Kg)	d ±0.1	d ₁	a	b ±0.5	f	k	l ₁ ±1	r ₁	r ₂	s
C101-02-016-016	320	640	16	M16	20	28	3	5	58	5	8	24
C101-02-020-020	500	1000	20	M20	22	34	3	6	68	5	8	30
C101-02-025-024	1000	2000	25	M24	25	38	4	8	78	6	10	36
C101-02-032-030	1500	3000	32	M30	32	45	5	10	95	6	10	41
C101-02-040-036	2500	5000	40	M36	40	56	5	12	118	8	12	50

WARNING !

For safety reasons, the weight of the tool has to be supported by just two lifting pins.

Respect the max load

UYARI !

Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.

Maksimum yükü göz ardı etmeyiniz

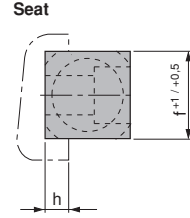
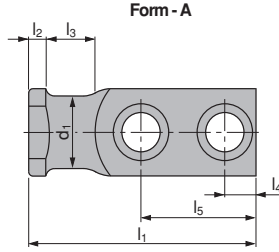
ACHTUNG !

Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.

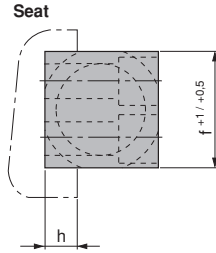
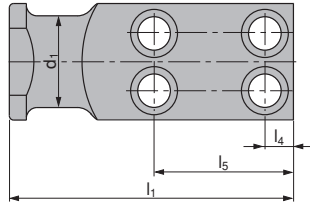
Maximale Nutzlast beachten



Material :
CK45
700 ÷ 800 N/mm²



Form - A



Form - B

WARNING !

For safety reasons, the weight of the tool has to be supported by just two lifting brackets.

Respect the max load

UYARI !

Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma braketinin taşıyabileceği maksimum yük miktarını aşmamalıdır.

Maksimum yükü göz ardı etmeyiniz

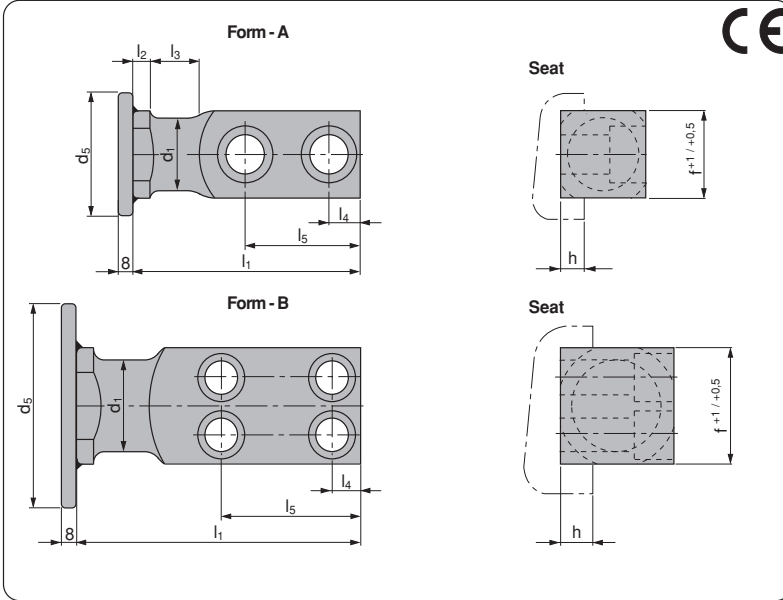
ACHTUNG !

Aus Sicherheitsgründen achten Sie immer dass zwei Tragzapfen das gesamte Werkzeugs gewicht tragen müssen.

Maximale Nutzlast beachten

GSB CODE:C101-04

Code	Max. Load (Kg)	Max. Die Weight (Kg)	Form	d ₁	f	h	l ₁	l ₂	l ₃	l ₄	l ₅	DIN 912 Screw 8.8
C101-04-020-080	320	640	A	16	20	6	80	6	20	10	44	M8x25
C101-04-025-090	630	1260	A	20	25	8	90	8	25	10	47	M10x30
C101-04-035-100	1250	2500	A	25	35	10	100	8	30	12	50	M12x40
C101-04-040-120	2000	4000	A	32	40	10	120	10	32	16	62	M16x45
C101-04-050-140	3200	6400	A	40	50	12	140	10	40	18	72	M20x60
C101-04-060-160	5000	10000	A	50	60	14	160	12	45	22	81	M24x70
C101-04-080-200	8000	16000	B	63	80	16	200	12	50	20	98	M20x90
C101-04-100-250	12500	25000	B	80	100	18	250	15	65	25	125	M24x110
C101-04-120-300	20000	40000	B	100	120	20	300	15	80	30	155	M30x130



Material :
CK45
700 ÷ 800 N/mm²

Designed according to BMW
Norm B2 5602 11 06/2012

GSB CODE:C101-05

Code	Max. Load (Kg)	Max. Die Weight (Kg)	Form	d ₁	d ₅	f	h	l ₁	l ₂	l ₃	l ₄	l ₅	DIN 912 Screw 8.8
C101-05-020-080	320	640	A	16	60	20	6	80	6	20	10	44	M8x25
C101-05-025-090	630	1260	A	20	70	25	8	90	8	25	10	47	M10x30
C101-05-035-100	1250	2500	A	25	70	35	10	100	8	30	12	50	M12x40
C101-05-040-120	2000	4000	A	32	110	40	10	120	10	32	16	62	M16x45
C101-05-050-140	3200	6400	A	40	110	50	12	140	10	40	18	72	M20x60
C101-05-060-160	5000	10000	A	50	150	60	14	160	12	45	22	81	M24x70
C101-05-080-200	8000	16000	B	63	150	80	16	200	12	50	20	98	M20x90
C101-05-100-250	12500	25000	B	80	150	100	18	250	15	65	25	125	M24x110
C101-05-120-300	20000	40000	B	100	150	120	20	300	15	80	30	155	M30x130

WARNING !
For safety reasons, the weight of the tool has to be supported by just two lifting brackets.

Respect the max load

UYARI !
Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma braketinin taşıyabileceği maksimum yük miktarını aşmamalıdır.

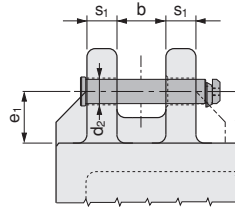
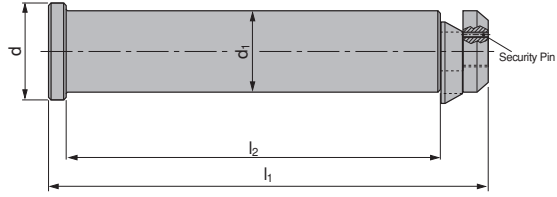
Maksimum yükü göz ardı etmeyiniz

ACHTUNG !
Aus Sicherheitsgründen achten Sie immer dass zwei Tragzapfen das gesamte Werkzeugs gewicht tragen müssen.

Maximale Nutzlast beachten



Designed according to VDI 3366
Standard 03/1997



GSB CODE:C103-01

WARNING !

For safety reasons, the weight of the tool has to be supported by just two lifting pins.

Respect the max load

UYARI !

Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.

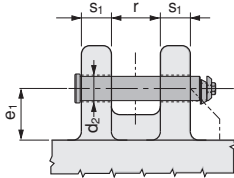
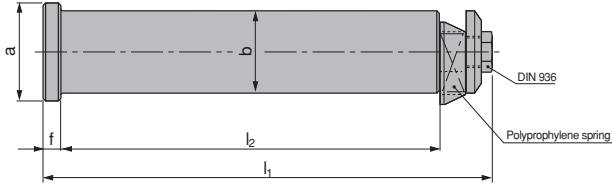
Maksimum yükü göz ardı etmeyiniz

ACHTUNG !

Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.

Maximale Nutzlast beachten

Code	Max. Load (Kg)	Max. Die Weight (Kg)	d	d ₁ h11	d ₂ +1	e ₁	l ₁ +1	l ₂ +1	s ₁	Material
C103-01-032-175	3200	6400	40	32	34	63	175	145	40	CK45
C103-01-040-225	5000	10000	50	40	42	80	225	188	50	CK45
C103-01-050-273	8000	16000	60	50	52	100	273	230	60	CK45
C103-01-063-347	12500	25000	75	63	65	125	347	295	80	CK45
C103-01-076-422	31500	63000	95	76	78	160	422	360	100	42CrMo4



Material :
CK45

Designed according FCA Norm
STQ 40002 04/12/2014

GSB CODE:C103-02

Code	Max. Load (Kg)	Max. Die Weight (Kg)	a	b	d ₂	e ₁	f	l ₁	l ₂	r	s ₁
C103-02-029-150	2000	4000	38	29	30	60	6	178,5	150	60	40
C103-02-033-170	3200	6400	43	33	35	65	6	200,5	170	60	50
C103-02-043-195	5000	10000	53	43	45	85	8	233	195	80	50
C103-02-053-235	8000	16000	65	53	55	105	10	282	235	100	60
C103-02-053-180	8000	16000	65	53	55	75	10	227	180	65	50
C103-02-063-215	12000	24000	78	63	65	130	12	352,5	295	120	80
C103-02-063-295	13000	26000	78	63	65	100	12	272,5	215	80	60
C103-02-078-355	30000	60000	95	78	81	150	14	421,5	355	140	100

WARNING !

For safety reasons, the weight of the tool has to be supported by just two lifting pins.

Respect the max load

UYARI !

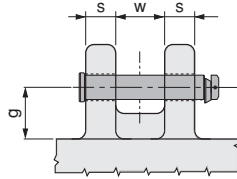
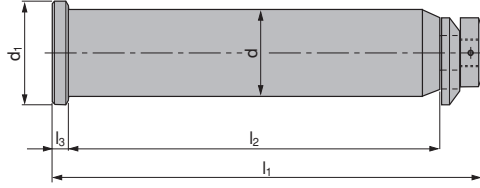
Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.

Maksimum yükü göz ardı etmeyiniz

ACHTUNG !

Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.

Maximale Nutzlast beachten



Material :
42CrMo4

Designed according FORD
Norm WDX22-60M 12/2015

WARNING !

For safety reasons, the weight of the tool has to be supported by just two lifting pins.

Respect the max load

UYARI !

Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.

Maksimum yükü göz ardı etmeyiniz

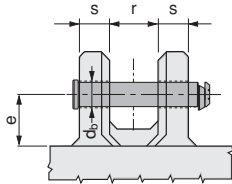
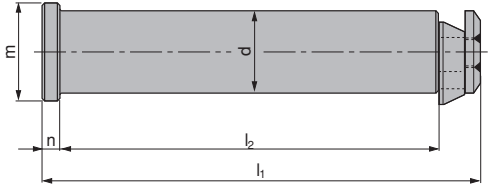
ACHTUNG !

Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.

Maximale Nutzlast beachten

GSB CODE:C103-03

Code	Max. Load (Kg)	Max. Die Weight (Kg)	d -0.3	d ₁	g min.	l ₁ ±1	l ₂	l ₃	s	w
C103-03-035-125	1500	3000	35	45	60	165	125	10	30	50
C103-03-050-190	5000	10000	50	63	65	230	190	10	50	70
C103-03-063-280	20000	40000	63	76	70	320	280	10	80	100
C103-03-080-320	30000	60000	80	89	80	370	320	15	100	100



Material :
CK45

Designed according CNOMO
Norm EM24.50.400 02/2014

GSB CODE:C103-05

Code	Max. Load (Kg)	Max. Die Weight (Kg)	d h11	d _b +0.5	e	l ₁ ±1	l ₂	m	n	r	s
C103-05-032-132	6000	12000	32	34	55	154	132	40	6	50	37,5
C103-05-040-170	9000	18000	40	42	70	197,5	170	50	8	65	47,5
C103-05-050-212	14000	28000	50	52	90	247,5	212	63	10	80	60
C103-05-063-265	22500	45000	63	65	100	309	265	80	12	100	75

WARNING !

For safety reasons, the weight of the tool has to be supported by just two lifting pins.

Respect the max load

UYARI !

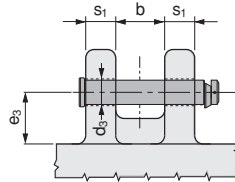
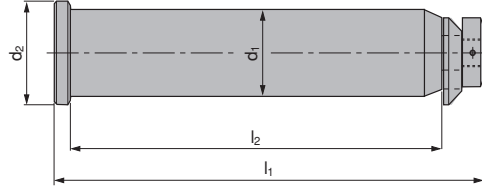
Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.

Maksimum yükü göz ardı etmeyiniz

ACHTUNG !

Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.

Maximale Nutzlast beachten



Material :
42CrMo4

Designed according OPEL - GM
Norm 90.15.00 06/2012

WARNING !

For safety reasons, the weight of the tool has to be supported by just two lifting pins.

Respect the max load

UYARI !

Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.

Maksimum yükü göz ardı etmeyiniz

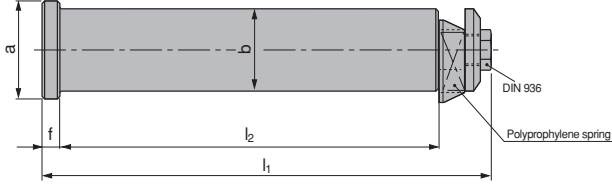
ACHTUNG !

Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.

Maximale Nutzlast beachten

GSB CODE:C103-06

Code	Max. Load (Kg)	Max. Die Weight (Kg)	b	d ₁	d ₂	d ₃	e ₃	l ₁	l ₂	s ₁
C103-06-032-155	3400	6800	70	32	40	34	65	177	155	40
C103-06-040-188	5650	11300	80	40	50	42	85	220	188	50
C103-06-050-230	8950	17900	100	50	60	52	100	270	230	60
C103-06-063-295	14350	28700	120	63	75	65	125	342	295	80
C103-06-080-335	26700	53400	120	80	89	82	160	387	335	100



Material :
CK45

Designed according FCA Norm
STQ 40001 04/12/2014

GSB CODE:C103-07

Code	Max. Load (Kg)	Max. Die Weight (Kg)	a	b h11	f	l ₁	l ₂
C103-07-00600	600	1200	25	15,6	6	102,5	77
C103-07-01000	1000	2000	30	20,6	6	113,5	86
C103-07-02000	2000	4000	35	25,6	6	128,5	100
C103-07-04000	4000	8000	43	33	6	166,5	135
C103-07-07000	7000	14000	53	43	8	210,5	175

WARNING !

For safety reasons, the weight of the tool has to be supported by just two lifting pins.

Respect the max load

UYARI !

Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.

Maksimum yükü göz ardı etmeyiniz

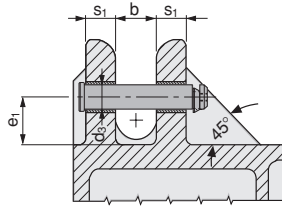
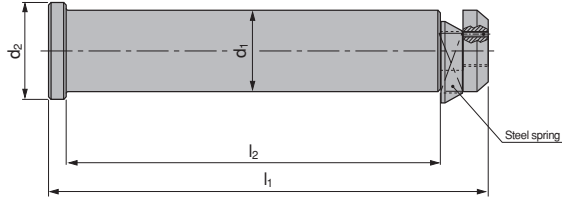
ACHTUNG !

Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.

Maximale Nutzlast beachten



Designed according VW/AUDI Norm 39D 866 09/2015



WARNING !

For safety reasons, the weight of the tool has to be supported by just two lifting pins.

Respect the max load

UYARI !

Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.

Maksimum yükü göz ardı etmeyiniz

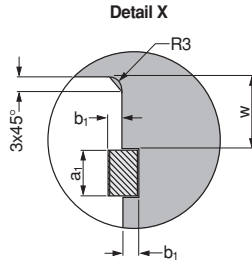
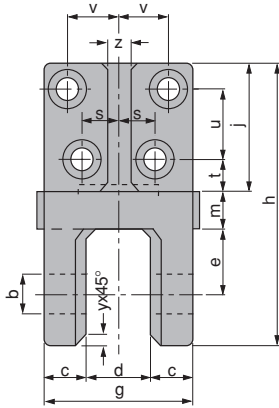
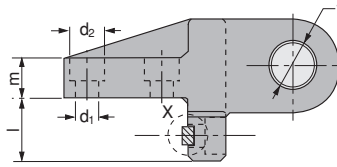
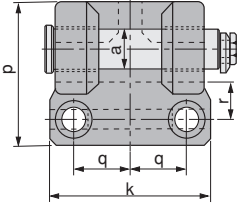
ACHTUNG !

Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.

Maximale Nutzlast beachten

GSB CODE:C103-09

Code	Max. Load (Kg)	Max. Die Weight (Kg)	b	d ₁	d ₂	d ₃	e ₁	l ₁	l ₂	s ₁	Material
C103-09-032-175	3200	6400	60	32	40	34	63	175	145	40	CK45
C103-09-040-225	5000	10000	80	40	50	42	80	225	188	50	CK45
C103-09-050-273	8000	16000	100	50	60	52	100	273	230	60	CK45
C103-09-063-347	12500	25000	120	63	75	65	125	347	295	80	CK45
C103-09-076-422	31500	63000	140	76	95	78	160	422	360	100	42CrMo4



Material :
CK45
800 ÷ 1000 N/mm²

Designed according CNOMO
Norm EM24.50.400 02/2014

GSB CODE:C105-01

Code	Max. Load (Kg)	Max. Die Weight (Kg)	a	b	c	d	d ₁	d ₂	e	f	g	h	j
			H13			H13							
C105-01-04000	4000	8000	32	33	35	55	18	36	55	36	125	221	100
C105-01-06300	6300	12600	40	41	50	60	22	45	60	45	160	270	125

Code	k	l	m	p	q	r	s	t	u	v	w	y	z	a ₁	b ₁	
															E9	+0,1
C105-01-04000	135	50	30	111	48	30	28	20	60	42	23	10	20	14	4,5	
C105-01-06300	180	60	40	140	65	35	40	30	70	55	27	12,5	25	16	5	

WARNING !

For safety reasons, the weight of the tool has to be supported by just two lifting pins.

Respect the max load

UYARI !

Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.

Maksimum yükü göz ardı etmeyiniz

ACHTUNG !

Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.

Maximale Nutzlast beachten



Material :
CK45
800 ÷ 1000 N/mm²

Designed according FCA Norm
STQ 40001 04/12/2014

WARNING !
For safety reasons, the weight of the tool has to be supported by just two lifting pins.

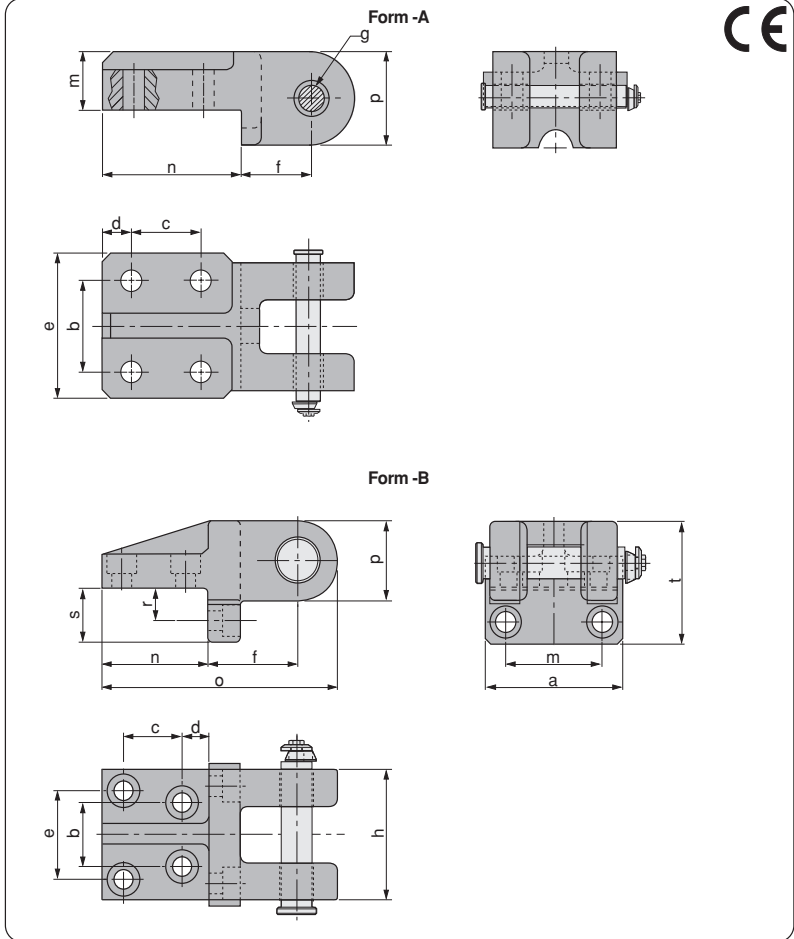
Respect the max load

UYARI !
Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.

Maksimum yükü göz ardı etmeyiniz

ACHTUNG !
Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.

Maximale Nutzlast beachten



GSB CODE:C105-02

Code	Max. Load (Kg)	Max. Die Weight (Kg)	Form	a	b	c	d	e	f
C105-02-00600	600	1200	A	80	50	40	22,5	-	39
C105-02-01000	1000	2000	A	90	60	40	27,5	-	42
C105-02-02000	2000	4000	A	100	65	65	32,5	-	60
C105-02-04000	4000	8000	B	135	56	60	20	84	85
C105-02-07000	7000	14000	B	180	80	70	30	110	100

Code	g	h	l	m	n	o	p	r	s	t
C105-02-00600	16	70	102,5	32	80	145	52	-	-	-
C105-02-01000	21	79	113,5	36	90	160	56	-	-	-
C105-02-02000	26	90	128,5	50	120	215	70	-	-	-
C105-02-04000	34	125	166,5	96	100	221	72	30	50	111
C105-02-07000	44	160	210,5	130	125	270	90	35	60	140



Guide Elements
Kılavuz Elemanları
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ANDERE KOMPONENTE


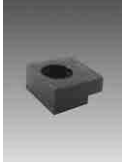





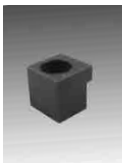

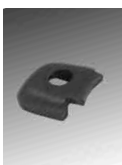
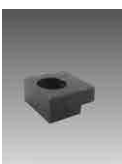



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TECHNICAL DATA
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TECHNISCHE INFORMATIONEN











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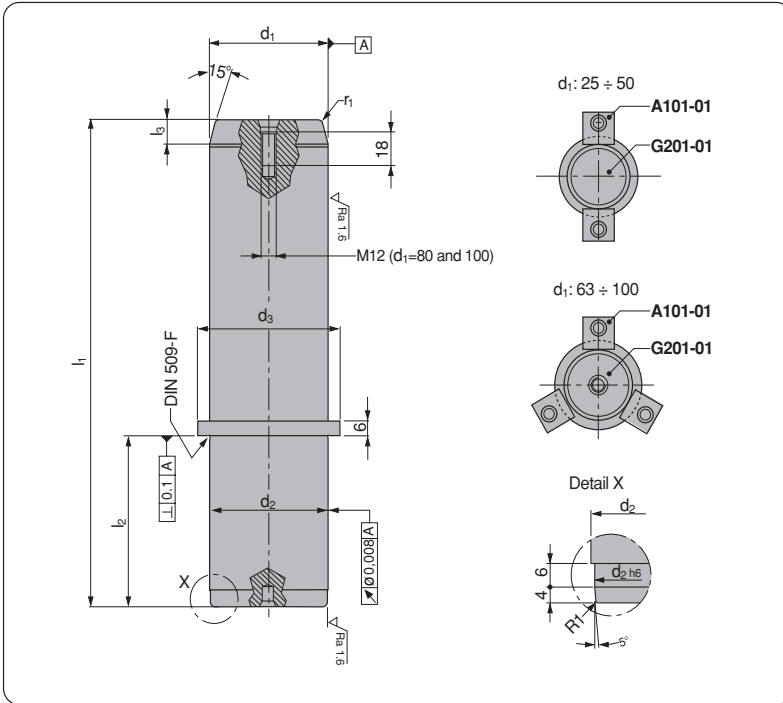
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Material :
Hardened Steel
HRC 57 ÷ 62

GSB CODE:G201-01

d ₁ f6	d ₂ r6	d ₃	l ₁										l ₂	l ₃	r ₁	
25	25	33	140	160	180	-	-	-	-	-	-	-	-	40	4	2
32	32	40	140	160	180	200	-	-	-	-	-	-	45	8	2	2
40	40	50	-	160	180	200	224	250	-	-	-	-	56	8	2	2
50	50	60	-	160	180	200	224	250	280	315	-	-	70	10	2.5	2.5
63	63	80	-	-	-	200	224	250	280	315	355	400	80	10	2.5	2.5
80	80	90	-	-	-	-	-	250	280	315	355	400	500	100	10	3
100	100	110	-	-	-	-	-	-	-	315	355	400	500	125	10	3

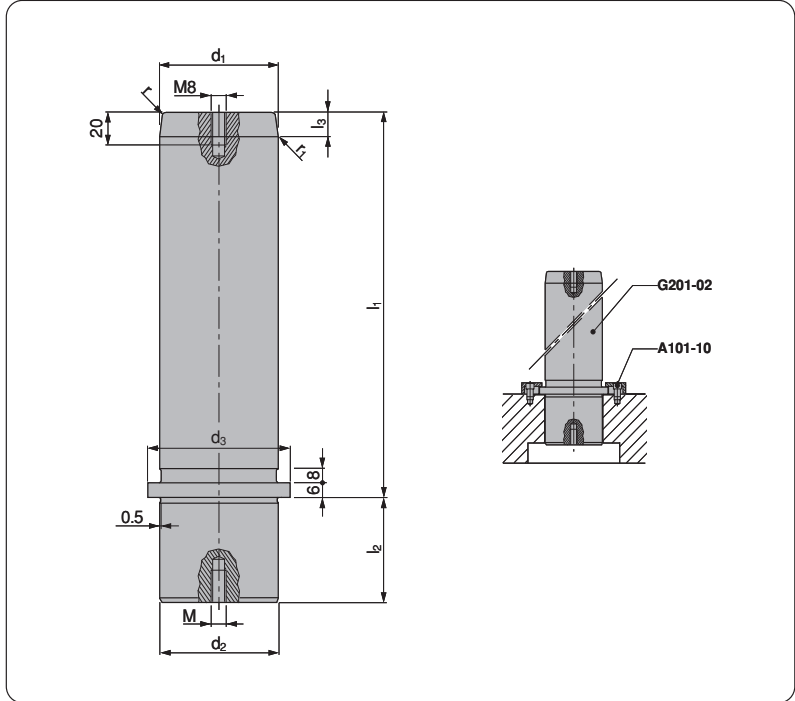
Order Example:

d₁=80 and l=315

Order Code:G201-01-080-315



Material :
Hardened Steel
HRC 60 ÷ 64



GSB CODE:G201-02

d ₁	d ₂	d ₃	l ₁											l ₂	l ₃	M	r	r ₁		
h4	j6		100	112	125	140	160	180	200	-	-	-	-	-	-	20	20,5	M8	2	15
15	15	22	100	112	125	140	160	180	200	-	-	-	-	-	-	20	20,5	M8	2	15
16	16	22	100	112	125	140	160	180	200	-	-	-	-	-	-	20	20,5	M8	2	15
19	19	25	100	112	125	140	160	180	200	-	-	-	-	-	-	23	23,5	M8	2,5	20
20	20	25	100	112	125	140	160	180	200	-	-	-	-	-	-	23	23,5	M8	2,5	20
24	24	32	100	112	125	140	160	180	200	224	250	-	-	-	-	30	30,5	M8	3	20
25	25	32	100	112	125	140	160	180	200	224	250	-	-	-	-	30	30,5	M8	3	20
30	30	40	-	112	125	140	160	180	200	224	250	280	315	-	-	37	37,5	M8	3	30
32	32	40	-	112	125	140	160	180	200	224	250	280	315	-	-	37	37,5	M8	3	30
38	38	50	-	-	125	140	160	180	200	224	250	280	315	355	-	37	37,5	M8	3,5	30
40	40	50	-	-	125	140	160	180	200	224	250	280	315	355	-	37	37,5	M8	3,5	30
48	48	63	-	-	-	140	160	180	200	224	250	280	315	355	400	47	47,5	M8	3,5	30
50	50	63	-	-	-	140	160	180	200	224	250	280	315	355	400	47	47,5	M8	3,5	30
60	60	80	-	-	-	-	160	180	200	224	250	280	315	355	400	47	47,5	M8	4	30
63	63	80	-	-	-	-	160	180	200	224	250	280	315	355	400	47	47,5	M8	4	30
80	80	95	-	-	-	-	-	180	200	224	250	280	315	355	400	60	60,5	M12	4	30

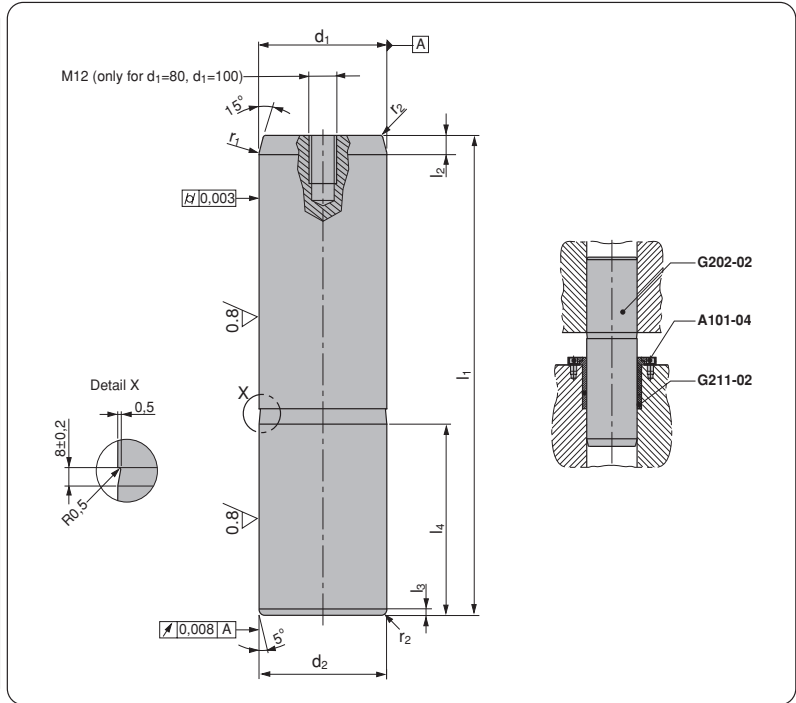
Order Example:

d₁=80 l₂=60 and l₁=315

Order Code:G201-02-8060315



Material :
Hardened Steel
HRC 60 ÷ 64



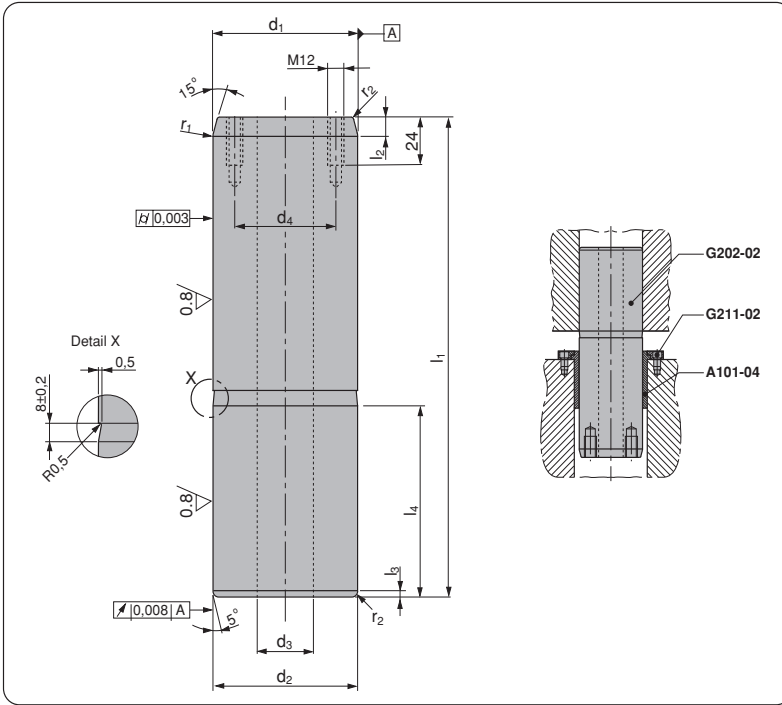
GSB CODE:G202-02

d ₁	d ₂							l ₁						l ₂	l ₃	l ₄	r ₁	r ₂
16	r6							-1						+0,8	+0,8	+0,8		
25	25	125	140	160	180	200	224	-	-	-	-	-	-	8	4	40	3	2
32	32	-	140	160	180	200	224	250	-	-	-	-	8	4	45	3	2	
40	40	-	140	160	180	200	224	250	280	-	-	-	8	4	56	3	2	
50	50	-	-	160	180	200	224	250	280	315	355	-	10	4	70	5	2,5	
63	63	-	-	-	180	200	224	250	280	315	355	400	10	4	80	6	2,5	
80	80	-	-	-	-	200	224	250	280	315	355	400	450	10	4	100	8	3
100	100	-	-	-	-	-	224	250	280	315	355	400	450	10	4	125	10	3

Order Example:

d₁=80 and l=315

Order Code:G202-02-080-315



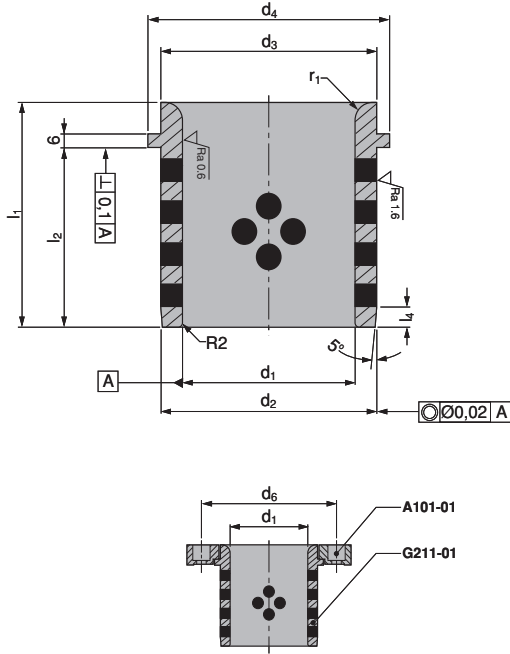
Material :
Hardened Steel
HRC 60 ÷ 64

GSB CODE:G202-03

d ₁	d ₂	d ₃	d ₄					l ₁					l ₂	l ₃	l ₄	r ₁	r ₂	
f6	r6	±2	+0,8					-1					+0,8	+0,8	+0,8			
80	80	40	58	200	224	250	280	315	355	400	450	-	-	10	4	100	8	3
100	100	50	72	-	224	250	280	315	355	400	450	-	-	10	4	125	10	3
125	125	65	90	-	-	-	-	315	355	400	450	500	-	12	4	140	12	4
160	160	95	132	-	-	-	-	-	-	400	450	500	560	12	5	180	18	4

Order Example:

d₁=80 and l=315
Order Code:G202-03-080-315



Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion



GSB CODE:G211-01

Code	d ₁ H7	d ₂ g6	d ₃ -0.25	d ₄ -0.8	d ₆ ±0.3	l ₁ -0.5	l ₂	l ₄	r ₁
G211-01-025-040	25	32	32	40	75	40	30	4	3
G211-01-032-050	32	40	40	50	83	50	40	4	3
G211-01-040-063	40	50	50	63	93	63	50	5	3
G211-01-050-071	50	63	63	71	106	71	56	6	5
G211-01-063-080	63	80	80	90	123	80	63	8	6
G211-01-080-100	80	100	100	112	143	100	80	10	8
G211-01-100-125	100	125	125	140	168	125	106	12	10
G211-01-125-160	125	160	160	180	203	160	132	12	12

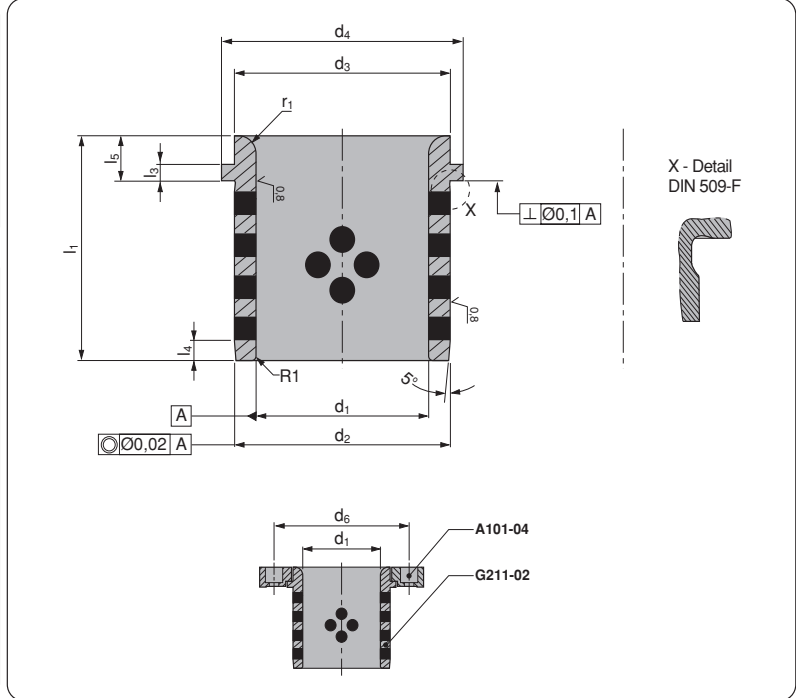
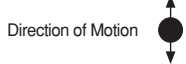
Order Example:

d₁=80 and l₁=100

Order Code:G211-01-080-100



Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190



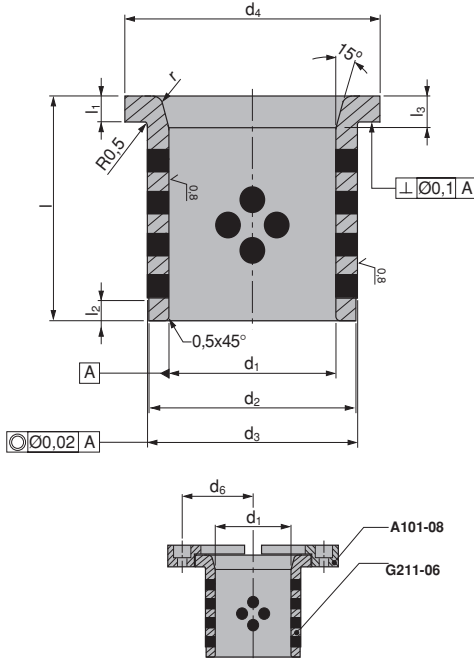
GSB CODE:G211-02

Code	d ₁	d ₂	d ₃	d ₄	d ₆	l ₁	l ₃	l ₄	l ₅	r ₁
G211-02-025-040	H7	h6	-0.25	-0.8	±0.3	-0.5 / -1	±0.1	±1	-0.5	
G211-02-032-050	25	32	32	40	58	40	6,3	3	10	3
G211-02-040-063	32	40	40	50	66	50	6,3	4	12	3
G211-02-040-063	40	50	50	63	79	63	6,3	5	15	3
G211-02-050-071	50	63	63	71	89	71	6,3	6,3	17	5
G211-02-063-080	63	80	80	90	123	80	10	8	19	6
G211-02-080-100	80	100	100	112	143	100	10	10	22	8
G211-02-100-125	100	125	125	140	168	125	10	12,5	21	10
G211-02-125-160	125	160	160	180	203	160	10	16	30	12
G211-02-160-200	160	200	200	220	243	200	10	16	32	18

Order Example:

d₁=80 and l₁=100

Order Code:G211-02-080-100



Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion



GSB CODE:G211-06

Code	d ₁ G7	d ₂ d8	d ₃ m6	d ₄	d ₆	l -0.2 / -0.5	l ₁ -0.05	l ₂	l ₃	r ₁
G211-06-020-032	20	28	32	32	16	32	4	3	-	2
G211-06-025-040	25	35	40	40	20	40	5	5	-	2
G211-06-032-050	32	44	50	50	25	50	6	5	-	3
G211-06-040-063	40	52	60	60	38,5	63	8	8	-	3
G211-06-050-080	50	63	71	71	46	80	10	8	8	3
G211-06-063-100	63	80	90	90	55	100	12	10	10	3
G211-06-080-125	80	100	112	112	70	125	16	10	10	4
G211-06-100-160	100	125	140	140	81	160	20	10	10	4

Order Example:

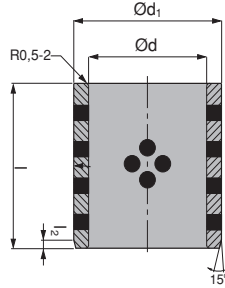
d₁=80 and l₁=125

Order Code:G211-06-080-125



Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion



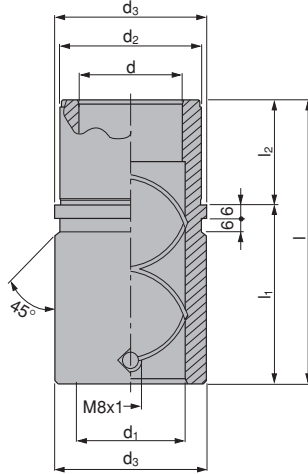
GSB CODE:G212-01

d	d ₁	l												l ₂				
F7	m6	-0,1 / -0,3																
8	12	8	10	12	15	-	-	-	-	-	-	-	-	-	-	-	2	
10	14	-	10	12	15	-	20	-	-	-	-	-	-	-	-	-	2	
12	18	-	10	12	-	16	20	25	30	-	-	-	-	-	-	-	2	
16	22	-	-	12	-	16	20	25	30	35	40	-	-	-	-	-	2	
18	24	-	-	-	-	-	20	25	30	35	40	-	-	-	-	-	2	
20	28	-	-	-	-	-	20	25	30	35	40	-	-	-	-	-	2	
20	30	-	-	-	-	16	20	25	30	35	40	-	-	-	-	-	2	
25	33	-	-	-	-	-	20	25	30	35	40	50	-	-	-	-	2	
25	35	-	-	-	-	-	20	25	30	35	40	50	-	-	-	-	2	
30	38	-	-	-	-	-	-	25	30	35	40	50	60	-	-	-	2	
30	40	-	-	-	-	-	20	-	30	35	40	50	60	-	-	-	2	
35	44	-	-	-	-	-	-	-	-	-	40	50	-	-	-	-	2	
35	45	-	-	-	-	-	-	-	30	-	40	50	60	-	-	-	2	
40	50	-	-	-	-	-	-	25	30	35	40	50	60	-	-	-	2	
40	55	-	-	-	-	-	-	-	-	-	-	50	60	-	-	-	2	
50	60	-	-	-	-	-	-	-	-	-	-	50	60	70	-	-	2	
50	62	-	-	-	-	-	-	-	-	-	-	-	60	70	-	-	2	
50	65	-	-	-	-	-	-	-	-	-	-	50	-	70	-	-	2	
60	75	-	-	-	-	-	-	-	-	-	-	50	60	-	80	-	2	
70	85	-	-	-	-	-	-	-	-	-	-	-	60	70	80	100	2	
80	96	-	-	-	-	-	-	-	-	-	-	-	60	-	-	100	2	
80	100	-	-	-	-	-	-	-	-	-	-	-	60	-	-	100	120	2
100	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120	2
110	130	-	-	-	-	-	-	-	-	-	-	-	-	-	80	-	120	2
130	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	4

Order Example:

d= 25, d₁= 33 and l₁= 50

Order Code:G212-01-025033050



Material :
16MnCr5
HRC 58 ÷ 62

GSB CODE:G213-01

Code	d -1	d ₁ G6	d ₂ j6	d ₃	l	l ₁	l ₂
G213-01-020-070	20	20	28	34	70	47	23
G213-01-025-080	25	25	34	39	80	57	23
G213-01-030-090	30	30	39	44	90	53	37
G213-01-040-100	40	40	50	54	100	63	37
G213-01-050-120	50	50	60	64	120	73	47

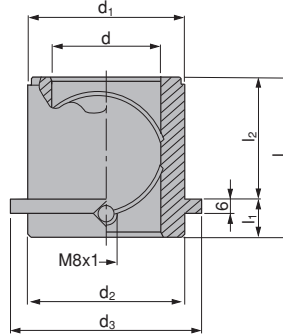
Order Example:

d₁=20 and l=70

Order Code:G213-01-020-070



Material :
16MnCr5
HRC 58 ÷ 62



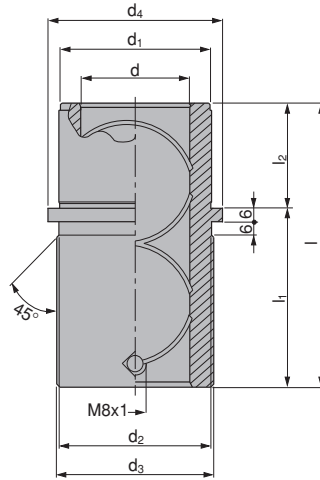
GSB CODE:G213-02

Code	d G6	d ₁ j6	d ₂	d ₃	l	l ₁	l ₂
G213-02-020-036	20	28	28	34	36	13	23
G213-02-025-036	25	34	34	39	36	13	23
G213-02-030-050	30	39	39	44	50	13	37
G213-02-040-050	40	50	50	54	50	13	37
G213-02-050-060	50	60	60	64	60	13	47

Order Example:

d=20 and l=36

Order Code:G213-02-020-036



Material :
16MnCr5
HRC 58 ÷ 62

GSB CODE:G213-03

Code	d H5	d ₁ j6	d ₂	d ₃	d ₄	l	l ₁	l ₂
G213-03-019-043	19	32	32	39	40	43	20	23
G213-03-019-059	19	32	32	39	40	59	36	23
G213-03-020-043	20	32	32	39	40	43	20	23
G213-03-020-059	20	32	32	39	40	59	36	23
G213-03-024-059	24	40	40	46	48	59	36	23
G213-03-024-079	24	40	40	46	48	79	56	23
G213-03-025-059	25	40	40	46	48	59	36	23
G213-03-025-079	25	40	40	46	48	79	56	23
G213-03-030-075	30	48	48	53	56	75	45	30
G213-03-030-093	30	48	48	53	56	93	63	30
G213-03-032-075	32	48	48	53	56	75	45	30
G213-03-032-093	32	48	48	53	56	93	63	30
G213-03-038-082	38	58	58	63	66	82	45	37
G213-03-038-108	38	58	58	63	66	108	71	37
G213-03-040-082	40	58	58	63	66	82	45	37
G213-03-040-108	40	58	58	63	66	108	71	37
G213-03-048-097	48	70	70	77	80	97	50	47
G213-03-048-127	48	70	70	77	80	127	80	47
G213-03-050-097	50	70	70	77	80	97	50	47
G213-03-050-127	50	70	70	77	80	127	80	47
G213-03-060-116	60	85	85	92	95	116	56	60
G213-03-060-150	60	85	85	92	95	150	90	60
G213-03-063-116	63	85	85	92	95	116	56	60
G213-03-063-150	63	85	85	92	95	150	90	60
G213-03-080-120	80	105	105	115	118	120	60	60
G213-03-080-150	80	105	105	115	118	150	90	60

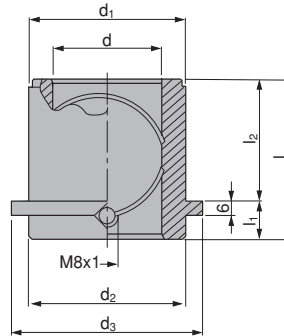
Order Example:

d=30 and l=75

Order Code: **G213-03-030-075**



Material :
16MnCr5
HRC 58 ÷ 62

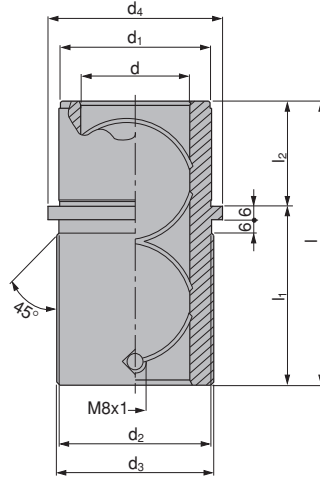


GSB CODE:G213-04

Code	d H5	d ₁ j6	d ₂	d ₃	l	l ₁	l ₂
G213-04-019-035	19	32	32	40	35	12	23
G213-04-020-035	20	32	32	40	35	12	23
G213-04-024-035	24	40	40	48	35	12	23
G213-04-025-035	25	40	40	48	35	12	23
G213-04-030-042	30	48	48	56	42	12	30
G213-04-032-042	32	48	48	56	42	12	30
G213-04-038-052	38	58	58	66	52	15	37
G213-04-040-052	40	58	58	66	52	15	37
G213-04-048-065	48	70	70	80	65	18	47
G213-04-050-065	50	70	70	80	65	18	47
G213-04-060-080	60	85	85	95	80	20	60
G213-04-063-080	63	85	85	95	80	20	60
G213-04-080-080	80	105	105	118	80	20	60

Order Example:

d=20 and l=35
Order Code:G213-04-020-035



Material :
16MnCr5
HRC 58 ÷ 62
Bronze HB ≥ 190

GSB CODE:G217-01

Code	d H5	d ₁ j6	d ₂	d ₃	d ₄	l	l ₁	l ₂
G217-01-019-043	19	32	32	39	40	43	20	23
G217-01-019-059	19	32	32	39	40	59	36	23
G217-01-020-043	20	32	32	39	40	43	20	23
G217-01-020-059	20	32	32	39	40	59	36	23
G217-01-024-059	24	40	40	46	48	59	36	23
G217-01-024-079	24	40	40	46	48	79	56	23
G217-01-025-059	25	40	40	46	48	59	36	23
G217-01-025-079	25	40	40	46	48	79	56	23
G217-01-030-075	30	48	48	53	56	75	45	30
G217-01-030-093	30	48	48	53	56	93	63	30
G217-01-032-075	32	48	48	53	56	75	45	30
G217-01-032-093	32	48	48	53	56	93	63	30
G217-01-038-082	38	58	58	63	66	82	45	37
G217-01-038-108	38	58	58	63	66	108	71	37
G217-01-040-082	40	58	58	63	66	82	45	37
G217-01-040-108	40	58	58	63	66	108	71	37
G217-01-048-097	48	70	70	77	80	97	50	47
G217-01-048-127	48	70	70	77	80	127	80	47
G217-01-050-097	50	70	70	77	80	97	50	47
G217-01-050-127	50	70	70	77	80	127	80	47
G217-01-060-116	60	85	85	92	95	116	56	60
G217-01-060-150	60	85	85	92	95	150	90	60
G217-01-063-116	63	85	85	92	95	116	56	60
G217-01-063-150	63	85	85	92	95	150	90	60
G217-01-080-120	80	105	105	115	118	120	60	60
G217-01-080-150	80	105	105	115	118	150	90	60

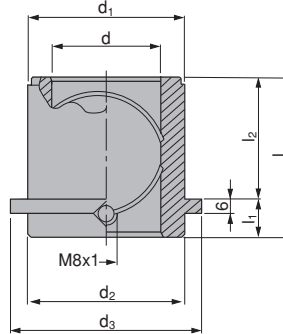
Order Example:

d=23 and l=75

Order Code:G217-01-030-075



Material :
16MnCr5
HRC 58 ÷ 62
Bronze HB ≥ 190



GSB CODE:G217-02

Code	d H5	d1 j6	d2	d3	l	l1	l2
G217-02-019-035	19	32	32	40	35	12	23
G217-02-020-035	20	32	32	40	35	12	23
G217-02-024-035	24	40	40	48	35	12	23
G217-02-025-035	25	40	40	48	35	12	23
G217-02-030-042	30	48	48	56	42	12	30
G217-02-032-042	32	48	48	56	42	12	30
G217-02-038-052	38	58	58	66	52	15	37
G217-02-040-052	40	58	58	66	52	15	37
G217-02-048-065	48	70	70	80	65	18	47
G217-02-050-065	50	70	70	80	65	18	47
G217-02-060-080	60	85	85	95	80	20	60
G217-02-063-080	63	85	85	95	80	20	60
G217-02-080-080	80	105	105	118	80	20	60

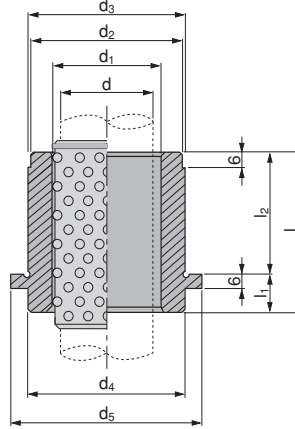
Order Example:

d=20 and l=35

Order Code:G217-02-020-035



Material :
16MnCr5
HRC 58 ÷ 62



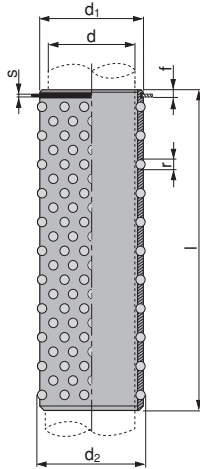
GSB CODE:G215-02

Code	d	d ₁ H4	d ₂ f7	d ₃ j6	d ₄	d ₅ ±0,2	l -0,2	l ₁	l ₂ -0,2
G215-02-019-035	19	25	32	32	32	40	35	12	23
G215-02-020-035	20	26	32	32	32	40	35	12	23
G215-02-024-035	24	30	40	40	40	48	35	12	23
G215-02-025-035	25	31	40	40	40	48	35	12	23
G215-02-030-042	30	38	48	48	48	56	42	12	30
G215-02-032-042	32	40	48	48	48	56	42	12	30
G215-02-038-052	38	46	58	58	58	66	52	15	37
G215-02-040-052	40	48	58	58	58	66	52	15	37
G215-02-048-065	48	56	70	70	70	80	65	18	47
G215-02-050-065	50	58	70	70	70	80	65	18	47
G215-02-060-080	60	68	85	85	85	95	80	20	60
G215-02-063-080	63	71	85	85	85	95	80	20	60
G215-02-080-080	80	92	105	105	105	118	80	20	60

Order Example:

d=20 and l=35

Order Code:G215-02-020-035



Material :
Bushes : SnBz10
Ball : 100Cr6

GSB CODE:G216-01

d	d ₁	d ₂	f												r	s	
19	24	25	2,9	45	56	71	80	95	-	-	-	-	-	-	3	1,2	
20	25	26	2,9	45	56	71	80	95	-	-	-	-	-	-	3	1,2	
24	29	30	3,2	45	56	71	80	95	105	120	140	-	-	-	3	1,5	
25	30	31	3,2	45	56	71	80	95	105	120	140	-	-	-	3	1,5	
30	37	38	3,95	45	56	71	80	95	105	120	140	-	-	-	4	1,75	
32	39	40	3,95	45	56	71	80	95	105	120	140	-	-	-	4	1,75	
38	45	46	3,95	-	56	71	80	95	105	120	140	160	-	-	4	1,75	
40	47	48	3,95	-	56	71	80	95	105	120	140	160	-	-	4	1,75	
48	55	56	4,25	-	-	71	80	95	105	120	140	160	-	-	4	2	
50	57	58	4,25	-	-	71	80	95	105	120	140	160	-	-	4	2	
60	67	70	4,75	-	-	-	80	95	105	120	140	160	180	200	240	4	2,5
63	70	73	4,75	-	-	-	80	95	105	120	140	160	180	200	240	4	2,5
80	90	92	6,15	-	-	-	-	-	-	120	140	160	180	200	240	6	3

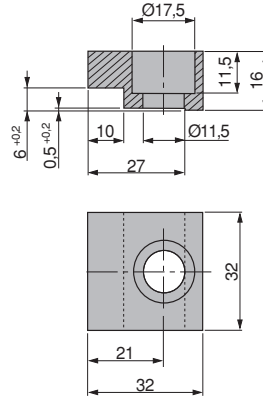
Order Example:

d=63 and l=120

Order Code:G216-01-063-120



Material :
CK45



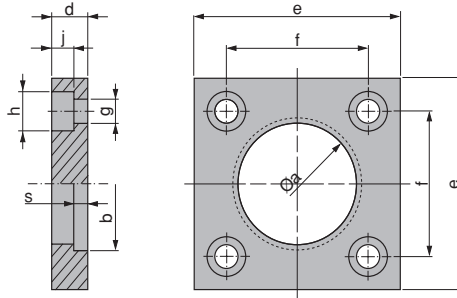
GSB CODE:A101-01

Code

A101-01-032-032

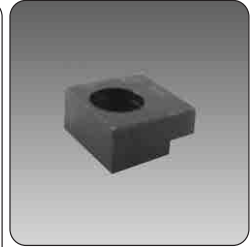
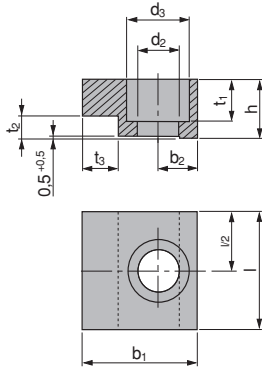


Material :
CK45



GSB CODE:A101-03

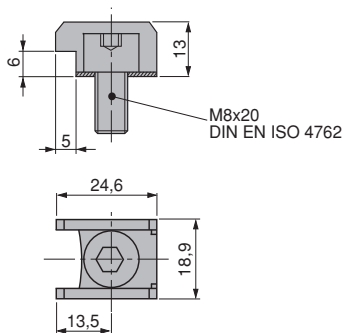
Code	a	b	d	e	f	g	h	j	s
A101-03-025	25	28	10	45	31	7	11	7	2,7
A101-03-032	32	37	10	56	36	7	11	7	4,2
A101-03-040	40	45	12	70	50	7	11	7	4,2
A101-03-050	50	55	14	80	55	9	16	9	4,2
A101-03-063	63	70	18	100	70	11	18	11	6,2
A101-03-080	80	87	20	110	80	14	22	14	6,2
A101-03-100	100	107	20	140	100	14	22	14	6,2



Material :
CK45

GSB CODE:A101-04

Code	b ₁	b ₂	d ₂ +0,2	d ₃ +0,2	h	l	t ₁ +0,2	t ₂ -0,3	t ₃ +0,2	Bushes Size
A101-04-020-020	20	7,5	7	11	10	20	7	6,3	5	Ø25-Ø50
A101-04-032-032	32	11	11,5	17,5	16	32	11,5	10	10	Ø63-Ø160



Material :
CK45

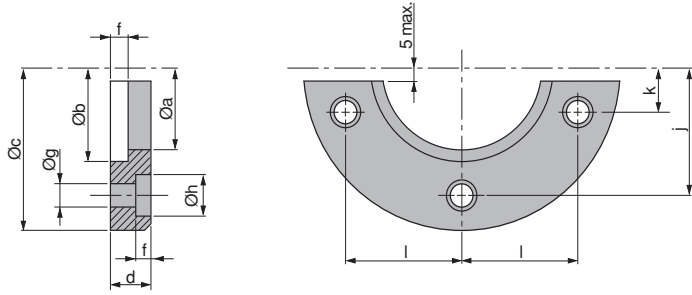
GSB CODE:A101-05

Code

A101-05-189-246

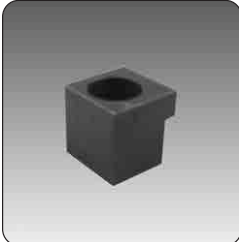


Material :
CK45

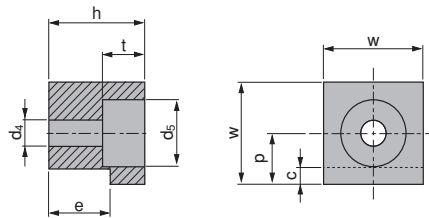


GSB CODE:A101-08

Code	a	b	c	d	e	f	g	h	j	k	l	Bushes Size
A101-08-025	32	41	72	10	5	7	6,6	12	-	20	20	25
A101-08-032	40	51	80	12	6	7	6,6	12	-	21	25	32
A101-08-040	50	61	100	12	8	7	6,6	12	41	14	38,5	40
A101-08-050	63	72	125	16	10	9	9	16	49	17	46	50
A101-08-063	80	91	140	20	12	11	11	18	57,5	17	55	63
A101-08-080	100	113	180	25	16	13	14	22	72	20	70	80
A101-08-100	125	141	200	32	20	13	14	22	85	25	81	100

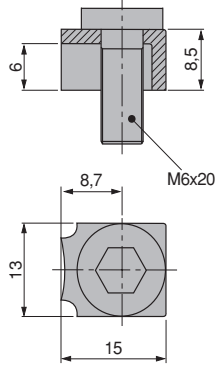


Material :
CK45



GSB CODE:A101-09

Code	p	w	h	e	c	t	d ₄	d ₅
A101-09-040-018	9,5	18	12	8	3	7	6,6	11
A101-09-050-022	12	22	16	10	4	9	9	15
A101-09-063-026	15	26	20	12	5	11	11	18
A101-09-080-026	15	26	25	16	5	11	11	18
A101-09-100-026	15	26	32	20	5	11	11	18

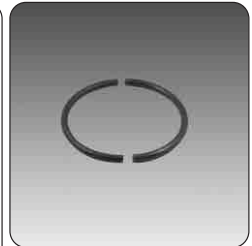
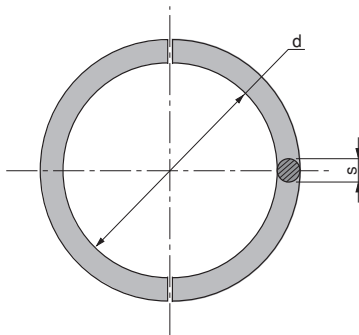


Material :
St 37

GSB CODE:A101-10

Code

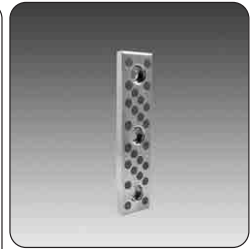
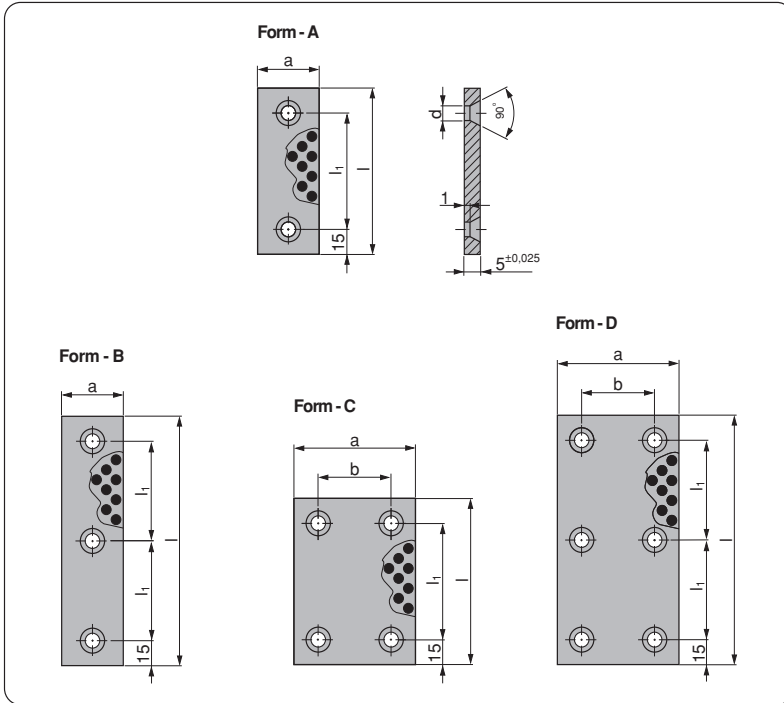
A101-10-013-015



Material :
CK45

GSB CODE:A102-01

Code	d	s	Guide Post Size
A102-01-025	22,5	h10 2,5	Ø25
A102-01-032	28	4	Ø32
A102-01-040	36	4	Ø40
A102-01-050	46	4	Ø50
A102-01-063	57	6	Ø63
A102-01-080	74	6	Ø80
A102-01-100	94	6	Ø100

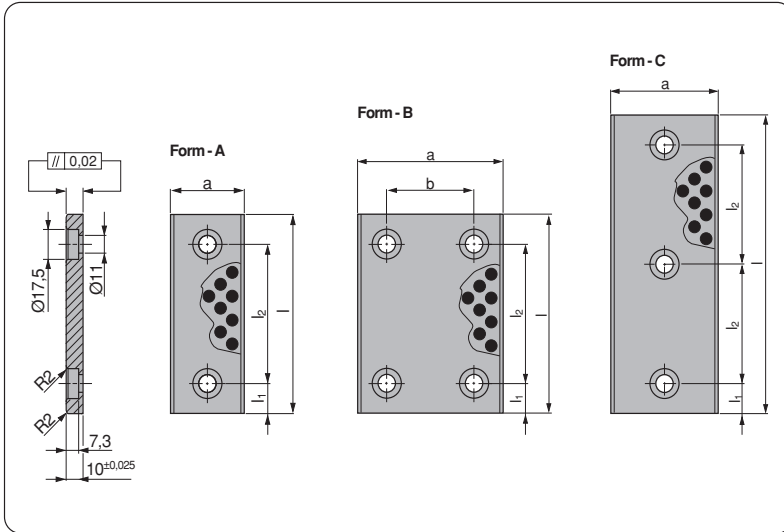


Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190



GSB CODE:P605-01

Code	Form	a	b	d	l	l ₁
P605-01-018-050	A	18	-	6,5	50	20
P605-01-018-075	A	18	-	6,5	75	45
P605-01-018-100	A	18	-	6,5	100	70
P605-01-018-150	B	18	-	6,5	150	60
P605-01-028-050	A	28	-	9	50	20
P605-01-028-075	A	28	-	9	75	45
P605-01-028-100	A	28	-	9	100	70
P605-01-028-150	B	28	-	9	150	60
P605-01-038-050	A	38	-	9	50	20
P605-01-038-075	A	38	-	9	75	45
P605-01-038-100	A	38	-	9	100	70
P605-01-038-150	B	38	-	9	150	60
P605-01-048-075	A	48	-	9	75	45
P605-01-048-100	A	48	-	9	100	70
P605-01-048-125	A	48	-	9	125	95
P605-01-048-150	B	48	-	9	150	60
P605-01-075-075	C	75	45	9	75	45
P605-01-075-100	C	75	45	9	100	70
P605-01-075-125	C	75	45	9	125	95
P605-01-075-150	D	75	45	9	150	60
P605-01-100-100	C	100	70	9	100	70
P605-01-100-125	C	100	70	9	125	95
P605-01-100-150	D	100	70	9	150	60



Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

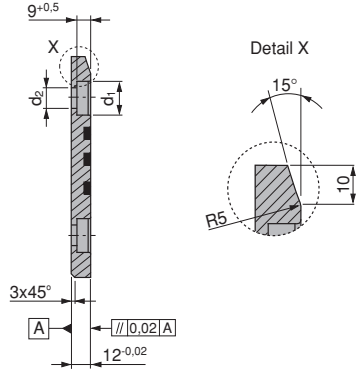
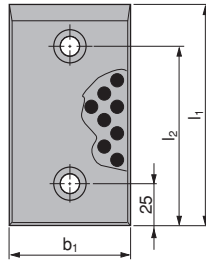
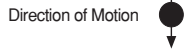


GSB CODE:G220-03

Code	Form	a	b	l	l ₁	l ₂
G220-03-028-075	A	28	-	75	15	45
G220-03-028-100	A	28	-	100	25	50
G220-03-028-125	A	28	-	125	25	75
G220-03-028-150	A	28	-	150	25	100
G220-03-038-075	A	38	-	75	15	45
G220-03-038-100	A	38	-	100	25	50
G220-03-038-125	A	38	-	125	25	75
G220-03-038-150	A	38	-	150	25	100
G220-03-048-075	A	48	-	75	15	45
G220-03-048-100	A	48	-	100	25	50
G220-03-048-125	A	48	-	125	25	75
G220-03-048-150	A	48	-	150	25	100
G220-03-048-200	A	48	-	200	50	100
G220-03-058-075	A	58	-	75	15	45
G220-03-058-100	A	58	-	100	25	50
G220-03-058-125	A	58	-	125	25	75
G220-03-058-150	A	58	-	150	25	100
G220-03-058-200	A	58	-	200	50	100
G220-03-075-075	A	75	-	75	15	45
G220-03-075-100	A	75	-	100	25	50
G220-03-075-125	A	75	-	125	25	75
G220-03-075-150	A	75	-	150	25	100
G220-03-075-200	C	75	-	200	25	75
G220-03-100-100	B	100	50	100	25	50
G220-03-100-125	B	100	50	125	25	75
G220-03-100-150	B	100	50	150	25	100
G220-03-100-200	B	100	50	200	25	150
G220-03-100-250	B	100	50	250	25	200
G220-03-125-150	B	125	50	150	25	100
G220-03-125-200	B	125	50	200	25	150
G220-03-125-250	B	125	50	250	25	200
G220-03-150-150	B	150	100	150	25	100
G220-03-150-200	B	150	100	200	25	150

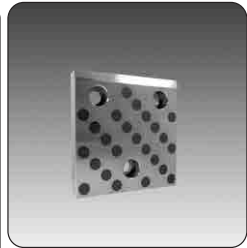
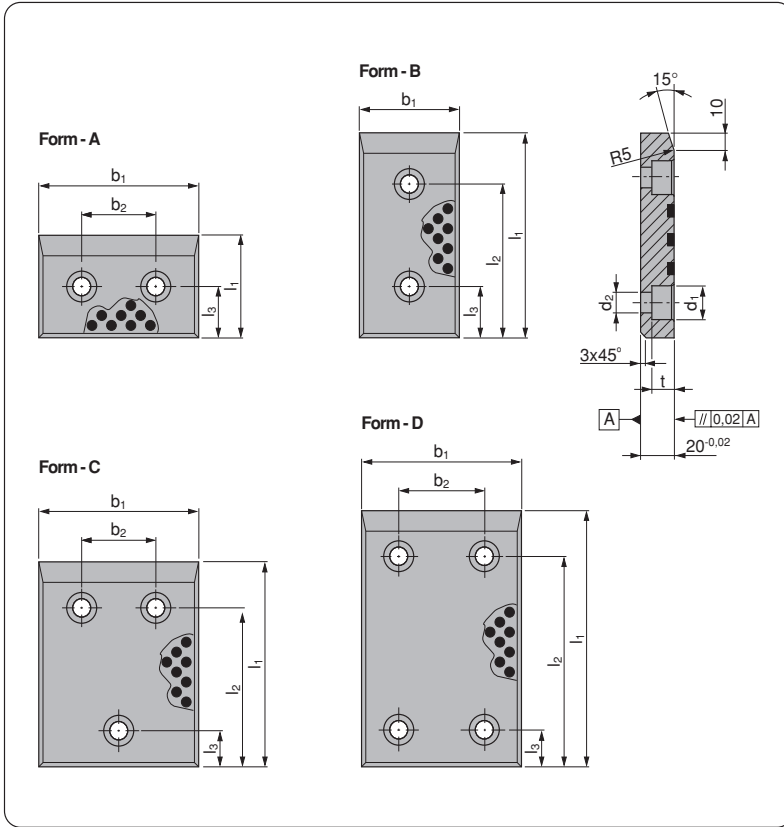


Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190



GSB CODE:G222-01

Code	b ₁	d ₁ H13	d ₂ H13	l ₁ ±0,2	l ₂ ±0,2
G222-01-030-080	30	15	9	80	55
G222-01-030-100	30	15	9	100	75
G222-01-030-125	30	15	9	125	100
G222-01-030-160	30	15	9	160	135
G222-01-030-200	30	15	9	200	175
G222-01-040-080	40	15	9	80	55
G222-01-040-100	40	15	9	100	75
G222-01-040-125	40	15	9	125	100
G222-01-040-160	40	15	9	160	135
G222-01-040-200	40	15	9	200	175
G222-01-050-080	50	15	9	80	55
G222-01-050-100	50	15	9	100	75
G222-01-050-125	50	15	9	125	100
G222-01-050-160	50	15	9	160	135
G222-01-050-200	50	15	9	200	175
G222-01-060-080	60	15	9	80	55
G222-01-060-100	60	15	9	100	75
G222-01-060-125	60	15	9	125	100
G222-01-060-160	60	15	9	160	135
G222-01-060-200	60	15	9	200	175
G222-01-080-080	80	15	9	80	55
G222-01-080-100	80	15	9	100	75
G222-01-080-125	80	15	9	125	100
G222-01-080-160	80	15	9	160	135
G222-01-080-200	80	15	9	200	175



Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion



GSB CODE:G224-01

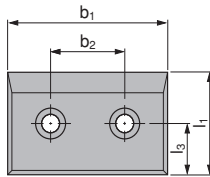
Code	Form	b ₁	b ₂	d ₁	d ₂	l ₁	l ₂	l ₃	t
				±0,2	H13	H13	±0,2	±0,2	±0,2
G224-01-050-080	B	50	-	15	9	80	55	25	9
G224-01-050-100	B	50	-	20	13,5	100	75	25	13
G224-01-050-125	B	50	-	20	13,5	125	100	25	13
G224-01-050-160	B	50	-	20	13,5	160	135	25	13
G224-01-050-200	B	50	-	20	13,5	200	175	25	13
G224-01-080-050	A	80	50	15	9	50	-	25	9
G224-01-080-080	B	80	-	20	13,5	80	55	25	13
G224-01-080-100	B	80	-	20	13,5	100	75	25	13
G224-01-080-125	B	80	-	20	13,5	125	100	25	13
G224-01-080-160	B	80	-	20	13,5	160	135	25	13
G224-01-080-200	B	80	-	20	13,5	200	175	25	13
G224-01-080-250	B	80	-	20	13,5	250	210	40	13
G224-01-080-315	B	80	-	20	13,5	315	275	40	13
G224-01-100-050	A	100	50	20	13,5	50	-	25	13
G224-01-100-080	A	100	80	20	13,5	80	-	40	13
G224-01-100-100	B	100	-	20	13,5	100	75	25	13
G224-01-100-125	B	100	-	20	13,5	125	100	25	13
G224-01-100-160	B	100	-	20	13,5	160	135	25	13
G224-01-100-200	B	100	-	20	13,5	200	175	25	13
G224-01-100-250	B	100	-	20	13,5	250	210	40	13
G224-01-100-315	B	100	-	20	13,5	315	275	40	13

Code	Form	b ₁	b ₂	d ₁	d ₂	l ₁	l ₂	l ₃	t
				±0,2	H13	H13	±0,2	±0,2	±0,2
G224-01-125-050	A	125	75	20	13,5	50	-	25	13
G224-01-125-080	A	125	75	20	13,5	80	-	40	13
G224-01-125-100	C	125	75	20	13,5	100	75	25	13
G224-01-125-125	C	125	75	20	13,5	125	100	25	13
G224-01-125-160	C	125	75	20	13,5	160	135	25	13
G224-01-125-200	C	125	75	20	13,5	200	175	25	13
G224-01-125-250	C	125	75	20	13,5	250	210	40	13
G224-01-125-315	C	125	75	20	13,5	315	275	40	13
G224-01-160-050	A	160	110	20	13,5	50	-	25	13
G224-01-160-080	A	160	110	20	13,5	80	-	40	13
G224-01-160-100	C	160	110	20	13,5	100	75	25	13
G224-01-160-125	C	160	110	20	13,5	125	100	25	13
G224-01-160-160	C	160	110	20	13,5	160	135	25	13
G224-01-160-200	C	160	110	20	13,5	200	175	25	13
G224-01-160-250	D	160	110	20	13,5	250	210	40	13
G224-01-160-315	D	160	110	20	13,5	315	275	40	13
G224-01-160-2501	C	160	110	20	13,5	250	210	40	13
G224-01-160-3151	C	160	110	20	13,5	315	275	40	13

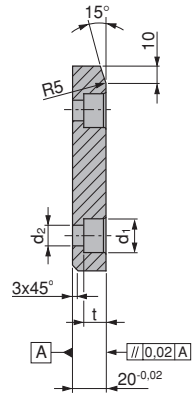
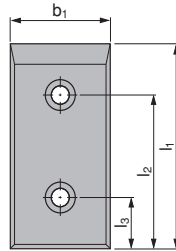


Material :
16MnCr5
HRC 60 ÷ 64

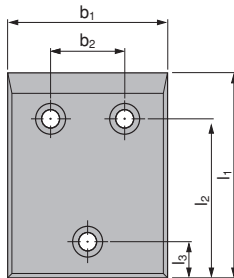
Form - A



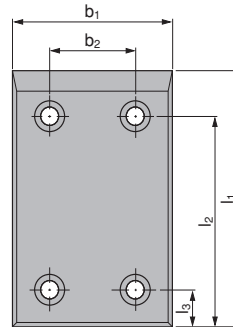
Form - B



Form - C



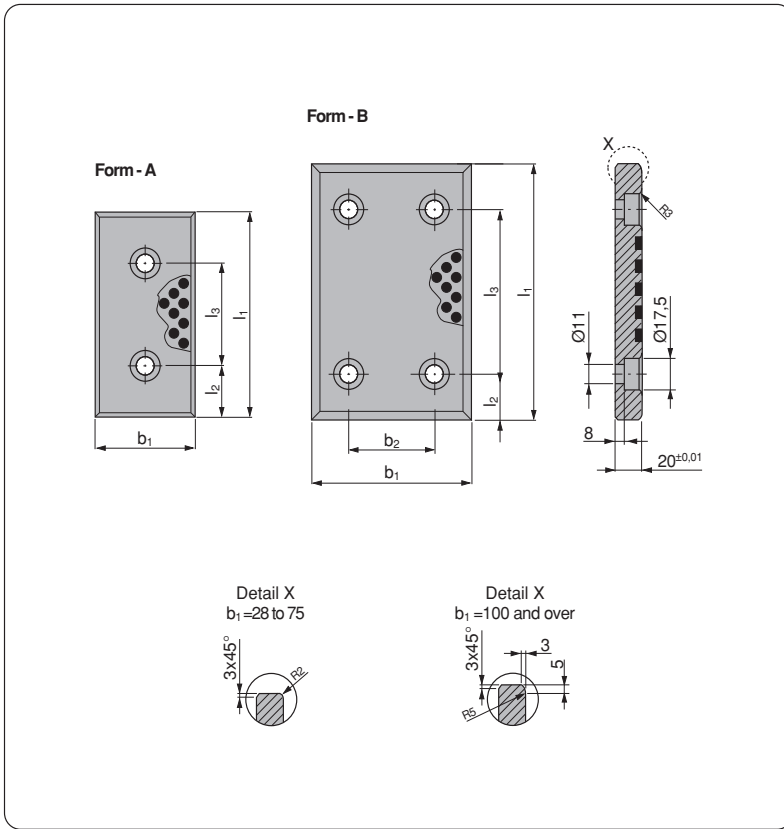
Form - D



GSB CODE:G225-01

Code	Form	b ₁	b ₂	d ₁	d ₂	l ₁	l ₂	l ₃	t
				±0,2	H13	H13	±0,2	±0,2	±0,2
G225-01-050-080	B	50	-	15	9	80	55	25	9
G225-01-050-100	B	50	-	20	13,5	100	75	25	13
G225-01-050-125	B	50	-	20	13,5	125	100	25	13
G225-01-050-160	B	50	-	20	13,5	160	135	25	13
G225-01-050-200	B	50	-	20	13,5	200	175	25	13
G225-01-080-050	A	80	50	15	9	50	-	25	9
G225-01-080-080	B	80	-	20	13,5	80	55	25	13
G225-01-080-100	B	80	-	20	13,5	100	75	25	13
G225-01-080-125	B	80	-	20	13,5	125	100	25	13
G225-01-080-160	B	80	-	20	13,5	160	135	25	13
G225-01-080-200	B	80	-	20	13,5	200	175	25	13
G225-01-080-250	B	80	-	20	13,5	250	210	40	13
G225-01-080-315	B	80	-	20	13,5	315	275	40	13
G225-01-100-050	A	100	50	20	13,5	50	-	25	13
G225-01-100-080	A	100	80	20	13,5	80	-	40	13
G225-01-100-100	B	100	-	20	13,5	100	75	25	13
G225-01-100-125	B	100	-	20	13,5	125	100	25	13
G225-01-100-160	B	100	-	20	13,5	160	135	25	13
G225-01-100-200	B	100	-	20	13,5	200	175	25	13
G225-01-100-250	B	100	-	20	13,5	250	210	40	13
G225-01-100-315	B	100	-	20	13,5	315	275	40	13

Code	Form	b ₁	b ₂	d ₁	d ₂	l ₁	l ₂	l ₃	t
				±0,2	H13	H13	±0,2	±0,2	±0,2
G225-01-125-050	A	125	75	20	13,5	50	-	25	13
G225-01-125-080	A	125	75	20	13,5	80	-	40	13
G225-01-125-100	C	125	75	20	13,5	100	75	25	13
G225-01-125-125	C	125	75	20	13,5	125	100	25	13
G225-01-125-160	C	125	75	20	13,5	160	135	25	13
G225-01-125-200	C	125	75	20	13,5	200	175	25	13
G225-01-125-250	C	125	75	20	13,5	250	210	40	13
G225-01-125-315	C	125	75	20	13,5	315	275	40	13
G225-01-160-050	A	160	110	20	13,5	50	-	25	13
G225-01-160-080	A	160	110	20	13,5	80	-	40	13
G225-01-160-100	C	160	110	20	13,5	100	75	25	13
G225-01-160-125	C	160	110	20	13,5	125	100	25	13
G225-01-160-160	C	160	110	20	13,5	160	135	25	13
G225-01-160-200	C	160	110	20	13,5	200	175	25	13
G225-01-160-250	D	160	110	20	13,5	250	210	40	13
G225-01-160-315	D	160	110	20	13,5	315	275	40	13
G225-01-160-2501	C	160	110	20	13,5	250	210	40	13
G225-01-160-3151	C	160	110	20	13,5	315	275	40	13



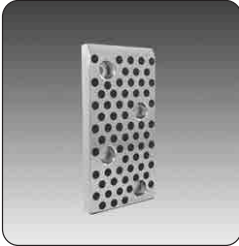
Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190



GSB CODE:G224-02

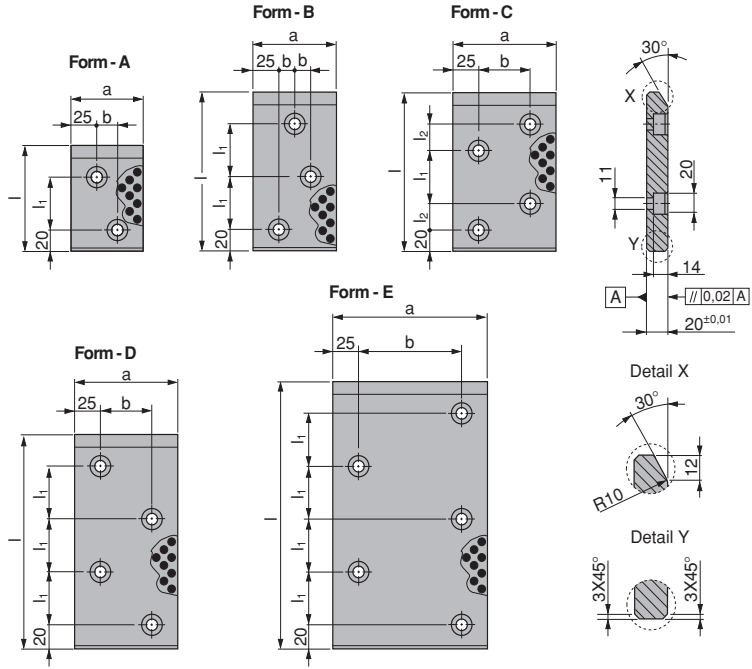
Code	Form	b ₁ -0,1 / -0,3	b ₂	l ₁ -0,1 / -0,3	l ₂	l ₃ ±0,2
G224-02-028-075	A	28	-	75	15	45
G224-02-028-100	A	28	-	100	25	50
G224-02-028-150	A	28	-	150	25	100
G224-02-038-075	A	38	-	75	15	45
G224-02-038-100	A	38	-	100	25	50
G224-02-038-150	A	38	-	150	25	100
G224-02-038-200	A	38	-	200	25	150
G224-02-048-075	A	48	-	75	15	45
G224-02-048-100	A	48	-	100	25	50
G224-02-048-125	A	48	-	125	25	75
G224-02-048-150	A	48	-	150	25	100
G224-02-048-200	A	48	-	200	25	15
G224-02-058-075	A	58	-	75	15	45
G224-02-058-100	A	58	-	100	25	50
G224-02-058-150	A	58	-	150	25	100
G224-02-075-075	A	75	-	75	15	45
G224-02-075-100	A	75	-	100	25	50
G224-02-075-125	A	75	-	125	25	75
G224-02-075-150	A	75	-	150	25	100
G224-02-075-200	A	75	-	200	25	150

Code	Form	b ₁ -0,1 / -0,3	b ₂	l ₁ -0,1 / -0,3	l ₂	l ₃ ±0,2
G224-02-100-100	B	100	50	100	25	50
G224-02-100-125	B	100	50	125	25	75
G224-02-100-150	B	100	50	150	25	100
G224-02-100-200	B	100	50	200	25	150
G224-02-100-250	B	100	50	250	25	200
G224-02-100-300	B	100	50	300	25	250
G224-02-125-125	B	125	50	125	25	75
G224-02-125-150	B	125	50	150	25	100
G224-02-125-200	B	125	50	200	25	150
G224-02-125-250	B	125	50	250	25	200
G224-02-125-300	B	125	50	300	25	250
G224-02-125-350	B	125	50	350	25	300
G224-02-150-150	B	150	100	150	25	100
G224-02-150-200	B	150	100	200	25	150
G224-02-150-250	B	150	100	250	25	200
G224-02-150-300	B	150	100	300	25	250
G224-02-150-350	B	150	100	350	25	300
G224-02-200-200	B	200	150	200	25	150
G224-02-200-250	B	200	150	250	25	200
G224-02-200-300	B	200	150	300	25	250
G224-02-200-350	B	200	150	350	25	300



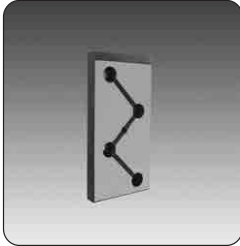
Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion

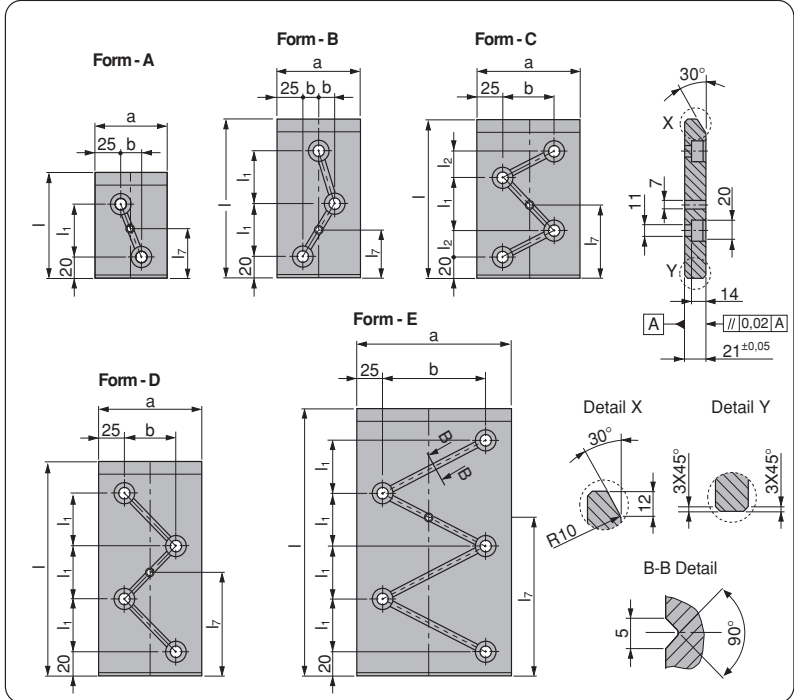


GSB CODE:G224-08

Code	Form	a	b	l	l ₁	l ₂
		-2	±0,1	±0,1	±0,1	±0,1
G224-08-070-100	A	70	20	100	50	-
G224-08-070-150	B	70	10	150	50	-
G224-08-070-200	D	70	20	200	50	-
G224-08-100-150	C	100	50	150	50	25
G224-08-100-200	D	100	50	200	50	-
G224-08-100-250	E	100	50	250	50	-
G224-08-150-200	D	150	100	200	50	-
G224-08-150-250	E	150	100	250	50	-

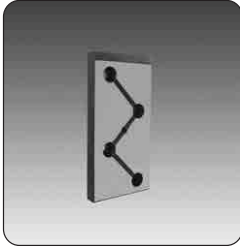


Material :
18NiCr5-4
HRC 60 ÷ 64

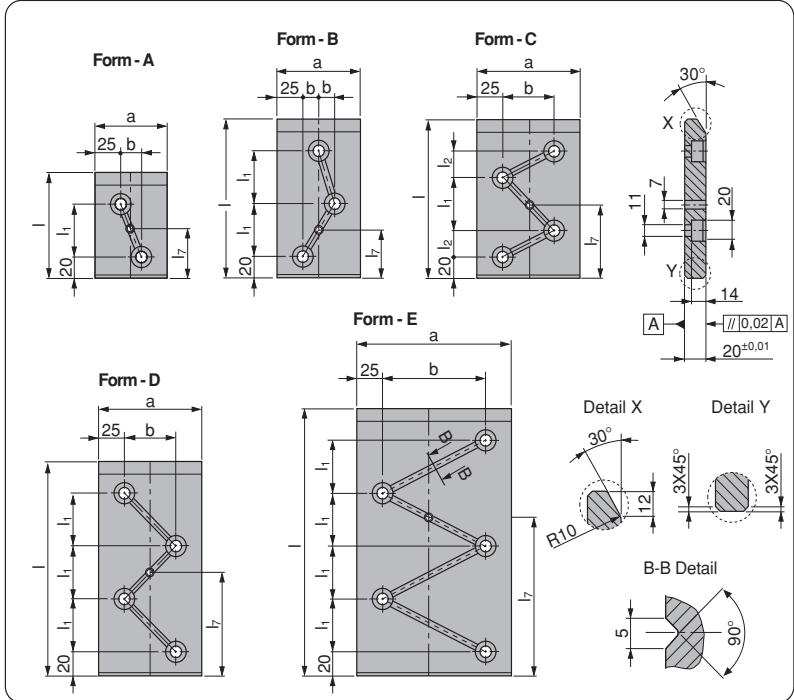


GSB CODE:G225-07

Code	Form	a	b	l	l ₁	l ₂	l ₇
		-2	±0,1	±0,1	±0,1	±0,1	
G225-07-070-100	A	70	20	100	50	-	45
G225-07-070-150	B	70	10	150	50	-	45
G225-07-070-200	D	70	20	200	50	-	95
G225-07-100-150	C	100	50	150	50	25	70
G225-07-100-200	D	100	50	200	50	-	95
G225-07-100-250	E	100	50	250	50	-	145
G225-07-150-200	D	150	100	200	50	-	95
G225-07-150-250	E	150	100	250	50	-	145



Material :
18NiCr5-4
HRC 60 ÷ 64

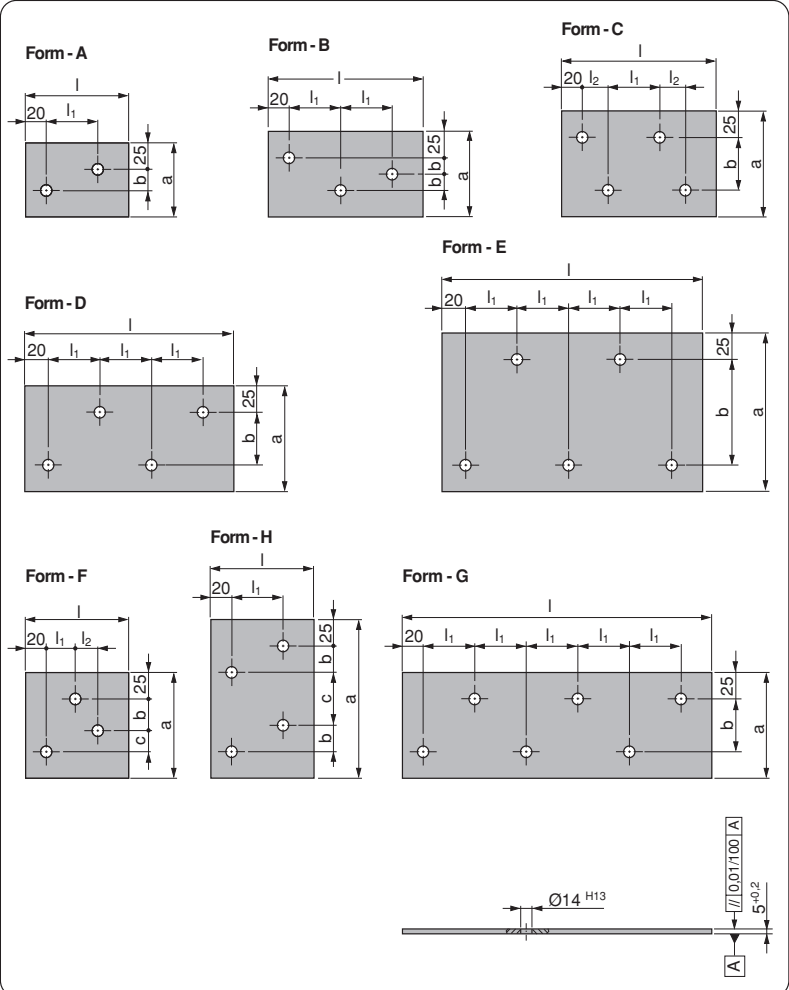


GSB CODE:G225-07

Code	Form	a	b	l	l ₁	l ₂	l ₇
G225-07-070-1001	A	70	20	100	50	-	45
G225-07-070-1501	B	70	10	150	50	-	45
G225-07-070-2001	D	70	20	200	50	-	95
G225-07-100-1501	C	100	50	150	50	25	70
G225-07-100-2001	D	100	50	200	50	-	95
G225-07-100-2501	E	100	50	250	50	-	145
G225-07-150-2001	D	150	100	200	50	-	95
G225-07-150-2501	E	150	100	250	50	-	145

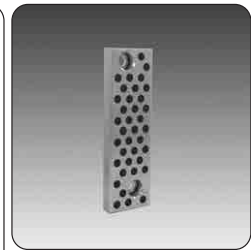
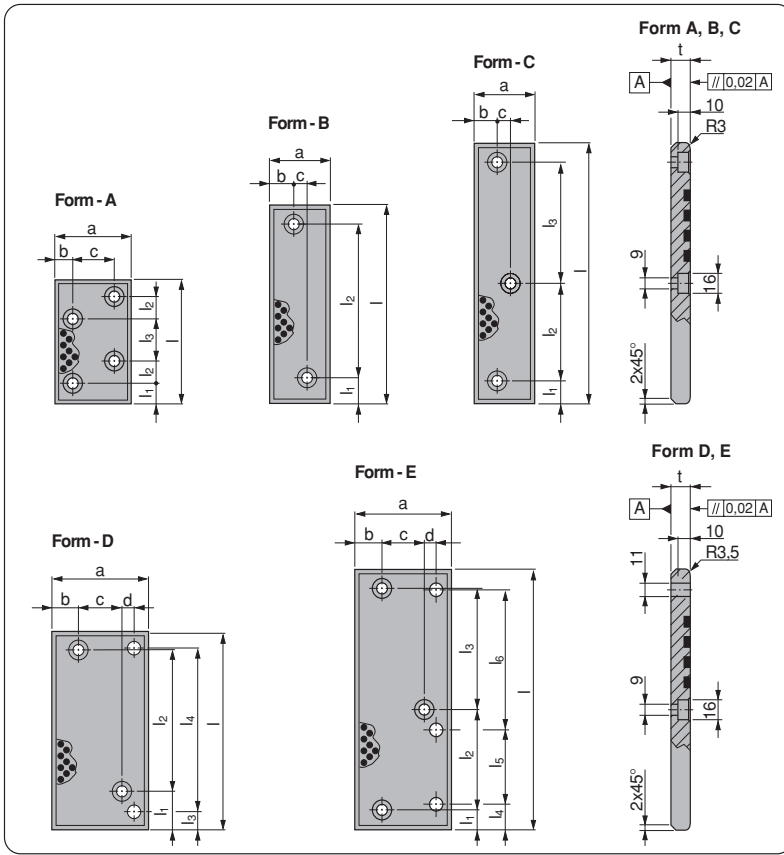


Material :
ST 37



GSB CODE:G234-01

Code	Form	a	b	c	l	l ₁	l ₂
		-2	±0,1	±0,1	±0,1	±0,1	±0,1
G234-01-070-100	A	70	20	-	100	50	-
G234-01-070-150	B	70	10	-	150	50	-
G234-01-070-200	D	70	20	-	200	50	-
G234-01-100-100	F	100	30	20	100	25	25
G234-01-100-150	C	100	50	-	150	50	25
G234-01-100-200	D	100	50	-	200	50	-
G234-01-100-250	E	100	50	-	250	50	-
G234-01-100-300	G	100	50	-	300	50	-
G234-01-150-100	H	150	25	50	100	50	-
G234-01-150-150	I	150	25	50	150	25	50
G234-01-150-200	D	150	100	-	200	50	-
G234-01-150-250	E	150	100	-	250	50	-
G234-01-150-300	G	150	100	-	300	50	-
G234-01-200-100	H	200	50	50	100	50	-

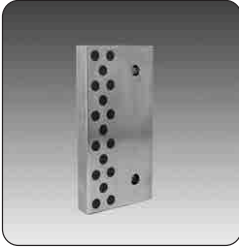


Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190



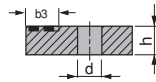
GSB CODE:G224-09

Code	Form	a	b	c	d	l	l ₁	l ₂	l ₃	l ₄	l ₅	l ₆	l ₇	t	t
G224-09-050-063	B	50	15	20	-	63	12	39	-	-	-	-	32,5	16	-
G224-09-050-160	B	50	19	12	-	160	21	126	-	-	-	-	145	-	16
G224-09-050-250	C	50	19	12	-	250	21	100	116	-	-	-	45	-	16
G224-09-063-100	A	63	12	39	-	100	15	18	34	-	-	-	70	16	-
G224-09-080-160	D	80	22	36	10	160	31	116	15	130	-	-	145	-	16
G224-09-080-250	E	80	22	36	10	250	21	100	116	25	80	130	45	-	16

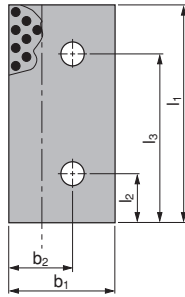


Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

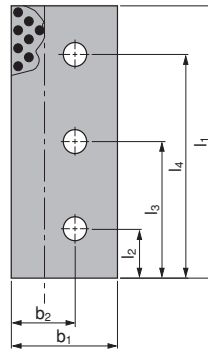
Direction of Motion



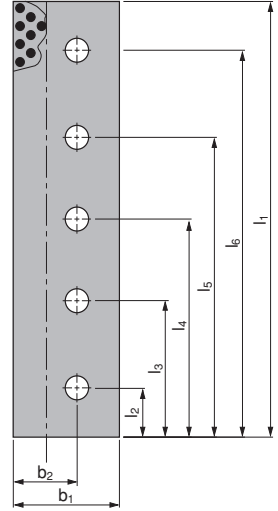
Form - A



Form - B

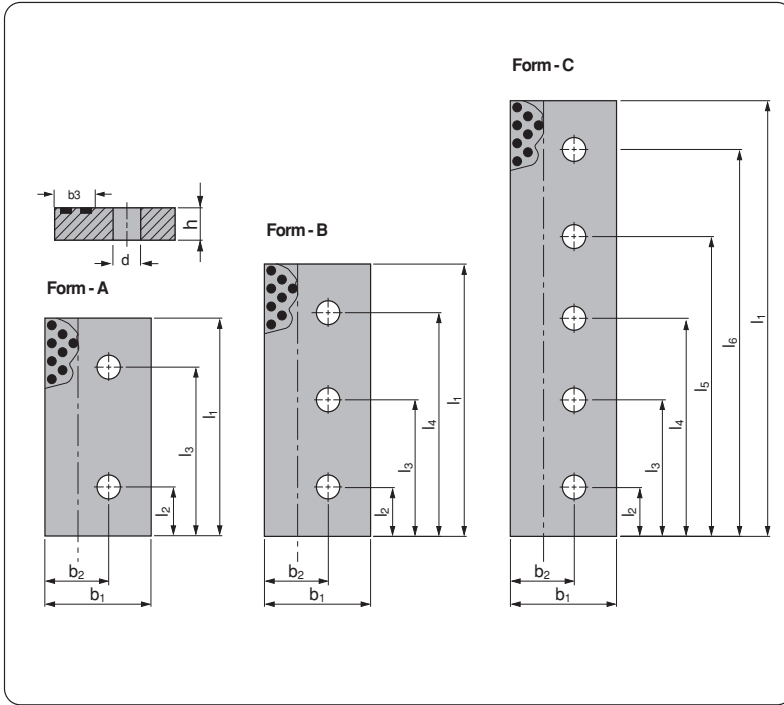


Form - C



GSB CODE:G224-11

Code	Form	b ₁	b ₂	b ₃	d	h	l ₁	l ₂	l ₃	l ₄	l ₅	l ₆
					H13			±0,2	±0,2	±0,2	±0,2	±0,2
G224-11-075-160	A	75	40	25	17,5	25	160	45	115	-	-	-
G224-11-075-200	A	75	40	25	17,5	25	200	45	155	-	-	-
G224-11-075-250	B	75	40	25	17,5	25	250	45	125	205	-	-
G224-11-100-160	A	100	60	30	17,5	25	160	45	115	-	-	-
G224-11-100-200	A	100	60	30	17,5	25	200	45	155	-	-	-
G224-11-100-250	B	100	60	30	17,5	25	250	45	125	205	-	-
G224-11-100-400	C	100	60	30	17,5	25	400	45	125	200	275	355
G224-11-100-1601	A	100	60	30	22	30	160	45	115	-	-	-
G224-11-100-2001	A	100	60	30	22	30	200	45	155	-	-	-
G224-11-100-2501	B	100	60	30	22	30	250	45	125	205	-	-
G224-11-100-4001	C	100	60	30	22	30	400	45	125	200	275	355
G224-11-125-160	A	125	75	30	22	30	160	45	115	-	-	-
G224-11-125-200	A	125	75	30	22	30	200	45	155	-	-	-
G224-11-125-250	B	125	75	30	22	30	250	45	125	205	-	-
G224-11-125-400	C	125	75	30	22	30	400	45	125	200	275	355



Material :
CK45 with Non-liquid Lubricant
HRC 58 ÷ 62

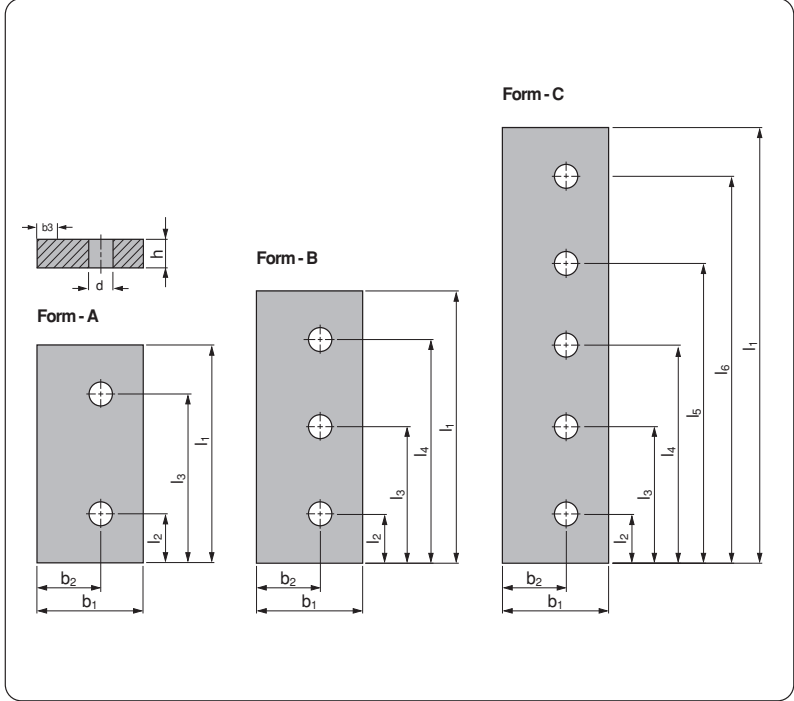


GSB CODE:G225-08

Code	Form	b ₁	b ₂	b ₃	d	h	l ₁	l ₂	l ₃	l ₄	l ₅	l ₆
G225-08-075-160	A	75	40	25	17,5	25	160	45	115	-	-	-
G225-08-075-200	A	75	40	25	17,5	25	200	45	155	-	-	-
G225-08-075-250	B	75	40	25	17,5	25	250	45	125	205	-	-
G225-08-100-160	A	100	60	30	17,5	25	160	45	115	-	-	-
G225-08-100-200	A	100	60	30	17,5	25	200	45	155	-	-	-
G225-08-100-250	B	100	60	30	17,5	25	250	45	125	205	-	-
G225-08-100-400	C	100	60	30	17,5	25	400	45	125	200	275	355
G225-08-100-1601	A	100	60	30	22	30	160	45	115	-	-	-
G225-08-100-2001	A	100	60	30	22	30	200	45	155	-	-	-
G225-08-100-2501	B	100	60	30	22	30	250	45	125	205	-	-
G225-08-100-4001	C	100	60	30	22	30	400	45	125	200	275	355
G225-08-125-160	A	125	75	30	22	30	160	45	115	-	-	-
G225-08-125-200	A	125	75	30	22	30	200	45	155	-	-	-
G225-08-125-250	B	125	75	30	22	30	250	45	125	205	-	-
G225-08-125-400	C	125	75	30	22	30	400	45	125	200	275	355

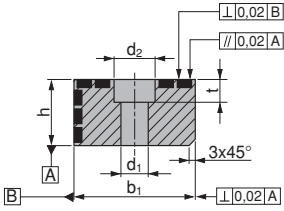


Material :
CK45
HRC 58 ÷ 62

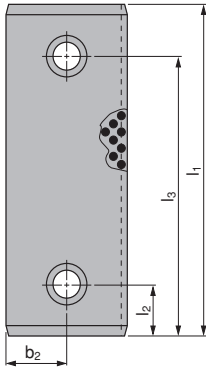


GSB CODE:G225-09

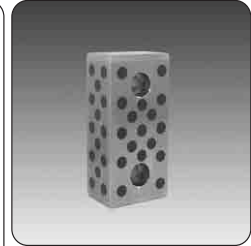
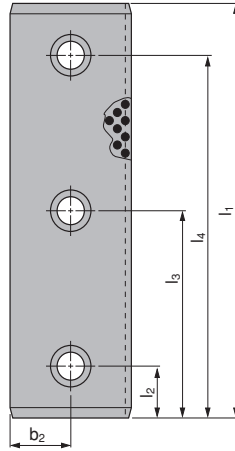
Code	Form	b_1	b_2	b_3	d H13	h	l_1	l_2 $\pm 0,2$	l_3 $\pm 0,2$	l_4 $\pm 0,2$	l_5 $\pm 0,2$	l_6 $\pm 0,2$
G225-09-075-160	A	75	40	25	17,5	25	160	45	115	-	-	-
G225-09-075-200	A	75	40	25	17,5	25	200	45	155	-	-	-
G225-09-075-250	B	75	40	25	17,5	25	250	45	125	205	-	-
G225-09-100-160	A	100	60	30	17,5	25	160	45	115	-	-	-
G225-09-100-200	A	100	60	30	17,5	25	200	45	155	-	-	-
G225-09-100-250	B	100	60	30	17,5	25	250	45	125	205	-	-
G225-09-100-400	C	100	60	30	17,5	25	400	45	125	200	275	355
G225-09-100-1601	A	100	60	30	22	30	160	45	115	-	-	-
G225-09-100-2001	A	100	60	30	22	30	200	45	155	-	-	-
G225-09-100-2501	B	100	60	30	22	30	250	45	125	205	-	-
G225-09-100-4001	C	100	60	30	22	30	400	45	125	200	275	355
G225-09-125-160	A	125	75	30	22	30	160	45	115	-	-	-
G225-09-125-200	A	125	75	30	22	30	200	45	155	-	-	-
G225-09-125-250	B	125	75	30	22	30	250	45	125	205	-	-
G225-09-125-400	C	125	75	30	22	30	400	45	125	200	275	355



Form - A



Form - B



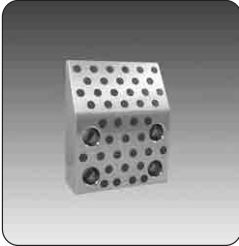
Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion



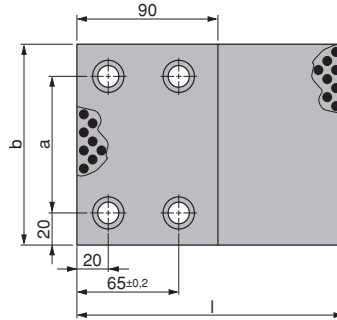
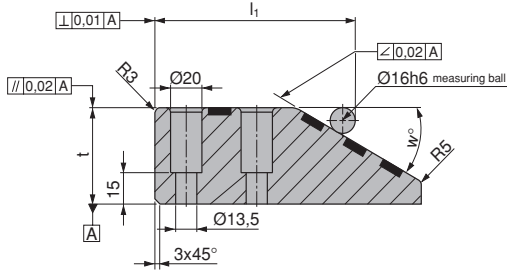
GSB CODE:G224-12

Code	Form	b ₁ -0,02	b ₂	d ₁ H13	d ₂ H13	h -0,02	l ₁	l ₂	l ₃ ±0,2	l ₄ ±0,2	t +0,5
G224-12-012-110	A	25	12,5	9	15	12	110	25	85	-	8,5
G224-12-012-120	A	25	12,5	9	15	12	120	25	95	-	8,5
G224-12-015-110	A	25	12,5	11	18	15	110	25	85	-	10,5
G224-12-015-120	A	25	12,5	11	18	15	120	25	95	-	10,5
G224-12-030-125	A	60	30	13,5	20	30	125	25	100	-	13
G224-12-030-160	A	60	30	13,5	20	30	160	25	135	-	13
G224-12-030-200	B	60	30	13,5	20	30	200	25	100	175	13
G224-12-040-125	A	60	30	13,5	20	40	125	25	100	-	13
G224-12-040-160	A	60	30	13,5	20	40	160	25	135	-	13
G224-12-040-200	B	60	30	13,5	20	40	200	25	100	175	13



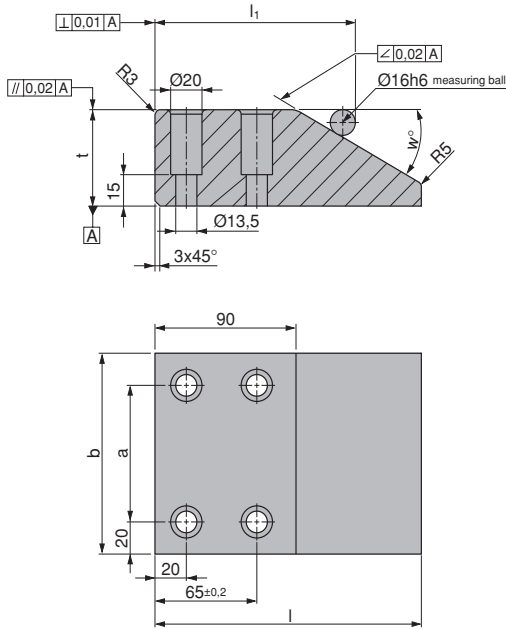
Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion



GSB CODE:G228-01

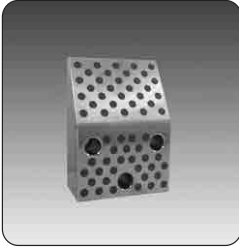
Code	a	b	l	l ₁ ±0,05	t ±0,01	w
G228-01-10017045	60	100	170	143,37	45	20°
G228-01-12517045	85	125	170	143,37	45	20°
G228-01-15017045	110	150	170	143,37	45	20°
G228-01-10015045	60	100	150	127,86	45	30°
G228-01-10017060	60	100	170	127,86	60	30°
G228-01-12515045	85	125	150	127,86	45	30°
G228-01-12517060	85	125	170	127,86	60	30°
G228-01-15015045	110	150	150	127,86	45	30°
G228-01-15017060	110	150	170	127,86	60	30°



Material :
X153CrMoV12
HRC 60 ÷ 62

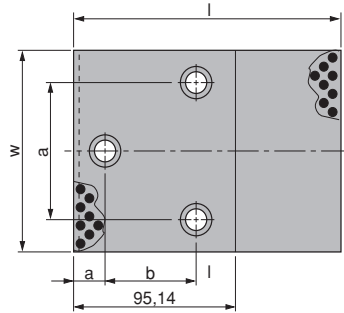
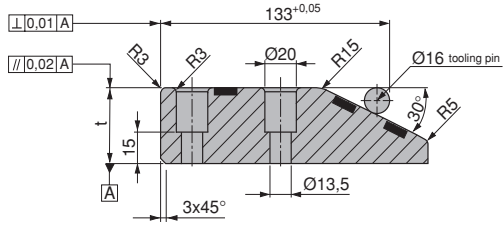
GSB CODE:G229-01

Code	a	b	l	l ₁ ±0,05	t ±0,01	w
G228-01-10017045	60	100	170	143,37	45	20°
G228-01-12517045	85	125	170	143,37	45	20°
G228-01-15017045	110	150	170	143,37	45	20°
G228-01-10015045	60	100	150	127,86	45	30°
G228-01-10017060	60	100	170	127,86	60	30°
G228-01-12515045	85	125	150	127,86	45	30°
G228-01-12517060	85	125	170	127,86	60	30°
G228-01-15015045	110	150	150	127,86	45	30°
G228-01-15017060	110	150	170	127,86	60	30°



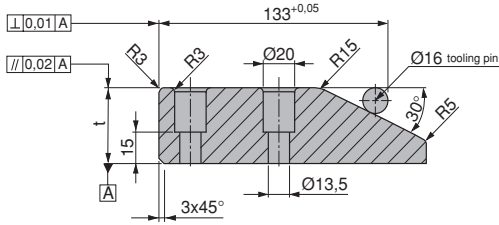
Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion



GSB CODE:G228-04

Code	t	w	l	a	b
G228-04-10012530	30	100	125	60	50
G228-04-10015045	45	100	150	60	45
G228-04-10017060	60	100	170	60	45
G228-04-12512530	30	125	125	85	50
G228-04-12515045	45	125	150	85	45
G228-04-12517060	60	125	170	85	45
G228-04-16012530	30	160	125	120	50
G228-04-16015045	45	160	150	120	45
G228-04-16017060	60	160	170	120	45



Material :
42CrMo4
HRC 55 ÷ 60

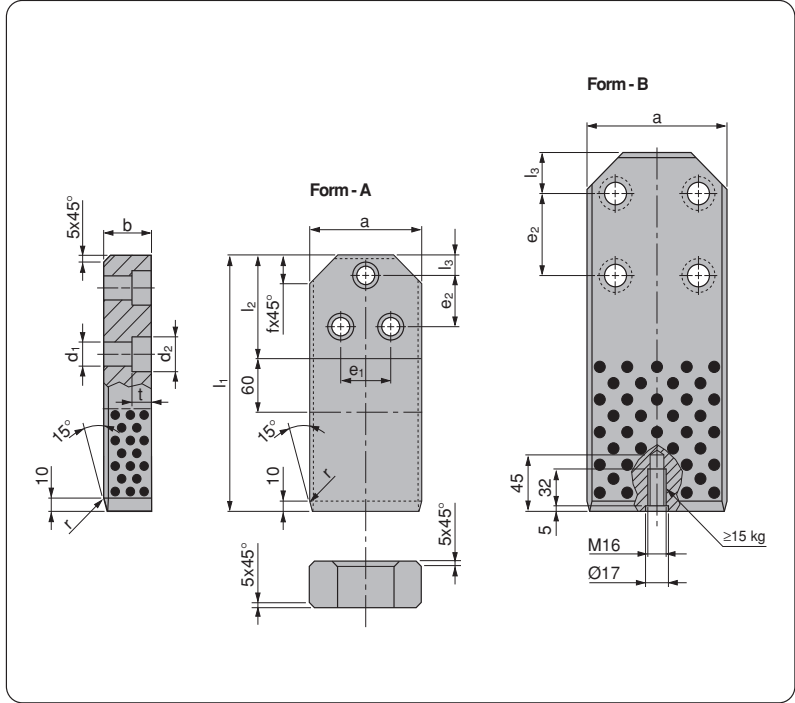
GSB CODE:G229-03

Code	t	w	l	a	b
G229-03-10012530	30	100	125	60	50
G229-03-10015045	45	100	150	60	45
G228-03-10017060	60	100	170	60	45
G229-03-12512530	30	125	125	85	50
G229-03-12515045	45	125	150	85	45
G229-03-12517060	60	125	170	85	45
G229-03-16012530	30	160	125	120	50
G229-03-16015045	45	160	150	120	45
G229-03-16017060	60	160	170	120	45



Material :
CK45 with Non-liquid Lubricant
HRC 58 ÷ 60

Direction of Motion



GSB CODE:G229-05

Code	Form	a	b	d ₁	d ₂	e ₁	e ₂	f	l ₁	l ₂	l ₃	t	r
G229-05-06318036	A	63	180	36	90	20	50	36	18	16	14	20	16
G229-05-06320036	A	63	200	36	90	20	50	36	18	16	14	20	16
G229-05-06322436	A	63	224	36	90	20	50	36	18	16	14	20	16
G229-05-07118036	A	71	180	36	90	20	50	36	18	16	14	20	16
G229-05-07120036	A	71	200	36	90	20	50	36	18	16	14	20	16
G229-05-07122436	A	71	224	36	90	20	50	36	18	16	14	20	16
G229-05-09020036	A	90	200	36	100	20	50	50	28	21	18	26	25
G229-05-09022436	A	90	224	36	100	20	50	50	28	21	18	26	25
G229-05-09025036	A	90	250	36	100	20	50	50	28	21	18	26	25
G229-05-09020045	A	90	200	45	100	20	50	50	28	21	18	26	25
G229-05-09022445	A	90	224	45	100	20	50	50	28	21	18	26	25
G229-05-09025045	A	90	250	45	100	20	50	50	28	21	18	26	25
G229-05-11220045	A	112	200	45	100	20	50	50	28	21	18	26	25
G229-05-11222445	A	112	224	45	100	20	50	50	28	21	18	26	25
G229-05-11225045	A	112	250	45	100	20	50	50	28	21	18	26	25
G229-05-14031545	B	140	315	45	150	40	80	90	36	25,5	22	33	31,5
G229-05-14040045	B	140	400	45	150	40	80	90	36	25,5	22	33	31,5
G229-05-14031556	B	140	315	56	150	40	80	90	36	25,5	22	33	31,5
G229-05-24063056	B	140	400	56	150	40	80	90	36	25,5	22	33	31,5
G229-05-14040056	B	190	315	45	150	40	80	90	36	25,5	22	33	31,5
G229-05-19031545	B	190	400	45	150	40	80	90	36	25,5	22	33	31,5
G229-05-19040045	B	190	315	56	150	40	80	90	36	25,5	22	33	31,5
G229-05-19031556	B	190	400	56	150	40	80	90	36	25,5	22	33	31,5
G229-05-19040056	B	240	500	56	250	40	160	160	36	30,5	26	40	31,5
G229-05-24050056	B	240	630	56	250	40	160	160	36	30,5	26	40	31,5



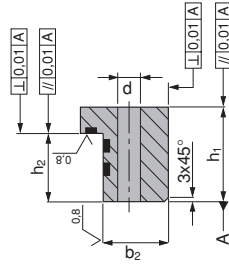
Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion

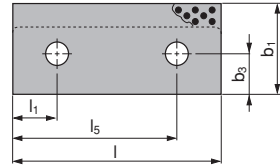
Ordering Example

G231-04-5555100X

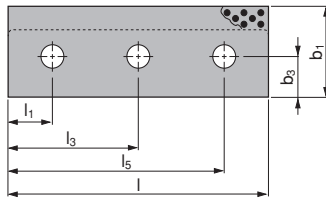
D= With Dowel Holes
Blank= Without Dowel Holes



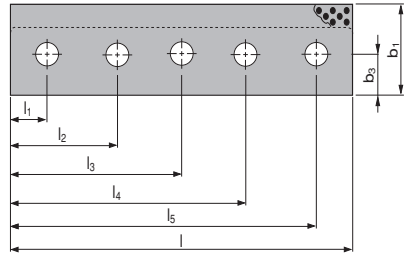
Form - A



Form - B

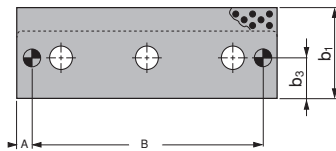


Form - C

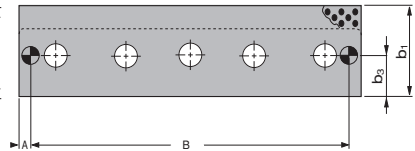


Dowel Holes Location on Request

Form - B

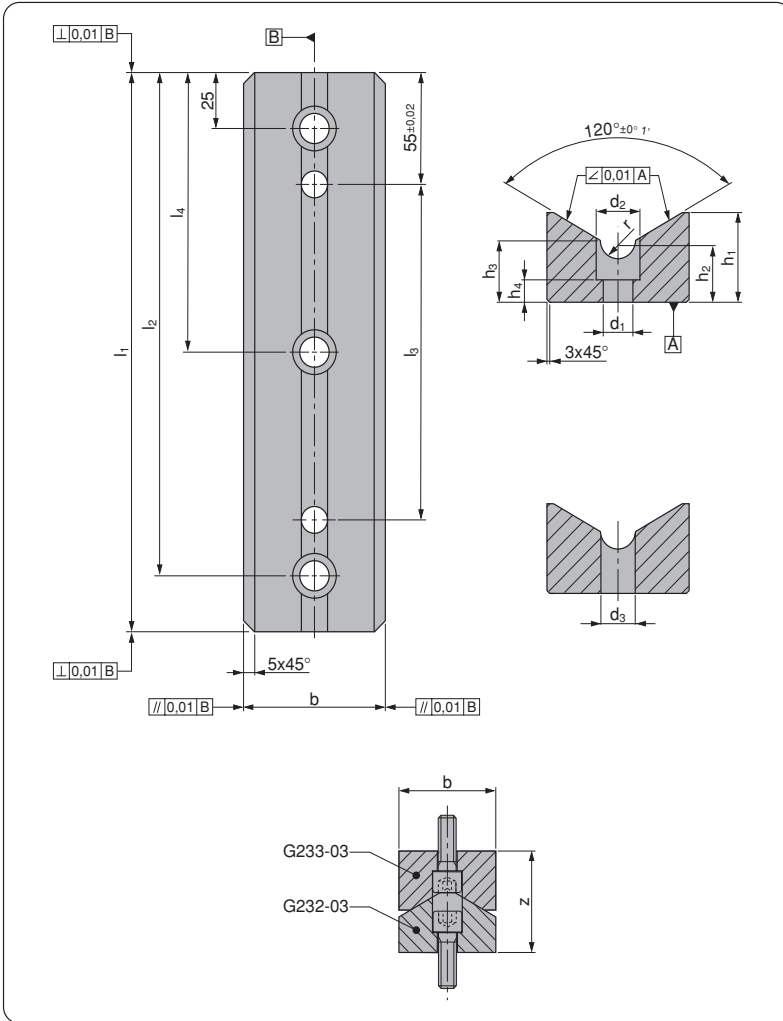


Form - C



GSB CODE:G231-04

Code	Form	b ₁ ±0,2	b ₂ -0,02	b ₃ ±0,2	d H13	l -0,2	l ₁ ±0,2	l ₂ ±0,2	l ₃ ±0,2	l ₄ ±0,2	l ₅ ±0,2	h ₁ ±0,2	h ₂ +0,02	A	B +0,02
G231-04-5555100	A	55	37	20	13,5	100	27,5	-	-	-	72,5	55	39	10	80
G231-04-5555160	A	55	37	20	13,5	160	27,5	-	-	-	132,5	55	39	10	140
G231-04-7075160	A	70	50	30	17,5	160	35	-	-	-	125	75	55	12,5	135
G231-04-7075200	A	70	50	30	17,5	200	35	-	-	-	165	75	55	12,5	175
G231-04-7075250	B	70	50	30	17,5	250	35	-	125	-	215	75	55	12,5	225
G231-04-7075400	C	70	50	30	17,5	400	35	125	200	275	365	75	55	12,5	375
G231-04-8590160	A	85	63	38	22	160	42,5	-	-	-	117,5	90	65	15	130
G231-04-8590200	A	85	63	38	22	200	42,5	-	-	-	157,5	90	65	15	170
G231-04-8590250	B	85	63	38	22	250	42,5	-	125	-	207,5	90	65	15	220
G231-04-8590400	C	85	63	38	22	400	42,5	125	200	275	357,5	90	65	15	370



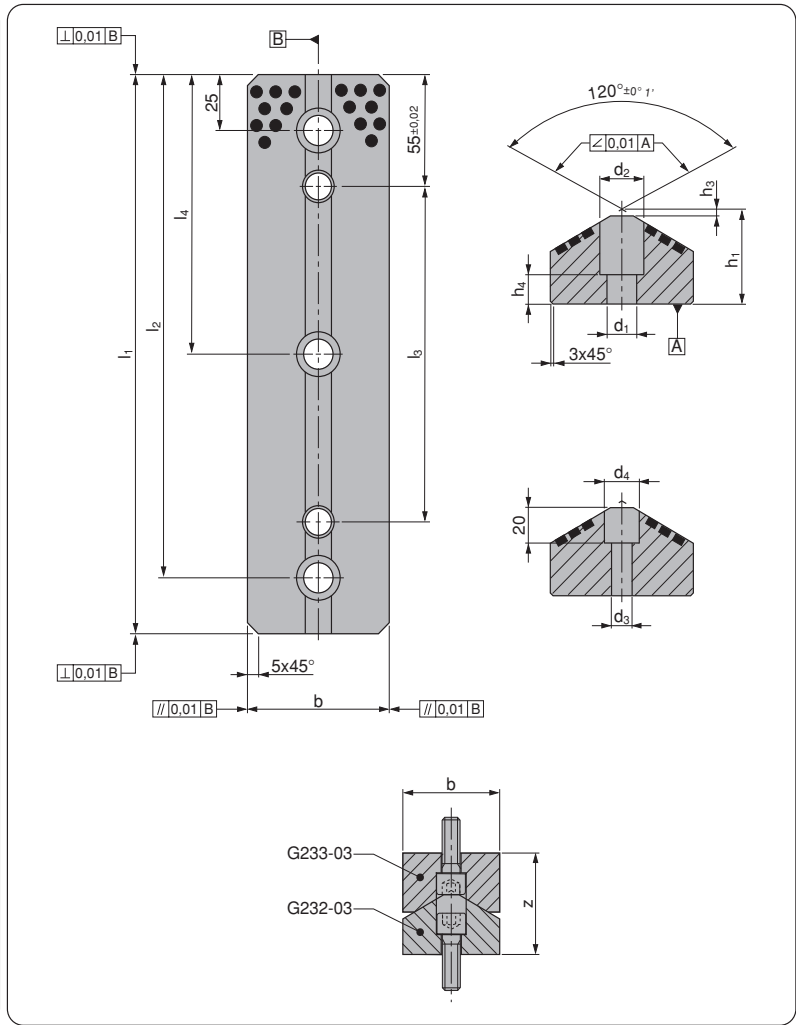
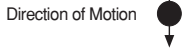
Material :
CK45
HRC 56 ÷ 60

GSB CODE:G233-03

Code	b	d ₁	d ₂	d ₃	h ₁	h ₂	h ₃	h ₄	l ₁	l ₂	l ₃	l ₄	r	z
	h6	H13	H13	H7	±0.2	±0.01	±0.2		-0.2	±0.2	±0.01	±0.2		+0.05
G233-03-0650150	65	13,5	20	12	35	18	22	8	150	125	45	-	7	65
G233-03-0650200	65	13,5	20	12	35	18	22	8	200	175	95	-	7	65
G233-03-0650250	65	13,5	20	12	35	18	22	8	250	225	145	125	7	65
G233-03-0650300	65	13,5	20	12	35	18	22	8	300	275	195	150	7	65
G233-03-1250150	125	17,5	26	16	60	28	34	15	150	125	45	-	10	85
G233-03-1250200	125	17,5	26	16	60	28	34	15	200	175	95	-	10	85
G233-03-1250250	125	17,5	26	16	60	28	34	15	250	225	145	125	10	85
G233-03-1250300	125	17,5	26	16	60	28	34	15	300	275	195	150	10	85

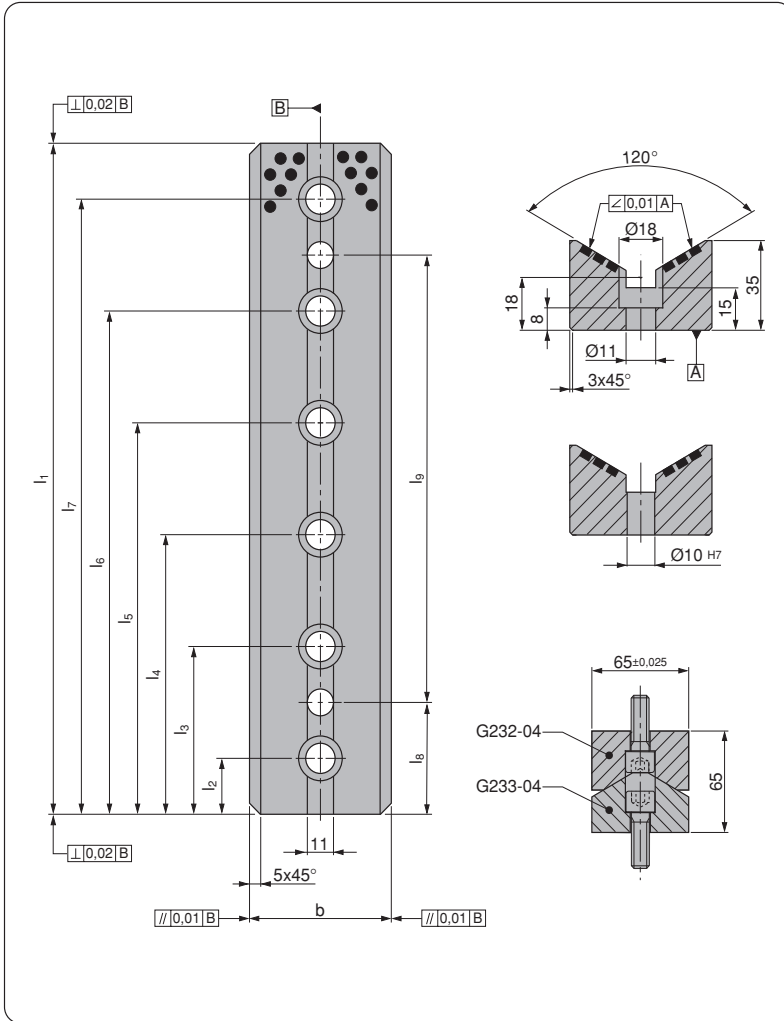


Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190



GSB CODE:G232-03

Code	b	d ₁	d ₂	d ₃	d ₄	h ₁	h ₃	h ₄	l ₁	l ₂	l ₃	l ₄	z
	h6	H13	H13	H7	H13	±0,01			-0,2	±0,2	±0,01	±0,2	+0,05
G232-03-0650150	65	13,5	20	12	14	47	3	20	150	125	45	-	65
G232-03-0650200	65	13,5	20	12	14	47	3	20	200	175	95	-	65
G232-03-0650250	65	13,5	20	12	14	47	3	20	250	225	145	125	65
G232-03-0650300	65	13,5	20	12	14	47	3	20	300	275	195	150	65
G232-03-1250150	125	17,5	26	16	18	57	5	15	150	125	45	-	85
G232-03-1250200	125	17,5	26	16	18	57	5	15	200	175	95	-	85
G232-03-1250250	125	17,5	26	16	18	57	5	15	250	225	145	125	85
G232-03-1250300	125	17,5	26	16	18	57	5	15	300	275	195	150	85



Material :
Bronze with Non-Liquid Lubricant
HB \geq 190

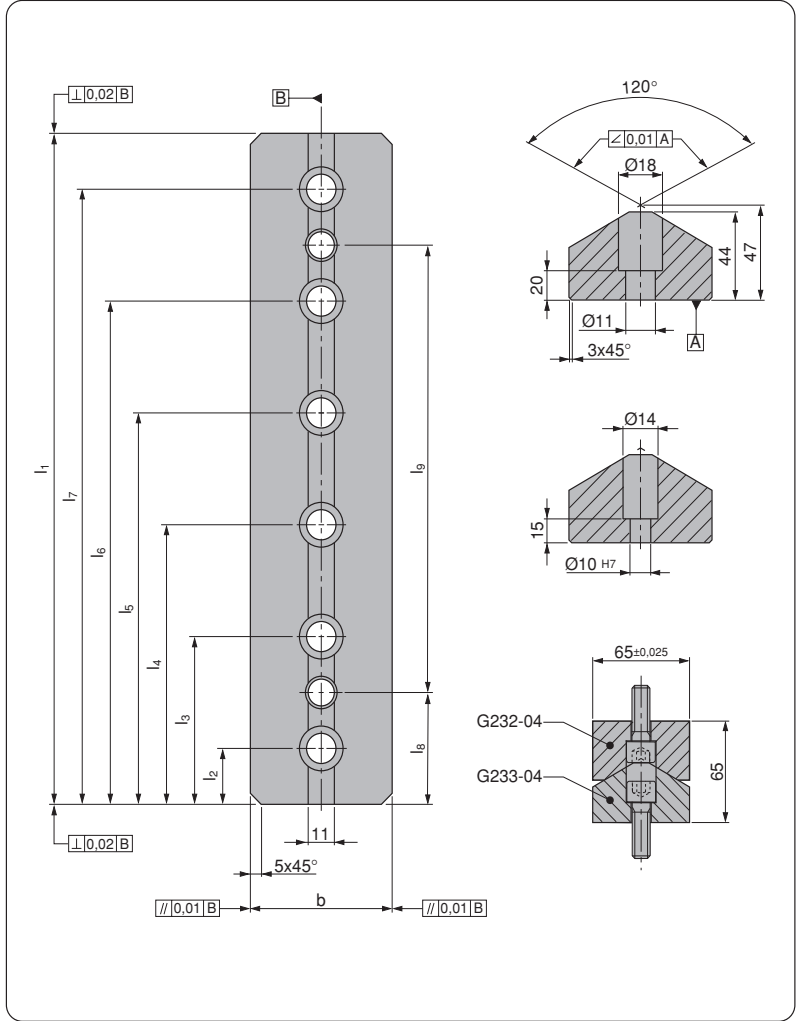
Direction of Motion

GSB CODE:G232-04

Code	b ± 0.025	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8 ± 0.02	l_9 ± 0.01
G232-04-3565100	65	100	20	80	-	-	-	-	40	20
G232-04-3565150	65	150	25	75	125	-	-	-	50	50
G232-04-3565200	65	200	25	75	125	175	-	-	50	100
G232-04-3565250	65	250	25	75	125	175	225	-	50	150
G232-04-3565300	65	300	25	75	125	175	225	275	50	200



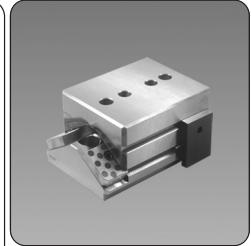
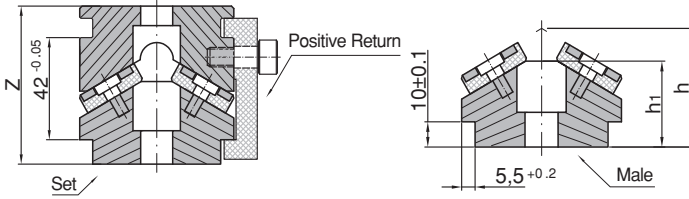
Material :
CK45
HRC 56 ÷ 60



GSB CODE:G233-04

Code	b ±0.025	l ₁	l ₂	l ₃	l ₄	l ₅	l ₆	l ₇	l ₈ ±0.02	l ₉ ±0.01
G233-04-3565100	65	100	20	80	-	-	-	-	40	20
G233-04-3565150	65	150	25	75	125	-	-	-	50	50
G233-04-3565200	65	200	25	75	125	175	-	-	50	100
G233-04-3565250	65	250	25	75	125	175	225	-	50	150
G233-04-3565300	65	300	25	75	125	175	225	275	50	200

VDI 3357



Material (U Block) :
CK45
Hardened
HRC : 60 ÷ 64

Material (V Block - Body) :

G245-01
Bronze with non-liquid
Lubricant

G245-03
Sintered Material

Direction of Motion



Screws not included.

"B" and "C" dimension is given by the customer.

Two Positive return clamp supplied with each "V" Driver Set.

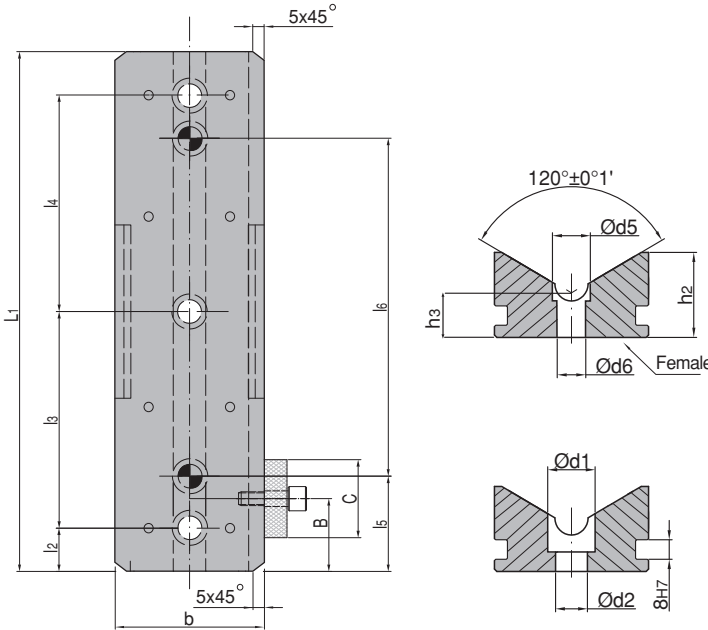
Ordering Example

G245-XX-0615-01-X-BC

Part Type
S=Set
M=Male
F=Female

Sliding Type

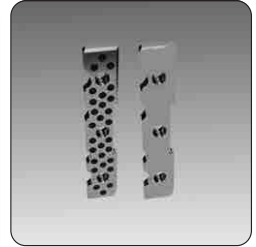
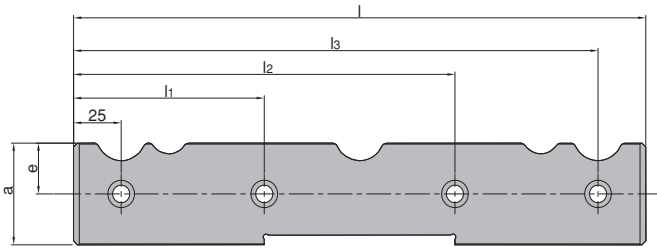
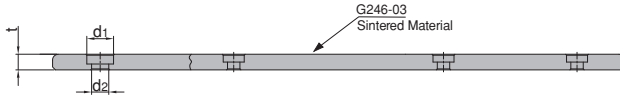
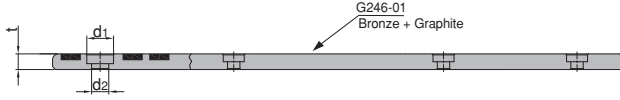
01=Bronze with non-liquid Lubricant
03=Sintered Lubricant



European patents pending.

GSB CODE:G245-XX

Code	b	d ₁	d ₂	d ₅	d ₆	l ₁	l ₂	l ₃	l ₄	l ₅	l ₆	h	h ₁	h ₂	h ₃	z
n	±0.026	H13	H13	H13	H7	-0.2	±0.2	±0.12	±0.12	±0.02	±0.01	±0.01		±0.2	±0.01	±0.05
G245-XX-0615-01-X-BC	65	20	13,5	16	12	150	25	-	100	55	45	47	34	35	18	65
G245-XX-0620-01-X-BC	65	20	13,5	16	12	200	25	-	150	55	95	47	34	35	18	65
G245-XX-0625-01-X-BC	65	20	13,5	16	12	250	25	100	100	55	145	47	34	35	18	65
G245-XX-0630-01-X-BC	65	20	13,5	16	12	300	25	125	125	55	195	47	34	35	18	65
G245-XX-1215-01-X-BC	125	26	17,5	20	16	150	25	-	100	55	45	57	44	60	28	85
G245-XX-1220-01-X-BC	125	26	17,5	20	16	200	25	-	150	55	95	57	44	60	28	85
G245-XX-1225-01-X-BC	125	26	17,5	20	16	250	25	100	100	55	145	57	44	60	28	85
G245-XX-1230-01-X-BC	125	26	17,5	20	16	300	25	125	125	55	195	57	44	60	28	85



Material :

G246-01
Bronze with non-liquid
Lubricant

G246-03
Sintered Material

Direction of Motion →

Screws not included.

Ordering Example

G246-XX-065-150-01

Sliding Type

01=Bronze with non-liquid Lubricant
03=Sintered Material

GSB CODE:G246-XX

Code	a	d ₁	d ₂	e	h	l ₁	l ₂	l ₃	t
G246-XX-065-150-01	27	11	6,5	9	4	75	-	125	8
G246-XX-065-200-01	27	11	6,5	9	4	75	125	175	8
G246-XX-065-250-01	27	11	6,5	9	4	90	160	225	8
G246-XX-065-300-01	27	11	6,5	9	4	95	205	275	8
G246-XX-125-150-01	52	14	9	22	5	75	-	125	8
G246-XX-125-200-01	52	14	9	22	5	75	125	175	8
G246-XX-125-250-01	52	14	9	22	5	90	160	225	8
G246-XX-125-300-01	52	14	9	22	5	100	200	275	8



**Die Components
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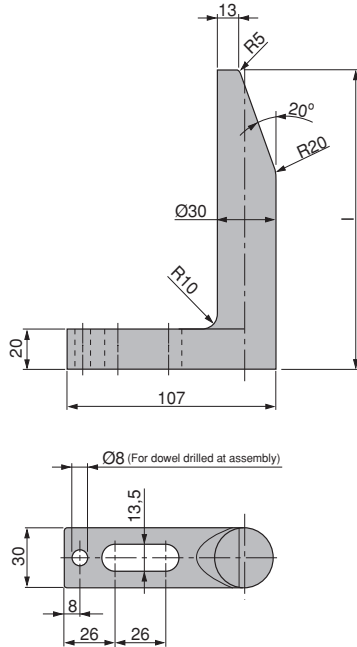
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Material :
CK45
Forged

GSB CODE:M301-00

Code	l
M301-00-065	65
M301-00-090	90
M301-00-120	120
M301-00-150	150
M301-00-180	180
M301-00-250	250
M301-00-300	300
M301-00-350	350

If special length "l" is given by the customer ($l_{max} \leq 350$ mm)

Code	l
M301-00-???	???

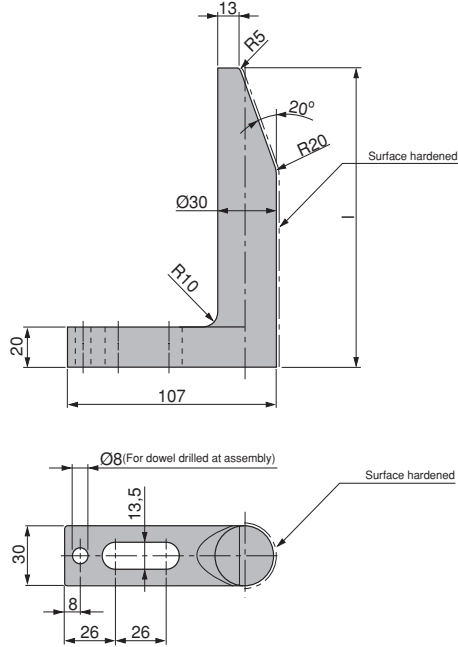
Order Example:

l=165

Order Code:**M301-00-165**



Material :
CK45
Forged
Hardened
HRC 50 ÷ 55



GSB CODE:M301-01

Code	l
M301-01-065	65
M301-01-090	90
M301-01-120	120
M301-01-150	150
M301-01-180	180
M301-01-250	250
M301-01-300	300
M301-01-350	350

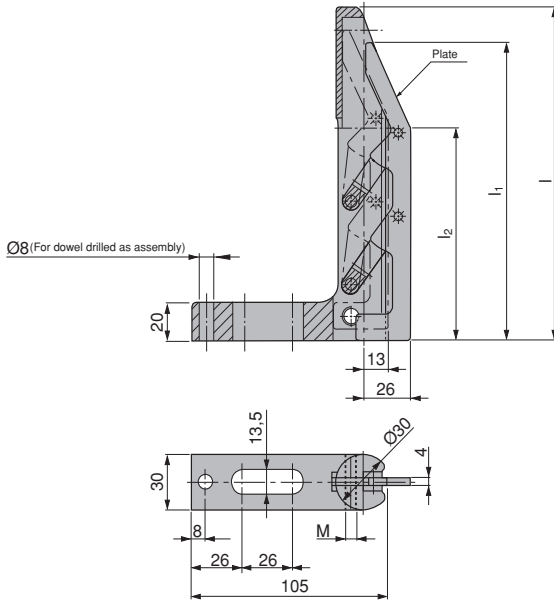
If special length "l" is given by the customer ($l_{max} \leq 350$ mm)

Code	l
M301-01-???	???

Order Example:

l=165

Order Code:**M301-01-165**



Material (Gage) :
Forged
CK45

Material (Plate) :
St 52
Hardened
HRC 58 ± 60

GSB CODE:M301-05

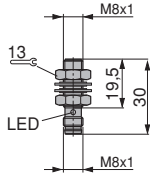
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M301-05-120-001	120	113	78	M8x1
M301-05-120-002	120	113	78	M12x1
M301-05-150-001	150	130	90	M8x1
M301-05-150-002	150	130	90	M12x1
M301-05-180-001	180	160	114	M8x1
M301-05-180-002	180	160	114	M12x1
M301-05-250-001	250	160	114	M8x1
M301-05-250-002	250	160	114	M12x1
M301-05-250-003	250	230	184	M8x1
M301-05-250-004	250	230	184	M12x1



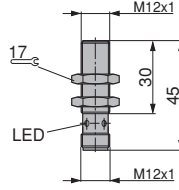
Manufactured
Balluff

SENSORS

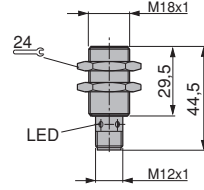
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M301-03-01-002

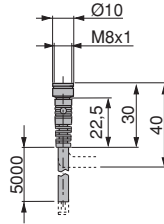


M301-03-01-003

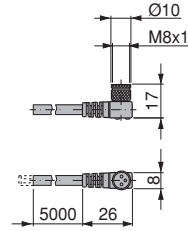


CONNECTORS

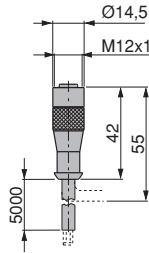
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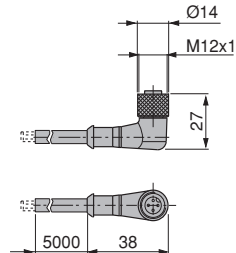
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M301-03-02-003



M301-03-02-004



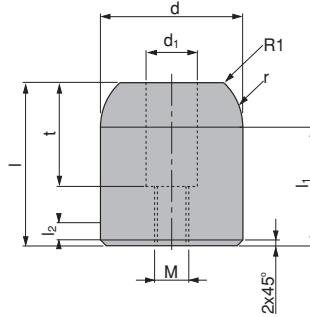
GSB CODE:M301-03

TECHNICAL DATA

Order Code	M301-03-01-001	M301-03-01-002	M301-03-01-003
Rated operational voltage U _e	24 V DC	24 V DC	24 V DC
Supply voltage U _b	10...30 V DC	10...30 V DC	10...30 V DC
No load supply current I _r max.	<9 mA	<10 mA	<8 mA
Of state current I _r	<20 \square A	50 \square A	<50 \square A
Repat accuracy R	<%5	<%5	<%5
Ambient temperature range T _a	-25...+70° C	-25...+85° C	-25...+70° C
Frequency of operating cycles f	3000 Hz	2000 Hz	1000 Hz
Degree of protection per IEC 60529	IP 68	IP 68	IP 67
Housing Material	Stainless Steel	Stainless Steel	CuZn, Nickel Plate
Connection	Connector	Connector	Connector



Material :
16MnCr5
Hardened
HRC : 60 ÷ 64

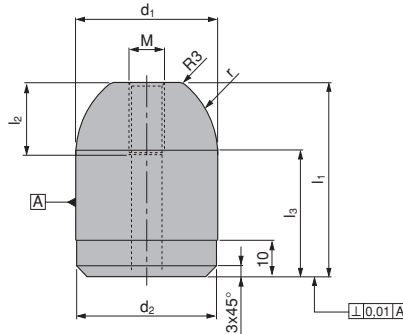


GSB CODE:M303-01

Code	d j6	d ₁ +0.2	l	l ₁	l ₂	M	r	t
M303-01-022045	22	14	45	37,5	8	M10	12,5	25
M303-01-032050	32	18	50	40	10	M12	20	35
M303-01-040055	40	18	55	40	10	M12	20	35
M303-01-050055	50	18	55	40	10	M12	20	35



Material :
16MnCr5
Hardened
HRC : 60 ÷ 64



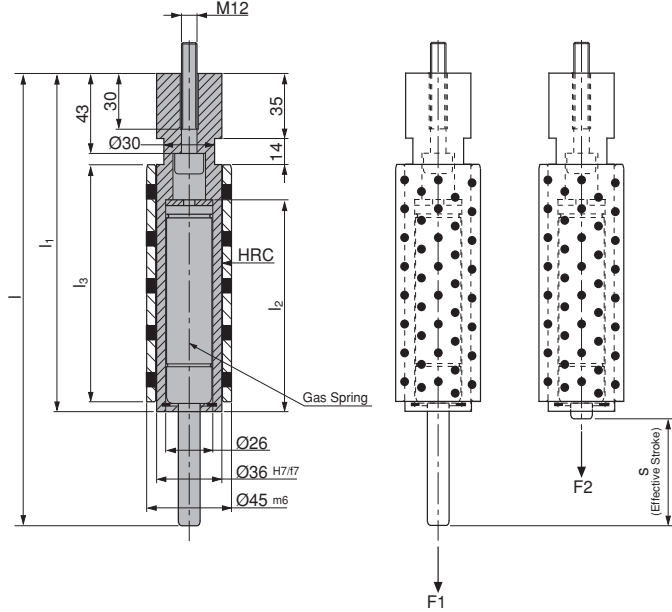
GSB CODE:M303-02

Code	d ₁ h6	d ₂ -0.05	l ₁ +0.2	l ₂ +0.2	l ₃ +0.2	M +0.2	r +0.2
M303-02-022045	22	22	45	16	35	M8	15
M303-02-022055	22	22	55	16	45	M8	15
M303-02-032050	32	32	50	20	37,5	M10	20
M303-02-040055	40	40	55	20	35	M10	25
M303-02-040065	40	40	65	20	45	M10	25
M303-02-040085	40	40	85	20	65	M10	25
M303-02-050055	50	50	55	20	41,25	M10	25
M303-02-056080	56	56	80	20	60	M10	30



Material (Sleeve):
CK45
Hardened
HRC 58 ÷ 62

Material (Bushes):
Bronze with Non-Liquid Lubricant
HB ≥ 190

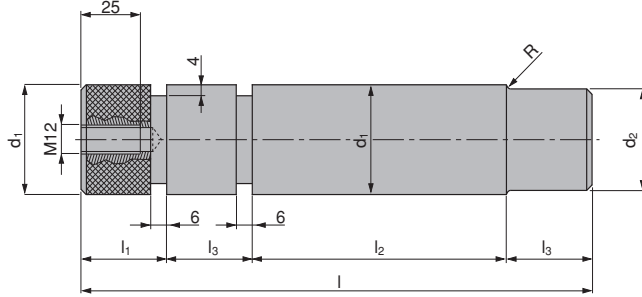


GSB CODE:M305-04

Code	F1 (daN)	F2 (daN)	l	l ₁	l ₂	l ₃	s
M305-04-50050	50	68	240	182	118	115	50
M305-04-50100	100	136	240	182	118	115	50
M305-04-50150	150	204	240	182	118	115	50
M305-04-50200	200	272	240	182	118	115	50
M305-04-65050	50	68	274	200	135	145	65
M305-04-65100	100	136	274	200	135	145	65
M305-04-65150	150	204	274	200	135	145	65
M305-04-65200	200	272	274	200	135	145	65
M305-04-80050	50	68	314	220	155	170	80
M305-04-80100	100	136	314	220	155	170	80
M305-04-80150	150	204	314	220	155	170	80
M305-04-80200	200	272	314	220	155	170	80



Material :
42CrMo5
800 ÷ 1000 N/mm²



GSB CODE:M306-03

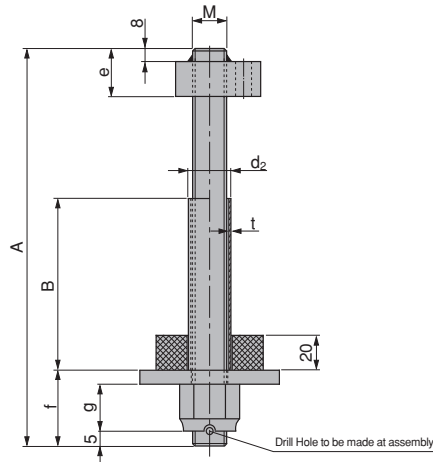
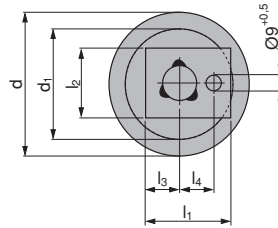
Code	d_1 e8	d_2 +0,05	l	l_1	l_2	l_3	r	Dynamic load (kg)
M306-03-032130	32	29	130	22	58	25	4	500
M306-03-032147	32	29	147	22	75	25	4	500
M306-03-040171	40	37	171	32	75	32	5	750
M306-03-040191	40	37	191	32	95	32	5	750
M306-03-050207	50	47	207	32	95	40	6	1250
M306-03-050232	50	47	232	32	120	40	6	1250
M306-03-063252	63	60	252	32	120	50	6	2500
M306-03-063287	63	60	287	32	155	50	6	2500



Material (Sleeve):
Steel Grade 8.8
Elastomer 92 Sh

A and B are given by the customer.

Respect the max. load.



GSB CODE:M307-01

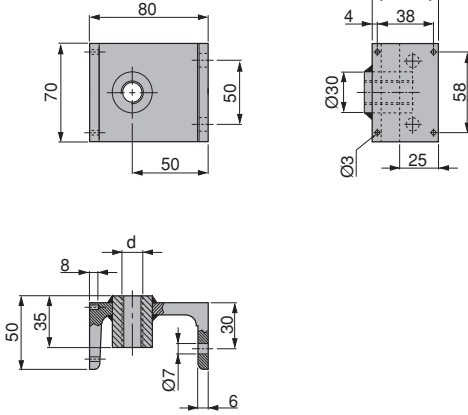
Code	M	d	d ₁	d ₂	e	f	g	l ₁	l ₂	l ₃	l ₄ ±0.5	t	Max. Load (Kg)
M307-01-16AAABBB	M16	65	50	22	28	30	19	50	35	20	20	2	250
M307-01-20AAABBB	M20	82	63	25	28	35	22	50	40	20	20	2	450
M307-01-24AAABBB	M24	105	80	30	28	42	27	50	45	20	20	2.5	750
M307-01-30AAABBB	M30	130	100	38	33	50	33	63	50	28	26	3.5	1250

Order Example:

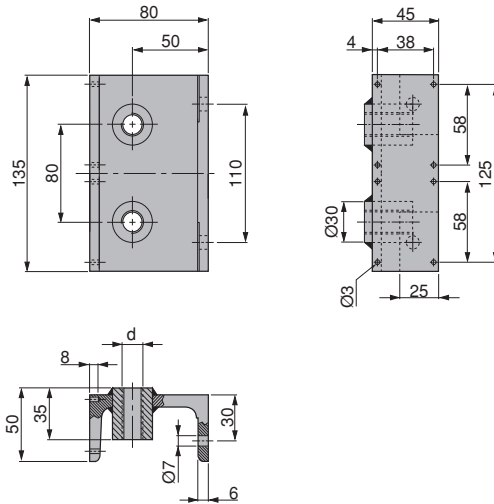
M=20, A= 247 and B=110

Order Code:**M307-01-20-247110**

Form - A



Form - B



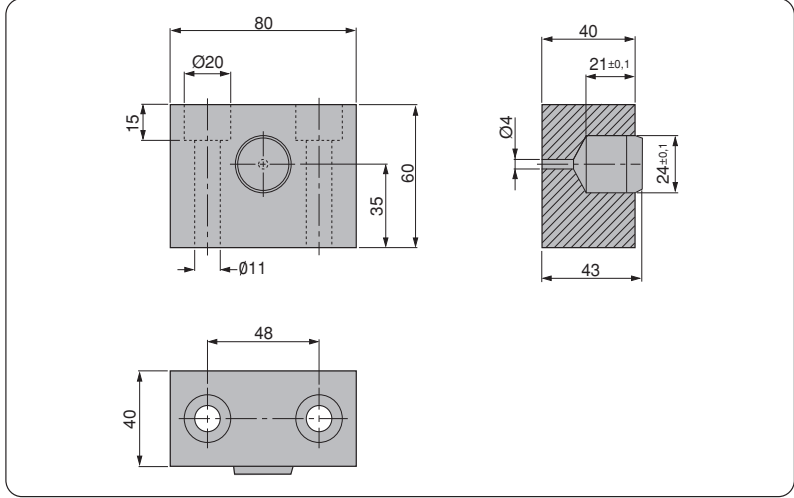
Material :
St 37

GSB CODE:M308-07

Code	Form	d
M308-07-080070	A	G 3/8"
M308-07-080135	B	G 1/4"



Material :
CK45
Elastomer 92 Sh



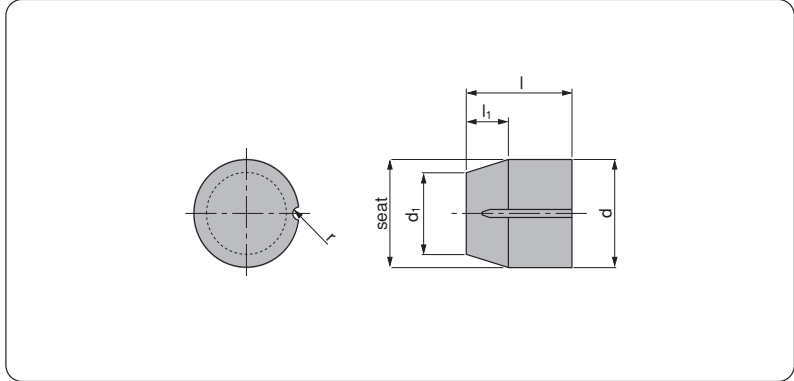
GSB CODE:M309-02

Code

M309-02-040080



Material :
Elastomer 92 Shore



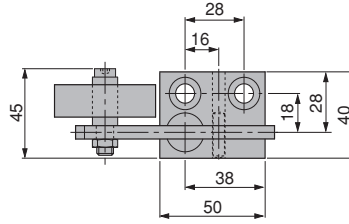
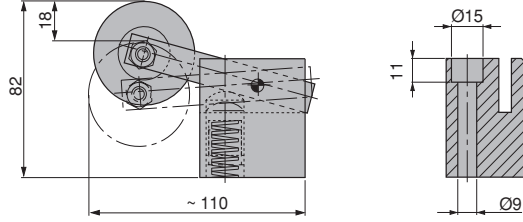
GSB CODE:S511-01

Code	d +0.3 / +0.5	d ₁	l	l ₁	r	F max. (N)	seat ±0,1
S511-01-006	6	3,6	10	4,5	-	100	6
S511-01-010	10	6	15	7,5	1	450	10
S511-01-016	16	9,5	25	12	1,5	1500	16
S511-01-024	24	18	25	10	2	3000	24
S511-01-040	40	30	40	16	3	25000	40

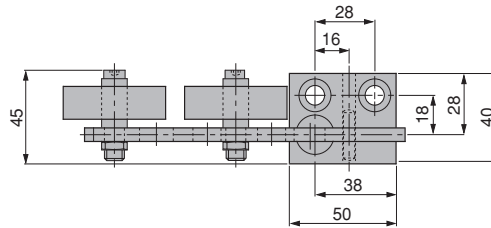
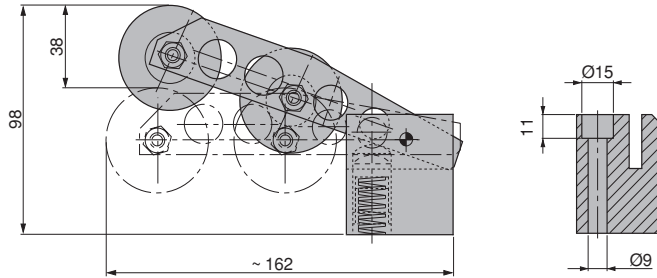


Material :
Steel

Form - A



Form - B



GSB CODE:M310-01

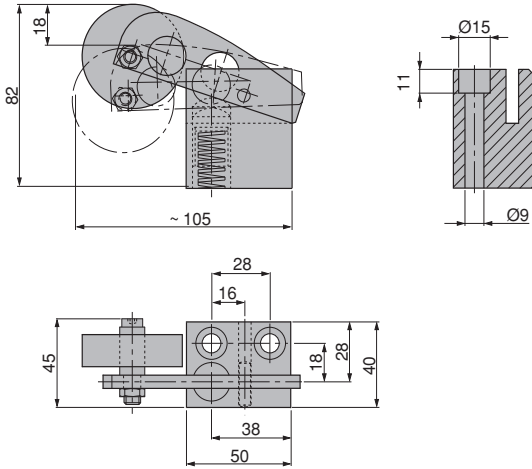
Code Form

M310-01-001 A

M310-01-002 B



Form - C



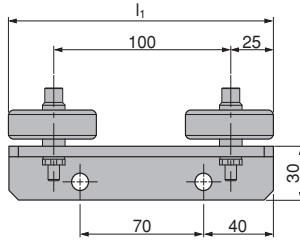
Material :
Steel

GSB CODE:M310-01

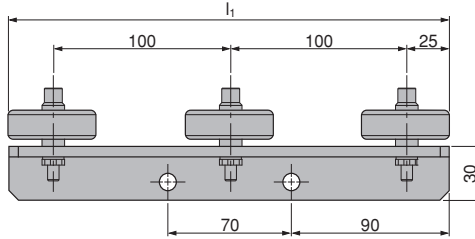
Code	Form
M310-01-003	C



Material :
Steel

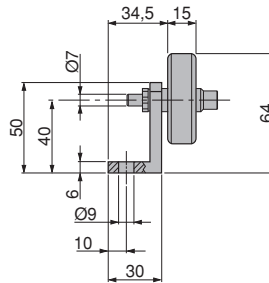
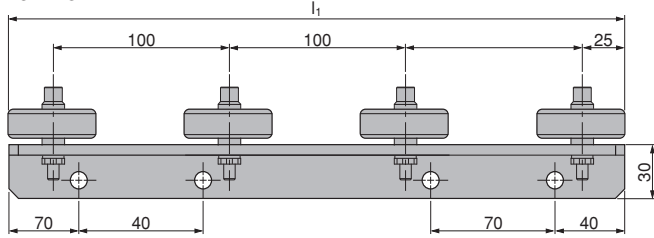


Form - B



Form - C

Form - A

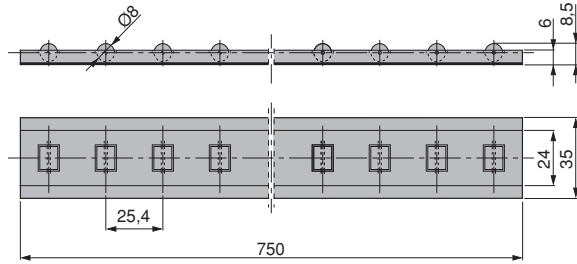


GSB CODE:M310-08

Code	Form	l_1
M310-08-064-150	A	150
M310-08-064-250	B	250
M310-08-064-350	C	350



Material :
Steel



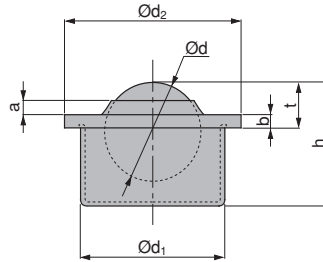
GSB CODE:M310-03

Code

M310-03-35750

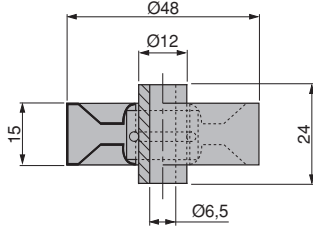


Material :
Steel



GSB CODE:M310-04

Code	a	b	d	d ₁	h	t	Load (KG)
M310-04-0015	3,5	2,8	15	24 ±0,065	21,5	9,5 ±0,2	50
M310-04-0030	4,3	4,0	30	45 ±0,080	37,5	13,8 ±0,3	250

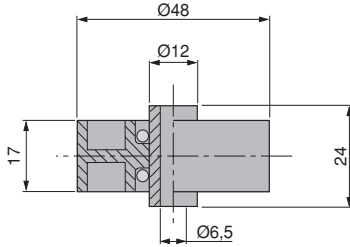


Material :
Steel

GSB CODE:M310-05

Code

M310-05-001



Material :
Polypropylene

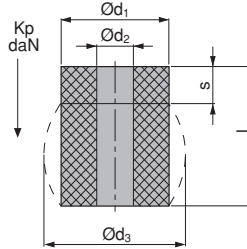
GSB CODE:M310-06

Code

M310-06-001

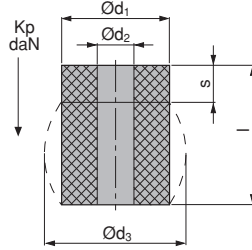


Material :
Elastomer 92 Sh



GSB CODE:S514-192

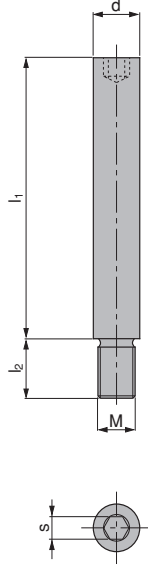
Code	d_1	d_2	l	s	Max. Deflection %30	d_3	K_p daN
S514-192-0160016	16	6,5	16	4,8		19	130
S514-192-0160020	16	6,5	20	6		19	130
S514-192-0160025	16	6,5	25	8		19	130
S514-192-0160032	16	6,5	32	10		19	130
S514-192-0200016	20	8,5	16	5		26	200
S514-192-0200020	20	8,5	20	6		26	200
S514-192-0200025	20	8,5	25	8		26	200
S514-192-0200032	20	8,5	32	10		26	200
S514-192-0200040	20	8,5	40	12		26	200
S514-192-0250016	25	10,5	16	5		30	300
S514-192-0250020	25	10,5	20	6		30	300
S514-192-0250025	25	10,5	25	8		30	300
S514-192-0250032	25	10,5	32	10		30	300
S514-192-0250040	25	10,5	40	12		30	300
S514-192-0250050	25	10,5	50	15		30	300
S514-192-0320016	32	13,5	16	5		41	580
S514-192-0320020	32	13,5	20	6		41	580
S514-192-0320025	32	13,5	25	8		41	580
S514-192-0320032	32	13,5	32	10		41	580
S514-192-0320040	32	13,5	40	12		41	580
S514-192-0320050	32	13,5	50	15		41	580
S514-192-0320063	32	13,5	63	19		41	580
S514-192-0400020	40	13,5	20	6		50	1200
S514-192-0320025	40	13,5	25	8		50	1200
S514-192-0320032	40	13,5	32	10		50	1200
S514-192-0320040	40	13,5	40	12		50	1200
S514-192-0320050	40	13,5	50	15		50	1200
S514-192-0320063	40	13,5	63	19		50	1200
S514-192-0320080	40	13,5	80	24		50	1200
S514-192-0500025	50	17	25	8		62	1700
S514-192-0500032	50	17	32	10		62	1700
S514-192-0500040	50	17	40	12		62	1700
S514-192-0500050	50	17	50	15		62	1700
S514-192-0500063	50	17	63	19		62	1700
S514-192-0500080	50	17	80	24		62	1700
S514-192-0500100	50	17	100	30		62	1700



Material :
Elastomer 92 Sh

GSB CODE:S514-192

Code	d ₁	d ₂	l	s	Max. Deflection 30%	
					d ₃	Kp daN
S514-192-0630032	63	17	32	10	78	2500
S514-192-0630040	63	17	40	12	78	2500
S514-192-0630050	63	17	50	15	78	2500
S514-192-0630063	63	17	63	19	78	2500
S514-192-0630080	63	17	80	24	78	2500
S514-192-0630100	63	17	100	30	78	2500
S514-192-0630125	63	17	125	38	78	2500
S514-192-0800040	80	21	40	12	98	4300
S514-192-0800050	80	21	50	15	98	4300
S514-192-0800063	80	21	63	19	98	4300
S514-192-0800080	80	21	80	24	98	4300
S514-192-0800100	80	21	100	30	98	4300
S514-192-0800125	80	21	125	38	98	4300
S514-192-0800160	80	21	160	48	98	4300
S514-192-1000050	100	21	50	15	120	6500
S514-192-1000063	100	21	63	19	120	6500
S514-192-1000080	100	21	80	24	120	6500
S514-192-1000100	100	21	100	30	120	6500
S514-192-1000125	100	21	125	38	120	6500
S514-192-1000160	100	21	160	48	120	6500
S514-192-1250063	125	27	63	19	152	10500
S514-192-1250080	125	27	80	24	152	10500
S514-192-1250100	125	27	100	30	152	10500
S514-192-1250125	125	27	125	37,5	152	10500
S514-192-1250160	125	27	160	48	152	10500
S514-192-1250200	125	27	200	60	152	10500

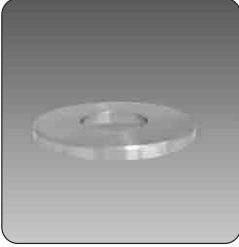


Material :
CK45

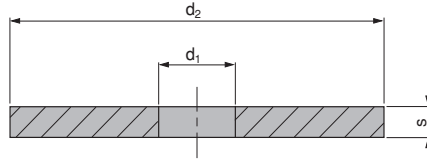
Order Example:
M=10, l₁= 50
Order Code: M311-05-10050

GSB CODE: M311-05

d	M	l ₁										l ₂	s	
6	M4	20	25	32	-	-	-	-	-	-	-	-	6	3
8	M6	20	25	32	40	50	-	-	-	-	-	-	9	4
10	M8	20	25	32	40	50	63	-	-	-	-	-	15	5
13	M10	-	-	32	40	50	63	80	95	-	-	-	15	6
16	M12	-	-	32	40	50	63	80	95	118	140	-	18	8
20	M16	-	-	32	40	50	63	80	95	118	140	-	25	10
25	M20	-	-	32	40	50	63	80	95	118	140	180	30	14

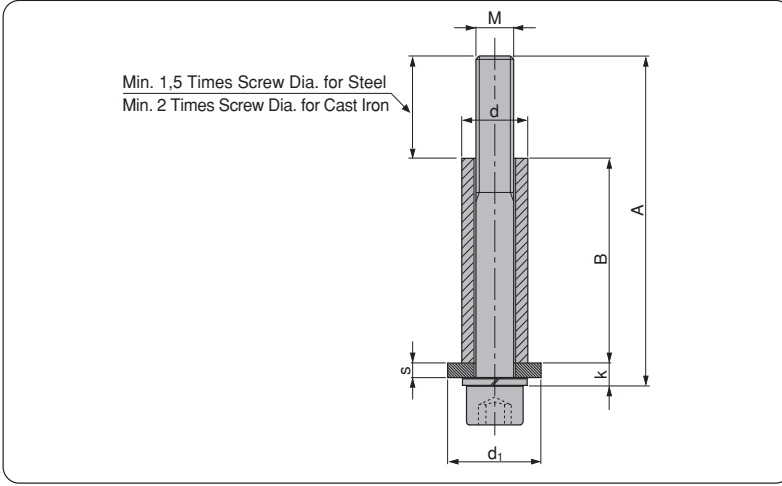


Material :
CK45



GSB CODE:M313-04

Code	d ₁	d ₂	s	Elastomer Ø
M313-04-020004	20	6,5	4	16
M313-04-025004	25	8,5	4	20
M313-04-030005	30	10,5	5	25
M313-04-040005	40	13,5	5	32
M313-04-050005	50	13,5	5	40
M313-04-060006	60	16,5	6	50
M313-04-080006	80	16,5	6	63
M313-04-100008	100	20,5	8	80
M313-04-120008	120	20,5	8	100
M313-04-150008	150	26	8	125



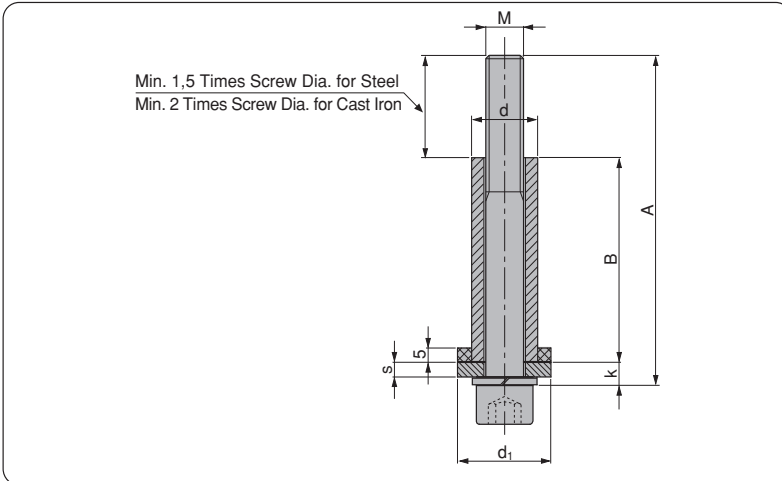
Material :
Steel
Screw DIN 912 8.8

A and B are given by the customer.

Order Example:
M=12, A= 110 and B=76
Order Code:M312-03-12110076

GSB CODE:M312-03

Code	d	d ₁	k	M	s	Max. Load (KG)
M312-03-10AAABBB	16x2,5	25	6,5	M10	4	100
M312-03-12AAABBB	20x3,5	30	8,5	M12	6	150
M312-03-16AAABBB	28x5,5	40	9,5	M16	6	250



Material :
Screw DIN 912 8.8
Steel and Elastomer 92 Sh.

A and B are given by the customer.

Order Example:
M=12, A= 110 and B=76
Order Code:M312-08-12110076

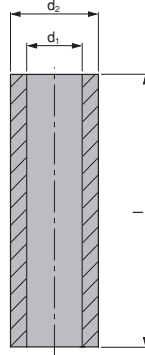
GSB CODE:M312-08

Code	d	d ₁	k	M	s	Max. Load (KG)
M312-08-10AAABBB	16x2,5	32	6,5	M10	4	100
M312-08-12AAABBB	20x3,5	36	8,5	M12	6	150
M312-08-16AAABBB	28x5,5	45	9,5	M16	6	250



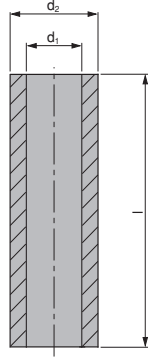
Material :
St 037

Order Example:
 $d_2=20, l=120$
Order Code: **M313-01-020120**



GSB CODE:M313-01

d_1	d_2	Screw				l		
9	13	M8	40	50	63	-	-	-
11	16	M10	40	50	63	-	100	-
13	20	M12	-	50	63	80	100	125
17	25	M16	-	-	63	80	100	125
22	30	M20	-	-	-	80	-	125
26	36	M24	-	-	-	80	100	125



Material :
St 037

Surface hardened.

Order Example:
 $d_2=20, l=120$
Order Code: **M313-02-020120**

GSB CODE:M313-02

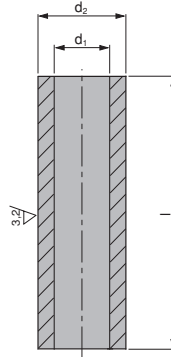
d_1	d_2	Screw				l			
9	13	M8	50	63	-	100	-	-	-
11	16	M10	50	63	80	100	125	-	200
13	20	M12	50	63	80	100	125	-	200
17	25	M16	50	63	80	100	125	150	200
22	30	M20	50	63	80	100	125	150	200
26	36	M24	-	-	80	100	125	150	200
32	42	M30	-	-	-	-	-	150	200



Material :
St 037

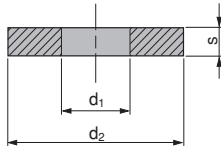
HRC 62 ÷ 65

Order Example:
 $d_2=20, l=120$
Order Code: **M313-03-020120**



GSB CODE: M313-03

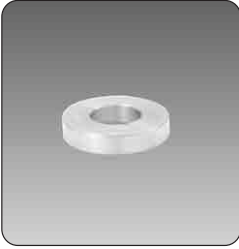
d ₁	d ₂	Screw	l ±0,1													
7	10	M6	20	30	40	50	-	63	-	80	-	-	-	-	-	-
9	12,5	M8	20	30	40	50	-	63	-	80	-	100	-	-	-	-
9	13	M8	20	30	40	50	-	63	-	80	-	100	-	-	-	-
11	16	M10	-	30	40	50	60	63	-	80	-	100	125	-	160	200
13	19	M12	-	30	40	50	60	63	-	80	-	100	125	-	-	200
13	20	M12	-	30	40	50	60	63	-	80	-	100	125	-	-	200
17	25	M16	-	-	-	50	60	63	70	80	90	100	125	-	-	200
22	30	M20	-	-	-	-	-	-	70	80	90	100	125	150	-	200
26	36	M24	-	-	-	-	-	-	-	80	-	100	125	150	-	200



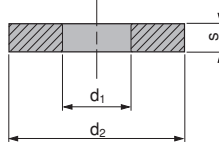
Material :
CK45

GSB CODE:M313-05

Order Code	d_1	d_2	s
M313-05-001	20	8,5	4
M313-05-002	25	10,5	5
M313-05-003	25	13,5	5
M313-05-004	30	13,2	5
M313-05-005	30	13,5	5
M313-05-006	32	12,5	5
M313-05-007	32	12,5	6
M313-05-008	32	13,0	5
M313-05-009	32	13,5	6
M313-05-010	36	10,5	5
M313-05-011	36	13,5	5
M313-05-012	36	16,5	5
M313-05-013	36	20,5	5
M313-05-014	38	17,0	6
M313-05-015	40	13,5	5
M313-05-016	45	20,5	5
M313-05-017	45	21,0	8
M313-05-018	55	10,5	5
M313-05-019	55	13,5	5
M313-05-020	55	20,5	5
M313-05-021	55	25,0	10
M313-05-022	55	25,5	5
M313-05-023	55	30,5	5
M313-05-024	60	12,5	5
M313-05-025	60	16,5	5
M313-05-026	75	12,5	5
M313-05-027	75	16,5	5
M313-05-028	90	16,5	5
M313-05-029	90	21,0	5
M313-05-030	120	21,0	5

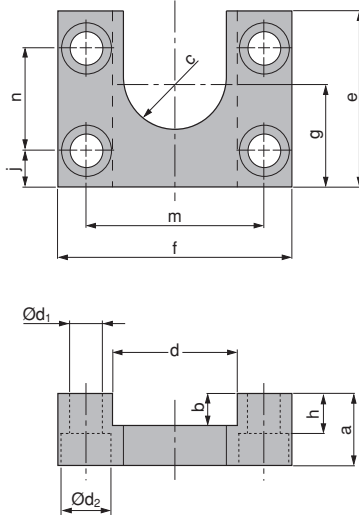


Material :
CK45
Hardened
HRC 45 ÷ 50



GSB CODE:M313-06

Order Code	d ₁	d ₂	s
M313-06-001	17	6,4	3
M313-06-002	23	8,4	4
M313-06-003	26	10,5	4
M313-06-004	30	13	5
M313-06-005	35	17	4
M313-06-006	35	17	5
M313-06-007	35	17	6
M313-06-008	42	21	8
M313-06-009	46	21	6
M313-06-010	46	25	10
M313-06-011	55	25	10



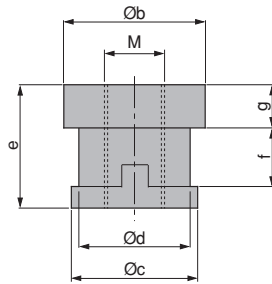
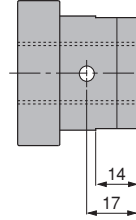
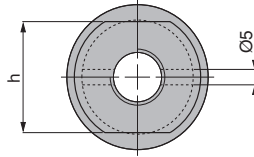
Material :
CK45

GSB CODE:M316-01

Order Code	a	b	c	d	d ₁	d ₂	e	f	g	h	j	m	n	Screw
M316-01-001	25	11	14	38	11	17	50	80	30	15	11,5	57	27	M10
M316-01-002	32	15	20	50	13	20	55	100	35	20	12,5	75	30	M12
M316-01-003	40	20	25	60	17	26	65	120	45	24	16	88	33	M16
M316-01-004	45	20	33	80	21	32	100	150	64	19	18	114	64	M20



Material :
CK45

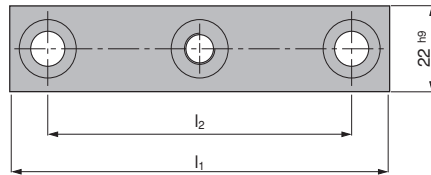
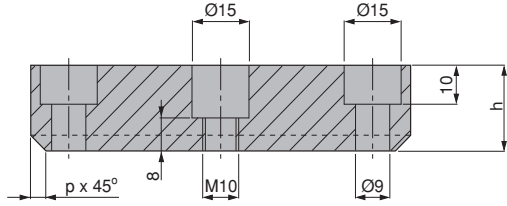


GSB CODE:M316-02

Order Code	b	c	d	e	f	g	h	l	M	Air Cyl. Bore Size ø
M316-02-001	35	30	25	30	16	10	24	-	M10x1,25	32
M316-02-002	35	30	25	30	16	10	24	24	M12x1,25	40
M316-02-003	47	42	37	40	19	14	36	36	M16x1,5	50, 63
M316-02-004	47	42	37	40	19	14	36	36	M20x1,5	80, 100
M316-02-005	47	42	37	40	19	14	36	36	M27x2,0	125
M316-02-006	57	52	47	50	24	19	46	45	M36x2,0	160, 200
M316-02-007	76	64	59	76	50	19	60	55	M42x2,0	250



Material :
CK45

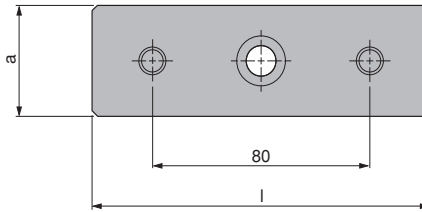
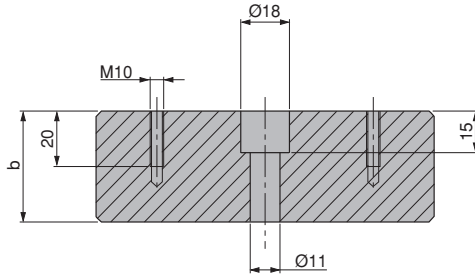


GSB CODE:M317-05

Order Code	l_1	l_2	h	p
M317-05-014050	50	32	14	-
M317-05-014080	80	50	14	-
M317-05-014100	100	80	14	-
M317-05-014125	125	100	14	-
M317-05-022050	50	32	22	4
M317-05-022080	80	50	22	4
M317-05-022100	100	80	22	4
M317-05-022125	125	100	22	4
M317-05-040050	50	32	40	4
M317-05-040080	80	50	40	4
M317-05-040100	100	80	40	4
M317-05-040125	125	100	40	4

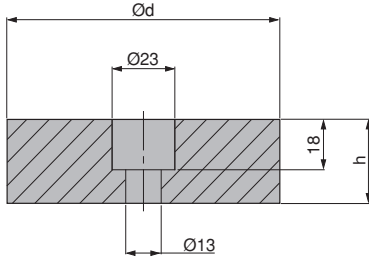


Material :
CK45



GSB CODE:M317-10

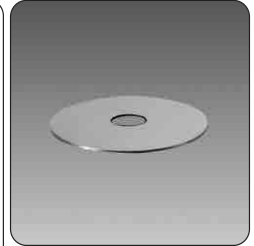
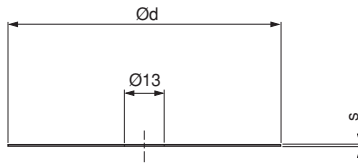
Order Code	a	b	l
M317-10-42125	42	40	125
M317-10-50135	50	48	135
M317-10-50220	50	48	220



Material :
42CrMo4
Hardened
HRC 46 ÷ 48

GSB CODE:M318-07

Code	d	h
M318-07-080025	80	25
M318-07-080030	80	30
M318-07-100025	100	25
M318-07-100030	100	30
M318-07-120025	120	25
M318-07-120030	120	30



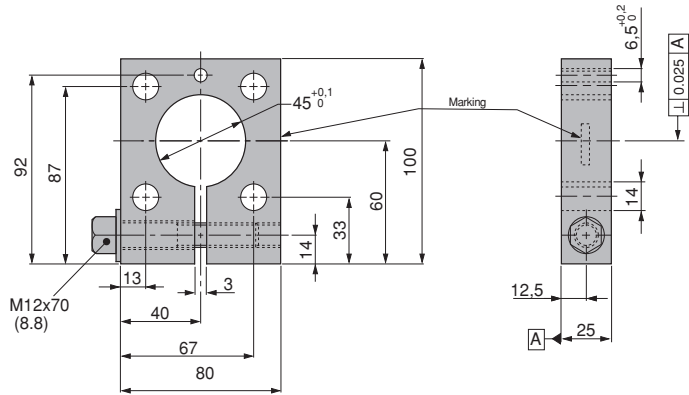
Material :
Steel or Brass

GSB CODE:M318-08

Code	d	h	Material
M318-08-080001	80	0,1	Brass
M318-08-080005	80	0,5	Steel
M318-08-100001	100	0,1	Brass
M318-08-100005	100	0,5	Steel
M318-08-120001	120	0,1	Brass
M318-08-120005	120	0,5	Steel



Material :
CK45



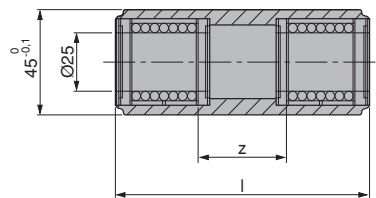
GSB CODE:M319-01

Code

M319-01-100080



Material :
CK45



GSB CODE:M319-01

Code

l

z

M319-01-045112

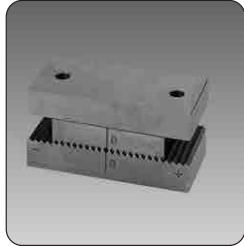
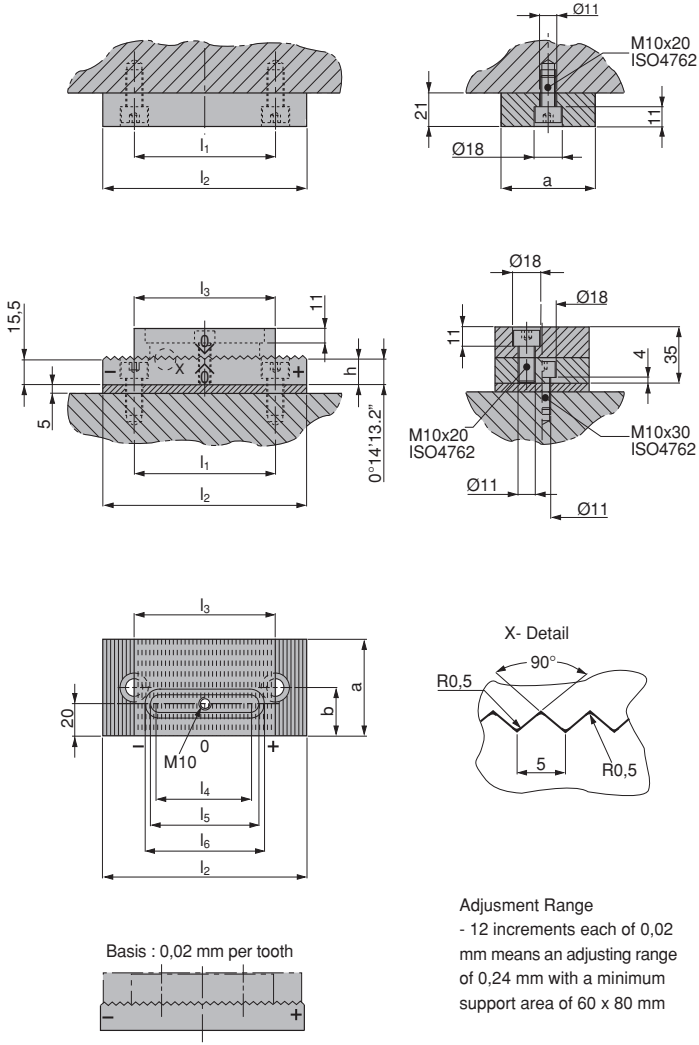
112

40

M319-01-045200

200

120



Material :
90MnCrV8
HRC 58 ÷ 60

Screws not included.

Adjustment Range
- 12 increments each of 0,02 mm means an adjusting range of 0,24 mm with a minimum support area of 60 x 80 mm

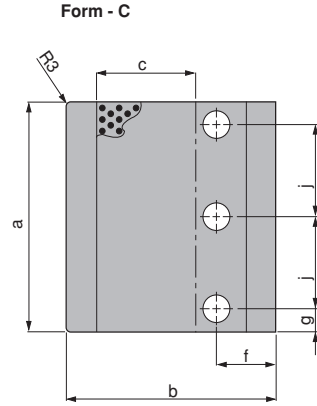
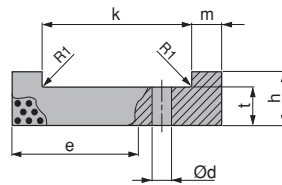
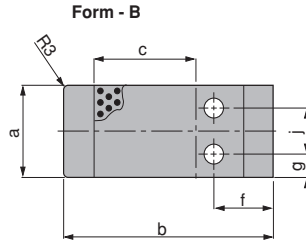
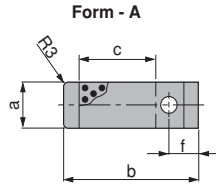
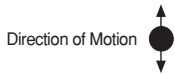
- 14 increments each of 0,02 mm means an adjusting range of 0,28 mm with a minimum support area of 100 x 80 mm

GSB CODE:M319-02

Code	a	b	l ₁	l ₂	l ₃	l ₄	l ₅	l ₆	h
M319-02-060130	60	30	90	130	90	61	72	79	16,04
M319-02-080160	80	40	120	160	110	71	82	89	16,16



Material :
Bronze with Non-liquid Lubricant



GSB CODE:M320-03

Order Code	Form	a	b	c	d	e	f	g	h	j	k	m	t
		<small>h7</small>								<small>±0,2</small>		<small>-0,1</small>	
M320-03-030070	A	30	70	30	11	40	20	-	17	-	50	10	12
M320-03-030090	A	30	90	50	11	60	20	-	17	-	70	10	12
M320-03-045070	B	45	70	30	11	40	20	11,5	25	22	50	10	15
M320-03-045090	B	45	90	50	11	60	20	11,5	25	22	70	10	15
M320-03-060120	B	60	120	40	13	60	40	15	35	30	80	20	25
M320-03-060140	B	60	140	60	13	80	40	15	35	30	100	20	25
M320-03-060160	B	60	160	80	13	100	40	15	35	30	120	20	25
M320-03-100120	B	100	120	40	18	60	40	15	35	70	80	20	25
M320-03-100140	B	100	140	60	18	80	40	15	35	70	100	20	25
M320-03-100160	B	100	160	80	18	100	40	15	35	70	120	20	25
M320-03-150120	C	150	120	40	18	60	40	15	35	60	80	20	25
M320-03-150140	C	150	140	60	18	80	40	15	35	60	100	20	25
M320-03-150160	C	150	160	80	18	100	40	15	35	60	120	20	25
M320-03-150180	C	150	180	100	18	120	40	15	35	60	140	20	25

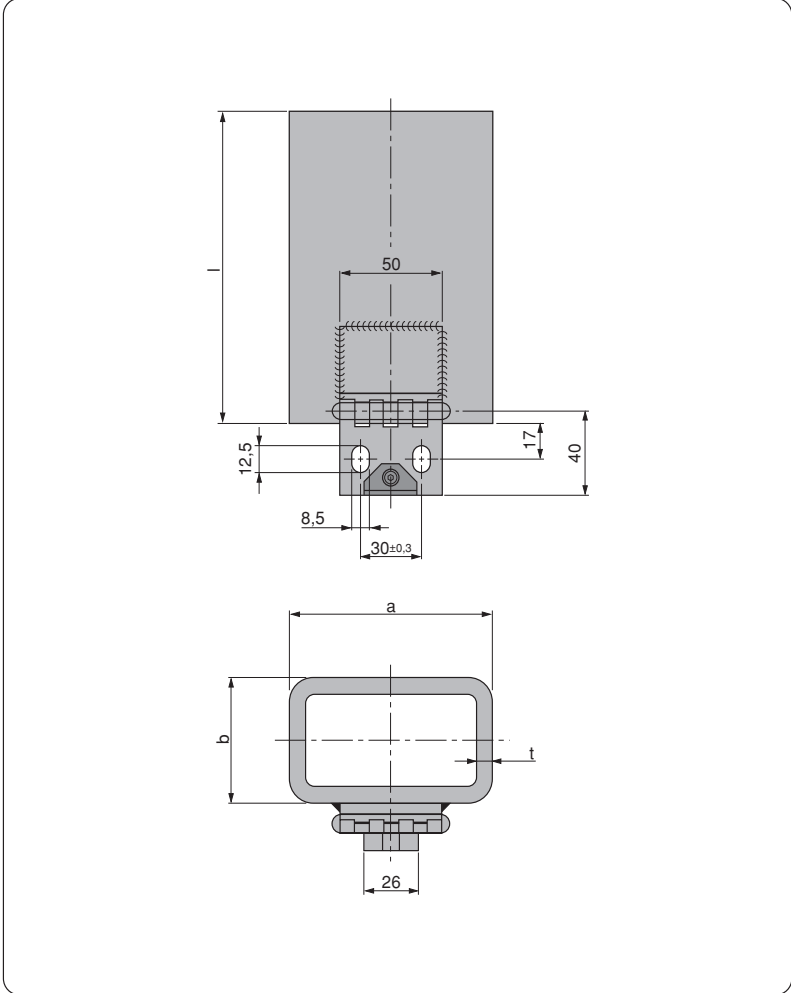


Material :
St 37
Hinge AHA
Polyurethane 68 Sh.

l is given by the customer.

lmax=400

Order Example:
a=100, l=200
Order Code: M321-01-100200



GSB CODE:M321-01

Code	a	b	l	t	Max. Load (KG)
M321-01-070???	70	50	???	3	10.000
M321-01-100???	100	60	???	7-8	30.000



Standard

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FÜHRUNGSELEMENTE

4

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NORMALIEN

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Mercedes-Benz

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ANDERE KOMPONENTE








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TECHNISCHE INFORMATIONEN



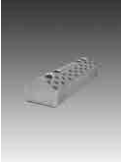





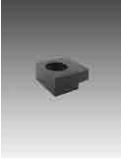





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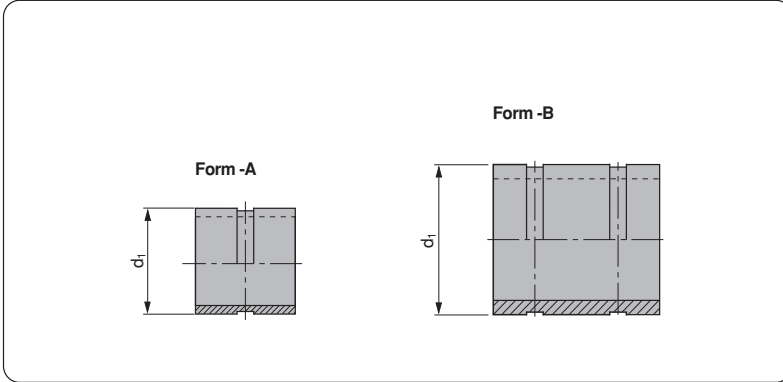
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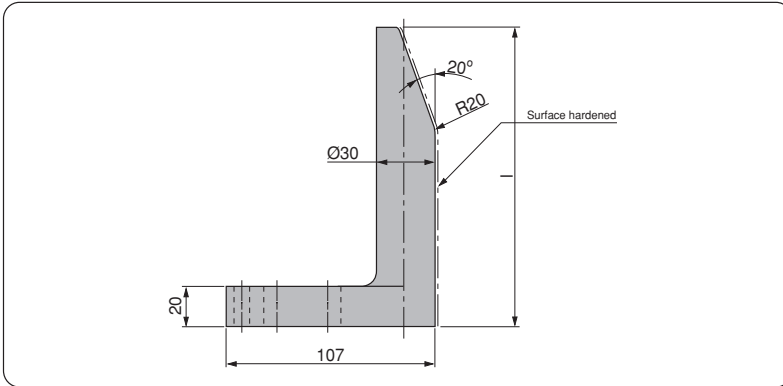
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Material :
Steel

BMW CODE:B2 2101 16

BMW ID Number	d ₁	Form
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2 173 600	52	A
2 173 601	62	A
2 173 602	75	A
2 173 603	100	B
2 173 604	105	B



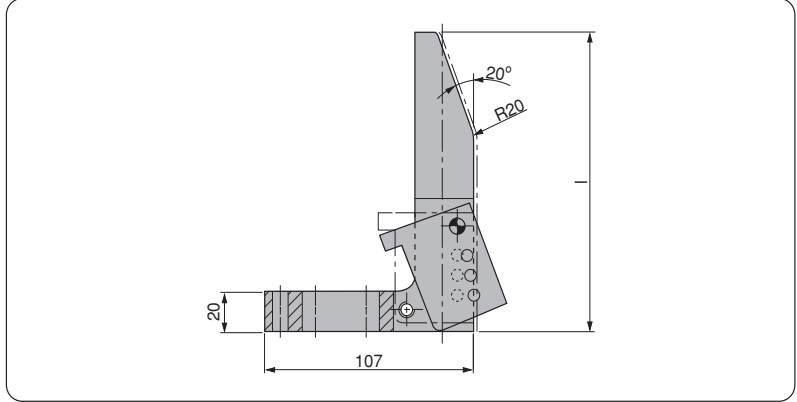
Material :
CK45
Forged
Hardened
HRC 50 ÷ 55

BMW CODE:B2 2305 17

BMW ID Number	l
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2 173 836	90
2 173 837	120
2 173 838	150
2 173 839	180
2 173 840	250
2 175 127	300
2 175 128	350



Material :
CK45
Forged
Hardened
HRC 50 ÷ 55

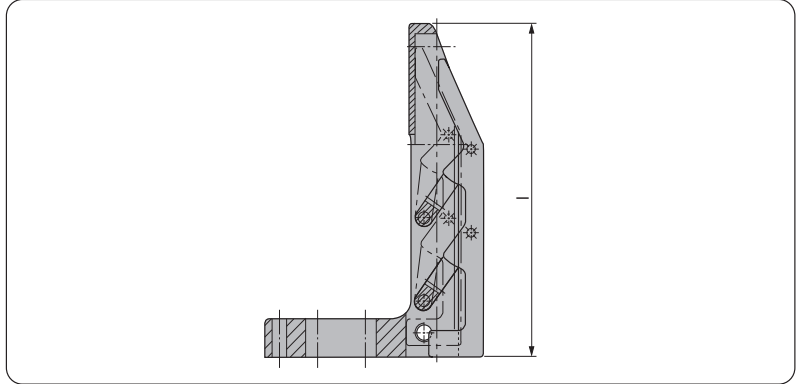


BMW CODE:B2 2305 22 / B2 2305 23

BMW ID Number	l	BMW ID Number	l
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2 173 842	120	2 173 846	180
2 173 843	150	2 173 847	250
2 173 844	150	2 173 848	250

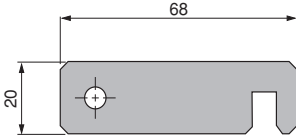


Material :
Steel
Forged



BMW CODE:B2 2305 24

BMW ID Number	l
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2 173 850	150
2 173 851	180
2 173 852	250
2 173 853	250



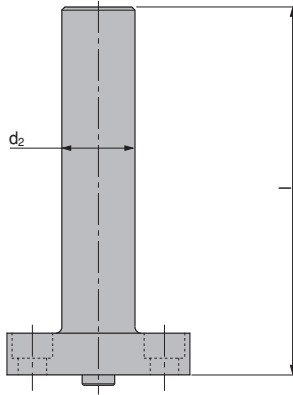
BMW ID Number

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Material :
Steel



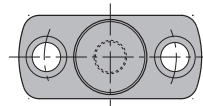
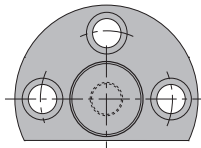
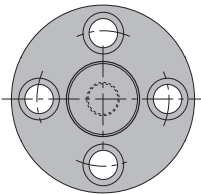
BMW CODE:B2 2506 12



Form -A

Form -B

Form -C

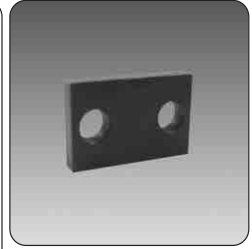
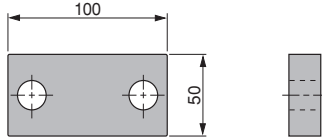


Material :
CK45
800 ÷ 1000 N/mm²
Forged

Order Example:
BMW ID Number+ l=290
Order Code:2168288L=290

BMW CODE:B2 2604 12

BMW ID Number	Form	d ₂	l	BMW ID Number	Form	d ₂	l
2 168 288	A	40	≤ 260	2 168 292	A	50	260 > l ≤ 380
2 172 200	B	40	≤ 260	2 172 208	B	50	260 > l ≤ 380
2 172 201	C	40	≤ 260	2 172 209	C	40	260 > l ≤ 380
2 168 291	A	50	≤ 260	2 168 293	A	40	> 380
2 172 206	B	50	≤ 260	2 172 210	B	40	> 380
2 172 207	C	50	≤ 260	2 172 211	C	50	> 380

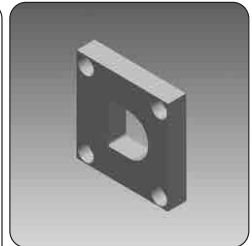
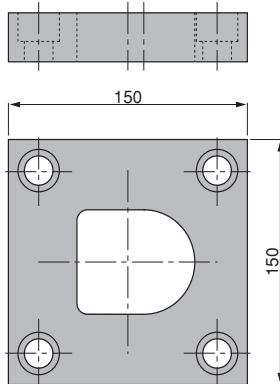


Material :
Steel

BMW CODE:B2 2625 11

BMW ID Number

2 171 716

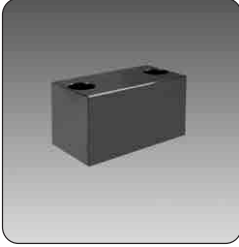


Material :
90MnCrV8
Hardened
HRC 58 ÷ 60

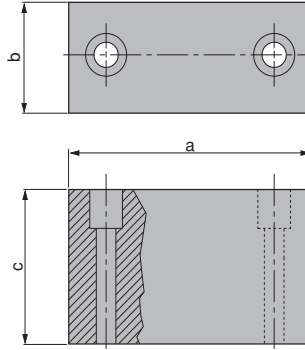
BMW CODE:B2 2625 11

BMW ID Number

2 172 935



Material :
Steel

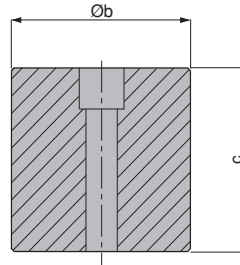


BMW CODE:B2 2705 11

BMW ID Number	a	b	c
2 175 074	65	30	30
2 175 075	65	30	50
2 175 076	100	40	30
2 175 077	100	40	50

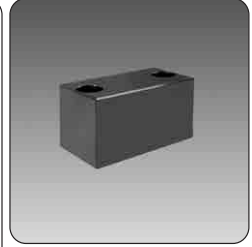
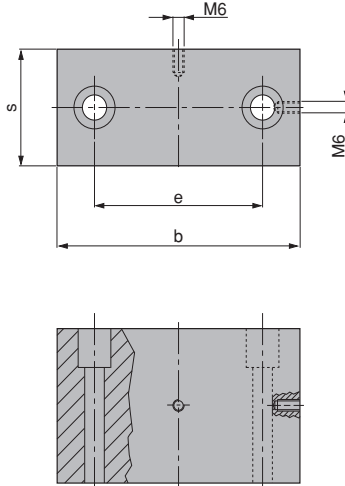


Material :
Steel



BMW CODE:B2 2705 11

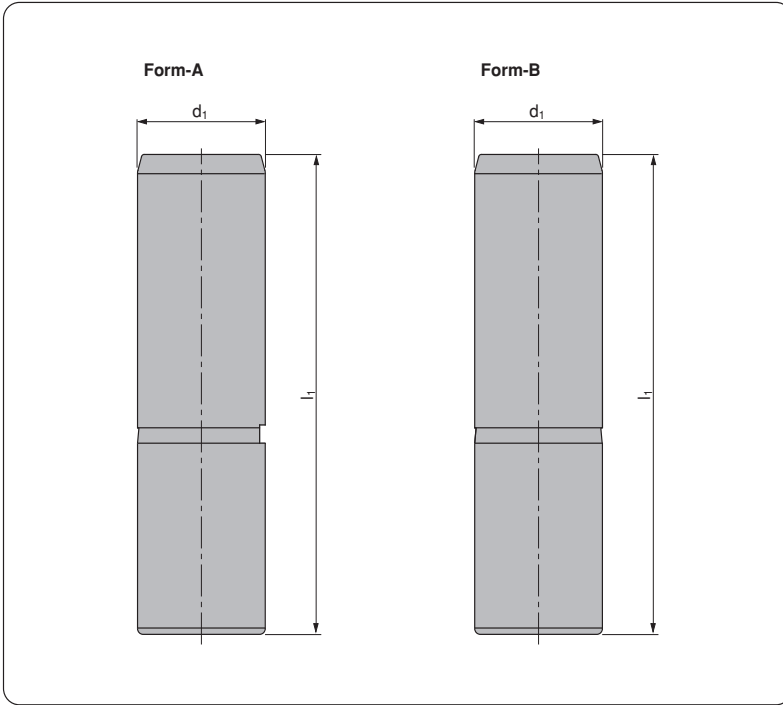
BMW ID Number	b	c
2 172 078	40	30
2 172 079	40	50



Material :
Steel

BMW CODE: B2 2708 11

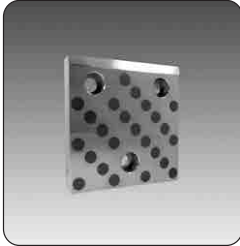
BMW ID Number	b	e	s	Max. Load (kN)	BMW ID Number without thread M6	b	e	s	Max. Load (kN)
2 172 064	65	35	30	270	2 173 866	65	35	30	270
2 172 065	100	68	40	700	2 173 867	100	68	40	700
2 168 316	160	98	40	1100	2 173 868	160	98	40	1100
2 172 066	110	78	50	1000	2 173 869	110	78	50	1000
2 168 317	180	114	50	1600	2 173 870	180	114	50	1600
2 172 067	130	90	60	1500	2 173 871	130	90	60	1500
2 175 145	130	90	60	1500	2 175 146	130	90	60	1500
2 168 318	200	130	60	2300	2 173 872	200	130	60	2300
2 174 518	200	125	60	2300	2 174 519	200	125	60	2300
2 168 319	160	115	80	2350	2 173 873	160	115	80	2350
2 175 003	160	115	80	2350	2 175 004	160	115	80	2350
2 168 320	250	160	80	3650	2 173 874	250	160	80	3650
2 174 520	250	155	80	3650	2 174 521	250	155	80	3650



Material :
16MnCr5
Hardened
HRC : 60 ÷ 62

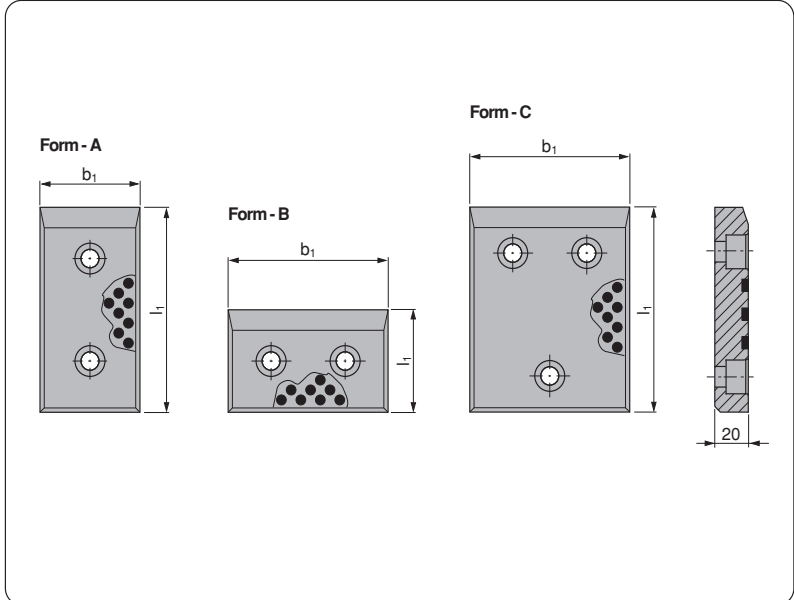
BMW CODE: B2 2920 1

BMW ID Number	Form	d ₁	l ₁
2 174 492	A	25	125
2 174 493	A	25	140
2 174 494	A	25	160
2 174 495	A	25	180
2 174 496	A	25	200
2 174 497	A	32	160
2 174 498	A	32	200
2 174 499	A	40	160
2 174 500	A	40	180
2 174 501	A	40	200
2 174 502	A	40	224
2 174 503	A	40	250
2 174 504	A	40	280
2 174 505	A	50	160
2 174 506	A	50	200
2 174 507	A	50	250
2 174 508	A	50	280
2 174 509	A	50	315
2 174 510	A	50	355
2 168 677	B	63	200
2 168 678	B	63	250
2 168 679	B	63	315
2 168 680	B	63	355
2 172 538	B	63	400



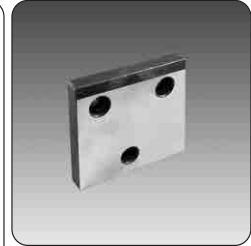
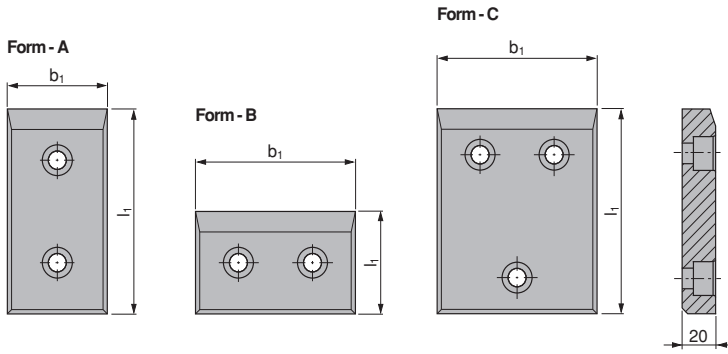
Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion



BMW CODE: B2 2960 12

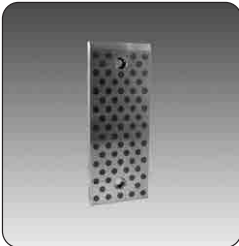
BMW ID Number	Form	b ₁	l ₁
2 168 337	B	50	80
2 168 338	B	50	100
2 168 339	B	50	125
2 168 340	B	50	160
2 168 341	B	50	200
2 168 342	A	80	50
2 168 343	B	80	80
2 168 344	B	80	100
2 168 345	B	80	125
2 168 346	B	80	160
2 168 347	B	80	200
2 168 348	A	100	50
2 168 349	A	100	80
2 168 350	B	100	100
2 168 351	B	100	125
2 168 352	B	100	160
2 168 353	B	100	200
2 168 354	A	125	50
2 168 355	A	125	80
2 168 356	C	125	100
2 168 357	C	125	125
2 168 358	C	125	160
2 168 359	C	125	200
2 168 360	A	160	50
2 168 361	A	160	80
2 168 362	C	160	100
2 168 363	C	160	125
2 168 364	C	160	160
2 168 365	C	160	200



Material :
16MnCr5
Hardened
HRC 60 ÷ 64

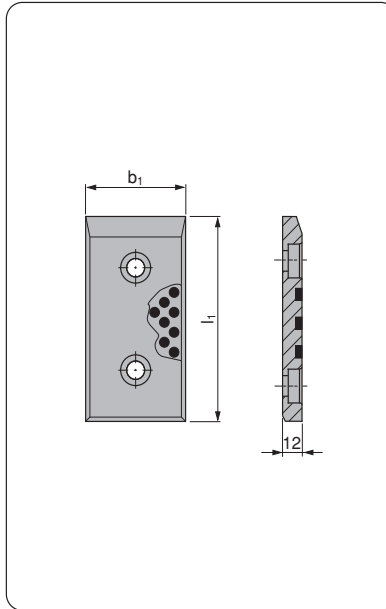
BMW CODE: B2 2960 12

BMW ID Number	Form	b ₁	l ₁
2 168 366	B	50	80
2 168 367	B	50	100
2 168 368	B	50	125
2 168 369	B	50	160
2 168 370	B	50	200
2 168 371	A	80	50
2 168 372	B	80	80
2 168 373	B	80	100
2 168 374	B	80	125
2 168 375	B	80	160
2 168 376	B	80	200
2 168 377	A	100	50
2 168 378	A	100	80
2 168 379	B	100	100
2 168 380	B	100	125
2 168 381	B	100	160
2 168 382	B	100	200
2 168 383	A	125	50
2 168 384	A	125	80
2 168 385	C	125	100
2 168 386	C	125	125
2 168 387	C	125	160
2 168 388	C	125	200
2 168 389	A	160	50
2 168 390	A	160	80
2 168 391	C	160	100
2 168 392	C	160	125
2 168 393	C	160	160
2 168 394	C	160	200



Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion

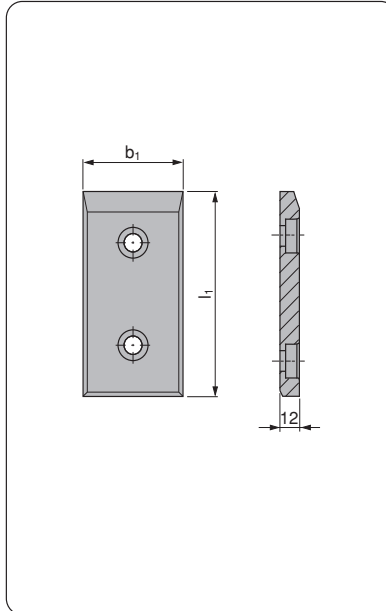


BMW ID Number	b ₁	l ₁
2 169 171	30	80
2 169 172	30	100
2 169 173	30	125
2 169 174	30	160
2 169 175	30	200
2 169 176	40	80
2 169 177	40	100
2 169 178	40	125
2 169 179	40	160
2 169 180	40	200
2 169 181	50	80
2 169 182	50	100
2 169 183	50	125
2 169 184	50	160
2 169 185	50	200
2 169 186	60	80
2 169 187	60	100
2 169 188	60	125
2 169 189	60	160
2 169 190	60	200
2 169 191	80	80
2 169 192	80	100
2 169 193	80	125
2 169 194	80	160
2 169 195	80	200

BMW CODE: B2 2961 11



Material :
16MnCr5
Hardened
HRC 60 ÷ 64



BMW ID Number	b ₁	l ₁
2 170 888	30	80
2 170 889	30	100
2 170 890	30	125
2 170 891	30	160
2 170 892	30	200
2 170 893	40	80
2 170 894	40	100
2 170 895	40	125
2 170 896	40	160
2 170 897	40	200
2 170 898	50	80
2 170 899	50	100
2 170 900	50	125
2 170 901	50	160
2 170 902	50	200
2 170 903	60	80
2 170 904	60	100
2 170 905	60	125
2 170 906	60	160
2 170 907	60	200
2 170 908	80	80
2 170 909	80	100
2 170 910	80	125
2 170 911	80	160
2 170 912	80	200

BMW CODE: B2 2961 11



Material (U Block) :
CK45
HRC : 60 ÷ 64

Material (V Block - Body) :
CK45

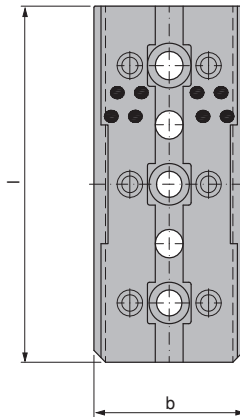
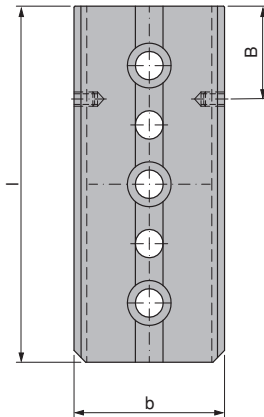
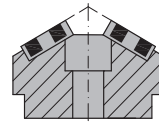
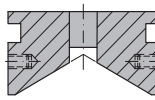
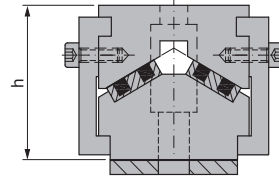
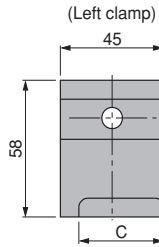
Material (Replaceable Plate) :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Material (Positive Return) :
Steel
HRC : 40 ÷ 45

Material (Shim) :
St 52

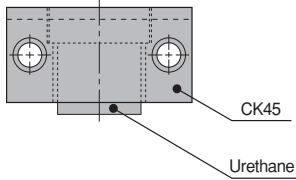
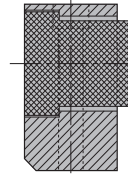
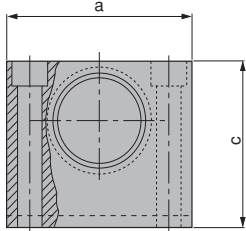
Screws included.

The measure **B** and **C** must be
determine in design and given
by order!



BMW CODE: B2 2978 20

BMW ID Number	b	h	l
2 175 061	65	65	150
2 175 062	65	65	200
2 175 063	65	65	250
2 175 064	65	65	300
2 175 065	125	85	150
2 175 066	125	85	200
2 175 067	125	85	250
2 175 068	125	85	300



Material :
CK45
Urethane

BMW CODE: B2 3001 20

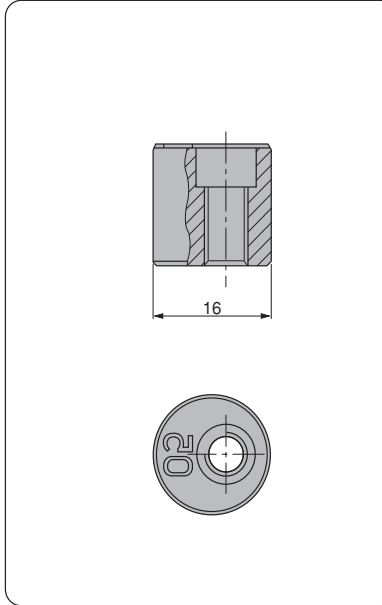
BMW ID Number	a	c
2 172 563	65	60
2 171 476	65	60
2 173 856*	65	60
2 172 564	75	70
2 171 477	75	70
2 173 857*	75	70

* Without urethane



Material :
X155CrVMo12
Hardened
HRC 55 ÷ 58

Screws not included.



BMW ID Number

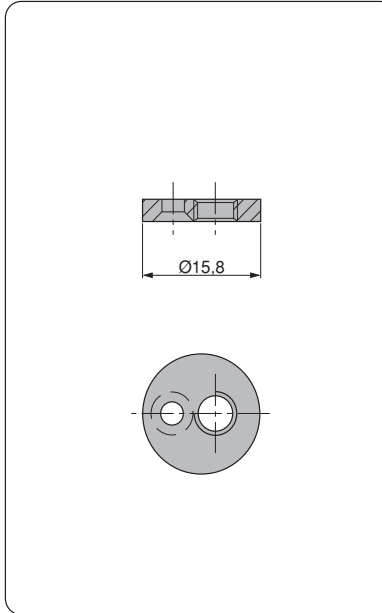
2 169 003
2 171 527
2 171 528
2 169 002
2 171 533
2 171 529
2 171 530
2 171 531
2 171 532
2 174 593
2 173 712
2 173 713
2 173 812
2 173 813
2 173 714
2 173 715
2 173 716
2 173 717

BMW CODE: B2 3602 15



Material :
Steel

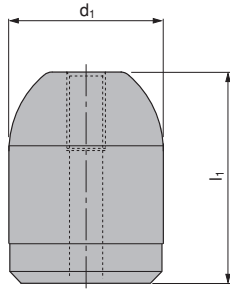
Screws not included.



BMW ID Number

2 168 546

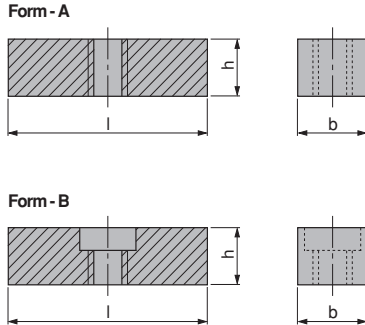
BMW CODE: B2 3602 15



Material :
16MnCr5
Hardened
HRC 60 ÷ 64

BMW CODE: B2 4068 2

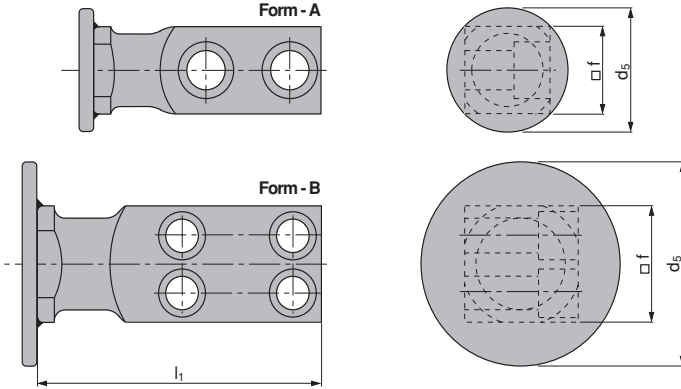
BMW ID Number	d_1	l_1
2 172 410	22	45
2 172 411	32	50
2 172 412	40	55
2 172 413	50	55
2 173 658	56	80



Material :
CK45

BMW CODE: B2 4069 1

BMW ID Number	Form	b	h	l
2 172 053	A	22	14	80
2 172 224	A	30	30	80
2 172 808	A	22	14	50
2 172 809	A	30	30	120
2 174 226	A or B	20	20	50
2 174 227	A or B	20	20	80
2 174 835	B	16	10	50
2 174 836	B	16	10	80



Material :
CK45
700 ÷ 800 N/mm²

WARNING !
For safety reasons, the weight of the tool has to be supported by just two lifting brackets.

Respect the max load

UYARI !
Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma braketinin taşıyabileceği maksimum yük miktarını aşmamalıdır.

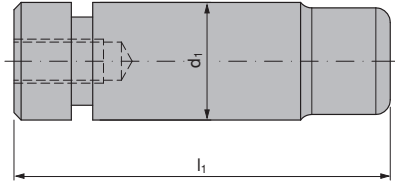
Maksimum yükü göz ardı etmeyiniz

ACHTUNG !
Aus Sicherheitsgründen achten Sie immer dass zwei Tragzapfen das gesamte Werkzeugs gewicht tragen müssen.

Maximale Nutzlast beachten

BMW CODE: B2 5602 11

BMW ID Number	Max. Load (Kg)	Max. Die Weight (Kg)	Form	d ₅	f	l ₁	l ₁
2 169 231	320	640	A	60	20	80	80
3 275 834	630	1260	A	70	25	90	90
3 275 835	1250	2500	A	70	35	100	100
3 275 836	2000	4000	A	110	40	120	120
3 275 838	3200	6400	A	110	50	140	140
3 275 839	5000	10000	A	150	60	160	160
3 275 840	8000	16000	B	150	80	200	200
2 169 238	12500	25000	B	150	100	250	250
2 169 239	20000	40000	B	150	120	300	300

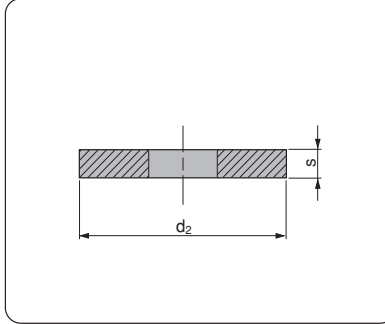


Material :
42CrMoS4V

BMW CODE: B2 5702 12

BMW ID Number	d_1	l_1	BMW ID Number	d_1	l_1
2 173 659	32	111	2 173 663	32	128
2 173 660	40	145	2 173 664	40	165
2 173 661	50	171	2 173 665	50	196
2 173 662	63	206	2 173 666	63	241

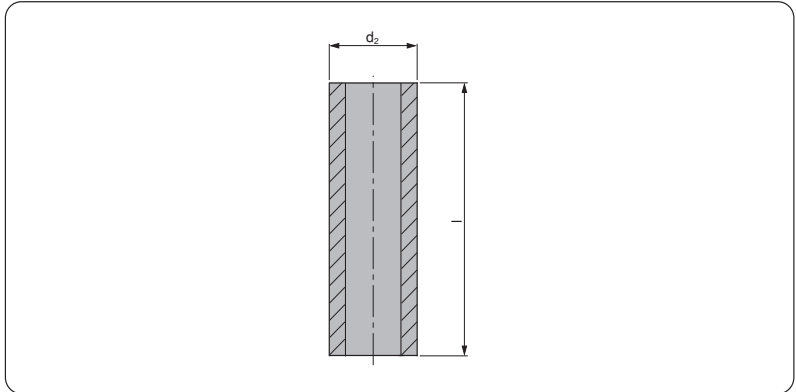




BMW ID Number	d ₂	s
0 281 620	35	6
0 281 619	42	8
0 281 618	56	10
2 171 891	68	10

Material :
CK45
Hardened
HRC 45 ÷ 50

BMW CODE:B2 6201 11

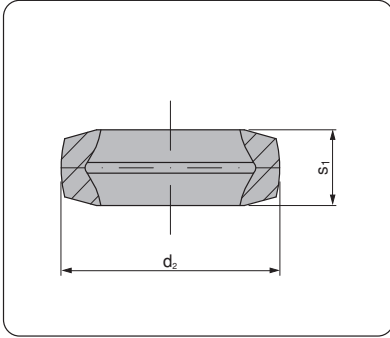


Material :
Steel (E235+C)

Surface hardened.

BMW CODE:B2 6201 12

BMW ID Number	BMW ID Number	BMW ID Number
2 168 799	2 168 813	2 168 826
2 168 800	2 173 793	2 173 795
3 380 926	2 171 894	2 171 897
2 174 881	2 168 814	2 172 153
2 171 892	2 168 815	3 021 664
2 168 802	2 168 816	2 168 829
2 168 803	2 168 817	2 168 830
2 168 804	2 168 818	2 168 831
3 021 663	2 171 895	2 173 796
0 266 957	2 168 819	2 171 898
2 168 807	2 173 794	2 168 832
2 173 792	2 171 896	2 168 833
2 171 893	2 168 820	2 173 797
2 168 808	2 168 821	2 171 899
2 168 809	2 168 822	
3 021 666	2 168 823	
2 168 811	2 168 824	
2 168 812	2 168 825	

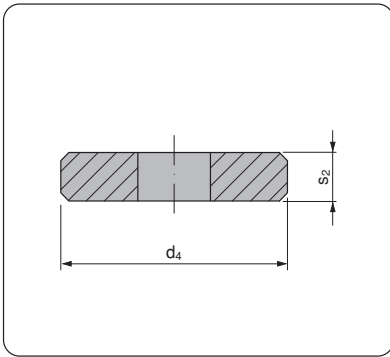


BMW ID Number	d ₂	s ₁
2 173 880	26,2	7,1
2 173 881	32,1	10,0
2 173 882	46,3	16,3
2 173 883	54,6	19,5
2 173 884	61,8	19,8
2 173 885	78,2	27,6



Material :
CO - Polyester Elastomer

BMW CODE: B2 6202 1

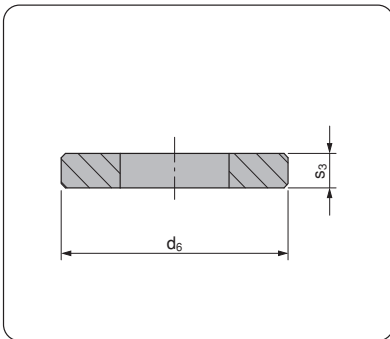


BMW ID Number	d ₄	s ₂
2 173 886	36	6
2 173 887	46	8
2 173 888	58	10
2 173 889	68	12
2 173 890	80	12
2 173 891	92	15

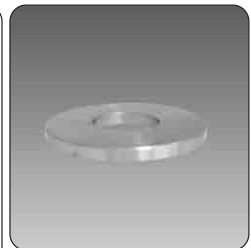


Material :
CK45

BMW CODE: B2 6202 1



BMW ID Number	d ₆	s ₃
2 173 892	36	4
2 173 893	46	6
2 173 894	58	6
2 173 895	68	8
2 173 896	80	8
2 173 897	92	8

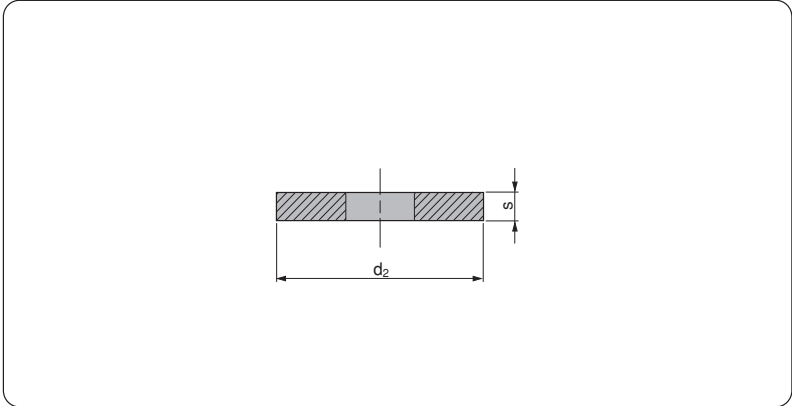


Material :
90MnCrV8
Hardened
HRC 56 ÷ 60

BMW CODE: B2 6202 1



Material :
CK45
HRC 45 ÷ 50

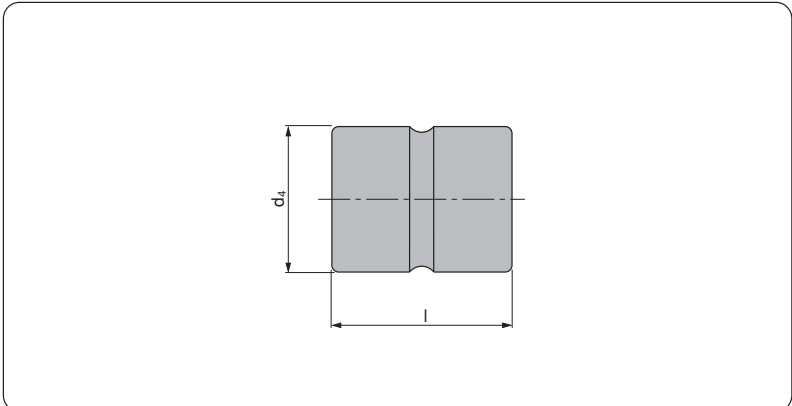


BMW CODE: B2 6202 13

BMW ID Number	d ₂	s
0 281 173	23	4
0 281 622	26	4
0 281 621	30	5
2 168 849	23	4
2 168 850	26	4
2 168 851	30	5



Material :
Co. ACE TecPak



BMW CODE: B2 6204 12

BMW ID Number	d ₄	l
2 173 697	40	60
2 173 698	50	70
2 173 699	63	80
2 173 700	80	90

FCA

FIAT CHRYSLER AUTOMOBILES

Standard

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İNDEKS
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TRAGELEMENTE

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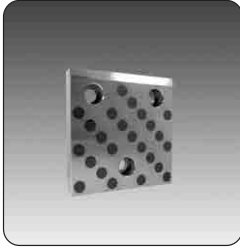
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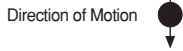


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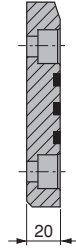
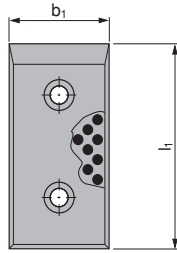
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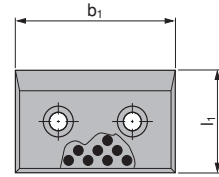
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Bronze with Non-Liquid Lubricant
HB ≥ 190



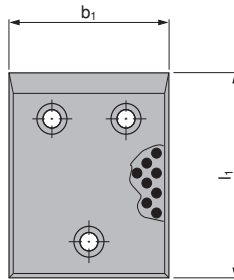
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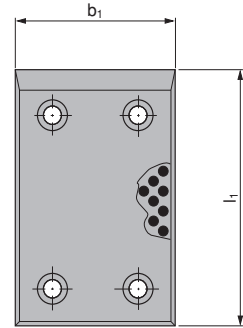
Form - B



Form - C



Form - D

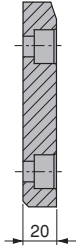
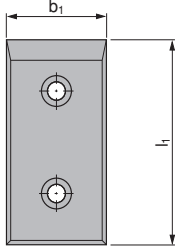


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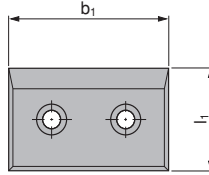
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PBR_05020200	A	50	200
PBR_08020050	B	80	50
PBR_08020080	A	80	80
PBR_08020100	A	80	100
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PBR_08020160	A	80	160
PBR_08020200	A	80	200
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PBR_10020160	A	100	160
PBR_10020200	A	100	200
PBR_10020250	A	100	250
PBR_10020315	A	100	315

FCA Code	Form	b ₁	l ₁
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PBR_125-080	B	125	80
PBR_125-100	C	125	100
PBR_125-125	C	125	125
PBR_125-160	C	125	160
PBR_125-200	C	125	200
PBR_125-250	C	125	250
PBR_125-315	C	125	315
PBR_160-100	C	160	100
PBR_160-125	C	160	125
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PBR_160-200	C	160	200
PBR_160-250	D	160	250
PBR_160-315	D	160	315

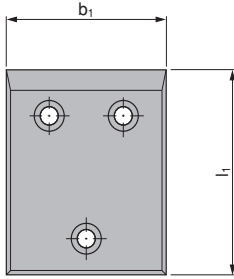
Form - A



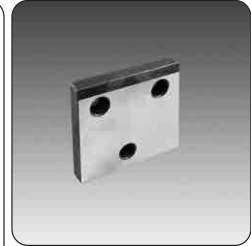
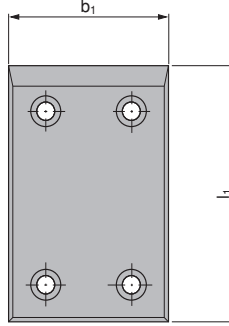
Form - B



Form - C



Form - D



Material :
16MnCr5
Hardened
HRC 58 ÷ 62

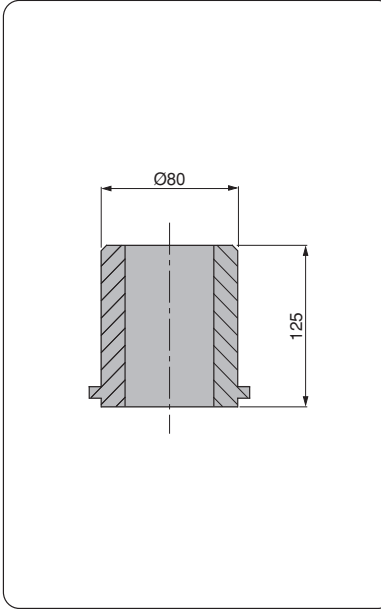
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PAC_05020160	A	50	160
PAC_05020200	A	50	200
PAC_08020050	B	80	50
PAC_08020080	A	80	80
PAC_08020100	A	80	100
PAC_08020125	A	80	125
PAC_08020160	A	80	160
PAC_08020200	A	80	200
PAC_10020050	B	100	50
PAC_10020080	B	100	80
PAC_10020100	A	100	100
PAC_10020125	A	100	125
PAC_10020160	A	100	160
PAC_10020200	A	100	200
PAC_10020250	A	100	250
PAC_10020315	A	100	315

FCA Code	Form	b ₁	l ₁
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PAC_125-250	C	125	250
PAC_125-315	C	125	315
PAC_160-100	C	160	100
PAC_160-125	C	160	125
PAC_160-160	C	160	160
PAC_160-200	C	160	200
PAC_160-250	D	160	250
PAC_160-315	D	160	315



Material :
16MnCr5
Hardened
HRC : 58 ÷ 60



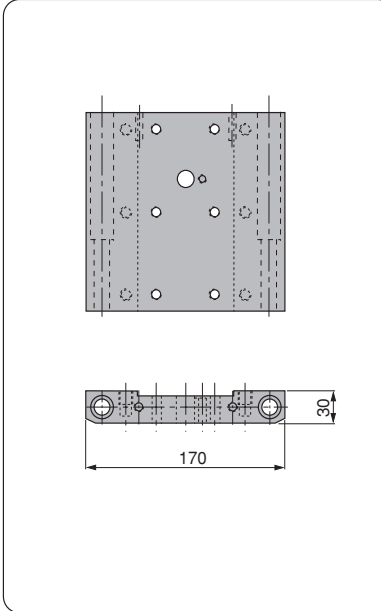
FCA Code

BOCB_060125

FCA CODE:STQ 20025



Material :
16MnCr5
Hardened
HRC : 58 ÷ 60



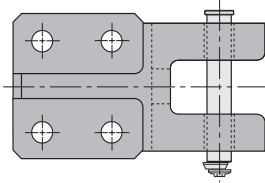
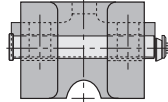
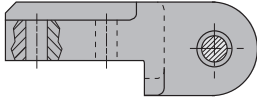
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Part 1

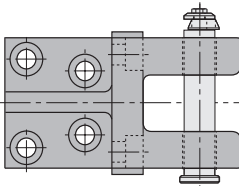
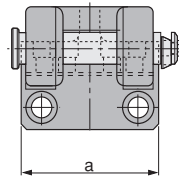
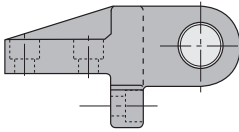
GU - 030 170 XXX

FCA CODE:STQ 20026

Form - A



Form - B



Material :
CK45
800 ÷ 1000 N/mm²

WARNING !
For safety reasons, the weight of the tool has to be supported by just two lifting pins.

Respect the max load

UYARI !
Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.

Maksimum yükü göz ardı etmeyiniz

ACHTUNG !
Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.

Maximale Nutzlast beachten

FCA CODE:STQ 40001

FCA Code

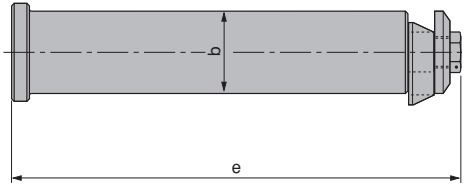
GR_ST_KG600

GR_ST_KG1000

GR_ST_KG2000

GR_ST_KG4000

GR_ST_KG7000



Material :
CK45

WARNING !
For safety reasons, the weight of the tool has to be supported by just two lifting pins.

Respect the max load

UYARI !
Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.

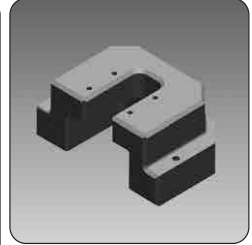
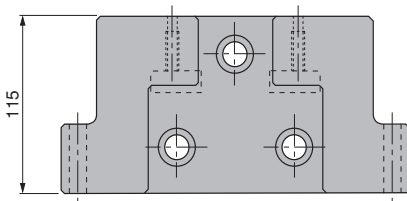
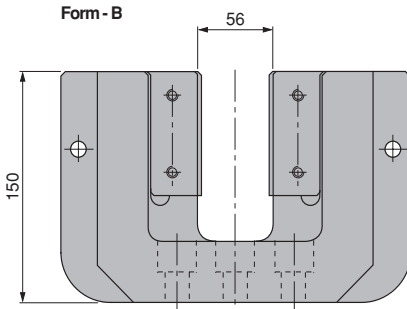
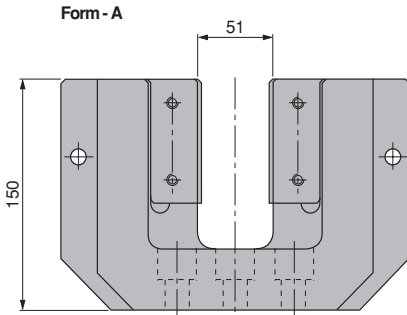
Maksimum yükü göz ardı etmeyiniz

ACHTUNG !
Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.

Maximale Nutzlast beachten

FCA CODE:STQ 4002

FCA Code	Max. Load (Kg)	Max. Die Weight (Kg)	b	e
SOL_KG2000	2000	4000	29	178,5
SOL_KG3200	3200	6400	33	200,5
SOL_KG5000	5000	10000	43	233
SOL_KG8000	8000	16000	53	282
SOL_KG12000	12000	24000	63	352,5
SOL_KG8000_T	8000	16000	53	227
SOL_KG13000_T	13000	26000	63	272,5



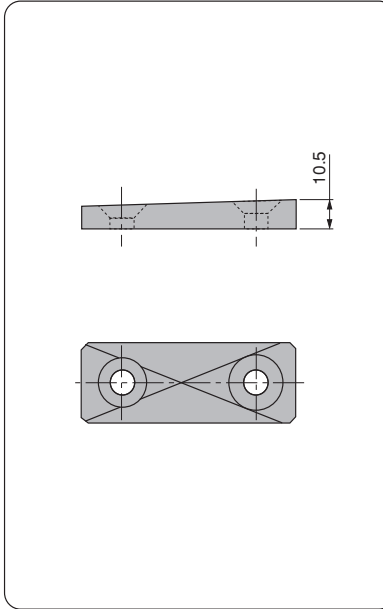
Material :
36CrNiMo4
950 ÷ 1000 N/mm²

FCA CODE:STQ 40005

FCA Code	Form
ST_S01	A
ST_S02	B



Material :
36CrNiMo4
Hardened
HRC : 50 ÷ 52



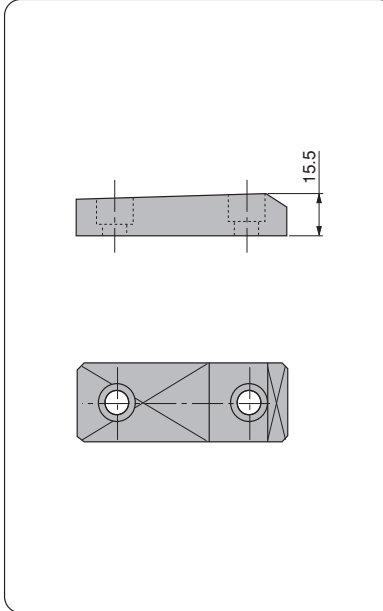
FCA Code

PIA_PA01

FCA CODE:STQ 40005



Material :
36CrNiMo4
Hardened
HRC : 50 ÷ 52



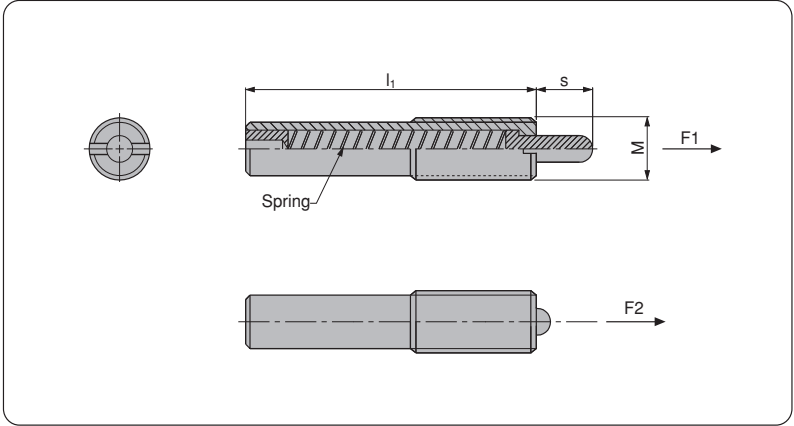
FCA Code

PIA_PA02

FCA CODE:STQ 40005



Material :
Steel

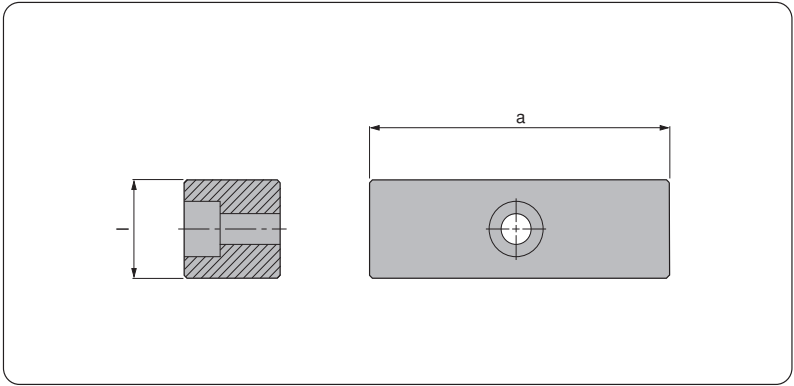


FCA CODE:STQ 40012

FCA Code	M	l ₁	F1 (N/mm ²)	F2 (N/mm ²)
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ESP_H_M1615	M16	60	15	80
ESP_H_M1630	M16	125	20	80



Material :
CK45

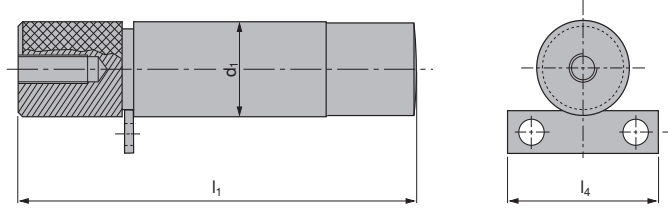


FCA CODE:STQ 40013

FCA Code	a	l
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CH_R_030080	80	30
CH_R_030125	125	30
CH_R_034090	90	34



Material :
36CrNiMo4

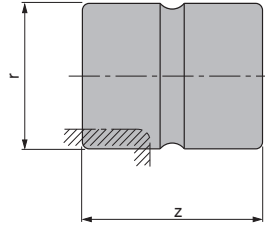


FCA CODE:STQ 40017

FCA Code	d ₁	l ₁	l ₄
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PRN_050206	50	206	70



Material :
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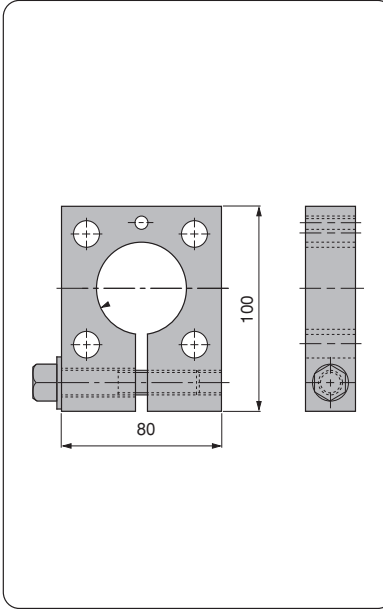


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FCA Code	r	z
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AMM_06380	63	80



Material :
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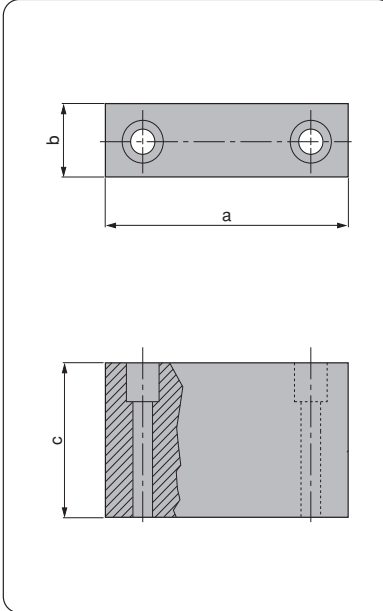
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FCA CODE:STQ 40021



Material :
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FCA Code

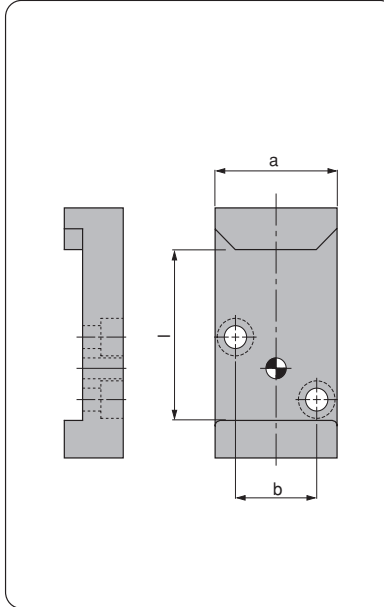
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ARR_502545	50	25	45
ARR_502565	50	25	65
ARR_752545	75	25	45
ARR_752565	75	25	65

FCA CODE:STQ 60010



Material :
CK45
Hardened
HRC 52 ÷ 54

Order Example:
a=35 and l=110
OrderCode:
GA_35110

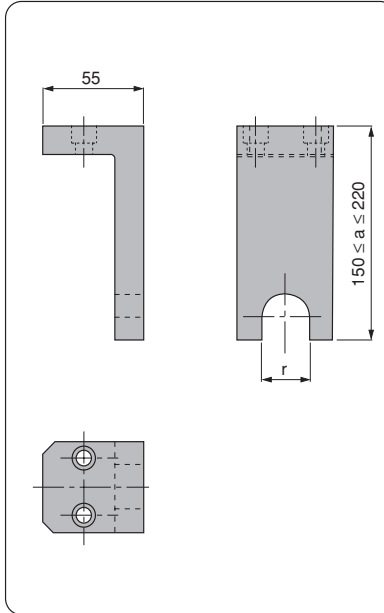


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GA_60XXX	60	40	XXX

FCA CODE:STQ 60014



Material :
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FCA Code	a	r
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FOR_49XXX	150 ≤ A ≤ 220	49

FCA CODE:STQ 60015

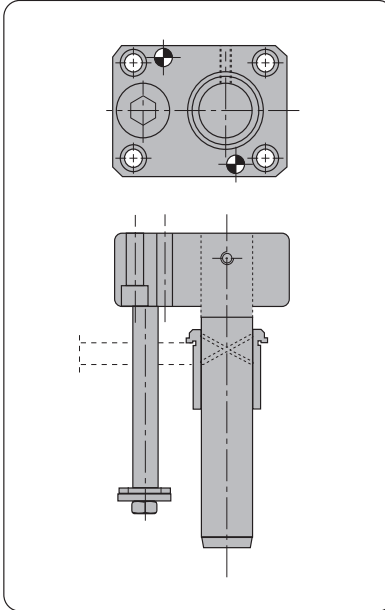


Material (Bush) :
Bronze HB > 190

Material (Guide Post) :
16MnCr5
Hardened
HRC 52 ÷ 54

Material (Block) :
St52

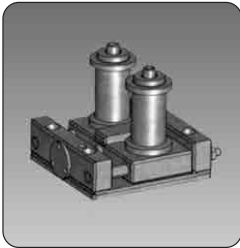
Material (Elastomer Damper) :
Elastomer 90 Sh
M12x30 DIN 913



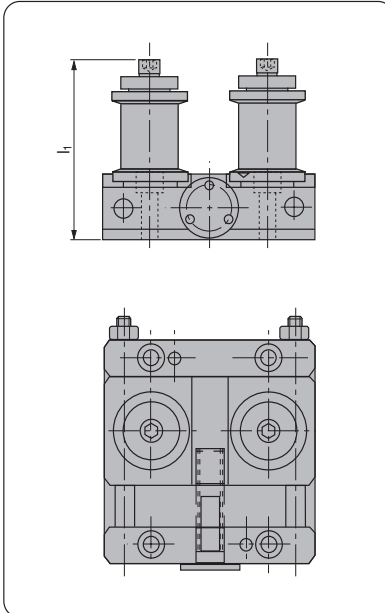
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FCA CODE:STQ 80002



Material :
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FCA Code

l_1

Stroke

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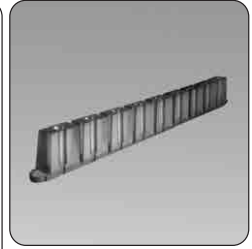
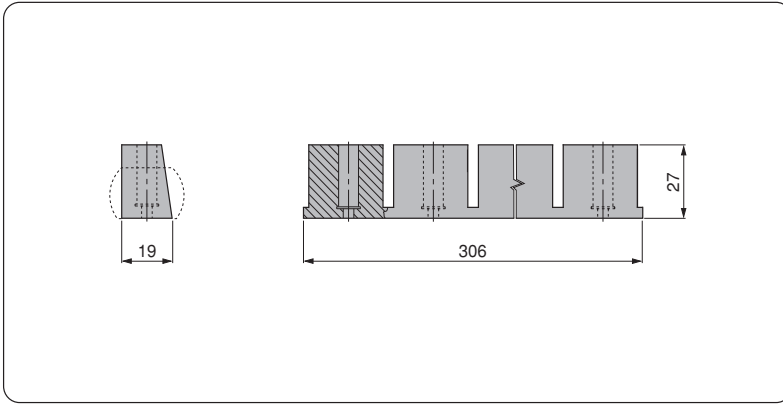
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FCA CODE:STQ 80003

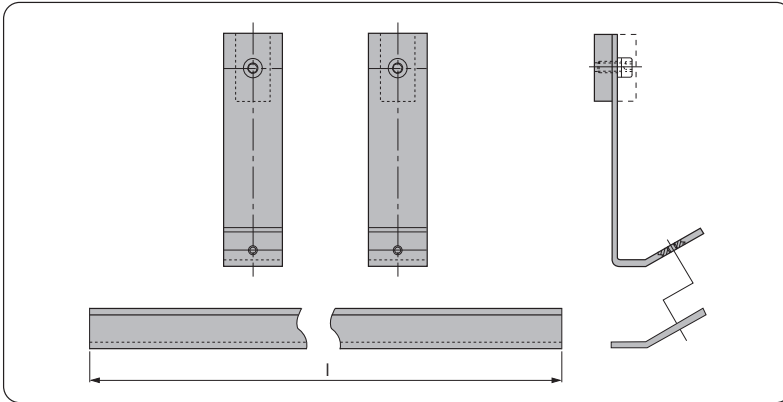


Material :
Elastomer 70 Sh

FCA CODE:STQ 80009

FCA Code

ES_EL_027306



Material :
Steel

FCA CODE:STQ 80010

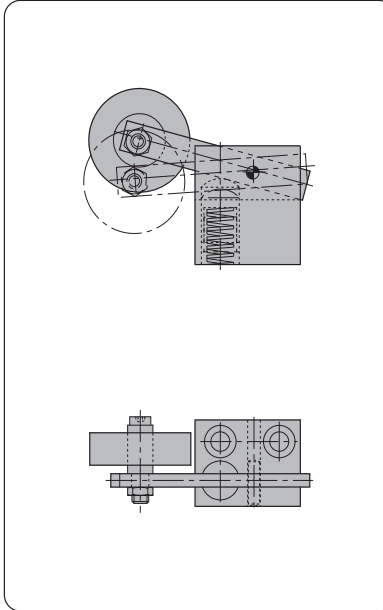
FCA Code

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GRR_CI_440	440
GRR_CI_485	485
GRR_CI_620	620



Material :
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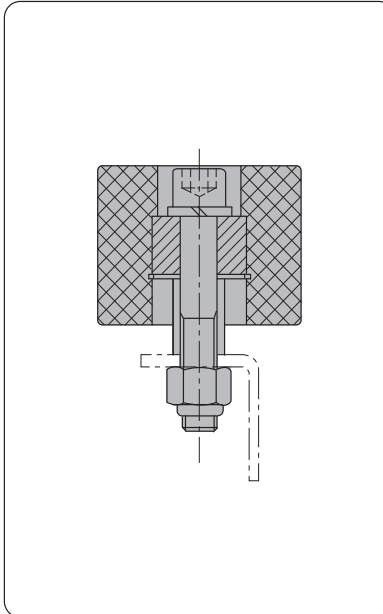
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FCA CODE:STQ 80013



Material :
Steel
Nylon



FCA Code

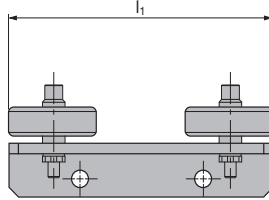
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FCA CODE:STQ 80014

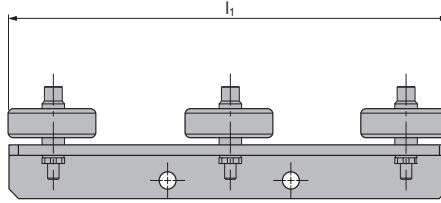


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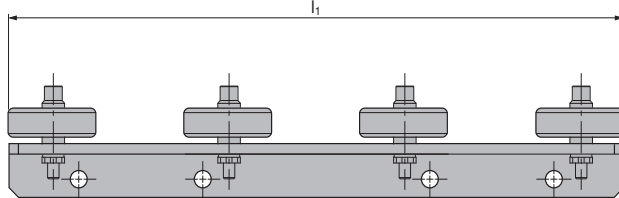
Form - A



Form - B



Form - C



FCA CODE:STQ 80023

FCA Code	Form	l_1
SP_R_150	A	150
SP_R_250	B	250
SP_R_350	C	350



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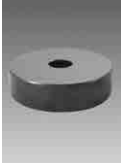




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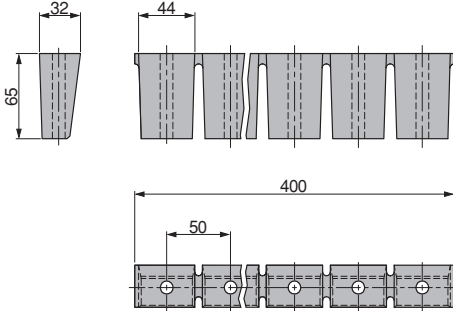
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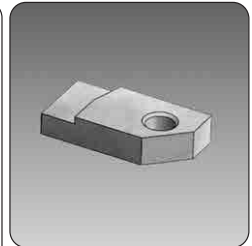
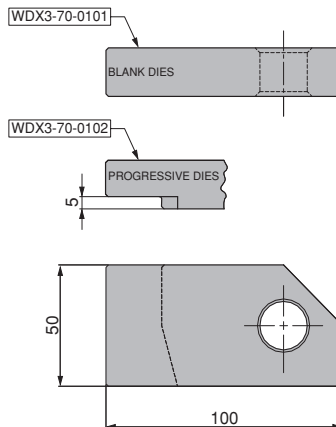
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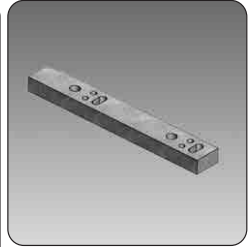
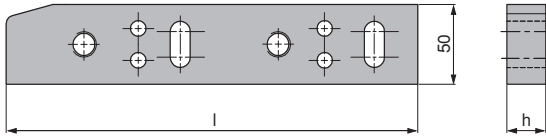
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WDX3-70-0103	Progressive Dies Opposite



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St 37

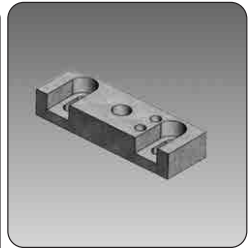
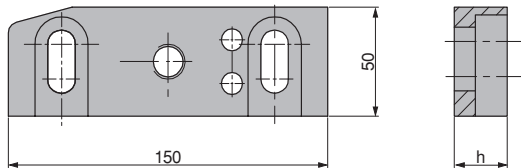
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HRC 56 ÷ 58

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Hardened
HRC 56 ÷ 58

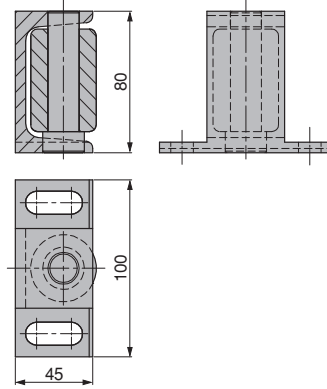
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FORD Code	h
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WDX3-70-0506	50

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R = COUNTER BORE FOR RIGHT SIDE (SHOWN)
L = COUNTER BORE FOR LEFT SIDE



Material :
Steel



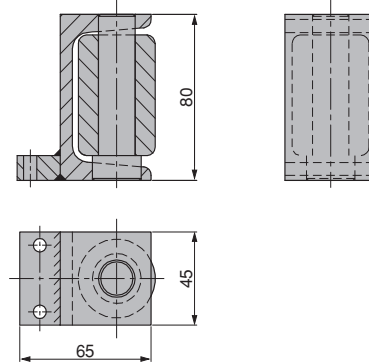
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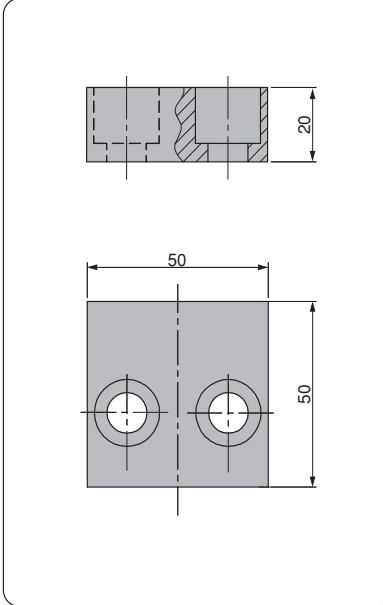
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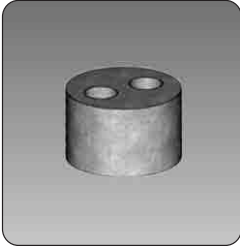
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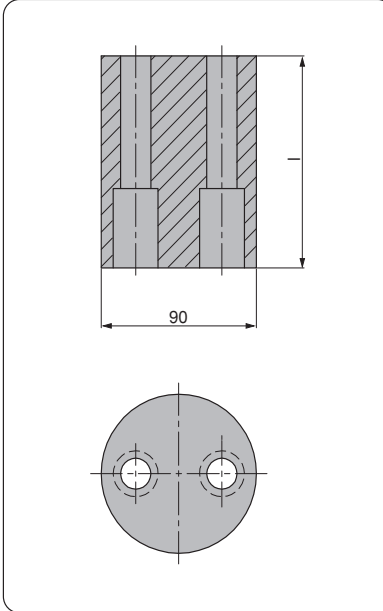
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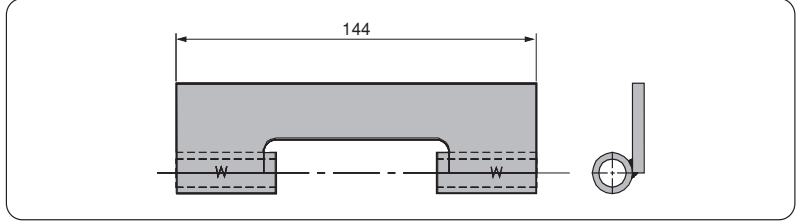
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WDX4-70-12120	120
WDX4-70-12145	145

FORD CODE:WDX4-70

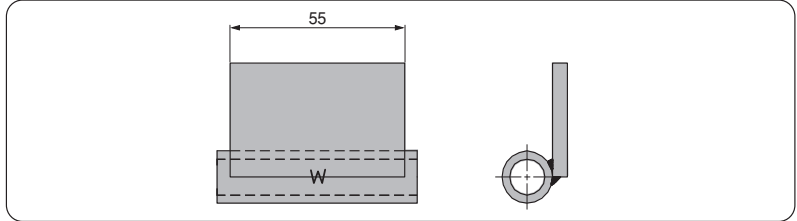
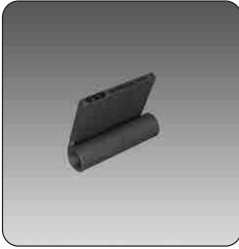


FORD CODE:WDX5-60

Material :
Steel

FORD Code

WDX5-60-3301

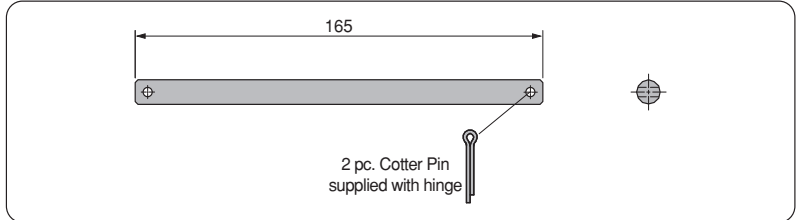


FORD CODE:WDX5-60

Material :
Steel

FORD Code

WDX5-60-3302

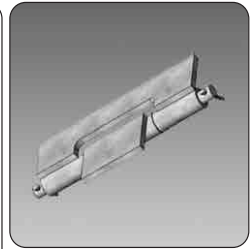
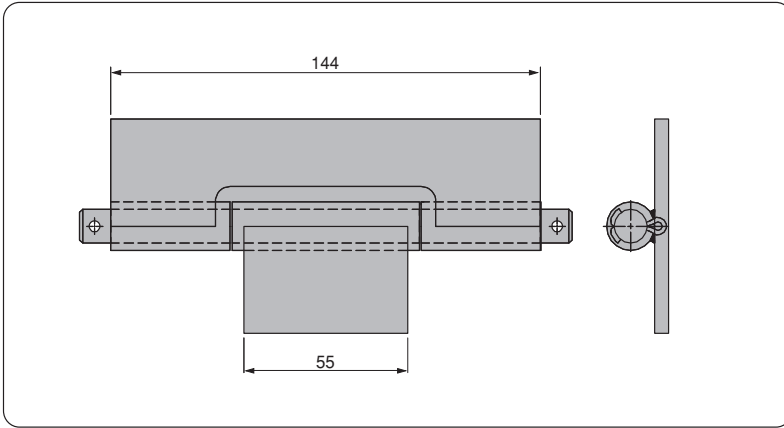


FORD CODE:WDX5-60

Material :
Steel

FORD Code

WDX5-60-3303

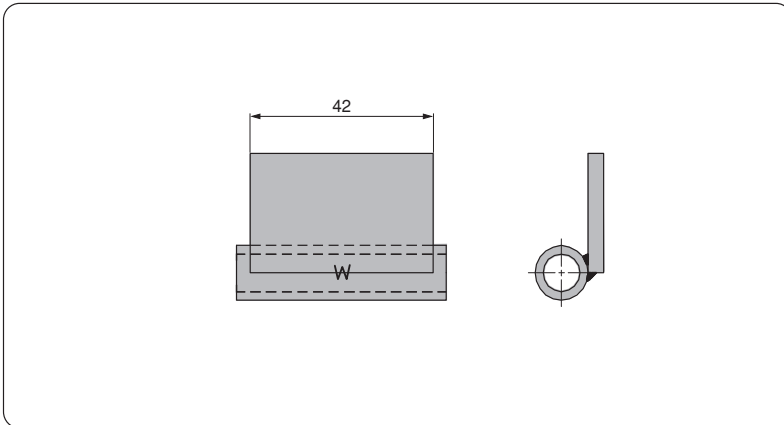


Material :
Steel

FORD Code

WDX5-60-3301-A

FORD CODE:WDX5-60

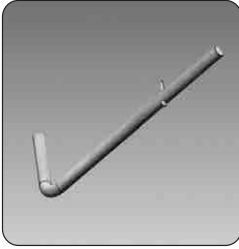


Material :
Steel

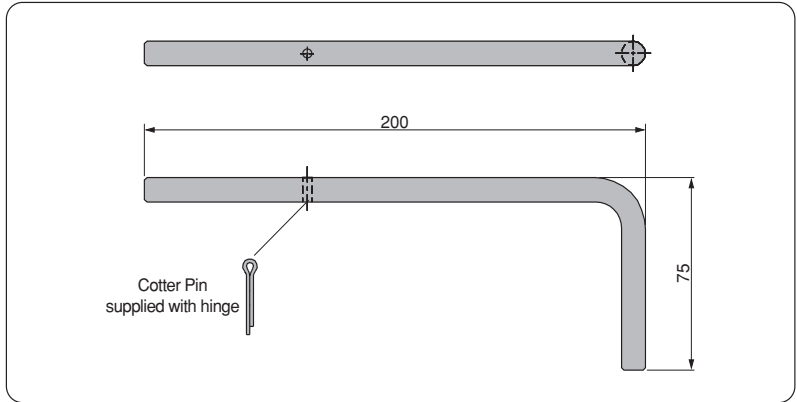
FORD Code

WDX5-60-3401

FORD CODE:WDX5-60



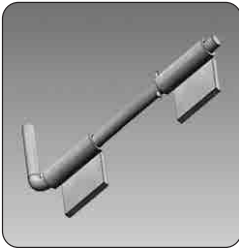
Material :
Steel



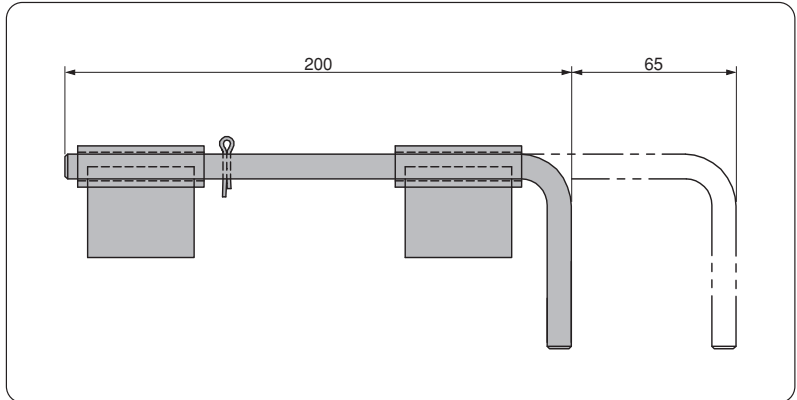
FORD Code

WDX5-60-3420

FORD CODE:WDX5-60



Material :
Steel



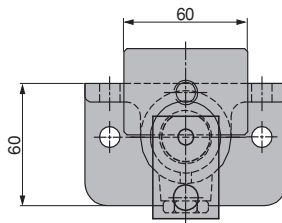
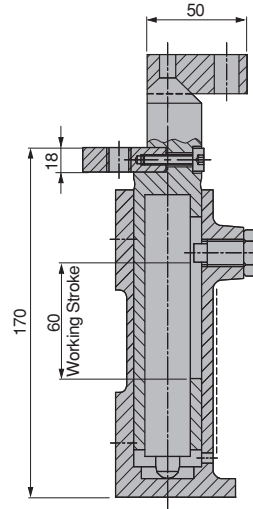
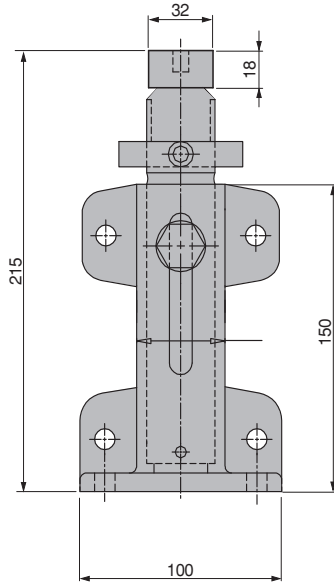
FORD Code

WDX5-60-3401-A

FORD CODE:WDX5-60

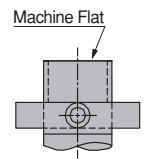
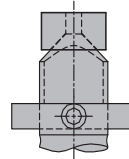


Material :
Steel
Gas Spring



Form - A

Form - B

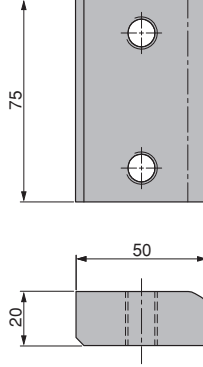


FORD CODE:WDX6-60

FORD Code	Form
WDX6-60-0401	A
WDX6-60-0402	B

FORD Code

WDX7-60-1101

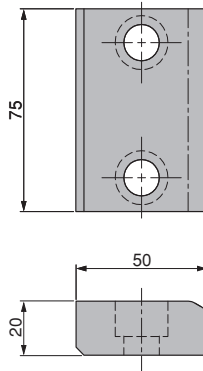


Material :
CK45
Hardened
HRC 56 ± 60

FORD CODE:WDX7-60

FORD Code

WDX7-60-1102

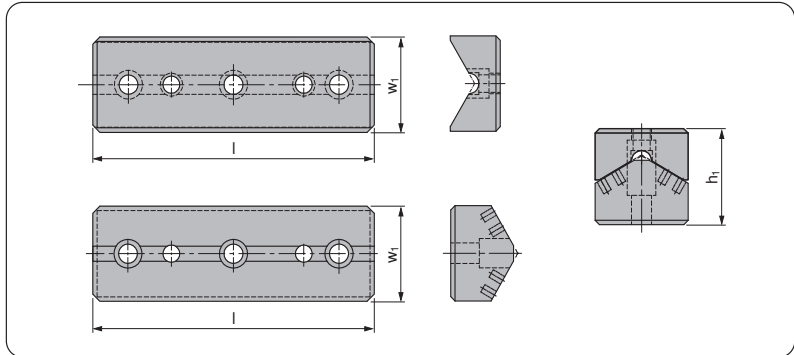


Material :
CK45
Hardened
HRC 56 ± 60

FORD CODE:WDX7-60

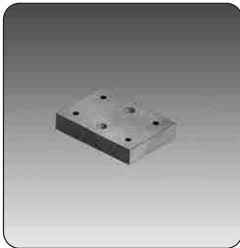


Material :
CK45
Hardened
HRC 56 ÷ 60
Bronze with Non-Liquid Lubricant
HB ≥ 190

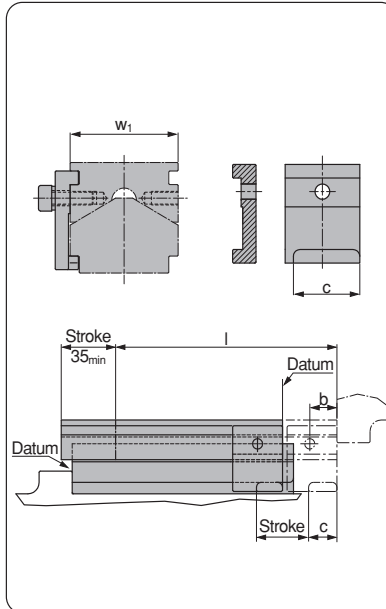


FORD CODE:WDX7-65

FORD Code	h_1	w_1	l
WDX7-65-03065150	65	65	150
WDX7-65-03065200	65	65	200
WDX7-65-03065250	65	65	250
WDX7-65-03065300	65	65	300
WDX7-65-03125150	85	125	150
WDX7-65-03125200	85	125	200
WDX7-65-03125250	85	125	250
WDX7-65-03125300	85	125	300



Material :
CK45
Bronze with Non-Liquid Lubricant
HB ≥ 190



Ordering Example:
Clamp=Right, l=200
C=24 mm and B=26 mm
FORD CODE
WDX7-65-05122-A-B26C24

FORD Code	w_1	l	Clamp
WDX7-65-05111-A	65	150	Right
WDX7-65-05112-A	65	200	Left
WDX7-65-05113-A	65	250	Both
WDX7-65-05121-A	65	300	Right
WDX7-65-05122-A	65	150	Left
WDX7-65-05123-A	65	200	Both
WDX7-65-05131-A	65	250	Right
WDX7-65-05132-A	65	300	Left
WDX7-65-05133-A	65	150	Both
WDX7-65-05141-A	65	200	Right
WDX7-65-05142-A	65	250	Left
WDX7-65-05143-A	65	300	Both
WDX7-65-05211-A	125	150	Right
WDX7-65-05212-A	125	200	Left
WDX7-65-05213-A	125	250	Both
WDX7-65-05221-A	125	300	Right
WDX7-65-05222-A	125	150	Left
WDX7-65-05223-A	125	200	Both
WDX7-65-05231-A	125	250	Right
WDX7-65-05232-A	125	300	Left
WDX7-65-05233-A	125	150	Both
WDX7-65-05241-A	125	200	Right
WDX7-65-05242-A	125	250	Left
WDX7-65-05243-A	125	300	Both

FORD CODE:WDX7-65

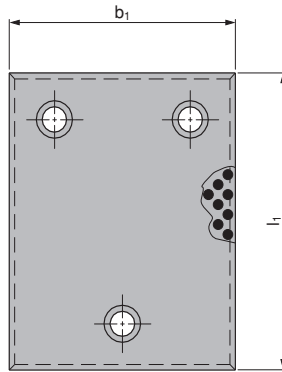


Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

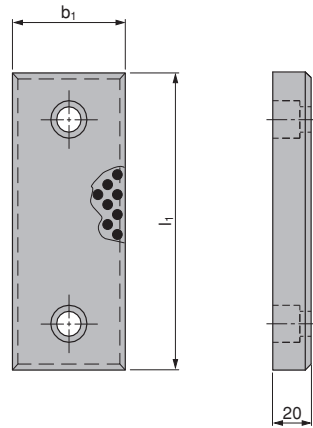
Direction of Motion



Form - A

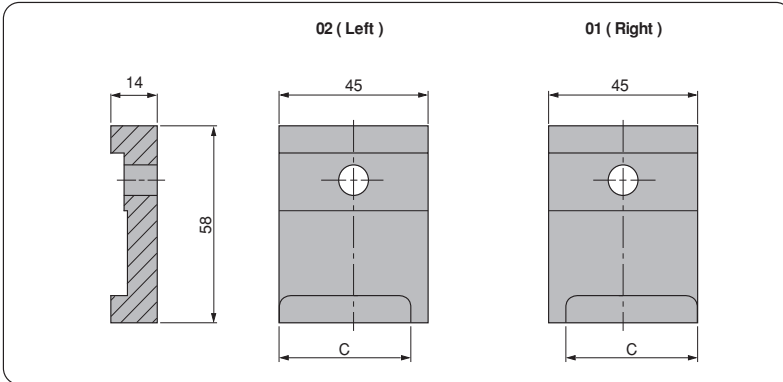


Form - B



FORD CODE:WDX7-65

FORD Code	Form	b ₁	l ₁
WDX7-65-10050100Y	B	50	100
WDX7-65-10050125Y	B	50	125
WDX7-65-10050160Y	B	50	160
WDX7-65-10050200Y	B	50	200
WDX7-65-10080100Y	B	80	100
WDX7-65-10080125Y	B	80	125
WDX7-65-10080160Y	B	80	160
WDX7-65-10080200Y	B	80	200
WDX7-65-10080250Y	B	80	250
WDX7-65-10080315Y	B	80	315
WDX7-65-10125100Y	A	125	100
WDX7-65-10125125Y	A	125	125
WDX7-65-10125160Y	A	125	160
WDX7-65-10125200Y	A	125	200
WDX7-65-10125250Y	A	125	250
WDX7-65-10125315Y	A	125	315
WDX7-65-10160100Y	A	160	100
WDX7-65-10160125Y	A	160	125
WDX7-65-10160160Y	A	160	160
WDX7-65-10160200Y	A	160	200
WDX7-65-10160250Y	A	160	250
WDX7-65-10160315Y	A	160	315



Material :
CK45
Hardened
HRC 28 ÷ 30

FORD CODE:WDX7-65

FORD Code

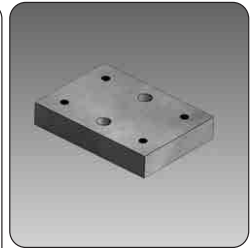
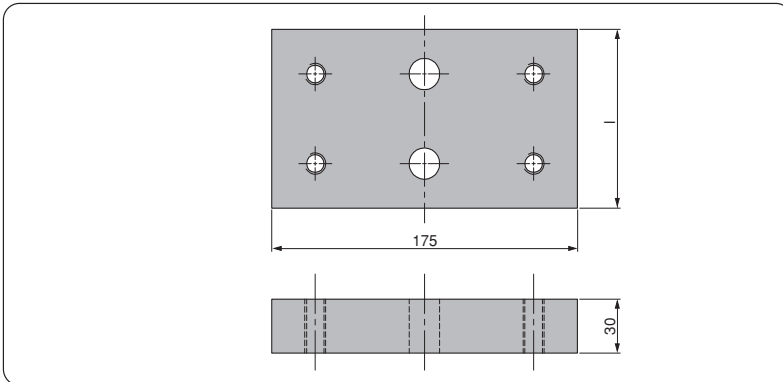
WDX7-65-0445-_-C_-

WHEN ORDERING CLAMP ONLY: SPECIFY "C" DIMENSION AND
LOCATION OF RETURN CLAMP:

1=RIGHT SIDE

2=LEFT SIDE

3=BOTH SIDES



Material :
Steel

FORD CODE:WDX7-65

FORD Code

h

WDX7-65-11175100

100

WDX7-65-11175125

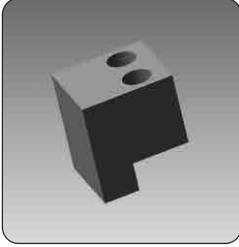
125

WDX7-65-11175160

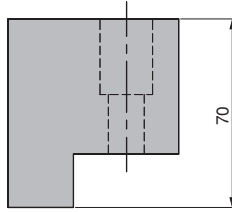
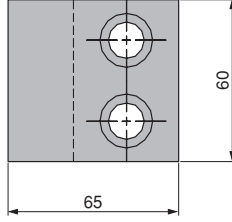
160

WDX7-65-11175200

200



Material :
Steel



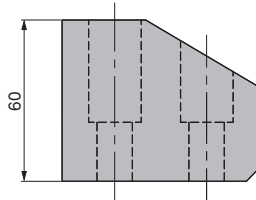
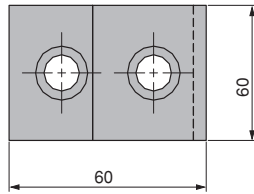
FORD Code

WDX7-65-1201

FORD CODE:WDX7-65



Material :
Steel



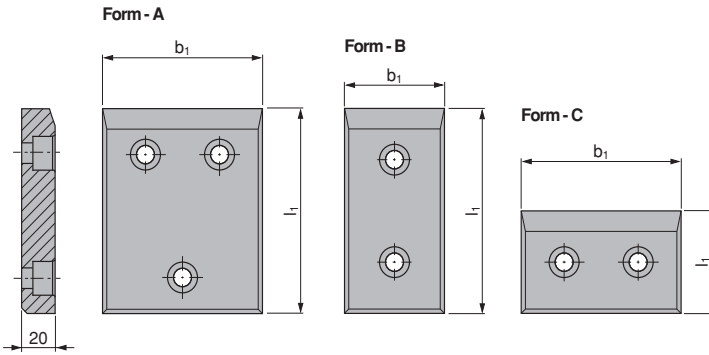
FORD Code

WDX7-65-1202

FORD CODE:WDX7-65



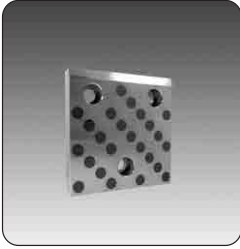
Material :
16MnCr5
Hardened
HRC 60 ÷ 64



FORD CODE:WDX13-65

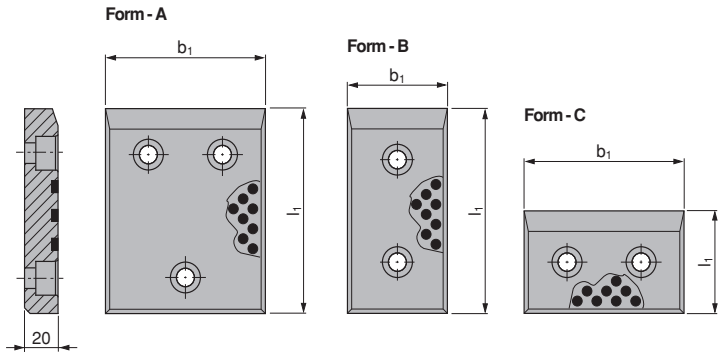
FORD Code	Form	b ₁	l ₁
WDX13-65-01050100X	B	50	100
WDX13-65-01050125X	B	50	125
WDX13-65-01050160X	B	50	160
WDX13-65-01050200X	B	50	200
WDX13-65-01080100X	B	80	100
WDX13-65-01080125X	B	80	125
WDX13-65-01080160X	B	80	160
WDX13-65-01080200X	B	80	200
WDX13-65-01080250X	B	80	250
WDX13-65-01080315X	B	80	315
WDX13-65-01100050X	C	100	50
WDX13-65-01100100X	B	100	100
WDX13-65-01100125X	B	100	125
WDX13-65-01100160X	B	100	160
WDX13-65-01100200X	B	100	200
WDX13-65-01100250X	B	100	250
WDX13-65-01100315X	B	100	315

FORD Code	Form	b ₁	l ₁
WDX13-65-01125100X	C	125	100
WDX13-65-01125125X	C	125	125
WDX13-65-01125160X	C	125	160
WDX13-65-01125200X	C	125	200
WDX13-65-01125250X	C	125	250
WDX13-65-01125315X	C	125	315
WDX13-65-01160100X	C	160	100
WDX13-65-01160125X	C	160	125
WDX13-65-01160160X	C	160	160
WDX13-65-01160200X	C	160	200
WDX13-65-01160250X	C	160	250
WDX13-65-01160315X	C	160	315



Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion

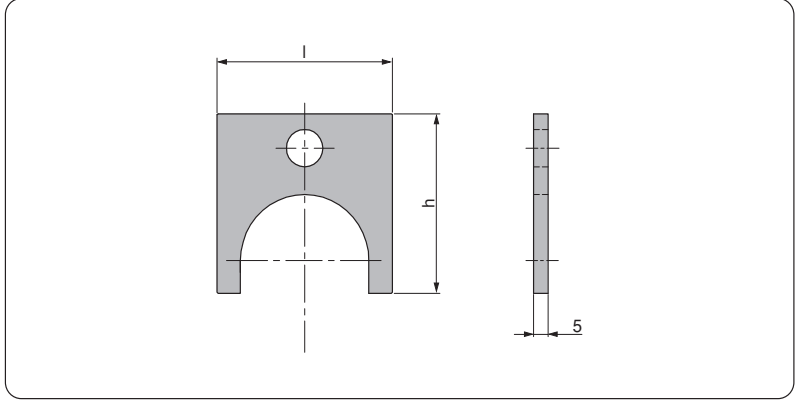


FORD CODE:WDX13-65

FORD Code	Form	b ₁	l ₁	FORD Code	Form	b ₁	l ₁
WDX13-65-01050100Y	B	50	100	WDX13-65-01125100Y	C	125	100
WDX13-65-01050125Y	B	50	125	WDX13-65-01125125Y	C	125	125
WDX13-65-01050160Y	B	50	160	WDX13-65-01125160Y	C	125	160
WDX13-65-01050200Y	B	50	200	WDX13-65-01125200Y	C	125	200
WDX13-65-01080100Y	B	80	100	WDX13-65-01125250Y	C	125	250
WDX13-65-01080125Y	B	80	125	WDX13-65-01125315Y	C	125	315
WDX13-65-01080160Y	B	80	160	WDX13-65-01160100Y	C	160	100
WDX13-65-01080200Y	B	80	200	WDX13-65-01160125Y	C	160	125
WDX13-65-01080250Y	B	80	250	WDX13-65-01160160Y	C	160	160
WDX13-65-01080315Y	B	80	315	WDX13-65-01160200Y	C	160	200
WDX13-65-01100050Y	C	100	50	WDX13-65-01160250Y	C	160	250
WDX13-65-01100100Y	B	100	100	WDX13-65-01160315Y	C	160	315
WDX13-65-01100125Y	B	100	125				
WDX13-65-01100160Y	B	100	160				
WDX13-65-01100200Y	B	100	200				
WDX13-65-01100250Y	B	100	250				
WDX13-65-01100315Y	B	100	315				



Material :
Steel



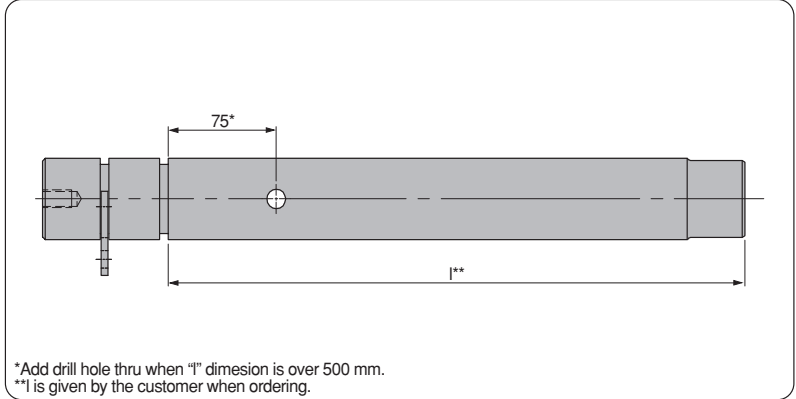
FORD Code	l	h
WDX14-60-0125	40	50
WDX14-60-0135	50	55
WDX14-60-0150	60	60
WDX14-60-0155	70	65
WDX14-60-0163	80	70

FORD CODE:WDX14-60



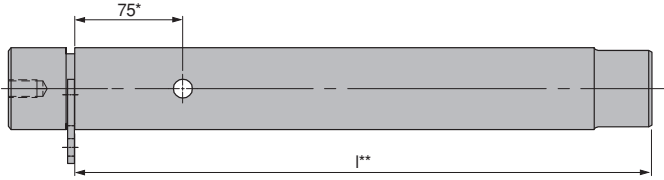
Material (Pad Retainer Pin) :
CK45

Material (Pad Retainer Plate) :
Steel



FORD Code	l	load per pin (Kg)
WDX14-60-0255501-A-L???	???	5200

FORD CODE:WDX14-60



*Add drill hole thru when "l" dimension is over 500 mm.
**l is given by the customer when ordering.

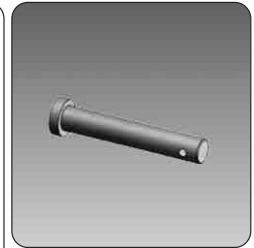
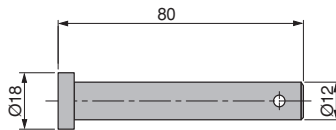


Material (Pad Retainer Pin) :
CK45

Material (Pad Retainer Plate) :
Steel

FORD Code	l	load per pin (Kg)
WDX14-60-025502-A-L???	???	5200

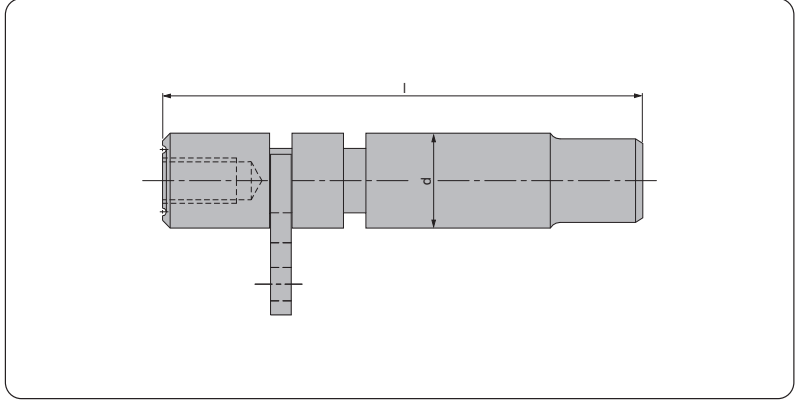
FORD CODE:WDX14-60



Material :
CK45

FORD Code
WDX14-60-0280

FORD CODE:WDX14-60

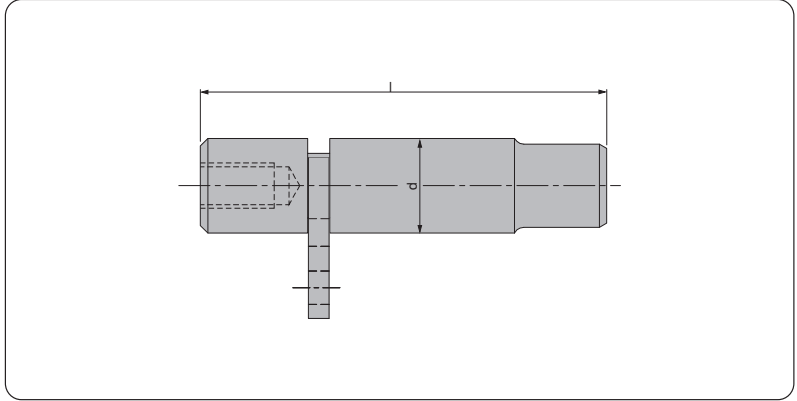


Material (Pad Retainer Pin) :
CK45

Material (Pad Retainer Plate) :
Steel

FORD Code	d	l	Load Permissible per pin (Kg)
WDX14-60-0325-A	25	130	1000
WDX14-60-0335-A	35	155	2500
WDX14-60-0350-A	50	200	5000
WDX14-60-0363-A	63	250	8000

FORD CODE:WDX14-60

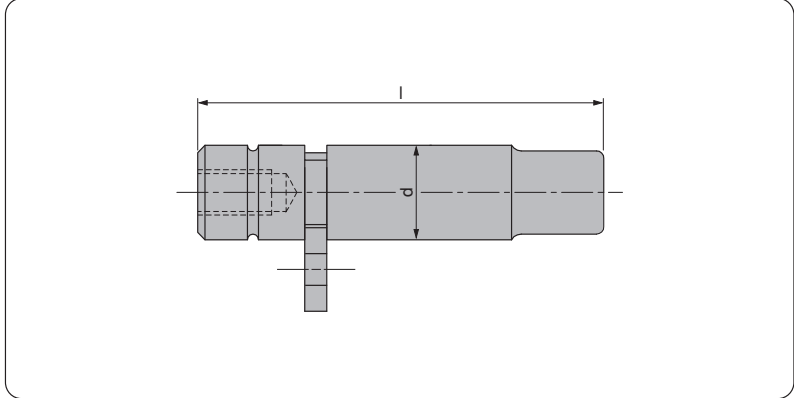


Material (Pad Retainer Pin) :
CK45

Material (Pad Retainer Plate) :
Steel

FORD Code	d	l	Load Permissible per pin (Kg)
WDX14-60-0425-A	25	110	1000
WDX14-60-0435-A	35	130	2500
WDX14-60-0450-A	50	170	5000
WDX14-60-0463-A	63	210	8000

FORD CODE:WDX14-60

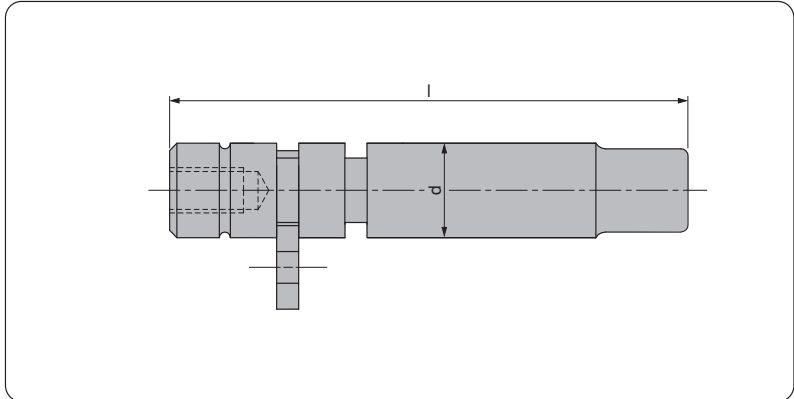


Material (Pad Retainer Pin) :
CK45

Material (Pad Retainer Plate) :
Steel

FORD Code	d	l	Load Permissible per pin (Kg)
WDX14-60-1425-A	25	120	1000
WDX14-60-1435-A	35	140	2500
WDX14-60-1450-A	50	180	5000
WDX14-60-1463-A	63	210	8000

FORD CODE:WDX14-60

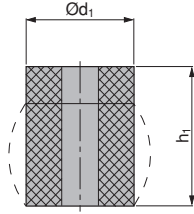


Material (Pad Retainer Pin) :
CK45

Material (Pad Retainer Plate) :
Steel

FORD Code	d	l	Load Permissible per pin (Kg)
WDX14-60-1525-A	25	145	1000
WDX14-60-1535-A	35	170	2500
WDX14-60-1550-A	50	215	5000
WDX14-60-1563-A	63	255	8000

FORD CODE:WDX14-60



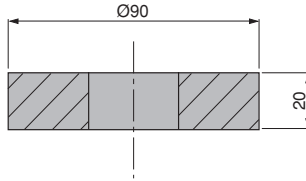
Material :
Elastomer 92 Sh

FORD CODE:WDX14-70

FORD Code	d_1	h_1
WDX14-70-194032	40	32
WDX14-70-194040	40	40
WDX14-70-194050	40	50
WDX14-70-194063	40	63
WDX14-70-194080	40	80
WDX14-70-195032	50	32
WDX14-70-195040	50	40
WDX14-70-195050	50	50
WDX14-70-195063	50	63
WDX14-70-195080	50	80
WDX14-70-1950100	50	100
WDX14-70-196332	63	32
WDX14-70-196340	63	40
WDX14-70-196350	63	50
WDX14-70-196363	63	63
WDX14-70-196380	63	80
WDX14-70-1963100	63	100
WDX14-70-1963125	63	125
WDX14-70-198032	80	32
WDX14-70-198040	80	40
WDX14-70-198050	80	50
WDX14-70-198063	80	63
WDX14-70-198080	80	80
WDX14-70-1980100	80	100
WDX14-70-1980125	80	125



Material :
42CrMo4



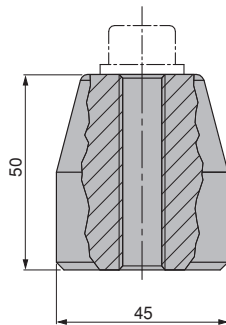
FORD Code

WDX15-70-0201

FORD CODE:WDX15-70



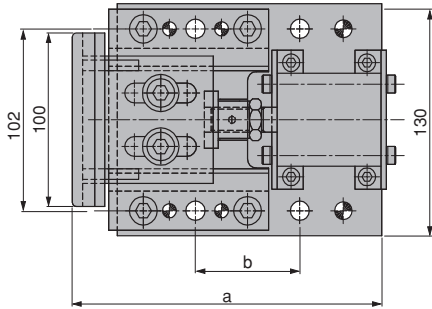
Material :
CK45



FORD Code

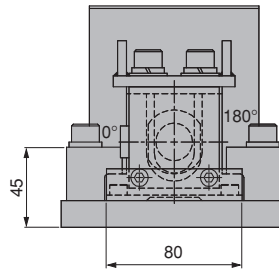
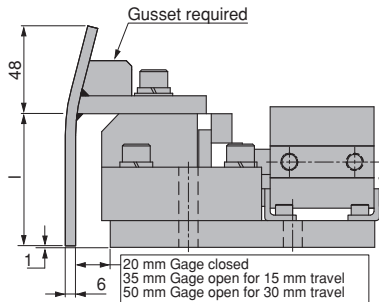
WDX15-70-0401

FORD CODE:WDX15-70



Material :
Steel
Bronze
Air Cylinder

Air cylinder bracket must be secured to air cylinder with screws, serrated safety washers and properly torque.

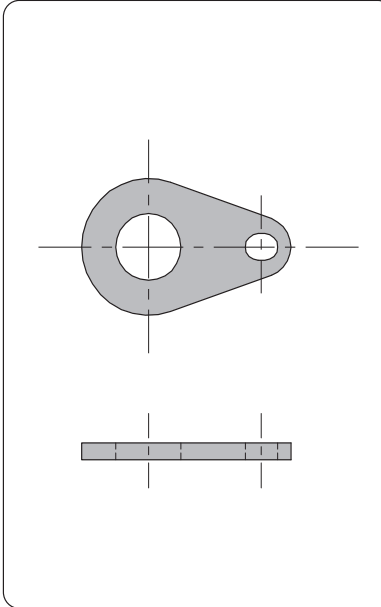


FORD CODE:WDX16-80

FORD Code	Air Cylinder Travel	a CLOSED	a OPEN	b	l
WDX16-80-3330075	30	184	214	60	75
WDX16-80-3330100	30	184	214	60	100
WDX16-80-3330125	30	184	214	60	125
WDX16-80-3330150	30	184	214	60	150
WDX16-80-3330175	30	184	214	60	175
WDX16-80-3330200	30	184	214	60	200



Material :
Steel



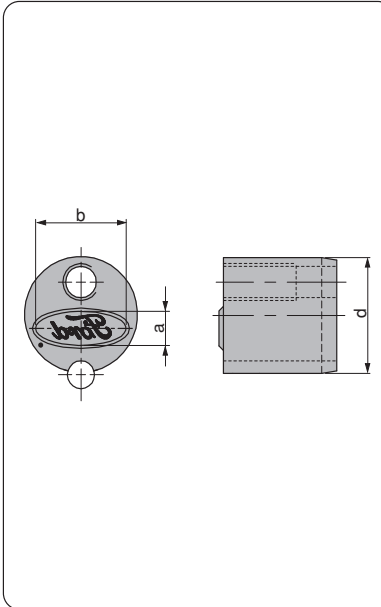
FORD Code

WDX19-70-0703

FORD CODE:WDX19-70



Material :
X155CrVMo12
Hardened
HRC 60 ÷ 62

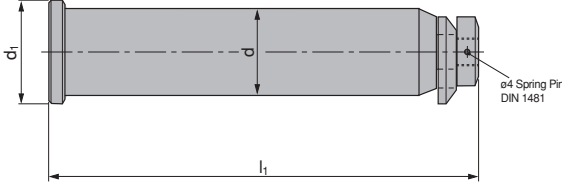


FORD Code

a b d

WDX20-65-0310	2,2	6	10
WDX20-65-0313	3,6	10	13
WDX20-65-0325	7,3	20	25

FORD CODE:WDX20-65



Material :
42CrMo4

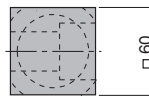
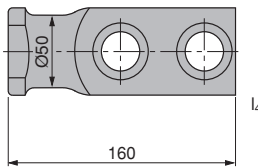
WARNING !
For safety reasons, the weight of the tool has to be supported by just two lifting pins.
Respect the max load

UYARI !
Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.
Maksimum yükü göz ardı etmeyiniz

ACHTUNG !
Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.
Maximale Nutzlast beachten

FORD CODE:WDX22-60

FORD Code	Max. Load (Kg)	Max. Die Weight (Kg)	d	d ₁	l ₁
WDX22-60-0135	1500	3000	35	45	165
WDX22-60-0150	5000	10000	50	63	230
WDX22-60-0163	20000	40000	63	76	320
WDX22-60-0180	30000	60000	80	89	370



Material :
CK45
700 ÷ 800 N/mm²

WARNING !
For safety reasons, the weight of the tool has to be supported by just two lifting pins.
Respect the max load

UYARI !
Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.
Maksimum yükü göz ardı etmeyiniz

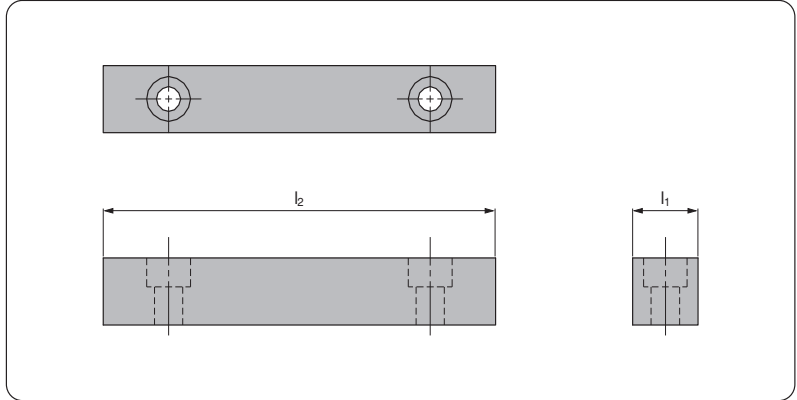
ACHTUNG !
Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.
Maximale Nutzlast beachten

FORD CODE:WDX22-70

FORD Code	Max. Load (Kg)	Max. Die Weight (Kg)
WDX22-70-0501	5000	10000

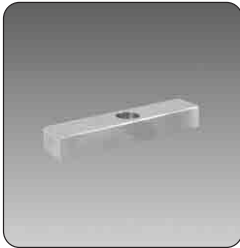


Material :
CK45

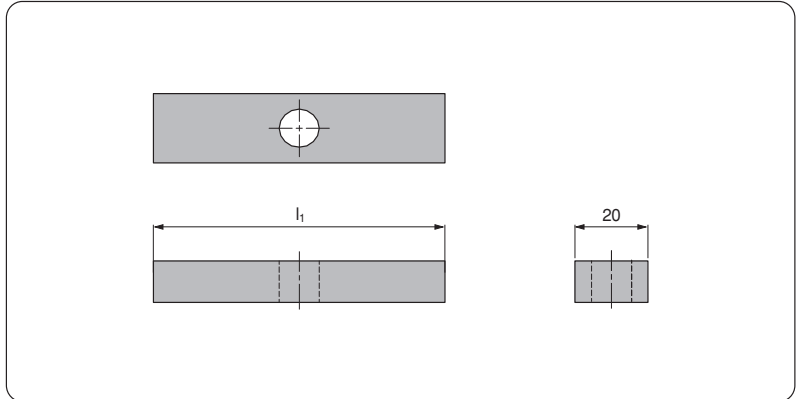


FORD Code	l_1	l_2
WDX30-60-0125125	25	125
WDX30-60-0125180	25	180
WDX30-60-0130125	30	125
WDX30-60-0130180	30	180

FORD CODE:WDX30-60

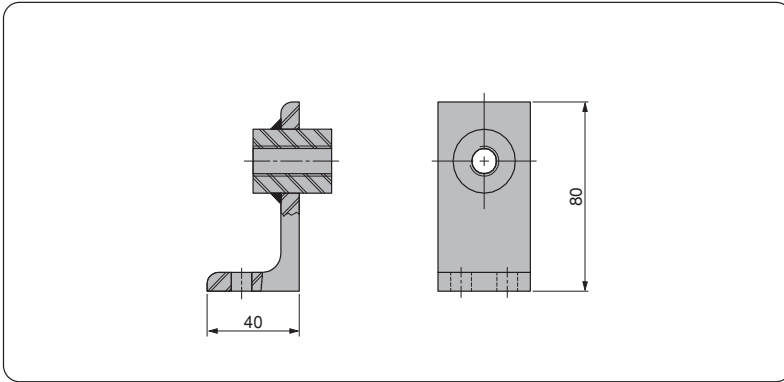


Material :
CK45



FORD Code	l_1
WDX30-60-02080	80
WDX30-60-02125	125

FORD CODE:WDX30-60

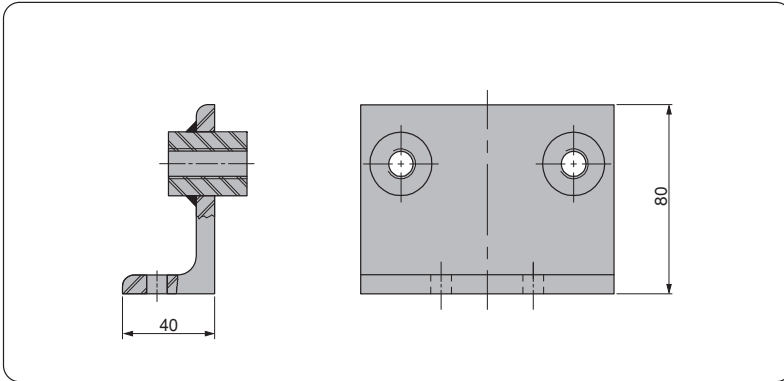


Material :
Steel

FORD CODE:WDX35-70

FORD Code

WDX35-70-1401



Material :
Steel

FORD CODE:WDX35-70

FORD Code

WDX35-70-1502



Mercedes-Benz

Standard

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Mercedes-Benz

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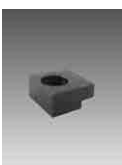
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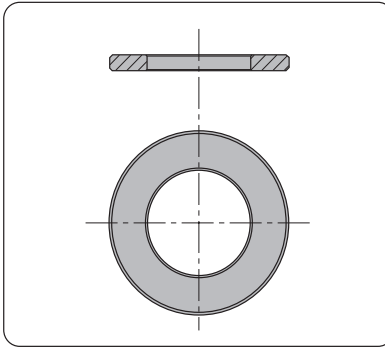
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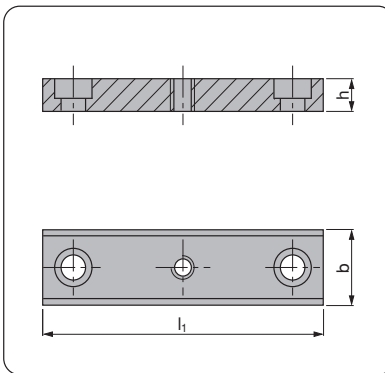
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Material :
CK45

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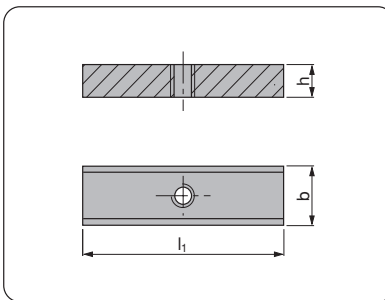
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B8 0111 0332858	30	30	100
B8 0111 0370158	30	30	175
B8 0111 0333602	30	30	250
B8 0111 0332733	22	14	50
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Material :
CK45

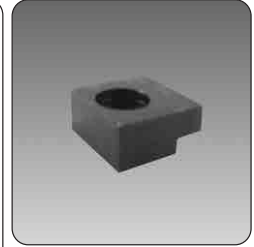
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B8 0111 1081867	22	14	90



Material :
CK45

MERCEDES-BENZ Code: B8 0111 131 008 812



Material :
CK45

MERCEDES-BENZ Code	Bushing Size
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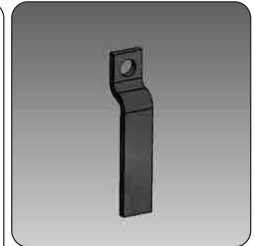
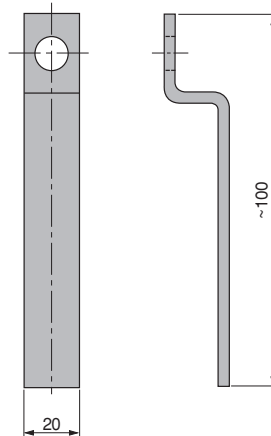
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MERCEDES-BENZ Code

B8 0162 0530492



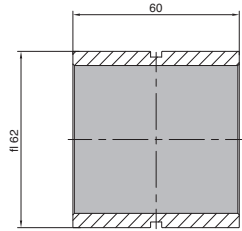
Material :
Steel

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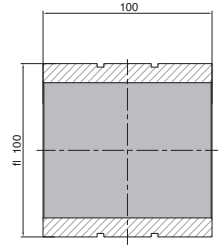


Material :
St37

Form-A



Form-B



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MERCEDES-BENZ Code

I

B8 0541 0093839

65

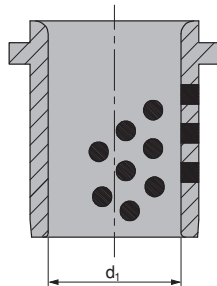
B8 0541 0093840

90



Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion



MERCEDES-BENZ Code

d₁

B8 0441 0331931 25

B8 0441 0331932 32

B8 0441 0331933 40

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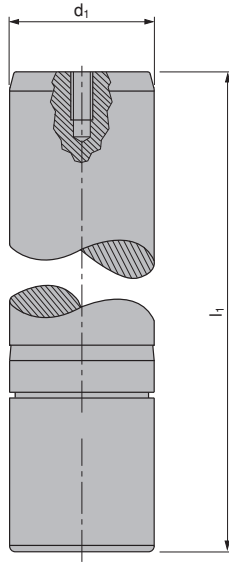
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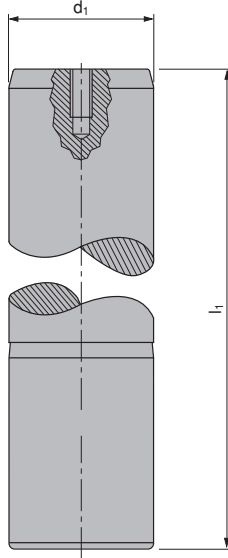
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Material :
16MnCr5
Hardened
HRC 60 ÷ 62

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B8 0450 0333410	40	280
B8 0450 0333411	50	160
B8 0450 0333412	50	180
B8 0450 0333413	50	200
B8 0450 0333414	50	224
B8 0450 0333415	50	250
B8 0450 0333416	50	280
B8 0450 0333417	50	315
B8 0450 0333418	50	355
B8 0450 0333419	63	180
B8 0450 0333420	63	200
B8 0450 0333421	63	224
B8 0450 0333422	63	250
B8 0450 0333423	63	280
B8 0450 0333424	63	315
B8 0450 0333425	63	355
B8 0450 0333426	63	400
B8 0450 0333427	80	224
B8 0450 0333428	80	250
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Material :
16MnCr5
Hardened
HRC 60 ÷ 62

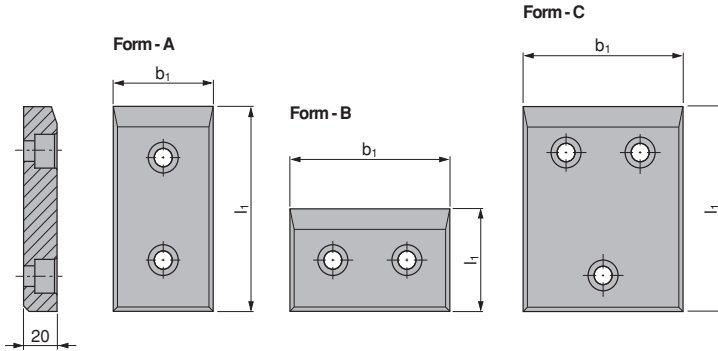
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B8 0450 0332524	40	200
B8 0450 0332525	40	224
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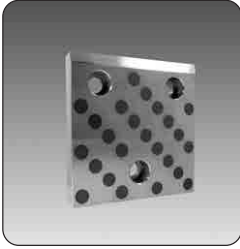
Material :
16MnCr5
Hardened
HRC 60 ÷ 64



MERCEDES-BENZ Code: B8 0460 219 008 001

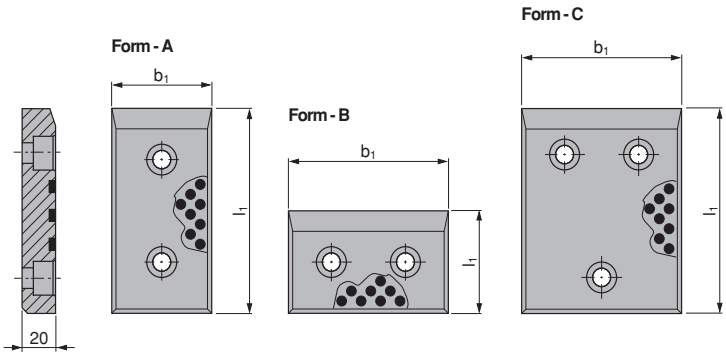
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B8 0460 0332866	A	90	80
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B8 0460 0332883	B	170	50
B8 0460 0332884	B	170	80
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Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion

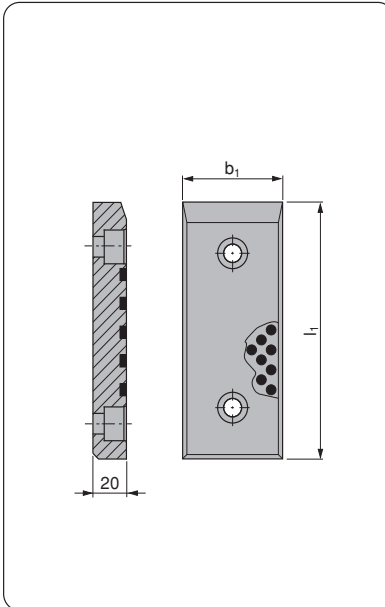


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B8 0460 0332591	A	50	200
B8 0460 0332592	B	80	50
B8 0460 0332593	A	80	80
B8 0460 0332594	A	80	100
B8 0460 0332595	A	80	125
B8 0460 0332596	A	80	160
B8 0460 0332597	A	80	200
B8 0460 0332598	B	100	50
B8 0460 0332599	B	100	80
B8 0460 0332600	A	100	100
B8 0460 0332601	A	100	125
B8 0460 0332602	A	100	160
B8 0460 0332603	A	100	200

MERCEDES-BENZ Code	Form	b ₁	l ₁
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B8 0460 0332605	B	125	80
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B8 0460 0332607	C	125	125
B8 0460 0332608	C	125	160
B8 0460 0332609	C	125	200
B8 0460 0332610	B	160	50
B8 0460 0332611	B	160	80
B8 0460 0332612	C	160	100
B8 0460 0332613	C	160	125
B8 0460 0332614	C	160	160
B8 0460 0332615	C	160	200

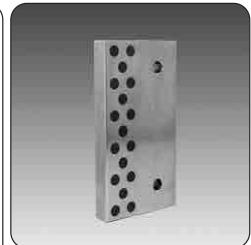
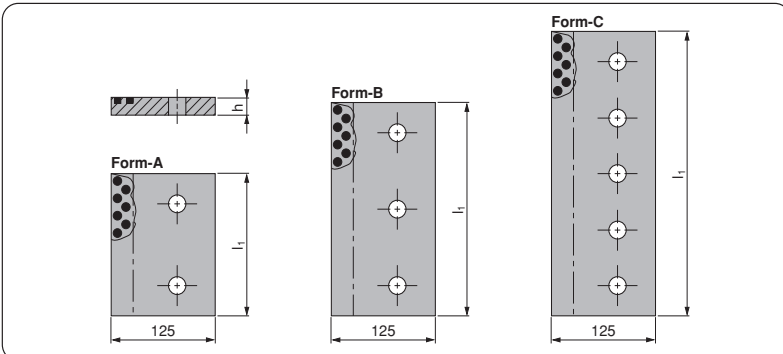
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B8 0460 0333606	30	160
B8 0460 0333607	30	200
B8 0460 0333608	40	80
B8 0460 0333609	40	100
B8 0460 0333610	40	125
B8 0460 0333611	40	160
B8 0460 0333612	40	200
B8 0460 0333613	60	80
B8 0460 0333614	60	100
B8 0460 0333615	60	125
B8 0460 0333616	60	160
B8 0460 0333617	60	200



Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion

MERCEDES-BENZ Code: B8 0460 231 008 801

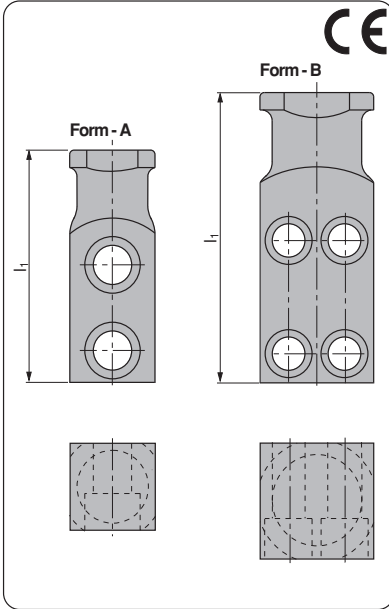


Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion

MERCEDES-BENZ Code: B8 0460 231 009 003

MERCEDES-BENZ Code	Form	h	l ₁
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B8 0460 0528245	B	25	250
B8 0460 0528246	C	25	400
B8 0460 0528247	A	30	160
B8 0460 0528248	B	30	200
B8 0460 0528249	B	30	250
B8 0460 0528250	C	30	400



MERCEDES-BENZ Code	Max. Load (Kg)	Max. Die Weight (Kg)
B8 1240 0333078	320	640
B8 1240 0333079	630	1260
B8 1240 0333080	1250	2500
B8 1240 0333081	2000	4000
B8 1240 0333082	3200	6400
B8 1240 0333083	5000	10000
B8 1240 0333084	8000	16000
B8 1240 0333085	12500	25000
B8 1240 0333086	20000	40000



MERCEDES-BENZ Code	Form	l1
B8 1240 0333078	A	80
B8 1240 0333079	A	90
B8 1240 0333080	A	100
B8 1240 0333081	A	120
B8 1240 0333082	A	140
B8 1240 0333083	A	160
B8 1240 0333084	B	200
B8 1240 0333085	B	250
B8 1240 0333086	B	300

Material :
CK45
700 ÷ 800 N/mm²

WARNING !

For safety reasons, the weight of the tool has to be supported by just two lifting pins.
Respect the max load

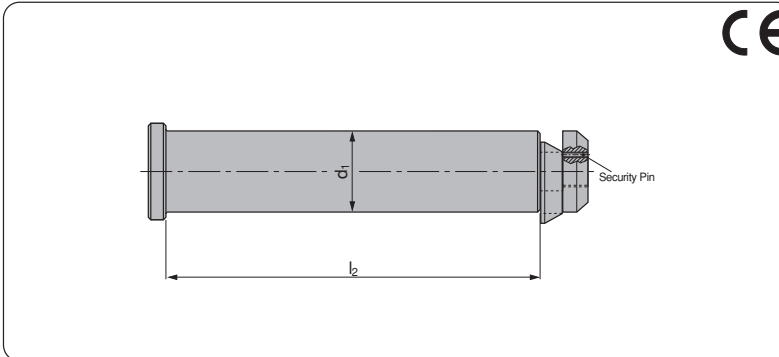
UYARI !

Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.
Maksimum yükü göz ardı etmeyiniz

ACHTUNG !

Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.
Maximale Nutzlast beachten

MERCEDES-BENZ Code: B8 1240 300 009 001



Material :
d₁ ≤ 63 1.0503 CK45
d₁ = 76 1.7225 42CrMo4

WARNING !

For safety reasons, the weight of the tool has to be supported by just two lifting pins.
Respect the max load

UYARI !

Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.
Maksimum yükü göz ardı etmeyiniz

ACHTUNG !

Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.
Maximale Nutzlast beachten

MERCEDES-BENZ Code: B8 2002 231 009 001

MERCEDES-BENZ Code	Max. Load (Kg)	Max. Die Weight (Kg)	d ₁	l ₂
B8 2002 0370693	3200	6400	32	145
B8 2002 0370694	5000	10000	40	188
B8 2002 0537341	8000	16000	50	230
B8 2002 0537342	12500	25000	63	295
B8 2002 0537343	31500	63000	76	360



Standard

1

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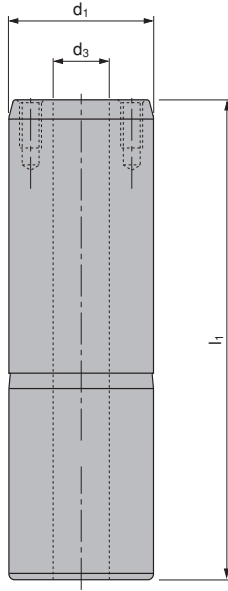
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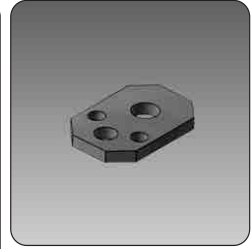
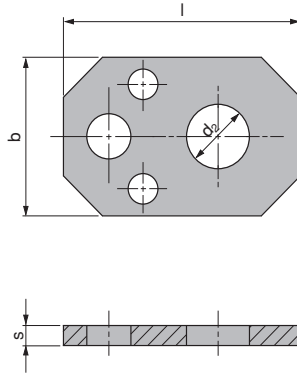
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Material :
16MnCr5
Hardened
HRC 60 ÷ 62

OPEL Code: F3301

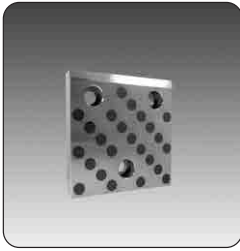
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F33010041	100	50	400
F33010042	125	65	315
F33010043	125	65	355
F33010044	125	65	400
F33010045	125	65	450
F33010050	100	50	450
F33010051	100	50	500
F33010052	100	50	550
F33010053	100	50	600
F33010054	100	50	650
F33010055	125	65	500
F33010056	125	65	550
F33010057	125	65	600
F33010058	125	65	650



Material :
CK45

OPEL Code: F3303

OPEL Code	b	d ₂	l	s
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F33030042	40	6,5	60	4
F33030043	40	6,5	60	6
F33030044	40	9,5	60	2
F33030045	40	9,5	60	4
F33030046	40	9,5	60	6
F33030047	40	11	60	2
F33030048	40	11	60	4
F33030049	40	11	60	6
F33030050	40	13,5	60	2
F33030051	40	13,5	60	4
F33030052	40	13,5	60	6
F33030056	40	19	60	2
F33030057	40	19	60	4
F33030058	40	19	60	6
F33030059	40	22,5	60	2
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F33030061	40	22,5	60	6
F33030062	60	28,5	80	2
F33030063	60	28,5	80	4
F33030064	60	28,5	80	6
F33030065	60	37,5	80	2
F33030066	60	37,5	80	4
F33030067	60	37,5	80	6
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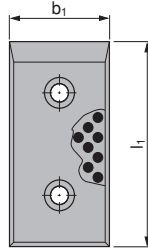


Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

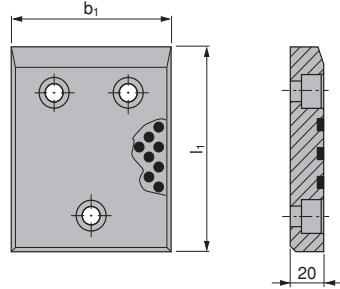
Direction of Motion



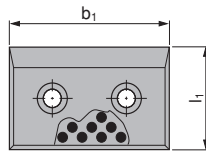
Form - A



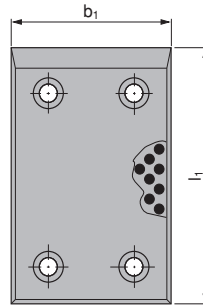
Form - B



Form - C



Form - D



OPEL CODE:F3304

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F33040002	A	50	160
F33040003	A	50	200
F33040004	A	80	100
F33040005	A	80	125
F33040006	A	80	160
F33040007	A	80	200
F33040008	C	100	50
F33040009	C	100	80
F33040010	A	100	100
F33040011	A	100	125
F33040012	A	100	160
F33040013	A	100	200
F33040014	C	125	80
F33040015	B	125	100
F33040016	B	125	125
F33040017	B	125	160
F33040018	B	160	100
F33040019	B	160	125
F33040020	B	160	160

Code	Form	b ₁	l ₁
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F33040114*	D	125	200
F33040115*	D	160	200
F33040116*	D	160	250
F33040117*	D	160	300
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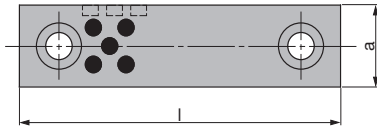
Conforms to VDI 3357, unless noted with*



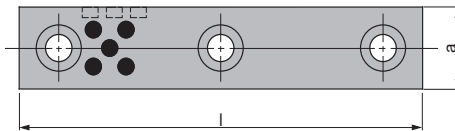
Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion

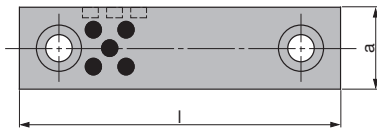
Form - A



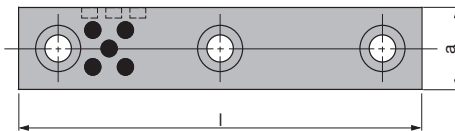
Form - B



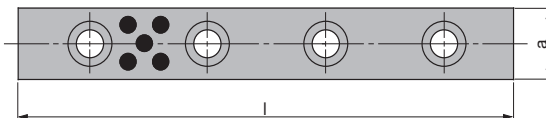
Form - C



Form - D

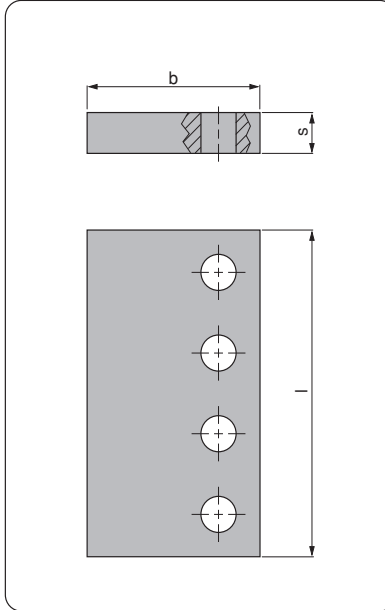


Form - E



OPEL CODE:F3304

OPEL Code	Form	a	l	s
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F33040025	E	35	150	10
F33040026	E	35	200	10
F33040027	E	35	250	10
F33040028	E	35	300	10
F33040029	E	35	350	10
F33040030	A	50	150	25
F33040031	A	50	200	25
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F33040034	D	75	200	25
F33040035	D	75	250	25

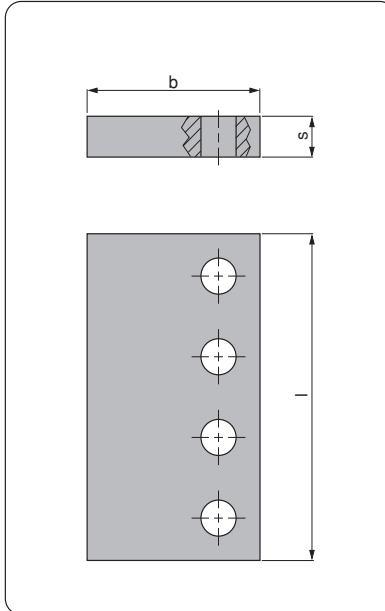
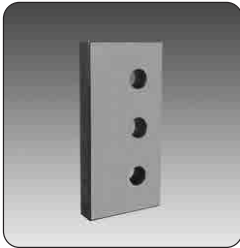


Material :
CK45 with Non-Liquid Lubricant

HRC 58 ÷ 60

OPEL Code	b	l	s	Holes
F33050089	52	150	20	3
F33050090	52	200	20	3
F33050091	52	250	20	4
F33050092	72	150	30	3
F33050093	72	200	30	3
F33050094	72	250	30	4
F33050095	77	150	35	3
F33050096	77	200	35	3
F33050097	77	250	35	4
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OPEL Code: F3305

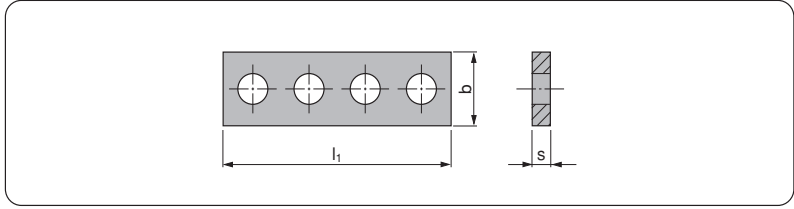
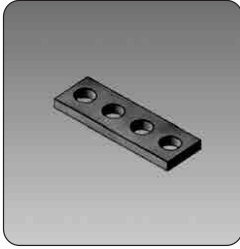


Material :
CK45 with Non-Liquid Lubricant

HRC 58 ÷ 60

OPEL Code	b	l	s	Holes
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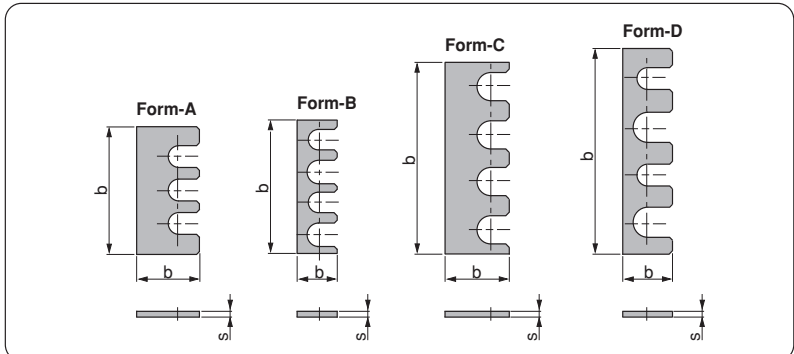
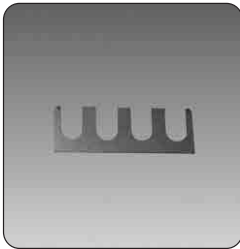


OPEL Code: F3316

Material :
CK45

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F33160114	20	60	5,6
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F33160116	16	65	4,6
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F33160120	16	65	5,4
F33160121	16	65	5,6

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F33160199	12,5	42	5,8
F33160200	12,5	42	7,8
F33160201	16	65	5,8
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Material :
Steel

OPEL Code: F3316

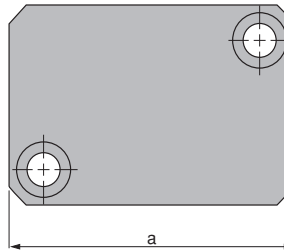
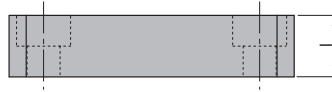
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OPEL Code	Form	b	l ₁	s
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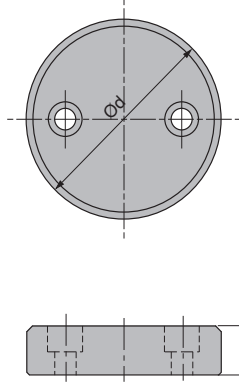
Material :
16MnCr5
Hardened
HRC 60 ÷ 63



OPEL CODE:F3316

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F33160276	50	35
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F33160282	95	23
F33160283	95	26
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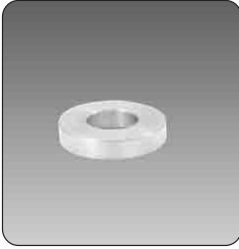
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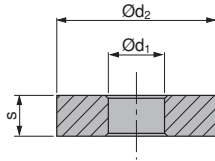
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42CrMo4
Hardened
HRC 48 + 52

OPEL CODE:F3316

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Material :
CK45

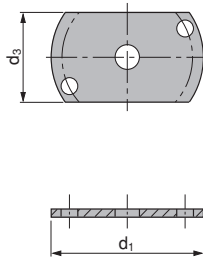


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OPEL Code: F3318

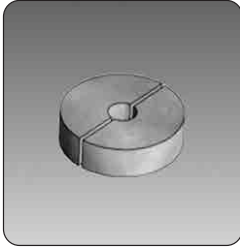


Material :
CK45

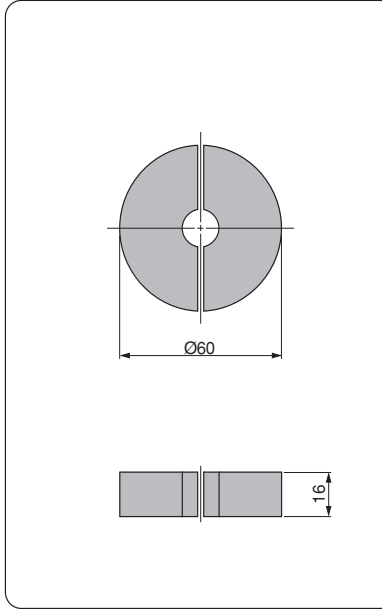


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OPEL Code: F3318



Material :
CK45



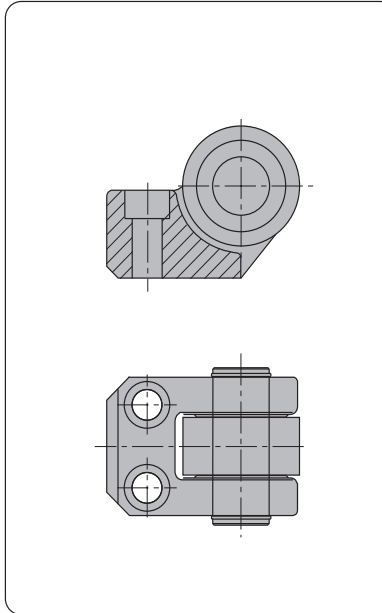
OPEL Code

F33260030

OPEL Code: F3326



Material :
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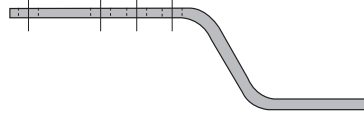
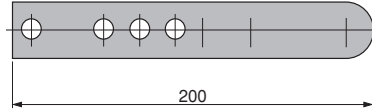
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OPEL Code: F3326



Material :
Steel



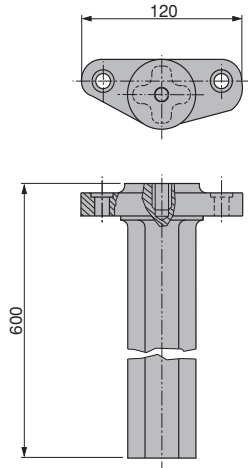
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OPEL Code

F33280001



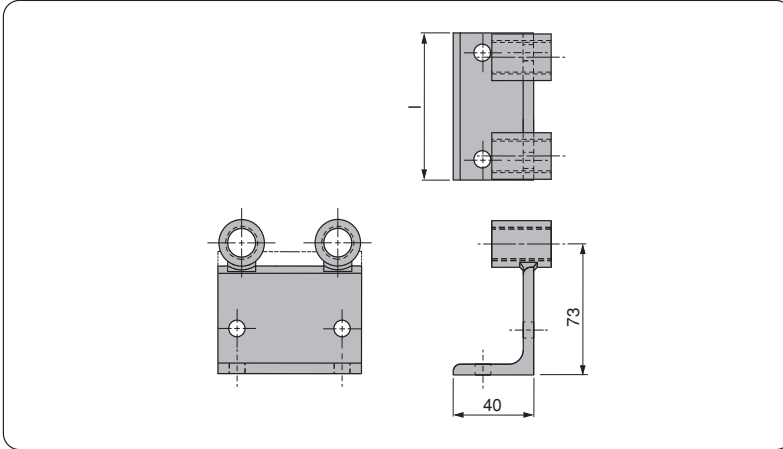
Material :
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OPEL Code

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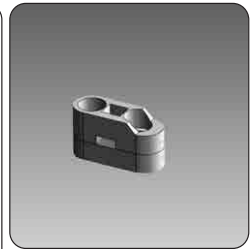
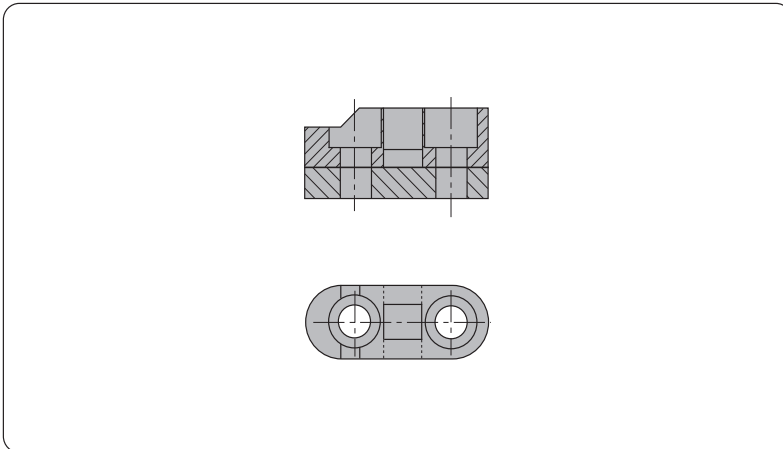
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Material :
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F33910003	125

OPEL Code: F3391



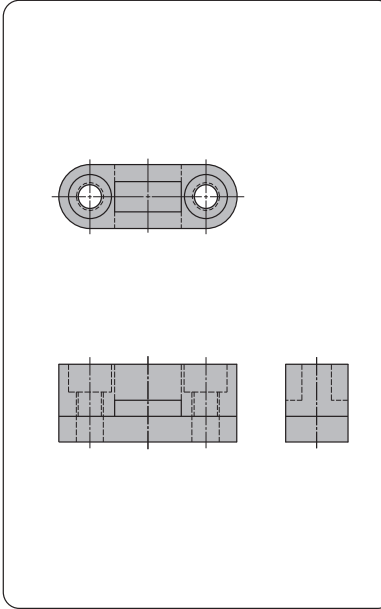
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OPEL Code	
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OPEL Code: F3391



Material :
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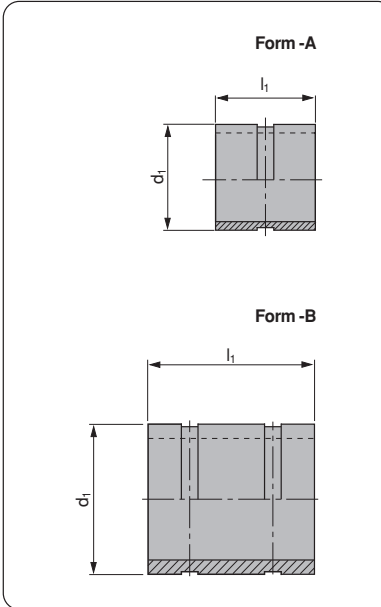
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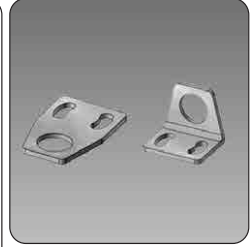
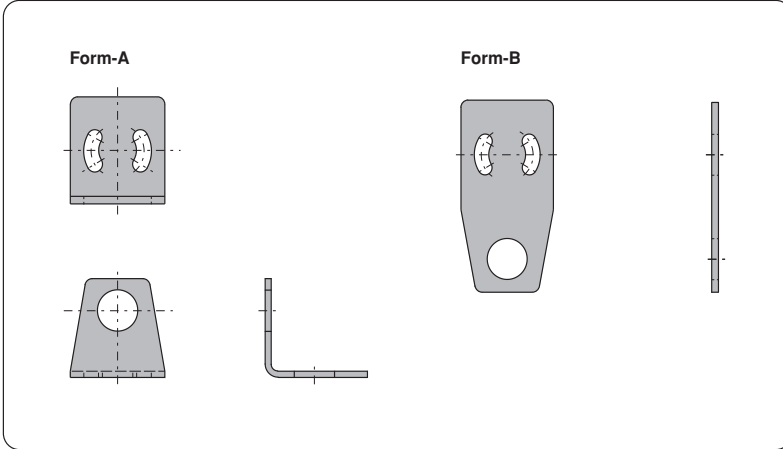


Material :
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F33910112	A	62	60
F33910113	A	75	80
F33910115	B	100	100

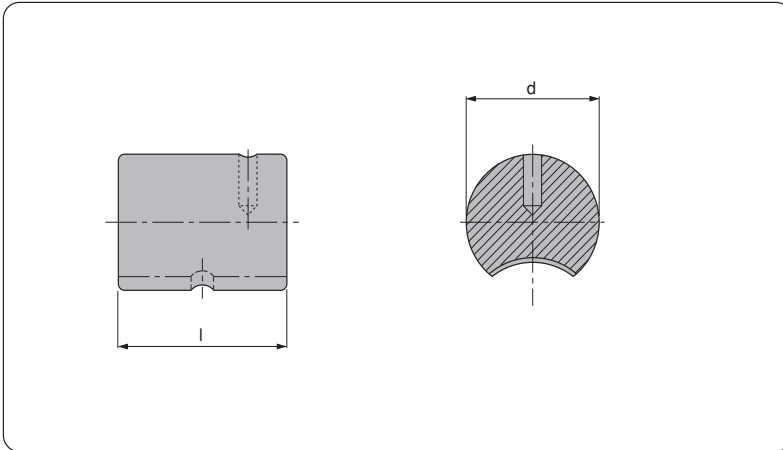
OPEL Code: F3391



Material :
Steel

OPEL Code	Form
J06910069	B
J06910070	A

OPEL Code: J0691



Material :
Elastomer 92 SH

OPEL Code	d	l
M16045182	40	60
M16045183	50	80
M16045184	63	80

OPEL Code: M1604



PEUGEOT



CITROËN

PSA Standard



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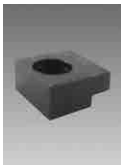




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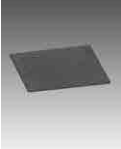
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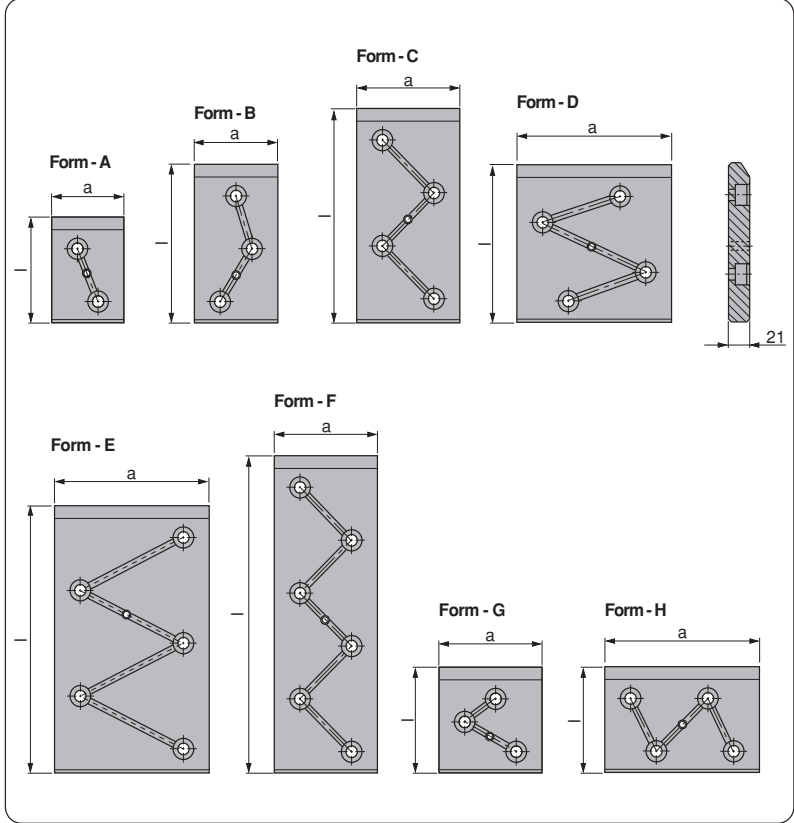
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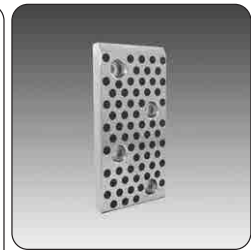
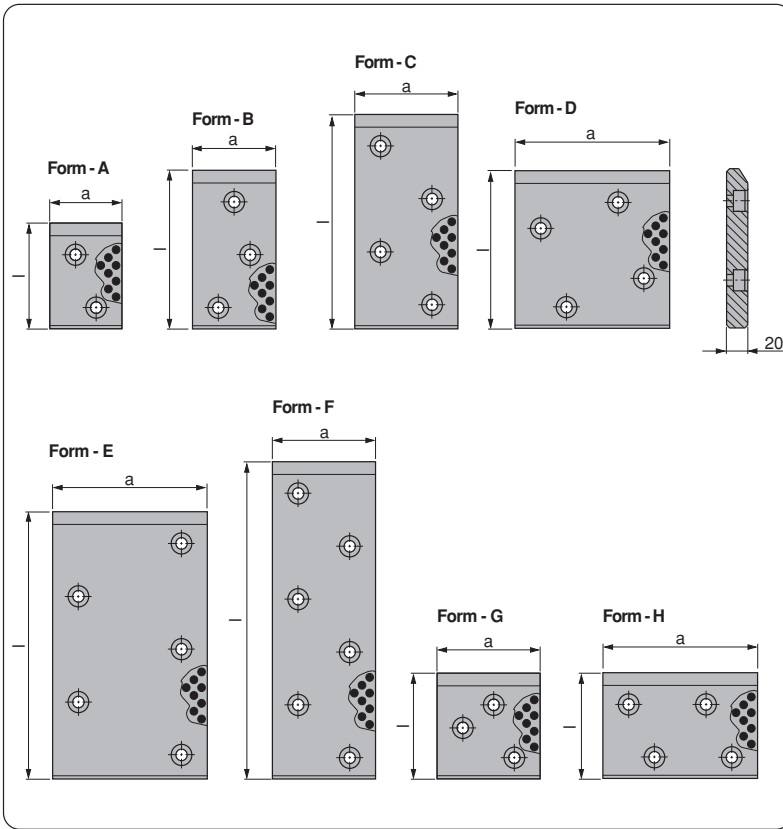


Material :
18NiCr5-4
Hardened
HRC 58 ÷ 60



PSA CODE: E24.52.504.G

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P 446 627 059	C	70	200
P 446 625 855	G	100	100
P 446 626 559	C	100	150
P 446 627 060	C	100	200
P 446 627 454	E	100	250
P 446 627 754	F	100	300
P 446 626 560	H	150	100
P 446 626 561	D	150	150
P 446 627 061	C	150	200
P 446 627 455	E	150	250
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Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion



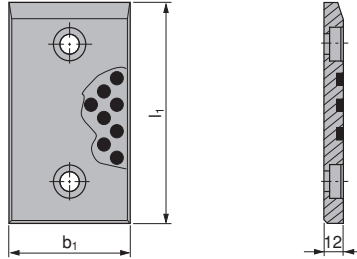
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Z 000 166 217	C	100	150
Z 000 166 222	C	100	200
Z 000 166 225	E	100	250
Z 000 166 227	F	100	300
Z 000 166 218	H	150	100
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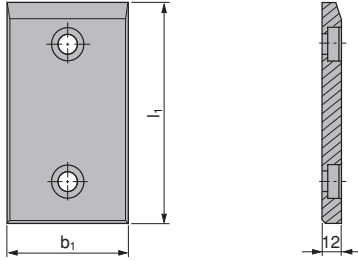
Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion



PSA CODE: E24.52.504.G

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N 001 276 936	30	125
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N 001 278 396	30	200
N 001 276 836	40	80
N 001 276 897	40	100
N 001 276 937	40	125
N 001 278 315	40	160
N 001 278 415	40	200
N 001 276 855	50	80
N 001 276 915	50	100
N 001 276 938	50	125
N 001 278 335	50	160
N 001 278 435	50	200
N 001 276 875	60	80
N 001 276 916	60	100
N 001 276 939	60	125
N 001 278 355	60	160
N 001 278 455	60	200
N 001 276 895	80	80
N 001 276 935	80	100
N 001 276 940	80	125
N 001 278 375	80	160
N 001 278 475	80	200



Material :
16MnCr5
Hardened
HRC 58 ÷ 60

Direction of Motion

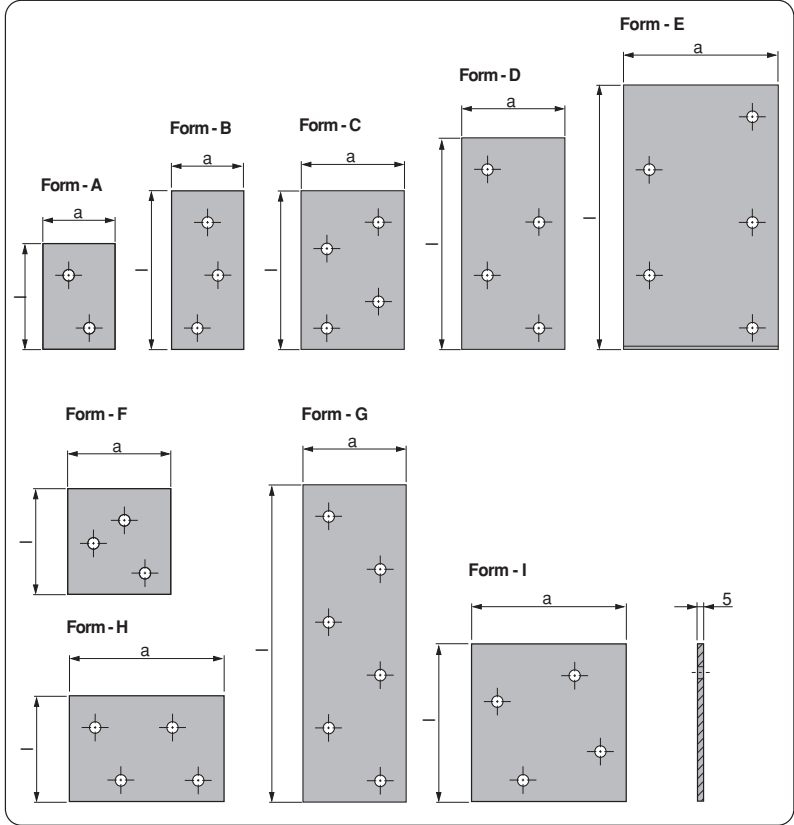


PSA CODE:E24.52.504.G

Code	b ₁	l ₁
N 001 278 535	30	80
N 001 278 635	30	100
N 001 278 895	30	125
N 001 279 015	30	160
N 001 279 057	30	200
N 001 278 555	40	80
N 001 278 655	40	100
N 001 278 915	40	125
N 001 279 035	40	160
N 001 279 075	40	200
N 001 278 575	50	80
N 001 278 815	50	100
N 001 278 935	50	125
N 001 279 036	50	160
N 001 279 076	50	200
N 001 278 595	60	80
N 001 278 855	60	100
N 001 278 936	60	125
N 001 279 055	60	160
N 001 279 095	60	200
N 001 278 615	80	80
N 001 278 875	80	100
N 001 278 997	80	125
N 001 279 056	80	160
N 001 279 115	80	200

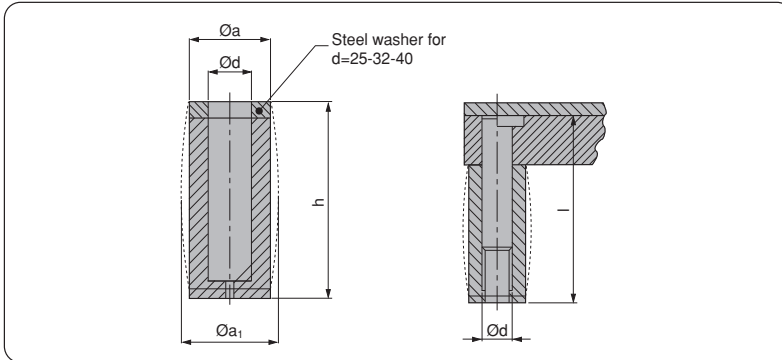


Material :
St 37



PSA CODE:E24.52.540.G

PSA Code	Form	a	l
P446 935 710	A	70	100
P446 935 711	B	70	150
P446 935 712	D	70	200
P446 935 713	F	100	100
P446 935 714	C	100	150
P446 935 715	D	100	200
P446 935 716	E	100	250
P446 935 717	G	100	300
P446 935 718	H	150	100
P446 935 719	I	150	150
P446 935 720	D	150	200
P446 935 721	E	150	250
P446 935 722	G	150	300
P446 935 723	I	200	100

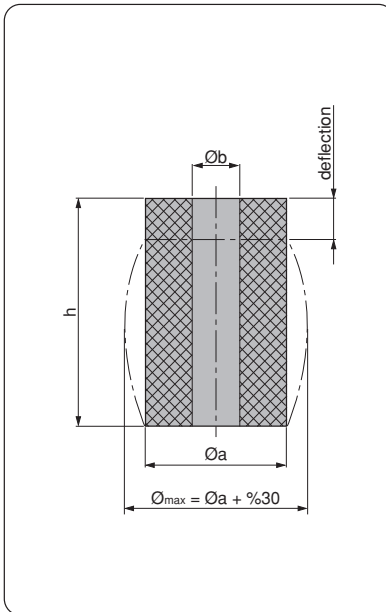


Material :
Urelast 90 Shore A

PSA CODE:E24.53.920.G

PSA Code	d	l	a	h
P399 341 508	8	71	21	48,5
P399 341 503	10	71	23	48,5
P399 341 504	13	71	26	48,5
P399 341 505	16	71	30	48,5
P399 341 506	20	71	38	48,5
Z000 173 577	25	71	48	48,5
Z000 166 048	32	71	55	48,5
Z000 166 049	40	71	63	48,5

PSA Code	a	b	h
X 346 552 172	16	6,5	20
X 346 552 171	16	6,5	25
X 346 552 670	20	8,5	25
X 346 552 671	20	8,5	32
Z 000 163 267	25	10,5	20
X 346 553 173	25	10,5	32
Z 000 163 268	32	13,5	40
Z 000 163 783	40	13,5	32
X 346 553 871	40	13,5	63
X 346 554 700	50	17	40
X 346 554 772	50	17	50
X 346 554 770	50	17	80
X 346 554 703	50	17	100
Z 000 163 269	63	17	40
Z 000 163 270	63	17	50
X 346 555 572	80	21	50
Z 000 163 271	80	21	100
X 346 555 570	80	21	125
X 346 555 372	100	21	80
X 346 555 373	100	21	100
X 346 555 578	100	21	125
Z 000 163 272	125	27	100
X 346 556 305	125	27	160

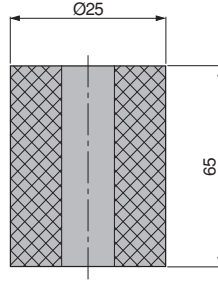


Material :
Polyurethane 90 Shore A

PSA CODE:E24.54.410.G

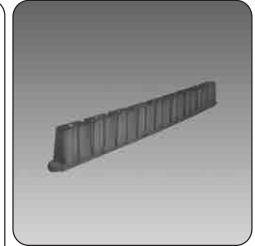
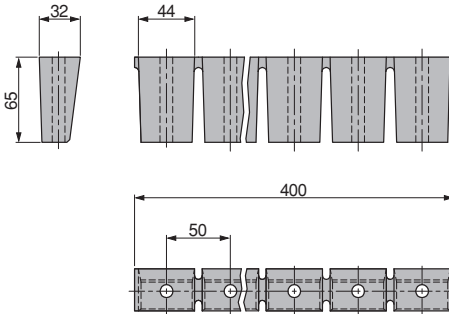
PSA Code

Z 000 151 239



Material :
Polyurethane 92 Sh

PSA CODE:E24.54.445.G

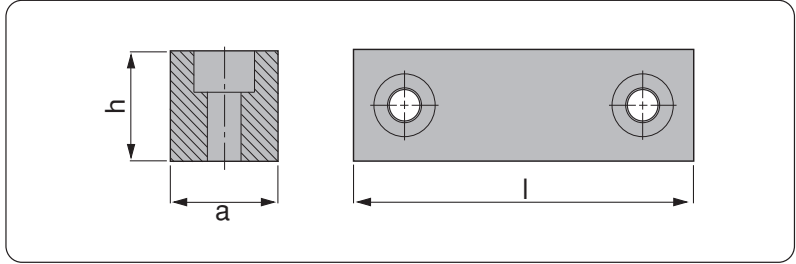


Material :
Polyurethane 92 Sh

PSA Code

X 346 538 770

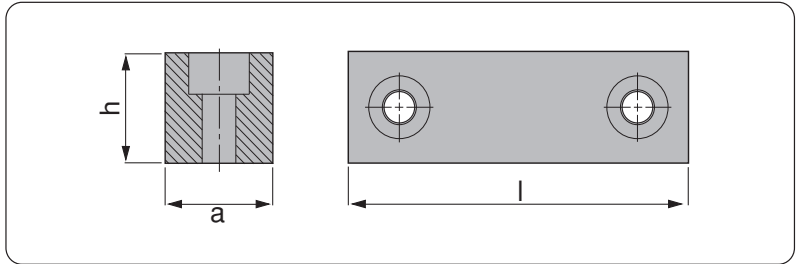
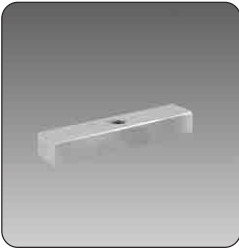
PSA CODE:E24.54.445.G



Material :
CK45

PSA Code	a	h	l
J 859 623 004	25	25	75
J 859 623 014	32	32	75

PSA CODE:E24.56.630.G



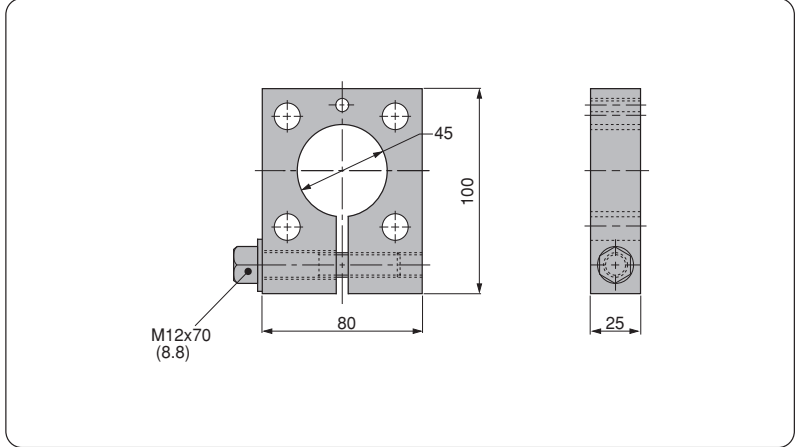
Material :
16MnCr5
Hardened
HRC 60 + 62

PSA Code	a	h	l
N 001 327 511	45 h6	45	100
N 001 327 512	45 h6	45	200

PSA CODE:E24.56.630.G



Material :
CK45



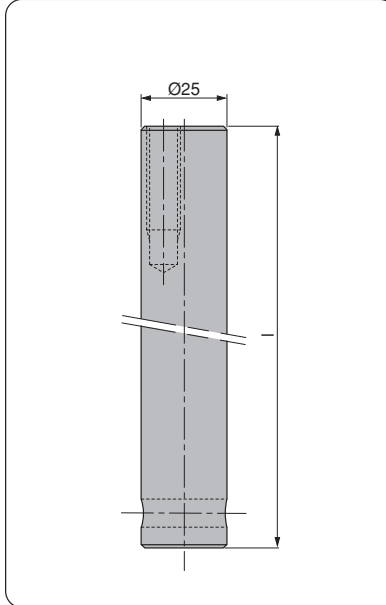
PSA Code

P 446 932 718

PSA CODE:E24.57.370.G



Material :
16MnCr5
Hardened
HRC 60 ÷ 62



PSA Code

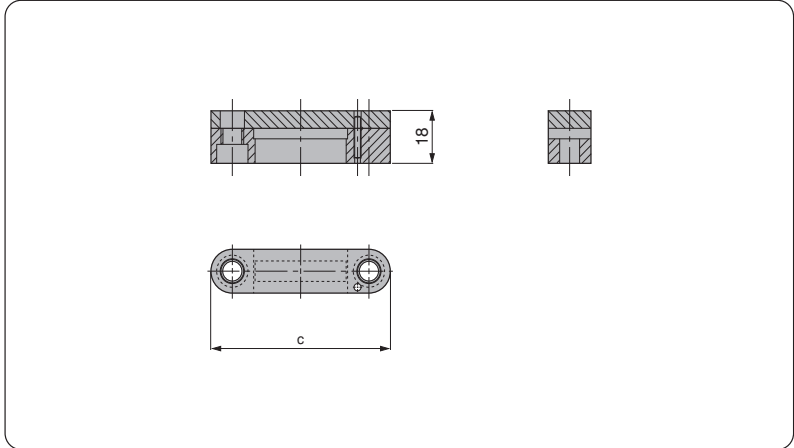
l

P 446 940 700	265
P 446 940 701	350
P 446 940 702	400
P 446 940 703	450
P 446 940 704	500

PSA CODE:E24.57.370.G



Material :
CK45

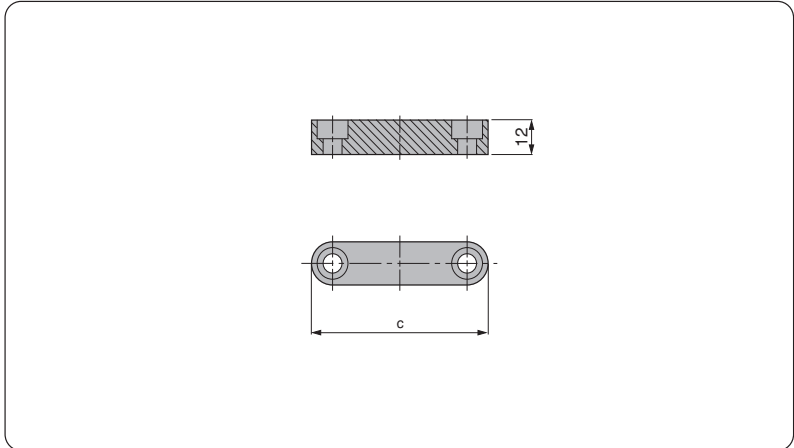


PSA Code	c	Number of Punch
P 399 391 701	47	4
N 000 467 867	55	6
P 399 391 702	63	8
P 399 391 703	71	10

PSA CODE:E24.64.100.G



Material :
CK45



PSA Code	c	Number of Punch
Z 000 151 091	47	4
N 000 467 866	55	6
Z 000 151 092	63	8
Z 000 151 093	71	10

PSA CODE:E24.64.100.G



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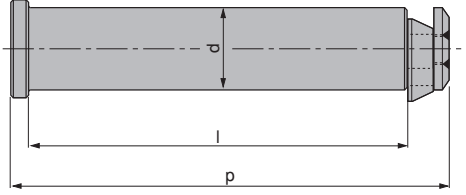
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Material :
CK45

WARNING !

For safety reasons, the weight of the tool has to be supported by just two lifting pins.
Respect the max load

UYARI !

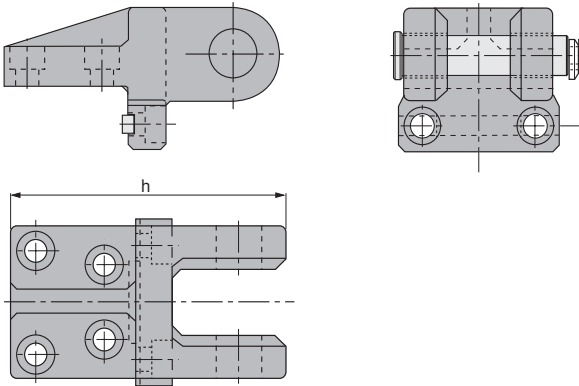
Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.
Maksimum yükü göz ardı etmeyiniz

ACHTUNG !

Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.
Maximale Nutzlast beachten

RENAULT Code: EM24.50.400/F

RENAULT Code	Max. Load (Kg)	Max. Die Weight (Kg)	d	l	p
P 953 254 770	6000	12000	32	132	154
P 953 255 870	9000	18000	40	170	197,75
P 953 256 670	14000	28000	50	212	247,60
P 953 257 470	22500	45000	63	265	309



Material :

CK45
800 ÷ 1000 N/mm²

WARNING !

For safety reasons, the weight of the tool has to be supported by just two lifting pins.
Respect the max load

UYARI !

Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.
Maksimum yükü göz ardı etmeyiniz

ACHTUNG !

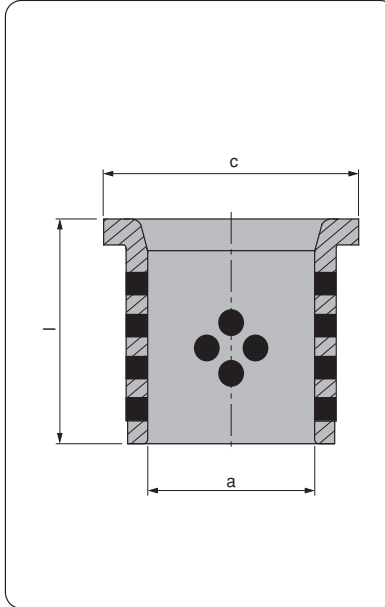
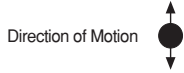
Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.
Maximale Nutzlast beachten

RENAULT Code: EM24.50.400/F

RENAULT Code	Max. Load (Kg)	Max. Die Weight (Kg)	h
P 953 548 270	4000	8000	221
P 953 549 070	6300	12600	270



Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

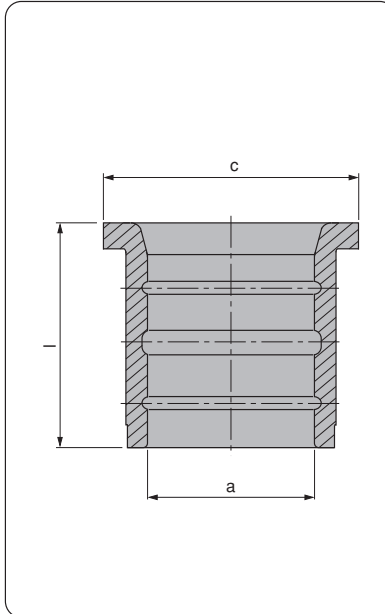


RENAULT Code	a	c	l
M764 539 401	40	60	63
M764 544 501	50	71	80
M764 549 501	63	90	100
M764 554 601	80	112	125
X345 298 500	100	140	160

RENAULT Code: EM24.52.100/J

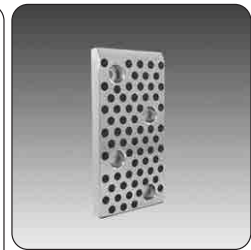
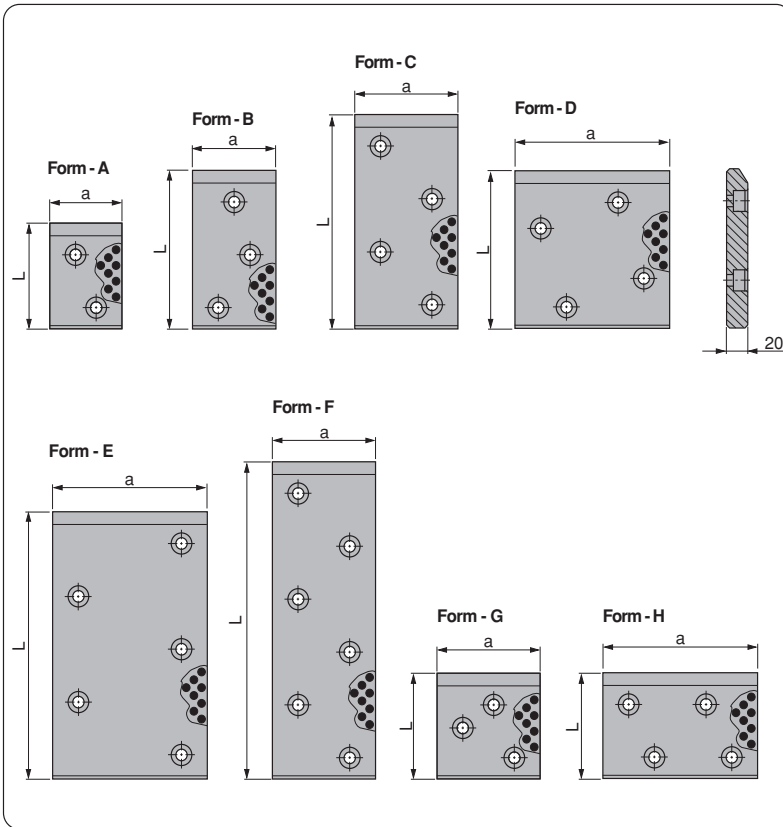


Material :
Bronze with oil groove
HB ≥ 190



RENAULT Code	a	c	l
M255 334 301	20	32	32
M255 339 301	25	40	40
M256 444 401	32	50	50
M256 447 401	40	60	63
M256 451 501	50	71	80
M256 456 502	63	90	100
M256 460 602	80	112	125
X345 098 407	100	140	160

RENAULT Code: EM24.52.100/J



Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190



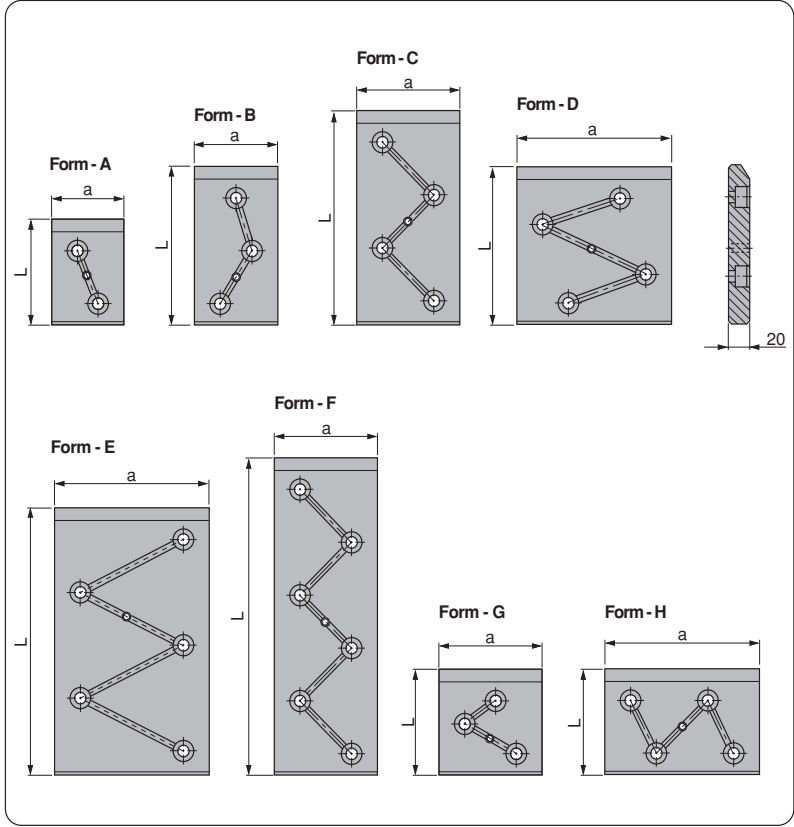
Direction of Motion

RENAULT CODE:EM24.52.300/C

RENAULT Code	Form	l	L
R100 092 843	A	70	100
R100 092 844	B	70	150
R100 092 845	C	70	200
R100 092 846	G	100	100
R100 092 883	D	100	150
R100 092 884	C	100	200
R100 092 885	E	100	250
R100 092 886	F	100	300
R100 092 887	H	150	100
R100 092 888	D	150	150
R100 092 890	C	150	200
R100 092 893	E	150	250
R100 092 894	F	150	300
R100 092 895	H	200	100

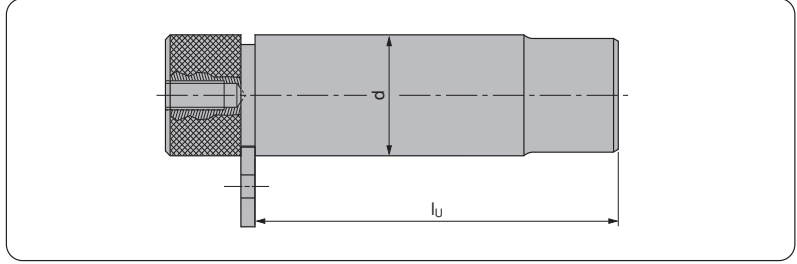


Material :
16MnCr5
Hardened
HRC 58 ÷ 60



RENAULT CODE:EM24.52.300/C

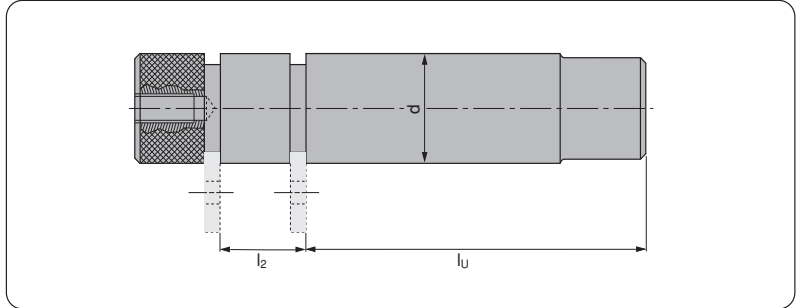
RENAULT Code	Form	l	L
P446 625 854	A	70	100
P446 626 558	B	70	150
P446 627 059	C	70	200
P446 625 855	G	100	100
P446 626 559	D	100	150
P446 627 060	C	100	200
P446 627 454	E	100	250
P446 627 754	F	100	300
P446 626 560	H	150	100
P446 626 561	D	150	150
P446 627 061	C	150	200
P446 627 455	E	150	250
P446 627 755	F	150	300
P446 627 062	H	200	100



Material :
CK45

RENAULT Code	d	l _u
R100 306 188	20	81
R100 306 190	25	81
R100 306 191	25	98
R100 306 194	32	103
R100 306 198	32	148
R100 306 201	40	132
R100 306 204	40	192
R100 306 207	50	165
R100 306 209	50	220
R100 306 210	63	210
R100 306 213	63	250
R100 357 232	80	210

RENAULT Code: EM24.55.100/G



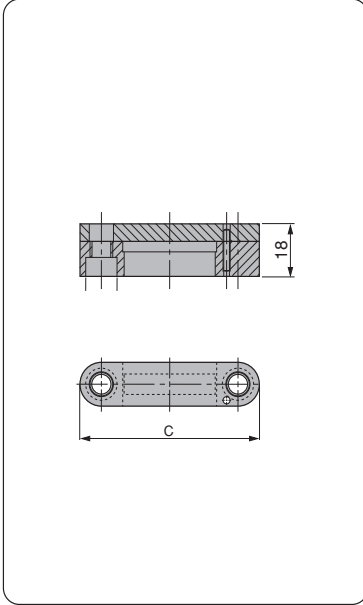
Material :
CK45

RENAULT Code	d	l _u	l ₂
R100 306 215	25	81	20
R100 306 217	25	98	20
R100 306 218	32	103	25
R100 306 219	32	148	25
R100 306 220	40	132	32
R100 306 221	40	192	32
R100 306 223	50	165	40
R100 306 225	50	220	40
R100 306 226	63	210	50
R100 306 227	63	250	50

RENAULT Code: EM24.55.100/G

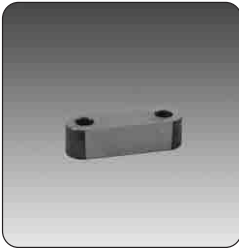


Material :
CK45

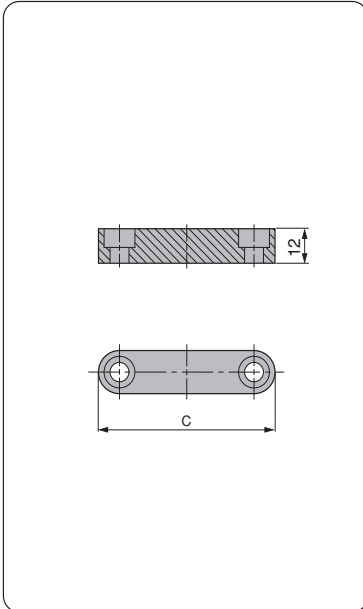


RENAULT Code	C	N° of punch	N° of punch
		Thickness: 2 mm	Thickness: 4 mm
R100 050 232	47	8	4
R100 197 803	55	12	6
R100 050 234	63	16	8
R100 352 214	71	20	10

RENAULT Code: EM24.59.500/I



Material :
CK45



RENAULT Code	C	N° of punch	N° of punch
		Thickness: 2 mm	Thickness: 4 mm
R100 050 235	47	8	4
R100 197 805	55	12	6
R100 050 236	63	16	8
R100 352 230	71	20	10

RENAULT Code: EM24.59.500/I



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 <p>39D 651 Elastomer Spring Amortisör Vulkolon Spannschlitz</p>	12.21	 <p>39D 828 Washer Rondela Scheibe</p>	12.25
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 <p>39D 807 Gage Hardened Sertleştirilmiş Mekanik Dayamalar Einweiser Gehartet</p>	12.22	 <p>39D 828 Retainer Bolt Sets Emniyet Cıvata ve Rondela Setleri Zugbolzensatz</p>	12.26















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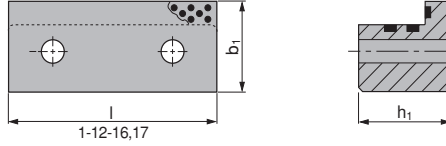
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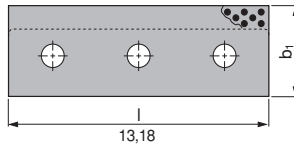
Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion ← ● →

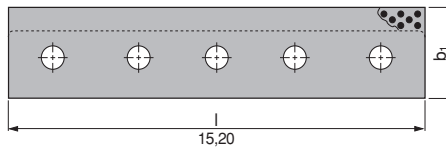
Form - A



Form - B

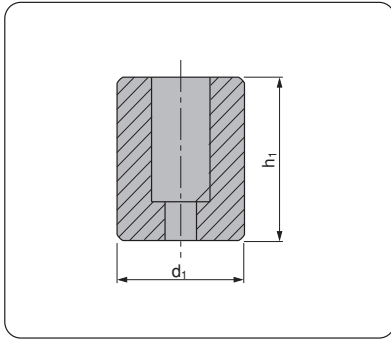


Form - C



VW CODE:39D 582

VW Code	Form	b ₁	h ₁	l ₁
39D 582/1	A	25	15	125
39D 582/2	A	25	15	160
39D 582/3	A	32	30	125
39D 582/4	A	32	30	160
39D 582/5	A	32	30	200
39D 582/6	A	55	55	100
39D 582/7	A	55	55	160
39D 582/11	A	70	75	160
39D 582/12	A	70	75	200
39D 582/13	B	70	75	250
39D 582/15	C	70	75	400
39D 582/16	A	85	90	160
39D 582/17	A	85	90	200
39D 582/18	B	85	90	250
39D 582/20	C	85	90	400



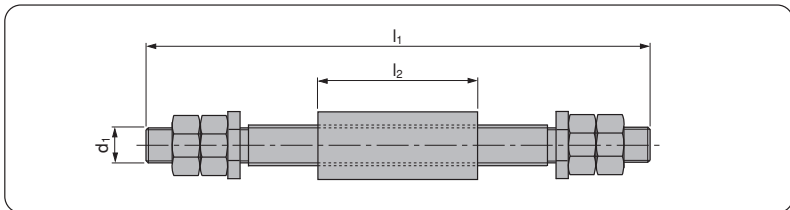
VW Code	d ₁	h ₁
39D 592/10	25	??
39D 592/11	30	??
39D 592/12	40	??
39D 592/13	50	??
Order Example:		
d ₁ =40, h ₁ =30		
Order Code:		
39D 592/12 H1=30		



Material :
CK45

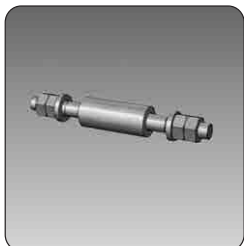
h₁ is given by the customer.

VW CODE:39D 592



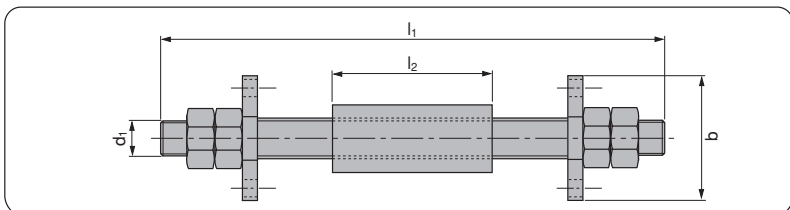
VW CODE:39D 599

VW Code	d ₁	l ₁	l ₂
39D 599/1	M42x1,5	???	???



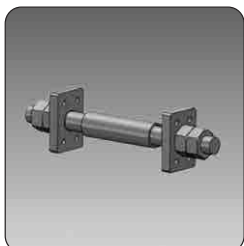
Material :
Steel

l₁ and l₂ are given by the customer.



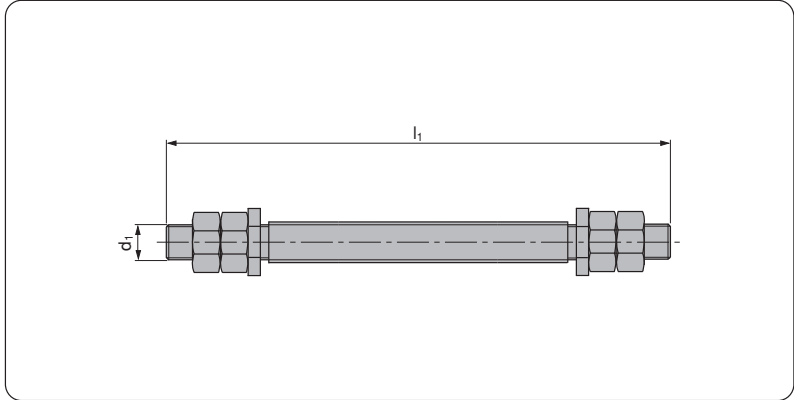
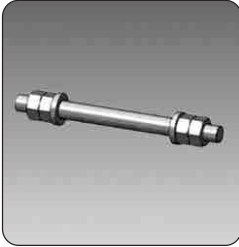
VW CODE:39D 599

VW Code	b	d ₁	l ₁	l ₂
39D 599/2	140	M42x1,5	???	???
39D 599/5	160	M42x1,5	???	???



Material :
Steel

l₁ and l₂ are given by the customer.

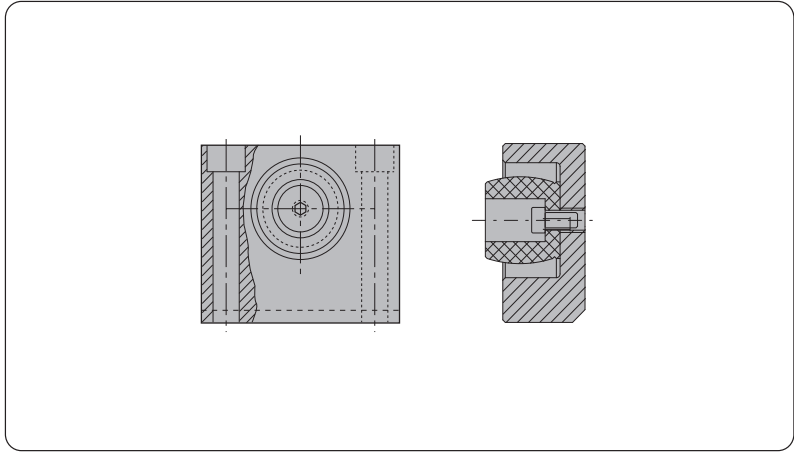
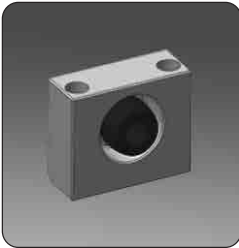


Material :
Steel

l_1 and l_2 are given by the customer.

VW Code	d_1	l_1
39D 599/3	M42x1,5	???
39D 599/4	M56x1,5	???

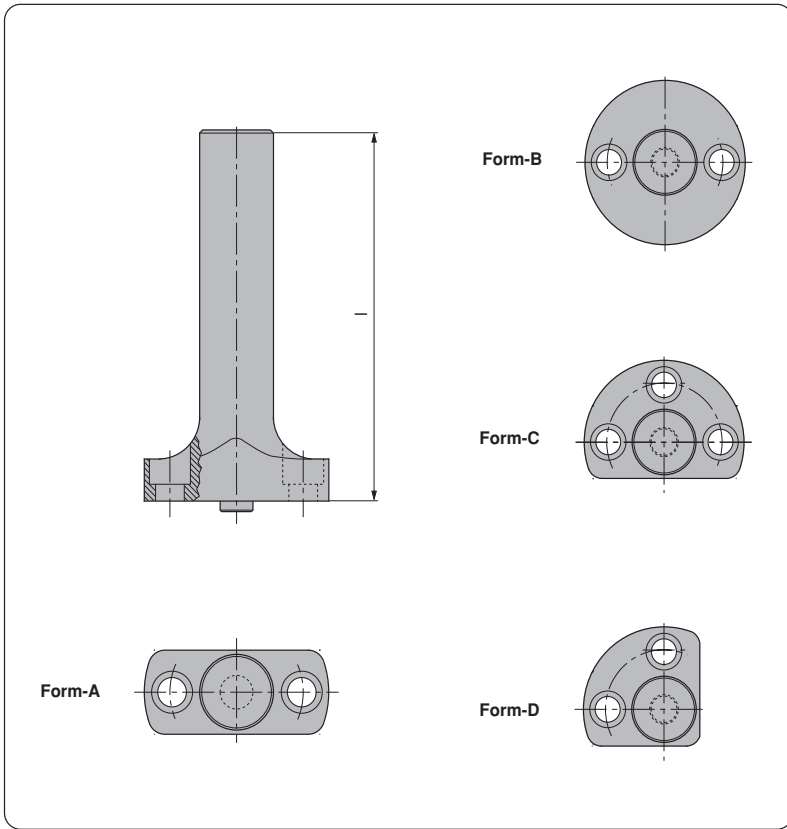
VW CODE:39D 599



Material :
CK45
CO-Polyester Elastomer

VW Code
39D 630/20

VW CODE:39D 630



Material :
CK45
800 ÷ 1000 N/mm²
Forged

Lenght (l) is given by the customer;

Order Example:
l=150 and Form= A
Order Code:
39D 638/2 L=150

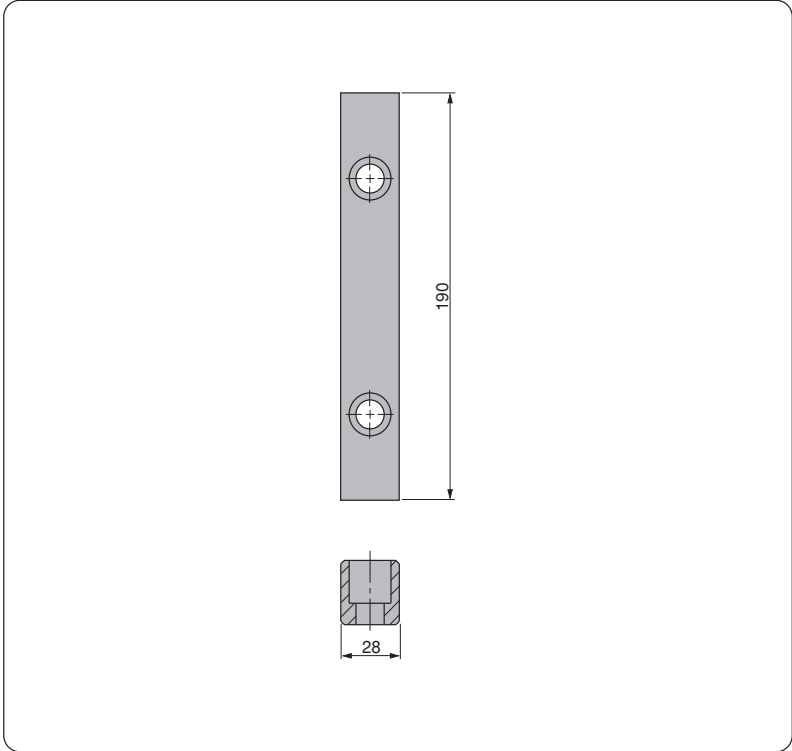
VW Code:39D 638

VW Code	Form	l	Max Load kN
39D 638/2	A	???	50
39D 638/3	B	???	50
39D 638/4	C	???	50
39D 638/5	D	???	50

ONLY FOR REPLACEMENT



Material :
16MnCr5
HRC 58 ÷ 60

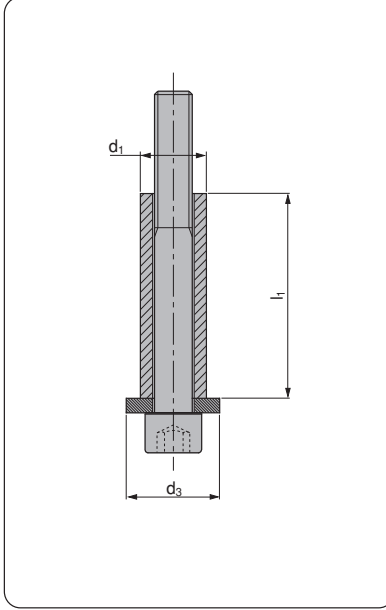


VW CODE:39D 826

VW Code

39D 826

VW Code	$d_1 \times l_1$	d_3
39D 828/4	16 x 40	25
39D 828/5	16 x 50	25
39D 828/6	16 x 63	25
39D 828/8	16 x 100	25
39D 828/9	20 x 50	30
39D 828/10	20 x 63	30
39D 828/11	20 x 80	30
39D 828/12	20 x 100	30
39D 828/13	25 x 63	38
39D 828/14	25 x 80	38
39D 828/15	25 x 100	38
39D 828/16	25 x 125	38
39D 828/17	30 x 80	45
39D 828/19	30 x 125	45
39D 828/20	36 x 80	55
39D 828/21	36 x 100	55
39D 828/22	36 x 125	55
39D 828/23	42 x 80	65
39D 828/24	42 x 100	65
39D 828/25	42 x 125	65

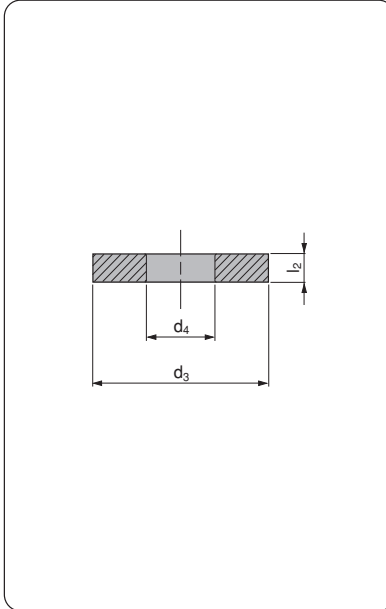


Material (Tube) :
Steel

Material (Washer)
CK45

VW CODE:39D 828

VW Code	d_3	d_4	l_2
39D 828/41	25	10,5	5
39D 828/42	30	13,2	5
39D 828/43	38	17,0	6
39D 828/44	45	21,0	8
39D 828/45	55	25,0	10
39D 828/46	30	10,5	5
39D 828/47	35	13,0	5
39D 828/48	50	17,0	6
39D 828/49	65	21,0	8
39D 828/50	70	25,0	10
39D 828/57	65	32,0	15
39D 828/58	90	32,0	15

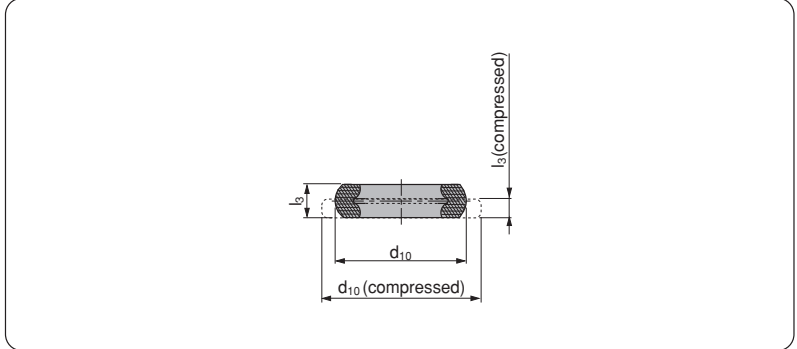


Material (Gage) :
CK45

VW CODE:39D 828



Material :
Co-Polyester Elastomer



VW CODE:39D 828

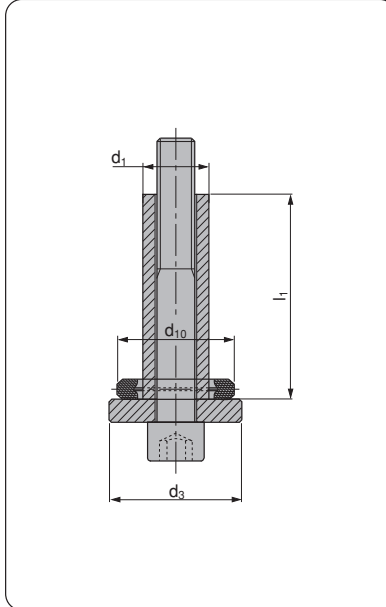
VW Code	d ₁₀ ±0.5	d ₁₀ ±0.5 compressed	l ₃	l ₃ ±0.3 compressed	Shore	Load (N)
39D 828/51	26,4	28,4	7,8±0,3	5,5	55D	5500
39D 828/52	32,1	35,1	10,8±0,3	6,0	72D	9000
39D 828/53	45,8	49,8	17,0±0,4	11,6	72D	20000
39D 828/54	54,6	61,8	21,3±0,4	13,0	55D	30000
39D 828/55	61,8	69,9	21,5±0,4	13,2	55D	46000
39D 828/56	78,5	89,0	29,8±0,5	17,9	55D	75000



Material(Tube) :
Steel

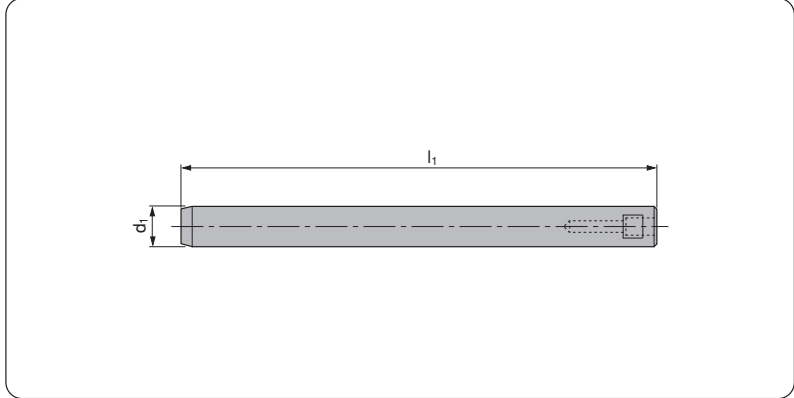
Material(Rondela) :
CK45

Material(Elastomer Washer) :
Co-Polyester Elastomer



VW Code	d ₁ xL ₁	d ₃	d ₁₀	Shore
39D 828/73	16x40	30	26,4	55D
39D 828/74	16x50	30	26,4	55D
39D 828/75	16x63	30	26,4	55D
39D 828/77	16x100	30	26,4	55D
39D 828/78	20x50	35	32,1	72D
39D 828/79	20x63	35	32,1	72D
39D 828/80	20x80	35	32,1	72D
39D 828/81	20x100	35	32,1	72D
39D 828/82	25x63	50	45,8	72D
39D 828/83	25x80	50	45,8	72D
39D 828/84	25x100	50	45,8	72D
39D 828/85	25x125	50	45,8	72D
39D 828/86	30x80	65	54,6	55D
39D 828/88	30x125	65	54,6	55D
39D 828/89	36x80	70	61,8	55D
39D 828/90	36x100	70	61,8	55D
39D 828/91	36x125	70	61,8	55D
39D 828/92	42x80	90	78,5	55D
39D 828/93	42x100	90	78,5	55D
39D 828/94	42x125	90	78,5	55D

VW CODE:39D 828



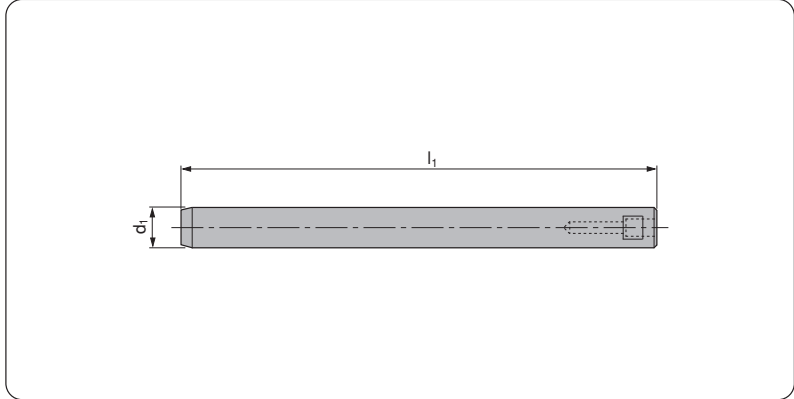
Material :
CK45
Hardened
HRC 60 ÷ 62

Lenght (l_1) is given by the customer.

Order Example:
 $l_1=25, l_1=300$
Order Code:
39D 851/25 L1=300

VW Code	d_1	l_1
39D 851/20	20	???
39D 851/25	25	???
39D 851/30	30	???

VW CODE:39D 851



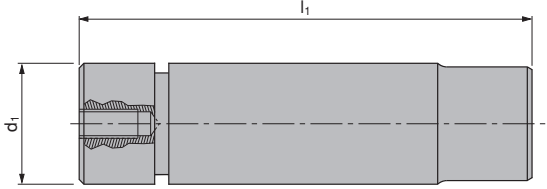
Material :
CK45
Hardened
HRC 60 ÷ 62

Lenght (l_1) is given by the customer.

Order Example:
 $l_1=25, l_1=300$
Order Code:
39D 851/25 L1=300

VW Code	d_1	l_1
39D 851/32	30	270
39D 851/34	30	425

VW CODE:39D 851

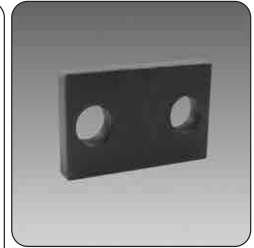
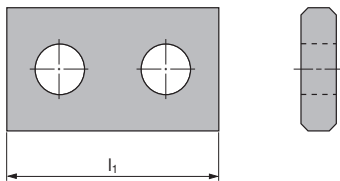


Material :
CK45
800 ÷ 1000 N/mm²

VW CODE:39D 854

VW Code	d_1	l_1
39D 854/1	32	105
39D 854/2	32	122
39D 854/3	40	139
39D 854/4	40	159
39D 854/5	50	167
39D 854/6	50	192
39D 854/7	63	202
39D 854/8	63	237

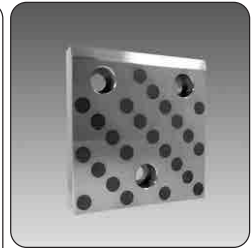
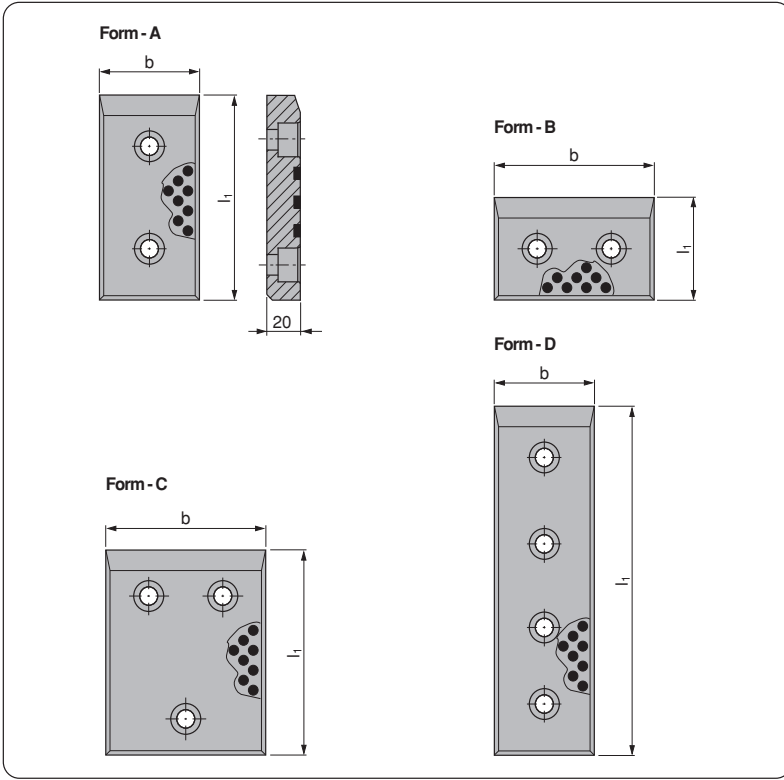
Respect the max. load.



Material :
Steel

VW CODE:39D 856

VW Code	Guide Post Diameter \varnothing	l_1
39D 856/2	25 ÷ 32	40
39D 856/4	40 ÷ 50	48
39D 856/6	63 ÷ 80	60



Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion



VW CODE:39D 863

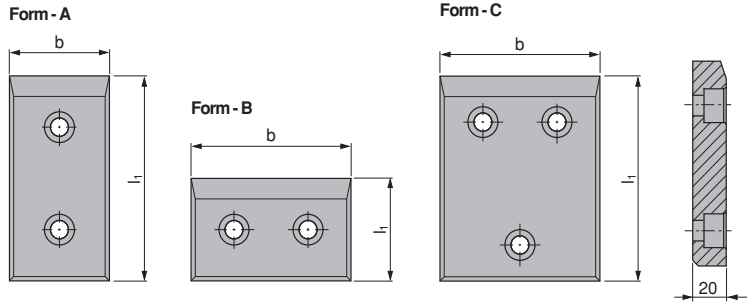
VW Code	Form	b	l ₁
39D 863/12	A	50	80
39D 863/13	A	50	100
39D 863/14	A	50	125
39D 863/15	A	50	160
39D 863/16	A	50	200
39D 863/21	B	80	50
39D 863/22	A	80	80
39D 863/23	A	80	100
39D 863/24	A	80	125
39D 863/25	A	80	160
39D 863/26	A	80	200
39D 863/31	B	100	50
39D 863/32	B	100	80
39D 863/33	A	100	100
39D 863/34	A	100	125
39D 863/35	A	100	160
39D 863/36	A	100	200
39D 863/41	B	125	50
39D 863/42	B	125	80
39D 863/43	C	125	100
39D 863/44	C	125	125
39D 863/45	C	125	160
39D 863/46	C	125	200

VW Code	Form	b	l ₁
39D 863/51	B	160	50
39D 863/52	B	160	80
39D 863/53	C	160	100
39D 863/54	C	160	125
39D 863/55	C	160	160
39D 863/56	C	160	200
39D 863/111	D	50	250
39D 863/112	D	50	300
39D 863/113	D	50	350
39D 863/114	D	50	400
39D 863/115	D	50	450
39D 863/116	D	50	500
39D 863/121	D	80	250
39D 863/122	D	80	300
39D 863/123	D	80	350
39D 863/124	D	80	400
39D 863/125	D	80	450
39D 863/126	D	80	500
39D 863/131	D	100	450
39D 863/132	D	100	500
39D 863/141	D	125	450
39D 863/142	D	125	500
39D 863/150	D	100	250

VW Code	Form	b	l ₁
39D 863/151	D	100	300
39D 863/152	D	100	350
39D 863/153	D	100	400
39D 863/155	D	125	250
39D 863/156	D	125	300
39D 863/157	D	125	350
39D 863/158	D	125	400
39D 863/160	D	160	250
39D 863/161	D	160	300
39D 863/162	D	160	350
39D 863/163	D	160	400
39D 863/164	D	160	450
39D 863/165	D	160	500

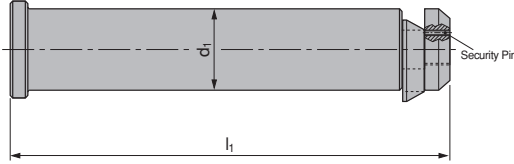


Material :
16MnCr5
Hardened
HRC : 60 ÷ 62



VW CODE:39D 863

VW Code	Form	b	l ₁
39D 863/62	A	50	80
39D 863/63	A	50	100
39D 863/64	A	50	125
39D 863/65	A	50	160
39D 863/66	A	50	200
39D 863/71	B	80	50
39D 863/72	A	80	80
39D 863/73	A	80	100
39D 863/74	A	80	125
39D 863/75	A	80	160
39D 863/76	A	80	200
39D 863/81	B	100	50
39D 863/82	A	100	80
39D 863/83	A	100	100
39D 863/84	A	100	125
39D 863/85	A	100	160
39D 863/86	A	100	200
39D 863/91	B	125	50
39D 863/92	B	125	80
39D 863/93	C	125	100
39D 863/94	C	125	125
39D 863/95	C	125	160
39D 863/96	C	125	200
39D 863/101	B	160	50
39D 863/102	B	160	80
39D 863/103	C	160	100
39D 863/104	C	160	125
39D 863/105	C	160	160
39D 863/106	C	160	200



Material :
d₁ ≤ 63 CK45
d₁ = 76 42CrMo4

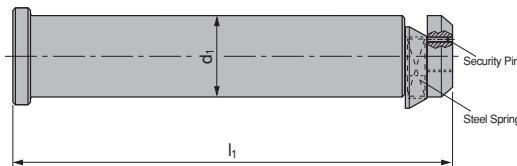
WARNING !
For safety reasons, the weight of the tool has to be supported by just two lifting pins.
Respect the max load

UYARI !
Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.
Maksimum yükü göz ardı etmeyiniz

ACHTUNG !
Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.
Maximale Nutzlast beachten

VW CODE:39D 866

VW Code	Max. Load (Kg)	Max. Die Weight (Kg)	d ₁	l ₁
39D 866/3	3200	6400	32	175
39D 866/4	5000	10000	40	225
39D 866/5	8000	16000	50	273
39D 866/6	12500	25000	63	347
39D 866/7	31500	63000	76	422
39D 866/25	8000	16000	50	221
39D 866/26	12500	25000	63	277



Material :
d₁ ≤ 63 CK45
d₁ = 76 42CrMo4

WARNING !
For safety reasons, the weight of the tool has to be supported by just two lifting pins.
Respect the max load

UYARI !
Güvenlik nedeniyle kalıp ağırlığı iki adet taşıma piminin taşıyabileceği maksimum yük miktarını aşmamalıdır.
Maksimum yükü göz ardı etmeyiniz

ACHTUNG !
Aus Sicherheitsgründen achten Sie immer dass zwei Tragbolzen das gesamte Werkzeugs gewicht tragen müssen.
Maximale Nutzlast beachten

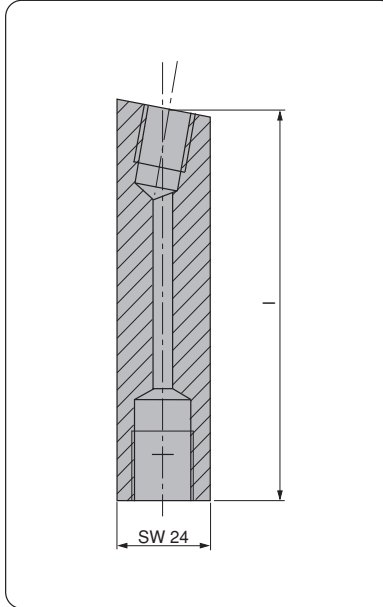
VW CODE:39D 866

VW Code	Max. Load (Kg)	Max. Die Weight (Kg)	d ₁	l ₁
39D 866/13	3200	6400	32	175
39D 866/14	5000	10000	40	225
39D 866/15	8000	16000	50	273
39D 866/16	12500	25000	63	347
39D 866/17	31500	63000	76	422



Material (Gage) :
CK45

Lenght (l) is given by the
customer.



VW Code

l

39D 887/2

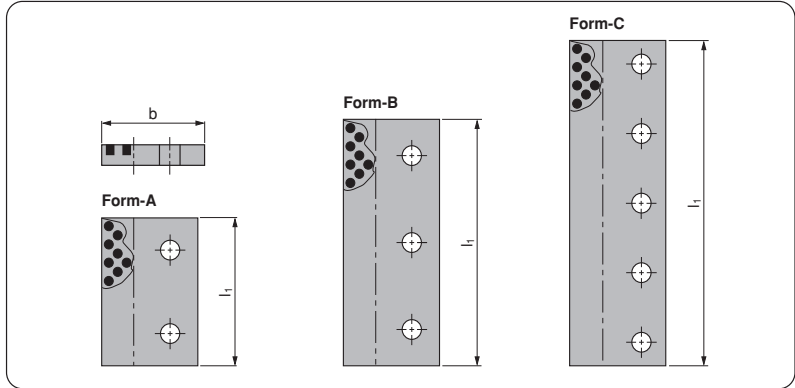
???

VW CODE:39D 887



Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion

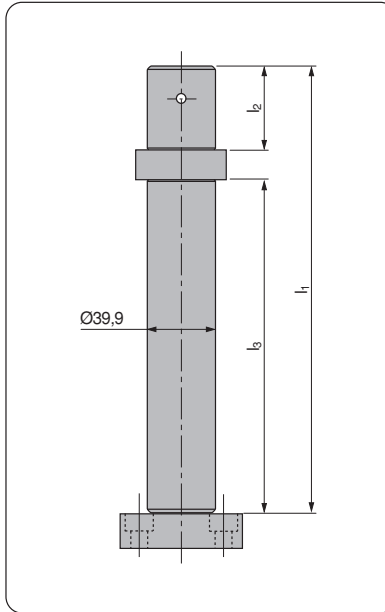


VW CODE:39D 890

VW Code	b
39D 890/25	85
39D 890/26	85
39D 890/27	85
39D 890/28	85
39D 890/29	85
39D 890/30	85
39D 890/15	125

l ₁	VW Code	b
160	39D 890/16	125
200	39D 890/17	125
250	39D 890/18	125
300	39D 890/19	125
350	39D 890/20	125
400	39D 890/21	125
160	39D 890/22	125

l ₁
200
250
300
350
400
450
500



VW Code

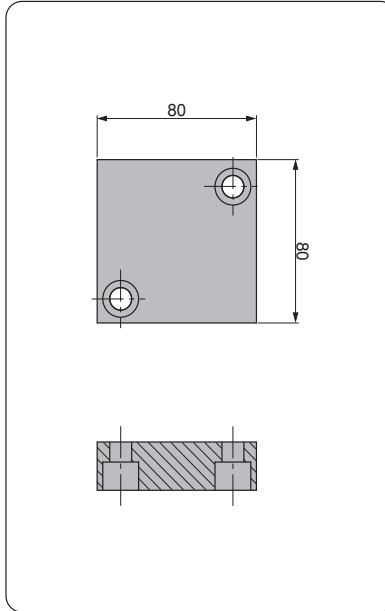
39D 896/4

Material :
16MnCr5
HRC : 60 ÷ 64

"l₁", "l₂" and "l₃" are given by the customer.

Order Example:
l₁=300, l₂=50, l₃=230,
Order Code:
39D 896/4 L1-300,L2-50,L3-230

VW CODE:39D 896

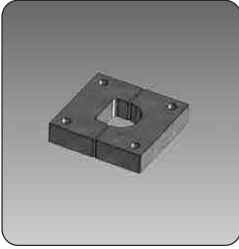


VW Code

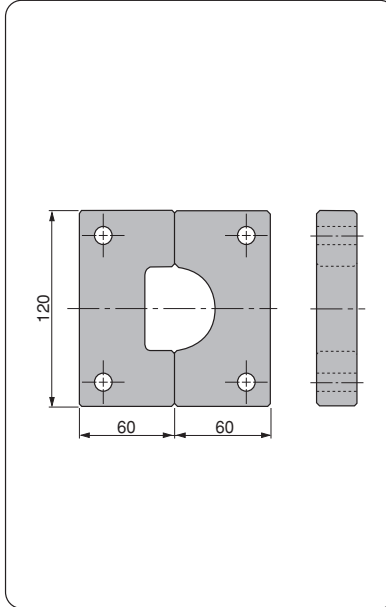
39D 896/1-02

Material :
16MnCr5
HRC : 60 ÷ 64

VW CODE:39D 896



Material :
16MnCr5
HRC 60 ÷ 64



VW Code

39D 896/4

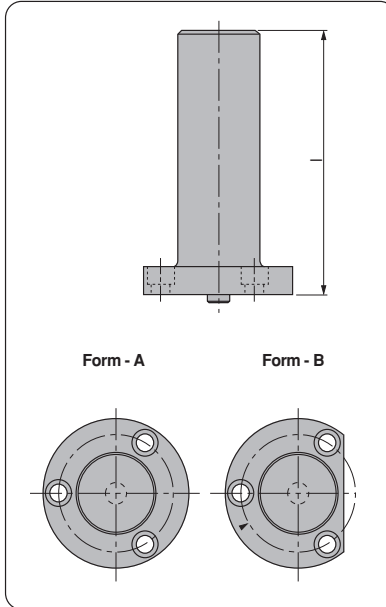
VW CODE:39D 896



Material :
CK45
800 ÷ 1000 N/mm²
Forged

L_{max}= 440

Order Example:
l=300
Order Code:
39D 951/1 L=300



VW Code

39D 951/1

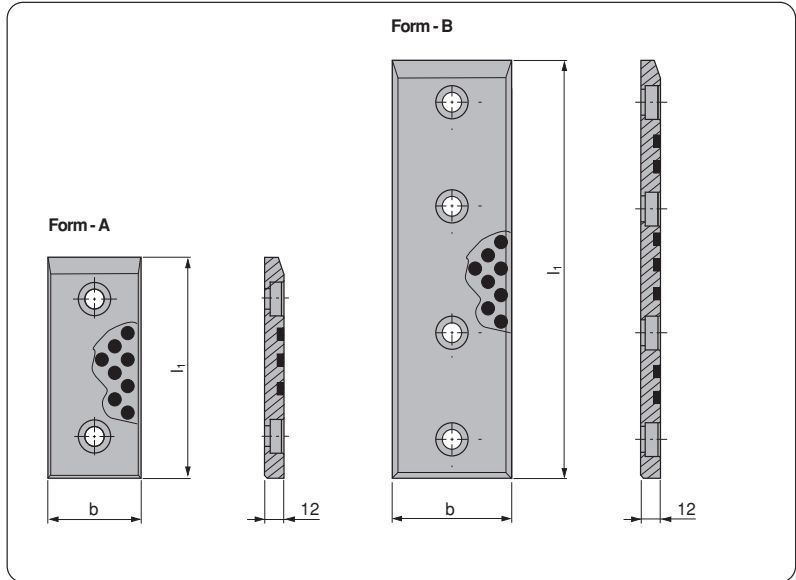
39D 951/2

VW CODE:39D 951



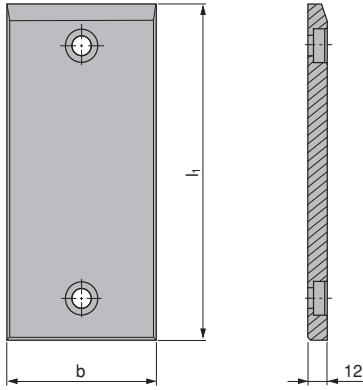
Material :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Direction of Motion



VW CODE:39D 954

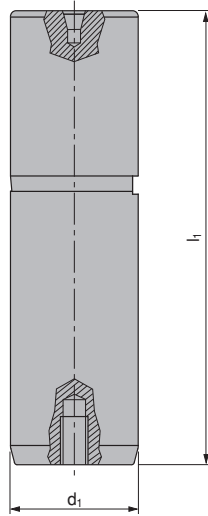
VW Code	Form	b	l ₁
39D 954/11	A	30	80
39D 954/12	A	30	100
39D 954/13	A	30	125
39D 954/14	A	30	160
39D 954/15	A	30	200
39D 954/16	A	40	80
39D 954/17	A	40	100
39D 954/18	A	40	125
39D 954/19	A	40	160
39D 954/20	A	40	200
39D 954/21	A	50	80
39D 954/22	A	50	100
39D 954/23	A	50	125
39D 954/24	A	50	160
39D 954/25	A	50	200
39D 954/26	A	60	80
39D 954/27	A	60	100
39D 954/28	A	60	125
39D 954/29	A	60	160
39D 954/30	A	60	200
39D 954/31	A	60	80
39D 954/32	A	80	100
39D 954/33	A	80	125
39D 954/34	A	80	160
39D 954/35	A	80	200
39D 954/36	B	50	250
39D 954/37	B	50	300
39D 954/38	B	50	350
39D 954/39	B	50	400



Material :
16MnCr5
HRC : 60 ÷ 64

VW Code:39D 954

VW Code	b	l
39D 954/41	30	80
39D 954/42	30	100
39D 954/43	30	125
39D 954/44	30	160
39D 954/45	30	200
39D 954/46	40	80
39D 954/47	40	100
39D 954/48	40	125
39D 954/49	40	160
39D 954/50	40	200
39D 954/51	50	80
39D 954/52	50	100
39D 954/53	50	125
39D 954/54	50	160
39D 954/55	50	200
39D 954/56	60	80
39D 954/57	60	100
39D 954/58	60	125
39D 954/59	60	160
39D 954/60	60	200
39D 954/61	80	80
39D 954/62	80	100
39D 954/63	80	125
39D 954/64	80	160
39D 954/65	80	200



Material :
16MnCr5
HRC 60 ÷ 64

VW CODE:39D 969

VW Code	d ₁	l ₁
39D 969/13	25	125
39D 969/14	25	140
39D 969/15	25	160
39D 969/16	25	180
39D 969/23	32	140
39D 969/24	32	160
39D 969/25	32	180
39D 969/26	32	200
39D 969/32	40	160
39D 969/33	40	180
39D 969/34	40	200
39D 969/35	40	224
39D 969/36	40	250
39D 969/37	40	280
39D 969/43	50	200
39D 969/44	50	224
39D 969/45	50	250
39D 969/46	50	280
39D 969/47	50	315
39D 969/48	50	355
39D 969/53	63	224
39D 969/54	63	250
39D 969/55	63	280
39D 969/56	63	315
39D 969/57	63	355
39D 969/58	63	400
39D 969/64	80	250
39D 969/65	80	280
39D 969/66	80	315
39D 969/67	80	355
39D 969/68	80	400



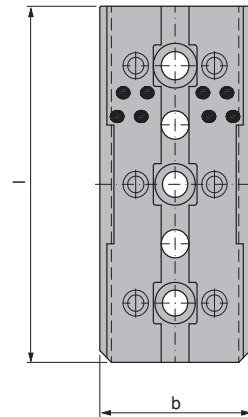
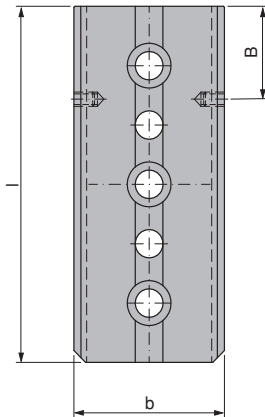
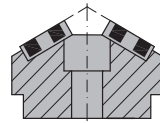
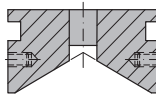
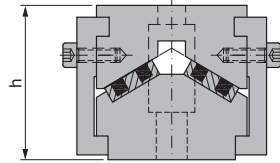
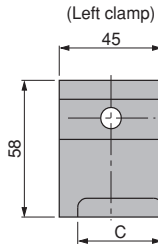
Material (U Block) :
CK45
HRC : 60 ÷ 64

Material (V Block - Body) :
CK45

Material (Replaceable Plate) :
Bronze with Non-Liquid Lubricant
HB ≥ 190

Material (Positive Return) :
Steel
HRC : 40 ÷ 45

The measure **B** and **C** must be
determine in design and given
by order!



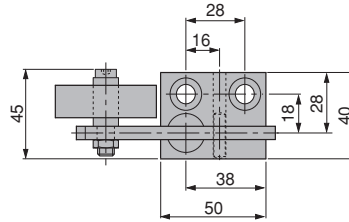
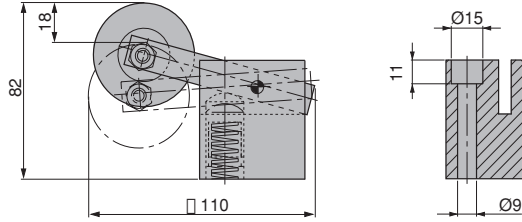
VW CODE:39D 996

VW ID Number	b	h	l
39D 996/1	65	65	150
39D 996/2	65	65	200
39D 996/3	65	65	250
39D 996/4	65	65	300
39D 996/5	125	85	150
39D 996/6	125	85	200
39D 996/7	125	85	250
39D 996/8	125	85	300

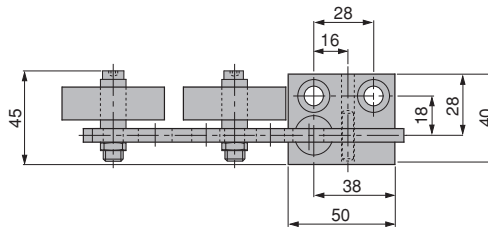
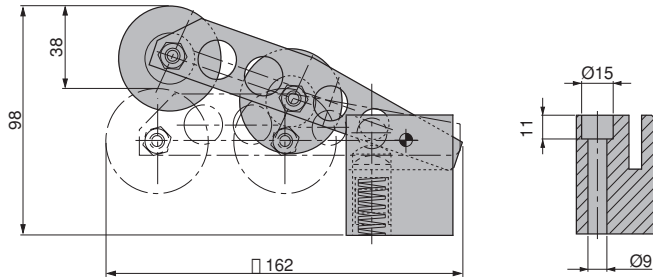


Material :
Steel

Form - A



Form - B



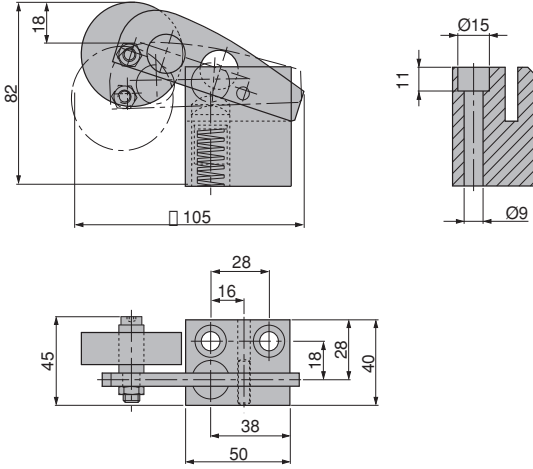
VW CODE:39V 1569

VW Code Form

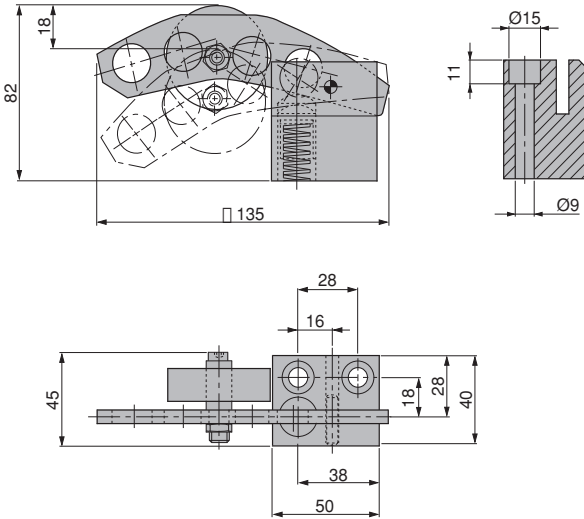
39V 1569/1 A

39V 1569/2 B

Form - C



Form - D



Material :
Steel

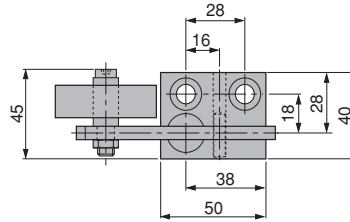
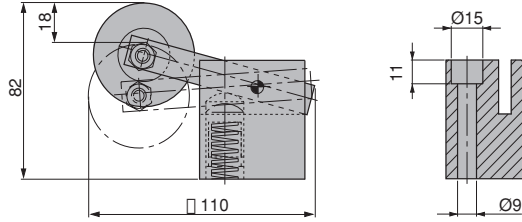
VW CODE:39V 1569

VW Code	Form
39V 1569/3	C
39V 1569/4	D

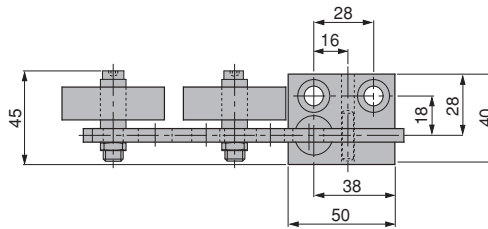
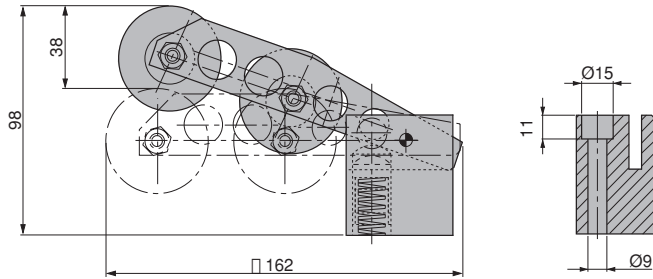


Material :
Steel

Form - A



Form - B



VW CODE:39V 1569

VW Code Form

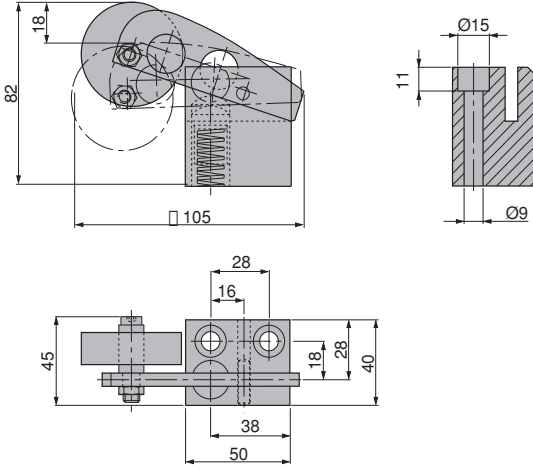
39V 1569/10

A

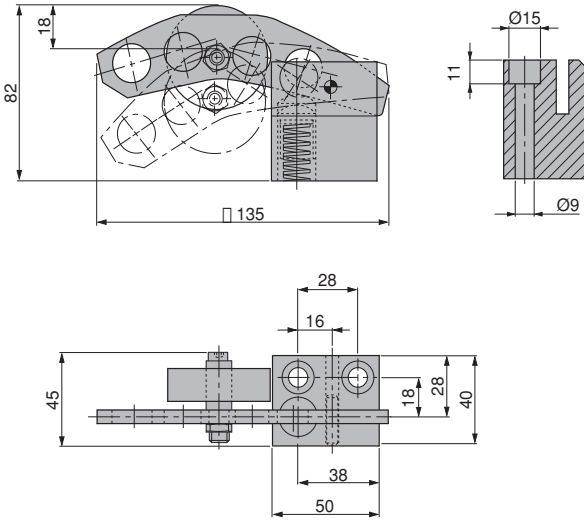
39V 1569/11

B

Form - C



Form - D



Material :
Steel

VW CODE:39V 1569

VW Code Form

39V 1569/12 C

39V 1569/13 D



Springs
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Federn

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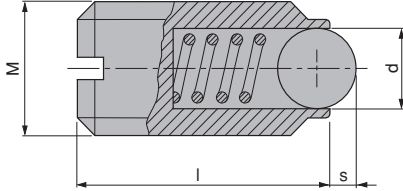
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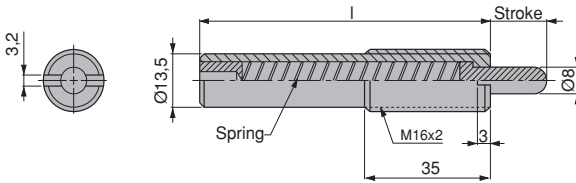


Material :
Steel Class 5.8
Hardened inox.

Black oxide finish.

GSB CODE:M314-01

GSB Code	M	l	s	d	Initial Force	Final Force
M314-01-004	M4	9	0.8	2.5	6 N	12 N
M314-01-005	M5	12	0.9	3.0	7 N	13 N
M314-01-006	M6	14	1.0	3.5	9 N	15 N
M314-01-008	M8	16	1.5	5.0	20 N	35 N
M314-01-010	M10	19	2.0	6.0	25 N	45 N
M314-01-012	M12	22	2.5	8.0	35 N	60
M314-01-016	M16	24	3.5	10.0	65 N	110 N



Material :
C80W2
HRC 36 ÷ 40

Body 34CrMo4

Springs C80W2
HRC 36 ÷ 40

Black oxide finish.

GSB CODE:M314-02

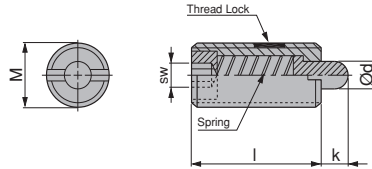
GSB Code	Stroke	l	Initial Force	Final Force
M314-02-060	60	150	11 N	45 N
M314-02-080	80	200	2 N	38 N



Material :
90Mn4
HRC 36 ÷ 40

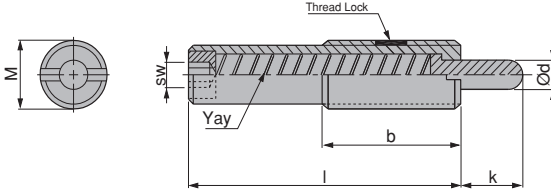
Body 34CrMo4

Black oxide finish.



GSB CODE:M314-03

GSB Code	M	k	l	d	sw	Initial Force N (Kgf)	Final Force N (Kgf)
M314-03-001	M3x0,5	1,5	10	1,0	0,8	0,4 (0,05)	2,9 (0,3)
M314-03-002	M4x0,7	2,0	12	1,6	0,8	1,9 (0,2)	9,8 (1,0)
M314-03-003	M5x0,8	3,0	20	2,0	1,5	3,9 (0,4)	19,6 (2,0)
M314-03-004	M5x0,8	3,0	13	2,0	1,5	1,9 (0,2)	7,8 (0,8)
M314-03-005	M5x0,8	3,0	20	2,0	1,5	1,9 (0,2)	9,8 (1,0)
M314-03-006	M6x1,0	3,0	25	2,5	2,0	2,9 (0,3)	9,8 (1,0)
M314-03-007	M6x1,0	3,0	25	2,5	2,0	7,8 (0,8)	29,4 (3,0)
M314-03-008	M8x1,25	3,0	25	3,1	2,5	2,9 (0,3)	9,8 (1,0)
M314-03-009	M8x1,25	3,0	25	3,1	2,5	7,8 (0,8)	29,4 (3,0)
M314-03-010	M10x1,5	5,0	30	3,8	3,0	2,9 (0,3)	14,7 (1,5)
M314-03-011	M10x1,5	5,0	30	3,8	3,0	9,8 (1,0)	49,0 (5,0)
M314-03-012	M12x1,75	5,0	30	5,5	4,0	1,9 (0,2)	9,8 (1,0)
M314-03-013	M12x1,75	5,0	30	5,5	4,0	9,8 (1,0)	49,0 (5,0)



Material :
Pin 90Mn4
HRC 36 ÷ 40

Body 34CrMo4

Black oxide finish.

GSB CODE:M314-04

GSB Code	M	k	l	b	d	sw	Initial Force N (Kgf)	Final Force N (Kgf)
M314-04-001	M12x1,75	10	43	35	5,5	4	3,9 (0,4)	19,6 (2)
M314-04-002	M12x1,75	10	43	35	5,5	4	6,8 (0,7)	39,2 (4)
M314-04-003	M16x2,0	10	50	35	8	5	9,8 (1)	49,0 (5)
M314-04-004	M16x2,0	10	50	35	8	5	19,6 (2)	98,0 (10)
M314-04-005	M16x2,0	10	60	35	8	5	12,7 (1,3)	39,2 (4)
M314-04-006	M16x2,0	10	60	35	8	5	26,4 (2,7)	78,4 (8)
M314-04-007	M16x2,0	15	60	35	8	5	9,8 (1)	39,2 (4)
M314-04-008	M16x2,0	15	60	35	8	5	14,7 (1,5)	78,4 (8)
M314-04-009	M16x2,0	20	60	35	8	5	12,7 (1,3)	39,2 (4)
M314-04-010	M16x2,0	20	85	35	8	5	16,6 (1,7)	78,4 (8)
M314-04-011	M16x2,0	30	125	35	8	5	17,6 (1,8)	39,2 (4)
M314-04-012	M16x2,0	30	125	35	8	5	19,6 (2)	78,4 (8)
M314-04-013	M16x2,0	50	155	35	8	8	19,6 (2)	49,0 (5)
M314-04-014	M16x2,0	50	155	35	8	8	29,4 (3)	98,0 (10)
M314-04-015	M24x3,0	15	60	45	10	8	19,6 (2)	98,0 (10)
M314-04-016	M24x3,0	15	60	45	10	8	39,2 (4)	196,1 (20)
M314-04-017	M30x3,5	20	70	45	15	12	29,4 (3)	147,0 (15)
M314-04-018	M30x3,5	20	70	45	15	12	49,0 (5)	294,1 (30)

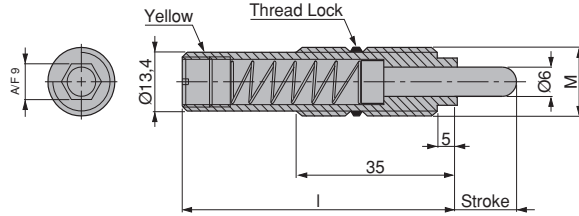


Material :
Pin 90Mn4
HRC 36 ÷ 40

Body 34CrMo4

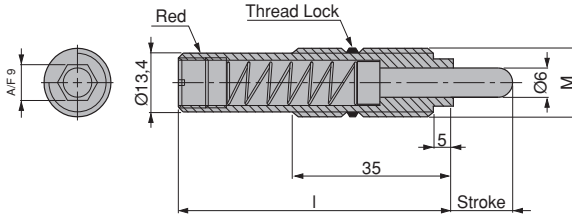
Black oxide finish.

Colour marking yellow.



GSB CODE:S504-03

GSB Code	M	Stroke	l	Spring Force N /mm	Initial Force N	Final Force N
S504-03-010060	M16x1,5	10	60	0,95	3,8	13,3
S504-03-015060	M16x1,5	15	60	2	10	40,0
S504-03-020080	M16x1,5	20	80	1,38	6,9	34,5
S504-03-030080	M16x1,5	30	80	1,30	6,5	45,5
S504-03-030120	M16x1,5	30	120	0,73	18	40
S504-03-040150	M16x1,5	40	150	0,6	13,2	37,2
S504-03-050150	M16x1,5	50	150	0,6	13,2	43,2
S504-03-060150	M16x1,5	60	150	0,6	13,2	49,2
S504-03-070200	M16x1,5	70	200	0,44	9,68	40,5
S504-03-080200	M16x1,5	80	200	0,44	9,68	44,8



Material :
Pin 90Mn4
HRC 36 ÷ 40

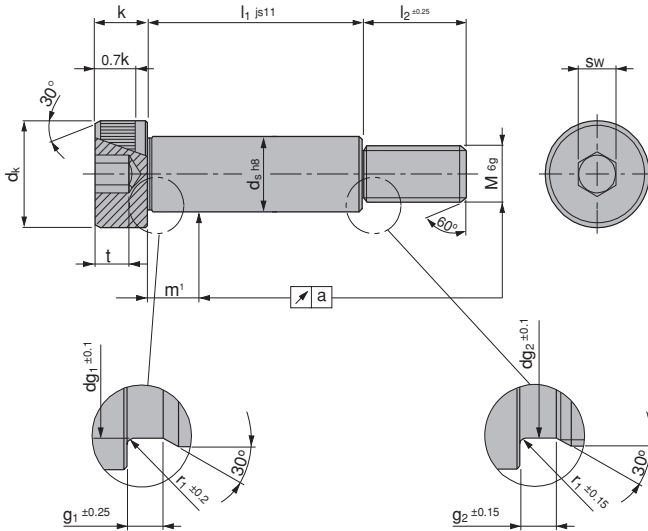
Body 34CrMo4

Black oxide finish.

Colour marking red.

GSB CODE:S504-04

Order Code	M	Stroke	l	Spring Rate N /mm	Initial Force N	Final Force N
S504-04-010060	M16x1,5	10	60	3,25	13	45,5
S504-04-015060	M16x1,5	15	60	2,60	15	56,0
S504-04-020080	M16x1,5	20	80	6,90	34,5	172,5
S504-04-030120	M16x1,5	30	120	2,00	20	80,0
S504-04-030150	M16x1,5	30	150	2,55	56,1	132,6
S504-04-040150	M16x1,5	40	150	2,55	56,1	158,1
S504-04-050200	M16x1,5	50	200	1,61	19,3	99,9
S504-04-060200	M16x1,5	60	200	1,61	19,3	116,1
S504-04-070200	M16x1,5	70	200	1,61	19,3	132,1
S504-04-080200	M16x1,5	80	200	0,94	25	100,1



Material :
High grade alloy steel ISO 12.9
HRC : 39 - 44

Tensile Strength Rm =1200 N/mm²
Yield Strength Rp =1080 N/mm²
Shear Strength Tm =720 N/mm²
Elongation A =%8 min.
Impact Test : KCU 15J min.

m¹ measuring point = "ds"

Order Example
M315-01 -M -ds - l₁
M= M6, ds=8 , l₁ =40
Order Code:M315-01-0608040

GSB CODE:M315-01

ds	6	8	10	12	16	20	24
M	M5	M6	M8	M10	M12	M16	M20
dk / k	10/4,5	13/5,5	16/7	18/9	24/11	30/14	36/16
dg₁	5,52	7,52	9,52	11,52	15,52	19,52	23,52
g₁ / g₂	1,85/1,8	1,85/2,3	1,85/2,6	1,85/2,8	1,85/3,8	2,65/4,6	2,65/5,4
r₁ / f₂	0,4/0,5	0,6/0,6	0,6/0,7	0,8/0,9	0,8/1	1/1,1	1/1,3
l₂	9,5	11	13	16	18	22	27
t / sw	2,4/3	3,3/4	4,2/5	4,9/6	6,3/8	8,8/10	10/12
l₁							
10	●						
12	●	●					
15	●	●	●	●			
16	●	●	●	●			
20	●	●	●	●			
25	●	●	●	●			
30	●	●	●	●	●		
35	●	●	●	●	●		
40	●	●	●	●	●	●	
45	●	●	●	●	●	●	
50	●	●	●	●	●	●	●
55	●	●	●	●	●	●	●
60	●	●	●	●	●	●	●
65		●	●	●	●	●	●
70		●	●	●	●	●	●
80		●	●	●	●	●	●
90		●	●	●	●	●	●
100		●	●	●	●	●	●
120				●	●	●	●

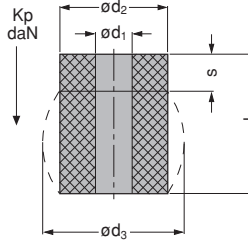
Order Example

Hardness - Colour - Deflection
82 Shore A - Yellow %35
92 Shore A - Red %30
94 Shore A - Green %25
90 Shore A - Orange %30

Diameter (d_2) = 32
Length (l) = 40

Order Code:

S514-182-032040
S514-192-032040
S514-194-032040
S514-290-032040

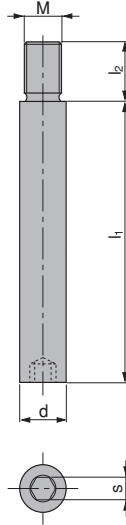


Ultrafleks -Hardness
82 Shore A
92 Shore A
94 Shore A

Adipol -Hardness
90 Shore A

GSB CODE:S514

$d_2 \times l$ mm	A mm	B mm	H mm	S514-182			S514-192			S514-194			S514-290		
				S mm	D mm	Kp daN	S mm	D mm	Kp daN	S mm	D mm	Kp daN	S mm	D mm	Kp daN
Ø16 x 16	16	7	16	5,6	22	80	4,8	19	130	4	19	160	4,8	21	140
Ø16 x 20	16	7	20	7	22	80	6	19	130	5	19	160	6	21	140
Ø16 x 25	16	7	25	9	22	80	8	19	130	6	19	160	8	21	140
Ø16 x 32	16	7	32	11,2	22	80	10	19	130	8	19	160	9,6	21	140
Ø20 x 16	20	9	16	6	28	150	5	26	200	4	25	325	5	27	150
Ø20 x 20	20	9	20	7	28	150	6	26	200	5	25	325	6	27	150
Ø20 x 25	20	9	25	9	28	150	8	26	200	6	25	325	8	27	150
Ø20 x 32	20	9	32	11,2	28	150	10	26	200	8	25	325	10	27	150
Ø20 x 40	20	9	40	14	28	150	12	26	200	10	25	325	12	27	150
Ø25 x 16	25	11	16	6	33	210	5	30	300	4	29	450	5	33	400
Ø25 x 20	25	11	20	7	33	210	6	30	300	5	29	450	6	33	400
Ø25 x 25	25	11	25	9	33	210	8	30	300	6	29	450	8	33	400
Ø25 x 32	25	11	32	11	33	210	10	30	300	8	29	450	10	33	400
Ø25 x 40	25	11	40	14	33	210	12	30	300	10	29	450	12	33	400
Ø25 x 50	25	11	50	17,5	33	210	15	30	300	13	29	450	15	33	400
Ø32 x 16	32	14	16	6	43	360	5	41	580	4	38	800	5	42	580
Ø32 x 20	32	14	20	7	43	360	6	41	580	5	38	800	6	42	580
Ø32 x 25	32	14	25	9	43	360	8	41	580	6	38	800	8	42	580
Ø32 x 32	32	14	32	11	43	360	10	41	580	8	38	800	10	42	580
Ø32 x 40	32	14	40	14	43	360	12	41	580	10	38	800	12	42	580
Ø32 x 50	32	14	50	18	43	360	15	41	580	13	38	800	15	42	580
Ø32 x 63	32	14	63	22	43	360	19	41	580	16	38	800	18,9	42	580
Ø40 x 20	40	14	20	7	54	650	6	50	1200	5	47	1500	6	52	900
Ø40 x 25	40	14	25	9	54	650	8	50	1200	6	47	1500	8	52	900
Ø40 x 32	40	14	32	11	54	650	10	50	1200	8	47	1500	10	52	900
Ø40 x 40	40	14	40	14	54	650	12	50	1200	10	47	1500	12	52	900
Ø40 x 50	40	14	50	18	54	650	15	50	1200	13	47	1500	15	52	900
Ø40 x 63	40	14	63	22	54	650	19	50	1200	16	47	1500	18,9	52	900
Ø40 x 80	40	14	80	28	54	650	24	50	1200	20	47	1500	24	52	900
Ø50 x 25	50	17	25	9	65	1100	8	62	1700	6	60	2000	8	65	1800
Ø50 x 32	50	17	32	11	65	1100	10	62	1700	8	60	2000	10	65	1800
Ø50 x 40	50	17	40	14	65	1100	12	62	1700	10	60	2000	12	65	1800
Ø50 x 50	50	17	50	18	65	1100	15	62	1700	13	60	2000	15	65	1800
Ø50 x 63	50	17	63	22	65	1100	19	62	1700	16	60	2000	18,9	65	1800
Ø50 x 80	50	17	80	28	65	1100	24	62	1700	20	60	2000	24	65	1800
Ø50 x 100	50	17	100	35	65	1100	30	62	1700	25	60	2000	30	65	1800

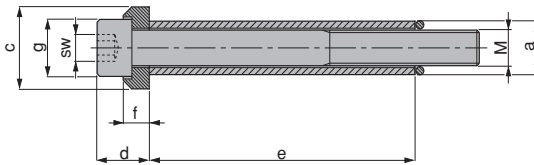


Material :
CK45

GSB CODE:M311-05

GSB Code	d	l ₁	l ₂	M	s
M311-05-04020	6	20	6	M4	3
M311-05-04025	6	25	6	M4	3
M311-05-04032	6	32	6	M4	3
M311-05-06020	8	20	9	M6	4
M311-05-06025	8	25	9	M6	4
M311-05-06032	8	32	9	M6	4
M311-05-06040	8	40	9	M6	4
M311-05-06050	8	50	9	M6	4
M311-05-08020	10	20	15	M8	5
M311-05-08025	10	25	15	M8	5
M311-05-08032	10	32	15	M8	5
M311-05-08040	10	40	15	M8	5
M311-05-08050	10	50	15	M8	5
M311-05-08063	10	63	15	M8	5
M311-05-10032	13	32	15	M10	6
M311-05-10040	13	40	15	M10	6
M311-05-10050	13	50	15	M10	6
M311-05-10063	13	63	15	M10	6
M311-05-10080	13	80	15	M10	6
M311-05-10095	13	95	15	M10	6
M311-05-12032	16	32	18	M12	8
M311-05-12040	16	40	18	M12	8
M311-05-12050	16	50	18	M12	8
M311-05-12063	16	63	18	M12	8
M311-05-12080	16	80	18	M12	8
M311-05-12095	16	95	18	M12	8

GSB Code	d	l ₁	l ₂	M	s
M311-05-12118	16	118	18	M12	8
M311-05-12140	16	140	18	M12	8
M311-05-16032	20	32	25	M16	10
M311-05-16040	20	40	25	M16	10
M311-05-16050	20	50	25	M16	10
M311-05-16063	20	63	25	M16	10
M311-05-16080	20	80	25	M16	10
M311-05-16095	20	95	25	M16	10
M311-05-16118	20	118	25	M16	10
M311-05-16140	20	140	25	M16	10
M311-05-20032	25	32	30	M20	14
M311-05-20040	25	40	30	M20	14
M311-05-20050	25	50	30	M20	14
M311-05-20063	25	63	30	M20	14
M311-05-20080	25	80	30	M20	14
M311-05-20095	25	95	30	M20	14
M311-05-20118	25	118	30	M20	14
M311-05-20140	25	140	30	M20	14
M311-05-20180	25	180	30	M20	14



Material :
Screw class ISO 12.9 DIN 912

Washer
Hardened and tempered steel,
not ground

Tensile Strength
Rm = 100 Kg/mm²

Sleeve
Hardened, tempered and ground
steel.

Tensile Strength
Rm = 120 -140 Kg/mm²

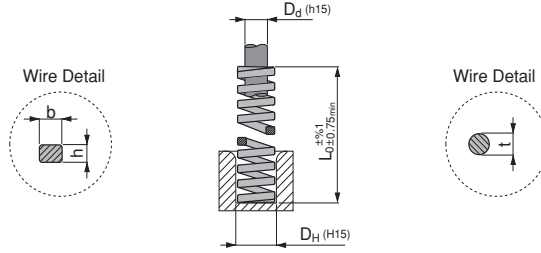
GSB CODE:M315-02

GSB Code	a	c	d	e	f	g	M	sw
M315-02-06020	10	15	10	20	5,5	10	M6	5
M315-02-06025	10	15	10	25	5,5	10	M6	5
M315-02-06030	10	15	10	30	5,5	10	M6	5
M315-02-06035	10	15	10	35	5,5	10	M6	5
M315-02-06040	10	15	10	40	5,5	10	M6	5
M315-02-06045	10	15	10	45	5,5	10	M6	5
M315-02-06050	10	15	10	50	5,5	10	M6	5
M315-02-06055	10	15	10	55	5,5	10	M6	5
M315-02-06060	10	15	10	60	5,5	10	M6	5
M315-02-06070	10	15	10	70	5,5	10	M6	5
M315-02-06080	10	15	10	80	5,5	10	M6	5
M315-02-06090	10	15	10	90	5,5	10	M6	5
M315-02-06100	10	15	10	100	5,5	10	M6	5
M315-02-08030	12,5	19	13	30	6,5	13	M8	6
M315-02-08035	12,5	19	13	35	6,5	13	M8	6
M315-02-08040	12,5	19	13	40	6,5	13	M8	6
M315-02-08045	12,5	19	13	45	6,5	13	M8	6
M315-02-08050	12,5	19	13	50	6,5	13	M8	6
M315-02-08055	12,5	19	13	55	6,5	13	M8	6
M315-02-08060	12,5	19	13	60	6,5	13	M8	6
M315-02-08070	12,5	19	13	70	6,5	13	M8	6
M315-02-08080	12,5	19	13	80	6,5	13	M8	6
M315-02-08090	12,5	19	13	90	6,5	13	M8	6
M315-02-08100	12,5	19	13	100	6,5	13	M8	6
M315-02-10030	15	23	15	30	7,5	16	M10	8
M315-02-10035	15	23	15	35	7,5	16	M10	8
M315-02-10040	15	23	15	40	7,5	16	M10	8
M315-02-10045	15	23	15	45	7,5	16	M10	8
M315-02-10050	15	23	15	50	7,5	16	M10	8
M315-02-10055	15	23	15	55	7,5	16	M10	8

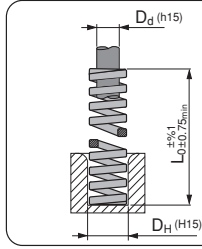
GSB Code	a	c	d	e	f	g	M	sw
M315-02-10060	15	23	15	60	7,5	16	M10	8
M315-02-10070	15	23	15	70	7,5	16	M10	8
M315-02-10080	15	23	15	80	7,5	16	M10	8
M315-02-10090	15	23	15	90	7,5	16	M10	8
M315-02-10100	15	23	15	100	7,5	16	M10	8
M315-02-10120	15	23	15	120	7,5	16	M10	8
M315-02-12040	17,5	27	18	40	9	18	M12	10
M315-02-12045	17,5	27	18	45	9	18	M12	10
M315-02-12050	17,5	27	18	50	9	18	M12	10
M315-02-12055	17,5	27	18	55	9	18	M12	10
M315-02-12060	17,5	27	18	60	9	18	M12	10
M315-02-12070	17,5	27	18	70	9	18	M12	10
M315-02-12080	17,5	27	18	80	9	18	M12	10
M315-02-12090	17,5	27	18	90	9	18	M12	10
M315-02-12100	17,5	27	18	100	9	18	M12	10
M315-02-12110	17,5	27	18	110	9	18	M12	10
M315-02-12120	17,5	27	18	120	9	18	M12	10
M315-02-12140	17,5	27	18	140	9	18	M12	10
M315-02-16050	23	34	24	50	11	24	M16	14
M315-02-16060	23	34	24	60	11	24	M16	14
M315-02-16070	23	34	24	70	11	24	M16	14
M315-02-16080	23	34	24	80	11	24	M16	14
M315-02-16090	23	34	24	90	11	24	M16	14
M315-02-16100	23	34	24	100	11	24	M16	14
M315-02-16110	23	34	24	110	11	24	M16	14
M315-02-16120	23	34	24	120	11	24	M16	14
M315-02-16140	23	34	24	140	11	24	M16	14
M315-02-16150	23	34	24	150	11	24	M16	14
M315-02-16160	23	34	24	160	11	24	M16	14



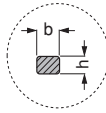
Die Springs DIN/ ISO 10243
Tel Yaylar DIN/ ISO 10243
Federn DIN/ ISO 10243



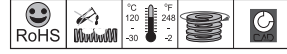
Special Springs Code	D _H	D _d	L ₀	b x h mm	R ± 10 Spring Constant N/mm	A	B	C	D	E
						%30 L ₀ 3.000.000 mm N	%40 L ₀ 1.500.000 mm N	%45 L ₀ 300-500.000 mm N	%50 L ₀ 100-200.000 mm N	Closed Don't use! mm
DH	-Hole diameter -Delik çapı -Außenführungsdurchmesser						B -Advised total working deflection for about 1.500.000 cycles. -1.500.000 baskı için tavsiye edilen baskı kuvveti -Empfohlener Gesamtfederweg für eine der Feder für durchschnittliche Lebensdauer von 1.500.000 Zyklen.			
Dd	-Rod diameter -Piston çapı -Innenführungsdurchmesser							C -Advised total working deflection for about 300.000-500.000 cycles. -300.000-500.000 arası baskı için tavsiye edilen baskı kuvveti -Empfohlener Gesamtfederweg für eine Lebensdauer der Feder von ca. 300.000-500.000 Zyklen.		
bxh	-Cross wire section -Tel Yay Ölçüsü -Profilquerschnitt								D -Advised total working deflection for about 100.000-200.000 cycles. -100.000-200.000 arası baskı için tavsiye edilen baskı kuvveti -Maximaler Gesamtfederweg für eine Lebensdauer der Feder von ca. 100.000-200.000 Zyklen.	
L ₀	-Spring free length -Yüksüz yay boyu -Länge der unbelasteten Feder									E -Solid deflection (approximate value) -Tam kapama kuvveti (Önerilmez) -Näherungswert Federweg für Blockfeder
R	-Spring rate (Load required for 1 mm deflection) -1 mm baskı için gerekli olan kuvvet -Federrate									
A	-Advised total working deflection for more than 3.000.000 cycles. -3.000.000 ve üzeri baskı için tavsiye edilen baskı kuvveti -Empfohlener Gesamtfederweg für eine Lebensdauer der Feder von Mehr als 3.000.0000 Zyklen.									



Wire Detail

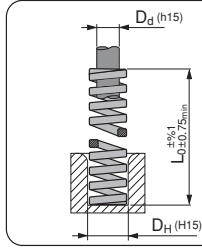


D_d :Rod diameter
D_H :Hole diameter
b x h:Cross wire section
L₀ :Free Length
R :Spring Constant (Load required for 1 mm deflection)

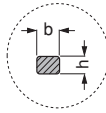


Special Springs Code	D _H	D _d	L ₀	b x h mm	R ± %10 Spring Constant N/mm	%30 L ₀		%40 L ₀		%45 L ₀		%50 L ₀		Closed Don't use! mm
						mm	N	mm	N	mm	N	mm	N	
VL20-025	20	10	25	4,3x1,7	29,4	7,5	221	10,0	294	11,3	331	12,5	368	13,9
VL20-032	20	10	32	4,3x1,7	22,6	9,6	217	12,8	289	14,4	325	16,0	362	18,2
VL20-038	20	10	38	4,3x1,7	18,6	11,4	212	15,2	283	17,1	318	19,0	353	22,0
VL20-044	20	10	44	4,3x1,7	15,7	13,2	207	17,6	276	19,8	311	22,0	345	25,8
VL20-051	20	10	51	4,3x1,7	13,7	15,3	210	20,4	279	23,0	314	25,5	349	30,3
VL20-064	20	10	64	4,3x1,7	11,3	19,2	217	25,6	289	28,8	325	32,0	362	38,9
VL20-076	20	10	76	4,3x1,7	9,8	22,8	223	30,4	298	34,2	335	38,0	372	47,0
VL20-089	20	10	89	4,3x1,7	8,3	26,7	222	35,6	295	40,1	332	44,5	369	55,7
VL20-102	20	10	102	4,3x1,7	7,4	30,6	226	40,8	302	45,9	340	51,0	377	64,2
VL20-115	20	10	115	4,3x1,7	6,4	34,5	221	46,0	294	51,8	331	57,5	368	72,9
VL20-127	20	10	127	4,3x1,7	5,9	38,1	225	50,8	300	57,2	337	63,5	375	80,7
VL20-139	20	10	139	4,3x1,7	5,4	41,7	225	55,6	300	62,6	338	69,5	375	88,4
VL20-152	20	10	152	4,3x1,7	4,9	45,6	223	60,8	298	68,4	335	76,0	372	96,7
VL20-305	20	10	305	4,3x1,7	2,5	91,5	229	122,0	305	137	343	153	381	196,3
VL25-025	25	12,5	25	5,4x2,2	53,9	7,5	404	10,0	539	11,3	606	12,5	674	12,9
VL25-032	25	12,5	32	5,4x2,2	42,2	9,6	405	12,8	540	14,4	608	16,0	675	17,2
VL25-038	25	12,5	38	5,4x2,2	35,8	11,4	408	15,2	544	17,1	612	19,0	680	20,7
VL25-044	25	12,5	44	5,4x2,2	31,4	13,2	414	17,6	553	19,8	622	22,0	691	24,4
VL25-051	25	12,5	51	5,4x2,2	27,0	15,3	413	20,4	551	23,0	620	25,5	689	28,5
VL25-064	25	12,5	64	5,4x2,2	21,6	19,2	415	25,6	553	28,8	622	32,0	691	36,5
VL25-076	25	12,5	71	5,4x2,2	18,1	22,8	413	30,4	550	34,2	619	38,0	688	43,9
VL25-089	25	12,5	89	5,4x2,2	15,2	26,7	406	35,6	541	40,1	609	44,5	676	51,4
VL25-102	25	12,5	102	5,4x2,2	13,2	30,6	404	40,8	539	45,9	606	51,0	673	59,3
VL25-115	25	12,5	115	5,4x2,2	11,8	34,5	407	46,0	543	51,8	611	57,5	679	67,2
VL25-127	25	12,5	127	5,4x2,2	10,6	38,1	404	50,8	538	57,2	606	63,5	673	74,4
VL25-139	25	12,5	139	5,4x2,2	9,6	41,7	400	55,6	534	62,6	600	69,5	667	81,6
VL25-152	25	12,5	152	5,4x2,2	8,8	45,6	401	60,8	535	68,4	602	76,0	669	89,5
VL25-178	25	12,5	178	5,4x2,2	7,6	53,4	406	71,2	541	80,1	609	89,0	676	105
VL25-203	25	12,5	203	5,4x2,2	6,7	60,9	408	81,2	544	91,4	612	102	680	121
VL25-305	25	12,5	305	5,4x2,2	4,4	91,5	403	122,0	537	137	604	153	671	182
VL32-038	32	16	38	6,5x2,6	43,1	11,4	491	15,2	655	17,1	737	19,0	819	13,9
VL32-044	32	16	44	6,5x2,6	37,3	13,2	492	17,6	656	19,8	739	22,0	821	23,5
VL32-051	32	16	51	6,5x2,6	32,4	15,3	496	20,4	661	23,0	744	25,5	826	27,6
VL32-064	32	16	64	6,5x2,6	25,5	19,2	490	25,6	653	28,8	734	32,0	816	35,2
VL32-076	32	16	76	6,5x2,6	21,6	22,8	492	30,4	657	34,2	739	38,0	821	42,4
VL32-089	32	16	89	6,5x2,6	18,1	26,7	483	35,6	644	40,1	725	44,5	805	50,0
VL32-102	32	16	102	6,5x2,6	15,7	30,6	480	40,8	641	45,9	721	51,0	801	57,6
VL32-115	32	16	115	6,5x2,6	14,2	34,5	490	46,0	653	51,8	735	57,5	817	65,5
VL32-127	32	16	127	6,5x2,6	12,7	38,1	484	50,8	645	57,2	726	63,5	806	72,5
VL32-139	32	16	139	6,5x2,6	11,6	41,7	484	55,6	645	62,6	726	69,5	806	79,4
VL32-152	32	16	152	6,5x2,6	10,6	45,6	483	60,8	644	68,4	725	76,0	806	87,3
VL32-178	32	16	178	6,5x2,6	9,0	53,4	481	71,2	641	80,1	721	89,0	801	102,9
VL32-203	32	16	203	6,5x2,6	7,8	60,9	475	81,2	633	91,4	713	102	792	117,7
VL32-254	32	16	254	6,5x2,6	6,4	76,2	488	102	650	114	732	127,0	813	148,1
VL32-305	32	16	305	6,5x2,6	5,3	91,5	485	122,0	647	137	727	153	808	178,3

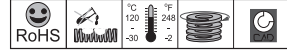
Special Springs Code	D _H	D _d	L ₀	b x h mm	R ± %10	%30 L ₀		%40 L ₀		%45 L ₀		%50 L ₀		Closed Don't use! mm
					Spring Constant N/mm	3.000.000 mm N	1.500.000 mm N	300-500.000 mm N	100-200.000 mm N					
VL40-051	40	20	51	8,0x3,4	48,1	15,3	736	20,4	981	23,0	1104	25,5	1227	28,0
VL40-064	40	20	64	8,0x3,4	39,2	19,2	753	25,6	1004	28,8	1129	32,0	1254	36,2
VL40-076	40	20	76	8,0x3,4	33,3	22,8	759	30,4	1012	34,2	1139	38,0	1265	43,7
VL40-089	40	20	89	8,0x3,4	28,4	26,7	758	35,6	1011	40,1	1137	44,5	1264	51,7
VL40-102	40	20	102	8,0x3,4	24,5	30,6	750	40,8	1000	45,9	1125	51,0	1250	59,8
VL40-115	40	20	115	8,0x3,4	22,1	34,5	762	46,0	1017	51,8	1144	57,5	1271	67,9
VL40-127	40	20	127	8,0x3,4	19,6	38,1	747	50,8	996	57,2	1120	63,5	1245	75,2
VL40-139	40	20	139	8,0x3,4	17,7	41,7	738	55,6	984	62,6	1107	69,5	1230	82,4
VL40-152	40	20	152	8,0x3,4	16,2	45,6	739	60,8	985	68,4	1108	76,0	1231	90,6
VL40-178	40	20	178	8,0x3,4	13,7	53,4	732	71,2	975	80,1	1097	89,0	1219	106
VL40-203	40	20	203	8,0x3,4	12,3	60,9	749	81,2	999	91,4	1124	101	1248	122
VL40-254	40	20	254	8,0x3,4	9,8	76,2	747	102	996	114	1120	127,0	1245	154
VL40-305	40	20	305	8,0x3,4	8,3	91,5	759	122,0	1013	137	1139	152	1266	185
VL50-064	50	25	64	10,5x4,1	86,3	19,2	1657	25,6	2209	28,8	2485	32,0	2762	35,1
VL50-076	50	25	76	10,5x4,1	70,6	22,8	1610	30,4	2146	34,2	2415	38,0	2683	42,2
VL50-089	50	25	89	10,5x4,1	59,8	26,7	1597	35,6	2129	40,1	2395	44,5	2661	50,3
VL50-102	50	25	102	10,5x4,1	52,0	30,6	1591	40,8	2122	45,9	2387	51,0	2652	58,4
VL50-115	50	25	115	10,5x4,1	46,1	34,5	1590	46,0	2121	51,8	2386	57,5	2651	66,1
VL50-127	50	25	127	10,5x4,1	42,2	38,1	1608	50,8	2144	57,2	2412	63,5	2680	73,8
VL50-139	50	25	139	10,5x4,1	38,2	41,7	1593	55,6	2124	62,6	2389	69,5	2655	80,9
VL50-152	50	25	152	10,5x4,1	34,3	45,6	1564	60,8	2085	68,4	2346	76,0	2607	89
VL50-178	50	25	178	10,5x4,1	29,4	53,4	1570	71,2	2093	80,1	2355	89,0	2612	105
VL50-203	50	25	203	10,5x4,1	25,5	60,9	1553	81,2	2071	91,4	2329	101	2588	121
VL50-254	50	25	254	10,5x4,1	20,6	76,2	1570	102	2093	114	2355	127,0	2616	152
VL50-305	50	25	305	10,5x4,1	17,2	91,5	1574	122,0	2098	137	2361	152	2623	184



Wire Detail

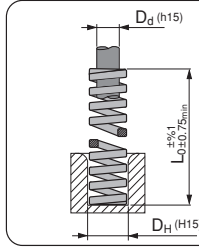


D_d :Rod diameter
 D_H :Hole diameter
 $b \times h$:Cross wire section
 L_0 :Free Length
 R :Spring Constant (Load required for 1 mm deflection)

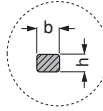


Special Springs Code	D_H	D_d	L_0	$b \times h$ mm	$R \pm \%10$ Spring Constant N/mm	%30 L_0		%40 L_0		%45 L_0		%50 L_0		Closed Don't use! mm
						mm	N	mm	N	mm	N	mm	N	
V10-025	10	5	25	1,7X1,1	10,0	6,3	63	7,5	75	8,8	88	10,0	100	13,5
V10-032	10	5	32	1,7X1,1	8,5	8,0	68	9,6	82	11,2	95	12,8	109	17,5
V10-038	10	5	38	1,7X1,1	6,8	9,5	65	11,4	78	13,3	90	15,2	103	20,8
V10-044	10	5	44	1,7X1,1	6,0	11,0	66	13,2	79	15,4	92	17,6	106	23,9
V10-051	10	5	51	1,7X1,1	5,0	12,8	64	15,3	77	17,9	89	20,4	102	28,9
V10-064	10	5	64	1,7X1,1	4,3	16,0	69	19,2	83	22,4	96	25,6	110	36,1
V10-076	10	5	76	1,7X1,1	3,2	19,0	61	22,8	73	26,6	85	30,4	97	43,2
V10-305	10	5	305	1,7X1,1	1,1	76,3	84	91,5	101	107	117	122,0	134	178
V13-025	12,5		25	2,4x1,4	17,9	6,3	113	7,5	134	8,8	157	10,0	179	13,2
V13-032	12,5	6,3	32	2,4x1,4	16,4	8,0	131	9,6	157	11,2	184	12,8	210	18,0
V13-038	12,5		38	2,4x1,4	13,6	9,5	129	11,4	155	13,3	181	15,2	207	21,0
V13-044	12,5	6,3	44	2,4x1,4	12,1	11,0	133	13,2	160	15,4	186	17,6	213	24,0
V13-051	12,5		51	2,4x1,4	11,4	12,8	146	15,3	174	17,9	203	20,4	233	28,7
V13-064	12,5	6,3	64	2,4x1,4	9,3	16,0	149	19,2	179	22,4	208	25,6	238	35,8
V13-076	12,5		76	2,4x1,4	7,1	19,0	135	22,8	162	26,6	189	30,4	216	42,7
V13-089	12,5	6,3	89	2,4x1,4	5,4	22,3	120	26,7	144	31,2	168	35,6	192	50,4
V13-102	12,5		102	2,4x1,4	4,1	25,5	105	30,6	125	35,7	146	40,8	167	58,4
V13-305	12,5	6,3	305	2,4x1,4	1,4	76,3	107	91,5	128	107	149	122,0	171	172,0
V16-025	16		25	3,2x1,5	23,4	6,3	147	7,5	176	8,8	205	10,0	234	12,6
V16-032	16	6,3	32	3,2x1,5	22,9	8,0	183	9,6	220	11,2	256	12,8	293	16,4
V16-038	16		38	3,2x1,5	19,3	9,5	183	11,4	220	13,3	257	15,2	293	19,7
V16-044	16	6,3	44	3,2x1,5	17,1	11,0	188	13,2	226	15,4	263	17,6	301	22,5
V16-051	16		51	3,2x1,5	15,7	12,8	201	15,3	240	17,9	280	20,4	320	26,3
V16-064	16	6,3	64	3,2x1,5	10,7	16,0	171	19,2	205	22,4	240	25,6	274	33,3
V16-076	16		76	3,2x1,5	10,0	19,0	190	22,8	228	26,6	266	30,4	304	40,2
V16-089	16	6,3	89	3,2x1,5	8,6	22,3	192	26,7	230	31,2	268	35,6	306	47,6
V16-102	16		102	3,2x1,5	7,8	25,5	199	30,6	239	35,7	278	40,8	318	55,4
V16-115	16	6,3	115	3,2x1,5	6,6	28,8	190	34,5	228	40,3	266	46,0	304	60,8
V16-305	16	8	305	3,2x1,5	2,5	76,3	191	91,5	229	107	267	122,0	305	165,3
V20-025	20	8	25	4,0x2,1	55,8	6,3	352	7,5	419	8,8	488	10,0	558	12,1
V20-032	20	8	32	4,0x2,1	45,0	8,0	360	9,6	432	11,2	504	12,8	576	15,3
V20-038	20	8	38	4,0x2,1	33,3	9,5	316	11,4	380	13,3	443	15,2	506	18,9
V20-044	20	8	44	4,0x2,1	30,0	11,0	330	13,2	396	15,4	462	17,6	528	21,5
V20-051	20	8	51	4,0x2,1	24,5	12,8	314	15,3	375	17,9	437	20,4	500	25,0
V20-064	20	8	64	4,0x2,1	20,0	16,0	320	19,2	384	22,4	448	25,6	512	31,1
V20-076	20	8	76	4,0x2,1	16,0	19,0	304	22,8	365	26,6	426	30,4	486	37,3
V20-089	20	8	89	4,0x2,1	14,0	22,3	312	26,7	374	31,2	436	35,6	498	44,5
V20-102	20	8	102	4,0x2,1	12,0	25,5	306	30,6	367	35,7	428	40,8	490	51,1
V20-115	20	8	115	4,0x2,1	10,9	28,8	314	34,5	376	40,3	439	46,0	501	58,2
V20-127	20	10	127	4,0x2,1	9,5	31,8	302	38,1	362	44,5	422	50,8	483	64,9
V20-139	20	10	139	4,0x2,1	8,4	35,0	294	42,0	353	48,7	409	56,0	470	71,5
V20-152	20	10	152	4,0x2,1	7,5	38,0	285	45,6	342	53,2	399	60,8	456	78,8
V20-305	20	10	305	4,0x2,1	4,0	76,3	305	91,5	366	107	427	122,0	488	157

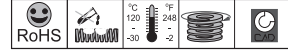
Special Springs Code	D _H	D _d	L ₀	b x h mm	R ± %10 Spring Constant N/mm	%30 L ₀		%40 L ₀		%45 L ₀		%50 L ₀		Closed Don't use! mm
						3.000.000	mm N	1.500.000	mm N	300-500.000	mm N	100-200.000	mm N	
V25-025	25	12,5	25	5,4x2,7	100,0	6,3	630	7,5	750	8,8	875	10,0	1000	11,9
V25-032	25	12,5	32	5,4x2,7	80,3	8,0	642	9,6	771	11,2	899	12,8	1028	16,0
V25-038	25	12,5	38	5,4x2,7	62,0	9,5	589	11,4	707	13,3	825	15,2	942	18,3
V25-044	25	12,5	44	5,4x2,7	52,9	11,0	582	13,2	698	15,4	815	17,6	931	21,4
V25-051	25	12,5	51	5,4x2,7	44,0	12,8	563	15,3	673	17,9	785	20,4	898	24,9
V25-064	25	12,5	64	5,4x2,7	35,2	16,0	563	19,2	676	22,4	788	25,6	901	31,4
V25-076	25	12,5	76	5,4x2,7	28,0	19,0	532	22,8	638	26,6	745	30,4	851	37,5
V25-089	25	12,5	89	5,4x2,7	24,0	22,3	535	26,7	641	31,2	748	35,6	854	43,5
V25-102	25	12,5	102	5,4x2,7	21,1	25,5	538	30,6	646	35,7	753	40,8	861	51,1
V25-115	25	12,5	115	5,4x2,7	18,7	28,8	539	34,5	645	40,3	753	46,0	860	58,1
V25-127	25	12,5	127	5,4x2,7	16,7	31,8	531	38,1	636	44,5	742	50,8	848	64,1
V25-139	25	12,5	139	5,4x2,7	15,3	35,0	536	42,0	643	48,7	744	56,0	857	70,4
V25-152	25	12,5	152	5,4x2,7	14,0	38,0	532	45,6	638	53,2	745	60,8	851	77,1
V25-178	25	12,5	178	5,4x2,7	12,5	44,5	556	53,4	668	62,3	779	71,2	890	93,1
V25-203	25	12,5	203	5,4x2,7	10,4	50,8	528	60,9	633	71,1	739	81,2	844	103
V25-305	25	12,5	305	5,4x2,7	7,0	76,3	534	91,5	641	107	747	122,0	854	156
V32-038	32	16	38	6,8x3,3	94,0	9,5	893	11,4	1072	13,3	1250	15,2	1429	18,3
V32-044	32	16	44	6,8x3,3	79,5	11,0	875	13,2	1049	15,4	1224	17,6	1399	21,5
V32-051	32	16	51	6,8x3,3	67,0	12,8	858	15,3	1025	17,9	1196	20,4	1367	25,5
V32-064	32	16	64	6,8x3,3	53,0	16,0	848	19,2	1018	22,4	1187	25,6	1357	31,9
V32-076	32	16	76	6,8x3,3	44,0	19,0	836	22,8	1003	26,6	1170	30,4	1338	38,6
V32-089	32	16	89	6,8x3,3	37,2	22,3	830	26,7	993	31,2	1159	35,6	1324	46,5
V32-102	32	16	102	6,8x3,3	32,0	25,5	816	30,6	979	35,7	1142	40,8	1306	53,2
V32-115	32	16	115	6,8x3,3	29,0	28,8	835	34,5	1001	40,3	1167	46,0	1334	60,0
V32-127	32	16	127	6,8x3,3	25,0	31,8	795	38,1	953	44,5	1111	50,8	1270	66,7
V32-139	32	16	139	6,8x3,3	23,0	35,0	805	42,0	966	48,7	1119	56,0	1288	71,8
V32-152	32	16	152	6,8x3,3	21,5	38,0	817	45,6	980	53,2	1144	60,8	1307	78,5
V32-178	32	16	178	6,8x3,3	18,2	44,5	810	53,4	972	62,3	1134	71,2	1296	94,4
V32-203	32	16	203	6,8x3,3	15,8	50,8	803	60,9	962	71,1	1123	81,2	1283	107,1
V32-254	32	16	254	6,8x3,3	12,5	63,5	794	76,2	953	88,9	1111	102	1270	136,5
V32-305	32	16	305	6,8x3,3	10,3	76,3	786	91,5	942	107	1100	122	1257	163
V40-051	40	20	51	8,1x4,0	92,0	12,8	1178	15,3	1408	17,9	1642	20,4	1877	25,5
V40-064	40	20	64	8,1x4,0	73,0	16,0	1168	19,2	1402	22,4	1635	25,6	1869	31,4
V40-076	40	20	76	8,1x4,0	63,0	19,0	1197	22,8	1436	26,6	1676	30,4	1915	37,8
V40-089	40	20	89	8,1x4,0	51,0	22,3	1137	26,7	1362	31,2	1589	35,6	1816	44,3
V40-102	40	20	102	8,1x4,0	43,0	25,5	1097	30,6	1316	35,7	1535	40,8	1754	50,7
V40-115	40	20	115	8,1x4,0	39,6	28,8	1140	34,5	1366	40,3	1594	46,0	1822	58,1
V40-127	40	20	127	8,1x4,0	37,0	31,8	1177	38,1	1410	44,5	1645	50,8	1880	64,6
V40-139	40	20	139	8,1x4,0	32,0	35,0	1120	42,0	1344	48,7	1557	56,0	1792	70,1
V40-152	40	20	152	8,1x4,0	28,0	38,0	1064	45,6	1277	53,2	1490	60,8	1702	76,6
V40-178	40	20	178	8,1x4,0	25,2	44,5	1121	53,4	1346	62,3	1570	71,2	1794	90,4
V40-203	40	20	203	8,1x4,0	22,7	50,8	1153	60,9	1382	71,1	1613	81,2	1843	102,4
V40-254	40	20	254	8,1x4,0	17,0	63,5	1080	76,2	1295	88,9	1511	102	1727	129
V40-305	40	20	305	8,1x4,0	14,8	76,3	1129	91,5	1354	107	1580	122	1806	156,1
V50-064	50	25	64	10,9x5,3	156	16,0	2496	19,2	2995	22,4	3494	25,6	3994	31,0
V50-076	50	25	76	10,9x5,3	125	19,0	2375	22,8	2850	26,6	3325	30,4	3800	37,2
V50-089	50	25	89	10,9x5,3	109	22,3	2431	26,7	2910	31,2	3395	35,6	3880	43,6
V50-102	50	25	102	10,9x5,3	94,0	25,5	2397	30,6	2876	35,7	3356	40,8	3835	50,3
V50-115	50	25	115	10,9x5,3	81,0	28,8	2333	34,5	2795	40,3	3260	46,0	3726	58,1
V50-127	50	25	127	10,9x5,3	71,0	31,8	2258	38,1	2705	44,5	3156	50,8	3607	63,7
V50-139	50	25	139	10,9x5,3	66,5	35,0	2328	42,0	2793	48,7	3235	56,0	3724	69,5
V50-152	50	25	152	10,9x5,3	60,0	38,0	2280	45,6	2736	53,2	3192	60,8	3648	76,5
V50-178	50	25	178	10,9x5,3	52,0	44,5	2314	53,4	2777	62,3	3240	71,2	3702	91,9
V50-203	50	25	203	10,9x5,3	44,0	50,8	2235	60,9	2680	71,1	3126	81,2	3573	105
V50-254	50	25	254	10,9x5,3	35,0	63,5	2223	76,2	2667	88,9	3112	102	3556	131
V50-305	50	25	305	10,9x5,3	28,5	76,3	2175	91,5	2608	107	3042	122	3477	155
V63-076	63	38	76	11,0x7,8	189	19,0	3591	22,8	4309	26,6	5027	30,4	5746	36,5
V63-089	63	38	89	11,0x7,8	158	22,3	3523	26,7	4219	31,2	4922	35,6	5625	43,4
V63-102	63	38	102	11,0x7,8	131	25,5	3341	30,6	4009	35,7	4677	40,8	5345	49,7
V63-115	63	38	115	11,0x7,8	116	28,8	3341	34,5	4002	40,3	4669	46,0	5336	55,6
V63-127	63	38	127	11,0x7,8	103	31,8	3275	38,1	3924	44,5	4578	50,8	5232	62,7
V63-152	63	38	152	11,0x7,8	84,3	38,0	3203	45,6	3844	53,2	4485	60,8	5125	77,1
V63-178	63	38	178	11,0x7,8	71,5	44,5	3182	53,4	3818	62,3	4454	71,2	5091	92,2
V63-203	63	38	203	11,0x7,8	61,7	50,8	3134	60,9	3758	71,1	4384	81,2	5010	103
V63-254	63	38	254	11,0x7,8	47,0	63,5	2985	76,2	3581	88,9	4178	102	4775	130
V63-305	63	38	305	11,0x7,8	38,2	76,3	2915	91,5	3495	107	4078	122	4660	157



Wire Detail

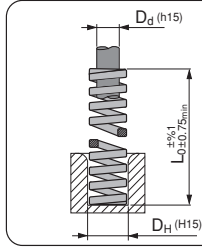


D_d :Rod diameter
D_H :Hole diameter
b x h:Cross wire section
L₀ :Free Length
R :Spring Constant (Load required for 1 mm deflection)

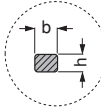


Special Springs Code	D _H	D _d	L ₀	b x h mm	R ± %10 Spring Constant N/mm	%30 L ₀		%40 L ₀		%45 L ₀		%50 L ₀		Closed Don't use! mm
						mm	N	mm	N	mm	N	mm	N	
B10-025	10	5	25	1,9x1,3	16,0	6,3	101	7,5	120	8,4	135	9,4	150	10,2
B10-032	10	5	32	1,9x1,3	13,0	8,0	104	9,6	125	10,8	140	12,0	156	14,2
B10-038	10	5	38	1,9x1,3	11,9	9,5	113	11,4	136	12,8	153	14,3	170	16,8
B10-044	10	5	44	1,9x1,3	10,3	11,0	113	13,2	136	14,9	153	16,5	170	19,4
B10-051	10	5	51	1,9x1,3	8,9	12,8	114	15,3	136	17,2	153	19,1	170	23,4
B10-064	10	5	64	1,9x1,3	7,5	16,0	120	19,2	144	21,6	162	24,0	180	28,2
B10-076	10	5	76	1,9x1,3	5,3	19,0	101	22,8	121	25,7	136	28,5	151	34,2
B10-305	10	5	305	1,9x1,3	1,6	76,3	122	91,5	146	103	165	114	183	134
B13-025	12,5	6,3	25	2,5x1,5	30,0	6,3	189	7,5	225	8,4	253	9,4	282	11,9
B13-032	12,5	6,3	32	2,5x1,5	24,8	8,0	198	9,6	238	10,8	268	12,0	298	16,2
B13-038	12,5	6,3	38	2,5x1,5	21,4	9,5	203	11,4	244	12,8	274	14,3	306	18,7
B13-044	12,5	6,3	44	2,5x1,5	18,5	11,0	204	13,2	244	14,9	275	16,5	305	21,3
B13-051	12,5	6,3	51	2,5x1,5	15,5	12,8	198	15,3	237	17,2	267	19,1	296	25,6
B13-064	12,5	6,3	64	2,5x1,5	12,1	16,0	194	19,2	232	21,6	261	24,0	290	32,4
B13-076	12,5	6,3	76	2,5x1,5	10,2	19,0	194	22,8	233	25,7	262	28,5	291	39,0
B13-089	12,5	6,3	89	2,5x1,5	8,4	22,3	187	26,7	224	30	252	33,4	281	45,9
B13-102	12,5	6,3	102	2,5x1,5	6,3	25,5	161	30,6	193	34,4	217	38,3	241	52,3
B13-305	12,5	6,3	305	2,5x1,5	2,1	76,3	160	91,5	192	103	216	114	240	153
B16-025	16	8	25	3,2x2,0	49,4	6,3	311	7,5	371	8,4	417	9,4	464	10,5
B16-032	16	8	32	3,2x2,0	37,1	8,0	297	9,6	356	10,8	401	12,0	445	13,2
B16-038	16	8	38	3,2x2,0	33,9	9,5	322	11,4	386	12,8	435	14,3	485	17,2
B16-044	16	8	44	3,2x2,0	30,0	11,0	330	13,2	396	14,9	446	16,5	495	19,4
B16-051	16	8	51	3,2x2,0	26,4	12,8	338	15,3	404	17,2	454	19,1	504	24,2
B16-064	16	8	64	3,2x2,0	20,5	16,0	328	19,2	394	21,6	443	24,0	492	29,2
B16-076	16	8	76	3,2x2,0	17,8	19,0	338	22,8	406	25,7	457	28,5	507	36,3
B16-089	16	8	89	3,2x2,0	15,2	22,3	339	26,7	406	30	457	33,4	508	41,7
B16-102	16	8	102	3,2x2,0	13,5	25,5	344	30,6	413	34,4	465	38,3	517	48,9
B16-115	16	8	115	3,2x2,0	11,8	28,8	340	34,5	407	38,8	458	43,1	509	53,1
B16-305	16	8	305	3,2x2,0	4,8	76,3	366	91,5	439	103	494	114	549	142
B20-025	20	10	25	4,1x2,4	98,0	6,3	617	7,5	735	8,4	827	9,4	921	10,5
B20-032	20	10	32	4,1x2,4	72,6	8,0	581	9,6	697	10,8	784	12,0	871	13,9
B20-038	20	10	38	4,1x2,4	56,0	9,5	532	11,4	638	12,8	718	14,3	801	16,6
B20-044	20	10	44	4,1x2,4	47,5	11,0	523	13,2	627	14,9	705	16,5	784	18,8
B20-051	20	10	51	4,1x2,4	41,7	12,8	534	15,3	638	17,2	718	19,1	796	23,1
B20-064	20	10	64	4,1x2,4	32,3	16,0	517	19,2	620	21,6	698	24,0	775	27,5
B20-076	20	10	76	4,1x2,4	25,1	19,0	477	22,8	572	25,7	644	28,5	715	33,8
B20-089	20	10	89	4,1x2,4	22,0	22,3	491	26,7	587	30	661	33,4	735	39,7
B20-102	20	10	102	4,1x2,4	19,8	25,5	505	30,6	606	34,4	682	38,3	758	47,3
B20-115	20	10	115	4,1x2,4	18,1	28,8	521	34,5	624	38,8	703	43,1	780	52,5
B20-127	20	10	127	4,1x2,4	16,6	31,8	528	38,1	632	42,9	712	47,6	790	56,9
B20-139	20	10	139	4,1x2,4	15,1	35,0	529	42,0	634	46,9	708	52,5	793	62,1
B20-152	20	10	152	4,1x2,4	13,2	38,0	500	45,6	600	51,3	677	57,0	750	67,6
B20-305	20	10	305	4,1x2,4	6,1	76,3	465	91,5	558	103	628	114	698	143
B25-025	25	12,5	25	5,4x3,3	147	6,3	926	7,5	1103	8,4	1240	9,4	1382	10,2
B25-032	25	12,5	32	5,4x3,3	118	8,0	944	9,6	1133	10,8	1274	12,0	1416	13,7
B25-038	25	12,5	38	5,4x3,3	93,0	9,5	884	11,4	1060	12,8	1193	14,3	1330	15,7
B25-044	25	12,5	44	5,4x3,3	80,8	11,0	889	13,2	1067	14,9	1200	16,5	1333	18,2
B25-051	25	12,5	51	5,4x3,3	68,6	12,8	878	15,3	1050	17,2	1181	19,1	1310	21,7
B25-064	25	12,5	64	5,4x3,3	53,0	16,0	848	19,2	1018	21,6	1145	24,0	1272	26,0
B25-076	25	12,5	76	5,4x3,3	43,2	19,0	821	22,8	985	25,7	1108	28,5	1231	32,3
B25-089	25	12,5	89	5,4x3,3	38,2	22,3	852	26,7	1020	30,0	1147	33,4	1276	38,0
B25-102	25	12,5	102	5,4x3,3	33,0	25,5	842	30,6	1010	34,4	1136	38,3	1264	43,0
B25-115	25	12,5	115	5,4x3,3	28,0	28,8	806	34,5	966	38,8	1087	43,1	1207	48,6
B25-127	25	12,5	127	5,4x3,3	25,9	31,8	824	38,1	987	42,9	1110	47,6	1233	53,7

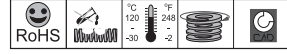
Special Springs Code	D _H	D _d	L ₀	b x h mm	R ± %10	%30 L ₀		%40 L ₀		%45 L ₀		%50 L ₀		Closed Don't use! mm
					Spring Constant N/mm	3.000.000 mm N	1.500.000 mm N	300-500.000 mm N	100-200.000 mm N					
B25-139	25	12,5	139	5,4x3,3	23,2	35,0	812	42,0	974	46,9	1088	52,5	1218	59,4
B25-152	25	12,5	152	5,4x3,3	20,8	38,0	790	45,6	948	51,3	1067	57,0	1186	63,8
B25-178	25	12,5	178	5,4x3,3	17,8	44,5	792	53,4	951	60,1	1069	66,8	1189	76,6
B25-203	25	12,5	203	5,4x3,3	15,8	50,8	803	60,9	962	68,5	1082	76,1	1202	88,4
B25-305	25	12,5	305	5,4x3,3	10,2	76,3	778	91,5	933	103	1050	114	1167	135,1
B32-038	32	16	38	6,8x4,0	185	9,5	1758	11,4	2109	12,8	2373	14,3	2646	16,3
B32-044	32	16	44	6,8x4,0	158	11,0	1738	13,2	2086	14,9	2346	16,5	2607	18,9
B32-051	32	16	51	6,8x4,0	134	12,8	1715	15,3	2050	17,2	2306	19,1	2559	23,1
B32-064	32	16	64	6,8x4,0	99,0	16,0	1584	19,2	1901	21,6	2138	24,0	2376	28,5
B32-076	32	16	76	6,8x4,0	80,5	19,0	1530	22,8	1835	25,7	2065	28,5	2294	34,2
B32-089	32	16	89	6,8x4,0	69,1	22,3	1541	26,7	1845	30,0	2076	33,4	2308	40,4
B32-102	32	16	102	6,8x4,0	58,8	25,5	1499	30,6	1799	34,4	2024	38,3	2252	48,0
B32-115	32	16	115	6,8x4,0	51,5	28,8	1483	34,5	1777	38,8	1999	43,1	2220	54,3
B32-127	32	16	127	6,8x4,0	44,8	31,8	1425	38,1	1707	42,9	1920	47,6	2132	59,2
B32-139	32	16	139	6,8x4,0	42,3	35,0	1481	42,0	1777	46,9	1984	52,5	2221	65,3
B32-152	32	16	152	6,8x4,0	37,8	38,0	1436	45,6	1724	51,3	1939	57,0	2155	73,0
B32-178	32	16	178	6,8x4,0	32,5	44,5	1446	53,4	1736	60,1	1952	66,8	2171	84,5
B32-203	32	16	203	6,8x4,0	28,9	50,8	1468	60,9	1760	68,5	1980	76,1	2199	96,9
B32-254	32	16	254	6,8x4,0	21,4	63,5	1359	76,2	1631	85,7	1835	95,3	2039	120,9
B32-305	32	16	305	6,8x4,0	18,3	76,3	1396	91,5	1674	103	1884	114	2094	146,9
B40-051	40	20	51	8,2x4,7	181,6	12,8	2330	15,3	2785	17,2	3130	19,1	3469	21,4
B40-064	40	20	64	8,2x4,7	140,0	16,0	2240	19,2	2688	21,6	3024	24,0	3360	26,8
B40-076	40	20	76	8,2x4,7	108,0	19,0	2052	22,8	2462	25,7	2770	28,5	3078	32,7
B40-089	40	20	89	8,2x4,7	90,7	22,3	2023	26,7	2422	30,0	2724	33,4	3029	39,0
B40-102	40	20	102	8,2x4,7	81,0	25,5	2066	30,6	2479	34,4	2788	38,3	3102	44,1
B40-115	40	20	115	8,2x4,7	71,8	28,8	2068	34,5	2477	38,8	2787	43,1	3095	50,6
B40-127	40	20	127	8,2x4,7	62,7	31,8	1994	38,1	2389	42,9	2687	47,6	2985	55,9
B40-139	40	20	139	8,2x4,7	57,5	35,0	2013	42,0	2415	46,9	2697	52,5	3019	61,8
B40-152	40	20	152	8,2x4,7	51,6	38,0	1961	45,6	2353	51,3	2647	57,0	2941	67,5
B40-178	40	20	178	8,2x4,7	44,1	44,5	1962	53,4	2355	60,1	2649	66,8	2946	77,2
B40-203	40	20	203	8,2x4,7	36,7	50,8	1864	60,9	2235	68,5	2514	76,1	2793	91,8
B40-254	40	20	254	8,2x4,7	30,1	63,5	1911	76,2	2294	85,7	2580	95,3	2869	113
B40-305	40	20	305	8,2x4,7	24,6	76,3	1877	91,5	2251	103	2532	114	2814	138
B50-064	50	25	64	11,1x5,8	209	16,0	3344	19,2	4013	21,6	4514	24,0	5016	28,2
B50-076	50	25	76	11,1x5,8	168	19,0	3192	22,8	3830	25,7	4309	28,5	4788	34,9
B50-089	50	25	89	11,1x5,8	140	22,3	3122	26,7	3738	30,0	4205	33,4	4676	39,2
B50-102	50	25	102	11,1x5,8	119	25,5	3035	30,6	3641	34,4	4097	38,3	4558	47,3
B50-115	50	25	115	11,1x5,8	106	28,8	3053	34,5	3657	38,8	4114	43,1	4569	52,6
B50-127	50	25	127	11,1x5,8	97,0	31,8	3085	38,1	3696	42,9	4158	47,6	4617	59,8
B50-139	50	25	139	11,1x5,8	87,0	35,0	3045	42,0	3654	46,9	4081	52,5	4568	65,1
B50-152	50	25	152	11,1x5,8	80,0	38,0	3040	45,6	3648	51,3	4104	57,0	4560	70,8
B50-178	50	25	178	11,1x5,8	69,5	44,5	3093	53,4	3711	60,1	4175	66,8	4643	84,2
B50-203	50	25	203	11,1x5,8	59,8	50,8	3038	60,9	3642	68,5	4097	76,1	4551	96,5
B50-229	50	25	229	11,1x5,8	50,9	57,3	2917	68,7	3497	77,3	3934	85,9	4372	108
B50-254	50	25	254	11,1x5,8	43,9	63,5	2788	76,2	3345	85,7	3763	95,3	4184	122
B50-305	50	25	305	11,1x5,8	38,6	76,3	2945	91,5	3532	103	3973	114	4416	147
B63-076	63	38	76	11x5x9,1	312	19,0	5928	22,8	7114	25,7	8003	28,5	8892	30,7
B63-089	63	38	89	11x5x9,1	260	22,3	5798	26,7	6942	30,0	7810	33,4	8684	36,5
B63-102	63	38	102	11x5x9,1	221	25,5	5636	30,6	6763	34,4	7608	38,3	8464	43,6
B63-115	63	38	115	11x5x9,1	187	28,8	5386	34,5	6452	38,8	7258	43,1	8060	48,9
B63-127	63	38	127	11x5x9,1	168	31,8	5342	38,1	6401	42,9	7201	47,6	7997	54,2
B63-152	63	38	152	11x5x9,1	136	38,0	5168	45,6	6202	51,3	6977	57,0	7752	65,7
B63-178	63	38	178	11x5x9,1	114	44,5	5073	53,4	6088	60,1	6849	66,8	7615	76,5
B63-203	63	38	203	11x5x9,1	100	50,8	5080	60,9	6090	68,5	6851	76,1	7610	88,0
B63-229	63	38	229	11x5x9,1	89,2	57,3	5111	68,7	6128	77,3	6894	85,9	7662	104
B63-254	63	38	254	11x5x9,1	78,4	63,5	4978	76,2	5974	85,7	6721	95,3	7472	112
B63-305	63	38	305	11x5x9,1	64,7	76,3	4937	91,5	5920	103	6660	114	7402	134



Wire Detail



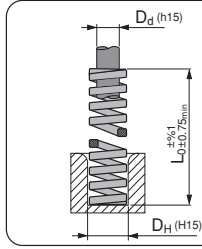
D_d :Rod diameter
D_H :Hole diameter
b x h :Cross wire section
L₀ :Free Length
R :Spring Constant (Load required for 1 mm deflection)



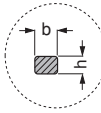
Special Springs Code	D _H	D _d	L ₀	b x h mm	R ± %10 Spring Constant N/mm	%30 L ₀		%40 L ₀		%45 L ₀		%50 L ₀		Closed Don't use! mm
						mm	N	mm	N	mm	N	mm	N	
R10-025	10	5	25	1,9x1,5	22,1	5,0	111	6,3	139	6,9	152	7,5	166	9,2
R10-032	10	5	32	1,9x1,5	17,5	6,4	112	8,0	140	8,8	154	9,6	168	12,1
R10-038	10	5	38	1,9x1,5	17,1	7,6	130	9,5	162	10,5	179	11,4	195	13,2
R10-044	10	5	44	1,9x1,5	15,0	8,8	132	11,0	165	12,1	182	13,2	198	15,1
R10-051	10	5	51	1,9x1,5	12,8	10,2	131	12,8	164	14,0	180	15,3	196	19,5
R10-064	10	5	64	1,9x1,5	10,7	12,8	137	16,0	171	17,6	188	19,2	205	21,8
R10-076	10	5	76	1,9x1,5	7,5	15,2	114	19,0	143	20,9	157	22,8	171	27,9
R10-305	10	5	305	1,9x1,5	2,1	61,0	128	76,3	160	83,9	176	91,5	192	127
R13-025	12,5	6,3	25	2,4x1,9	42,1	5,0	211	6,3	265	6,9	289	7,5	316	9,8
R13-032	12,5	6,3	32	2,4x1,9	33,2	6,4	212	8,0	266	8,8	292	9,6	319	13,6
R13-038	12,5	6,3	38	2,4x1,9	29,3	7,6	223	9,5	278	10,5	306	11,4	334	14,6
R13-044	12,5	6,3	44	2,4x1,9	24,6	8,8	216	11,0	271	12,1	298	13,2	325	18,1
R13-051	12,5	6,3	51	2,4x1,9	19,6	10,2	200	12,8	251	14,0	275	15,3	300	22,3
R13-064	12,5	6,3	64	2,4x1,9	15,0	12,8	192	16,0	240	17,6	264	19,2	288	27,3
R13-076	12,5	6,3	76	2,4x1,9	13,2	15,2	201	19,0	251	20,9	276	22,8	301	33,1
R13-089	12,5	6,3	89	2,4x1,9	11,4	17,8	203	22,3	254	24,5	279	26,7	304	38,9
R13-102	12,5	6,3	102	2,4x1,9	8,4	20,4	171	25,5	214	28,1	236	30,6	257	43,8
R13-305	12,5	6,3	305	2,4x1,9	2,8	61,0	171	76,3	214	83,9	235	91,5	256	140
R16-025	16	8	25	3,1x2,5	75,7	5,0	379	6,3	477	6,9	520	7,5	568	8,4
R16-032	16	8	32	3,1x2,5	52,8	6,4	338	8,0	422	8,8	465	9,6	507	10,5
R16-038	16	8	38	3,1x2,5	48,5	7,6	369	9,5	461	10,5	507	11,4	553	13,6
R16-044	16	8	44	3,1x2,5	42,8	8,8	377	11,0	471	12,1	518	13,2	565	15,9
R16-051	16	8	51	3,1x2,5	37,1	10,2	378	12,8	475	14,0	520	15,3	568	18,9
R16-064	16	8	64	3,1x2,5	30,3	12,8	388	16,0	485	17,6	533	19,2	582	24,9
R16-076	16	8	76	3,1x2,5	25,7	15,2	391	19,0	488	20,9	537	22,8	586	29,2
R16-089	16	8	89	3,1x2,5	21,7	17,8	386	22,3	484	24,5	531	26,7	579	34,5
R16-102	16	8	102	3,1x2,5	19,3	20,4	394	25,5	492	28,1	541	30,6	591	39,1
R16-115	16	8	115	3,1x2,5	15,7	23,0	361	28,8	452	31,6	497	34,5	542	44,0
R16-305	16	8	305	3,1x2,5	7,1	61,0	433	76,3	542	83,9	596	91,5	650	104
R20-025	20	10	25	4,0x3,3	216	5,0	1080	6,3	1361	6,9	1485	7,5	1620	8,3
R20-032	20	10	32	4,0x3,3	168	6,4	1075	8,0	1344	8,8	1478	9,6	1613	10,9
R20-038	20	10	38	4,0x3,3	129	7,6	980	9,5	1226	10,5	1348	11,4	1471	12,5
R20-044	20	10	44	4,0x3,3	112	8,8	986	11,0	1232	12,1	1355	13,2	1478	15,0
R20-051	20	10	51	4,0x3,3	94,0	10,2	959	12,8	1203	14,0	1318	15,3	1438	17,6
R20-064	20	10	64	4,0x3,3	72,1	12,8	923	16,0	1154	17,6	1269	19,2	1384	22,6
R20-076	20	10	76	4,0x3,3	59,7	15,2	907	19,0	1134	20,9	1248	22,8	1361	27,5
R20-089	20	10	89	4,0x3,3	50,5	17,8	899	22,3	1126	24,5	1236	26,7	1348	31,7
R20-102	20	10	102	4,0x3,3	44,2	20,4	902	25,5	1127	28,1	1240	30,6	1353	37,5
R20-115	20	10	115	4,0x3,3	38,4	23,0	883	28,8	1106	31,6	1214	34,5	1325	42,6
R20-127	20	10	127	4,0x3,3	34,1	25,4	866	31,8	1084	34,9	1191	38,1	1299	45,5
R20-139	20	10	139	4,0x3,3	31,0	28,0	868	35,0	1085	38,2	1185	42,0	1302	50,1
R20-152	20	10	152	4,0x3,3	28,2	30,4	857	38,0	1072	41,8	1179	45,6	1286	55,8
R20-305	20	10	305	4,0x3,3	15,0	61,0	915	76,3	1145	83,9	1258	91,5	1373	114
R25-025	25	12,5	25	5,5x4,2	375	5,0	1875	6,3	2363	6,9	2578	7,5	2813	8,5
R25-032	25	12,5	32	5,5x4,2	297	6,4	1901	8,0	2376	8,8	2614	9,6	2851	11,0
R25-038	25	12,5	38	5,5x4,2	219	7,6	1664	9,5	2081	10,5	2289	11,4	2497	12,6
R25-044	25	12,5	44	5,5x4,2	187	8,8	1646	11,0	2057	12,1	2263	13,2	2468	14,8
R25-051	25	12,5	51	5,5x4,2	156	10,2	1591	12,8	1997	14,0	2188	15,3	2387	17,9
R25-064	25	12,5	64	5,5x4,2	123	12,8	1574	16,0	1968	17,6	2165	19,2	2362	23,1
R25-076	25	12,5	76	5,5x4,2	99,0	15,2	1505	19,0	1881	20,9	2069	22,8	2257	26,3
R25-089	25	12,5	89	5,5x4,2	84,0	17,8	1495	22,3	1873	24,5	2056	26,7	2243	30,5
R25-102	25	12,5	102	5,5x4,2	73,0	20,4	1489	25,5	1862	28,1	2048	30,6	2234	37,3
R25-115	25	12,5	115	5,5x4,2	65,0	23,0	1495	28,8	1872	31,6	2056	34,5	2243	41,9
R25-127	25	12,5	127	5,5x4,2	57,7	25,4	1466	31,8	1835	34,9	2015	38,1	2198	46,2

Special Springs Code	D _H	D _d	L ₀	b x h mm	R ± %10 Spring Constant N/mm	%30 L ₀		%40 L ₀		%45 L ₀		%50 L ₀		Closed Don't use! mm
						3.000.000 mm N	1.500.000 mm N	300-500.000 mm N	100-200.000 mm N					
R25-139	25	12,5	139	5,5x4,2	52,7	28,0	1476	35,0	1845	38,2	2014	42,0	2213	49,3
R25-152	25	12,5	152	5,5x4,2	47,8	30,4	1453	38,0	1816	41,8	1998	45,6	2180	55,7
R25-178	25	12,5	178	5,5x4,2	41,0	35,6	1460	44,5	1825	49,0	2007	53,4	2189	65,1
R25-203	25	12,5	203	5,5x4,2	35,8	40,6	1453	50,8	1819	55,8	1999	60,9	2180	74,5
R25-305	25	12,5	305	5,5x4,2	22,9	61,0	1397	76,3	1747	83,9	1921	91,5	2095	110
R32-038	32	16	38	7,1x5,4	388	7,6	2949	9,5	3686	10,5	4055	11,4	4423	12,5
R32-044	32	16	44	7,1x5,4	324	8,8	2851	11,0	3564	12,1	3920	13,2	4277	14,9
R32-051	32	16	51	7,1x5,4	272	10,2	2774	12,8	3482	14,0	3815	15,3	4162	17,8
R32-064	32	16	64	7,1x5,4	212	12,8	2714	16,0	3392	17,6	3731	19,2	4070	22,4
R32-076	32	16	76	7,1x5,4	172	15,2	2614	19,0	3268	20,9	3595	22,8	3922	26,1
R32-089	32	16	89	7,1x5,4	141	17,8	2510	22,3	3144	24,5	3451	26,7	3765	30,8
R32-102	32	16	102	7,1x5,4	122	20,4	2489	25,5	3111	28,1	3422	30,6	3733	36,8
R32-115	32	16	115	7,1x5,4	107	23,0	2461	28,8	3082	31,6	3384	34,5	3692	41,4
R32-127	32	16	127	7,1x5,4	93,0	25,4	2362	31,8	2957	34,9	3248	38,1	3543	44,4
R32-139	32	16	139	7,1x5,4	86,0	28,0	2408	35,0	3010	38,2	3287	42,0	3612	48,5
R32-152	32	16	152	7,1x5,4	78,0	30,4	2371	38,0	2964	41,8	3260	45,6	3557	54,8
R32-178	32	16	178	7,1x5,4	67,2	35,6	2392	44,5	2990	49,0	3289	53,4	3588	63,6
R32-203	32	16	203	7,1x5,4	59,1	40,6	2399	50,8	3002	55,8	3299	60,9	3599	72,5
R32-254	32	16	254	7,1x5,4	46,4	50,8	2357	63,5	2946	69,9	3241	76,2	3536	92,8
R32-305	32	16	305	7,1x5,4	38,0	61,0	2318	76,3	2899	83,9	3187	91,5	3477	112
R40-051	40	20	51	8,4x6,2	350	10,2	3570	12,8	4480	14,0	4909	15,3	5355	17,0
R40-064	40	20	64	8,4x6,2	269	12,8	3443	16,0	4304	17,6	4734	19,2	5165	21,9
R40-076	40	20	76	8,4x6,2	219	15,2	3329	19,0	4161	20,9	4577	22,8	4993	26,7
R40-089	40	20	89	8,4x6,2	190	17,8	3382	22,3	4237	24,5	4650	26,7	5073	31,3
R40-102	40	20	102	8,4x6,2	163	20,4	3325	25,5	4157	28,1	4572	30,6	4988	37,1
R40-115	40	20	115	8,4x6,2	142	23,0	3266	28,8	4090	31,6	4491	34,5	4899	41,0
R40-127	40	20	127	8,4x6,2	128	25,4	3251	31,8	4070	34,9	4470	38,1	4877	46,5
R40-139	40	20	139	8,4x6,2	115	28,0	3220	35,0	4025	38,2	4396	42,0	4830	53,1
R40-152	40	20	152	8,4x6,2	105	30,4	3192	38,0	3990	41,8	4389	45,6	4788	56,1
R40-178	40	20	178	8,4x6,2	89	35,6	3168	44,5	3961	49,0	4357	53,4	4753	67,4
R40-203	40	20	203	8,4x6,2	77	40,6	3126	50,8	3912	55,8	4299	60,9	4689	76,2
R40-254	40	20	254	8,4x6,2	61	50,8	3099	63,5	3874	69,9	4261	76,2	4648	96,2
R40-305	40	20	305	8,4x6,2	51	61,0	3111	76,3	3891	83,9	4278	91,5	4667	115
R50-064	50	25	64	11,1x7,6	413	12,8	5286	16,0	6608	17,6	7269	19,2	7930	22,4
R50-076	50	25	76	11,1x7,6	339	15,2	5153	19,0	6441	20,9	7085	22,8	7729	26,5
R50-089	50	25	89	11,1x7,6	288	17,8	5126	22,3	6422	24,5	7049	26,7	7690	31,5
R50-102	50	25	102	11,1x7,6	245	20,4	4998	25,5	6248	28,1	6872	30,6	7497	37,6
R50-115	50	25	115	11,1x7,6	215	23,0	4945	28,8	6192	31,6	6799	34,5	7418	42,7
R50-127	50	25	127	11,1x7,6	192	25,4	4877	31,8	6106	34,9	6706	38,1	7315	47,5
R50-139	50	25	139	11,1x7,6	168	28,0	4704	35,0	5880	38,2	6422	42,0	7056	51,8
R50-152	50	25	152	11,1x7,6	154	30,4	4682	38,0	5852	41,8	6437	45,6	7022	57,8
R50-178	50	25	178	11,1x7,6	134	35,6	4770	44,5	5963	49,0	6559	53,4	7156	68,5
R50-203	50	25	203	11,1x7,6	117	40,6	4750	50,8	5944	55,8	6532	60,9	7125	77,6
R50-254	50	25	254	11,1x7,6	89	50,8	4521	63,5	5652	69,9	6217	76,2	6782	97,9
R50-305	50	25	305	11,1x7,6	73	61	4453	76,3	5570	83,9	6123	91,5	6680	121
R63-076	63	38	76	11,6x12,3	618	15,2	9394	19,0	11742	20,9	12916	22,8	14090	24,7
R63-089	63	38	89	11,6x12,3	515	17,8	9167	22,3	11485	24,5	12605	26,7	13751	30,0
R63-102	63	38	102	11,6x12,3	438	20,4	8935	25,5	11169	28,1	12286	30,6	13403	35,1
R63-115	63	38	115	11,6x12,3	370	23,0	8510	28,8	10656	31,6	11701	34,5	12765	37,5
R63-127	63	38	127	11,6x12,3	333	25,4	8458	31,8	10589	34,9	11630	38,1	12687	45,9
R63-152	63	38	152	11,6x12,3	269	30,4	8178	38,0	10222	41,8	11244	45,6	12266	56,5
R63-178	63	38	178	11,6x12,3	226	35,6	8046	44,5	10057	49,0	11063	53,4	12068	66,8
R63-203	63	38	203	11,6x12,3	198	40,6	8039	50,8	10058	55,8	11053	60,9	12058	78,8
R63-254	63	38	254	11,6x12,3	155	50,8	7874	63,5	9843	69,9	10827	76,2	11811	102
R63-305	63	38	305	11,6x12,3	128	61,0	7808	76,3	9766	83,9	10736	91,5	11712	122

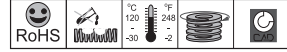
Estimated life 100.000 cycles



Wire Detail



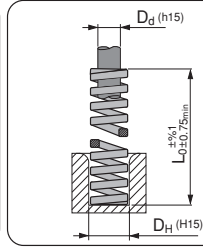
D_d :Rod diameter
D_H :Hole diameter
b × h :Cross wire section
L₀ :Free Length
R :Spring Constant (Load required for 1 mm deflection)



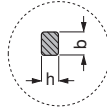
Special Springs Code	D _H	D _d	L ₀	b × h mm	R ± %10 Spring Constant N/mm	%30 L ₀		%40 L ₀		%45 L ₀		%50 L ₀		Closed Don't use! mm
						mm	N	mm	N	mm	N	mm	N	
G10-025	10	5	25	1,9x1,6	36,8	4,3	158	5,0	184	5,6	207	6,3	232	7,7
G10-032	10	5	32	1,9x1,6	27,9	5,4	151	6,4	179	7,2	201	8,0	223	10,6
G10-038	10	5	38	1,9x1,6	23,7	6,5	154	7,6	180	8,6	203	9,5	225	12,6
G10-044	10	5	44	1,9x1,6	19,2	7,5	144	8,8	169	9,9	190	11,0	211	13,8
G10-051	10	5	51	1,9x1,6	16,5	8,7	144	10,2	168	11,5	189	12,8	211	16,2
G10-064	10	5	64	1,9x1,6	13,2	10,9	144	12,8	169	14,4	190	16,0	211	20,4
G10-076	10	5	76	1,9x1,6	10,9	12,9	141	15,2	166	17,1	186	19,0	207	25,2
G10-305	10	5	305	1,9x1,6	2,6	51,9	135	61,0	159	68,6	178	76,3	198	111
G13-025	12,5	6,3	25	2,6x2,0	58,5	4,3	252	5,0	293	5,6	329	6,3	369	8,1
G13-032	12,5	6,3	32	2,6x2,0	43,9	5,4	237	6,4	281	7,2	316	8,0	351	9,9
G13-038	12,5	6,3	38	2,6x2,0	36,0	6,5	234	7,6	274	8,6	308	9,5	342	12,9
G13-044	12,5	6,3	44	2,6x2,0	30,3	7,5	227	8,8	267	9,9	300	11,0	333	14,1
G13-051	12,5	6,3	51	2,6x2,0	26,2	8,7	228	10,2	267	11,5	301	12,8	335	17,4
G13-064	12,5	6,3	64	2,6x2,0	21,2	10,9	231	12,8	271	14,4	305	16,0	339	21,0
G13-076	12,5	6,3	76	2,6x2,0	17,1	12,9	221	15,2	260	17,1	292	19,0	325	26,4
G13-089	12,5	6,3	89	2,6x2,0	14,5	15,1	219	17,8	258	20,0	290	22,3	323	31,5
G13-102	12,5	6,3	102	2,6x2,0	12,7	17,3	220	20,4	259	23,0	291	25,5	324	36,0
G13-305	12,5	6,3	305	2,6x2,0	4,3	51,9	223	61,0	262	68,6	295	76,3	328	111
G16-025	16	8	25	3,2x2,9	118	4,3	507	5,0	590	5,6	664	6,3	743	8,5
G16-032	16	8	32	3,2x2,9	89,0	5,4	481	6,4	570	7,2	641	8,0	712	11,0
G16-038	16	8	38	3,2x2,9	72,1	6,5	469	7,6	548	8,6	616	9,5	685	13,2
G16-044	16	8	44	3,2x2,9	60,9	7,5	457	8,8	536	9,9	603	11,0	670	14,7
G16-051	16	8	51	3,2x2,9	52,3	8,7	455	10,2	533	11,5	600	12,8	669	17,7
G16-064	16	8	64	3,2x2,9	41,2	10,9	449	12,8	527	14,4	593	16,0	659	21,9
G16-076	16	8	76	3,2x2,9	34,1	12,9	440	15,2	518	17,1	583	19,0	648	27,8
G16-089	16	8	89	3,2x2,9	29,5	15,1	445	17,8	525	20,0	591	22,3	658	31,2
G16-102	16	8	102	3,2x2,9	25,6	17,3	443	20,4	522	23,0	588	25,5	653	37,9
G16-115	16	8	115	3,2x2,9	22,4	19,6	439	23,0	515	25,9	580	28,8	645	44,5
G16-305	16	8	305	3,2x2,9	8,4	51,9	436	61,0	512	68,6	576	76,3	641	113
G20-025	20	10	25	4,1x3,8	293	4,3	1260	5,0	1465	5,6	1648	6,3	1846	6,9
G20-032	20	10	32	4,1x3,8	224	5,4	1210	6,4	1434	7,2	1613	8,0	1792	9,4
G20-038	20	10	38	4,1x3,8	177	6,5	1151	7,6	1345	8,6	1513	9,5	1682	12,0
G20-044	20	10	44	4,1x3,8	149	7,5	1118	8,8	1311	9,9	1475	11,0	1639	13,5
G20-051	20	10	51	4,1x3,8	128	8,7	1114	10,2	1306	11,5	1469	12,8	1638	16,2
G20-064	20	10	64	4,1x3,8	99,0	10,9	1079	12,8	1267	14,4	1426	16,0	1584	21,2
G20-076	20	10	76	4,1x3,8	81,7	12,9	1054	15,2	1242	17,1	1397	19,0	1552	24,7
G20-089	20	10	89	4,1x3,8	69,5	15,1	1049	17,8	1237	20,0	1392	22,3	1550	28,8
G20-102	20	10	102	4,1x3,8	60,6	17,3	1048	20,4	1236	23,0	1391	25,5	1545	34,8
G20-115	20	10	115	4,1x3,8	53,0	19,6	1039	23,0	1219	25,9	1371	28,8	1526	39,0
G20-127	20	10	127	4,1x3,8	47,5	21,6	1026	25,4	1207	28,6	1357	31,8	1511	43,0
G20-139	20	10	139	4,1x3,8	43,0	23,8	1023	28,0	1204	31,3	1345	35,0	1505	45,3
G20-152	20	10	152	4,1x3,8	39,0	25,8	1006	30,4	1186	34,2	1334	38,0	1482	50,4
G20-305	20	10	305	4,1x3,8	21,2	51,9	1100	61,0	1293	68,6	1455	76,3	1618	103
G25-025	25	12,5	25	5,4x4,6	459	4,3	1974	5,0	2295	5,6	2582	6,3	2892	7,3
G25-032	25	12,5	32	5,4x4,6	374	5,4	2020	6,4	2394	7,2	2693	8,0	2992	10,7
G25-038	25	12,5	38	5,4x4,6	300	6,5	1950	7,6	2280	8,6	2580	9,5	2850	12,0
G25-044	25	12,5	44	5,4x4,6	244	7,5	1830	8,8	2147	9,9	2416	11,0	2684	14,4
G25-051	25	12,5	51	5,4x4,6	208	8,7	1810	10,2	2122	11,5	2392	12,8	2662	17,4
G25-064	25	12,5	64	5,4x4,6	161	10,9	1755	12,8	2061	14,4	2318	16,0	2576	21,4
G25-076	25	12,5	76	5,4x4,6	131	12,9	1690	15,2	1991	17,1	2240	19,0	2489	26,9
G25-089	25	12,5	89	5,4x4,6	111	15,1	1676	17,8	1976	20,0	2220	22,3	2475	30,9
G25-102	25	12,5	102	5,4x4,6	96,3	17,3	1666	20,4	1965	23,0	2210	25,5	2456	36,7
G25-115	25	12,5	115	5,4x4,6	85,7	19,6	1680	23,0	1971	25,9	2217	28,8	2468	40,3
G25-127	25	12,5	127	5,4x4,6	76,3	21,6	1648	25,4	1938	28,6	2180	31,8	2426	45,1

Special Springs Code	D _H	D _d	L ₀	b x h mm	R ± %10 Spring Constant N/mm	3.000.000		1.500.000		300-500.000		100-200.000		Closed Don't use! mm
						mm	N	mm	N	mm	N	mm	N	
G25-139	25	12,5	139	5,4x4,6	66,0	23,8	1571	28,0	1848	31,3	2066	35,0	2310	47,6
G25-152	25	12,5	152	5,4x4,6	63,5	25,8	1638	30,4	1930	34,2	2172	38,0	2413	53,5
G25-178	25	12,5	178	5,4x4,6	53,9	30,3	1633	35,6	1919	40,1	2159	44,5	2399	63,9
G25-203	25	12,5	203	5,4x4,6	47,0	34,5	1622	40,6	1908	45,7	2147	50,8	2388	70,2
G25-305	25	12,5	305	5,4x4,6	30,9	51,9	1604	61,0	1885	68,6	2121	76,3	2358	110
G32-038	32	16	38	7,3x5,9	480	6,5	3120	7,6	3648	8,6	4128	9,5	4560	11,4
G32-044	32	16	44	7,3x5,9	390	7,5	2925	8,8	3432	9,9	3861	11,0	4290	13,7
G32-051	32	16	51	7,3x5,9	320	8,7	2784	10,2	3264	11,5	3680	12,8	4096	15,6
G32-064	32	16	64	7,3x5,9	269	10,9	2934	12,8	3446	14,4	3876	16,0	4307	20,0
G32-076	32	16	76	7,3x5,9	219	12,9	2825	15,2	3329	17,1	3745	19,0	4161	24,4
G32-089	32	16	89	7,3x5,9	180	15,1	2723	17,8	3209	20,0	3611	22,3	4021	29,7
G32-102	32	16	102	7,3x5,9	155	17,3	2682	20,4	3162	23,0	3557	25,5	3953	35,1
G32-115	32	16	115	7,3x5,9	140	19,6	2744	23,0	3220	25,9	3623	28,8	4032	39,0
G32-127	32	16	127	7,3x5,9	124	21,6	2678	25,4	3150	28,6	3543	31,8	3943	42,8
G32-139	32	16	139	7,3x5,9	112	23,8	2673	28,0	3144	31,3	3512	35,0	3931	48,6
G32-152	32	16	152	7,3x5,9	102	25,8	2632	30,4	3101	34,2	3488	38,0	3876	52,4
G32-178	32	16	178	7,3x5,9	88,2	30,3	2672	35,6	3140	40,1	3532	44,5	3925	60,9
G32-203	32	16	203	7,3x5,9	76,0	34,5	2622	40,6	3086	45,7	3471	50,8	3861	69,2
G32-254	32	16	254	7,3x5,9	60,8	43,2	2627	50,8	3089	57,2	3475	63,5	3861	88,1
G32-305	32	16	305	7,3x5,9	49,0	51,9	2543	61,0	2989	68,6	3363	76,3	3739	104
G40-051	40	20	51	8,4x7,5	628	8,7	5464	10,2	6406	11,5	7206	12,8	8038	15,0
G40-064	40	20	64	8,4x7,5	487	10,9	5308	12,8	6234	14,4	7013	16,0	7792	19,5
G40-076	40	20	76	8,4x7,5	379	12,9	4889	15,2	5761	17,1	6481	19,0	7201	23,3
G40-089	40	20	89	8,4x7,5	321	15,1	4847	17,8	5714	20,0	6428	22,3	7158	26,7
G40-102	40	20	102	8,4x7,5	281	17,3	4861	20,4	5732	23,0	6449	25,5	7166	33,8
G40-115	40	20	115	8,4x7,5	245	19,6	4802	23,0	5635	25,9	6339	28,8	7056	36,2
G40-127	40	20	127	8,4x7,5	221	21,6	4774	25,4	5613	28,6	6315	31,8	7028	40,7
G40-139	40	20	139	8,4x7,5	190	23,8	4522	28,0	5320	31,3	5942	35,0	6650	44,5
G40-152	40	20	152	8,4x7,5	168	25,8	4334	30,4	5107	34,2	5746	38,0	6384	49,6
G40-178	40	20	178	8,4x7,5	146	30,3	4424	35,6	5198	40,1	5847	44,5	6497	59,9
G40-203	40	20	203	8,4x7,5	132	34,5	4554	40,6	5359	45,7	6029	50,8	6706	67,1
G40-254	40	20	254	8,4x7,5	107	43,2	4622	50,8	5436	57,2	6115	63,5	6795	86,3
G40-305	40	20	305	8,4x7,5	87,8	51,9	4557	61,0	5356	68,6	6025	76,3	6699	104
G50-064	50	25	64	11,5x9,0	709	10,9	7728	12,8	9075	14,4	10210	16,0	11344	19,3
G50-076	50	25	76	11,5x9,0	572	12,9	7379	15,2	8694	17,1	9781	19,0	10868	24,2
G50-089	50	25	89	11,5x9,0	475	15,1	7173	17,8	8455	20,0	9512	22,3	10593	28,0
G50-102	50	25	102	11,5x9,0	405	17,3	7007	20,4	8262	23,0	9295	25,5	10328	33,5
G50-115	50	25	115	11,5x9,0	352	19,6	6899	23,0	8096	25,9	9108	28,8	10138	38,6
G50-127	50	25	127	11,5x9,0	316	21,6	6826	25,4	8026	28,6	9030	31,8	10049	41,4
G50-139	50	25	139	11,5x9,0	289	23,8	6878	28,0	8092	31,3	9046	35,0	10115	47,3
G50-152	50	25	152	11,5x9,0	239	25,8	6166	30,4	7266	34,2	8174	38,0	9082	50,2
G50-178	50	25	178	11,5x9,0	215	30,3	6515	35,6	7654	40,1	8611	44,5	9568	61,1
G50-203	50	25	203	11,5x9,0	187	34,5	6452	40,6	7592	45,7	8541	50,8	9500	67,7
G50-254	50	25	254	11,5x9,0	153	43,2	6610	50,8	7772	57,2	8744	63,5	9716	87,0
G50-305	50	25	305	11,5x9,0	127	51,9	6591	61,0	7747	68,6	8715	76,3	9690	104
G63-076	63	38	76	11,6x14,9	952	12,9	12280	15,2	14470	-	-	-	-	15,5
G63-089	63	38	89	11,6x14,9	819	15,1	12360	17,8	14580	-	-	-	-	20,0
G63-102	63	38	102	11,6x14,9	700	17,3	12110	20,4	14280	23,0	16065	25,5	17850	30,7
G63-115	63	38	115	11,6x14,9	620	19,6	12152	23,0	14260	25,9	16043	28,8	17860	34,9
G63-127	63	38	127	11,6x14,9	565	21,6	12204	25,4	14351	28,6	16145	31,8	17967	38,0
G63-152	63	38	152	11,6x14,9	458	25,8	11816	30,4	13923	34,2	15664	38,0	17404	47,2
G63-178	63	38	178	11,6x14,9	384	30,3	11635	35,6	13670	40,1	15379	44,5	17088	55,8
G63-203	63	38	203	11,6x14,9	337	34,5	11627	40,6	13682	45,7	15392	50,8	17120	64,8
G63-254	63	38	254	11,6x14,9	263	43,2	11362	50,8	13360	57,2	15030	63,5	16701	86,7
G63-305	63	38	305	11,6x14,9	218	51,9	11314	61,0	13298	68,6	14960	76,3	16633	106

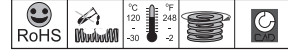
Estimated life 100.000 cycles



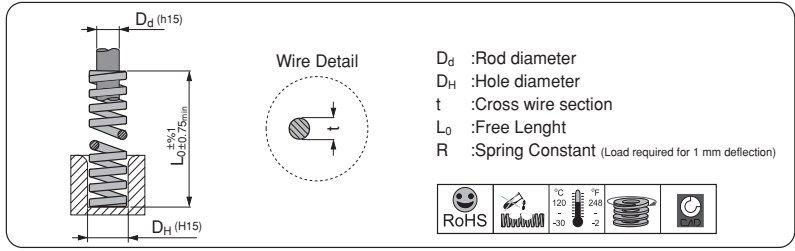
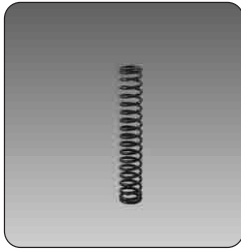
Wire Detail



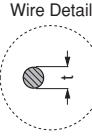
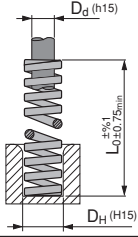
D_d :Rod diameter
 D_H :Hole diameter
 $b \times h$:Cross wire section
 L_0 :Free Lenght
 R :Spring Constant (Load required for 1 mm deflection)



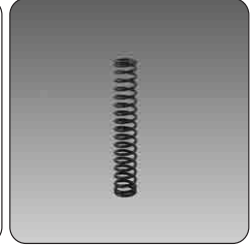
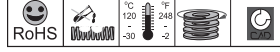
Special Springs Code	D_H	D_d	L_0	$b \times h$ mm	R \pm %10 Spring Constant N/mm	%30 L_0		%40 L_0		%45 L_0		%50 L_0		Closed Don't use! mm
						mm	N	mm	N	mm	N	mm	N	
A25-064	25	12,5	64	5,6x7,5	644	6,4	4122	7,7	4959	8,6	5564	9,6	6182	13
A25-076	25	12,5	76	5,6x7,5	556	7,6	4226	9,1	5060	10,3	5705	11,4	6338	16
A25-089	25	12,5	89	5,6x7,5	462	8,9	4112	10,7	4943	12,0	5551	13,4	6168	20
A25-102	25	12,5	102	5,6x7,5	390	10,2	3978	12,2	4758	13,8	5370	15,3	5967	23
A25-115	25	12,5	115	5,6x7,5	360	11,5	4140	13,8	4968	15,5	5589	17,3	6210	26
A25-127	25	12,5	127	5,6x7,5	326	12,7	4140	15,2	4955	17,1	5589	19,1	6210	28
A25-152	25	12,5	152	5,6x7,5	255	15,2	3876	18,2	4641	20,5	5233	22,8	5814	34
A25-178	25	12,5	178	5,6x7,5	230	17,8	4094	21,4	4922	24,0	5527	26,7	6141	39
A25-203	25	12,5	203	5,6x7,5	202	20,3	4101	24,4	4929	27,4	5536	30,5	6151	45
A25-305	25	12,5	305	5,6x7,5	136	30,5	4148	36,6	4978	41,2	5600	45,8	6222	63
A32-064	32	16	64	7,5x9,2	1077	6,4	6892	7,7	8270	8,6	9305	9,6	10337	13
A32-076	32	16	76	7,5x9,2	874	7,6	6642	9,1	7971	10,3	8967	11,4	9964	16
A32-089	32	16	89	7,5x9,2	721	8,9	6419	11	7702	12,0	8663	13,3	9628	20
A32-102	32	16	102	7,5x9,2	620	10	6324	12	7589	13,8	8537	15,3	9486	23
A32-115	32	16	115	7,5x9,2	560	12	6440	14	7728	15,5	8694	17,2	9660	26
A32-127	32	16	127	7,5x9,2	496	13	6299	15	7559	17,1	8504	19,0	9449	28
A32-152	32	16	152	7,5x9,2	408	15	6202	18	7442	20,5	8372	22,8	9302	34
A32-178	32	16	178	7,5x9,2	353	18	6280	21	7536	24,0	8483	26,7	9420	39
A32-203	32	16	203	7,5x9,2	304	20	6171	24	7405	27,4	8331	30,4	9257	45
A32-254	32	16	254	7,5x9,2	243	25	6177	30	7413	34,3	8332	38,1	9266	62
A32-305	32	16	305	7,5x9,2	196	31	5978	37	7174	41,2	8070	45,7	8967	75
A40-089	40	20	89	8,5x11,0	880	8,9	7832	10,7	9416	12,0	10573	13,4	11748	20
A40-102	40	20	102	8,5x11,0	762	10,2	7772	12,2	9296	13,8	10493	15,3	11659	23
A40-115	40	20	115	8,5x11,0	679	11,5	7809	13,8	9370	15,5	10541	17,3	11713	26
A40-127	40	20	127	8,5x11,0	622	12,7	7899	15,2	9454	17,1	10664	19,1	11849	28
A40-152	40	20	152	8,5x11,0	509	22,8	7737	18,2	9264	20,5	10445	22,8	11605	36
A40-178	40	20	178	8,5x11,0	429	17,8	7636	21,4	9181	24,0	10309	26,7	11454	43
A40-203	40	20	203	8,5x11,0	374	20,3	7592	24,4	9126	27,4	10249	30,5	11388	49
A40-254	40	20	254	8,5x11,0	296	25,4	7518	30,5	9028	34,3	10150	38,1	11278	62
A40-305	40	20	305	8,5x11,0	246	30,5	7530	36,6	9004	41,2	10129	45,8	11255	75
A50-089	50	25	89	11,8x13,5	1410	8,9	12549	10,7	15087	12,0	16941	13,4	18824	19
A50-102	50	25	102	11,8x13,5	1215	10,2	12393	12,2	14823	13,8	16731	15,3	18590	22
A50-115	50	25	115	11,8x13,5	1076	11,5	12374	13,8	14849	15,5	16705	17,3	18561	25
A50-127	50	25	127	11,8x13,5	968	12,7	12294	15,2	14714	17,1	16596	19,1	18440	28
A50-152	50	25	152	11,8x13,5	806	15,2	12251	18,2	14669	20,5	16539	22,8	18377	34
A50-178	50	25	178	11,8x13,5	698	17,8	12424	21,4	14937	24,0	16773	26,7	18637	40
A50-203	50	25	203	11,8x13,5	612	20,3	12424	24,4	14933	27,4	16772	30,5	18635	45
A50-254	50	25	254	11,8x13,5	472	25,4	11989	30,5	14396	34,3	16185	38,1	17983	58
A50-305	50	25	305	11,8x13,5	388	30,5	11834	36,6	14201	41,2	15976	45,8	17751	70



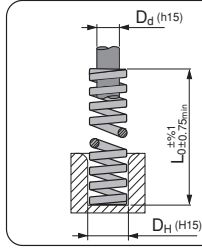
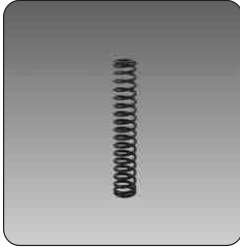
Special Springs Code	D_H	D_d	L_0	t mm	$R \pm \%10$ Spring Constant N/mm	%25 L_0		%30 L_0		%35 L_0		%40 L_0		Closed Don't use! mm
						mm	N	mm	N	mm	N	mm	N	
TV10-025	10	5	25	1,1	4,4	6,3	28	7,5	33	8,8	39	10,0	44	13,2
TV10-032	10	5	32	1,1	3,4	8,0	27	9,6	33	11,2	38	12,8	44	16,5
TV10-038	10	5	38	1,1	2,8	9,5	26	11,4	32	13,3	37	15,2	42	19,8
TV10-044	10	5	44	1,1	2,4	11,0	26	13,2	31	15,4	37	17,6	42	23,1
TV10-051	10	5	51	1,1	2,1	12,8	27	15,3	32	17,9	37	20,4	43	26,9
TV10-064	10	5	64	1,1	1,6	16,0	26	19,2	31	22,4	36	25,6	42	33,3
TV10-076	10	5	76	1,1	1,3	19,0	25	22,8	30	26,6	35	30,4	40	39,6
TV10-305	10	5	305	1,1	0,3	76,3	24	91,5	29	107	32	122,0	38	157,2
TV13-025	12,5	6,3	25	1,5	8,5	6,3	53	7,5	64	8,8	74	10,0	85	13,5
TV13-032	12,5	6,3	32	1,5	6,5	8,0	52	9,6	62	11,2	73	12,8	83	16,8
TV13-038	12,5	6,3	38	1,5	5,3	9,5	51	11,4	61	13,3	70	15,2	81	20,3
TV13-044	12,5	6,3	44	1,5	4,4	11,0	49	13,2	59	15,4	68	17,6	78	23,9
TV13-051	12,5	6,3	51	1,5	3,8	12,8	48	15,3	58	17,9	68	20,4	78	26,9
TV13-064	12,5	6,3	64	1,5	2,9	16,0	47	19,2	56	22,4	65	25,6	75	33,3
TV13-076	12,5	6,3	76	1,5	2,5	19,0	48	22,8	57	26,6	67	30,4	76	41,1
TV13-089	12,5	6,3	89	1,5	2,1	22,3	48	26,7	57	31,2	65	35,6	76	48,3
TV13-305	12,5	6,3	305	1,5	0,6	76,3	45	91,5	54	107	64	122,0	73	162,8
TV16-025	16	8	25	2	17,9	6,3	112	7,5	134	8,8	157	10,0	179	14,7
TV16-032	16	8	32	2	13,5	8,0	108	9,6	129	11,2	151	12,8	173	18,5
TV16-038	16	8	38	2	10,5	9,5	100	11,4	120	13,3	140	15,2	160	22,4
TV16-044	16	8	44	2	8,8	11,0	96	13,2	116	15,4	136	17,6	154	25,9
TV16-051	16	8	51	2	7,6	12,8	97	15,3	116	17,9	136	20,4	155	30,0
TV16-064	16	8	64	2	5,9	16,0	95	19,2	114	22,4	132	25,6	152	37,8
TV16-076	16	8	76	2	4,8	19,0	91	22,8	109	26,6	128	30,4	145	45,2
TV16-089	16	8	89	2	4,0	22,3	90	26,7	108	31,2	125	35,6	144	52,8
TV16-102	16	8	102	2	3,5	25,5	90	30,6	108	35,7	125	40,8	144	60,7
TV16-305	16	8	305	2	1,1	76,3	85	91,5	103	107	117	122,0	137	184



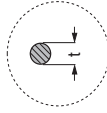
D_d :Rod diameter
D_H :Hole diameter
t :Cross wire section
L₀ :Free Length
R :Spring Constant (Load required for 1 mm deflection)



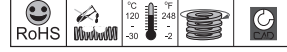
Special Springs Code	D _H	D _d	L ₀	t mm	R ± %10 Spring Constant N/mm	%25 L ₀		%30 L ₀		%35 L ₀		%40 L ₀		Closed Don't use! mm
						mm	N	mm	N	mm	N	mm	N	
TB10-025	10	5	25	1,5	12,3	6,3	77	7,5	92	8,4	104	9,4	115	10,4
TB10-032	10	5	32	1,5	9,5	8,0	76	9,6	91	10,8	103	12,0	113	13,2
TB10-038	10	5	38	1,5	7,8	9,5	74	11,4	88	12,8	100	14,3	111	16,0
TB10-044	10	5	44	1,5	6,5	11,0	72	13,2	86	14,9	97	16,5	108	18,5
TB10-051	10	5	51	1,5	5,6	12,8	72	15,3	86	17,2	96	19,1	108	21,1
TB10-064	10	5	64	1,5	4,5	16,0	71	19,2	86	21,6	97	24,0	107	26,4
TB10-076	10	5	76	1,5	3,7	19,0	70	22,8	84	25,7	95	28,5	105	31,8
TB10-305	10	5	305	1,5	0,9	76,3	68	91,5	82	103	93	114	102	129
TB13-025	12,5	6,3	25	1,8	21,7	6,3	136	7,5	163	8,4	183	9,4	204	11,2
TB13-032	12,5	6,3	32	1,8	16,8	8,0	134	9,6	161	10,8	181	12,0	202	14,0
TB13-038	12,5	6,3	38	1,8	13,8	9,5	131	11,4	158	12,8	177	14,3	197	17,3
TB13-044	12,5	6,3	44	1,8	11,6	11,0	127	13,2	153	14,9	172	16,5	191	19,8
TB13-051	12,5	6,3	51	1,8	10,0	12,8	127	15,3	153	17,2	172	19,1	191	22,9
TB13-064	12,5	6,3	64	1,8	7,8	16,0	125	19,2	150	21,6	168	24,0	187	28,4
TB13-076	12,5	6,3	76	1,8	6,4	19,0	122	22,8	146	25,7	164	28,5	183	34,3
TB13-089	12,5	6,3	89	1,8	5,6	22,3	125	26,7	150	30,0	168	33,4	188	41,4
TB13-305	12,5	6,3	305	1,8	1,5	76,3	118	91,5	141	103	154	114	176	139
TB16-025	16	8	25	2,2	31,9	6,3	199	7,5	239	8,4	269	9,4	299	10,9
TB16-032	16	8	32	2,2	24,0	8,0	192	9,6	230	10,8	259	12,0	288	13,7
TB16-038	16	8	38	2,2	19,4	9,5	185	11,4	222	12,8	249	14,3	277	16,5
TB16-044	16	8	44	2,2	16,1	11,0	177	13,2	213	14,9	239	16,5	266	19,3
TB16-051	16	8	51	2,2	13,8	12,8	176	15,3	212	17,2	238	19,1	265	22,1
TB16-064	16	8	64	2,2	10,7	16,0	171	19,2	205	21,6	231	24,0	256	27,4
TB16-076	16	8	76	2,2	8,8	19,0	166	22,8	200	25,7	226	28,5	250	33,0
TB16-089	16	8	89	2,2	7,5	22,3	167	26,7	200	30,0	225	33,4	250	38,6
TB16-102	16	8	102	2,2	6,5	25,5	167	30,6	200	34,4	224	38,3	250	44,5
TB16-305	16	8	305	2,2	2,1	76,3	159	91,5	191	103	216	114	238	134



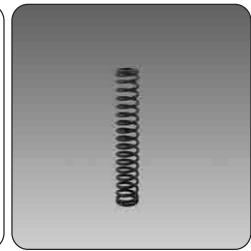
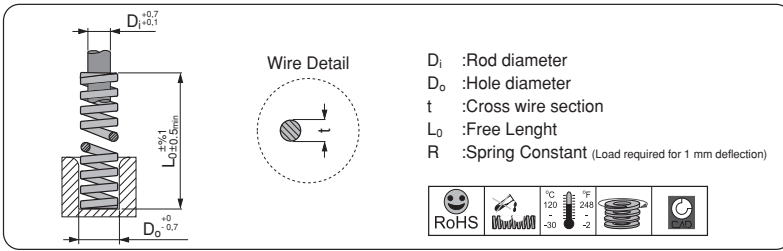
Wire Detail



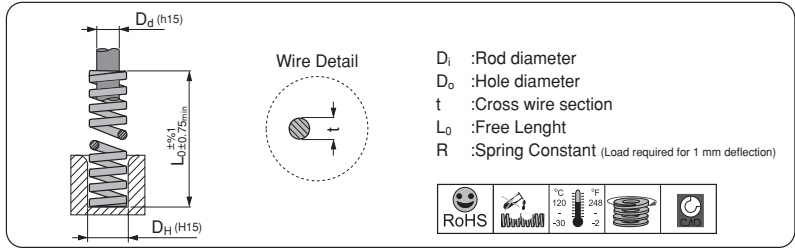
- D_d :Rod diameter
- D_H :Hole diameter
- t :Cross wire section
- L₀ :Free Length
- R :Spring Constant (Load required for 1 mm deflection)



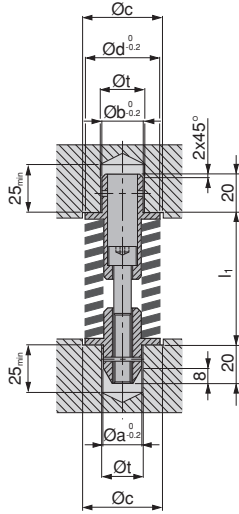
Special Springs Code	D _H	D _d	L ₀	t mm	R ± %10 Spring Constant N/mm	%25 L ₀		%30 L ₀		%35 L ₀		%40 L ₀		Closed Don't use! mm
						3,000,000 mm N	1,500,000 mm N	300-500,000 mm N	100-200,000 mm N					
TR10-025	10	5	25	1,6	20,7	5,0	103	6,3	129	6,9	142	7,5	155	8,6
TR10-032	10	5	32	1,6	13,0	7,6	98	9,5	123	10,5	136	11,4	148	13,2
TR10-044	10	5	44	1,6	10,9	8,8	96	11,0	119	12,1	132	13,2	143	14,7
TR10-051	10	5	51	1,6	9,6	10,2	98	12,8	123	14,0	135	15,3	147	17,8
TR10-064	10	5	64	1,6	7,7	12,8	98	16,0	123	17,6	136	19,2	147	22,9
TR10-076	10	5	76	1,6	6,3	15,2	96	19,0	119	20,9	132	22,8	143	26,9
TR10-305	10	5	305	1,6	1,5	61,0	93	76,3	116	83,9	126	91,5	139	110
TR13-025	12,5	6,3	25	2,2	37,5	5,0	187	6,3	234	6,9	258	7,5	281	8,9
TR13-032	12,5	6,3	32	2,2	28,9	6,4	185	8,0	231	8,8	254	9,6	277	11,2
TR13-038	12,5	6,3	38	2,2	23,5	7,6	178	9,5	223	10,5	246	11,4	268	13,7
TR13-044	12,5	6,3	44	2,2	19,6	8,8	173	11,0	216	12,1	237	13,2	259	15,7
TR13-051	12,5	6,3	51	2,2	17,3	10,2	177	12,8	221	14,0	243	15,3	265	18,8
TR13-064	12,5	6,3	64	2,2	13,5	12,8	173	16,0	216	17,6	238	19,2	259	23,6
TR13-076	12,5	6,3	76	2,2	11,2	15,2	170	19,0	213	20,9	234	22,8	256	28,4
TR13-089	12,5	6,3	89	2,2	9,5	17,8	168	22,3	210	24,5	233	26,7	252	33,0
TR13-305	12,5	6,3	305	2,2	2,7	61,0	162	76,3	203	83,9	226	91,5	244	114,0
TR16-025	16	8	25	2,8	81,6	5,0	408	6,3	510	6,9	561	7,5	612	9,1
TR16-032	16	8	32	2,8	61,3	6,4	392	8,0	490	8,8	539	9,6	588	11,4
TR16-038	16	8	38	2,8	49,9	7,6	379	9,5	474	10,5	521	11,4	569	14,2
TR16-044	16	8	44	2,8	40,8	8,8	359	11,0	449	12,1	494	13,2	539	16,3
TR16-051	16	8	51	2,8	35,6	10,2	363	12,8	453	14,0	499	15,3	544	18,8
TR16-064	16	8	64	2,8	27,8	12,8	356	16,0	446	17,6	489	19,2	535	23,9
TR16-076	16	8	76	2,8	22,8	15,2	346	19,0	433	20,9	477	22,8	519	29,0
TR16-089	16	8	89	2,8	19,6	17,8	349	22,3	436	24,5	480	26,7	524	34,3
TR16-102	16	8	102	2,8	17,0	20,4	347	25,5	433	28,1	477	30,6	520	39,4
TR16-305	16	8	305	2,8	5,4	61,0	330	76,3	413	83,9	453	91,5	495	119



Special Springs Code	Do	Di	L ₀	t	R ± %10 Spring Constant N/mm	%16 L ₀		%24 L ₀		%28 L ₀		%32 L ₀	
						3.000.000 mm N	4.4	1.500.000 mm N	6.62	300-500.000 mm N	6.9	100-200.000 mm N	8.8
L03-010	3	2	10	0,4	2,94	1,6	4,4	2,4	6,62	2,8	6,9	3,2	8,8
L03-015	3	2	15	0,4	1,96	2,4	4,4	3,6	6,62	4,2	6,9	4,8	8,8
L03-020	3	2	20	0,4	0,98	3,2	4,4	4,8	6,62	5,6	6,9	6,4	8,8
L03-025	3	2	25	0,4	0,98	4,0	4,4	6,0	6,62	7,0	6,9	8,0	8,8
L04-010	4	2,6	10	0,6	4,9	1,6	7,8	2,4	11,6	2,8	14,5	3,2	15,7
L04-015	4	2,6	15	0,6	2,94	2,4	7,8	3,6	11,6	4,2	14,5	4,8	15,7
L04-020	4	2,6	20	0,6	2,94	3,2	7,8	4,8	11,6	5,6	14,5	6,4	15,7
L04-025	4	2,6	25	0,6	1,96	4,0	7,8	6,0	11,6	7,0	14,5	8,0	15,7
L04-030	4	2,6	30	0,6	1,96	4,8	7,8	7,2	11,6	8,4	14,5	9,6	15,7
L06-015	6	4	15	0,9	7,85	2,4	17,7	3,6	26,5	4,2	32,4	4,8	35,5
L06-020	6	4	20	0,9	5,88	3,2	17,7	4,8	26,5	5,6	32,4	6,4	35,5
L06-025	6	4	25	0,9	4,90	4,0	17,7	6,0	26,5	7,0	32,4	8,0	35,5
L06-030	6	4	30	0,9	3,92	4,8	17,7	7,2	26,5	8,4	32,4	9,6	35,5
L06-035	6	4	35	0,9	2,94	5,6	17,7	8,4	26,5	9,8	32,4	11,2	35,5
L08-015	8	5,4	15	1,2	12,75	2,4	31,4	3,6	47,1	4,2	55,6	4,8	62,8
L08-020	8	5,4	20	1,2	9,81	3,2	31,4	4,8	47,1	5,6	55,6	6,4	62,8
L08-025	8	5,4	25	1,2	7,85	4,0	31,4	6,0	47,1	7,0	55,6	8,0	62,8
L08-030	8	5,4	30	1,2	6,86	4,8	31,4	7,2	47,1	8,4	55,6	9,6	62,8
L08-035	8	5,4	35	1,2	5,88	5,6	31,4	8,4	47,1	9,8	55,6	11,2	62,8
L08-040	8	5,4	40	1,2	4,90	6,4	31,4	9,6	47,1	11,2	55,6	12,8	62,8
L10-025	10	6,5	25	1,5	12,75	4,0	49,0	6,0	73,6	7,0	85,8	8,0	98
L10-030	10	6,5	30	1,5	9,81	4,8	49,0	7,2	73,6	8,4	85,8	9,6	98
L10-035	10	6,5	35	1,5	8,83	5,6	49,0	8,4	73,6	9,8	85,8	11,2	98
L10-040	10	6,5	40	1,5	7,85	6,4	49,0	9,6	73,6	11,2	85,8	12,8	98
L10-045	10	6,5	45	1,5	6,86	7,2	49,0	10,8	73,6	12,6	85,8	14,4	98
L10-050	10	6,5	50	1,5	5,88	8,0	49,0	12,0	73,6	14,0	85,8	16,0	98
L12-025	12	8	25	1,8	17,65	4,0	70,6	6,0	106,9	7,0	124,1	8,0	141,2
L12-030	12	8	30	1,8	14,71	4,8	70,6	7,2	106,9	8,4	124,1	9,6	141,2
L12-035	12	8	35	1,8	12,75	5,6	70,6	8,4	106,9	9,8	124,1	11,2	141,2
L12-040	12	8	40	1,8	10,79	6,4	70,6	9,6	106,9	11,2	124,1	12,8	141,2
L12-045	12	8	45	1,8	9,81	7,2	70,6	10,8	106,9	12,6	124,1	14,4	141,2
L12-050	12	8	50	1,8	8,83	8,0	70,6	12,0	106,9	14,0	124,1	16,0	141,2
L12-055	12	8	55	1,8	7,85	8,8	70,6	13,2	106,9	15,4	124,1	17,6	141,2
L12-060	12	8	60	1,8	7,85	9,6	70,6	14,4	106,9	16,8	124,1	19,2	141,2
L14-025	14	9,3	25	2,2	24,52	4,0	96,1	6,0	144,2	7,0	167,7	8,0	192,2
L14-030	14	9,3	30	2,2	19,61	4,8	96,1	7,2	144,2	8,4	167,7	9,4	192,2
L14-035	14	9,3	35	2,2	17,65	5,6	96,1	8,4	144,2	9,8	167,7	11,2	192,2
L14-040	14	9,3	40	2,2	14,71	6,4	96,1	9,6	144,2	11,2	167,7	12,8	192,2
L14-045	14	9,3	45	2,2	13,73	7,2	96,1	10,8	144,2	12,6	167,7	14,4	192,2
L14-050	14	9,3	50	2,2	11,77	8,0	96,1	12,0	144,2	14,0	167,7	16,0	192,2
L14-055	14	9,3	55	2,2	10,79	8,8	96,1	13,2	144,2	15,4	167,7	17,6	192,2
L14-060	14	9,3	60	2,2	9,81	9,6	96,1	14,4	144,2	16,8	167,7	19,2	192,2
L14-065	14	9,3	65	2,2	8,83	10,4	96,1	15,6	144,2	18,2	167,7	20,8	192,2
L14-070	14	9,3	70	2,2	8,83	11,2	96,1	16,8	144,2	19,6	167,7	22,4	192,2



Special Springs Code	D ₀	D _i	L ₀	t	R ± %10 Spring Constant N/mm	%16 L ₀		%24 L ₀		%28 L ₀		%32 L ₀	
						3.000.000 mm N	1.500.000 mm N	300-500.000 mm N	100-200.000 mm N				
L16-025	16	10,7	25	2,4	31,38	4,0	125,5	6,0	188,3	7,0	219,8	8,0	251,1
L16-030	16	10,7	30	2,4	26,48	4,8	125,5	7,2	188,3	8,4	219,8	9,6	251,1
L16-035	16	10,7	35	2,4	22,56	5,6	125,5	8,4	188,3	9,8	219,8	11,2	251,1
L16-040	16	10,7	40	2,4	19,61	6,4	125,5	9,6	188,3	11,2	219,8	12,8	251,1
L16-045	16	10,7	45	2,4	17,65	7,2	125,5	10,8	188,3	12,6	219,8	14,4	251,1
L16-050	16	10,7	50	2,4	15,69	8,0	125,5	12,0	188,3	14,0	219,8	16,0	251,1
L16-055	16	10,7	55	2,4	14,71	8,8	125,5	13,2	188,3	15,4	219,8	17,6	251,1
L16-060	16	10,7	60	2,4	12,75	9,6	125,5	14,4	188,3	16,8	219,8	19,2	251,1
L16-065	16	10,7	65	2,4	11,77	10,4	125,5	15,6	188,3	18,2	219,8	20,8	251,1
L16-070	16	10,7	70	2,4	10,79	11,2	125,5	16,8	188,3	19,6	219,8	22,4	251,1
L16-075	16	10,7	75	2,4	10,79	12,0	125,5	18,0	188,3	21,0	219,8	24,0	251,1
L16-080	16	10,7	80	2,4	9,81	12,8	125,5	19,2	188,3	22,4	219,8	25,6	251,1
L18-025	18	12	25	2,8	40,21	4,0	158,9	6,0	238,3	7,0	280,4	8,0	317,7
L18-030	18	12	30	2,8	33,34	4,8	158,9	7,2	238,3	8,4	280,4	9,6	317,7
L18-035	18	12	35	2,8	28,44	5,6	158,9	8,4	238,3	9,8	280,4	11,2	317,7
L18-040	18	12	40	2,8	24,52	6,4	158,9	9,6	238,3	11,2	280,4	12,8	317,7
L18-045	18	12	45	2,8	22,56	7,2	158,9	10,8	238,3	12,6	280,4	14,4	317,7
L18-050	18	12	50	2,8	19,61	8,0	158,9	12,0	238,3	14,0	280,4	16,0	317,7
L18-055	18	12	55	2,8	17,65	8,8	158,9	13,2	238,3	15,4	280,4	17,6	317,7
L18-060	18	12	60	2,8	16,67	9,6	158,9	14,4	238,3	16,8	280,4	19,2	317,7
L18-065	18	12	65	2,8	15,69	10,4	158,9	15,6	238,3	18,2	280,4	20,8	317,7
L18-070	18	12	70	2,8	14,71	11,2	158,9	16,8	238,3	19,6	280,4	22,4	317,7
L18-075	18	12	75	2,8	13,73	12,0	158,9	18,0	238,3	21,0	280,4	24,0	317,7
L18-080	18	12	80	2,8	12,75	12,8	158,9	19,2	238,3	22,4	280,4	25,6	317,7
L18-090	18	12	90	2,8	10,79	14,4	158,9	21,6	238,3	25,2	280,4	28,8	317,7
L20-025	20	13,5	25	3	49,03	4,0	196,1	6,0	294,2	7,0	346,3	8,0	392,3
L20-030	20	13,5	30	3	41,19	4,8	196,1	7,2	294,2	8,4	346,3	9,6	392,3
L20-035	20	13,5	35	3	35,30	5,6	196,1	8,4	294,2	9,8	346,3	11,2	392,3
L20-040	20	13,5	40	3	30,40	6,4	196,1	9,6	294,2	11,2	346,3	12,8	392,3
L20-045	20	13,5	45	3	27,46	7,2	196,1	10,8	294,2	12,6	346,3	14,4	392,3
L20-050	20	13,5	50	3	24,52	8,0	196,1	12,0	294,2	14,0	346,3	16,0	392,3
L20-055	20	13,5	55	3	22,56	8,8	196,1	13,2	294,2	15,4	346,3	17,6	392,3
L20-060	20	13,5	60	3	20,59	9,6	196,1	14,4	294,2	16,8	346,3	19,2	392,3
L20-065	20	13,5	65	3	18,63	10,4	196,1	15,6	294,2	18,2	346,3	20,8	392,3
L20-070	20	13,5	70	3	17,65	11,2	196,1	16,8	294,2	19,6	346,3	22,4	392,3
L20-075	20	13,5	75	3	16,67	12,0	196,1	18,0	294,2	21,0	346,3	24,0	392,3
L20-080	20	13,5	80	3	15,69	12,8	196,1	19,2	294,2	22,4	346,3	25,6	392,3
L20-090	20	13,5	90	3	13,73	14,4	196,1	21,6	294,2	25,2	346,3	28,8	392,3
L20-100	20	13,5	100	3	12,75	16,0	196,1	24,0	294,2	28,0	346,3	32,0	392,3
L22-025	22	14,7	25	3,4	59,82	4,0	237,3	6,0	356	7,0	415,9	8,0	474,6
L22-030	22	14,7	30	3,4	49,03	4,8	237,3	7,2	356	8,4	415,9	9,6	474,6
L22-035	22	14,7	35	3,4	42,17	5,6	237,3	8,4	356	9,8	415,9	11,2	474,6
L22-040	22	14,7	40	3,4	37,27	6,4	237,3	9,6	356	11,2	415,9	12,8	474,6
L22-045	22	14,7	45	3,4	33,34	7,2	237,3	10,8	356	12,6	415,9	14,4	474,6
L22-050	22	14,7	50	3,4	29,42	8,0	237,3	12,0	356	14,0	415,9	16,0	474,6



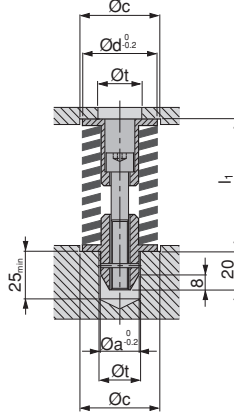
Material :
Steel

GSB CODE: 15 02 B

Special Springs Code	l_1	a	b	d	Initial Load		% 25 l_0		% 32 l_0		Spring data				
					mm	N	mm	N	mm	N	c	t	d_h	l_0	R
15 02 B40069	69	20,5	22	40	17	1836	3	2160	8	2700	42	22,5	40	76	108
15 02 B40076	76	20,5	22	40	10	1080	10	2160	15	2700	42	22,5	40	76	108
15 02 B40100	100	20,5	22	40	12	972	13	2025	20	2592	42	22,5	40	102	81
15 02 B40122	122	20,5	22	40	15	941	17	2006	25	2508	42	22,5	40	127	62,7
15 02 B40143	143	20,5	22	40	19	981	19	1961	30	2528	42	22,5	40	152	51,6
15 02 B40188	188	20,5	22	40	25	918	25	1835	40	2373	42	22,5	40	203	36,7
15 02 B50088	88	25,5	27	50	24	2856	-	-	8	3808	52	27,5	50	102	119
15 02 B50100	100	25,5	27	50	12	1428	13	2975	20	3808	52	27,5	50	102	119
15 02 B50122	122	25,5	27	50	15	1455	17	3104	25	3880	52	27,5	50	127	97
15 02 B50143	143	25,5	27	50	19	1520	19	3040	30	3920	52	27,5	50	152	80
15 02 B50188	188	25,5	27	50	25	1495	25	2990	40	3887	52	27,5	50	203	59,8
15 02 B50232	232	25,5	27	50	32	1405	31	2766	50	3600	52	27,5	50	254	43,9
15 02 B63105	105	36,5	38	63	32	5376	-	-	8	6720	65	38,5	63	127	168
15 02 B63122	122	36,5	38	63	15	2520	17	5376	25	6720	65	38,5	63	127	168
15 02 B63143	143	36,5	38	63	19	2584	19	5168	30	6664	65	38,5	63	152	136
15 02 B63188	188	36,5	38	63	25	2500	25	5000	40	6500	65	38,5	63	203	100
15 02 B63232	232	36,5	38	63	32	2509	31	4939	50	6429	65	38,5	63	254	78,4
15 02 B63277	277	36,5	38	63	38	2459	38	4917	60	6341	65	38,5	63	305	64,7

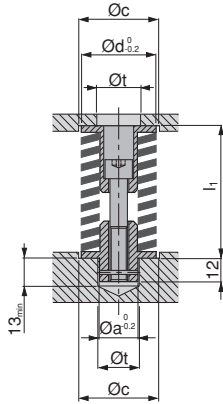


Material :
Steel



GSB CODE:15 01 B

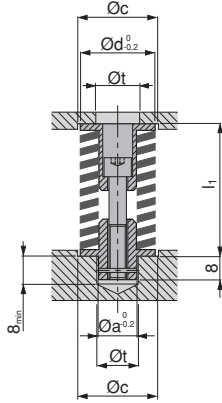
Special Springs Code	l_1	a	d	Initial Load		% 25 l_0		% 32 l_0		Spring data				
				mm	N	mm	N	mm	N	c	t	d_h	l_0	R
15 01 B40069	69	20,5	40	17	1836	3	2160	8	2700	42	22,5	40	76	108
15 01 B40076	76	20,5	40	10	1080	10	2160	15	2700	42	22,5	40	76	108
15 01 B40100	100	20,5	40	12	972	13	2025	20	2592	42	22,5	40	102	81
15 01 B40143	143	20,5	40	19	980	19	1961	30	2528	42	22,5	40	152	51,6
15 01 B40188	188	20,5	40	25	918	25	1835	40	2386	42	22,5	40	203	36,7
15 01 B50088	88	25,5	50	24	2856	-	-	8	3808	52	27,5	50	102	119
15 01 B50100	100	25,5	50	12	1428	13	2975	20	3808	52	27,5	50	102	119
15 01 B50143	143	25,5	50	19	1520	19	3040	30	3920	52	27,5	50	152	80
15 01 B50188	188	25,5	50	25	1495	25	2990	40	3887	52	27,5	50	203	59,8
15 01 B50232	232	25,5	50	32	1405	31	2766	50	3600	52	27,5	50	254	43,9
15 01 B63105	105	36,5	63	32	5376	-	-	8	6720	65	38,5	63	127	168
15 01 B63143	143	36,5	63	19	2584	19	5168	30	6664	65	38,5	63	152	136
15 01 B63188	188	36,5	63	25	2500	25	5000	40	6500	65	38,5	63	203	100
15 01 B63232	232	36,5	63	32	2509	31	4939	50	6429	65	38,5	63	254	78,4
15 01 B63277	277	36,5	63	38	2459	38	4917	60	6341	65	38,5	63	305	64,7



Material :
Steel

GSB CODE: 15 01 B

Special Springs Code	l_1	a	d	Initial Load		% 25 l_0		% 32 l_0		c	t	Spring data		
				mm	N	mm	N	mm	N			d_h	l_0	R
15 01 B40122	122	20,5	40	15	940	17	2006	25	2508	42	22,5	40	127	62,7
15 01 B50122	122	20,5	50	15	1455	17	3104	25	3880	52	27,5	50	127	97
15 01 B63122	122	20,5	63	15	2520	17	5376	25	6720	65	38,5	63	127	168



Material :
Steel

GSB CODE: 15 00 R

Special Springs Code	l_1	a	d	Initial Load		% 20 l_0		% 28 l_0		c	t	Spring data		
				mm	N	mm	N	mm	N			d_h	l_0	R
15 00 R32088	88	13	33	21	2562	-	-	8	3528	34	14	32	102	122
15 00 R32108	108	13	33	14	1498	9	2461	18	3424	34	14	32	115	107



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 <p>BW 100 Milling Machine for Model Making Mills Rigid Foams Strafor İşleme Pah Kırma Seti Fräsmaschinen set</p>	14.6		
 <p>BW 500 Hollow Cutter Strafor İşleme Takımı Fräser</p>	14.7		
 <p>D901-01-745 Dressing Paste For Surface Control Kalıp Aıştırma Boyası Retuschierfarbe</p>	14.8		
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 <p>A103-02 (h6) Dowel Pin with Thread DIN EN ISO 8735 Çektirmeli Pimler DIN EN ISO 8735 Führungssaulen DIN EN ISO 8735</p>	14.9		
 <p>A103-03 (m6) Dowel Pin Parallel DIN EN ISO 8734 Düz Tespit Pimleri DIN EN ISO 8734 Führungssaulen DIN EN ISO 8734</p>	14.10		



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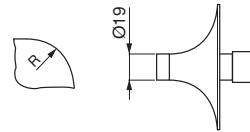
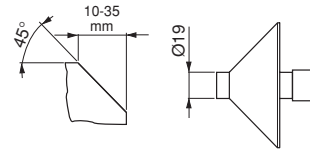
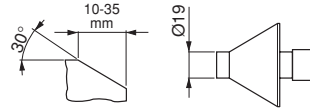
Material :
90Mn4
HRC 36 ÷ 40

Sleeve 1.7220 (34CrMo4)

Black oxide finish.

Technical Data

Order Code	BW 100-230V
Voltage	230 V
Frequency	50-60 Hz
Speed	4500 min ⁻¹
Case with insertion weight	1,4 Kg
Total weight	3,4 Kg
Dimension handbag	420x350x98 mm

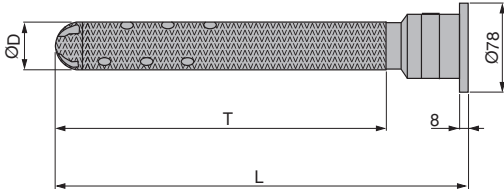


GSB CODE:BW 100

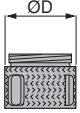
Code	Description	Weight Kg
BW 100-230V	APOLLO 2 - modelling-set, complete, 17 parts, scope see underneath 230 V, 50 Hz	4,900
	BW 500.460 - drive incl. 2 socket wrenches	1,460
	BW 500.461 - case with insertion	1,460
	BW 500.465 - chamfering cutter 45°	0,310
	BW 500.466 - chamfering cutter 30°	0,310
	BW 500.467 - rounding-off cutter R 10	0,160
	BW 500.468 - rounding-off cutter R 15	0,200
	BW 500.469 - rounding-off cutter R 20	0,230
	BW 500.470 - rounding-off cutter R 25	0,270
	BW 500.471 - depth limit H 10	0,090
	BW 500.472 - depth limit H 15	0,080
	BW 500.473 - depth limit H 20	0,070
	BW 500.474 - depth limit H 25	0,060
	BW 500.475 - depth limit H 30	0,050
	BW 500.476 - depth limit H 35	0,030
	BW 500.477 - connection piece	0,070
	BW 500.039 - suction tube (optional) Ø25 mm x 5 m	1,000

Benefits:

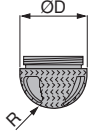
- For fine and accurate milling results
- For rapid chamfering and grinding of model edges
- Six different milling cutters are permanently available
- Compatible APOLLO 2 extension sets for bore cutting and 3D-milling are also available
- APOLLO 2 with electronic revolution control adapts optimally to all materials
- APOLLO 2-milling cutters with super-long tool life due to BW-special hardening
- Convenient tool exchange



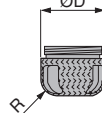
Form - W



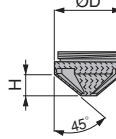
Form - X



Form - Y



Form - Z



Milling Materials
Hard, brittle, expanded plastics :
PS /XPS, PU

Semi-hard to viscous expanded
plastics:
PE, PPE / EPP, PU

and others

GSB CODE:BW 500

BW HOLLOW CUTTERS

Code	ØD	T	L
BW 500.200-__	15	120	190
BW 500.201-__	20	200	270
BW 500.207-__	20	250	320
BW 500.202-__	30	200	270
BW 500.208-__	30	250	320
BW 500.213-__	30	300	370
BW 500.218-__	30	350	420
BW 500.203-__	40	200	270
BW 500.209-__	40	250	320
BW 500.214-__	40	300	370
BW 500.221-__	40	350	420
BW 500.222-__	40	400	470
BW 500.397-__	40	450	520
BW 500.204-__	45	200	270
BW 500.210-__	45	250	320
BW 500.215-__	45	300	370
BW 500.219-__	45	350	420
BW 500.315-__	45	400	470
BW 500.384-__	45	450	520
BW 500.230-__	45	500	570
BW 500.205-__	50	200	270
BW 500.211-__	50	250	320
BW 500.216-__	50	300	370
BW 500.228-__	50	350	420
BW 500.295-__	50	400	470
BW 500.284-__	50	450	520
BW 500.280-__	50	500	570
BW 500.206-__	60	200	270
BW 500.212-__	60	250	320
BW 500.217-__	60	300	370
BW 500.220-__	60	350	420
BW 500.297-__	60	400	470
BW 500.282-__	60	450	520
BW 500.299-__	60	500	570
BW 500.276-__	60	600	670

HOLLOW CUTTER TIPS (Exchange tips)

Code	ØD
BW 500.430-15-__	15
BW 500.430-20-__	20
BW 500.430-25-__	25
BW 500.430-30-__	30
BW 500.430-40-__	40
BW 500.430-45-__	45
BW 500.430-50-__	50
BW 500.430-60-__	60

Order Example: (Hollow Cutters)

BW 500.Code-Form (R or H)

D=45, T=250 and Form=Y

Order Code: BW 500.210-YR10

Order Example: (Hollow Cutters Tips)

BW 500.430-D-Form

D=40, T=250, Form=Z, and H=25 mm

Order Code: BW 500.430-40-ZH25

Advantages :

Fast milling of patterns

Very good quality finishes

Provides high planning reliability ensuring quality products

Keep close tolerances

Continuous direct suction effectively removes chips internally through the hollow cutter by utilising a hollowshaft motor with a suction machine (suction milling)

Quickly exchangeable cutter tips

Special hardening guarantees a long service life

Dynamically balanced

Also available with integrated ISO or HSK adaptor



GSB Code	Colour	Lt.
D901-01-745	Blue	250 ml.

GSB CODE:D901-01-745

Physical and Chemical Properties

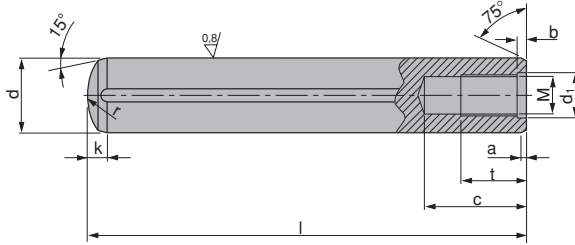
Physical State	Paste
Colour	Blue
Odour	Characteristic
Melting Point	45 °C
Flammability	> 150 °C
Explosiveness	not explosive
Density	0,85 g/ml
Solubility	In many solvents
Water Solubility (20°C)	Insoluble

Fiziksel ve Kimyasal Özellikler

Fiziksel Durum	Pasta
Renk	Mavi
Koku	Karakteristik
Erime Noktası	45 °C
Yanma Derecesi	> 150 °C
Patlayıcılık	Patlayıcı özelliği yoktur
Yoğunluk	0,85 g/ml
Çözünürlük	Bir çok çözücüde çözünür
Suda Çözünme (20°C)	Suda çözünmez

Physische und Chemische Eigenschaften

Physischer Zustand	Paste
Farbe	Blau
Geruch	Karakteristik
Schmelzpunkt	45 °C
Endzündbarkeit	> 150 °C
Brisant	Keine
Dichte	0,85 g/ml
Lösbarkeit	Mit den meisten Lösungsmittel lösbar
Wasserlöslichkeit (20°C)	Keine



Material :
16MnCr5
HRC 60 ÷ 62
Depth ≥ 0,8

GSB CODE:A103-01 & A103-02

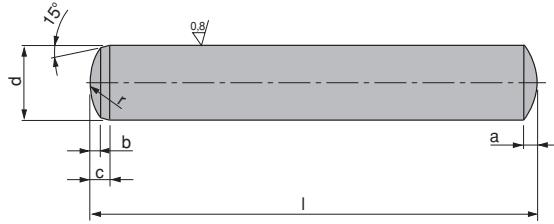
a	b	c	d	d _i	k	l												M	r	t		
0,8	1,0	10	6	4,3	1,5	20	25	30	35	40	45	50	55	60	70	80		M4	6	6		
1,0	1,2	12	8	5,3	2,0	20	25	30	35	40	45	50	55	60	70	80	90	100	120	M5	8	8
1,2	1,2	16	10	6,4	2,5	20	25	30	35	40	45	50	55	60	70	80	90	100	120	M6	10	10
1,6	1,2	20	12	6,4	3,0	20	25	30	35	40	45	50	55	60	70	80	90	100	120	M6	12	12
1,8	1,5	25	14	8,4	3,5			30	35	40	45	50	55	60	70	80	90	100	120	M8	14	14
2,0	1,5	25	16	8,4	4,0			30	35	40	45	50	55	60	70	80	90	100	120	M8	16	16
2,5	1,5	28	20	10,5	5,0			30	35	40	45	50	55	60	70	80	90	100	120	M10	20	18

Order Example:
d(dia.) for m6 tolerance;
A103-01- d - l
d=8, l=120
Order Code:A103-01-008-120

Order Example:
d(dia.) for h6 tolerance;
A103-02- d - l
d=8, l=120
Order Code:A103-02-008-120



Material :
16MnCr5
HRC 60 ÷ 62
Depth ≥ 0,8

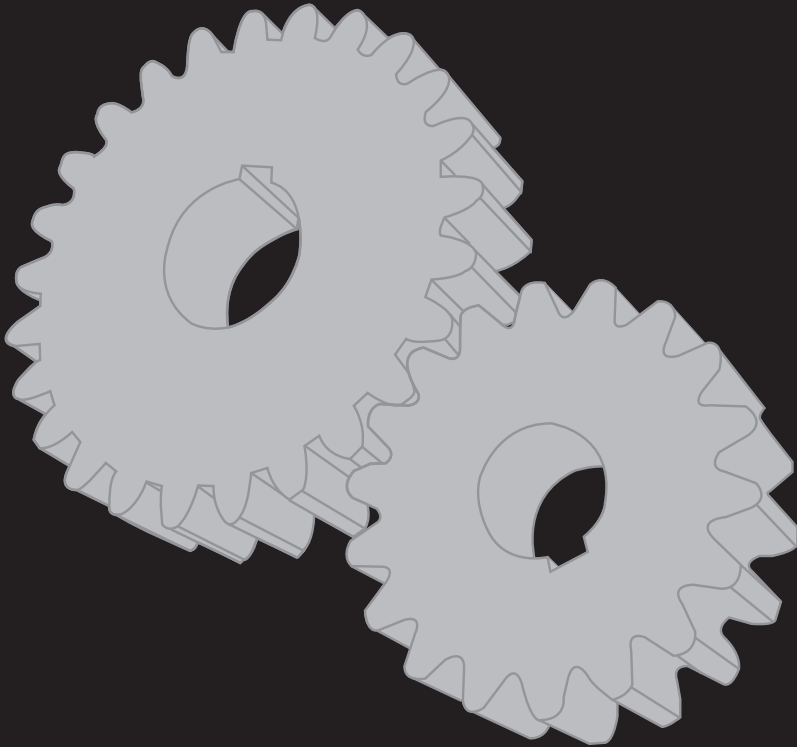


GSB CODE:A103-03 & A103-04

a	b	c	d	l													r	
0,9	0,6	1,5	6	20	25	30	35	40	45	50	55	60	70	80				6
1,2	0,8	2,0	8	20	25	30	35	40	45	50	55	60	70	80	90	100	120	8
1,5	1,0	2,5	10	20	25	30	35	40	45	50	55	60	70	80	90	100	120	10
1,8	1,3	3,0	12	20	25	30	35	40	45	50	55	60	70	80	90	100	120	12
2,0	1,3	3,5	14			30	35	40	45	50	55	60	70	80	90	100	120	14
2,5	1,7	4,0	16			30	35	40	45	50	55	60	70	80	90	100	120	16
3,0	2,0	5,0	20			30	35	40	45	50	55	60	70	80	90	100	120	20

Order Example:
d(dia.) for m6 tolerance;
A103-03- d - l
d=8, l=120
Order Code:A103-03-008-120

Order Example:
d(dia.) for h6 tolerance;
A103-04- d - l
d=8, l=120
Order Code:A103-04-008-120



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TOLERANCE AND FIT SYSTEMS

In today's global market, a product produced in a country and can be marketed in many countries through the world and number of companies that produce the same product can be more than one. From the point of users, different countries and/or companies that produce products must carry the same characteristics or specific criterias in the factory conditions. Past negative situation, such as the products differ, the economic and labor losses caused going to a worldwide standardization and creation of specific standards.

Identically products producing can not be achieved according to principal dimensions that indicated on technical drawings by using special equipment, work die, CNC controlled machines and it increases production cost. In the worldwide, an acceptable margin of error is supplied together with principal dimensions for such aims of decreasing production costs, mass churn out etc... Mainly in reference to principal dimension, its called "TOLERANCE" to the margin of error which in indicated top and lower limits. Tolerance may be known as margin of error to the manufacturer.

There are two types according to practice tolerance:

- 1- Construction Tolerance** : Based on difference of the biggest tolerance and the smallest tolerance.
- 2- Fit Tolerance** :Its made according to pin and hole system that indicated by DIN and ISO system.

There are two types according to types of writing:

- 1- Numerical Tolerance** : Written nearby principal dimensions (basic dimension)

Example : $60^{+0.05}_{-0.01}$, $60^{\pm 0.05}$ etc...

- 2- Letter Tolerance** : The letters and numbers which classifield according to DIN and ISO systems are written to right handside of the principal dimension and read according to micron kind.

Example : 60^{H7} , 60_{h6} etc...

ATTENTION !!!

It is easy to process exterior surface of products. Internal surfaces, in a sense the hole is difficult to measure process, giving a fixed tolerance to the hole and by giving tolerance to the pin will provide more precise processing.

COMPARING OF SYSTEMS OF DIN AND ISO

- 1- The both systems are seperated according to normal hole and pin system.
- 2- At the both systems normal temperature is agreed as 20° C.
- 3- Tolerance differences of pins and holes, often tolerance comparement and keeping the basis for tolerance of difference to a zero base line is the same in both.
- 4- At DIN system there are four types of fit which are sensitive, fine, midpoint and rough, at ISO system there are 18 kind different quality.
- 5- At DIN system the product diameter were found to be arithmetic average, at ISO system it is found by diameter's geometric average.

ISO - Tolerances of Commonly Used Shaft Fits

(DIN 7154 T1)

Tolerances zone class of shaft

(1 \square = 0,001 mm)

Basic Size Step from..... to..... (mm)	Hole						Shaft															
	H6	p5	n5	k6	j6	h5	H7	s6	r6	n6	m6	k6	j6	h6	g6	f7						
1...3	+6 0	+10 +6	+8 +4	+6 0	+4 -2	0 -4	+10 0	+20 +14	+16 +10	+10 +4	+8 +2	+6 0	+4 -2	0 -6	-2 -8	-6 -16						
3...6	+8 0	+17 +12	+13 +8	+9 +1	+6 -2	0 -5	+12 0	+27 +19	+23 +15	+16 +8	+12 +4	+9 +1	+6 -2	0 -8	-4 -12	-10 -22						
6...10	+9 0	+21 +15	+16 +10	+10 +1	+7 -2	0 -6	+15 0	+32 +23	+28 +19	+19 +10	+15 +6	+10 +1	+7 -2	0 -9	-5 -14	-13 -28						
10...14	+11 0	+26 +18	+20 +12	+12 +1	+8 -3	0 -8	+18 0	+39 +28	+34 +23	+23 +12	+18 +7	+12 +1	+8 -3	0 -11	-6 -17	-16 -34						
14...18																						
18...24	+13 0	+31 +22	+24 +15	+15 +2	+9 -4	0 -9	+21 0	+48 +35	+41 +28	+28 +15	+21 +8	+15 +2	+9 -4	0 -13	-7 -20	-20 -41						
24...30																						
30...40	+16 0	+37 +26	+28 +17	+18 +2	+11 -5	0 -11	+25 0	+59 +43	+50 +34	+33 +17	+25 +9	+18 +2	+11 -5	0 -16	-9 -25	-25 -50						
40...50																						
50...65	+19 0	+45 +32	+33 +20	+21 +2	+12 -7	0 -13	+30 0	+72 +53	+60 +41	+39 +20	+30 +11	+21 +2	+12 -7	0 -19	-10 -29	-30 -60						
65...80									+78 +59								+62 +43					
80...100	+22 0	+52 +37	+38 +23	+25 +3	+13 -9	0 15	+35 0	+93 +71	+73 +51	+45 +23	+35 +13	+25 +3	+13 -9	0 -22	-12 -34	-36 -71						
100...120									+101 +79								+76 +54					
120...140	+25 0	+61 +43	+45 +27	+28 +3	+14 -11	0 -18	+40 0	+117 +92	+88 +63	+52 +27	+40 +15	+28 +3	+14 -11	0 -25	-14 -39	-43 -83						
140...160																					+125 +100	+90 +65
160...180																					+133 +108	+93 +68
180...200	+29 0	+70 +50	+51 +31	+33 +4	+16 -13	0 -20	+46 0	+151 +122	+106 +77	+60 +31	+46 +17	+33 +4	+16 -13	0 -29	-15 -44	-50 -96						
200...225																					+159 +130	+109 +80
225...250																					+169 +140	+113 +84
250...280	+32 0	+79 +56	+57 +34	+36 +4	+16 -16	0 -23	+52 0	+190 +158	+126 +94	+66 +34	+52 +20	+36 +4	+16 -16	0 -32	-17 -49	-56 -108						
280...315																					+202 +170	+130 +98
315...355																					+226 +190	+144 +108
355...400	+36 0	+87 +62	+62 +37	+40 +4	+18 -18	0 -25	+57 0	+244 +208	+150 +114	+73 +37	+57 +21	+40 +4	+18 -18	0 -36	-18 -54	-62 -119						
400...450																					+272 +232	+166 +126
450...500	+40 0	+95 +67	+67 +40	+45 +5	+20 -20	0 -27	+63 0	+292 +252	+172 +132	+80 +40	+63 +21	+45 +5	+20 -20	0 -40	-20 -60	-68 -131						

ISO - Tolerances of Commonly Used Shaft Fits

(DIN 7154 T1)

Tolerances zone class of shaft

(1 \square = 0,001 mm)

Basic Size Step from..... to..... (mm)	Hole H8	Shaft					Hole H11	Shaft				
		x8	u8	h9	e8	d9		h9	h11	d9	c11	a11
1...3	+ 14 0	+ 34 + 20	-	0 - 25	- 14 - 28	- 20 - 45	+ 60 0	0 - 25	0 - 60	- 20 - 45	- 60 - 120	- 270 - 330
3...6	+ 18 0	+ 46 + 28	-	0 - 30	- 20 - 38	- 30 - 60	+ 75 0	0 - 30	0 - 75	- 30 - 60	- 70 - 145	- 270 - 345
6...10	+ 22 0	+ 56 + 34	-	0 - 36	- 25 - 47	- 40 - 76	+ 90 0	0 - 36	0 - 90	- 40 - 76	- 80 - 170	- 280 - 370
10...14	+ 27 0	+ 67 + 40	-	0 - 43	- 32 - 59	- 50 - 93	+ 110 0	0 - 43	0 - 110	- 50 - 93	- 95 - 205	- 290 - 400
14...18		+ 72 + 45	-									
18...24	+ 33 0	+ 87 + 54	-	0 - 52	- 40 - 73	- 65 - 117	+ 130 0	0 - 52	0 - 130	- 65 - 117	- 110 - 240	- 300 - 430
24...30		+ 97 + 64	+ 81 + 48									
30...40	+ 39 0	+ 119 + 80	+ 99 + 60	0 - 62	- 50 - 89	- 80 - 142	+ 160 0	0 - 62	0 - 160	- 80 - 142	- 120 - 280	- 310 - 470
40...50		+ 136 + 97	+ 109 + 70								- 130 - 290	- 320 - 480
50...65	+ 46 0	+ 168 + 122	+ 133 + 87	0 - 74	- 60 - 106	- 100 - 174	+ 190 0	0 - 74	0 - 190	- 100 - 174	- 140 - 330	- 340 - 530
65...80		+ 192 + 146	+ 148 + 102								- 150 - 340	- 360 - 550
80...100	+ 54 0	+ 232 + 178	+ 178 + 124	0 - 87	- 72 - 126	- 120 - 207	+ 220 0	0 - 87	0 - 220	- 120 - 207	- 170 - 390	- 380 - 600
100...120		+ 264 + 210	+ 198 + 144								- 180 - 400	- 410 - 630
120...140	+ 63 0	+ 311 + 248	+ 233 + 170	0 - 100	- 85 - 148	- 145 - 245	+ 250 0	0 - 100	0 - 250	- 145 - 245	- 200 - 450	- 460 - 710
140...160		+ 343 + 280	+ 253 + 190								- 210 - 460	- 520 - 770
160...180	0	+ 373 + 310	+ 273 + 210								- 230 - 480	- 580 - 830
180...200	+ 72 0	+ 422 + 350	+ 308 + 236	0 - 115	- 100 - 172	- 170 - 285	+ 290 0	0 - 115	0 - 290	- 170 - 285	- 240 - 530	- 660 - 950
200...225		+ 457 + 385	+ 330 + 258								- 260 - 550	- 740 - 1030
225...250	0	+ 497 + 425	+ 356 + 284								- 280 - 570	- 820 - 1110
250...280	+ 81 0	+ 556 + 475	+ 396 + 315	0 - 130	- 110 - 191	- 190 - 320	+ 320 0	0 - 130	0 - 320	- 190 - 320	- 300 - 620	- 920 - 1240
280...315		+ 606 + 525	+ 431 + 350								- 330 - 650	- 1050 - 1370
315...355	+ 89 0	+ 679 + 590	+ 479 + 390	0 - 140	- 125 - 214	- 210 - 350	+ 360 0	0 - 140	0 - 360	- 210 - 350	- 360 - 720	- 1200 - 1560
355...400		-	+ 524 + 435								- 400 - 760	- 1350 - 1710
400...450	+ 97 0	-	+ 587 + 490	0 - 155	- 135 - 232	- 230 - 385	+ 400 0	0 - 155	0 - 400	- 230 - 385	- 440 - 840	- 1500 - 1900
450...500		-	+ 637 + 540								- 480 - 880	- 1650 - 2050

ISO - Tolerances of Commonly Used Hole Fits

(DIN 7154 T1)

Tolerances zone class of hole

(1 \square = 0,001 mm)

Basic Size Step from.... to.... (mm)	Shaft	Hole					Shaft	Hole								
	h5	P6	N6	M6	J6	H6	h6	S7	R7	N7	M7	K7	J7	H7	G7	F7
1...3	0 - 4	- 6 -12	- 4 -10	- 2 - 8	+ 2 - 4	+ 6 0	0 - 6	- 14 -24	- 10 -20	- 4 -14	- 2 -12	0 -10	+ 4 - 6	+ 10 0	+ 12 + 2	+ 16 + 6
3...6	0 - 5	- 9 -17	- 5 -13	- 1 - 9	+ 5 - 3	+ 8 0	0 - 8	- 15 -27	- 11 -23	- 4 -16	0 -12	+ 3 - 9	+ 6 - 6	+ 12 0	+ 16 + 4	+ 22 + 10
6...10	0 - 6	-12 -21	- 7 -16	- 3 -12	+ 5 - 4	+ 9 0	0 - 9	- 17 -32	- 13 -28	- 4 -19	0 -15	+ 5 -10	+ 8 - 7	+ 15 0	+ 20 + 5	+ 28 + 13
10...14	0 - 8	-15 -26	- 9 -20	- 4 -15	+ 6 - 5	+ 11 0	0 -11	- 21 -39	- 16 -34	- 5 -23	0 -18	+6 -12	+ 10 - 8	+ 18 0	+ 24 + 6	+ 34 + 16
14...18																
18...24	0 - 9	-18 -31	- 11 -24	- 4 -17	+ 8 - 5	+ 13 0	0 -13	- 27 -48	- 20 -41	- 7 -28	0 -21	+ 6 -15	+ 12 - 9	+ 21 0	+ 28 + 7	+ 41 + 20
24...30																
30...40	0 -11	-21 -37	- 12 -28	- 4 -20	+ 10 - 6	+ 16 0	0 -16	- 34 -59	- 25 -50	- 8 -33	0 -25	+ 7 -18	+ 14 -11	+ 25 0	+ 34 + 9	+ 50 + 25
40...50																
50...65	0 -13	-26 -45	- 14 -33	- 5 -24	+ 13 - 6	+ 19 0	0 -19	-42 -72	-30 -60	- 9 -39	0 -30	- 9 -21	+ 18 -12	+ 30 0	+ 40 + 10	+ 60 + 30
65...80								-48 -78	-32 -62							
80...100	0 -15	-30 -52	- 16 -38	- 6 -28	+ 16 - 6	+ 22 0	0 -22	-58 -93	-38 -73	- 10 -45	0 -35	+ 10 -25	+ 22 -13	+ 35 0	+ 47 + 12	+ 71 + 36
100...120								-66 -101	-41 -76							
120...140	0 -18	-36 -61	- 20 -45	- 8 -33	+ 18 - 7	+ 25 0	0 -25	-77 -117	-48 -88	- 12 -40	0 -28	+ 12 -14	+ 26 - 14	+ 40 0	+ 54 + 14	+ 83 + 43
140...160								-85 -125	-50 -90							
160...180								-93 -133	-53 -93							
180...200	0 -20	-41 -70	- 22 -51	- 8 -37	+ 22 - 7	+ 29 0	0 -29	-105 -151	-60 -106	- 14 -46	0 + 33	+ 13 -16	+ 30 - 16	+ 46 0	+ 61 + 15	+ 96 + 50
200...225								-113 -159	-63 -109							
225...250								-123 -169	-67 -113							
250...280	0 -23	-47 -79	- 25 -57	- 9 -41	+ 25 - 7	+ 32 0	0 -32	-138 -190	-74 -126	- 14 -66	0 -52	+ 16 -36	+ 36 -16	+ 52 0	+ 69 + 17	+ 108 + 56
280...315								-150 -202	-78 -130							
315...355	0 -25	-51 -87	- 26 -62	- 10 -46	+ 29 - 7	+ 36 0	0 -36	-169 -226	-87 -144	- 16 -73	0 -57	+ 17 -40	+ 39 -18	+ 57 0	+ 75 + 18	+ 119 + 62
355...400								-187 -244	-93 -150							
400...450	0 -27	-55 -95	- 27 -67	- 10 -50	+ 33 - 7	+ 40 0	0 -40	-209 -272	-103 -166	- 17 -80	0 -63	+ 18 -45	+ 43 -20	+ 63 0	+ 83 + 20	+ 131 + 68
450...500								-229 -292	-109 -172							

ISO - Tolerances of Commonly Used Hole Fits

(DIN 7154 T1)

Tolerances zone class of hole

(1 \square = 0,001 mm)

Basic Size Step from.... to.... (mm)	Shaft	Hole						Shaft	Hole						
	h9	H8	H11	F8	E9	D10	C11	h11	H11	D11	C11	A11			
1...3	0 - 25	+ 14 0	+ 60 0	+ 20 + 6	+ 39 + 14	+ 60 + 20	+ 120 + 60	0 - 60	+ 60 0	+ 80 + 20	+ 120 + 60	+ 330 + 270			
3...6	0 - 30	+ 18 0	+ 75 0	+ 28 10	+ 50 + 20	+ 78 + 30	+ 145 + 70	0 -75	+ 75 0	+ 105 + 30	+ 145 + 70	+ 345 + 270			
6...10	0 - 36	+ 22 0	+ 90 0	+ 35 + 13	+ 61 + 25	+ 98 + 40	+ 170 + 80	0 -90	+ 90 0	+ 130 + 40	+ 170 + 80	+ 370 + 280			
10...14	0 - 43	+ 27 0	+ 110 0	+ 43 + 16	+ 75 + 32	+ 120 + 50	+ 205 + 95	0 - 110	+ 110 0	+ 160 + 50	+ 205 + 95	+ 400 + 290			
14...18															
18...24	0 - 52	+ 33 0	+ 130 0	+ 53 + 20	+ 92 + 40	+ 149 + 65	+ 240 + 110	0 - 130	+ 130 0	+ 195 + 65	+ 240 + 110	+ 430 + 300			
24...30															
30...40	0 - 62	+ 39 0	+ 160 0	+ 64 + 25	+ 112 + 50	+ 180 + 80	+ 280 + 120	0 - 160	+ 160 0	+ 240 + 80	+ 280 + 120	+ 470 + 310			
40...50													+ 290 + 130	+ 290 + 130	+ 480 + 320
50...65	0 - 74	+ 46 0	+ 190 0	+ 76 + 30	+ 134 + 60	+ 220 + 100	+ 330 + 140	0 -190	+190 0	+290 +100	+ 330 + 140	+ 530 + 340			
65...80													+ 340 + 150	+ 340 + 150	+ 550 + 360
80...100	0 - 87	+ 54 0	+ 220 0	+ 90 + 36	+ 159 + 72	+ 260 + 120	+ 390 + 170	0 -220	+ 220 0	+ 340 + 120	+ 390 + 170	+ 600 + 380			
100...120													+ 400 + 180	+ 400 + 180	+ 630 + 410
120...140	0 - 100	+ 63 0	+ 250 0	+ 106 + 43	+ 185 + 85	+ 305 + 145	+ 450 + 200	0 - 250	+ 250 0	+ 395 + 145	+ 450 + 210	+ 710 + 520			
140...160													+ 460 + 210	+ 460 + 210	+ 770 + 520
160...180													+ 480 + 230	+ 480 + 230	+ 830 + 580
180...200	0 - 115	+ 72 0	+ 290 0	+ 122 + 50	+ 215 + 100	+ 355 + 170	+ 530 + 240	0 - 290	+ 290 0	+ 460 + 170	+ 530 + 240	+ 950 + 660			
200...225													+ 550 + 260	+ 550 + 260	+ 1030 + 740
225...250													+ 570 + 280	+ 570 + 280	+ 1110 + 820
250...280	0 - 130	+ 81 0	+ 320 0	+ 137 + 56	+ 240 + 110	+ 400 + 190	+ 620 + 300	0 - 320	+ 320 0	+ 510 + 190	+ 620 + 300	+ 1240 + 920			
280...315													+ 650 + 330	+ 650 + 330	+ 1370 + 1050
315...355	0 - 140	+ 89 0	+ 360 0	+ 151 + 62	+ 265 + 125	+ 440 + 210	+ 720 + 360	0 - 360	+ 360 0	+ 570 + 210	+ 720 + 360	+ 1560 + 1200			
355...400													+ 760 + 400	+ 760 + 400	+ 1710 + 1350
400...450	0 - 155	+ 97 0	+ 400 0	+ 165 + 68	+ 290 + 135	+ 480 + 230	+ 840 + 440	0 - 400	+ 400 0	+ 630 + 230	+ 840 + 440	+ 1900 + 1500			
450...500													+ 880 + 480	+ 880 + 480	+ 2050 + 1650

TOLERANCE ZONE CLASS OF HOLE (JIS B 0401-1986)

(μ -0.01 mm)

Basic size step (mm)	B10	C9	C10	D8	D9	D10	E7	E8	E9	F6	F7	F8	G6	G7	H6	H7	H8	H9	H10	JS7	K6	K7	M6	M7	N6	N7	P6	P7	R7	S7	T7	U7	X7			
<	+180	+85	+100	+34	+45	+60	+24	+28	+39	+12	+16	+20	+8	+12	+6	+10	+14	+25	+40	±5	0	-2	0	-2	-4	-4	-6	-10	-14	-18	-20	-20	-20			
3	+140	+60	+60	+20	+20	+20	+14	+14	+14	+6	+6	+6	+2	+2	0	0	0	0	±3	-6	-10	-6	-12	-10	-14	-12	-16	-20	-24	-18	-20	-24	-20			
3	+188	+100	+118	+48	+60	+78	+32	+38	+50	+18	+22	+28	+12	+16	+8	+12	+18	+30	+48	+6	-9	-9	-12	-13	-16	-17	-20	-23	-27	-19	-24	-24	-24	-24		
6	+208	+116	+138	+62	+76	+98	+40	+47	+61	+22	+28	+35	+14	+20	+9	+15	+22	+36	+58	+4	+2	+5	-3	0	-7	-4	-12	-9	-13	-17	-22	-28	-28	-28		
6	+150	+80	+80	+40	+40	+40	+25	+25	+25	+13	+13	+13	+5	+5	0	0	0	0	+4.5	±7	-7	-10	-12	-15	-16	-19	-21	-24	-28	-37	-43	-37	-43			
10	+220	+138	+165	+77	+93	+120	+50	+59	+75	+27	+34	+43	+17	+24	+11	+18	+27	+43	+70	±9	+2	+6	-4	0	-9	-5	-15	-11	-16	-21	-26	-51	-26	-51		
14	+150	+95	+95	+50	+50	+50	+32	+32	+32	+16	+16	+16	+6	+6	0	0	0	0	±5.5	±9	-9	-12	-15	-18	-20	-23	-26	-29	-34	-39	-44	-56	-44	-56		
18	+244	+162	+194	+98	+117	+149	+61	+73	+92	+33	+41	+53	+20	+28	+13	+21	+33	+52	+84	±10	+2	+6	-4	0	-11	-7	-18	-14	-20	-27	-33	-46	-33	-46		
24	+160	+110	+110	+65	+65	+65	+40	+40	+40	+20	+20	+20	+7	+7	0	0	0	0	±6.5	±10	-11	-15	-17	-21	-24	-28	-31	-35	-41	-48	-54	-61	-54	-61		
30	+270	+182	+220	+119	+142	+180	+75	+89	+112	+41	+50	+64	+25	+34	+16	+25	+39	+62	+100	±8	+3	+7	-4	0	-12	-8	-21	-17	-25	-34	-45	-61	-39	-51		
30	+170	+120	+120	+80	+80	+80	+50	+50	+50	+25	+25	+25	+9	+9	0	0	0	0	0	±12	-13	-18	-20	-25	-28	-33	-37	-42	-50	-59	-70	-86	-45	-61		
40	+280	+192	+230	+120	+142	+180	+75	+89	+112	+41	+50	+64	+25	+34	+16	+25	+39	+62	+100	±8	+3	+7	-4	0	-12	-8	-21	-17	-25	-34	-45	-61	-45	-61		
40	+180	+130	+130	+80	+80	+80	+50	+50	+50	+25	+25	+25	+9	+9	0	0	0	0	0	±8	-13	-18	-20	-25	-28	-33	-37	-42	-50	-59	-70	-86	-45	-61		
50	+310	+214	+260	+146	+174	+220	+90	+106	+134	+49	+60	+76	+29	+40	+19	+30	+46	+74	+120	±15	+4	+9	-5	0	-14	-9	-26	-21	-30	-42	-55	-76	-55	-76		
50	+190	+140	+140	+100	+100	+100	+60	+60	+60	+30	+30	+30	+10	+10	0	0	0	0	0	±9.5	+4	+9	-5	0	-14	-9	-26	-21	-30	-42	-55	-76	-55	-76		
65	+320	+224	+270	+150	+174	+220	+90	+106	+134	+49	+60	+76	+29	+40	+19	+30	+46	+74	+120	±15	+4	+9	-5	0	-14	-9	-26	-21	-30	-42	-55	-76	-55	-76		
65	+200	+150	+150	+100	+100	+100	+60	+60	+60	+30	+30	+30	+10	+10	0	0	0	0	0	±15	-15	-21	-24	-30	-33	-39	-45	-51	-62	-78	-94	-121	-62	-78		
80	+360	+257	+310	+174	+207	+260	+107	+126	+159	+68	+71	+90	+34	+47	+22	+35	+54	+87	+140	±11	+4	+10	-6	0	-16	-10	-30	-24	-33	-45	-59	-76	-101	-126	-88	-117
80	+220	+170	+170	+120	+120	+120	+72	+72	+72	+36	+36	+36	+12	+12	0	0	0	0	0	±17	-18	-25	-28	-35	-38	-45	-52	-59	-71	-93	-113	-146	-93	-113		
100	+380	+267	+320	+180	+210	+260	+110	+126	+159	+68	+71	+90	+34	+47	+22	+35	+54	+87	+140	±11	+4	+10	-6	0	-16	-10	-30	-24	-33	-45	-59	-76	-101	-126	-88	-117
100	+240	+180	+180	+120	+120	+120	+72	+72	+72	+36	+36	+36	+12	+12	0	0	0	0	0	±17	-18	-25	-28	-35	-38	-45	-52	-59	-71	-93	-113	-146	-93	-113		
120	+420	+300	+360	+200	+230	+280	+120	+138	+171	+71	+81	+102	+36	+51	+24	+36	+54	+90	+150	±20	+4	+12	-8	0	-20	-12	-36	-28	-38	-58	-78	-111	-111	-88	-117	
120	+260	+200	+200	+140	+140	+140	+84	+84	+84	+42	+42	+42	+14	+14	0	0	0	0	0	±12.5	+4	+12	-8	0	-20	-12	-36	-28	-38	-58	-78	-111	-111	-88	-117	
140	+440	+310	+370	+208	+245	+305	+125	+148	+185	+83	+106	+83	+39	+54	+25	+40	+63	+100	+160	±20	+4	+12	-8	0	-20	-12	-36	-28	-38	-58	-78	-111	-111	-88	-117	
140	+280	+210	+210	+145	+145	+145	+85	+85	+85	+43	+43	+43	+14	+14	0	0	0	0	0	±20	-21	-28	-33	-40	-45	-52	-61	-68	-90	-125	-169	-169	-169	-169		
160	+470	+330	+390	+210	+245	+305	+125	+148	+185	+83	+106	+83	+39	+54	+25	+40	+63	+100	+160	±20	+4	+12	-8	0	-20	-12	-36	-28	-38	-58	-78	-111	-111	-88	-117	
160	+310	+230	+230	+160	+160	+160	+96	+96	+96	+48	+48	+48	+16	+16	0	0	0	0	0	±20	-21	-28	-33	-40	-45	-52	-61	-68	-90	-125	-169	-169	-169	-169		
180	+525	+355	+425	+242	+285	+355	+146	+172	+215	+79	+96	+122	+44	+61	+29	+46	+72	+115	+185	±23	+5	+13	-8	0	-22	-14	-41	-33	-43	-63	-113	-151	-151	-106	-151	
180	+380	+280	+280	+200	+200	+200	+120	+120	+120	+60	+60	+60	+20	+20	0	0	0	0	0	±23	-24	-33	-37	-46	-51	-60	-70	-79	-109	-159	-159	-159	-159	-109	-159	
200	+565	+375	+445	+242	+285	+355	+146	+172	+215	+79	+96	+122	+44	+61	+29	+46	+72	+115	+185	±23	+5	+13	-8	0	-22	-14	-41	-33	-43	-63	-113	-151	-151	-106	-151	
200	+380	+280	+280	+200	+200	+200	+120	+120	+120	+60	+60	+60	+20	+20	0	0	0	0	0	±23	-24	-33	-37	-46	-51	-60	-70	-79	-109	-159	-159	-159	-159	-109	-159	
225	+605	+385	+465	+242	+285	+355	+146	+172	+215	+79	+96	+122	+44	+61	+29	+46	+72	+115	+185	±23	+5	+13	-8	0	-22	-14	-41	-33	-43	-63	-113	-151	-151	-106	-151	
225	+420	+280	+280	+200	+200	+200	+120	+120	+120	+60	+60	+60	+20	+20	0	0	0	0	0	±23	-24	-33	-37	-46	-51	-60	-70	-79	-109	-159	-159	-159	-159	-109	-159	
250	+690	+430	+510	+271	+320	+400	+162	+191	+240	+88	+108	+137	+49	+69	+32	+52	+81	+130	+210	±26	+5	+16	-9	0	-25	-14	-47	-36	-46	-67	-123	-169	-169	-169	-169	
250	+480	+300	+300	+210	+210	+210	+120	+120	+120	+60	+60	+60	+20	+20	0	0	0	0	0	±26	+5	+16	-9	0	-25	-14	-47	-36	-46	-67	-123	-169	-169	-169	-169	
280	+750	+460	+540	+310	+360	+440	+170	+200	+250	+96	+116	+146	+54	+74	+36	+56	+86	+136	+230	±26	+5	+16	-9	0	-25	-14	-47	-36	-46	-67	-123	-169	-169	-169	-169	
280	+540	+330	+330	+230	+230	+230	+130	+130	+130	+65	+65	+65	+22	+22	0	0	0	0	0	±26	+5	+16	-9	0	-25	-14	-47	-36	-46	-67	-123	-169	-169	-169	-169	
315	+830	+500	+590	+350	+400	+480	+180	+210	+260	+96	+116	+146	+54	+74	+36	+56	+86	+136	+230	±26	+5	+16	-9	0	-25	-14	-47	-36	-46	-67	-123	-169	-169	-169	-169	
315	+600	+360	+360	+260	+260	+260	+150	+150	+150	+75	+75	+75	+25	+25	0	0	0	0	0	±26	+5	+16	-9	0	-25	-14	-47	-36	-46	-67	-123	-169	-169	-169	-169	
355	+910	+540	+630	+370	+420	+500	+190	+220	+270	+96	+116	+146	+54	+74	+36	+56	+86	+136	+230	±26	+5	+16	-9	0	-25	-14	-47	-36	-46	-67	-123	-169	-169	-169	-169	
355	+680	+400	+400	+																																

TOLERANCE ZONE CLASS OF SHAFT (JIS B 0401-1986)

($\mu = 0.01 \text{ mm}$)

Basic size step (mm)	b9	c9	d8	d9	e7	e8	e9	f6	f7	f8	g5	g6	h4*	h5	h6	h7	h8	h9	js5	js6	js7	k5	k6	m5	m6	n5*	n6	p6	r6	s6	t6	u6	x6
<	-140	-60	-20	-20	-14	-14	-14	-6	-6	-6	-2	-2	0	0	0	0	0	0	± 3	± 3	± 5	+4	+6	+6	+8	+8	+10	+12	+16	+20	+24	+26	
3	-165	-85	-34	-45	-24	-28	-39	-12	-16	-20	-6	-8	-3	-4	-6	-10	-14	-25	± 2	± 3	± 5	0	0	+2	+2	+4	+4	+6	+10	+14	+18	+20	
3	-140	-70	-30	-30	-20	-20	-20	-10	-10	-10	-4	-4	0	0	0	0	0	0	± 2.5	± 4	± 6	+6	+9	+9	+12	+13	+16	+20	+23	+27	+31	+36	
6	-170	-100	-48	-60	-32	-38	-50	-18	-22	-28	-9	-12	-4	-5	-8	-12	-18	-30	± 2.5	± 4	± 6	+6	+9	+9	+12	+13	+16	+20	+23	+27	+31	+36	
6	-150	-80	-40	-40	-25	-25	-13	-13	-13	-13	-5	-5	0	0	0	0	0	0	± 3	± 4.5	± 7	+7	+10	+12	+15	+16	+19	+24	+28	+32	+37	+43	
10	-186	-116	-62	-76	-40	-47	-61	-22	-28	-35	-11	-14	-4	-6	-9	-15	-22	-36	± 3	± 4.5	± 7	+7	+10	+12	+15	+16	+19	+23	+28	+34	+41	+51	
14	-150	-95	-50	-50	-32	-32	-32	-16	-16	-16	-6	-6	0	0	0	0	0	0	± 4	± 5.5	± 9	+9	+12	+15	+18	+20	+23	+29	+34	+39	+44	+40	
14	-193	-138	-77	-93	-50	-59	-75	-27	-34	-43	-14	-17	-5	-8	-11	-18	-27	-43	± 4	± 5.5	± 9	+9	+11	+7	+7	+12	+12	+18	+23	+28	+33	+56	
18	-160	-110	-65	-40	-40	-40	-40	-20	-20	-20	-7	-7	0	0	0	0	0	0	± 4.5	± 6.5	± 10	+11	+15	+17	+21	+24	+28	+35	+41	+48	+54	+67	
24	-212	-162	-98	-117	-61	-73	-92	-33	-41	-53	-16	-20	-6	-9	-13	-21	-33	-52	± 4.5	± 6.5	± 10	+11	+2	+2	+8	+15	+22	+28	+35	+41	+54	+77	
30	-242	-192	-119	-142	-75	-89	-112	-41	-50	-64	-20	-25	-7	-11	-16	-25	-39	-62	± 5.5	± 8	± 12	+13	+2	+9	+9	+17	+25	+34	+43	+54	+70	+86	
30	-170	-120	-80	-80	-50	-50	-50	-25	-25	-25	-9	-9	0	0	0	0	0	0	± 5.5	± 8	± 12	+13	+18	+20	+25	+28	+33	+42	+50	+59	+60	+60	
40	-232	-182	-119	-142	-75	-89	-112	-41	-50	-64	-20	-25	-7	-11	-16	-25	-39	-62	± 5.5	± 8	± 12	+13	+2	+9	+9	+17	+25	+34	+43	+54	+70	+86	
50	-284	-214	-140	-170	-90	-100	-120	-40	-50	-60	-30	-40	-10	-13	-19	-30	-46	-74	± 6.5	± 9.5	± 15	+15	+21	+24	+30	+33	+41	+51	+60	+72	+85	+106	
65	-327	-257	-170	-207	-107	-126	-159	-58	-71	-90	-27	-34	-10	-15	-22	-35	-54	-87	± 6.5	± 9.5	± 15	+15	+21	+24	+30	+33	+41	+51	+60	+72	+85	+106	
80	-307	-257	-170	-207	-107	-126	-159	-58	-71	-90	-27	-34	-10	-15	-22	-35	-54	-87	± 7.5	± 11	± 17	+18	+25	+28	+35	+38	+45	+59	+71	+91	+124		
100	-327	-267	-170	-207	-107	-126	-159	-58	-71	-90	-27	-34	-10	-15	-22	-35	-54	-87	± 7.5	± 11	± 17	+18	+3	+3	+13	+13	+23	+37	+54	+79	+104	+144	
120	-360	-300	-200	-240	-140	-160	-190	-60	-75	-95	-30	-40	-12	-18	-25	-40	-63	-100	± 12.5	± 20	± 20	+21	+28	+33	+40	+45	+60	+78	+109	+159	+212		
140	-380	-310	-208	-245	-145	-165	-195	-65	-80	-100	-32	-42	-12	-18	-25	-40	-63	-100	± 12.5	± 20	± 20	+21	+28	+33	+40	+45	+60	+78	+109	+159	+212		
160	-410	-330	-230	-268	-170	-190	-220	-70	-85	-105	-35	-45	-12	-18	-25	-40	-63	-100	± 12.5	± 20	± 20	+21	+28	+33	+40	+45	+60	+78	+109	+159	+212		
180	-440	-340	-240	-278	-180	-200	-230	-75	-90	-110	-38	-48	-12	-18	-25	-40	-63	-100	± 12.5	± 20	± 20	+21	+28	+33	+40	+45	+60	+78	+109	+159	+212		
200	-480	-360	-260	-300	-200	-220	-250	-80	-95	-115	-40	-50	-12	-18	-25	-40	-63	-100	± 12.5	± 20	± 20	+21	+28	+33	+40	+45	+60	+78	+109	+159	+212		
225	-535	-385	-285	-325	-215	-235	-265	-85	-100	-120	-42	-52	-12	-18	-25	-40	-63	-100	± 12.5	± 20	± 20	+21	+28	+33	+40	+45	+60	+78	+109	+159	+212		
250	-580	-400	-300	-340	-220	-240	-270	-90	-105	-125	-44	-54	-12	-18	-25	-40	-63	-100	± 12.5	± 20	± 20	+21	+28	+33	+40	+45	+60	+78	+109	+159	+212		
280	-640	-430	-330	-370	-230	-250	-280	-95	-110	-130	-46	-56	-12	-18	-25	-40	-63	-100	± 12.5	± 20	± 20	+21	+28	+33	+40	+45	+60	+78	+109	+159	+212		
315	-700	-460	-350	-390	-240	-260	-290	-100	-115	-135	-48	-58	-12	-18	-25	-40	-63	-100	± 12.5	± 20	± 20	+21	+28	+33	+40	+45	+60	+78	+109	+159	+212		
355	-760	-490	-380	-420	-250	-270	-300	-105	-120	-140	-50	-60	-12	-18	-25	-40	-63	-100	± 12.5	± 20	± 20	+21	+28	+33	+40	+45	+60	+78	+109	+159	+212		
400	-820	-540	-420	-460	-260	-280	-310	-110	-125	-145	-52	-62	-12	-18	-25	-40	-63	-100	± 12.5	± 20	± 20	+21	+28	+33	+40	+45	+60	+78	+109	+159	+212		
450	-880	-590	-450	-490	-270	-290	-320	-115	-130	-150	-54	-64	-12	-18	-25	-40	-63	-100	± 12.5	± 20	± 20	+21	+28	+33	+40	+45	+60	+78	+109	+159	+212		
500	-950	-635	-480	-520	-280	-300	-330	-120	-135	-155	-56	-66	-12	-18	-25	-40	-63	-100	± 12.5	± 20	± 20	+21	+28	+33	+40	+45	+60	+78	+109	+159	+212		

Note : This table shows that the upper figures are the upper deviation and the lower figures are the lower deviation.

Commonly used hole-basis fits

Basic Hole	Tolerance zone class of shaft															
	Clearance fit						Transition fit				Interference fit					
H6					g5	h5	js5	k5	m5							
				f6	g6	h6	js6	k6	m6	n6*	p6					
H7				f6	g6	h6	js6	k6	m6	n6	p6*	r6*	s6	t6	u6	x6
			e7	f7		h7	js7									
H8				f7		h7										
			e8	f8		h8										
H9			d9	e9												
			d8	e8		h8										
H10		c9	d9	e9		h9										
	b9	c9	d9													

Commonly used shaft-basis fits

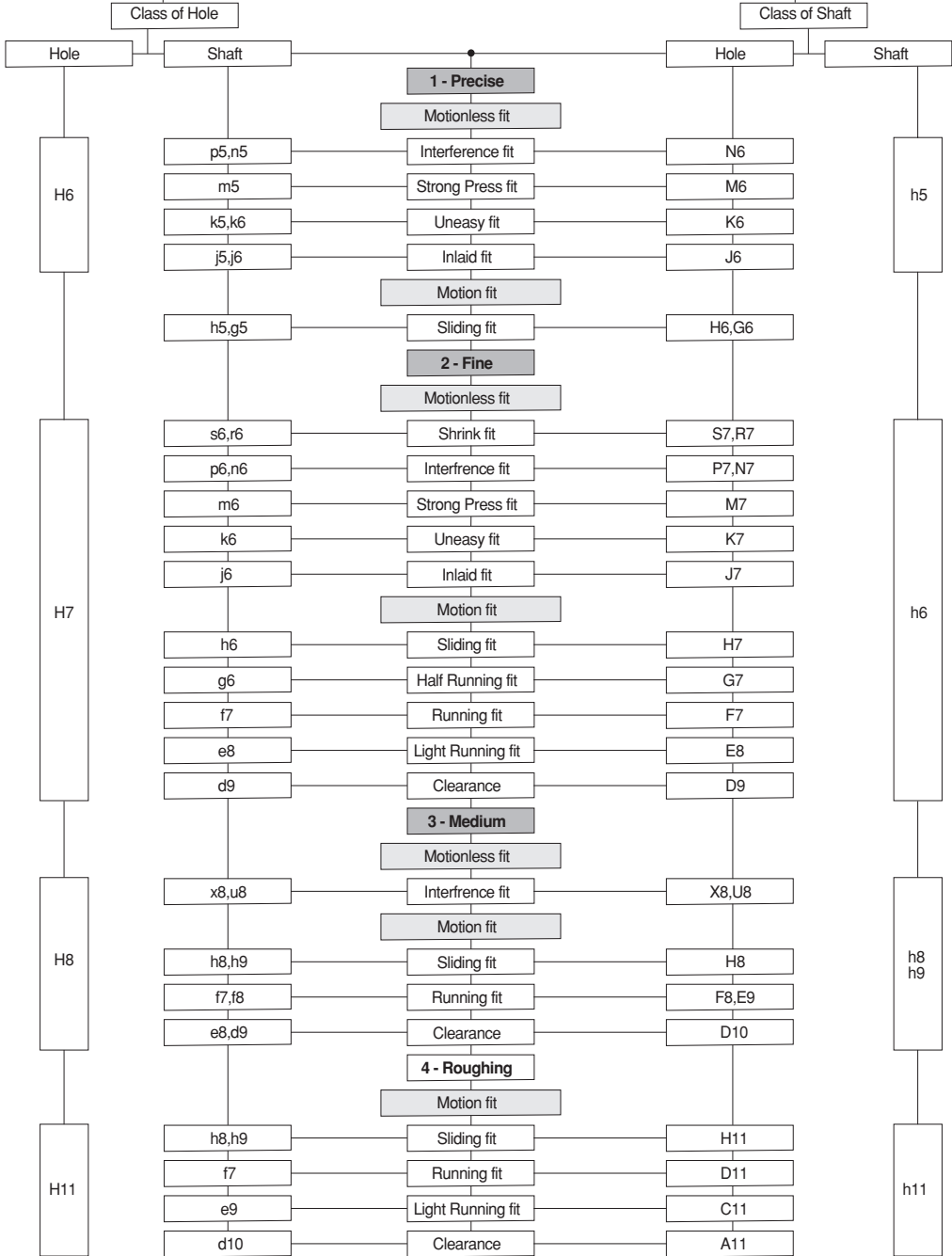
Basic Shaft	Tolerance zone class of shaft															
	Clearance fit						Transition fit				Interference fit					
h5						H6	JS6	K6	M6	N6*	P6					
				F6	G6	H6	JS6	K6	M6	N6	P6*					
h6				F7	G7	H7	JS7	K7	M7	N7	P7*	R7	S7	T7	U7	X7
			E7	F7		H7										
h7				F8		H8										
			D8	E8	F8	H8										
h8			D9	E9		H9										
			D8	E8		H8										
h9		C9	D9	E9		H9										
	B10	C10	D10													

Note : (*) Fits will make exceptions according to the size steps.

Same tolerances value without in table

Basic Step Size from to ... mm	Tolerance zone class of hole					Tolerance zone class of shaft				
	H3	H4	H5			h3	h4	h5	js4	
1...3	+2	+3	+4			0	0	0	+1.5	
	-2	0	0			-2	-3	-4	-1.5	
3...6	+2.5	+4	+5			0	0	0	+2	
	0	0	0			-2.5	-4	-5	-2	
6...10	+2.5	+4	+6			0	0	0	+2	
	0	0	0			-2.5	-4	-6	-2	
10...18	+3	+5	+8			0	0	0	+2.5	
	0	0	0			-3	-5	-8	-2.5	
18...30	+4	+6	+9			0	0	0	+3	
	0	0	0			-4	-6	-9	-3	
30...50	+4	+7	+11			0	0	0	+3.5	
	0	0	0			-4	-7	-11	-3.5	
50...80	+5	+8	+13			0	0	0	+4	
	0	0	0			-5	-8	-13	-4	
80...120	+6	+10	+15			0	0	0	+5	
	0	0	0			-6	-10	-15	-5	
120...180	+8	+12	+18			0	0	0	+6	
	0	0	0			-8	-12	-18	-6	
180...250	+10	+14	+20			0	0	0	+7	
	0	0	0			-10	-14	-20	-7	
250...315	+12	+16	+23			0	0	0	+8	
	0	0	0			-12	-18	-23	-8	
315...400	+13	+18	+25			0	0	0	+9	
	0	0	0			-13	-18	-25	-9	
400...500	+15	+20	+27			0	0	0	+10	
	0	0	0			-15	-20	-27	-10	

ISO TOLERANCE SYSTEM



ISO BASIC TOLERANCES

(DIN 7155)

Basic Size Step mm	IT Quality																		Main Tolerance μm (after IT 12 mm)																					
	01	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	01	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1...3	0,3	0,5	0,8	1,2	2	3	4	6	10	14	25	40	60	0,1	0,14	0,25	0,4	0,6	1	1,4	0,3	0,5	0,8	1,2	2	3	4	6	10	14	25	40	60	0,1	0,14	0,25	0,4	0,6	1	1,4
3...6	0,4	0,6	1	1,5	2,5	4	5	8	12	18	30	48	75	0,12	0,18	0,3	0,48	0,75	1,2	1,8	0,4	0,6	1	1,5	2,5	4	5	8	12	18	30	48	75	0,12	0,18	0,3	0,48	0,75	1,2	1,8
6...10	0,4	0,6	1	1,5	2,5	4	6	9	15	22	36	58	90	0,15	0,22	0,36	0,58	0,9	1,5	2,2	0,4	0,6	1	1,5	2,5	4	6	9	15	22	36	58	90	0,15	0,22	0,36	0,58	0,9	1,5	2,2
10...18	0,5	0,8	1,2	2	3	5	8	11	18	27	43	70	110	0,18	0,27	0,43	0,73	1,1	1,8	2,7	0,5	0,8	1,2	2	3	5	8	11	18	27	43	70	110	0,18	0,27	0,43	0,73	1,1	1,8	2,7
18...30	0,6	1	1,5	2,5	4	6	9	13	21	33	52	84	130	0,21	0,33	0,52	0,84	1,3	2,1	3,3	0,6	1	1,5	2,5	4	6	9	13	21	33	52	84	130	0,21	0,33	0,52	0,84	1,3	2,1	3,3
30...50	0,6	1	1,5	2,5	4	7	11	16	25	39	62	100	160	0,25	0,39	0,62	1	1,6	2,5	3,9	0,6	1	1,5	2,5	4	7	11	16	25	39	62	100	160	0,25	0,39	0,62	1	1,6	2,5	3,9
50...80	0,8	1,2	2	3	5	8	13	19	30	46	74	120	190	0,3	0,46	0,74	1,2	1,9	3	4,6	0,8	1,2	2	3	5	8	13	19	30	46	74	120	190	0,3	0,46	0,74	1,2	1,9	3	4,6
80...120	1	1,5	2,5	4	6	10	15	22	35	54	87	140	220	0,35	0,54	0,87	1,4	2,2	3,5	5,4	1	1,5	2,5	4	6	10	15	22	35	54	87	140	220	0,35	0,54	0,87	1,4	2,2	3,5	5,4
120...180	1,2	2	3,5	5	8	12	18	25	40	63	100	160	250	0,4	0,63	1	1,6	2,5	4	6,3	1,2	2	3,5	5	8	12	18	25	40	63	100	160	250	0,4	0,63	1	1,6	2,5	4	6,3
180...250	2	3	4,5	7	10	14	20	29	46	72	115	185	290	0,46	0,72	0,15	1,85	2,9	4,6	7,2	2	3	4,5	7	10	14	20	29	46	72	115	185	290	0,46	0,72	0,15	1,85	2,9	4,6	7,2
250...315	2,5	4	6	8	12	16	23	32	52	81	130	210	320	0,52	0,81	1,3	2,1	3,2	5,2	8,1	2,5	4	6	8	12	16	23	32	52	81	130	210	320	0,52	0,81	1,3	2,1	3,2	5,2	8,1
315...400	3	5	7	9	13	18	25	36	57	89	140	230	360	0,57	0,89	1,4	2,3	3,6	5,7	8,9	3	5	7	9	13	18	25	36	57	89	140	230	360	0,57	0,89	1,4	2,3	3,6	5,7	8,9
400...500	4	6	8	10	15	20	27	40	63	97	155	250	400	0,63	0,97	1,55	2,5	4	6,3	9,7	4	6	8	10	15	20	27	40	63	97	155	250	400	0,63	0,97	1,55	2,5	4	6,3	9,7

ISO BASIC TOLERANCES

1 μm =0,01 mm (DIN 7160 & DIN 7161)

Outside dimensions (Shaft) fit μm							Basic Size Step mm	Inside dimensions (Hole) fit μm								
h7	h8	h10	h12	js6	js8	js9		H9	H10	H12	J9	JS6	JS8	JS9	N9	P9
0 - 12	0 - 18	0 - 48	0 - 120	± 4	± 9	± 15	3...6	+ 30 0	+ 48 0	+ 120 0	± 15	± 4	± 9	± 15	0 - 30	- 12 - 42
0 - 15	0 - 22	0 - 58	0 - 150	$\pm 4,5$	± 11	± 18	6...10	+ 36 0	+ 58 0	+ 150 0	± 18	$\pm 4,5$	± 11	± 18	0 - 36	- 15 - 51
0 - 18	0 - 27	0 - 70	0 - 180	$\pm 5,5$	$\pm 13,5$	$\pm 21,5$	10...18	+ 43 0	+ 70 0	+ 180 0	+ 21 - 22	$\pm 5,5$	$\pm 13,5$	$\pm 21,5$	0 - 43	- 18 - 61
0 - 21	0 - 33	0 - 84	0 - 210	$\pm 6,5$	$\pm 16,5$	± 26	18...30	+ 52 0	+ 84 0	+ 210 0	± 26	$\pm 6,5$	$\pm 16,5$	± 26	0 - 52	- 21 - 74
0 - 25	0 - 39	0 - 100	0 - 250	± 8	$\pm 19,5$	± 31	30...50	+ 62 0	+ 100 0	+ 250 0	± 31	± 8	$\pm 19,5$	± 31	0 - 62	- 25 - 88
0 - 30	0 - 46	0 - 120	0 - 300	$\pm 9,5$	± 23	± 37	50...80	+ 74 0	+ 120 0	+ 300 0	± 37	$\pm 9,5$	± 23	± 37	0 - 74	- 30 - 106
0 - 35	0 - 54	0 - 140	0 - 350	± 11	± 27	$\pm 43,5$	80...120	+ 87 0	+ 140 0	+ 350 0	+ 43 - 44	± 11	± 27	$\pm 43,5$	0 - 87	- 35 - 124
0 - 40	0 - 63	0 - 160	0 - 400	$\pm 12,5$	$\pm 31,5$	± 50	120...180	+ 100 0	+ 160 0	+ 400 0	± 50	$\pm 12,5$	$\pm 31,5$	± 50	0 - 100	- 40 - 143
0 - 46	0 - 72	0 - 185	0 - 460	$\pm 14,5$	± 36	$\pm 57,5$	180...250	+ 115 0	+ 185 0	+ 460 0	+ 57 - 58	$\pm 14,5$	± 36	$\pm 57,5$	0 - 115	- 46 - 165

Tolerances for Length and Angle

TS1980 (ISO 2768)

For length

Tolerance Class	length: mm and fit: mm							
	0,5 to 3 incl.	Over 3 to 6 incl.	Over 6 to 30 incl.	Over 30 to 120 incl.	Over 120 to 400 incl.	Over 400 to 1000 incl.	Over 1000 to 2000 incl.	Over 2000 to 4000 incl.
f (Fine)	$\pm 0,05$	$\pm 0,05$	$\pm 0,1$	$\pm 0,15$	$\pm 0,2$	$\pm 0,3$	$\pm 0,5$	-
m (Medium)	$\pm 0,1$	$\pm 0,1$	$\pm 0,2$	$\pm 0,3$	$\pm 0,5$	$\pm 0,8$	$\pm 1,2$	± 2
c (Coarse)	$\pm 0,2$	$\pm 0,3$	$\pm 0,5$	$\pm 0,8$	$\pm 1,2$	± 2	± 3	± 4
v (Very Coarse)	-	$\pm 0,5$	± 1	$\pm 1,5$	$\pm 2,5$	± 4	± 6	± 8

For arc and chamfer

For angle

Tolerance Class	length: mm and fit: mm			Short edge: mm, Fit : Degree and minutes				
	0,5 to 3 incl.	over 3 to 6 incl.	Over 6	10 or less	Over 10 to 50 incl.	Over 50 to 120 incl.	Over 120 to 400 incl.	Over 400
f (Fine)	$\pm 0,2$	$\pm 0,5$	± 1	$\pm 1^\circ$	$\pm 0^\circ 30'$	$\pm 0^\circ 20'$	$\pm 0^\circ 10'$	$\pm 0^\circ 5'$
m (Medium)	$\pm 0,4$	± 1	± 2	$\pm 1^\circ 30'$	$\pm 1^\circ$	$\pm 0^\circ 30'$	$\pm 0^\circ 15'$	$\pm 0^\circ 10'$
c (Coarse)				$\pm 3^\circ$	$\pm 2^\circ$	$\pm 1^\circ$	$\pm 0^\circ 30'$	$\pm 0^\circ 20'$
v (Very Coarse)								

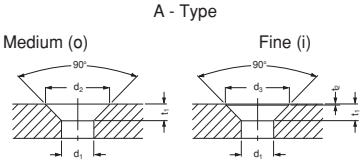
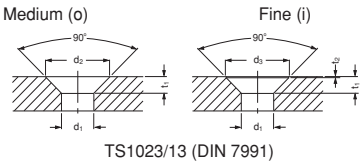
Mechanical Properties of Bolts

TS 3576 (DIN ISO 898)

Material Properties	3.6	4.6	4.8	5.6	5.8	6.8	8.8	9.8	10.9	12.9
Tensile Strength Rm N/mm ²	300	400		500		600	800	900	1000	1200
Yield Strength ReL N/mm ²	180	240	320	300	400	480	-	-	-	-
0,2 Yield Strength Rp 0,2 N/mm ²	-	-	-	-	-	-	640	720	900	1000
% Elongation As	25	22	14	20	10	8	12	10	9	8

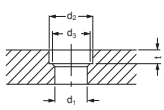
Hexagon Socket Countersunk Head Cap Screws

DIN 74

Screw Size		M2	M3	M4	M5	M6	M8	M10	M12	M16	M20	
 <p>A - Type Medium (o) Fine (i) TS 1023/1,3,4,7 TS 432/10,11,12,14,15,16</p>	Quality o	d1 H13	2,4	3,4	4,5	5,5	6,6	9	11	14	18	22
		d2 H13	4,6	6,5	8,6	10,4	12,4	16,4	20,4	24,4	32,4	40,4
		t1	1,1	1,6	2,1	2,5	2,9	3,7	4,7	5,2	7,2	9,2
Quality i	d1	2,2	3,2	4,3	5,3	6,4	8,4	10,5	13	17	21	
	d3	4,3	6	8	10	11,5	15	19	23	30	37	
	t1	1,2	1,7	2,2	2,6	3	4	5	5,7	7,7	9,7	
t2	0,15	0,25	0,3	0,3	0,45	0,7	0,7	0,7	1,2	1,7		
 <p>B - Type Medium (o) Fine (i) TS1023/13 (DIN 7991)</p>	Quality o	d1 H13	-	3,4	4,5	5,5	6,6	9	14	18	18	22
		d2 H13	-	6,6	9	11	13	17,2	21,5	26	32	38
		t1	-	1,6	2,3	2,8	3,2	4,1	5,3	6	7	8
Quality i	d1 H12	-	3,2	4,3	5,3	6,4	8,4	10,5	13	17	21	
	d3 H12	-	6,3	8,3	10,4	12,4	16,5	20,5	25	31	37	
	t1	-	1,7	2,4	2,9	3,3	4,4	5,5	6,5	7,5	8,5	
t2	-	0,2	0,3	0,3	0,3	0,4	0,5	0,5	0,5	0,5		

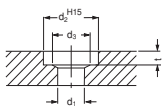
Hexagon Socket Head Cap Screws

DIN 974 -1, DIN 74

Screw Size		M5	M6	M8	M10	M12	M14	M16	M20	M24	M30	
 <p>H - Type : DIN TS 1020/18, TS 1020/17 J - Type : DIN TS 1020/16 K - Type : DIN TS 1020/15</p>	d ₁	o - H13	5,5	6,6	9	11	14	16	18	22	26	33
		i - H12	5,3	6,4	8,4	10,5	13	15	17	21	25	-
	d ₂	H13	10	11	15	18	20	24	26	33	40	48
	d ₃	Only burr					16	18	20	24	28	36
t	H - Type	H - Type	4	4,7	6	7	8	9	10,5	12,5	14,5	-
		J - Type	4,2	4,8	6	7,5	8,5	9,5	11,5	13,5	15,5	19,5
		K - Type	5,7	6,8	9	11	13	15	17,5	21,5	25,5	32

Flat Mushroom Head Screws with Hexagon Socket and Fillister Head Screw

DIN 974 -2, DIN 74

Screw Size		M5	M6	M8	M10	M12	M14	M16	M20	M24	M30	
 <p>DIN 931, 934 etc., (TS 1021/...etc.) Type-SA and Type-TA Type-SB and Type-TB</p>	d ₁	o - H13	5,5	6,6	9	11	14	16	18	22	28	33
		i - H12	5,3	6,4	8,4	10,5	13	15	17	21	25	-
	d ₂	SA, TA	15	18	24	28	33	36	40	46	57	71
	H15	SB, TB	18	20	26	33	36	43	46	53	71	82
	d ₃	Only burr							16	20	24	
t	SA, SB	SA, SB	4,2	4,8	6,5	8	9	10	11,5	14,5	16,5	21
		TA, TB	4,7	5,8	7,5	9	11	12	14,5	17,5	20,5	26

Comparison of Materials

Carbon Steels - Alloy steel and related materials

Material No	ASTM	ISO (683/1,10,11)	DIN 17200	SAE / AISI J 403	BS 970	NF A33-101	JIS G 4051	GB 1050,4543
1.0301	1008 1010	C10	CK10 C 10	1010	045A10 045M10	XC10	S10C	08 10
1.0401 1.1141	1015	C15E4 C15M2	C 15 CK15	1015	080M15	CC12 XC15	S15C	15
1.0402 1.1151	1020	-	C 20 CK20	1020	070M20 050A20	XC25	S20C	20
1.0528	1030	C30	C 30	1030	080A30	AF50-C30	S30C	30
1.0501	1035	C35	C 35	1035	080M36	AF50-C30	S35C	35
1.0511	1040	C40	C 40	1039 1040	080M40	AF60-C45 XC42H1	S40C	40
1.0503	1045	C45	C 45	1045 1046	060A45 080M46	AF65-C45 XC45	S45C	45
1.0540	1050	C50	C 50	1049 1050	080M50	XC50	S50C	50
1.0535	1055	C55	C 55	1055	070M55	AF70-C55	S55C	55
1.0601	1060	C60	C 60	1060	080A60	XC60	S58C	60
1.0603	1070	-	C 67	1070	080A67	XC68	-	-
1.0605	1074	-	C 75	1074	080A72	XC75	-	-

Sulfur and sulfur combined free cutting steels (TS 3051)

Material No	DIN	SAE/AISI	UNI	BS	NF / AFNOR	JIS	Notes
1.0711	9S20	1212	-	220 M 07	-	SUM21	Heat treatment isn't applied.
1.0715	9SMn20	1213	CF 9SMn28	230 M 07	S 520	SUM22	Heat treatment isn't applied.
1.0718	9SMnPb28	12L13	CF 9SMnPb28	230 M 07 Pb	S 520 Pb	SUM22L	Heat treatment isn't applied.
1.0736	9SMn36	1214	CF 9SMn36	230 M 07	S 300	SUM25	Heat treatment isn't applied.
1.0737	9SMnPb36	12L14	CF 9SMnPb36	230 M 07 Pb	S 300 Pb	SUM24L	Heat treatment isn't applied.
1.0721	10S20	1108	CF 10S20	210 M 15	13 MF 4	-	Cementation is applied.
1.0722	10SPb20	11L08	CF 10 SPb 20	-	13 MF 4 Pb	-	Cementation is applied.
1.0726	35S20	1140	-	212 M 36	-	-	Tempered is applied.
1.0727	45S20	1146	-	-	-	-	Tempered is applied.
1.0728	60S20	-	-	-	-	-	Tempered is applied.

Notes:

ISO: International Organization for Standardization / Uluslararası Standardizasyon Kurumu

AISI: American Iron and Steel Institute / Amerikan Demir Çelik Enstitüsü

SAE: Society Automotive Engineers / Otomotiv Mühendisleri Odası

BS: British Standard / İngiliz Standartları

DIN: Deutsches Institut für Normung / Alman Standartları Enstitüsü

NF: Norme Française / Fransız Normları

JIS : Japan Industrial Standards / Endüstriyel Japon Standartları

GB: Guo Biao Standard / Çin Standartları

UNI: Ente Nazionale Italiano di Unificazione / İtalyan Standartları Enstitüsü

Comparison of Materials

Case Hardened Steels

Material No	ISO (683/1,10,11)	SAE AISI	BS 970 Part-1	DIN	NF A35-551-554	JIS G 4052
1.5713	13NiCr6	3115	-	13NiCr6	10NC6	-
1.5752	14NiCr14	3415-3310	655H13	14NiCr14	14NC12	-
1.5919	15CrNi6	3115	S107,970-3	15CrNi6	16NC6	-
1.5920	18CrNi8	6264	080M46	18CrNi8	-	-
1.6523	21NiCrMo2	8620	805H20, 805M20	21NiCrMo2	20NCD2	SNCM220H
1.6587	17NiCrMo6	4820, 4317	820A16	17NiCrMo6	18NCD6	-
1.7015	15Cr3	5015	523M15,530A32	15Cr3	12C3, 15Cr2,18C3	-
1.7034	34Cr4	5135	530A36, 530M36	34Cr4	37Cr4, 38C4	-
1.7035	41Cr4	5140	530A40, 530M40	37Cr4	41Cr4, 42C4	-
1.7131	16MnCr5	5115	527M17, 590H17	16MnCr5	16MC5, 16MnCr5	-
1.7139	16MnCrS5	5115	527M17, 590H17	16MnCrS5	16MC5	SMnC420H
1.7147	20MnCr5	5120	-	20MnCr5	20MC5	SMnC420H
1.7149	20MnCrS5	4820, 4826	-	20MnCrS5	-	-
1.7243	18CrMo4	-	708M20	18CrMo4	18CD4	-
1.7321	20MoCr4	8620	805A22	20MoCr4	20MoCr4 KD	-
1.7323	20MoCrS4	8620	-	20MoCrS4	-	-
1.7325	25CrMo4	-	-	25CrMo4	-	-
1.7326	25CrMoS4	-	-	25CrMoS4	-	-

Tempered Steels

Material No	ISO (683/1,10,11)	SAE AISI	BS 970 Part-1	DIN	NF A35-551-554	JIS
1.6511	-	4340, 9840	817M37, 816M40	36CrNiMo4	35NCD5, 40NCD3	-
1.6580	-	4340	823M30	30CrNiMo8	30CND8	SNCM431
1.6582	-	4340, 4337	816M40, 817M40	34CrNiMo6	35NCD3	SNCM447
1.7006	-	5045, 5046	-	46Cr2	42C2, 46Cr2	-
1.7033	34Cr4	5132	530A32, 530M32	34Cr4	32C4, 34Cr4	SCr430
1.7034	37Cr4	5135	530A36, 530M36	37Cr4	38Cr4, 38C4	SCr435
1.7035	41Cr4	5140	530A40, 530M40	41Cr4	41Cr4, 42C4	SCr440
1.7218	-	4130	708A25	25CrMo4	25CD4, 25CrMo4	SCM430
1.7220	34CrMo4	4135, 4137	708A37	34CrMo4	35CrMo4, 35CD4	SCM432
1.7225	42CrMo4	4140, 4142	708M40, 3111-5/1	42CrMo4	42CD4TS	SCM440
1.7228	-	4150	708A47	50CrMo4	50CrMo4	SCM445

Bearing Steels

Material No	ISO	SAE AISI	BS	DIN	NF	JIS
1.3503	-	6443F, 51100	-	105Cr4	-	SUJ 1
1.3505	1.2067	6440K,52100	534A99	100Cr6	100C6	SUJ 2
1.3520	-	A485	535A99	100CrMn6	100CM6	SUJ 3
1.4125	X105CrMo17	440 C	-	X105CrMo17	Z100CD17	SUS 440C

Comparison of Materials

Alloy Tool Steels

Material No	DIN	AISI	BS	NF / AFNOR	JIS
1.2080	X210Cr12	D3	BD3	Z200C12, X200Cr12	SKD1
1.2345	X50CrVMo5-1	-	-	-	-
1.2379	X155CrVMo12-1	D2	BD2	Z160CDV12	SKD11
H.2380	X220CrVMo13-4	-	-	-	-
1.2436	X210CrW12	D6	-	-	SKD2
1.2601	X165CrMoVa12	-	-	-	SKD11

Alloy Tool Steels

Material No	DIN	AISI	BS	NF / AFNOR	JIS
1.2343	X38CrMoV5-1	H11	BH11	Z38CDV5	SKD6
1.2344	X40CrMoV5.1	H13	BH13	Z40CDV5	SKD61
1.2365	X32CrMoV3.3	H10	BH10	32CDV28	SKD7
1.2367	X38CrMoV5.3	H11	BH11	-	SKD61
1.2581	X30WCRV9 3	H21	BH21	Z30WCV9	SKD5
1.2714	X165CrMoVa12	6F3, L6	BS224	55NCDV7	SKT4

Alloy Tool Steels

Material No	DIN	AISI	JIS	ASTM	NF / AFNOR
1.2083	X42Cr13	420	SUS 420J2	-	X41CR13KU
1.2312	40CrMnMoS8-6	P20+S	-	-	-
1.2738	40CrMnNiMo8-6-4	P20	SNCM	P20+Ni	40CMND8

Alloy Tool Steels

Material No	DIN	AISI	BS	NF / AFNOR	JIS
1.2510	100MnCrW4	O1	-	-	SK33
1.2842	90MnCrV8	O2	BO2	90MV8	-

Spring Steels

Material No	DIN	AISI	BS	NF / AFNOR	EN 10027-2
1.0900	38Si6	-	-	-	1.5022
1.0902	46Si7	9245	-	45S7	1.5024
1.0903	51Si7	9255	-	50S7	1.5025
1.0904	55Si7	5155H, 9225	251A58	55S7	1.5026
1.0908	60SiMn5	-	-	-	1.5142
1.0961	60SiCr7	9262	-	-	-
1.0970	38Si7	-	-	-	1.5023
1.5028	65Si7	9260H	251A61	60S7	1.5028
1.5029	71Si7	-	-	-	-
1.5225	51MnV7	-	-	-	-
1.7103	67SiCr8	9254	-	-	1.7103
1.7138	52MnCrB3	50B50	-	-	-
1.7176	55Cr3	5155	-	-	-
1.7701	51CrMoV7	-	-	-	-



Comparison of Materials

According to Tensile Strength Structural Steel

Material	DIN 17100	SAE / AISI	EN 10025-2	NF / AFNOR 35-501	UNI 7070	BS 4360	JIS G3101
1.0035	St 33	-	S185	A 33	Fe 320	-	SS330
1.0037	St 37-2	-	S235JR	E24-2	Fe 360B	40 A	-
1.0036	USt 37-2	A570Gr.33.36	-	-	-	-	-
1.0038	RSt 37-2	A570Gr.36	S235JR	E24-2 NE	-	40 B	-
1.0116	St 37-3	A284Gr.D	S235JR	E24-4	Fe 360 D	40 D	-
1.0044	St 44-2	A570Gr.40	S275JR	E28-2	Fe 430 B	43 B	SS400
1.0144	St 44-3	A578Gr.70	S275JO	E28-3	Fe 430 C	43 C	-
1.0570	St 52-3	-	S355J2+N	E36-3	Fe 510 D	50 D	-
1.0050	St 50-2	A570Gr.50	E295	A50-2	Fe 490	-	SS500
1.0060	St 60-2	-	E335	A60-2	Fe 590	-	-
1.0070	St 70-2	-	E360	A70-2	Fe 690	-	-

U - Boiling Casting, R - Calm Casting

TS - 552 Gray Cast Irons

TS - 552 Lamellar Graphite Cast Irons

Symbol	DDL-15	DDL-20	DDL-25	DDL-30
Tensile Strength N/mm ²	150	200	250	300
Features				
Hardness HB	160-190	170-210	180-250	200-240
Mikro structure	Ferritic + Pearlitic	Pearlitic + Ferritic	Pearlitic (min %90)	Pearlitic (%100)
Chemical Composition	C : 3.40-3.60 Si : 2.30-2.50 Mn : 0.50-0.80 S : 0.12 max. P : 0.50 max.	C : 3.20-3.40 Si : 2.10-2.30 Mn : 0.50-0.80 S : 0.12 max. P : 0.40 max.	C : 3.00-3.25 Si : 1.85-2.10 Mn : 0.40-0.70 S : 0.12 max. P : 0.25 max.	C : 2.95-3.10 Si : 1.70-2.00 Mn : 0.40-0.70 S : 0.10 max. P : 0.20 max.

TS - 552 Comparison of Lamellar Graphite Cast Irons

TSE TS-552	EU - EN 1561	DIN 1691	ASTM A 4876	BS 1452	NF A32-101	UNI 5007	JIS G 5501
DDL-15	GJL 150	GG 15	Class 20 B	Grade 150	Ft 15 D	GG 15	FC 150
DDL-20	GJL 200	GG 20	Class 25 B	Grade 220	Ft 20 D	GG 20	FC 200
DDL-25	GJL 250	GG 25	Class 35 B	Grade 250	Ft 25 D	GG 25	FC 250
DDL-30	GJL 300	GG 30	Class 50 B	Grade 300	Ft 30 D	GG 30	FC 300



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