

# OPRAWY I CZĘŚCI ZNORMALIZOWANE DO TŁOCZNIKÓW DIE SETS AND COMPONENTS FOR DIE SETS



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# Informacje ogólne

General information



## Rodzaje stali Steel types

Oznaczenie materiału Material type	1.1730	1.2379	S355J2 (+N)
Skład chemiczny [ % ] Chemical composition	C=0,45 Mn=0,75 Si=0,30	C=1,6 Mn=0,3 Si=0,25 Cr=12,0 V=1,0	C=0,2 Mn=1,6 Si=0,55
Wytrzymałość na rozciąganie Tensile strength	600 N/mm <sup>2</sup>	855 N/mm <sup>2</sup>	450 - 630 N/mm <sup>2</sup>
Twardość Hardness	Max. 241HB	Max. 253HB	Max. 220HB
Charakterystyka General information	Stal konstrukcyjna w głowa na niehartowane płyty.  Unalloyed tool steel for not-hardened plates.	Stal narzędziowa, stopowa na matryce, stemple i inne narzędzia tnące. Wysoka udarność i odporność na cieranie w stanie zahartowanym. Hartuje się do 62HRC. Cięcie gazowe niemożliwe.  Alloyed tool steel for dies, punches and other cutting tools. High impact strength and wear resistance when hardened. Can be heat treated up to 62HRC. Gas cutting not available.	Niskostopowa stal konstrukcyjna o podwyższonej udarność, nie obrabiana cieplnie. Dobra spawalność.  Low-alloy not hardened tool steel with improved toughness and good weldability.

## CERTAL®

**Właściwości fizyko-mechaniczne**  
**Mechanical and physical properties**

**Oznaczenie stopu wg EN: AlZn5Mg3Cu**  
**Alloy code according to EN: AlZn5Mg3Cu**

Parametry Parameters	CERTAL® (T651)			CERTAL SPC® (T652)
Grubość Thickness [mm]	≥ 8 ÷ 25	> 25 ÷ 100	> 100 ÷ 140	≥ 150 ÷ 300
Granica plastyczności Re 0,2 Yield strength Re 0,2 [N/mm <sup>2</sup> ]	495	495	490	480
Wytrzymałość na rozciąganie Tensile strength [N/mm <sup>2</sup> ]	555	550	545	540
Twardość [HB] Hardness Brinell [2,5/62,5]	170	165	165	160
Gęstość Density [g/cm <sup>3</sup> ]	2,76			
Współczynnik rozszerzalności liniowej Lineal coefficient of expansion [K <sup>-1</sup> ]	23,6 x 10 <sup>-6</sup>			
Przewodność ciepła Thermal conductivity [W/m x K]	120 ÷ 150			
Charakterystyka General information	<p>Właściwości wytrzymałościowe porównywalne do stali konstrukcyjnych w głowach i niskostopowych nie obrabianych cieplnie. Bardzo dobra obrabialność skrawaniem i obróbka elektroerozyjna. Dobre spawanie oporowe. Stosowana na płyty podstawy, prowadnice i stemplowe w postaciach tłoczników. Cięcie gazowe niemożliwe.</p> <p>Strength properties comparable to not heat treated constructional carbon steel or low-alloy steel. Excellent machining properties and EDM properties. Good for resistance welding. Apply to die shoes, stripper plates and punch holders for progression tools. Gas cutting not available.</p>			

Uwaga: Inne gatunki materiałów według uzgodnienia      Note: Other materials upon consultation.

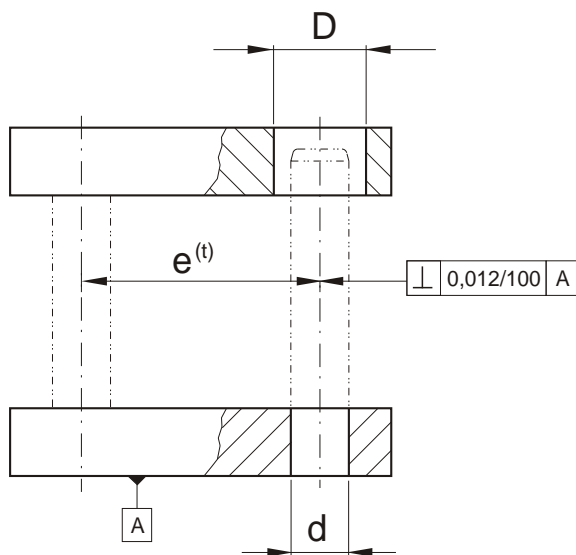
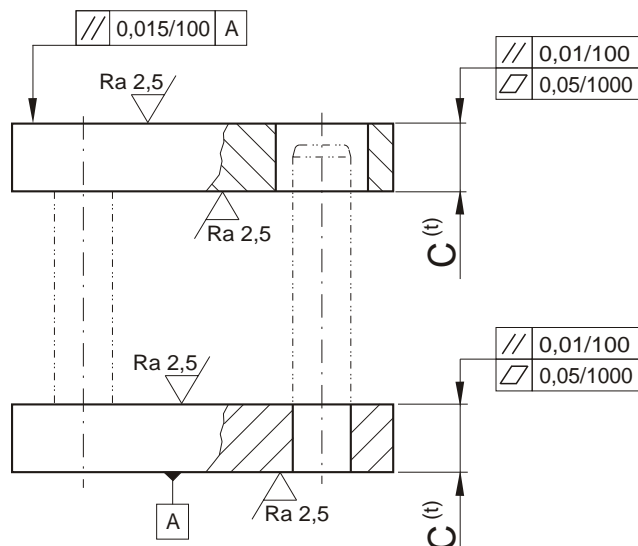
wersja version	<b>C</b> tolerancje tolerances ( t )
“T” - ta sza “T” - economy finish	+0,00 -2,00
“K” - dro sza “K”- upgraded finish	+0,00 -0,10

Uwaga:

Tolerancje płaskości i równoległości powierzchni oraz położenia otworów pod elementy prowadzące są zachowane niezależnie od wersji wykonania.

Note:

Tolerances of surface flatness and parallelism as well as tolerances of holes for guiding elements remain the same for both finish versions.



- 1) D= H5  
Odnosi si do tulei - **FT**  
**FB, FG, FC, BPE**  
Applies to bushes - **FT**  
**FB, FG, FC, BPE**
- 2) d= H5  
Odnosi si do słupa - **FK**  
Applies to pin - **FK**
- 3) d= R6  
Odnosi si do słupa - **FS**  
Applies to pin - **FS**

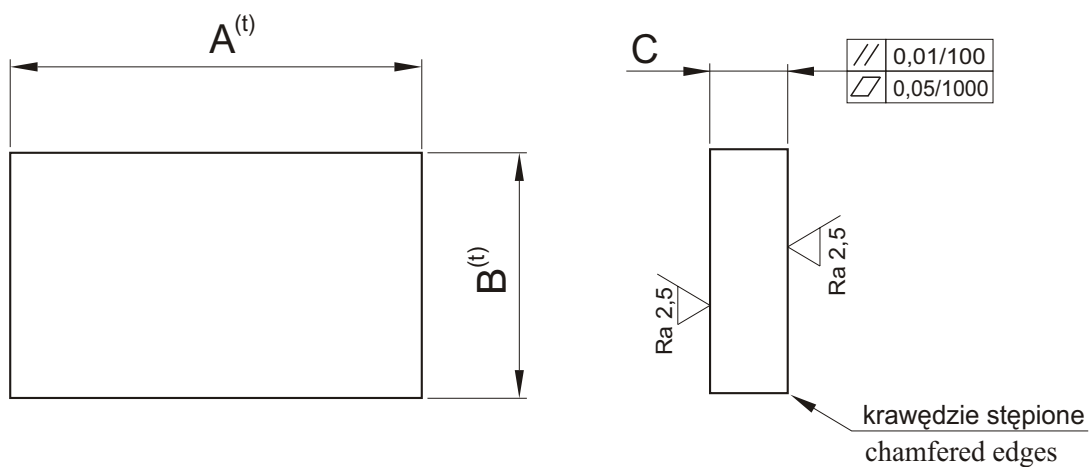
e	( t )
$\leq 100$	$\pm 0,008$
$> 100 - 180$	$\pm 0,010$
$> 180 - 350$	$\pm 0,012$
$> 350 - 500$	$\pm 0,015$
$> 500 - 800$	$\pm 0,018$
$> 800$	$\pm 0,020$

**Wykonanie I**

- obrysy płyt cięte gazowo CNC i malowane na kolor niebieski
- powierzchnie czołowe  $Ra < 2,5\mu m$

**Execution I**

- sides finish: CNC gas cut and painted in blue
- surface finish: roughness  $Ra < 2,5\mu m$



**TABELA TOLERANCJI CIĘCIA PALNIKIEM CNC PŁYT STALOWYCH**  
Kształt wewnętrzny i zewnętrzny mierzony przy powierzchni płyty

**OVERALL TOLERANCES FOR GAS CUT STEEL PLATE**  
External and internal shapes measured at plate surface

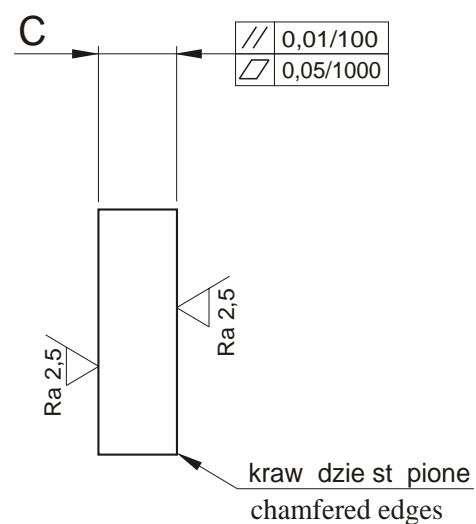
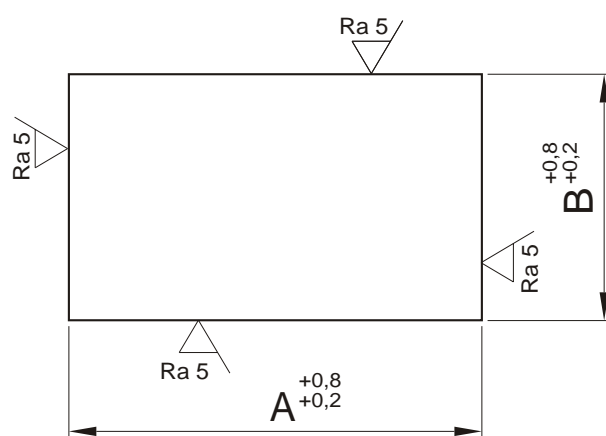
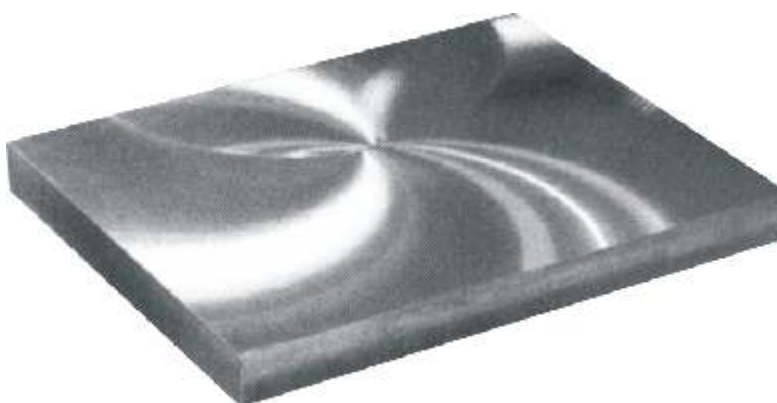
Grubość płyty  C  Plate thickness	A, B		Tolerancja wyciętego otworu  Burn outs tolerance	Min. szerokość wycięcia  Min. width cutout	Min. długość wycięcia  Min. length cutout	Min. średnica otworu  Min. hole diameter	Min. promień narożnika  Min. corner radius	Min. uwolnienia odpadu na stronę  Min. slug clearance/ side	Prostopadłość do powierzchni płyty.  Squarness to surface of plate	Min. odległość między wycięciami  Min. distance between cutout
	Wymiary płyty A, B  Plate size	Tolerancje płyty (t)  Plate tolerance overall								
9-50	760	$\pm 1,0$	+ 2,0	11,0	19,0	19,0	4,0	1,5	1,0	5,0
	>760-1500	$\pm 1,5$	+ 3,0							
	>1500-2500	$\pm 2,5$	+ 5,0							
>50-75	760	$\pm 1,0$	+ 3,0	15,0	23,0	23,0	4,0	1,5	1,0	5,0
	>760-1500	$\pm 1,5$	+ 3,0							
	>1500-2500	$\pm 2,5$	+ 5,0							
>75-115	760	$\pm 1,5$	+ 2,5	18,0	26,0	30,0	5,0	2,5	1,5	6,5
	>760-1500	$\pm 2,5$	+ 5,0							
	>1500-2500	$\pm 3,5$	+ 6,5							
>115-150	760	$\pm 1,5$	+ 3,0	23,0	32,0	32,0	5,0	3,5	1,5	10,0
	>760-1500	$\pm 2,5$	+ 5,0							
	>1500-2500	$\pm 3,5$	+ 7,0							
>150-190	760	$\pm 2,3$	+ 4,6	25,5	44,5	44,5	6,5	4,8	1,9	11,5
	>760-1500	$\pm 3,2$	+ 6,4							
	>1500-2500	$\pm 4,5$	+ 9,0							
>190-250	760	$\pm 2,5$	+ 5,0	44,5	63,5	63,5	6,5	6,5	2,5	16,0
	>760-1500	$\pm 4,0$	+ 8,0							
	>1500-2500	$\pm 5,0$	+ 10,0							

Wykonanie II

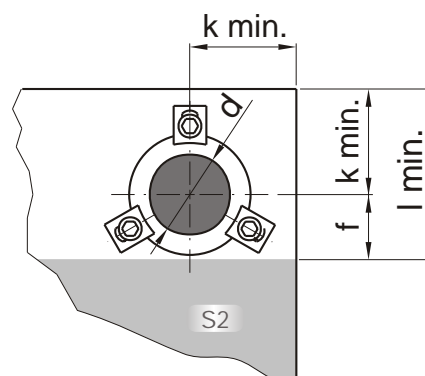
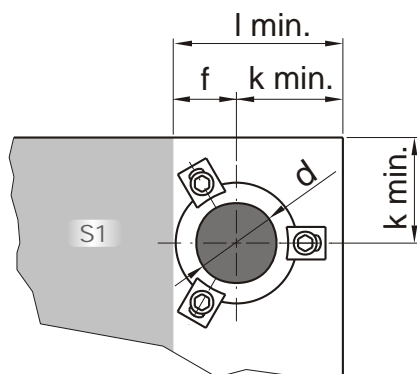
- obrysy płyt frezowane Ra < 5µm
- powierzchnie czołowe Ra < 2,5µm

Execution II

- sides finish: quality milling, roughness Ra < 5µm
- surface finish: roughness Ra < 2,5µm



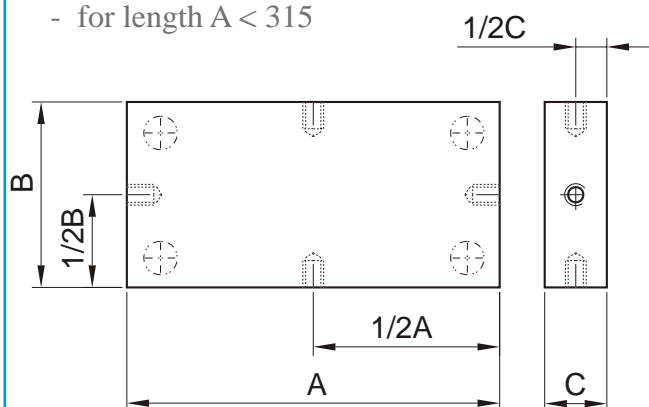
Dotyczy elementów prowadz cych wg norm ISO ( FB, FT, FG, FC, FS, FK)  
Applies to ISO standard elements ( FB, FT, FG, FC, FS, FK )



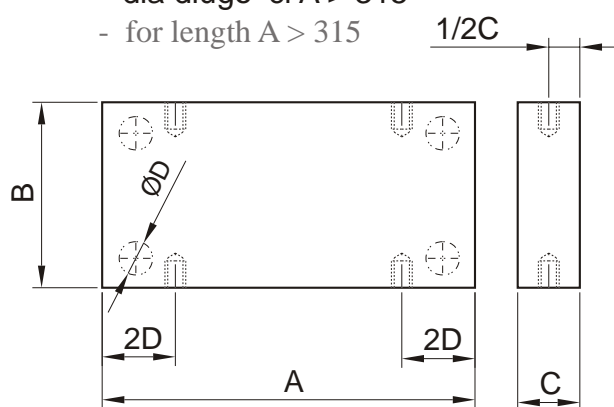
	FZM			ZMI		
d	kmin.	lmin.	f	kmin.	lmin.	f
20/19	39	59	20	40	60	20
25/24	44	71	27	45	74	29
32/30	47	76	29	50	81	31
40/38	50	83	33	55	88	33
50/48	56	96	40	60	100	40
63/60	65	113	48	70	118	48
80	75	134	59	80	139	59

Rozmieszczenie otworów dla czopów transportowych.  
Handling holes locations.

- dla długo ci  $A < 315$
- for length  $A < 315$



- dla długo ci  $A > 315$
- for length  $A > 315$



rednica czopa Lifting stud thread size	F max. [ kg ]
M16	320
M20	500
M24	1000
M30	1500
M36	2500

Uwaga:

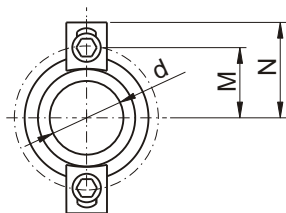
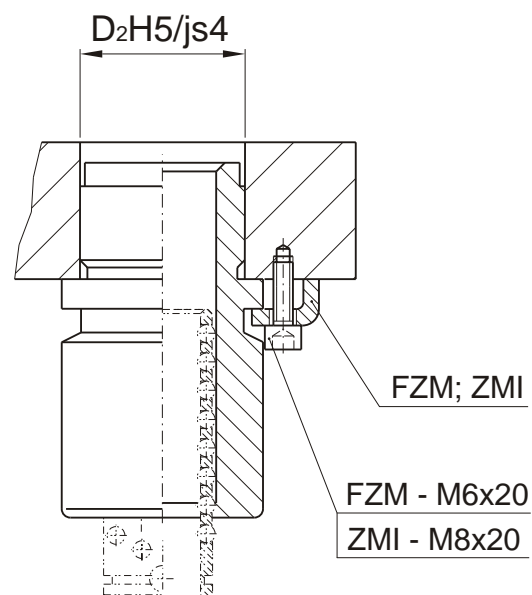
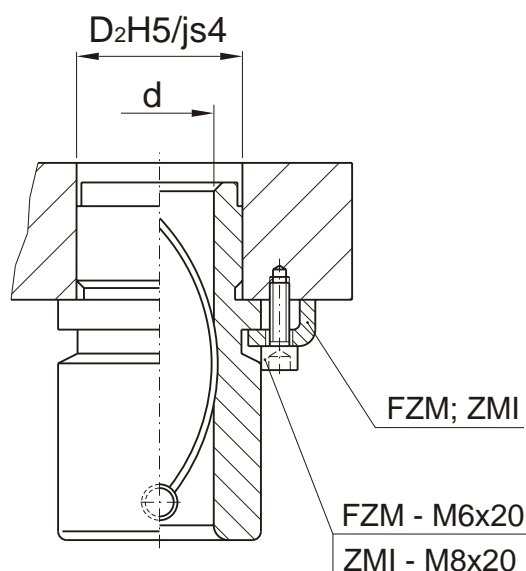
- 1) rednic (gwintu) czopa okre la zamawiaj cy na podstawie tabeli dopuszczalnych obci e (Fmax.)
- 2) Inne rozmieszczenie otworów - na yczenie.

Note:

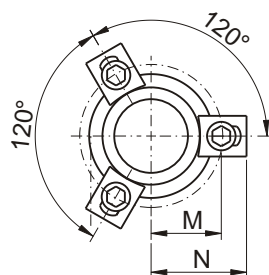
- 1) Specify thread size from chart.
- 2) Other hole locations on request.



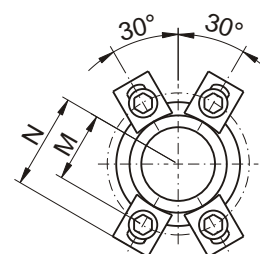
Tolerancje i pasowania odnoszą się do tulei wg norm ISO ( FB, FT, FG, FC )  
Tolerances and class of fit apply to ISO standard bushings ( FB, FT, FG, FC )



dla  $d < 20$   
for



dla  $24 < d < 32$   
for

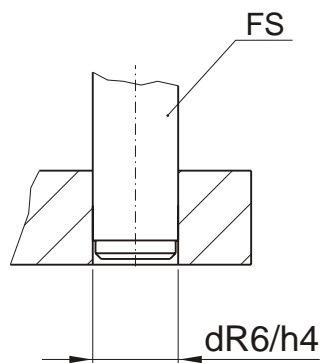


dla  $d > 38$   
for

D <sub>2</sub>	Tolerancje rednicy d Dia d tolerances		d	FZM		ZMI	
	dla otworu for hole H5	dla tulei for pin js4		M	N	M	N
32	+ 0,011 - 0,000	+ 0,0035 - 0,0035	20/19	26,0	34,5	27,0	36,0
40			25/24	30,0	38,5	31,0	40,0
48			32/30	33,5	42,0	35,0	44,0
58	+ 0,013 - 0,000	+ 0,004 - 0,004	40/38	38,5	47,0	40,0	49,0
70			50/48	45,5	54,0	47,0	56,0
85	+ 0,015 - 0,000	+ 0,005 - 0,005	63/60	53,0	61,5	54,5	63,5
105			80	64,5	73,0	66,0	75,0

Rodzaj Y

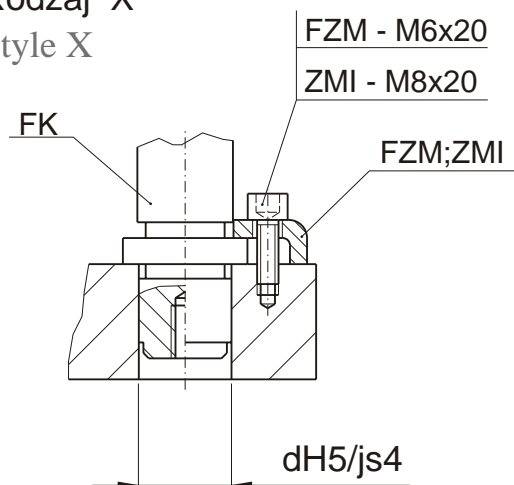
Style Y



d	Tolerancje rednicy d Dia d tolerances	
	dla otworu for hole R6	dla słupa for pin h4
20/19	- 0,024 - 0,037	+ 0,000 - 0,006
25/24		
30		
32	- 0,029 - 0,045	+ 0,000 - 0,007
40/38		
50/48		
63/60	- 0,035 - 0,054	+ 0,000 - 0,008
80	- 0,037 - 0,056	

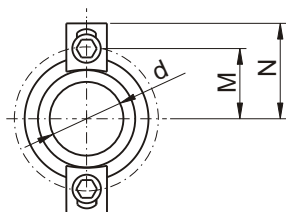
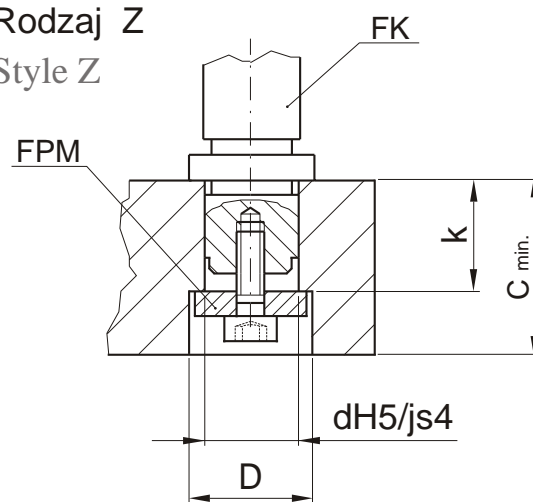
Rodzaj X

Style X

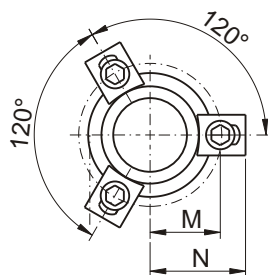


Rodzaj Z

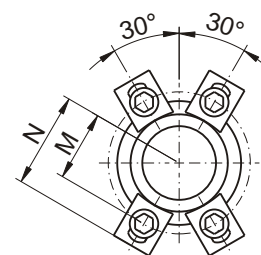
Style Z



dla  
for  $d < 20$



dla  
for  $24 < d < 32$



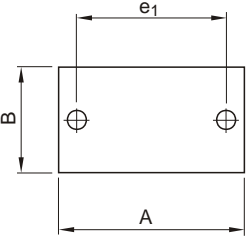
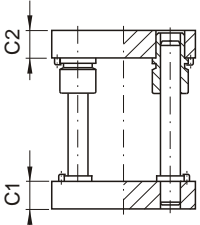
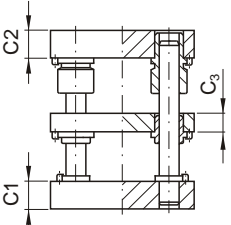
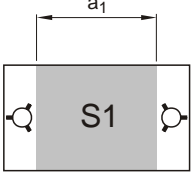
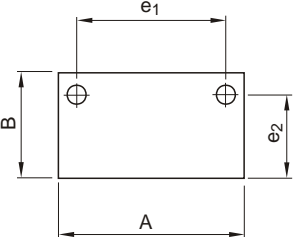
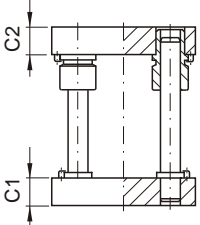
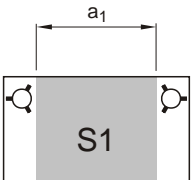
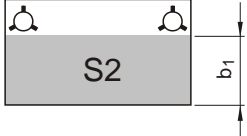
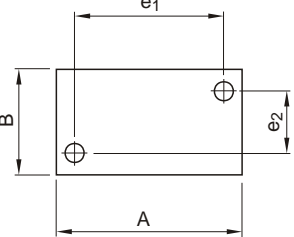
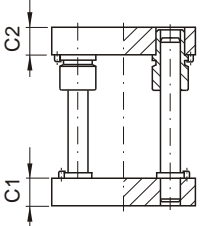
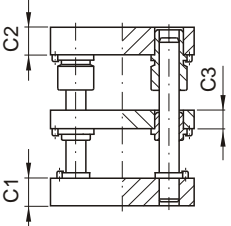
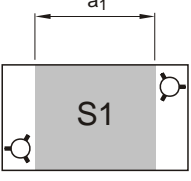
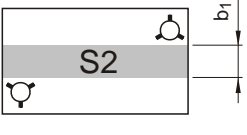
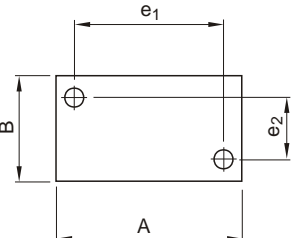
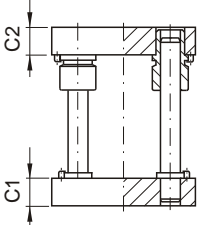
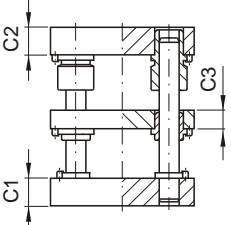
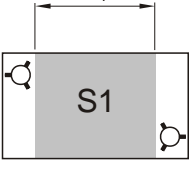
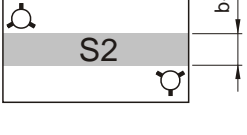
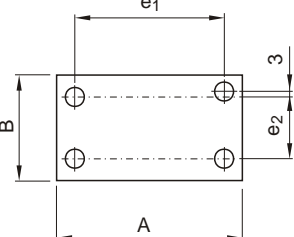
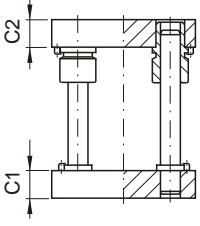
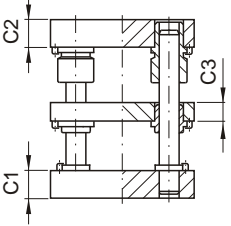
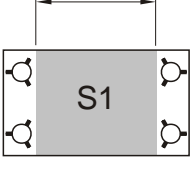
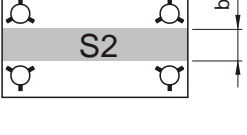
dla  
for  $d > 38$

d	Tolerancje rednicy d Dia d tolerances		D	k	Cmin.	FZM		ZMI	
	dla otworu for hole H5	dla słupa for pin js4				M	N	M	N
20/19	+ 0,009 - 0,000	+ 0,003 - 0,003	27	24	37	18,0	26,5	19,5	28,5
25/24			34	31	44	21,5	30,0	22,0	31,0
30			42	38	51	25,5	34,0	25,5	34,5
32	+ 0,011 - 0,000	+ 0,0035 - 0,0035	52			30,5	39,0	29,5	38,5
40/38			62	48	61	37,0	44,5	36,0	45,0
50/48			72			45,5	54,0	44,5	53,5
63/60	+ 0,013 - 0,000	+ 0,004 - 0,004	95	61	83	53,0	61,5	54,5	63,5
80									

# Oprawy standardowe

Standard die sets



Płyty Plates	Rodzaje opraw Die set types		Powierzchnia robocza Working area	
	<p><b>E/2-</b></p> 	<p><b>E/3-</b></p> 		
	<p><b>F/2-</b></p> 			
	<p><b>D/2-</b></p> 	<p><b>D/3-</b></p> 		
	<p><b>H/2-</b></p> 	<p><b>H/3-</b></p> 		
	<p><b>N/2-</b></p> 	<p><b>N/3-</b></p> 		

**Do opraw standardowych zastosowano płyty w wykonaniu:**

Obrysy płyt frezowane w tolerancjach  $\pm 0,1$  mm , chropowato  $Ra < 5\mu m$

Płaszczyzny czołowe płyt obrobione z zachowaniem parametrów:

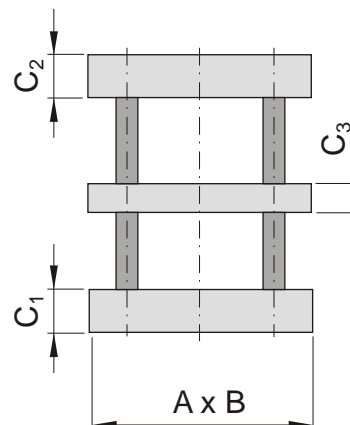
- płasko 0,05/1000
- równoległość 0,01/100
- chropowato  $Ra < 2,5\mu m$

**Standard die sets plates execution:**

Sides finish - milling, tol.  $\pm 0,1$ mm, roughness  $Ra < 5\mu m$

Plate surface finish with following parameters:

- flatness 0,05/1000
- parallelism: 0,01/100
- roughness:  $Ra < 2,5\mu m$

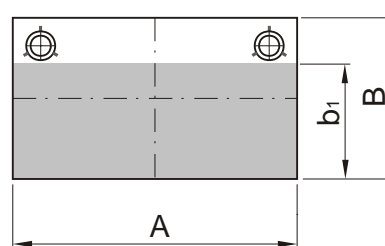
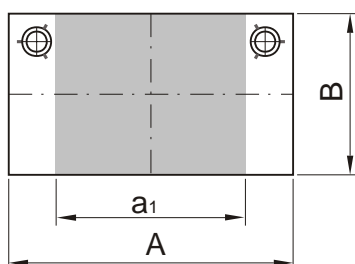


B x A	C <sub>1</sub> ; C <sub>2</sub> ; C <sub>3</sub>				
	27	36	46	56	66
156x156					
156x196					
156x246					
156x296					
196x196					
190x246					
196x296					
196x346					
196x396					
246x246					
246x296					
246x346					
246x396					
246x446					
246x496					
296x296					
296x346					
296x396					
296x446					
296x496					
346x346					
346x396					
346x446					
346x496					
396x396					
396x446					
396x496					
446x446					
446x496					
496x496					

Uwaga: Inne wymiary płyt na życzenie.

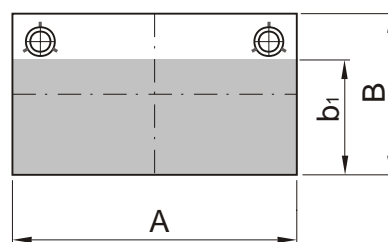
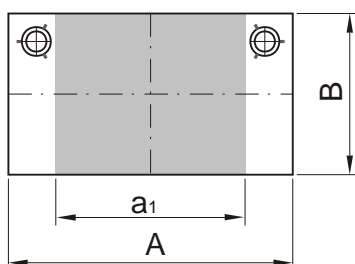
Note: - other plate sizes on request.

Rodzaje opraw / Die set types					
E	F	D	H	N	Powierzchnia robocza Working area
					S1
					S2



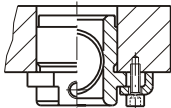
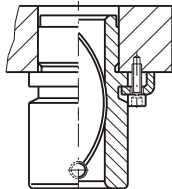
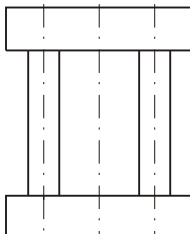
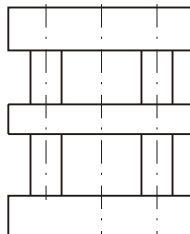
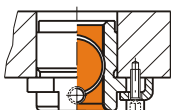
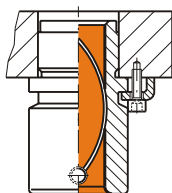
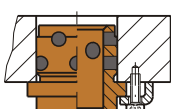
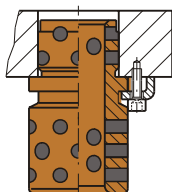
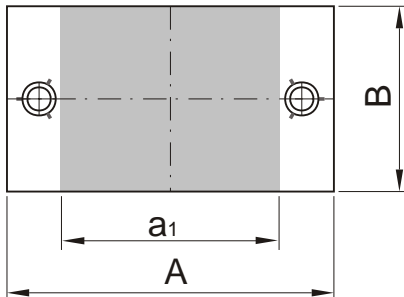
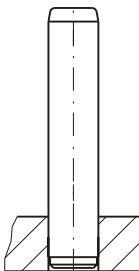
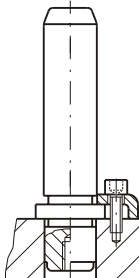
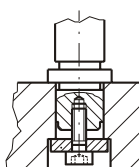
Wymiary opraw Die set dimension  B x A	Rodzaj oprawy / Die set type								
	E	F		D		H		N	
	S1 a1xB	S1 a1xB	S2 Axb1	S1 a1xB	S2 Axb1	S1 a1xB	S2 Axb1	S1 a1xB	S2 Axb1
156x156	74x156	40x156	156x98	40x156	156x40	40x156	156x40	34x156	156x37
156x196	114x156	80x156	196x98	80x156	196x40	80x156	196x40	74x156	196x37
156x246	164x156	130x156	246x98	130x156	246x40	130x156	246x40	124x156	246x37
156x296	214x156	180x156	296x98	180x156	296x40	180x156	296x40	174x156	296x37
196x196	58x196	58x196	196x127	58x196	196x58	58x196	196x58	52x196	196x55
190x246	108x190	108x190	246x121	108x190	246x52	108x190	246x52	102x190	246x49
196x296	158x196	158x196	296x127	158x196	296x58	158x196	296x58	152x196	296x55
196x346	208x196	208x196	346x127	208x196	346x58	208x196	346x58	202x196	346x55
196x396	258x196	258x196	396x127	258x196	396x58	258x196	396x58	252x196	396x55
246x246	96x246	96x246	246x171	96x246	246x96	96x246	246x96	90x246	246x93
246x296	146x246	146x246	296x171	146x246	296x96	146x246	296x96	140x246	296x93
246x346	196x246	196x246	346x171	196x246	346x96	196x246	346x96	190x246	346x93
246x396	246x246	246x246	396x171	246x246	396x96	246x246	396x96	240x246	396x93
246x446	296x246	296x246	446x171	296x246	446x96	296x246	446x96	290x246	446x93
246x496	346x246	346x246	496x171	346x246	496x96	346x246	496x96	340x246	496x93
296x296	146x296	146x296	296x221	146x296	296x146	146x296	296x146	140x296	296x143
296x346	196x296	196x296	346x221	196x296	346x146	196x296	346x146	190x296	346x143
296x396	246x296	246x296	396x221	246x296	396x146	246x296	396x146	240x296	396x143
296x446	312x296	282x296	446x214	282x296	446x132	282x296	446x132	276x296	446x129
296x496	362x296	332x296	496x214	332x296	496x132	332x296	496x132	326x296	496x129
346x346	212x346	182x346	346x264	182x346	346x182	182x346	346x182	176x346	346x179
346x396	262x346	232x346	396x264	232x346	396x182	232x346	396x182	226x346	396x179
346x446	312x346	282x346	446x264	282x346	446x182	282x346	446x182	276x346	446x179
346x496	362x346	332x346	496x264	332x346	496x182	332x346	496x182	326x346	496x179
396x396	262x396	232x396	396x314	232x396	396x232	232x396	396x232	226x396	396x229
396x446	312x396	282x396	446x314	282x396	446x232	282x396	446x232	276x396	446x229
396x496	362x396	332x396	496x314	332x396	496x232	332x396	496x232	326x396	496x229
446x446	312x446	282x446	446x364	282x446	446x282	282x446	446x282	276x446	446x279
446x496	362x446	332x446	496x364	332x446	496x282	332x446	496x282	326x446	496x279
496x496	362x496	332x496	496x414	332x496	496x332	332x496	496x332	326x496	496x329

Rodzaje opraw / Die set types					
E	F	D	H	N	Powierzchnia robocza Working area
					S1
					S2

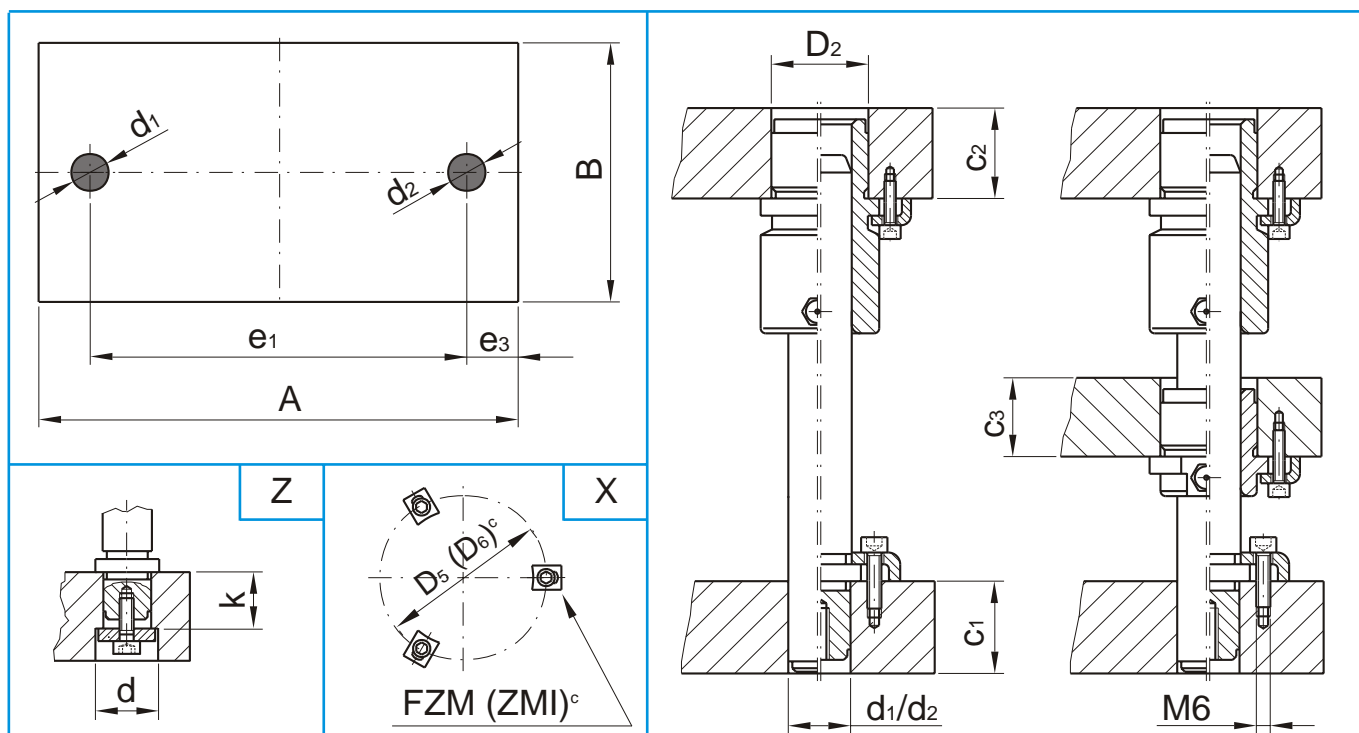


Powierzchnie robocze dla zaczepów mocujących ZMI ( wykonanie opcjonalne )  
Working areas for retaining clamps type ZMI ( optional execution )

Wymiary opraw Die set dimension  B x A	Rodzaj oprawy / Die set type								
	E	F		D		H		N	
	S1 a <sub>1</sub> x B	S1 a <sub>1</sub> x B	S2 A x b <sub>1</sub>	S1 a <sub>1</sub> x B	S2 A x b <sub>1</sub>	S1 a <sub>1</sub> x B	S2 A x b <sub>1</sub>	S1 a <sub>1</sub> x B	S2 A x b <sub>1</sub>
156x156	74x156	40x156	156x98	40x156	156x40	40x156	156x40	34x156	156x37
156x196	114x156	80x156	196x98	80x156	196x40	80x156	196x40	74x156	196x37
156x246	164x156	130x156	246x98	130x156	246x40	130x156	246x40	124x156	246x37
156x296	214x156	180x156	296x98	180x156	296x40	180x156	296x40	174x156	296x37
196x196	54x196	54x196	196x125	54x196	196x54	54x196	196x54	48x196	196x51
190x246	104x190	104x190	246x119	104x190	246x48	104x190	246x48	98x190	246x45
196x296	154x196	154x196	296x125	154x196	296x54	154x196	296x54	148x196	296x51
196x346	204x196	204x196	346x125	204x196	346x54	204x196	346x54	198x196	346x51
196x396	254x196	254x196	396x125	254x196	396x54	254x196	396x54	248x196	396x51
246x246	92x246	92x246	246x169	92x246	246x92	92x246	246x92	86x246	246x89
246x296	142x246	142x246	296x169	142x246	296x92	142x246	296x92	136x246	296x89
246x346	192x246	192x246	346x169	192x246	346x92	192x246	346x92	186x246	346x89
246x396	242x246	242x246	396x169	242x246	396x92	242x246	396x92	236x246	396x89
246x446	292x246	292x246	446x169	292x246	446x92	292x246	446x92	286x246	446x89
246x496	342x246	342x246	496x169	342x246	496x92	342x246	496x92	336x246	496x89
296x296	142x296	142x296	296x219	142x296	296x142	142x296	296x142	136x296	296x139
296x346	192x296	192x296	346x219	192x296	346x142	192x296	346x142	186x296	346x139
296x396	242x296	242x296	396x219	242x296	396x142	242x296	396x142	236x296	396x139
296x446	312x296	282x296	446x214	282x296	446x132	282x296	446x132	276x296	446x129
296x496	362x296	332x296	496x214	332x296	496x132	332x296	496x132	326x296	496x129
346x346	212x346	182x346	346x264	182x346	346x182	182x346	346x182	176x346	346x179
346x396	262x346	232x346	396x264	232x346	396x182	232x346	396x182	226x346	396x179
346x446	312x346	282x346	446x264	282x346	446x182	282x346	446x182	276x346	446x179
346x496	362x346	332x346	496x264	332x346	496x182	332x346	496x182	326x346	496x179
396x396	262x396	232x396	396x314	232x396	396x232	232x396	396x232	226x396	396x229
396x446	312x396	282x396	446x314	282x396	446x232	282x396	446x232	276x396	446x229
396x496	362x396	332x396	496x314	332x396	496x232	332x396	496x232	326x396	496x229
446x446	312x446	282x446	446x364	282x446	446x282	282x446	446x282	276x446	446x279
446x496	362x446	332x446	496x364	332x446	496x282	332x446	496x282	326x446	496x279
496x496	362x496	332x496	496x414	332x496	496x332	332x496	496x332	326x496	496x329

Typy tulejek prowadz cych Guide bushing types		Rodzaje opraw Die set styles			
 	FT	Dwupłytowe Two plates	E/2	Trzypłytowe Three plates	E/3
					
 	FB	Powierzchnie robocze. Working areas.			
 	FG				S1
	FC				S2
Typy słupów prowadz cych Guide pin types					
FS		FK			
		 			





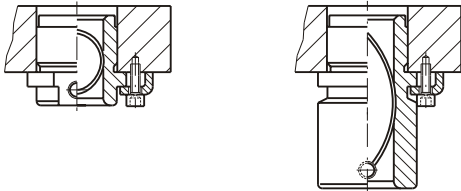
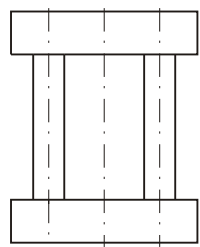
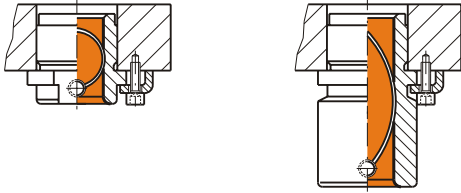
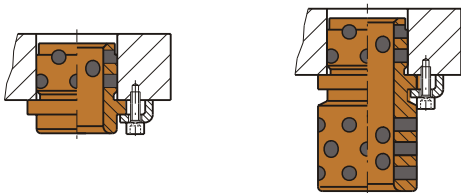
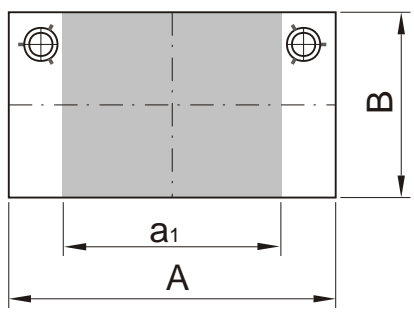
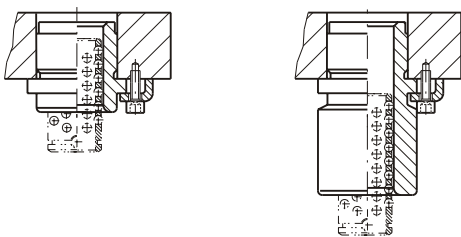
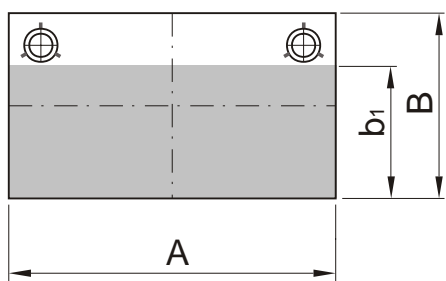
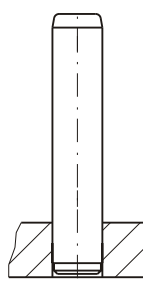
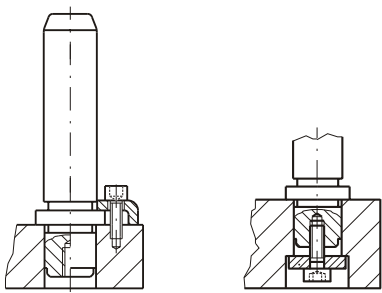
B x A	c <sub>1</sub>	c <sub>2</sub>	c <sub>3</sub>	d <sub>1</sub> /d <sub>2</sub>	D <sub>2</sub>	e <sub>1</sub>	e <sub>2</sub>	e <sub>3</sub>	d	k	D <sub>5</sub> (D <sub>6</sub> ) <sup>c</sup>		Powierzchnie robocze Working areas.	
											dla słupa for pin	dla tulei for bushing	S1 a <sub>1</sub> x <sub>1</sub> B	S2 A <sub>1</sub> x <sub>1</sub> b <sub>1</sub>
156x156	27 <sup>a</sup>	36 <sup>a</sup>	27	20/19	32	114	----	21	---	---	36 (39) <sup>c</sup>	52 (54) <sup>c</sup>	74x156	----
156x196						154	----						114x156	----
156x246						204	----						164x156	----
156x296						254	----						214x156	----
196x196						112	----						58x196	----
190x246	27 <sup>a</sup>	36 <sup>a</sup>	27	25/24	40	162	----	42	---	---	43 (44) <sup>c</sup>	60 (62) <sup>c</sup>	108x190	----
196x296						212	----						158x196	----
196x346						262	----						208x196	----
196x396						312	----						258x196	----
246x246						154	----						96x246	----
246x296	36 <sup>b</sup>	36	46	32/30	48	204	----	46	---	---	51 (51) <sup>c</sup>	67 (70) <sup>c</sup>	146x246	----
246x346						254	----						196x246	----
246x396						304	----						246x246	----
246x446						354	----						296x246	----
246x496						404	----						346x246	----
296x296						204	----						146x296	----
296x346						254	----						196x296	----
296x396						304	----						246x296	----
296x446						378	----						312x296	----
296x496						428	----						362x296	----
346x346	46 <sup>a</sup>	56	46	40/38	58	278	----	34	52	38	61 (59) <sup>c</sup>	77 (80) <sup>c</sup>	212x346	----
346x396						328	----						262x346	----
346x446						378	----						312x346	----
346x496						428	----						362x346	----
396x396						328	----						262x396	----
396x446						378	----						312x396	----
396x496						428	----						362x396	----
446x446						378	----						312x446	----
446x496						428	----						362x446	----
496x496						428	----						362x496	----

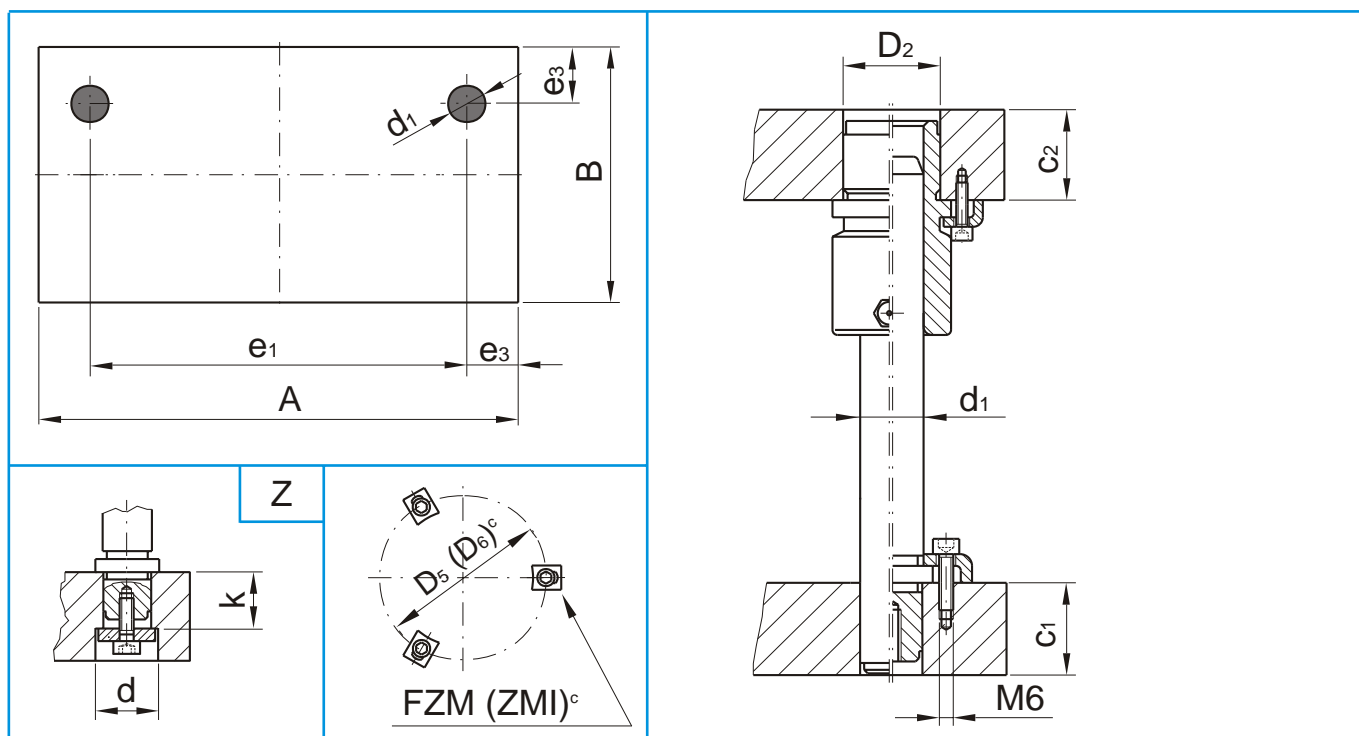
Uwaga:

- a- nie dotyczy mocowania słupa sposobem - Z
- b- dotyczy tylko mocowania słupa typ FS
- c- wykonanie opcjonalne: - powierzchnie robocze patrz na str. L.14
- zaczepy mocuj ce ZMI patrz na str. L.47

Note:

- a- does not apply to pin installation method - Z
- b- applies to installation of FS type pin
- c- optional execution: - working area see page L.14
- retaining clamps ZMI - see page L.47

Typy tulejek prowadz cych Guide bushing types		Rodzaje opraw Die set styles	
	FT	Dwupłytowe Two plates	F/2
			
	FB	Powierzchnie robocze. Working areas.	
	FG		S1
	FC		S2
Typy słupów prowadz cych Guide pin types			
FS		FK	
			



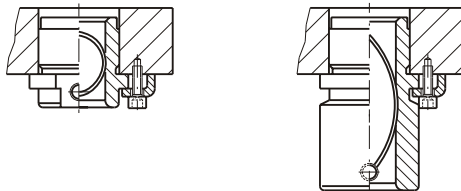
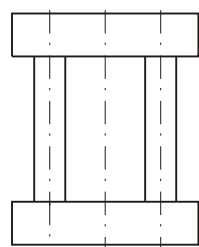
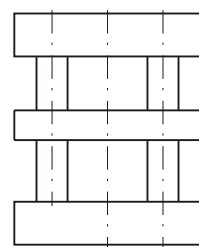
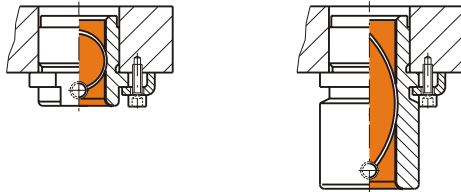
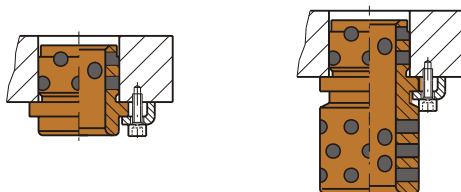
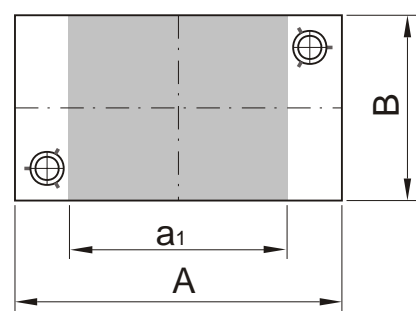
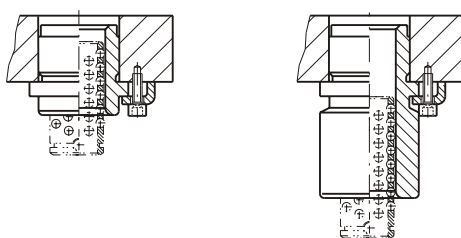
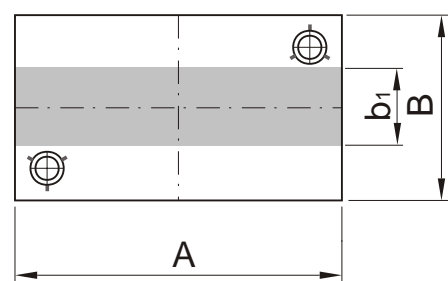
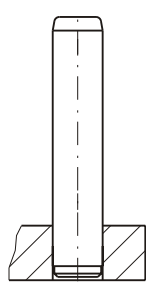
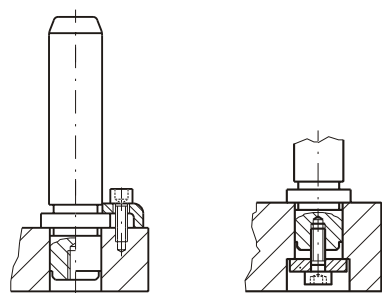
B x A	c <sub>1</sub>		c <sub>2</sub>		d <sub>1</sub>	D <sub>2</sub>	e <sub>1</sub>	e <sub>2</sub>	e <sub>3</sub>	d	k	D <sub>5</sub>		Powierzchnie robocze. Working areas.	
												dla słupa. for pin	dla tulei. for bushing	S1 a <sub>1</sub> x <sub>1</sub> B	S2 A <sub>1</sub> x <sub>1</sub> b <sub>1</sub>
156x156	27 <sup>a</sup>	36 <sup>a</sup>	27	36	20	32	80	----	38	---	---	36 (39) <sup>c</sup>	52 (54) <sup>c</sup>	40x156	156x98
156x196							120	----						80x156	196x98
156x246							170	----						130x156	246x98
156x296							220	----						180x156	296x98
196x196							112	----						58x196	196x127
190x246	27 <sup>a</sup>	36 <sup>a</sup>	27	36	20	32	162	----	38	---	---	36 (39) <sup>c</sup>	52 (54) <sup>c</sup>	80x196	246x127
196x296							212	----						108x196	296x127
196x346							262	----						158x196	346x127
196x396							312	----						208x196	396x127
246x246							154	----						258x196	396x127
246x296	27 <sup>a</sup>	36 <sup>a</sup>	27	36	20	32	204	----	38	---	---	36 (39) <sup>c</sup>	52 (54) <sup>c</sup>	96x246	246x171
246x346							254	----						146x246	296x171
246x396							304	----						196x246	346x171
246x446							354	----						246x246	396x171
246x496							404	----						296x246	446x171
296x296	27 <sup>a</sup>	36 <sup>a</sup>	27	36	20	32	204	----	38	---	---	36 (39) <sup>c</sup>	52 (54) <sup>c</sup>	346x246	496x171
296x346							254	----						146x296	296x221
296x396							304	----						196x296	346x221
296x446							354	----						246x296	396x221
296x496							404	----						296x296	446x221
346x346	27 <sup>a</sup>	36 <sup>a</sup>	27	36	20	32	348	----	38	---	---	36 (39) <sup>c</sup>	52 (54) <sup>c</sup>	346x296	496x221
346x396							398	----						396x296	496x221
346x446							448	----						446x296	496x221
346x496							498	----						496x296	496x221
396x396							548	----						496x296	496x221
396x446	27 <sup>a</sup>	36 <sup>a</sup>	27	36	20	32	598	----	38	---	---	36 (39) <sup>c</sup>	52 (54) <sup>c</sup>	496x296	496x221
396x496							648	----						496x296	496x221
446x446							698	----						496x296	496x221
446x496							748	----						496x296	496x221
496x496							798	----						496x296	496x221
156x156	27 <sup>a</sup>	36 <sup>a</sup>	27	36	20	32	80	----	38	---	---	36 (39) <sup>c</sup>	52 (54) <sup>c</sup>	40x156	156x98
156x196							120	----						80x156	196x98
156x246							170	----						130x156	246x98
156x296							220	----						180x156	296x98
196x196							112	----						58x196	196x127
190x246	27 <sup>a</sup>	36 <sup>a</sup>	27	36	20	32	162	----	38	---	---	36 (39) <sup>c</sup>	52 (54) <sup>c</sup>	80x196	246x127
196x296							212	----						108x196	296x127
196x346							262	----						158x196	346x127
196x396							312	----						208x196	396x127
246x246							154	----						258x196	396x127
246x296	27 <sup>a</sup>	36 <sup>a</sup>	27	36	20	32	204	----	38	---	---	36 (39) <sup>c</sup>	52 (54) <sup>c</sup>	96x246	246x171
246x346							254	----						146x246	296x171
246x396							304	----						196x246	346x171
246x446							354	----						246x246	396x171
246x496							404	----						296x246	446x171
296x296	27 <sup>a</sup>	36 <sup>a</sup>	27	36	20	32	204	----	38	---	---	36 (39) <sup>c</sup>	52 (54) <sup>c</sup>	346x246	496x171
296x346							254	----						146x296	296x221
296x396							304	----						196x296	346x221
296x446							354	----						246x296	396x221
296x496							404	----						296x296	446x221
346x346	27 <sup>a</sup>	36 <sup>a</sup>	27	36	20	32	448	----	38	---	---	36 (39) <sup>c</sup>	52 (54) <sup>c</sup>	346x296	496x221
346x396							498	----						396x296	496x221
346x446							548	----						446x296	496x221
346x496							598	----						496x296	496x221
396x396							648	----						496x296	496x221
396x446	27 <sup>a</sup>	36 <sup>a</sup>	27	36	20	32	698	----	38	---	---	36 (39) <sup>c</sup>	52 (54) <sup>c</sup>	496x296	496x221
396x496							748	----						496x296	496x221
446x446							798	----						496x296	496x221
446x496							848	----						496x296	496x221
496x496							898	----						496x296	496x221

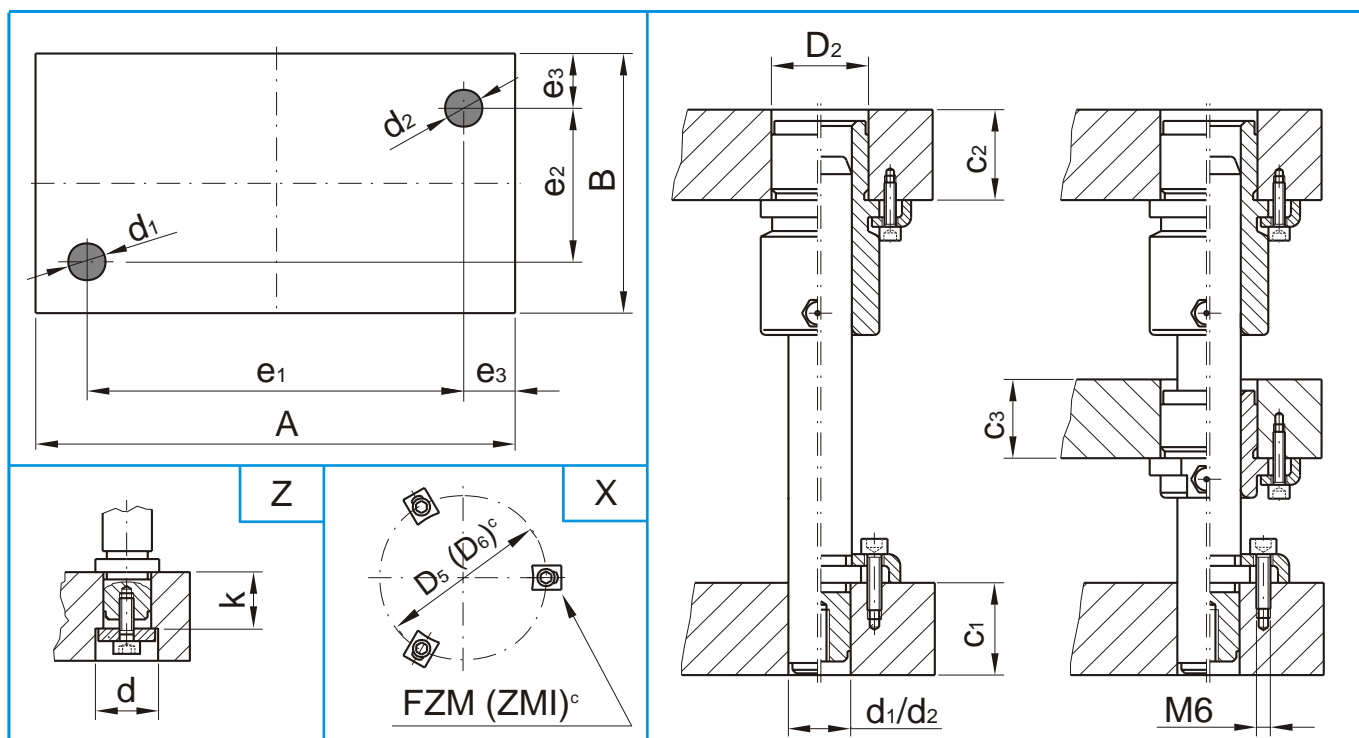
Uwaga:

- a- nie dotyczy mocowania słupa sposobem - Z
- b- dotyczy tylko mocowania słupa typ FS
- c- wykonanie opcjonalne: - powierzchnie robocze patrz na str. L.14
- zaczepy mocuj ce ZMI patrz na str. L.47

Note:

- a- does not apply to pin installation method - Z
- b- applies to installation of FS type pin
- c- optional execution: - working area see page L.14
- retaining clamps ZMI - see page L.47

Typy tulejek prowadz cych Guide bushing types		Rodzaje opraw Die set styles				
		Dwupłytowe Two plates		D/2	Trzypłytowe Three plates	D/3
						
		FB	Powierzchnie robocze. Working areas			
		FG				S1
		FC				S2
Typy słupów prowadz cych Guide pin types						
FS			FK			
						



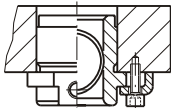
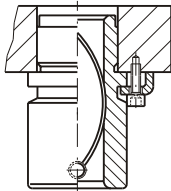
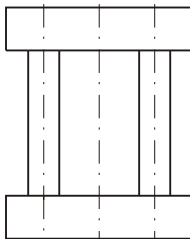
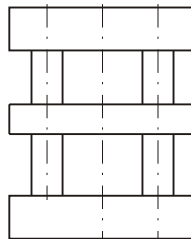
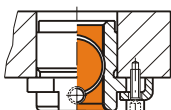
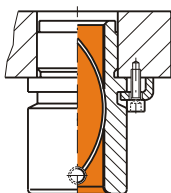
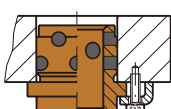
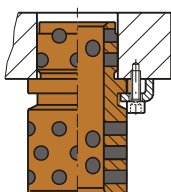
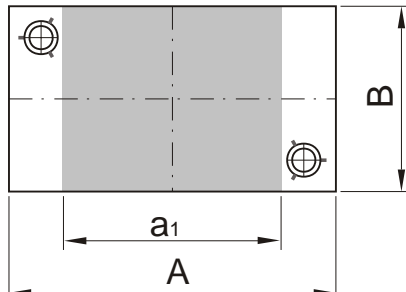
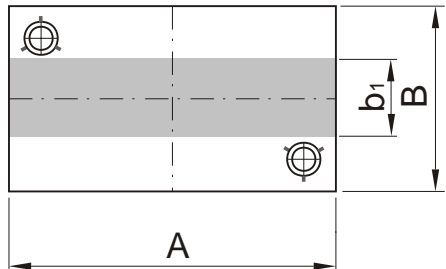
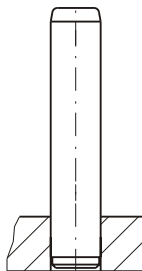
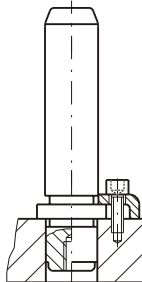
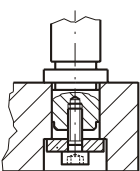
B x A	C <sub>1</sub>		C <sub>2</sub>		C <sub>3</sub>	d <sub>1</sub> /d <sub>2</sub>	D <sub>2</sub>	e <sub>1</sub>	e <sub>2</sub>	e <sub>3</sub>	d	k	D <sub>5</sub> (D <sub>6</sub> ) <sup>c</sup>		Powierzchnie robocze Working areas.	
													dla słupa. for pin	dla tulei. for bushing	S1 a <sub>1</sub> xB	S2 A <sub>x</sub> b <sub>1</sub>
156x156	27 <sup>a</sup>	36 <sup>a</sup>	27	36	27	20/19	32	80	80	38	---	---	36 (39) <sup>c</sup>	52 (54) <sup>c</sup>	40x156	156x40
156x196								120							80x156	196x40
156x246								170							130x156	246x40
156x296								220							180x156	296x40
196x196						25/24	40	112	112	42	---	---	43 (44) <sup>c</sup>	60 (62) <sup>c</sup>	58x196	196x58
190x246								162	106						108x190	246x52
196x296								212	112						158x196	296x58
196x346								262	112						208x196	346x58
196x396								312	112						258x196	396x58
246x246								46 <sup>a</sup>	36 <sup>b</sup>						36	46
246x296	204	146x246	296x96													
246x346	254	196x246	346x96													
246x396	304	246x246	396x96													
246x446	354	296x246	446x96													
246x496	404	346x246	496x96													
296x296	204	146x296	296x146													
296x346	254	196x296	346x146													
296x396	304	246x296	396x146													
296x446	40/38	58	348	49	52	38	61 (59) <sup>c</sup>			77 (80) <sup>c</sup>	282x296	446x132				
296x496			398								332x296	496x132				
346x346			248								182x346	346x182				
346x396			298								232x346	396x182				
346x446			348								282x346	446x182				
346x496	56	66	56	66	56	398	49			52	38	61 (59) <sup>c</sup>	77 (80) <sup>c</sup>	332x346		
396x396						298		232x396	396x232							
396x446						348		282x396	446x232							
396x496						398		332x396	496x232							
446x446						348		282x446	446x282							
446x496						398		332x446	496x282							
496x496						398		398	332x496					496x332		

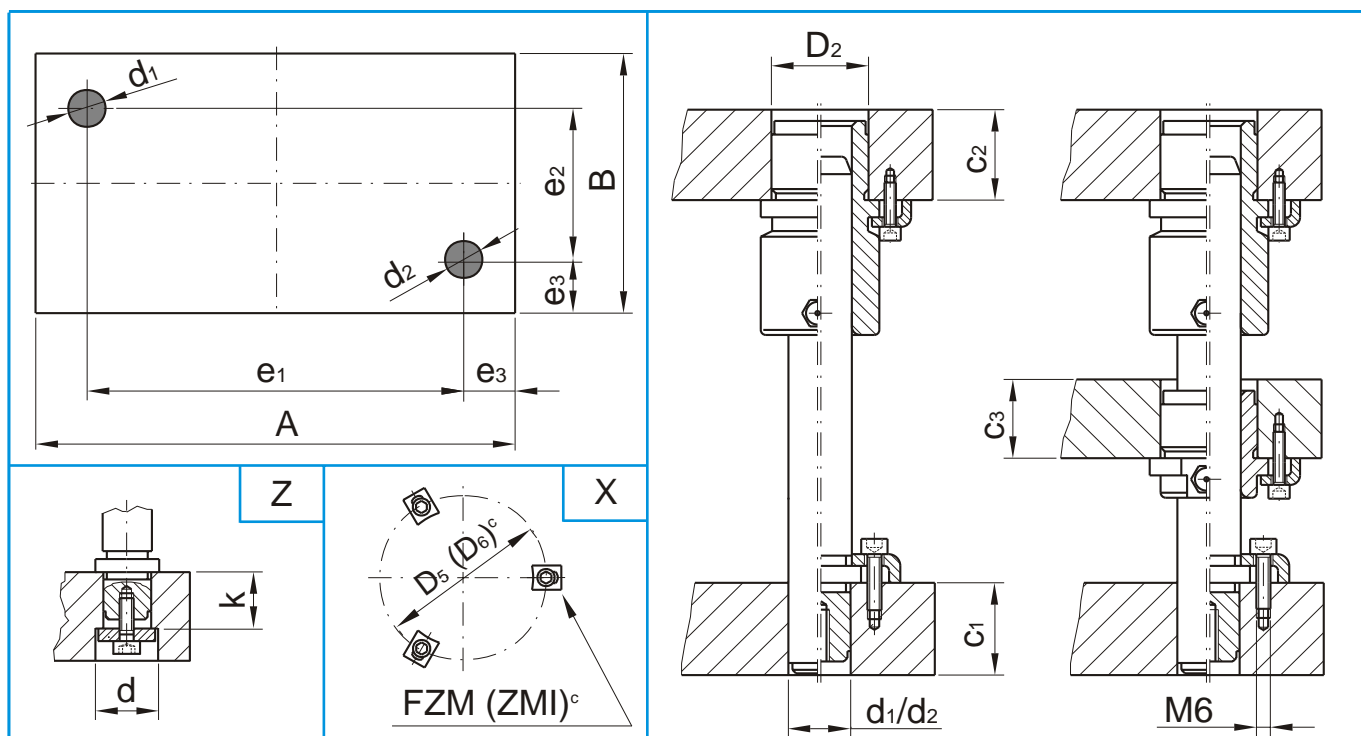
Uwaga:

- a- nie dotyczy mocowania słupa sposobem - Z
- b- dotyczy tylko mocowania słupa typ FS
- c- wykonanie opcjonalne: - powierzchnie robocze patrz na str. L.14
- zaczepy mocuj ce ZMI patrz na str. L.47

Note:

- a- does not apply to pin installation method - Z
- b- applies to installation of FS type pin
- c- optional execution: - working area see page L.14
- retaining clamps ZMI - see page L.47

Typy tulejek prowadz cych Guide bushing types		Rodzaje opraw Die set styles			
 	FT	Dwupłytowe Two plates	H/2	Trzypłytowe Three plates	H/3
					
 	FB	Powierzchnie robocze. Working areas.			
 	FG				S1
	FC				S2
Typy słupów prowadz cych Guide pin types					
FS		FK			
		 			



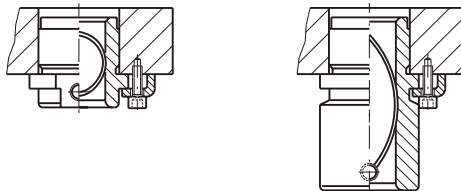
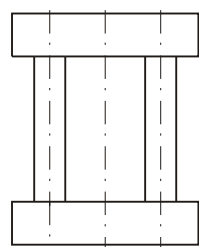
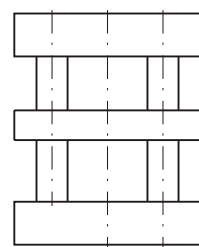
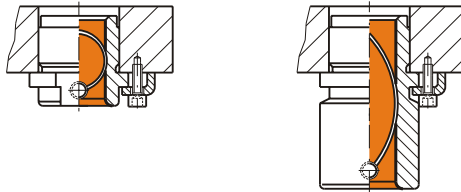
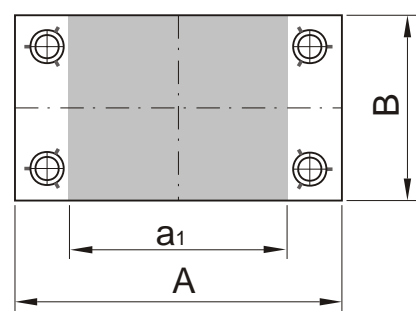
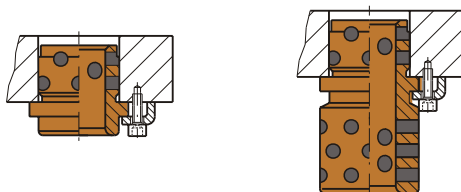
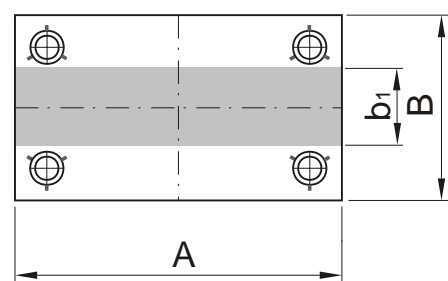
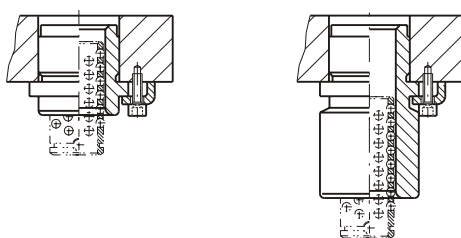
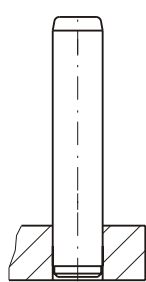
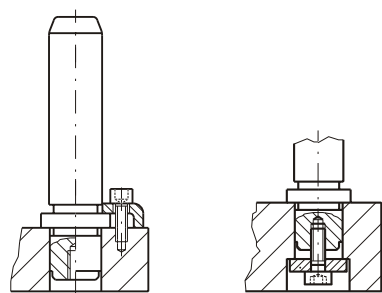
B x A	c <sub>1</sub>		c <sub>2</sub>		c <sub>3</sub>	d <sub>1</sub> /d <sub>2</sub>	D <sub>2</sub>	e <sub>1</sub>	e <sub>2</sub>	e <sub>3</sub>	d	k	D <sub>5</sub> (D <sub>6</sub> ) <sup>c</sup>		Powierzchnie robocze. Working areas.	
													dla słupa. for pin	dla tulei. for bushing	S1 a <sub>1</sub> xB	S2 A <sub>x</sub> b <sub>1</sub>
156x156	27 <sup>a</sup>	36 <sup>a</sup>	27	36	27	20/19	32	80	80	38	---	---	36 (39) <sup>c</sup>	52 (54) <sup>c</sup>	40x156	156x40
156x196								120							80x156	196x40
156x246								170							130x156	246x40
156x296								220							180x156	296x40
196x196						25/24	40	112	112	42	---	---	43 (44) <sup>c</sup>	60 (62) <sup>c</sup>	58x196	196x58
190x246								162	106						108x190	246x52
196x296								212	112						158x196	296x58
196x346								262	112						208x196	346x58
196x396								312	112						258x196	396x58
246x246								46 <sup>a</sup>	36 <sup>b</sup>						36	46
246x296	204	146x246	296x96													
246x346	254	196x246	346x96													
246x396	304	246x246	396x96													
246x446	354	296x246	446x96													
246x496	404	346x246	496x96													
296x296	204	146x296	296x146													
296x346	254	196x296	346x146													
296x396	304	246x296	396x146													
296x446	348	282x296	446x132													
296x496	398	332x296	496x132													
346x346	248	182x346	346x182													
346x396	298	232x346	396x182													
346x446	348	282x346	446x182													
346x496	398	332x346	496x182													
396x396	298	232x396	396x232													
396x446	348	282x396	446x232													
396x496	398	332x396	496x232													
446x446	348	282x446	446x282													
446x496	398	332x446	496x282													
496x496	398	398	332x496	496x332												

Uwaga:

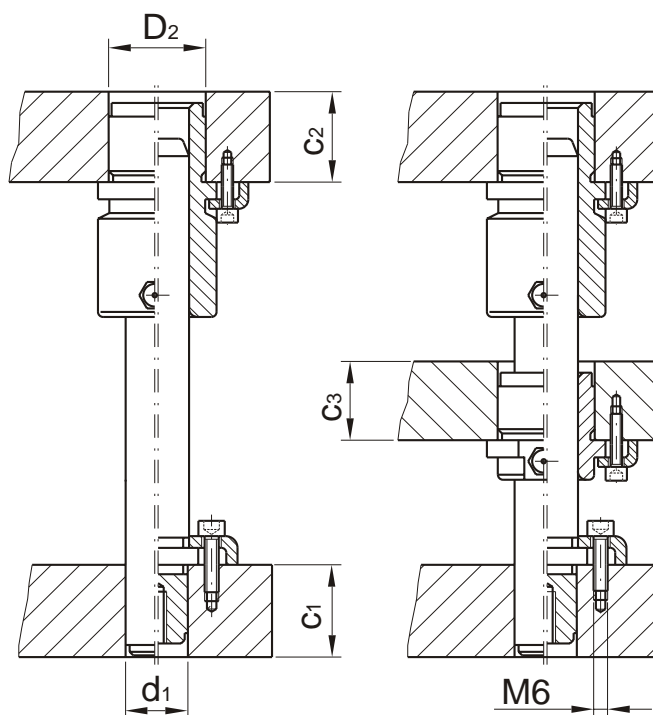
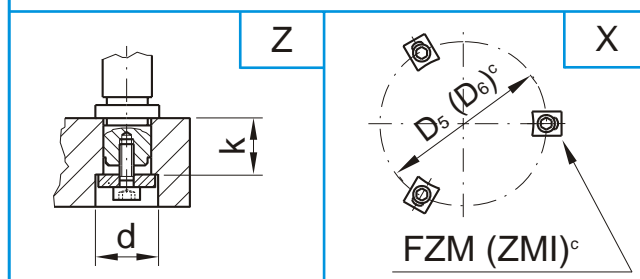
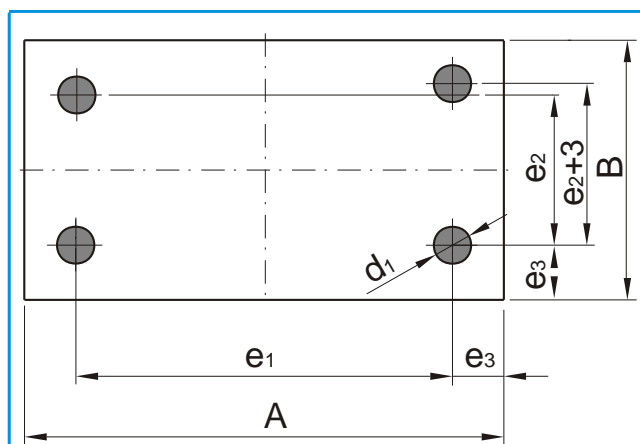
- a- nie dotyczy mocowania słupa sposobem - Z
- b- dotyczy tylko mocowania słupa typ FS
- c- wykonanie opcjonalne: - powierzchnie robocze patrz na str. L.14
- zaczepy mocuj ce ZMI patrz na str. L.47

Note:

- a- does not apply to pin installation method - Z
- b- applies to installation of FS type pin
- c- optional execution: - working area see page L.14
- retaining clamps ZMI - see page L.47

Typy tulejek prowadz cych Guide bushing types		Rodzaje opraw Die set styles				
		Dwupłytowe Two plates		N/2	Trzypłytowe Three plates	N/3
						
		Powierzchnie robocze. Working areas				
						S1
						S2
		FC				
Typy słupów prowadz cych						
FS		FK				
						





B x A	C <sub>1</sub>		C <sub>2</sub>		C <sub>3</sub>	d <sub>1</sub>	D <sub>2</sub>	e <sub>1</sub>	e <sub>2</sub>	e <sub>3</sub>	d	k	D <sub>5</sub> (D <sub>6</sub> ) <sup>c</sup>		Powierzchnie robocze. Working areas.	
													dla słupa. for pin	dla tulei. for bushing	S1 a <sub>1</sub> xB	S2 A <sub>x</sub> b <sub>1</sub>
156x156	27 <sup>a</sup>	36 <sup>a</sup>	27	36	27	20	32	74	74	41	---	---	36 (39) <sup>c</sup>	52 (54) <sup>c</sup>	34x156	156x37
156x196								114							74x156	196x37
156x246								164							124x156	246x37
156x296								214							174x156	296x37
196x196						25	40	106	106	45	---	---	43 (44) <sup>c</sup>	60 (62) <sup>c</sup>	52x196	196x55
190x246								156	100						102x190	246x49
196x296								206	106						152x196	296x55
196x346								256	106						202x196	346x55
196x396								306	106						252x196	396x55
246x246	36 <sup>b</sup>	36	46	36	32	48	148	148	49	---	---	51 (51) <sup>c</sup>	67 (70) <sup>c</sup>	90x246	246x93	
246x296							198							140x246	296x93	
246x346							248							190x246	346x93	
246x396							298							240x246	396x93	
246x446							348							290x246	446x93	
246x496							398							340x246	496x93	
296x296							198	198				140x296	296x143			
296x346							248					190x296	346x143			
296x396							298					240x296	396x143			
296x446							342					192	276x296	446x129		
296x496							392						326x296	496x129		
346x346							242						176x346	346x179		
346x396							292						226x346	396x179		
346x446							342						276x346	446x179		
346x496							392						242	326x346	496x179	
396x396	292	226x396	396x229													
396x446	342	276x396	446x229													
396x496	392	326x396	496x229													
446x446	342	342	276x446	446x279												
446x496	392		326x446	496x279												
496x496	392		326x496	496x329												

Uwaga:

- a- nie dotyczy mocowania słupa sposobem - Z
- b- dotyczy tylko mocowania słupa typ FS
- c- wykonanie opcjonalne: - powierzchnie robocze patrz na str. L.14
- zaczepy mocuj ce ZMI patrz na str. L.47

Note:

- a- does not apply to pin installation method - Z
- b- applies to installation of FS type pin
- c- optional execution: - working area see page L.14
- retaining clamps ZMI - see page L.47

Przykład:

Example:

**D/3-246x346/46x36x36-S2/X/6**

- typ oprawy — die set type
- rodzaj oprawy (ilość płyt) — die set style (number of plates)
- gabaryty płyt (BxA) — plates dimensions
- grubości płyt (C1xC2xC3) — plates thicknesses
- rodzaj powierzchni roboczej — working area
- sposób mocowania słupa prowadzącego ( X; Z; Y - patrz str. L.9 ) — pin installation methods ( X; Z; Y - see page no. L.9 )
- rodzaj zaczepek ( 6 - FZM ; 8 - ZMI - patrz str. L.47 ) — retaining clamps type ( 6 - FZM ; 8 - ZMI - see page no. L.47 )

Elementy prowadzące według ISO (tylko typy: FB, FT, FG, FC, FS, FK ) należy wyszczególnić na osobnej specyfikacji - szczegóły patrz cz. IV katalogu

Guiding components ISO (type only: FB, FT, FG, FC, FS, FK) to be specified on separate list. See part IV of this catalog for details.

**FB-32042 -1szt. (pcs)**

**FB-30042 -1szt. (pcs)**

**FB-32075 -1szt. (pcs)**

**FB-30075 -1szt. (pcs)**

**FK-32250 -1szt. (pcs)**

**FK-30250 -1szt. (pcs)**

Uwaga:

Note:

Otwory transportowe na życzenie. Dobór otworów - patrz str. L.7

Handling holes available on request. See page L7 for recommended handling holes location

# Oprawy specjalne

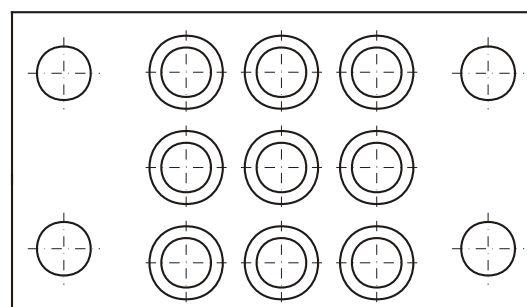
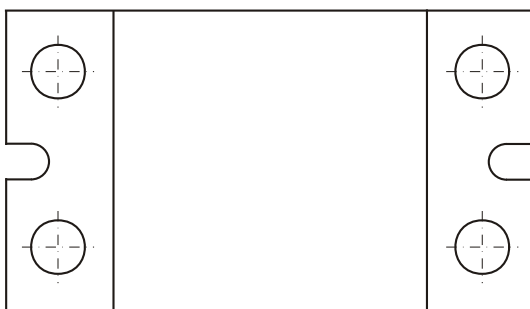
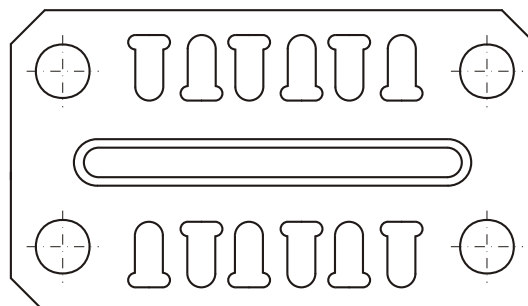
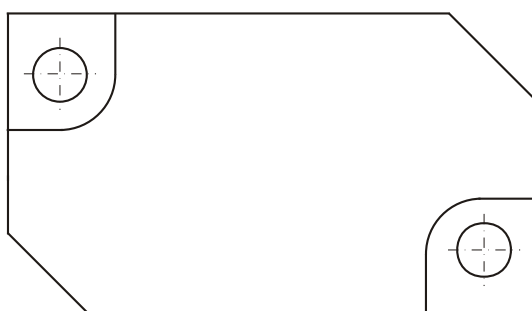
Special die sets

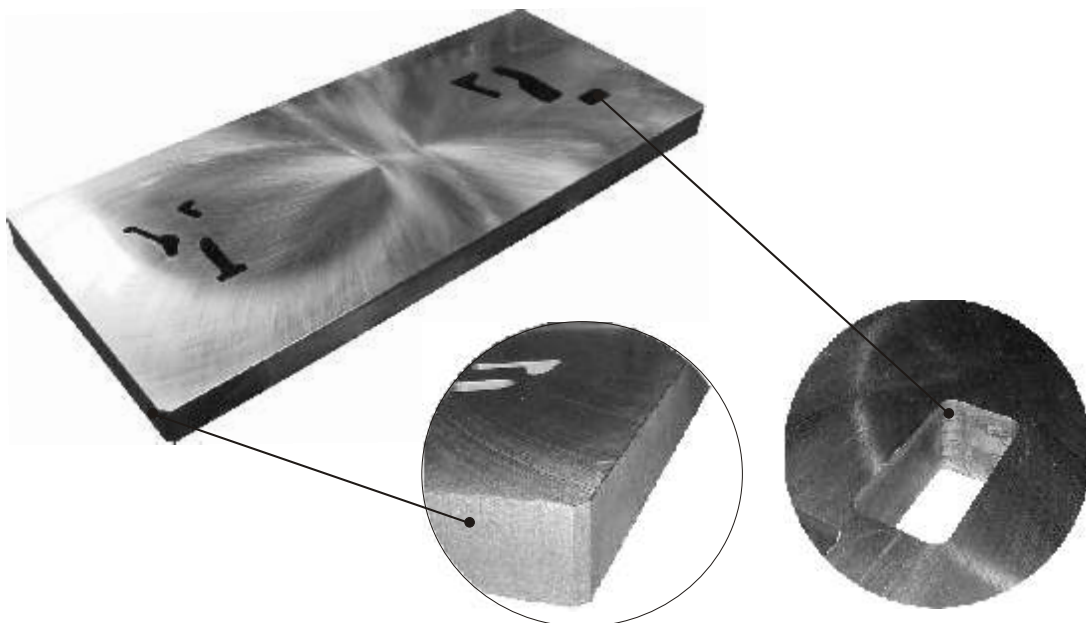


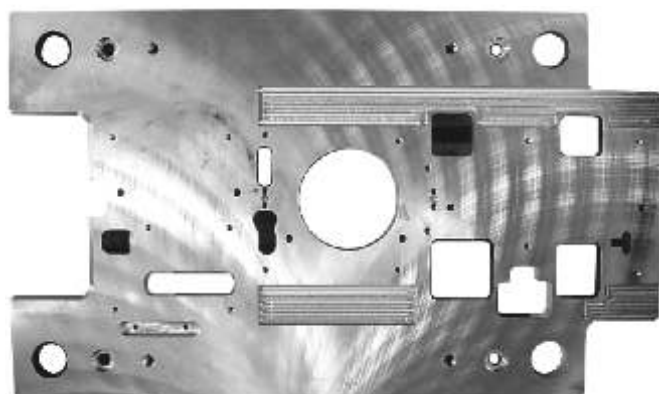
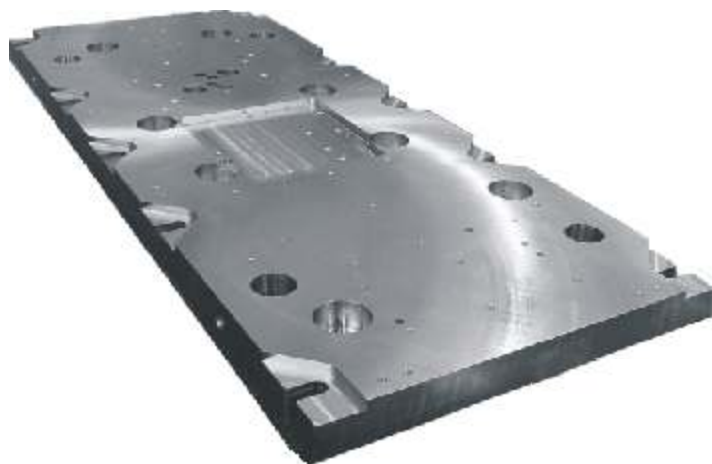
### Płyty specjalne do tłoczników / Custom made die sets plates

Płyty specjalne do tłoczników należy zamawiać dołączając szczegóły dokumentacji.  
W przypadku wersji elektronicznej dokumentu wymagany jest jeden z formatów: dwg, dxf, igs, sat, sldprt

When ordering custom made die sets or die set plates please enclose additional documents.  
As for electronic documents one of the following formats is required: dwg, dxf, igs, sat, sldprt

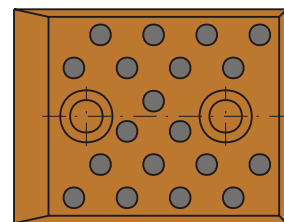
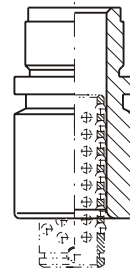
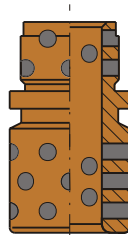
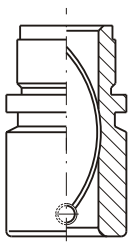






# Elementy prowadzące

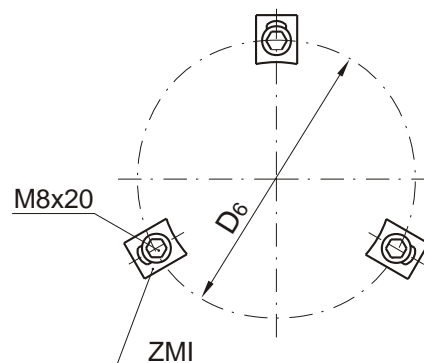
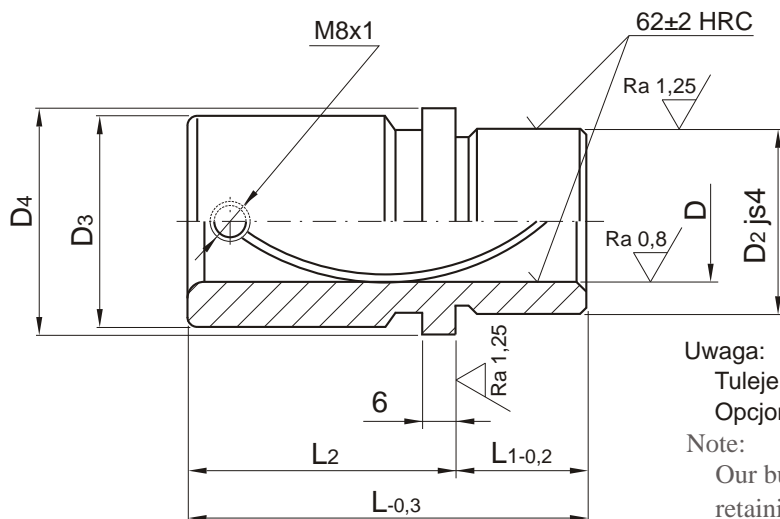
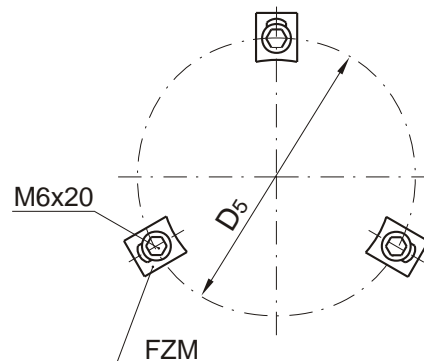
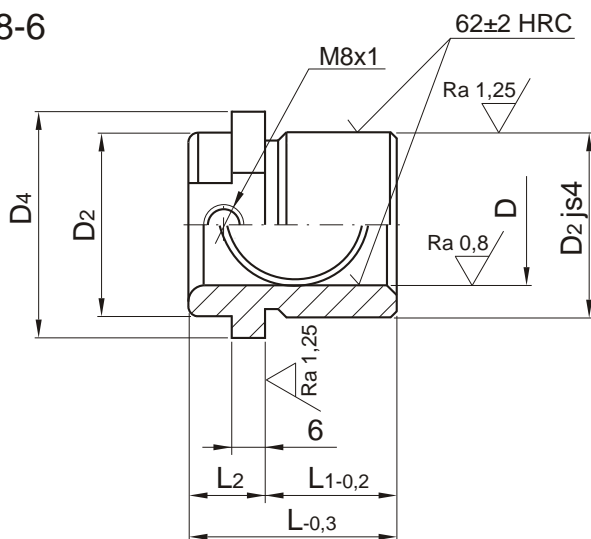
## Guiding components



# IV.

ISO 9448-6

FT



Uwaga:

Tuleje s dostarczane z zaczepami mocuj cymi **FZM**  
Opcjonalnie zaczepy mocuj ce ZMI na yczenie (str.L.47)

Note:

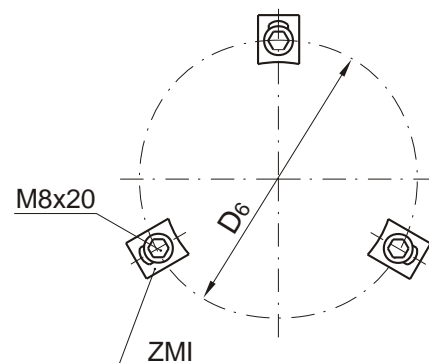
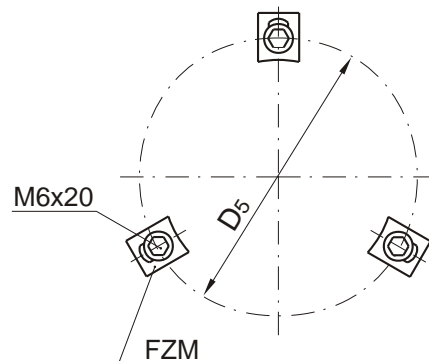
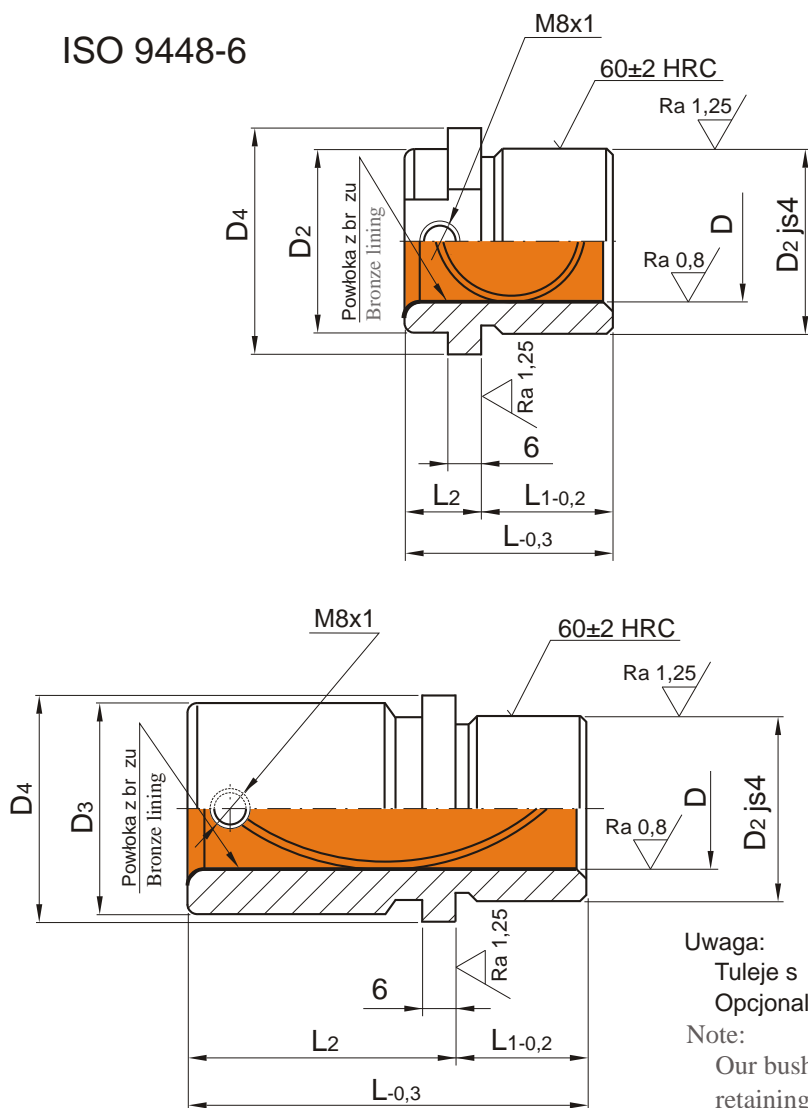
Our bushings are supplied together with **FZM** type retaining clamps as standard. ZMI retaining clamps available on request (page L.47)

D	Tol.	D2	D3	D4	FZM	ZMI	L1	L2	L	NR KAT.	
					D5	D6					
20/19	+0,012 +0,004	32	----	40	52	54	23	12	35	FT-20035	FT-19035
			39					20	43	FT-20043	FT-19043
			----					36	59	FT-20059	FT-19059
25/24	+0,012 +0,004	40	----	48	60	62	23	12	35	FT-25035	FT-24035
			46					36	59	FT-25059	FT-24059
			----					56	79	FT-25079	FT-24079
32/30	+0,015 +0,005	48	----	56	67	70	30	12	42	FT-32042	FT-30042
			53					45	75	FT-32075	FT-30075
			----					63	93	FT-32093	FT-30093
40/38	+0,015 +0,005	58	----	66	77	80	37	15	52	FT-40052	FT-38052
			63					45	82	FT-40082	FT-38082
			----					71	108	FT-40107	FT-38107
50/48	+0,015 +0,005	70	----	80	91	94	47	18	65	FT-50065	FT-48065
			77					50	97	FT-50097	FT-48097
			----					80	127	FT-50127	FT-48127
63/60	+0,018 +0,006	85	----	95	106	109	60	20	80	FT-63080	FT-60080
			92					56	116	FT-63115	FT-60115
			----					90	150	FT-63150	FT-60150
80	+0,018 +0,006	105	----	118	129	132	60	20	80	FT-80080	
			115					60	120	FT-80120	
			----					90	150	FT-80150	



ISO 9448-6

**FB**



Uwaga:

Tuleje s dostarczane z zaczepami mocuj cymi **FZM**  
Opcjonalnie zaczepy mocuj ce ZMI na yczenie (str.L.47)

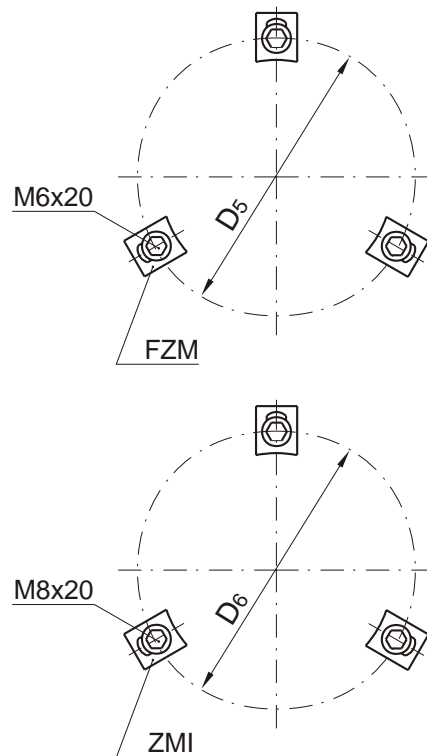
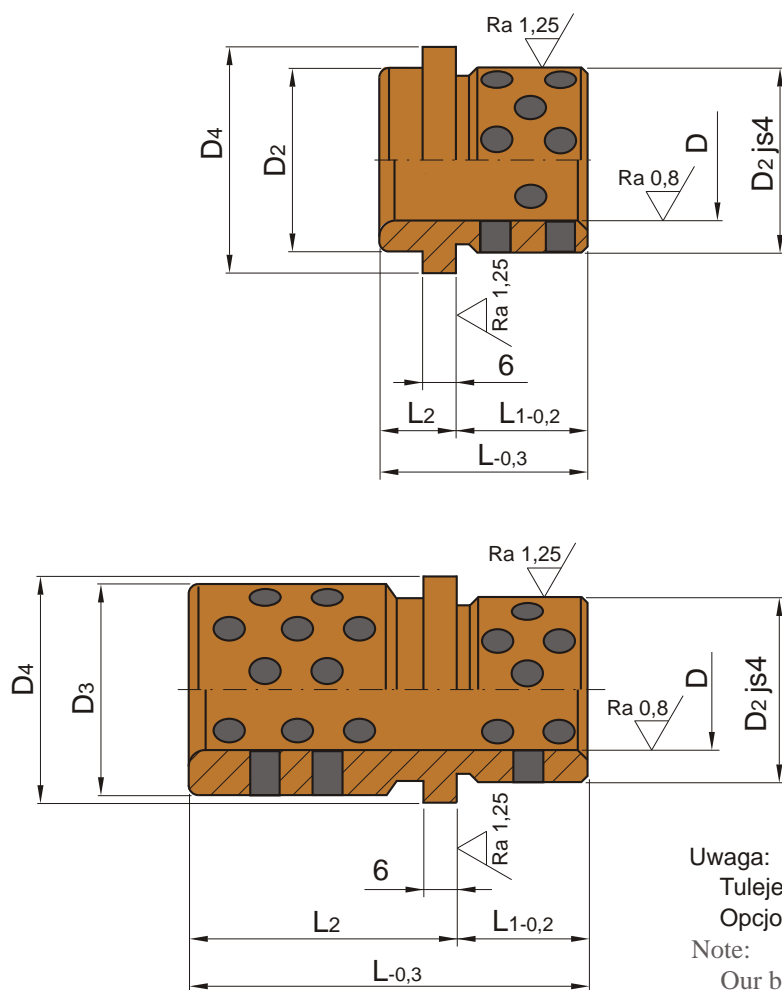
Note:

Our bushings are supplied together with **FZM** type retaining clamps as standard. ZMI retaining clamps available on request (page L.47)

D	Tol.	D2	D3	D4	FZM	ZMI	L1	L2	L	NR KAT.	
					D5	D6					
20/19	+0,012 +0,004	32	----	40	52	54	23	12	35	FB-20035	FB-19035
			39					20	43	FB-20043	FB-19043
			----					36	59	FB-20059	FB-19059
25/24		40	----	48	60	62	23	12	35	FB-25035	FB-24035
			46					36	59	FB-25059	FB-24059
			----					56	79	FB-25079	FB-24079
32/30		48	----	56	67	70	30	12	42	FB-32042	FB-30042
			53					45	75	FB-32075	FB-30075
			----					63	93	FB-32093	FB-30093
40/38	+0,015 +0,005	58	----	66	77	80	37	15	52	FB-40052	FB-38052
			63					45	82	FB-40082	FB-38082
			----					71	108	FB-40107	FB-38107
50/48		70	----	80	91	94	47	18	65	FB-50065	FB-48065
			77					50	97	FB-50097	FB-48097
			----					80	127	FB-50127	FB-48127
63/60		85	----	95	106	109	60	20	80	FB-63080	FB-60080
			92					56	116	FB-63115	FB-60115
			----					90	150	FB-63150	FB-60150
80	+0,018 +0,006	105	----	118	129	132	60	20	80	FB-80080	
			115					60	120	FB-80120	
			----					90	150	FB-80150	

ISO 9448-6

FG



Uwaga:

Tuleje s dostarczane z zaczepami mocuj cymi **FZM**

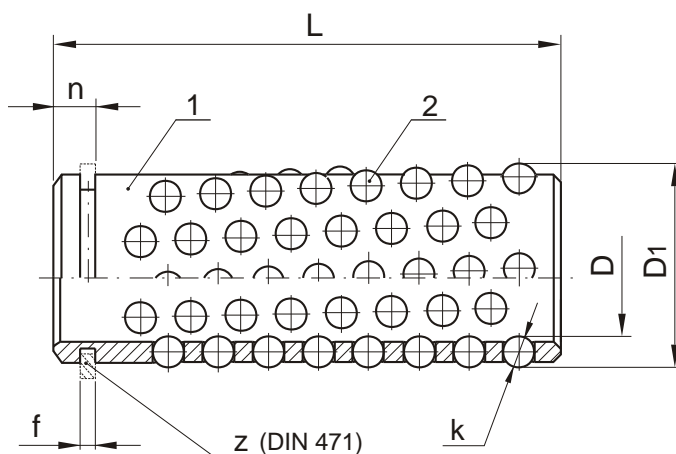
Opcjonalnie zaczepy mocuj ce ZMI na yczenie (str.L.47)

Note:

Our bushings are supplied together with **FZM** type retaining clamps as standard. ZMI retaining clamps available on request (page L.47)

Mat: - br z alumiowy / aluminium bronze  
- grafit / graphite

D					FZM	ZMI	L <sub>1</sub>	L <sub>2</sub>	L	NR KAT.	
D	Tol.	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>				FG-20035	FG-19035
20/19	+0,012 +0,004	32	----	40	52	54	23	12	35	FG-20035	FG-19035
			39					20	43	FG-20043	FG-19043
		25/24	40	----	48	60	62	23	36	59	FG-20059
46	12			35					FG-25035	FG-24035	
	36			59					FG-25059	FG-24059	
32/30		48	----	56	67	70	30	56	79	FG-25079	FG-24079
			53					12	42	FG-32042	FG-30042
		40/38	58	----	66	77	80	37	45	75	FG-32075
63	63			93					FG-32093	FG-30093	
	50/48			70					----	80	91
77		45	82		FG-40082	FG-38082					
		63/60	85		----	95	106	109	60		
92	18			65	FG-50065					FG-48065	
	80			105	----					118	129
115		80	127		FG-50127	FG-48127					
					85	----	95	106	109		
92	56			116		FG-63115				FG-60115	
				105	----	118	129	132	60	90	150
		115	20		80					FG-80080	
				105	----	118	129	132	60	60	120
115	90				150					FG-80150	

**FKL**


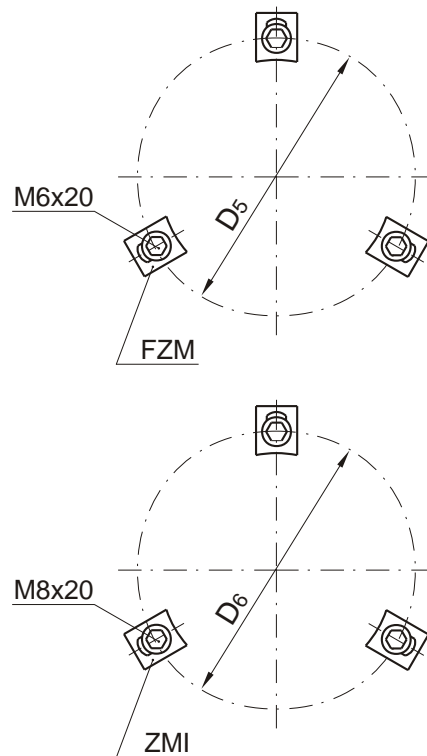
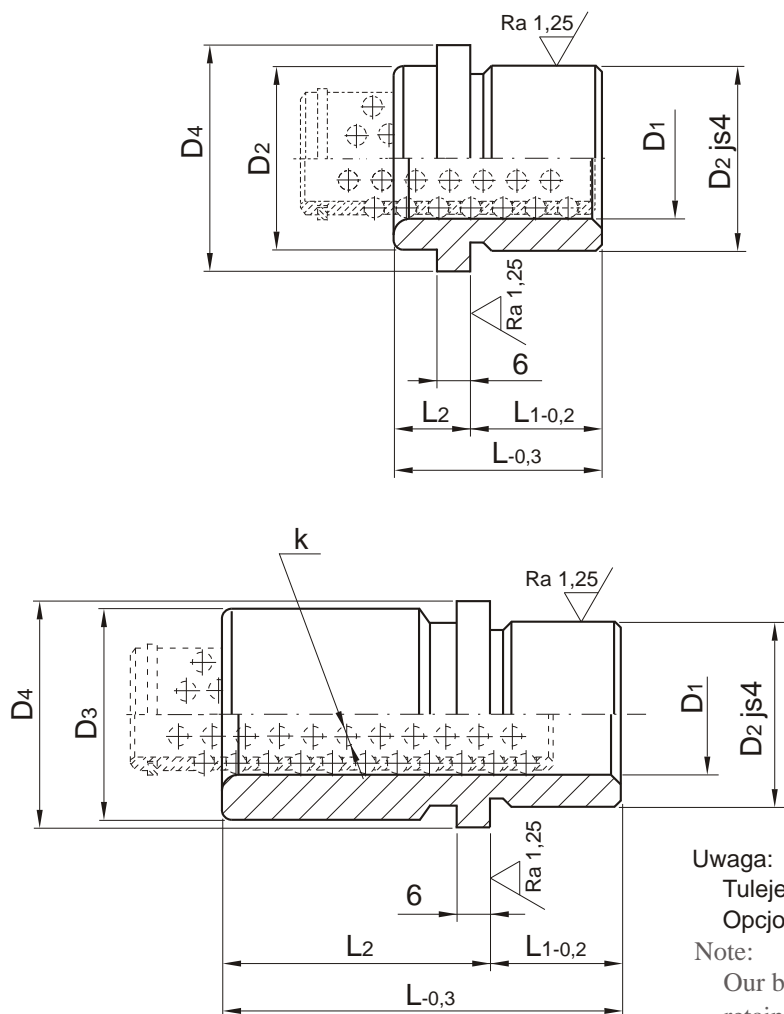
Mat: 1-Koszyk-aluminium  
Cage-aluminum

2-Kulki-stal łożyskowa  
Balls-ball bearing steel

D	D1	k	z	f	n	L	NR KAT.	
20/19	26/25	3	Z25/24	1,2	2,9	43	FKL-20043	FKL-19043
						54	FKL-20054	FKL-19054
						74	FKL-20074	FKL-19074
						95	FKL-20095	FKL-19095
25/24	31/30	3	Z30	1,5	3,2	43	FKL-25043	FKL-24043
						56	FKL-25056	FKL-24056
						74	FKL-25074	FKL-24074
						90	FKL-25090	FKL-24090
32/30	40/38	4	Z38/36	1,75	4,0	45	FKL-32045	FKL-30045
						54	FKL-32054	FKL-30054
						71	FKL-32071	FKL-30071
						83	FKL-32083	FKL-30083
40/38	48/46	4	Z48/45	1,75	4,0	103	FKL-32103	FKL-30103
						45	FKL-40045	FKL-38045
						58	FKL-40058	FKL-38058
						80	FKL-40080	FKL-38080
50/48	58/56	4	Z58/56	2,0	4,3	94	FKL-40094	FKL-38094
						128	FKL-40128	FKL-38128
						50	FKL-50050	FKL-48050
						63	FKL-50063	FKL-48063
63/60	73/70	5	Z72/70	2,5	4,8	74	FKL-50074	FKL-48074
						95	FKL-50095	FKL-48095
						108	FKL-50108	FKL-48108
						128	FKL-50128	FKL-48128
80	92	6	Z90	3,0	6,2	128	FKL-63095	FKL-60095
						95	FKL-63113	FKL-60113
						113	FKL-63128	FKL-60128
						154	FKL-63154	FKL-60154
						113	FKL-80113	
						138	FKL-80138	
						156	FKL-80156	

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FC



Uwaga:

Tuleje s dostarczane z zaczepami mocuj cymi **FZM**

Opcjonalnie zaczepy mocuj ce ZMI na yczenie (str.L.47)

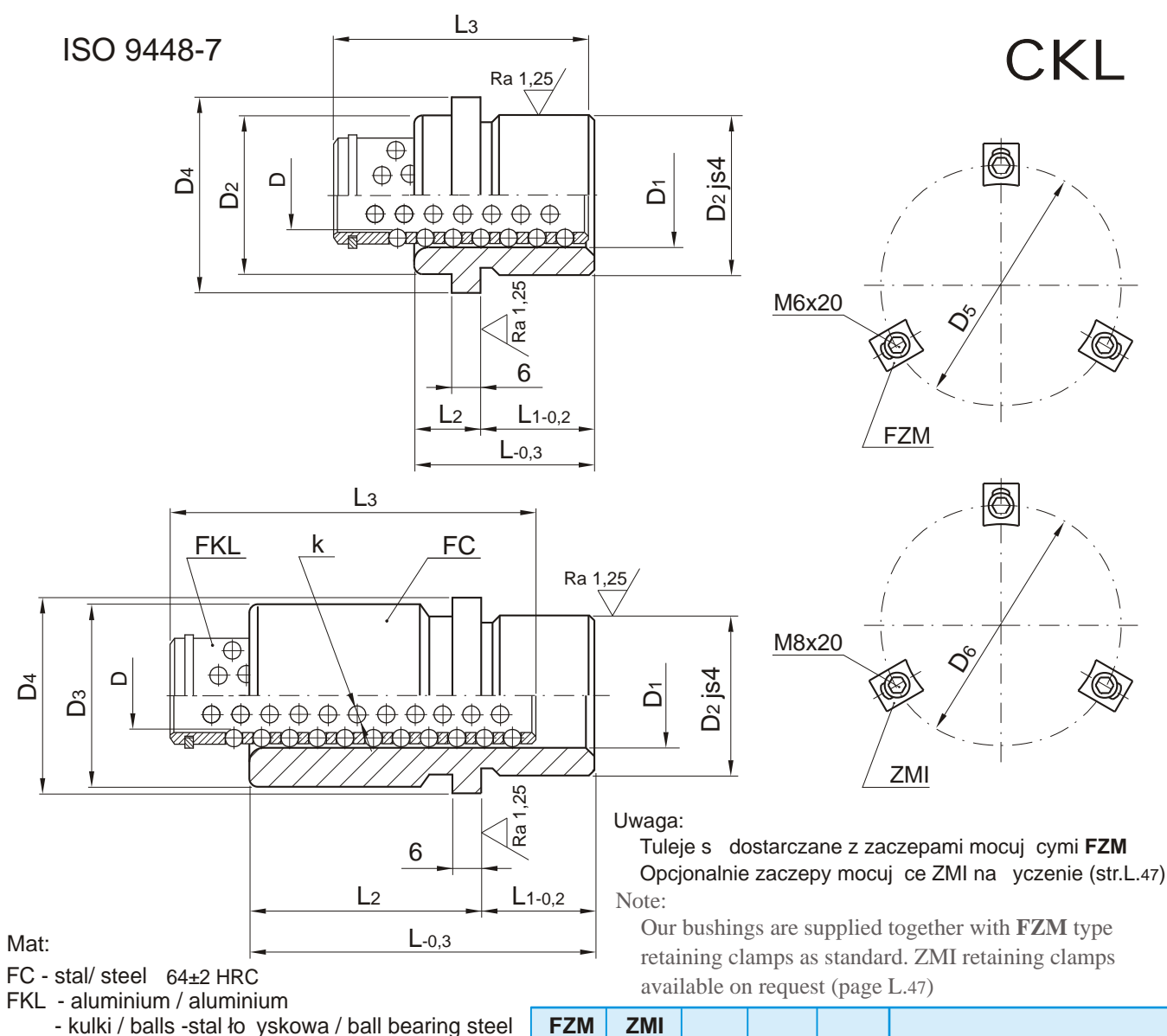
Note:

Our bushings are supplied together with **FZM** type retaining clamps as standard. ZMI retaining clamps available on request (page L.47)

Mat: stal / steel 64±2 HRC

D	D1	D2	D3	D4	k	FZM	ZMI	L1	L2	L	NR KAT.	
						D5	D6					
20/19	26/25	32	----	40	3	52	54	23	12	35	FC-20035	FC-19035
			39						20	43	FC-20043	FC-19043
			----						36	59	FC-20059	FC-19059
25/24	31/30	40	----	48	3	60	62	23	12	35	FC-25035	FC-24035
			46						36	59	FC-25059	FC-24059
			----						56	79	FC-25079	FC-24079
32/30	40/38	48	----	56	4	67	70	30	12	42	FC-32042	FC-30042
			53						45	75	FC-32075	FC-30075
			----						63	93	FC-32093	FC-30093
40/38	48/46	58	----	66	4	77	80	37	15	52	FC-40052	FC-38052
			63						45	82	FC-40082	FC-38082
			----						71	108	FC-40107	FC-38107
50/48	58/56	70	----	80	4	91	94	47	18	65	FC-50065	FC-48065
			77						50	97	FC-50097	FC-48097
			----						80	127	FC-50127	FC-48127
63/60	73/70	85	----	95	5	106	109	60	20	80	FC-63080	FC-60080
			92						56	116	FC-63115	FC-60115
			----						90	150	FC-63150	FC-60150
80	92	105	----	118	6	129	132	60	20	80	FC-80080	
			115						60	120	FC-80120	
			----						90	150	FC-80150	

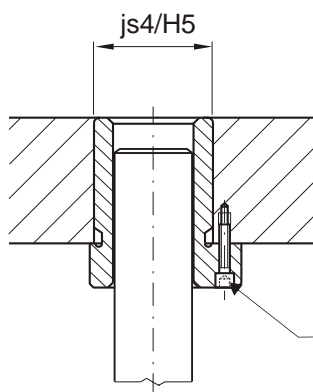
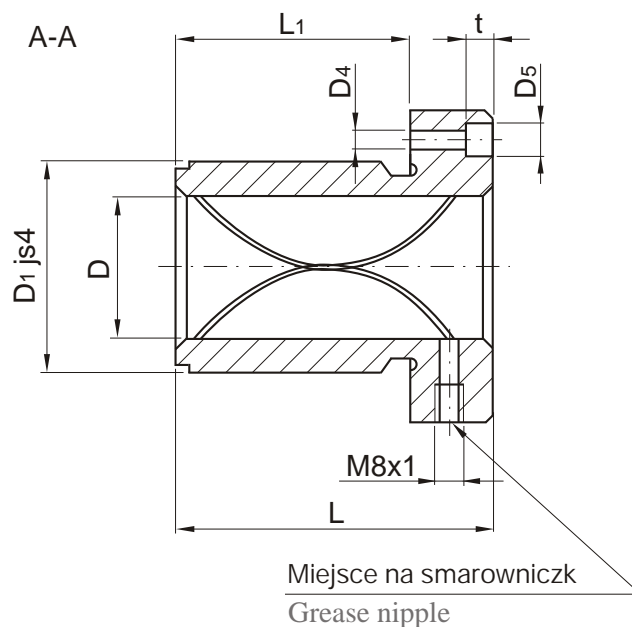
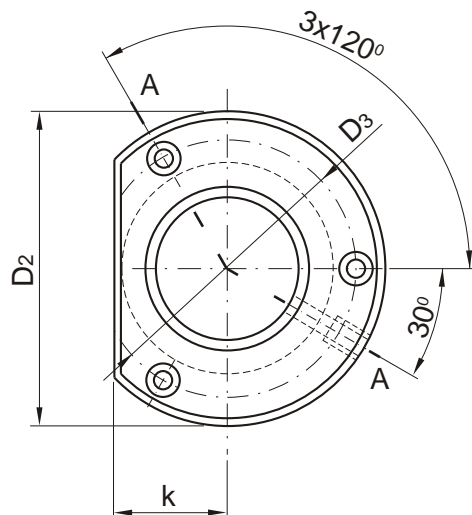
**TULEJA PROWADZ CA Z KOSZYKIEM**  
**GUIDE BUSHING-WITH BALL BEARING CAGE**



FKL - aluminium / aluminium - kulki / balls -stal to yskowa / ball bearing steel							FZM	ZMI					
D	D1	D2	D3	D4	L3	k	D5	D6	L1	L2	L	NR KAT.	
20/19	26/25	32	----	40	43	3	52	54	23	12	35	CKL-20035	CKL-19035
			39		54					20	43	CKL-20043	CKL-19043
					74					36	59	CKL-20059	CKL-19059
25/24	31/30	40	----	48	43	3	60	62	23	12	35	CKL-25035	CKL-24035
			46		74					36	59	CKL-25059	CKL-24059
					90					56	79	CKL-25079	CKL-24079
32/30	40/38	48	----	56	54	4	67	70	30	12	42	CKL-32042	CKL-30042
			53		83					45	75	CKL-32075	CKL-30075
					103					63	93	CKL-32093	CKL-30093
40/38	48/46	58	----	66	58	4	77	80	37	15	52	CKL-40052	CKL-38052
			63		94					45	82	CKL-40082	CKL-38082
					128					71	108	CKL-40107	CKL-38107
50/48	58/56	70	----	80	74	4	91	94	47	18	65	CKL-50065	CKL-48065
			77		108					50	97	CKL-50097	CKL-48097
					128					80	127	CKL-50127	CKL-48127
63/60	73/70	85	----	95	113	5	106	109	60	20	80	CKL-63080	CKL-60080
			92		128					56	116	CKL-63115	CKL-60115
					154					90	150	CKL-63150	CKL-60150
80	92	105	----	118	113	6	129	132	60	20	80	CKL-80080	
			115		138					60	120	CKL-80120	
					156					90	150	CKL-80150	

ISO 9448-4

FTA



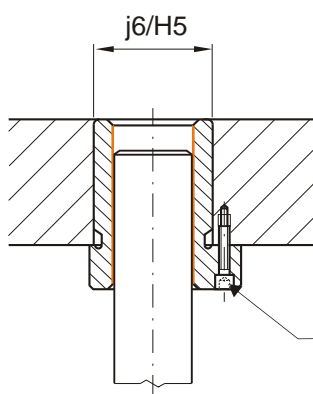
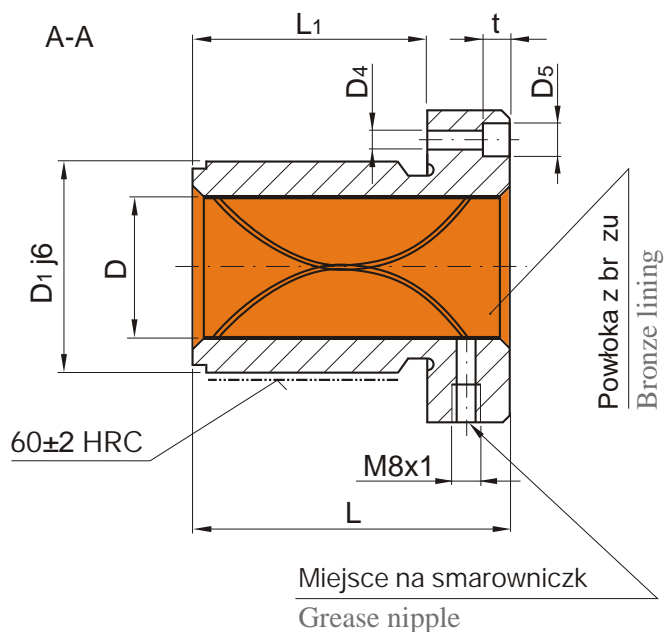
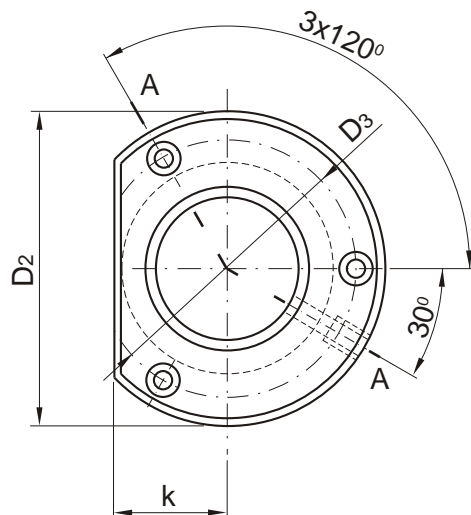
M (DIN EN ISO 4762)  
3 ruby (sprzedawane oddzielnie)  
3 screws (sold separately)

62±2 HRC

D	Tol.	D1	D2	D3	D4	D5	t	k	M	L1	L	NR KAT.	
20/19	+0,012 +0,003	32	50	40	4,5	8	4,6	18	M4x20	23	38	FTA-20038	FTA-19038
										30	45	FTA-20045	FTA-19045
										37	52	FTA-20052	FTA-19052
25/24	+0,012 +0,003	40	63	50	5,5	10	5,7	23	M5x30	23	38	FTA-25038	FTA-24038
										30	55	FTA-25055	FTA-24055
										37	62	FTA-25062	FTA-24062
32/30	+0,015 +0,004	48	72	58	6,6	11	6,8	28	M6x35	30	45	FTA-32045	FTA-30045
										37	62	FTA-32062	FTA-30062
										47	72	FTA-32072	FTA-30072
40/38	+0,015 +0,004	58	85	70	9	15	9	33	M8x50	30	55	FTA-40055	FTA-38055
										37	67	FTA-40067	FTA-38067
										47	77	FTA-40077	FTA-38077
50/48	+0,018 +0,005	70	104	86	11	18	11	38	M10x55	37	62	FTA-50062	FTA-48062
										47	89	FTA-50089	FTA-48089
										60	102	FTA-50102	FTA-48102
63/60	+0,018 +0,005	85	120	100	11	18	11	46	M10x55	47	89	FTA-63089	FTA-60089
										60	102	FTA-63102	FTA-60102
										75	125	FTA-80125	
80		105	148	125	11	18	11	56	M10x55	75	125	FTA-80125	

ISO 9448-4

FBA



M (DIN EN ISO 4762)

3 ruby (sprzedawane oddzielnie)

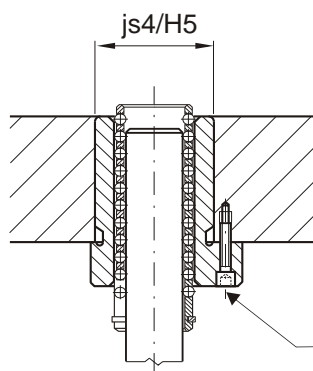
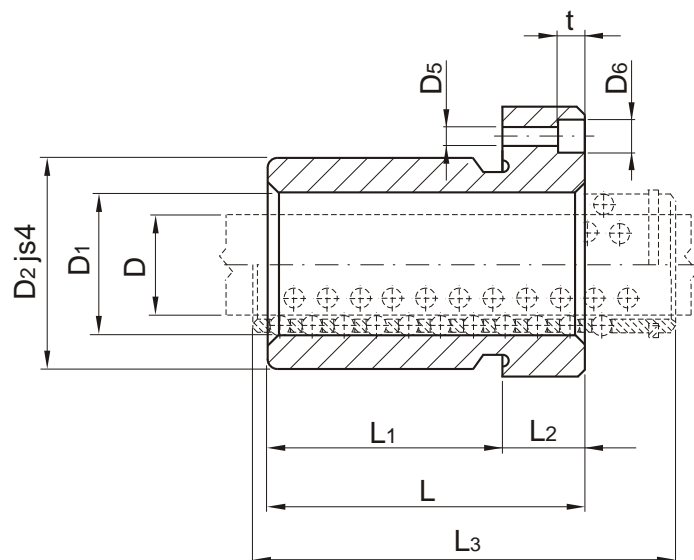
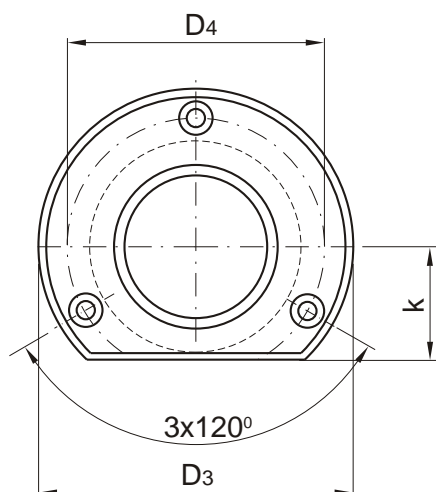
3 screws (sold separately)

Miejsce na smarowniczk  
Grease nipple

D	Tol.	D1	D2	D3	D4	D5	t	k	M	L1	L	NR KAT.	
20/19	+0,012 +0,003	32	50	40	4,5	8	4,6	18	M4x20	23	38	FBA-20038	FBA-19038
										30	45	FBA-20045	FBA-19045
										37	52	FBA-20052	FBA-19052
25/24	+0,012 +0,003	40	63	50	5,5	10	5,7	23	M5x30	23	38	FBA-25038	FBA-24038
										30	55	FBA-25055	FBA-24055
										37	62	FBA-25062	FBA-24062
32/30	+0,015 +0,004	48	72	58	6,6	11	6,8	28	M6x35	30	45	FBA-32045	FBA-30045
										37	62	FBA-32062	FBA-30062
										47	72	FBA-32072	FBA-30072
40/38	+0,015 +0,004	58	85	70	9	15	9	33	M8x50	30	55	FBA-40055	FBA-38055
										37	67	FBA-40067	FBA-38067
										47	77	FBA-40077	FBA-38077
50/48	+0,018 +0,005	70	104	86	11	18	11	38	M10x55	37	62	FBA-50062	FBA-48062
										47	89	FBA-50089	FBA-48089
										60	102	FBA-50102	FBA-48102
63/60	+0,018 +0,005	85	120	100	11	18	11	46	M10x55	47	89	FBA-63089	FBA-60089
										60	102	FBA-63102	FBA-60102
										75	125	FBA-80125	
80		105	148	125	11	18	11	56	M10x55	75	125	FBA-80125	

ISO 9448-5

FCA



M (DIN EN ISO 4762)  
3 ruby (sprzedawane oddzielnie)  
3 screws (sold separately)

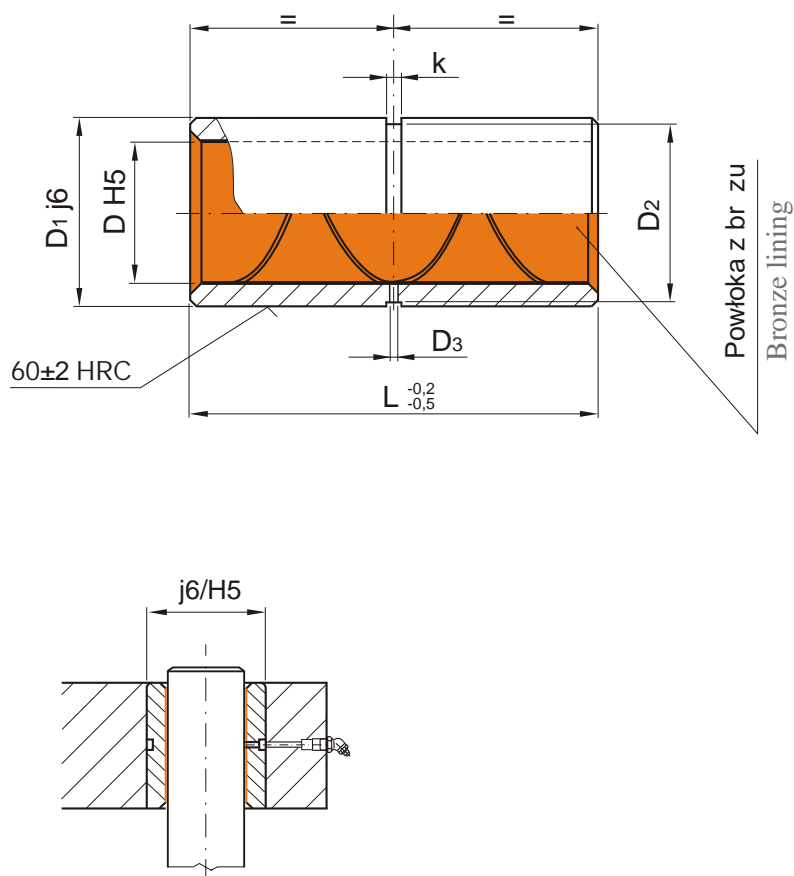
62±2 HRC

D	D1	D2	D3	D4	D5	D6	t	k	M	L3	L2	L1	L	NR KAT.	
20/19	26/25	32	50	40	4,5	8	4,6	18	M4x20	43	15	23	38	FCA-20038	FCA-19038
										54	15	30	45	FCA-20045	FCA-19045
										74	15	37	52	FCA-20052	FCA-19052
25/24	31/30	40	63	50	5,5	10	5,7	23	M5x30	43	15	23	38	FCA-25038	FCA-24038
										74	25	30	55	FCA-25055	FCA-24055
										74	25	37	62	FCA-25062	FCA-24062
32/30	40/38	48	72	58	5,5	10	5,7	28	M5x30	54	15	30	45	FCA-32045	FCA-30045
										71	25	37	62	FCA-32062	FCA-30062
										83	25	47	72	FCA-32072	FCA-30072
40/38	48/46	58	85	70	6,6	11	6,8	33	M6x35	58	25	30	55	FCA-40055	FCA-38055
										80	30	37	67	FCA-40067	FCA-38067
										94	30	47	77	FCA-40077	FCA-38077
50/48	58/56	70	104	86	9	15	9	38	M8x50	74	25	37	62	FCA-50062	FCA-48062
										95	42	47	89	FCA-50089	FCA-48089
										108	42	60	102	FCA-50102	FCA-48102
63/60	73/70	85	120	100	9	15	9	46	M8x50	95	42	47	89	FCA-63089	FCA-60089
										113	42	60	102	FCA-63102	FCA-60102
										113	42	60	102	FCA-63102	FCA-60102
80	92	105	148	125	11	18	11	56	M10x55	138	50	75	125	FCA-80125	



ISO 9448-2

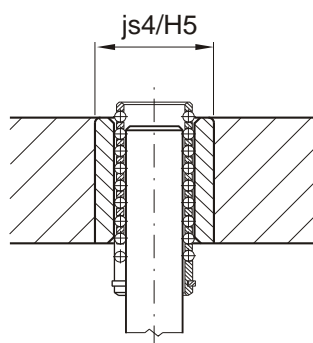
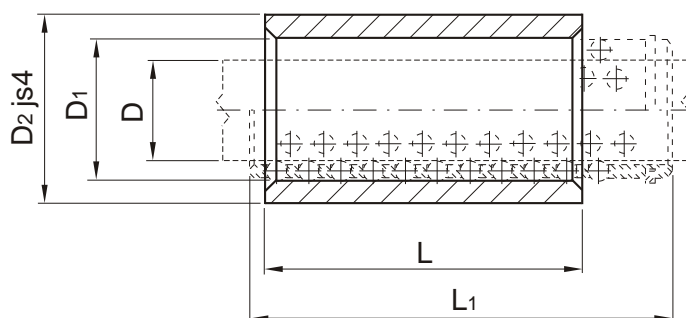
FBB



Monta na klej Loctitle 648  
Glue Loctite 648 mounting

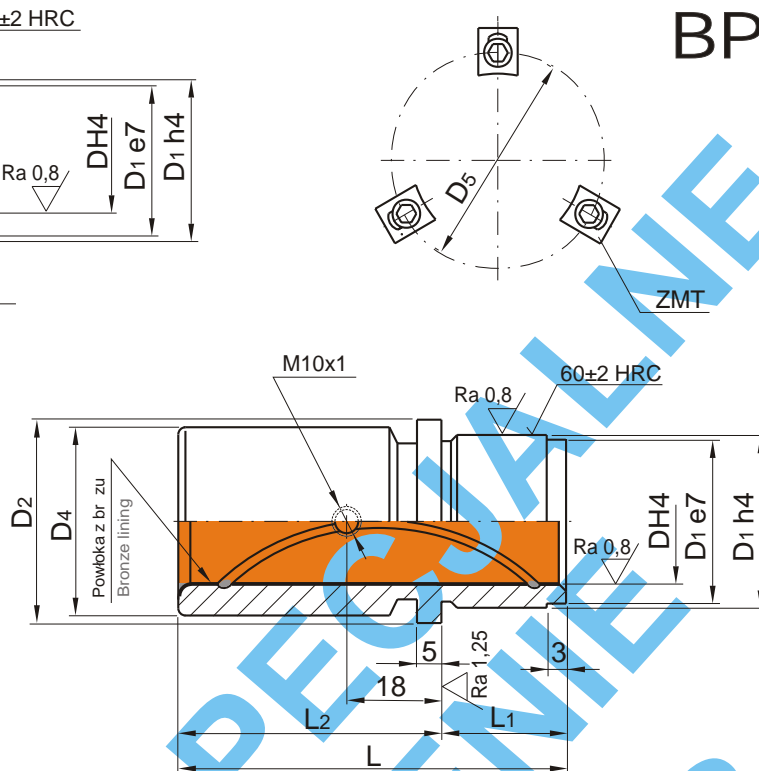
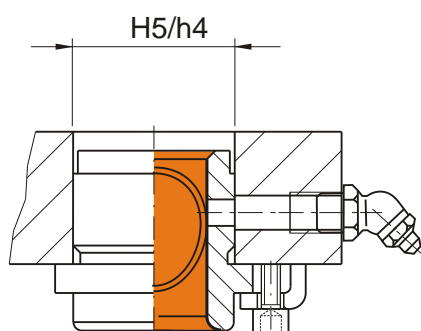
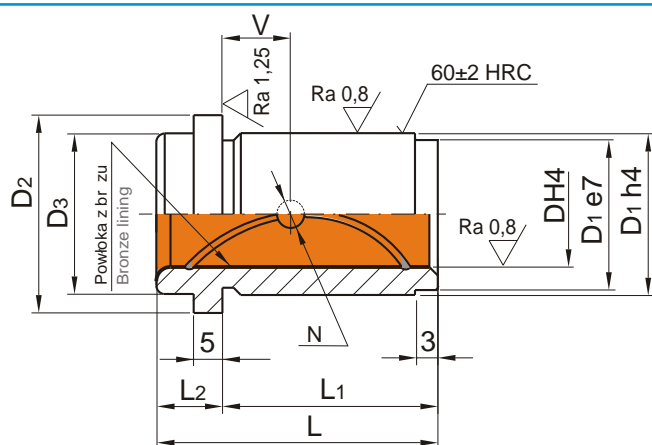
D	D1	D2	D3	k	L	NR KAT.			
20/19	32	30	4	5	23	FBB-20023	FBB-19023		
					30	FBB-20030	FBB-19030		
					37	FBB-20037	FBB-19037		
					47	FBB-20047	FBB-19047		
					60	FBB-20060	FBB-19060		
					77	FBB-20077	FBB-19077		
25/24	40	38			23	FBB-25023	FBB-24023		
					30	FBB-25030	FBB-24030		
					37	FBB-25037	FBB-24037		
					47	FBB-25047	FBB-24047		
					60	FBB-25060	FBB-24060		
					77	FBB-25077	FBB-24077		
32/30	48	46			30	FBB-32030	FBB-30030		
					37	FBB-32037	FBB-30037		
					47	FBB-32047	FBB-30047		
					60	FBB-32060	FBB-30060		
					77	FBB-32077	FBB-30077		
					95	FBB-32095	FBB-30095		
D	D1	D2	D3	k	L	NR KAT.			
40/38	58	56	4	5	30	FBB-40030	FBB-38030		
					37	FBB-40037	FBB-38037		
					47	FBB-40047	FBB-38047		
					60	FBB-40060	FBB-38060		
					77	FBB-40077	FBB-38077		
					95	FBB-40095	FBB-38095		
50/48	70	67	5	6	120	FBB-40120	FBB-38120		
					37	FBB-50037	FBB-48037		
					47	FBB-50047	FBB-48047		
					60	FBB-50060	FBB-48060		
					77	FBB-50077	FBB-48077		
					95	FBB-50095	FBB-48095		
63/60	85	82			120	FBB-50120	FBB-48120		
					60	FBB-63060	FBB-60060		
					77	FBB-63077	FBB-60077		
					95	FBB-63095	FBB-60095		
					120	FBB-63120	FBB-60120		
					120	FBB-80120			
80	105	101			8	9	135	FBB-80135	

ISO 9448-3

**FCB**

Monta na klej Loctite 648  
Glue Loctite 648 mounting

62±2 HRC

D	D1	D2	L1	L	NR KAT.	
20/19	26/25	32	43	23	FCB-20023	FCB-19023
			43	30	FCB-20030	FCB-19030
			43	37	FCB-20037	FCB-19037
			54	47	FCB-20047	FCB-19047
			74	60	FCB-20060	FCB-19060
			95	77	FCB-20077	FCB-19077
25/24	31/30	40	43	23	FCB-25023	FCB-24023
			43	30	FCB-25030	FCB-24030
			43	37	FCB-25037	FCB-24037
			56	47	FCB-25047	FCB-24047
			74	60	FCB-25060	FCB-24060
			90	77	FCB-25077	FCB-24077
32/30	40/38	48	45	30	FCB-32030	FCB-30030
			54	37	FCB-32037	FCB-30037
			54	47	FCB-32047	FCB-30047
			71	60	FCB-32060	FCB-30060
			83	77	FCB-32077	FCB-30077
			103	95	FCB-32095	FCB-30095
D	D1	D2	L1	L	NR KAT.	
40/38	48/46	58	45	30	FCB-40030	FCB-38030
			58	37	FCB-40037	FCB-38037
			58	47	FCB-40047	FCB-38047
			80	60	FCB-40060	FCB-38060
			94	77	FCB-40077	FCB-38077
			128	95	FCB-40095	FCB-38095
50/48	58/56	70	128	120	FCB-40120	FCB-38120
			50	37	FCB-50037	FCB-48037
			63	47	FCB-50047	FCB-48047
			74	60	FCB-50060	FCB-48060
			95	77	FCB-50077	FCB-48077
			108	95	FCB-50095	FCB-48095
63/60	73/70	85	128	120	FCB-50120	FCB-48120
			95	60	FCB-63060	FCB-60060
			95	77	FCB-63077	FCB-60077
			113	95	FCB-63095	FCB-60095
			128	120	FCB-63120	FCB-60120
			138	120	FCB-80120	

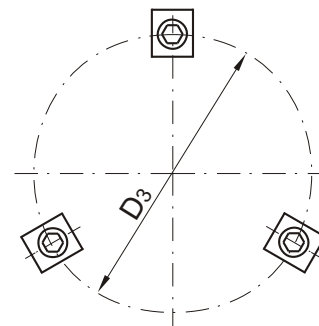
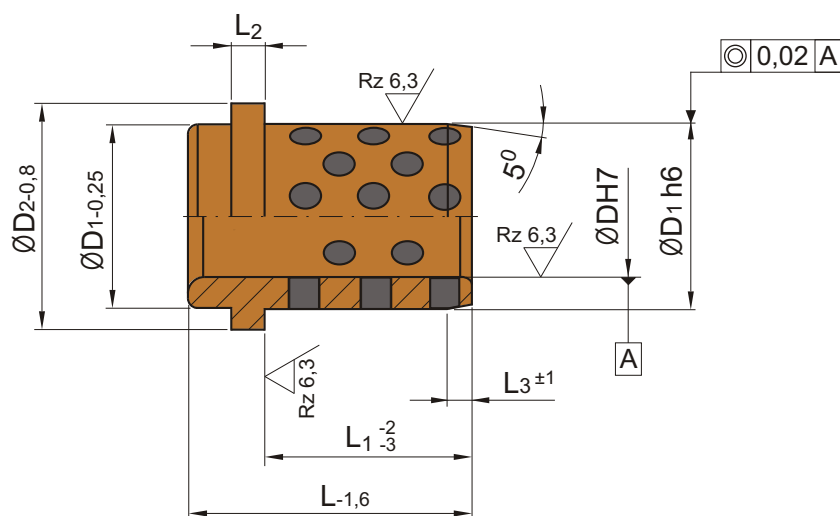
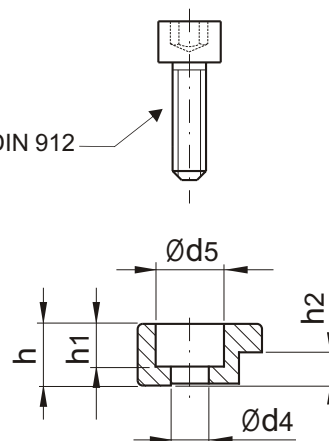


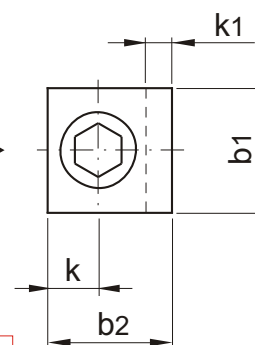
BPE

ZMT

M10x1

D	L	L1	L2	D1	D2	D3	D4	D5	V	N	NR KAT.	NR KAT.
18/19	31	18	13	28	34	29	31	47	8	5	BPE-1818031	BPE-1918031
	49	36									BPE-1836049	BPE-1936049
	50	18	32								BPE-1818050	BPE-1918050
	69	26	43								BPE-1826069	BPE-1926069
	70	18	52								BPE-1818070	BPE-1918070
24/25	36	23	13	38	44	39	41	57	12	5	BPE-2423036	BPE-2523036
	55	42									BPE-2442055	BPE-2542055
	55	23	32								BPE-2423055	BPE-2523055
	80	32	48								BPE-2432080	BPE-2532080
	80	23	57								BPE-2423080	BPE-2523080
30/32	43	30	13	45	53	48	50	66	15	5	BPE-3030043	BPE-3230043
	59	46									BPE-3046059	BPE-3246059
	60	26	34								BPE-3026060	BPE-3226060
	89	36	53								BPE-3036089	BPE-3236089
	90	26	64								BPE-3026090	BPE-3226090
40/42	49	36	13	54	63	58	60	76	19	8	BPE-4036049	BPE-4236049
	67	54									BPE-4054067	BPE-4254067
	67	30	37								BPE-4030067	BPE-4230067
	99	46	53								BPE-4046099	BPE-4246099
	100	30	70								BPE-4030100	BPE-4230100
50/52	59	46	13	65	79	74	76	92	19	8	BPE-5046059	BPE-5246059
	75	62									BPE-5062075	BPE-5262075
	75	35	40								BPE-5035075	BPE-5235075
	109	56	53								BPE-5056109	BPE-5256109
	110	35	75								BPE-5035110	BPE-5235110
63	74	61	13	81	92	87	89	105	19	8	BPE-6361074	
	89	76									BPE-6376089	
	88	46	42								BPE-6346088	
	129	66	63								BPE-6366129	
	128	46	82								BPE-6346128	
80	89	76	13	100	111	106	108	124	19	8	BPE-8076089	
	98	46	52								BPE-8046098	
	149	76	73								BPE-8076149	
	148	46	102								BPE-8046148	

**FA**

 śruba  
screw

**ZFA** - zaczepek  
mocujący DIN 9832

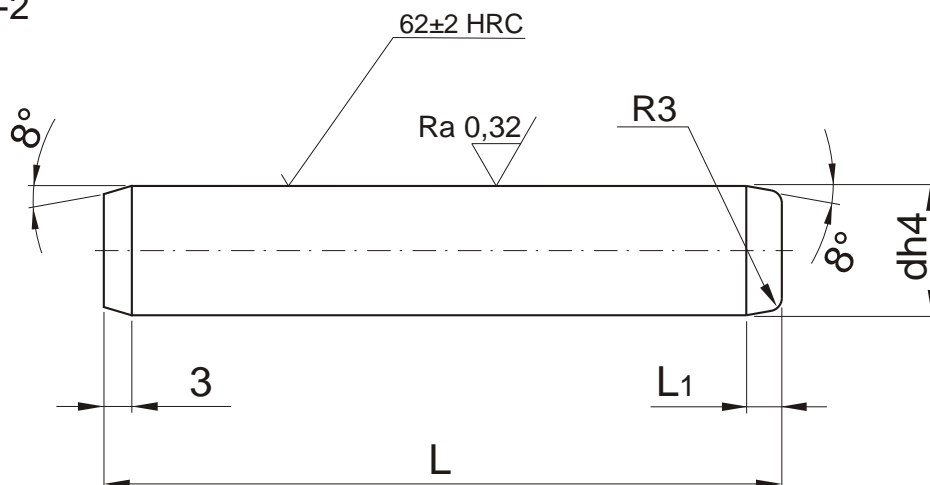
**ZFA** - screw  
clamps DIN 9832

 Mat: tuleja- brąz alumiowy  
- grafit  
zaczepek - stal

 Mat: bushing -aluminium bronze  
-graphite  
clamps - steel

**- DO WYCZERPANIA ZAPASÓW**  
**- UNTIL AVAILABLE**

Tuleja / Bushing									Zaczepek / Clamps									śruba screw	
D	D1	D2	L	L1	L2	L3	D3	NR KAT.	d4	d5	b1	b2	k	k1	h	h1	h2		
25/24	32	40	40	32	6,3	3,0	58	FA-25040	FA-24040	ZFA-10								M6 x 16	
32/30	40	50	50	40		4,0	66	FA-32050	FA-30050	7	11	20	20	7,5	5	10	7		6,3
40/38	50	63	63	50		5,0	79	FA-40063	FA-38063										
50/48	63	71	71	56		6,3	89	FA-50071	FA-48071										
63/60	80	90	80	63	10	8,0	123	FA-63080	FA-60080	ZFA-16								M10 x 20	
80	100	112	100	80		10,0	143	FA-80100		11,5	17,5	32	32	11	10	16	11,5		10
100	125	140	125	106		12,5	168	FA-100125											
125	160	180	160	132		16,0	203	FA-125160											
160	200	220	200	170		16,0	243	FA-160200											

ISO 9182-2

**FS**


Uwaga: Nakiełki technologiczne nie s symetryczne do rednicy zewn trznej słupa.

Note: Centre holes are not concentric with O.D.

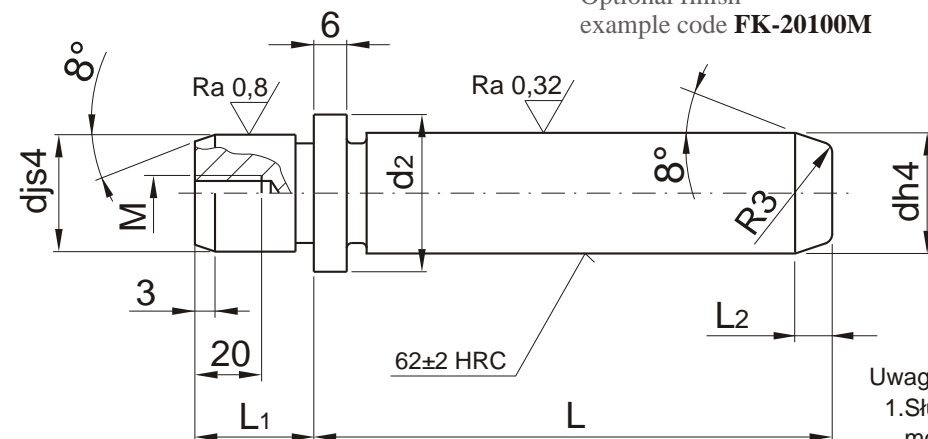
d	L	L1	NR KAT.		d	L	L1	NR KAT.	
20/19	100	4	FS-20100	FS-19100	40/38	250	6	FS-40250	FS-38250
	112		FS-20112	FS-19112		280		FS-40280	FS-38280
	125		FS-20125	FS-19125		315		FS-40315	FS-38315
	140		FS-20140	FS-19140		355		FS-40355	FS-38355
	160		FS-20160	FS-19160		400		FS-40400	FS-38400
	180		FS-20180	FS-19180		450		FS-40450	FS-38450
	200		FS-20200	FS-19200		500		FS-40500	FS-38500
	224		FS-20224	FS-19224		550		FS-40550	FS-38550
	250		FS-20250	FS-19250		600		FS-40600	FS-38600
	280		FS-20280	FS-19280	50/48	180	8	FS-50180	FS-48180
25/24	315	6	FS-20315	FS-19315		200		FS-50200	FS-48200
	100		FS-25100	FS-24100		224		FS-50224	FS-48224
	112		FS-25112	FS-24112		250		FS-50250	FS-48250
	125		FS-25125	FS-24125		280		FS-50280	FS-48280
	140		FS-25140	FS-24140		315		FS-50315	FS-48315
	160		FS-25160	FS-24160		355		FS-50355	FS-48355
	180		FS-25180	FS-24180		400		FS-50400	FS-48400
	200		FS-25200	FS-24200		450		FS-50450	FS-48450
	224		FS-25224	FS-24224		500		FS-50500	FS-48500
	250		FS-25250	FS-24250		550		FS-50550	FS-48550
32/30	280	6	FS-25280	FS-24280		600		FS-50600	FS-48600
	315		FS-25315	FS-24315	63/60	250	8	FS-63250	FS-60250
	355		FS-25355	FS-24355		280		FS-63280	FS-60280
	400		FS-25400	FS-24400		315		FS-63315	FS-60315
	125		FS-32125	FS-30125		355		FS-63355	FS-60355
	140		FS-32140	FS-30140		400		FS-63400	FS-60400
	160		FS-32160	FS-30160		450		FS-63450	FS-60450
	180		FS-32180	FS-30180		500		FS-63500	FS-60500
	200		FS-32200	FS-30200		550		FS-63550	FS-60550
	224		FS-32224	FS-30224		600		FS-63600	FS-60600
	250		FS-32250	FS-30250	80	280		FS-80280	
40/38	280	6	FS-32280	FS-30280		315		FS-80315	
	315		FS-32315	FS-30315		355		FS-80355	
	355		FS-32355	FS-30355		400		FS-80400	
	400		FS-32400	FS-30400		450		FS-80450	
	160		FS-40160	FS-38160		500		FS-80500	
	180		FS-40180	FS-38180		550		FS-80550	
	200		FS-40200	FS-38200		600		FS-80600	
	224		FS-40224	FS-38224					

ISO 9182-5

Wykonanie opcjonalne  
przykład oznaczenia **FK-20100M**

Optional finish  
example code **FK-20100M**

FK

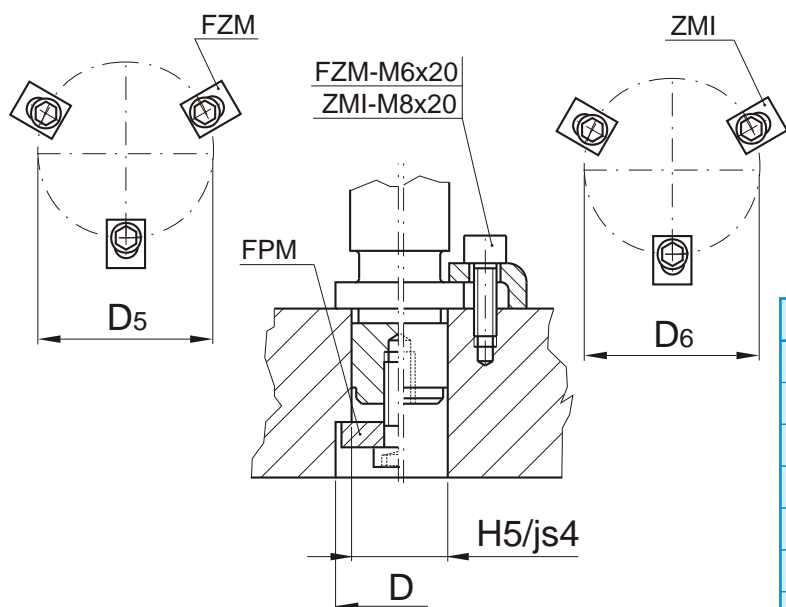


Uwaga:

1. Słupy s dostarczane z zaczepami mocuj cymi **FZM**. Opcjonalnie zaczepy mocuj ce **ZMI** na yczenie (str.L.47)
2. Nakiełki technologiczne nie s syme - tryczne do rednicy zewn trznej słupa.

Note:

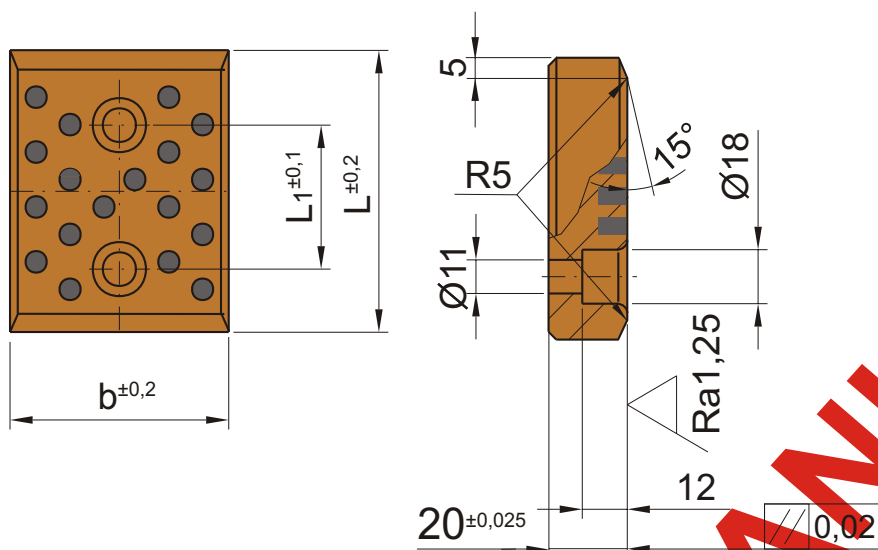
1. Our guide pins are supplied together with **FZM** type retaining clamps as standard. **ZMI** retaining clamps available on request (page L.47)
2. Centre holes are not concentric with O.D.



d	d2	L1	L2	M	D	D5	D6
20/19	25	23	4	M8	27	36	39
25/24	32	30	6		34	43	44
32/30	40	37	6		42	51	51
40/38	50	37	6		52	61	59
50/48	63	47	8		62	74	72
63/60	80	47	8	M12	72	91	89
80	95	60	8		95	106	109

d	L	NR KAT.		d	L	NR KAT.		d	L	NR KAT.	
20/19	100	FK-20100	FK-19100	32/30	200	FK-32200	FK-30200	50/48	280	FK-50280	FK-48280
	112	FK-20112	FK-19112		224	FK-32224	FK-30224		315	FK-50315	FK-48315
	125	FK-20125	FK-19125		250	FK-32250	FK-30250		355	FK-50355	FK-48355
	140	FK-20140	FK-19140		280	FK-32280	FK-30280		400	FK-50400	FK-48400
	160	FK-20160	FK-19160		315	FK-32315	FK-30315		160	FK-63160	FK-60160
	180	FK-20180	FK-19180		125	FK-40125	FK-38125	63/60	180	FK-63180	FK-60180
	200	FK-20200	FK-19200		140	FK-40140	FK-38140		200	FK-63200	FK-60200
25/24	100	FK-25100	FK-24100	40/38	160	FK-40160	FK-38160		224	FK-63224	FK-60224
	112	FK-25112	FK-24112		180	FK-40180	FK-38180		250	FK-63250	FK-60250
	125	FK-25125	FK-24125		200	FK-40200	FK-38200		280	FK-63280	FK-60280
	140	FK-25140	FK-24140		224	FK-40224	FK-38224		315	FK-63315	FK-60315
	160	FK-25160	FK-24160		250	FK-40250	FK-38250		355	FK-63355	FK-60355
	180	FK-25180	FK-24180		280	FK-40280	FK-38280		400	FK-63400	FK-60400
	200	FK-25200	FK-24200		315	FK-40315	FK-38315	80	200	FK-80200	
32/30	224	FK-25224	FK-24224	50/48	355	FK-40355	FK-38355		224	FK-80224	
	250	FK-25250	FK-24250		140	FK-50140	FK-48140		250	FK-80250	
	112	FK-32112	FK-30112		160	FK-50160	FK-48160		280	FK-80280	
	125	FK-32125	FK-30125		180	FK-50180	FK-48180		315	FK-80315	
	140	FK-32140	FK-30140		200	FK-50200	FK-48200		355	FK-80355	
	160	FK-32160	FK-30160		224	FK-50224	FK-48224		400	FK-80400	
	180	FK-32180	FK-30180		250	FK-50250	FK-48250				

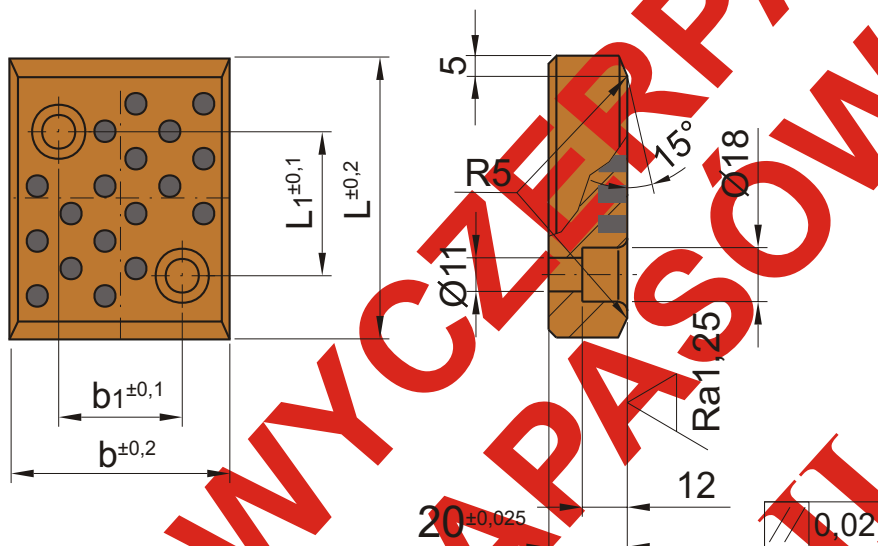
## PGA



Mat. -brąz alumiiniowy  
-grafit  
-aluminum bronce  
-graphite

b	L	L1	NR KAT.
48	75	45	PGA-048075
	100	50	PGA-048100
	125	75	PGA-048125
	150	100	PGA-048150
	200	150	PGA-048200
75	125	75	PGA-075125
	150	100	PGA-075150
	200	150	PGA-075200

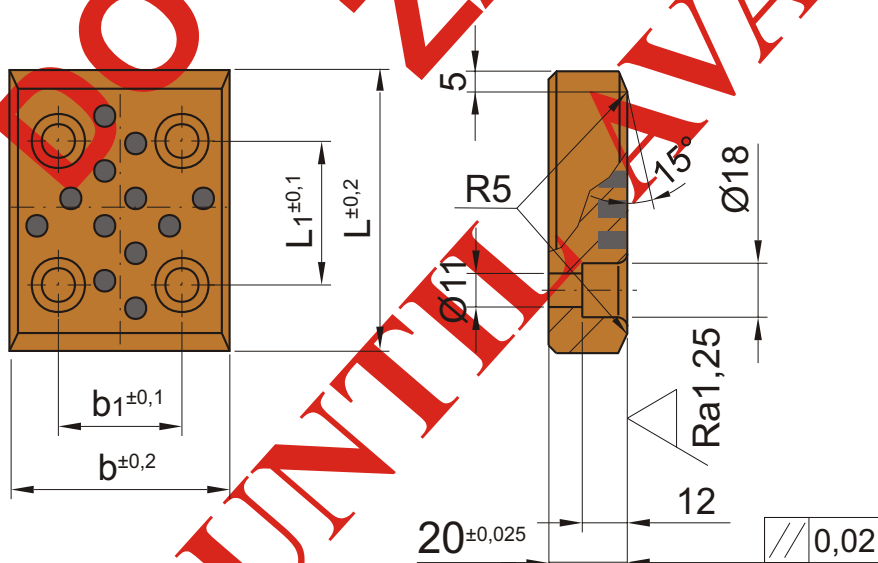
## PGB



Mat. -brąz alumiiniowy  
-grafit  
-aluminum bronce  
-graphite

b	b1	L	L1	NR KAT.
75	25	75	25	PGB-075075
		100	50	PGB-075100

## PGC



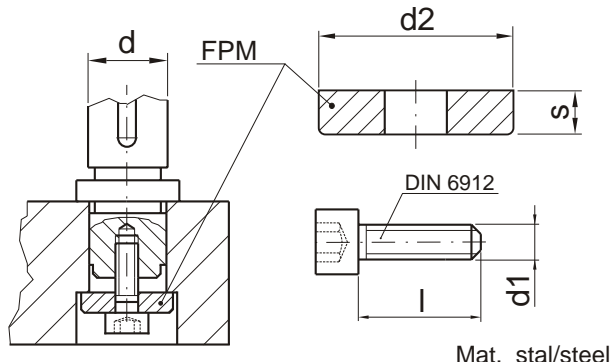
Mat. -brąz alumiiniowy  
-grafit  
-aluminum bronce  
-graphite

b	b1	L	L1	NR KAT.
100	50	100	50	PGC-100100
		125	75	PGC-100125
		150	100	PGC-100150
		200	150	PGC-100200
		250	200	PGC-100250
125	50	150	100	PGC-125150
		200	150	PGC-125200
		250	200	PGC-125250
150	100	150	100	PGC-150150
		200	150	PGC-150200
		250	200	PGC-150250



PIER CIE MOCUJ CY  
RETAINING RING

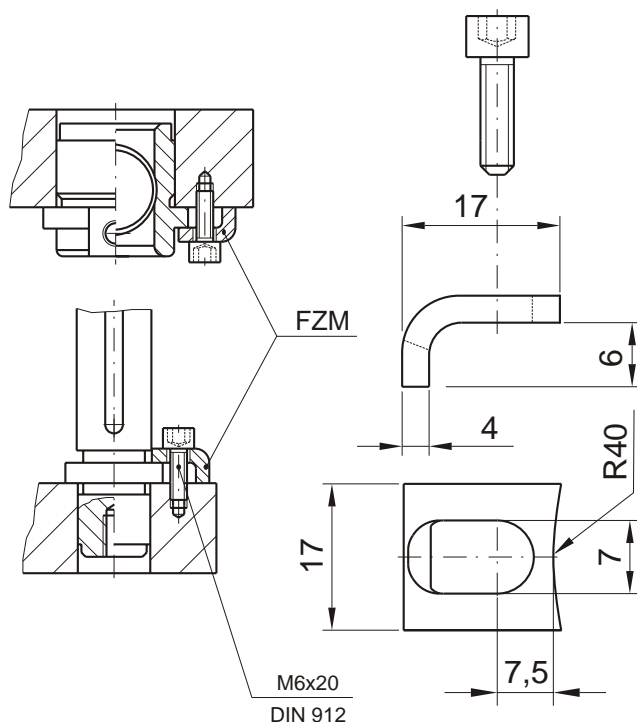
FPM



d	d2	s	d1	l	NR KAT.
19	25	6	M8	20	FPM-20
20	25				FPM-25
24	32				FPM-32
25	32				FPM-40
30	40				FPM-50
32	40				FPM-63
38	50				FPM-80
40	50				
48	60	12	M12	30	
50	60				
60	70				
63	70				
80	93				

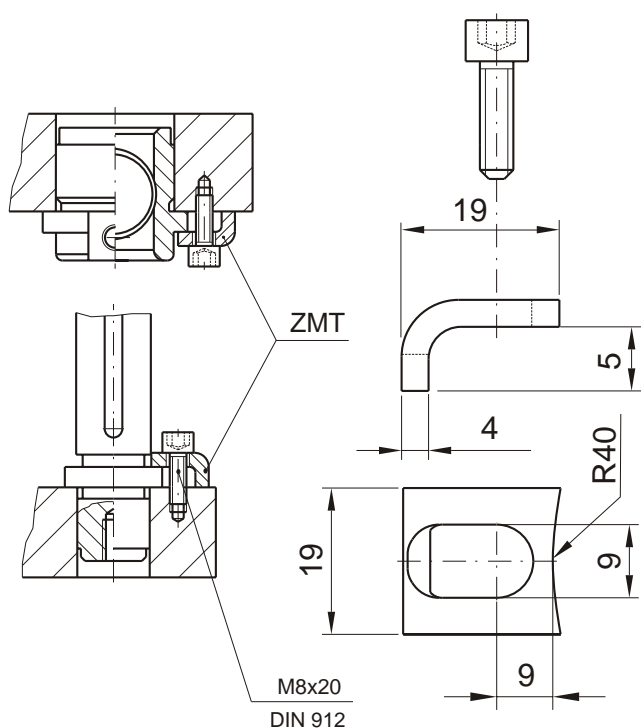
ZACZEP MOCUJ CY  
RETAINING CLAMP

FZM



ZACZEP MOCUJ CY  
RETAINING CLAMP

ZMT



ZACZEP MOCUJ CY  
RETAINING CLAMP

ZMI

