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## **A DIE SETS**



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## **B PRECISION GROUND PLATES AND FLAT BARS**



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## **C LIFTING AND CLAMPING DEVICES**



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## **D GUIDE ELEMENTS**



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## **E GROUND PRECISION COMPONENTS**



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## **F SPRINGS**



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## **G ELASTOMERS**



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## **H FIBRO-CHEMICAL TOOLING AIDS**



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## **J PERIPHERAL EQUIPMENT**



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## **K CAM UNITS**



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## **L STANDARD PARTS FOR MOULD MAKING**


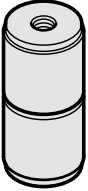

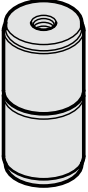

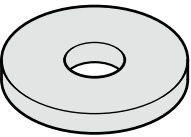

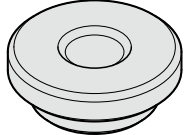


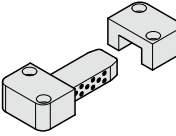

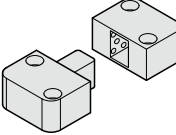



# STANDARD PARTS FOR MOULD MAKING

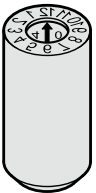

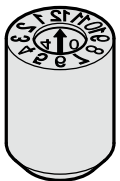

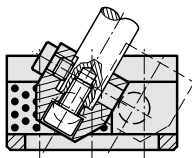





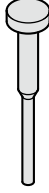
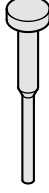





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FIBRO gas springs – The Safer Choice  
Maximum safety for persons and tools



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Gas spring (Spring plunger) MOULD LINE, with hexagon socket



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Gas spring (Spring plunger) MOULD LINE, with hexagon socket



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Gas spring MOULD LINE

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Gas spring MOULD LINE

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Gas spring MOULD LINE

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Gas spring MOULD LINE

# GUIDE ELEMENTS

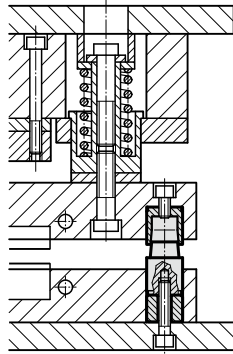


# CENTERING UNIT

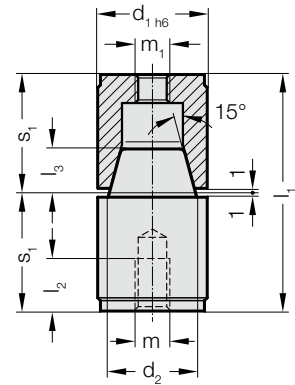
## CENTERING UNIT, FLAT



Mounting example



2442.12.



**Description:**

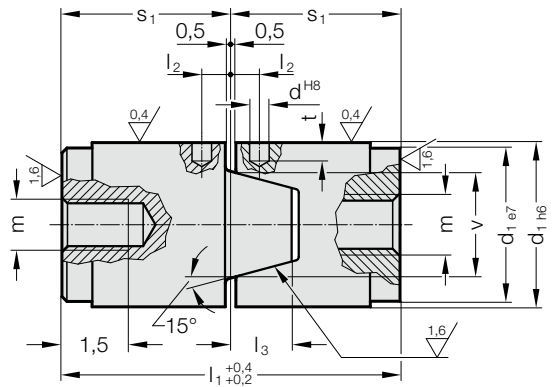
Conical centring units are used to increase repeat accuracy in mould, die and machine-making.

2442.12. Centering unit

Order No	d <sub>1</sub>	d <sub>2</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	m, m <sub>1</sub>	s <sub>1</sub>
2442.12.012.034	12	8	34	6	4	M4	17
2442.12.014.034	14	10	34	7.5	6	M5	17
2442.12.016.034	16	10	34	7.5	6	M5	17
2442.12.020.054	20	15	54	12	9	M8	27
2442.12.025.054	25	20	54	12	10	M8	27
2442.12.026.054	26	20	54	12	10	M8	27
2442.12.030.072	30	25	72	15	14	M10	36
2442.12.032.072	32	25	72	15	14	M10	36
2442.12.042.092	42	35	92	15	18	M10	46



2442.13.



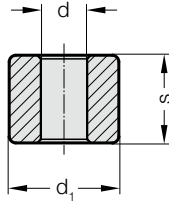
2442.13. Centering unit, flat

Order No	d <sub>1</sub>	d	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	v	s <sub>1</sub>	t	m
2442.13.030.072	30	4	72	5	10	18	36	5	M10
2442.13.042.092	42	5	92	6	14	23	46	7	M10
2442.13.054.112	54	6	112	8	17	30	56	8	M12
2442.13.080.152	80	8	152	8	27	42	76	11	M16



# ADJUSTING WASHER RETAINING WASHER

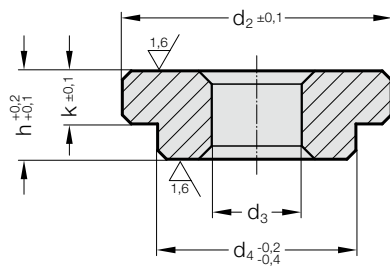
## 2442.12.3.



### 2442.12.3. Adjusting washer

Order No	$d_1$	$d$	$s$	Order No	$d_1$	$d$	$s$	Order No	$d_1$	$d$	$s$
2442.12.3.012.010	12	4.5	10	2442.12.3.020.020	20	8.5	20	2442.12.3.026.030	26	8.5	30
2442.12.3.014.005	14	5.5	5	2442.12.3.020.030	20	8.5	30	2442.12.3.030.010	30	12.5	10
2442.12.3.014.010	14	5.5	10	2442.12.3.020.040	20	8.5	40	2442.12.3.030.020	30	12.5	20
2442.12.3.014.014	14	5.5	14	2442.12.3.025.009	25	10.5	9	2442.12.3.030.030	30	12.5	30
2442.12.3.014.019	14	5.5	19	2442.12.3.025.010	25	10.5	10	2442.12.3.030.040	30	12.5	40
2442.12.3.016.005	16	6.5	5	2442.12.3.025.015	25	10.5	15	2442.12.3.030.050	30	12.5	50
2442.12.3.016.010	16	6.5	10	2442.12.3.025.020	25	10.5	20	2442.12.3.032.010	32	12.5	10
2442.12.3.016.015	16	6.5	15	2442.12.3.025.025	25	10.5	25	2442.12.3.032.020	32	12.5	20
2442.12.3.016.019	16	6.5	19	2442.12.3.025.035	25	10.5	35	2442.12.3.032.030	32	12.5	30
2442.12.3.016.020	16	6.5	20	2442.12.3.025.045	25	10.5	45	2442.12.3.032.040	32	12.5	40
2442.12.3.016.025	16	6.5	25	2442.12.3.025.055	25	10.5	55	2442.12.3.032.050	32	12.5	50
2442.12.3.020.009	20	8.5	9	2442.12.3.026.009	26	8.5	9	2442.12.3.042.010	42	10.5	10
2442.12.3.020.010	20	8.5	10	2442.12.3.026.010	26	8.5	10	2442.12.3.042.020	42	10.5	20
2442.12.3.020.015	20	8.5	15	2442.12.3.026.020	26	8.5	20	2442.12.3.042.030	42	10.5	30

## 2442.12.4.



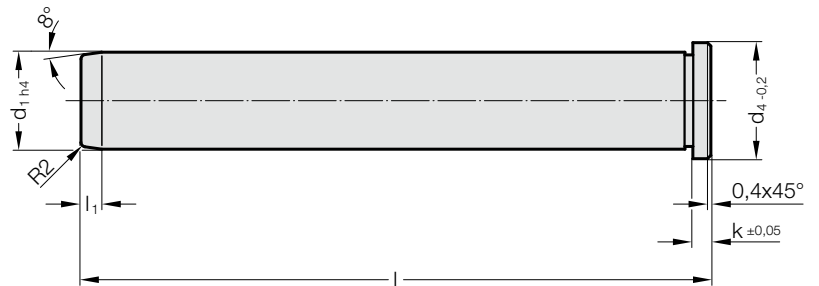
### 2442.12.4. Retaining washer

Order No	$d_4$	$d_3$	$d_2$	$h$	$k$
2442.12.4.014	14	5.5	16	5	3.2
2442.12.4.020	20	8.5	25.5	9	6.3
2442.12.4.026	26	8.5	31.5	9	6.3
2442.12.4.030	30	11	35.5	10	6.3
2442.12.4.042	42	11	47.5	10	6.3

## GUIDE PILLAR



### 3202.12.

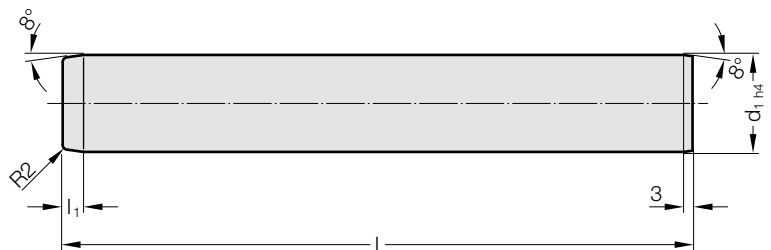


### 3202.12. Guide pillar

Order No	d <sub>1</sub>	l	d <sub>4</sub>	k	l <sub>1</sub>
3202.12.012.080	12	80	16	4	4
3202.12.012.100	12	100	16	4	4
3202.12.012.120	12	120	16	4	4
3202.12.018.120	18	120	22	6	7
3202.12.018.140	18	140	22	6	7
3202.12.018.160	18	160	22	6	7
3202.12.030.160	30	160	36	6	7
3202.12.030.200	30	200	36	6	7
3202.12.030.240	30	240	36	6	7



### 3202.13.



### 3202.13. Guide pillar

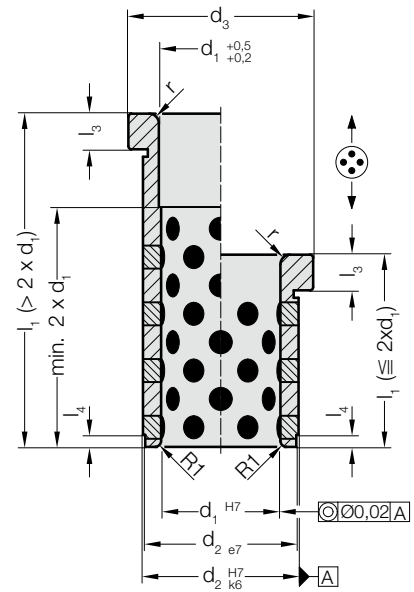
Order No	d <sub>1</sub>	l	l <sub>1</sub>
3202.13.012.100	12	100	3
3202.13.012.125	12	125	3
3202.13.018.125	18	125	6
3202.13.018.160	18	160	6
3202.13.030.160	30	160	6
3202.13.030.240	30	240	6



# GUIDE BUSH WITH COLLAR, BRONZE WITH SOLID LUBRICANT



2087.72.



**Material:**

Bronze with solid lubricant, oilless lubricating

**Note:**

☞ Assembly guide lines / Dimensional requirements and tolerances at the end of chapter D.

**Attention:**

Bushes can only be used with axial motion!

**2087.72. Guide bush with collar, Bronze with solid lubricant**

d <sub>1</sub>	9 10	12	14 15	16	18 20	22 24	25	30 32	40 42	50	60
d <sub>2</sub>	14	18	20	22	26	30	32	42	54	66	80
d <sub>3</sub>	16	23	25	27	31	35	38	47	60	72	86
r	0.5	1	1	2	2	3	3	3	3	3	3
l <sub>3</sub>	3	6	6	6	6	6	6	6	10	10	20
l <sub>4</sub>	1.5	2	2	2	2	3	3	4	5	5	5
l <sub>1</sub>											
12	●										
17	●	●	●	●	●	●					
22	●	●	●	●	●	●					
27	●	●	●	●	●	●					
36	●	●	●	●	●	●					
46	●	●	●	●	●	●	●	●			
56	●	●	●	●	●	●	●	●	●		
66					●	●	●	●	●	●	
76					●	●	●	●	●	●	●
86						●	●	●	●	●	●
96						●	●	●	●	●	●
116								●	●	●	●
136									●	●	●
156									●	●	●
196										●	●

**Ordering Code (example):**

Guide bush with collar, Bronze with solid lubricant	=2087.72.
Diameter of conduit d <sub>1</sub>	22 mm = 022.
total length l <sub>1</sub>	17 mm = 017
Order No	=2087.72. 022. 017

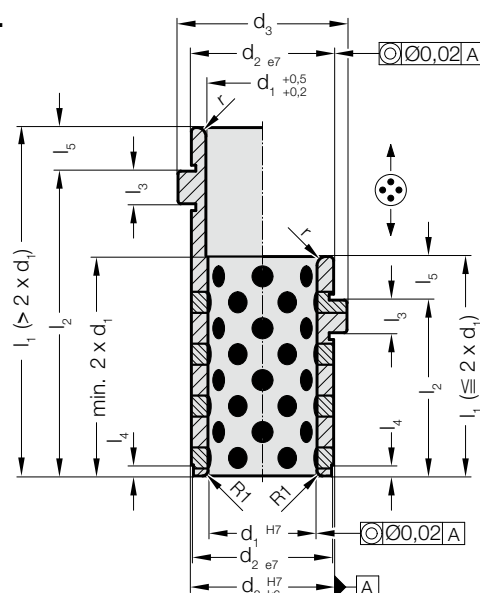
# GUIDE BUSH WITH COLLAR, BRONZE WITH SOLID LUBRICANT

## 2087.70. Guide bush with collar, Bronze with solid lubricant

$d_1$	9 10	14 15	18 20	22 24	30 32	40 42
$d_2$	14	20	26	30	42	54
$d_3$	16	25	31	35	47	60
$l_3$	3	6	6	6	6	10
$l_4$	1.5	2	2	3	4	5
$l_5$	3	6	8	8	8	12
$r$	0.5	1	2	3	3	3
$l_1 / l_2$						
15 12	•					
20 17	•					
23 17		•				
25 17			•	•		
25 22	•					
28 22		•				
30 22			•	•		
30 27	•					
33 27		•				
35 27			•	•	•	
39 36	•					
42 36		•				
44 36			•	•	•	
49 46	•					
52 46		•				
54 46			•	•	•	
58 46						•
59 56	•					
62 56		•				
64 56			•	•	•	
68 56						•
69 66	•					
72 66		•				
74 66			•	•	•	
78 66						•
82 76		•				
84 76			•	•	•	
88 76						•
92 86		•				
94 86			•	•	•	
98 86						•
104 96			•	•	•	
108 96						•
124 116			•	•	•	
128 116						•
144 136				•	•	
148 136						•
164 156				•		
168 156						•
208 196						•



### 2087.70.



### Material:

Bronze with solid lubricant, oilless lubricating

### Note:

Assembly guide lines / Dimensional requirements and tolerances at the end of chapter D.

### Attention:

Bushes can only be used with axial motion!

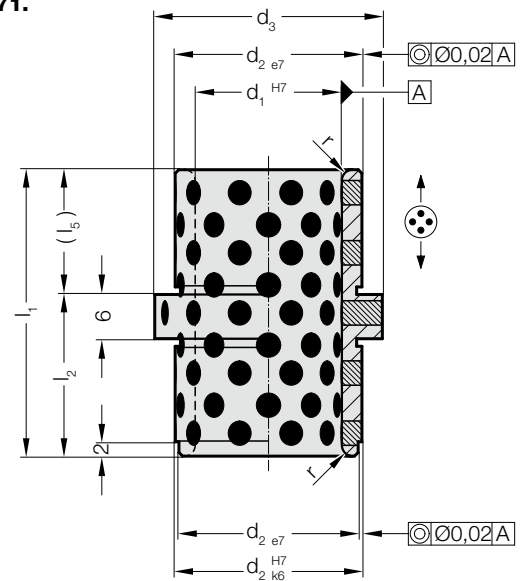
### Ordering Code (example):

Guide bush with collar, Bronze with solid lubricant	=2087.70.
Diameter of conduit $d_1$	22 mm = 022.
Length with bush $l_2$	17 mm = 017
Order No	=2087.70. 022. 017

## GUIDE BUSH WITH COLLAR, BRONZE WITH SOLID LUBRICANT



2087.71.



### Material:

Bronze with solid lubricant, oilless lubricating

### Note:

☞ Assembly guide lines / Dimensional requirements and tolerances at the end of chapter D.

### Attention:

Bushes can only be used with axial motion!

### 2087.71. Guide bush with collar, Bronze with solid lubricant

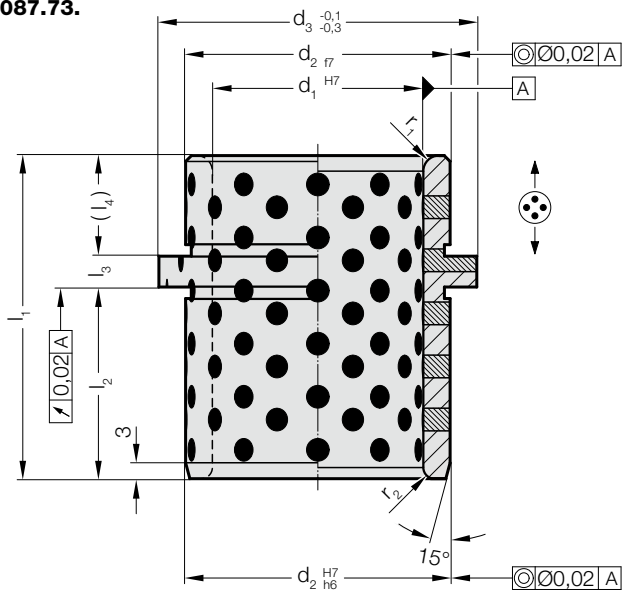
$d_1$	14 15	18 20	22 24	30 32
$d_2$	20	26	30	42
$d_3$	25	31	35	47
$r$	1	1.5	2	2
$l_1$	26	39	49	63
$l_2$	17	22	27	36
$l_5$	9	17	22	27

### Ordering Code (example):

Guide bush with collar, Bronze with solid lubricant	=2087.71.
Diameter of conduit $d_1$	22 mm = 022.
Length with bush $l_2$	27 mm = 027
Order No	=2087.71. 022. 027

## GUIDE BUSH WITH COLLAR, BRONZE WITH SOLID LUBRICANT


2087.73.



### Material:

Bronze with solid lubricant, oilless lubricating

### Note:

 Assembly guide lines / Dimensional requirements and tolerances at the end of chapter D.

### Attention:

Bushes can only be used with axial motion!

### 2087.73. Guide bush with collar, Bronze with solid lubricant

d <sub>1</sub>	25	30	40	40	50	50	60	63	63	63
d <sub>2</sub>	35	42	50	50	63	63	80	80	80	80
d <sub>3</sub>	40	47	60	60	72	72	86	90	90	90
r <sub>1</sub>	3	3	4	4	4	4	3	4	4	4
r <sub>2</sub>	2	2	2	2	3	3	3	3	3	3
l <sub>1</sub>	43	43	60	64	77	92	78	100	95	108
l <sub>2</sub>	24	24	35.5	39.5	44.5	55.5	49	62.5	55.5	62.5
l <sub>3</sub>	7.5	7.5	6	6	8	8	7.5	8	8	8
l <sub>4</sub>	11.5	11.5	18.5	18.5	24.5	28.5	21.5	29.5	31.5	37.5

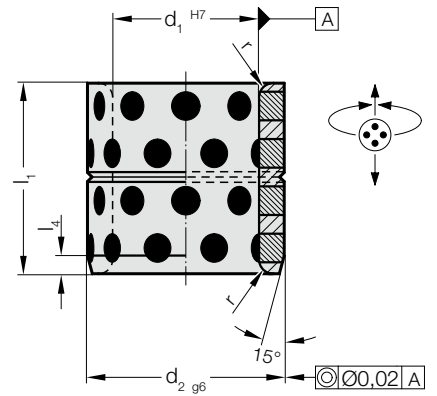
### Ordering Code (example):

Guide bush with collar, Bronze with solid lubricant =2087.73.  
 Diameter of conduit d<sub>1</sub> 50 mm = 050.  
 total length l<sub>1</sub> 77 mm = 077  
 Order No =2087.73. 050. 077

# GUIDE BUSH, BRONZE WITH SOLID LUBRICANT



3120.70.



**Material:**

Bronze with solid lubricant, oilless lubricating

**Note:**

Bushes can be used with radial or axial motion.

Assembly guide lines / Dimensional requirements and tolerances at the end of chapter D.

**Fixing:**

Connecting with adhesive or if needed secure with threaded pin or flat mushroom head screw 2192.61.

**3120.70. Guide bush, Bronze with solid lubricant**

d <sub>1</sub>	8	10	10	12	13	14	15	16	18	20	20	20	24	25	25	25	28	30	30	30	31.5	32	35	35	38	40	40	
d <sub>2</sub>	12	14	15	18	19	20	21	22	24	26	28	30	32	32	33	35	38	38	40	42	40	42	44	45	48	50	55	
r	0.5	0.5	0.5	0.5	0.5	0.5	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	1.5	1.5	1.5	
l <sub>1</sub>	2	2	2	2	2	2	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
l <sub>1</sub>	8	10	12	15	16	20	25	30	35	40	47	50	60	70	77	80												

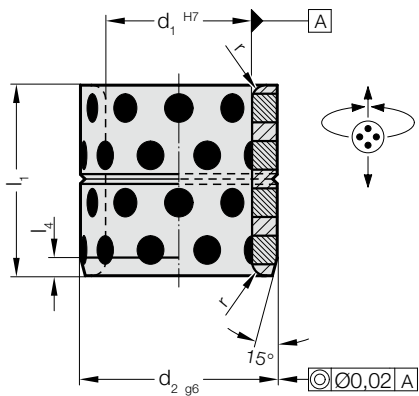
**Ordering Code (example):**

Guide bush, Bronze with solid lubricant	=3120.70.
Diameter of conduit d <sub>1</sub>	40 mm = 040.
Outer diameter d <sub>2</sub>	55 mm = 055.
Installation length l <sub>1</sub>	25 mm = 025
Order No	=3120.70. 040. 055.025



# GUIDE BUSH, BRONZE WITH SOLID LUBRICANT

3120.70.



**Material:**

Bronze with solid lubricant, oilless lubricating

**Note:**

Bushes can be used with radial or axial motion.

Assembly guide lines / Dimensional requirements and tolerances at the end of chapter D.

**Fixing:**

Connecting with adhesive or if needed secure with threaded pin or flat mushroom head screw 2192.61.

**3120.70. Guide bush, Bronze with solid lubricant**

	45	45	45	50	50	50	55	60	60	63	65	70	70	75	75	80	80	85	90	100	110	120	125	130	140	150	160
d <sub>1</sub>	45	45	45	50	50	50	55	60	60	63	65	70	70	75	75	80	80	85	90	100	110	120	125	130	140	150	160
d <sub>2</sub>	55	56	60	60	62	65	70	74	75	75	80	85	90	90	95	96	100	100	110	120	130	140	145	150	160	170	180
r	1.5	1.5	1.5	1.5	1.5	1.5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
l <sub>4</sub>	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
l <sub>1</sub>																											
30	•	•	•	•	•	•		•	•																		
35	•	•	•	•	•			•	•			•															
40	•	•	•	•	•	•	•	•	•			•					•	•									
50	•	•	•	•	•	•	•	•	•			•		•			•	•									
60	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•						
70			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
80			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
95				•																							
100					•				•			•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
120											•						•	•	•	•	•	•	•	•	•	•	•
130																									•		
140																										•	
150																											•

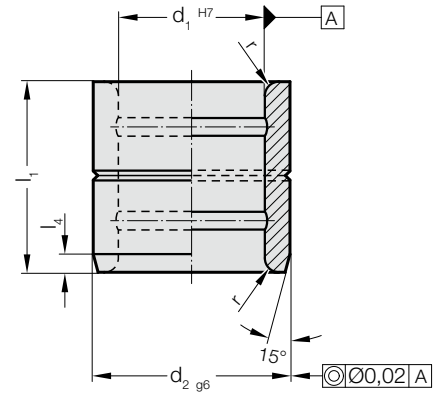
**Ordering Code (example):**

Guide bush, Bronze with solid lubricant	=3120.70.
Diameter of conduit d <sub>1</sub>	40 mm = 040.
Outer diameter d <sub>2</sub>	55 mm = 055.
Installation length l <sub>1</sub>	25 mm = 025
Order No	=3120.70. 040. 055.025

# GUIDE BUSH, BRONZE



3120.71.



**Material:**

Bronze

**Note:**

Bushes can be used with radial or axial motion.

Assembly guide lines / Dimensional requirements and tolerances at the end of chapter D.

**Fixing:**

Connecting with adhesive or if needed secure with threaded pin or flat mushroom head screw 2192.61.

**3120.71. Guide bush, Bronze**

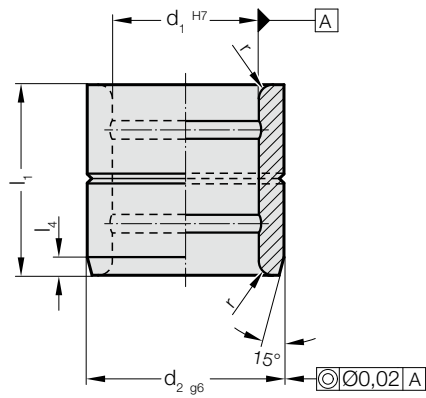
d <sub>1</sub>	8	10	10	12	13	14	15	16	18	20	20	20	24	25	25	25	28	30	30	30	31.5	32	35	35	38	40	40
d <sub>2</sub>	12	14	15	18	19	20	21	22	24	26	28	30	32	32	33	35	38	38	40	42	40	42	44	45	48	50	55
r	0.5	0.5	0.5	0.5	0.5	0.5	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	1.5	1.5	1.5
l <sub>4</sub>	2	2	2	2	2	2	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
l <sub>1</sub>																											
8	●	●																									
10	●	●	●	●	●	●	●	●																			
12	●	●		●	●	●	●	●																			
15	●	●		●	●	●	●	●	●																		
16				●	●	●	●	●	●																		
20		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
25				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
30				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
35																											
37																											
40																											
47																											
50																											
60																											
70																											
77																											
80																											

**Ordering Code (example):**

Guide bush, Bronze	=3120.71.
Diameter of conduit d <sub>1</sub>	40 mm = 040.
Outer diameter d <sub>2</sub>	55 mm = 055.
Installation length l <sub>1</sub>	25 mm = 025
Order No	=3120.71. 040. 055. 025

# GUIDE BUSH, BRONZE

3120.71.



**Material:**

Bronze

**Note:**

Bushes can be used with radial or axial motion.

Assembly guide lines / Dimensional requirements and tolerances at the end of chapter D.

**Fixing:**

Connecting with adhesive or if needed secure with threaded pin or flat mushroom head screw 2192.61.

**3120.71. Guide bush, Bronze**

d <sub>1</sub>	45	45	45	50	50	50	55	60	60	63	65	70	70	75	75	80	80	85	90	100	110	120	125	130	140	150	160	
d <sub>2</sub>	55	56	60	60	62	65	70	74	75	75	80	85	90	90	95	96	100	100	110	120	130	140	145	150	160	170	180	
r	1.5	1.5	1.5	1.5	1.5	1.5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
l <sub>4</sub>	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
l <sub>1</sub>																												
30	•	•	•	•	•	•		•	•																			
35	•	•	•	•	•	•		•	•			•																
40	•	•	•	•	•	•	•	•	•			•																
50	•	•	•	•	•	•	•	•	•			•																
60	•	•	•	•	•	•	•	•	•			•																
70			•	•	•	•	•	•	•			•																
80			•	•	•	•	•	•	•			•																
95				•																								
100						•			•																			
120											•																	
130																												
140																												
150																												

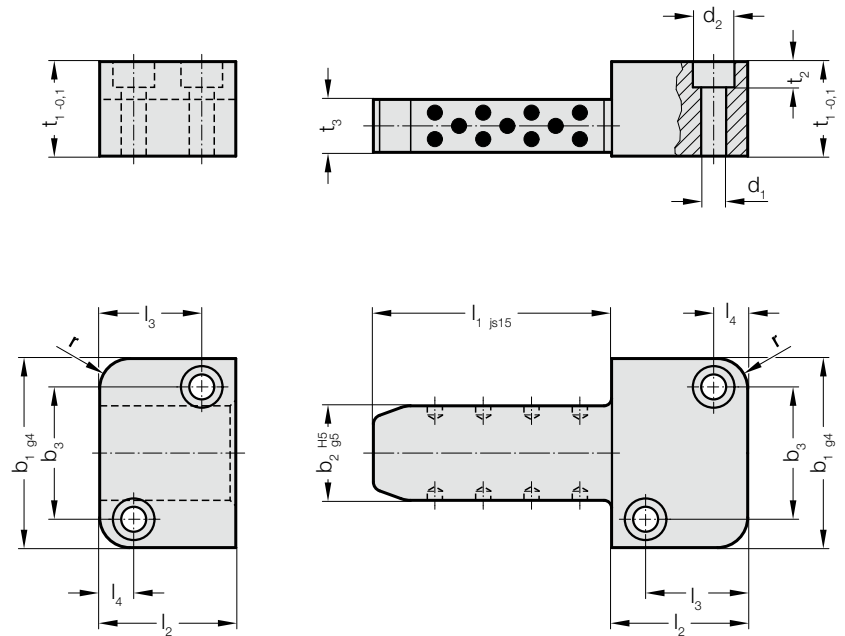
**Ordering Code (example):**

Guide bush, Bronze	=3120.71.
Diameter of conduit d <sub>1</sub> 40 mm	= 040.
Outer diameter d <sub>2</sub> 55 mm	= 055.
Installation length l <sub>1</sub> 25 mm	= 025
Order No	=3120.71. 040. 055.025

# RECTANGULAR GUIDE, STEEL WITH SOLID LUBRICANT



3131.40.



**Material:**

Steel with solid lubricant  
Surface: case hardened, 580+40 HV 30

Steel  
Surface: case hardened, 700+60 HV 30

**Note:**

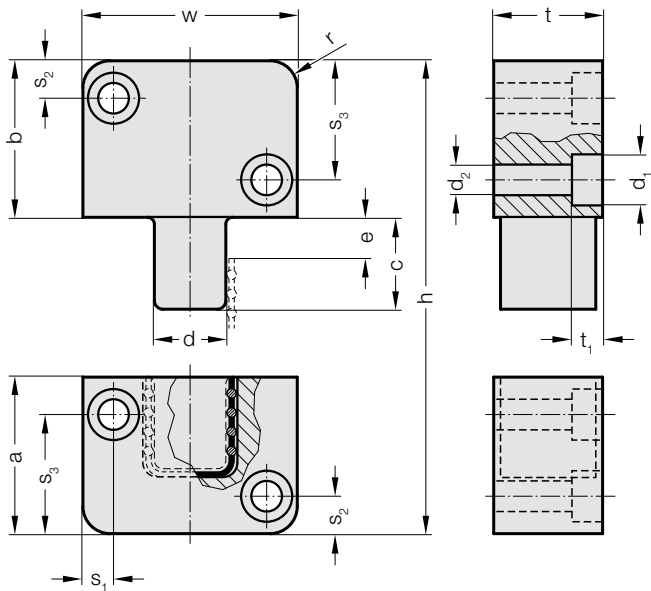
The maximum operating temperature is 200°C.

**3131.40. Rectangular Guide, Steel with solid lubricant**

Order No	$l_2$	$b_2$	$l_1$	$b_1$	$r$	$t_1$	$t_2$	$t_3$	$d_1$	$d_2$	$b_3$	$l_3$	$l_4$
3131.40.022.016.020	22	16	20	40	6	20	6.8	11	6.6	11	26	15	7
3131.40.022.016.040	22	16	40	40	6	20	6.8	11	6.6	11	26	15	7
3131.40.027.020.025	27	20	25	45	6	22	6.8	13	6.6	11	31	19	7
3131.40.027.020.050	27	20	50	45	6	22	6.8	13	6.6	11	31	19	7
3131.40.036.025.032	36	25	32	50	8	25	6.8	14	6.6	11	35	27	9
3131.40.036.025.063	36	25	63	50	8	25	6.8	14	6.6	11	35	27	9
3131.40.046.032.040	46	32	40	63	8	32	9	19	9	15	45	35	11
3131.40.046.032.080	46	32	80	63	8	32	9	19	9	15	45	35	11
3131.40.056.040.050	56	40	50	85	10	36	11	22	11	18	60	40	15
3131.40.056.040.100	56	40	100	85	10	36	11	22	11	18	60	40	15
3131.40.066.050.056	66	50	56	100	10	40	13	24	14	20	74	48	18
3131.40.066.050.112	66	50	112	100	10	40	13	24	14	20	74	48	18

# RECTANGULAR GUIDE, STEEL WITH ROLLERS

3131.80.



## Description:

The rectangular guides with rollers guarantee the greatest precision when their mould is moved together. The rectangular guides must always be installed in the outer area of the mould plates to ensure problem-free functionality.

**Advantages:** no play or friction, low maintenance and no lubrication

## Material:

Steel  
Hardness: 56-58 HRC  
Surface: burnished

## Note:

The maximum operating temperature is 150°C.

## 3131.80. Rectangular guide, Steel with Rollers

Order No	t	w	a	b	c	d	e	h	r	s <sub>1</sub>	s <sub>2</sub>	s <sub>3</sub>	d <sub>1</sub>	d <sub>2</sub>	t <sub>1</sub>
3131.80.032.063	32	63	46	46	27	21	12.1	92	8	9	11	35	15	9	9
3131.80.040.100	40	100	66	66	36	33	19.5	132	10	13	18	48	20	13.5	13



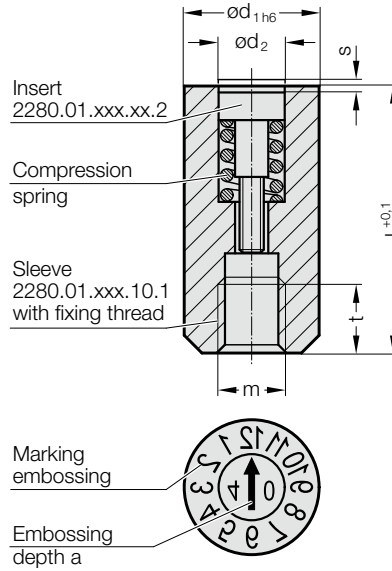
# MOULDING / DEMOULDING



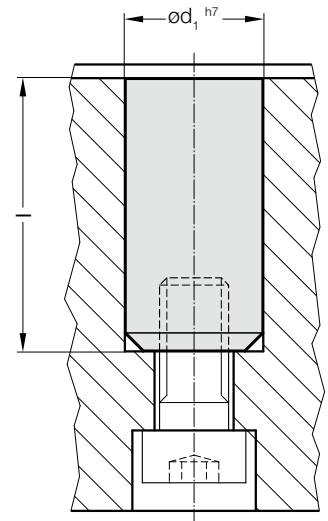
# DATE STAMP COMPLETE, EMBOSSED LETTERING



2280.01.



Mounting example



**Material:**

1.2767, hardened HRC 54±2, ground

**Note:**

The sleeve and insert can be ordered separately (see ordering example).

**Description:**

- sleeve with engraving
- adjustable insert with display arrow and year (can be rotated using an ordinary screwdriver)
- metric thread for fixing
- mirror image engraving

**Mounting:**

**Fixing:**

Screw in the insert in a clockwise direction until it is flush with the top edge and set to the required position.

**Setting:**

Set the insert by turning clockwise or anti-clockwise. When correctly set, the insert of a stamp with  $d_1 = 6$  mm (.060.) is typically a maximum of 0.1 mm above or below the top edge of the sleeve.

**Changing:**

To change the insert turn it anti-clockwise to remove.

**2280.01. Date stamp complete, embossed lettering**

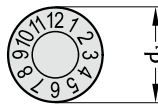
$d_1$	$d_2$	$l$	$m$	$t$	$s$	$a$
4	2.5	14	2	2	0.2	0.3
5	3.1	17	3	3	0.2	0.4
6	3.1	17	3	3	0.2	0.4
8	4.6	20	4	4	0.35	0.4
10	4.6	20	5	4	0.35	0.4
12	6.4	25	6	6	0.5	0.6
16	8.4	33	8	8	0.6	0.6

**Order samples:**

Date insert, complete	=	2280.
Standard design	=	01.
Diameter of guide sleeve		
$d_1 = 5$	=	050.
Sleeve with display:		
Months (1-12)	=	10.
Insert with display: Arrow + year		
(variable) e.g. 2004	=	04
Order No	=	2280.01.050.10.04

Date insert, Sleeve	=	2280.
Standard design	=	02.
Diameter of guide sleeve		
$d_1 = 5$	=	050.
Sleeve with display:		
Months (1-12)	=	10.
Sleeve	=	1
Order No	=	2280.02.050.10.1

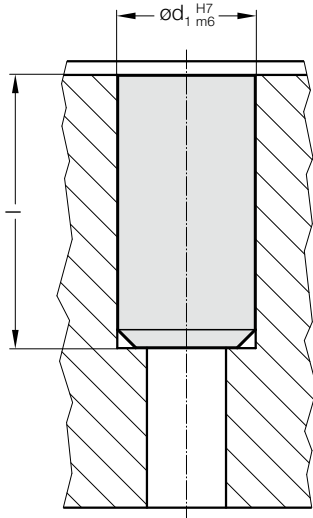
Date insert, Insert	=	2280.
Standard design	=	01.
Diameter of guide sleeve		
$d_1 = 5$	=	050.
Insert with display: Arrow + year		
(variable) e.g. 2004	=	04.
Insert	=	2
Order No	=	2280.01.050.04.2



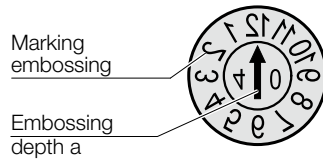
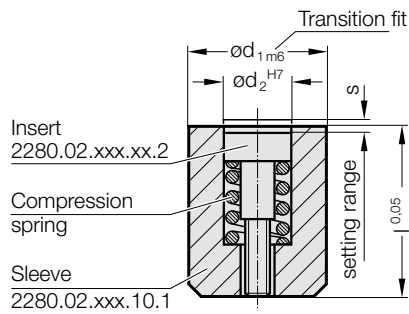


# DATE STAMP COMPLETE (SHORT VERSION), EMBOSSED LETTERING

## Mounting example



## 2280.02.



### Material:

1.2767, hardened HRC 54±2, ground

### Note:

The sleeve and insert can be ordered separately (see ordering example).

### Description:

- sleeve with engraving
- adjustable insert with display arrow and year (can be rotated using an ordinary screwdriver)
- metric thread for fixing
- mirror image engraving

### Mounting:

#### Fixing:

Screw in the insert in a clockwise direction until it is flush with the top edge and set to the required position.

#### Setting:

Set the insert by turning clockwise or anti-clockwise. When correctly set, the insert of a stamp with  $d_1 = 6$  mm (.060) is typically a maximum of 0.1 mm above or below the top edge of the sleeve.

#### Changing:

To change the insert turn it anti-clockwise to remove.

## 2280.02. Date stamp complete (short version), embossed lettering

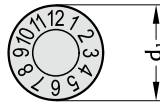
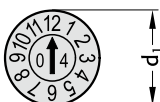
$d_1$	$d_2$	l	s	a
2.6	1.4	4	0.2	0.3
3	1.5	4	0.2	0.3
4	2.1	5	0.25	0.3
5	3.1	8	0.2	0.4
6	3.1	8	0.2	0.4
8	4.4	10	0.25	0.4
10	5.2	12	0.35	0.4
12	6.2	14	0.35	0.6

### Order samples:

Date insert, complete	=	2280.
short version	=	02.
Diameter of guide sleeve		
$d_1 = 5$	=	050.
Sleeve with display:		
Months (1-12)	=	10.
Insert with display: Arrow + year		
(variable) e.g. 2004	=	04
Order No	=	2280.02.050.10.04

Date insert, Sleeve	=	2280.
short version	=	02.
Diameter of guide sleeve		
$d_1 = 5$	=	050.
Sleeve with display:		
Months (1-12)	=	10.
Sleeve	=	1
Order No	=	2280.02.050.10.1

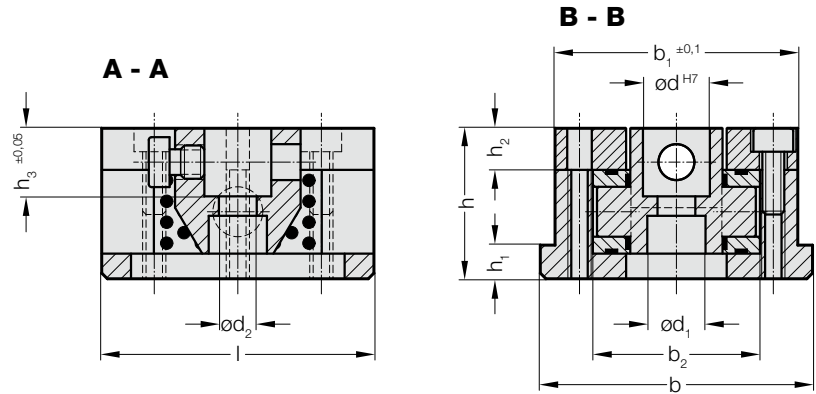
Date insert, Insert	=	2280.
short version	=	02.
Diameter of guide sleeve		
$d_1 = 5$	=	050.
Insert with display: Arrow + year		
(variable) e.g. 2004	=	04.
Insert	=	2
Order No	=	2280.02.050.04.2



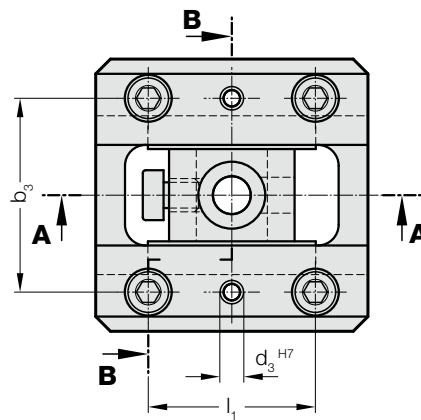
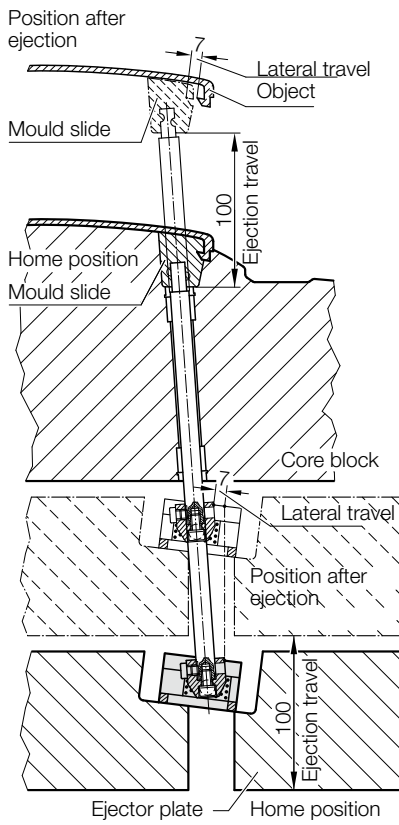
# BOLT GUIDE



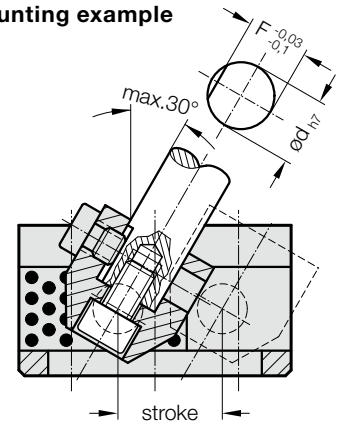
2967.10.



## Application example



## Mounting example



## 2967.10. Bolt guide

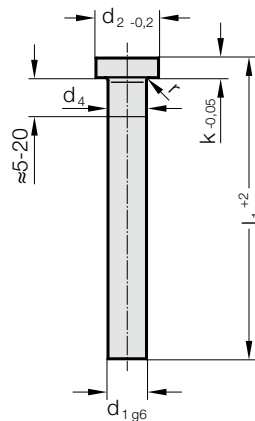
Order No	d	Stroke	b	l	h	b <sub>1</sub>	b <sub>2</sub>	b <sub>3</sub>	l <sub>1</sub>	h <sub>1</sub>	h <sub>2</sub>	h <sub>3</sub>	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	F
2967.10.08.010	8	10	33	32	22	30	19	24	20	5	7	8	8	4	3	7
2967.10.10.018	10	18	45	45	27	40	25	32	30	5	8	10	10	5	4	9
2967.10.12.020	12	20	57	50	32	51	31	39	35	7	10	12	11	7	6	11
2967.10.16.025	16	25	65	65	36	58	38	46	40	8	10	16	14	9	6	14.5
2967.10.20.030	20	30	80	80	42	72	44	56	55	11	12	20	17	11	8	18
2967.10.25.035	25	35	93	90	50	85	52	66	65	15	15	25	20	14	10	22.5
2967.10.30.040	30	40	101	100	55	93	60	74	70	15	15	30	20	14	10	27
2967.10.35.045	35	45	120	120	62	110	70	85	80	15	18	35	20	14	10	32
2967.10.40.050	40	50	130	135	70	120	80	95	90	15	18	40	26	17.5	10	36
2967.10.45.055	45	55	140	150	80	130	90	105	110	15	20	45	26	17.5	10	40



# EJECTOR PIN, HARDENED, DIN 1530-1 SHAPE A



237.1.



**Material:**

WS  
 Order No 237.1.  
 Hardness:  
 Shaft  $60 \pm 2$  HRC  
 Head  $45 \pm 5$  HRC

Description of FIBRO materials for tool and die components see at the beginning of Chapter E.

**Execution:**

Shaft precision ground, hardened.  
 Head hot dipped and tempered.  
 The compression thickening below the head is omitted depending on the manufacturing process.

$d_4$ : For  $d_1 < 5$  mm,  $d_4 = d_1 + 0,03$   
 For  $d_1 \geq 5$  mm,  $d_4 = d_1 + 0,04$   
 for  $d_1 \geq 18$  mm,  $d_4 = d_1 + 0,07$

**237.1. Ejector pin, hardened, DIN 1530-1 Shape A**

$d_1$	$d_2$	$k$	$r$	$l_1$	40	63	80	100	125	160	200	250	315	400	500
1	2.5	1.2	0.2		●	●	●	●	●	●	●				
1.1	2.5	1.2	0.2		●	●	●	●	●	●	●				
1.2	2.5	1.2	0.2		●	●	●	●	●	●	●				
1.3	3	1.5	0.2		●	●	●	●	●	●	●				
1.4	3	1.5	0.2		●	●	●	●	●	●	●				
1.5	3	1.5	0.2		●	●	●	●	●	●	●				
1.6	3	1.5	0.2		●	●	●	●	●	●	●				
1.7	3	1.5	0.2		●	●	●	●	●	●	●				
1.8	3	1.5	0.2		●	●	●	●	●	●	●				
1.9	3	1.5	0.2		●	●	●	●	●	●	●				
2	4	2	0.2		●	●	●	●	●	●	●	●	●		
2.2	4	2	0.2		●	●	●	●	●	●	●	●	●		
2.5	5	2	0.3		●	●	●	●	●	●	●	●	●		
2.7	5	2	0.3		●	●	●	●	●	●	●	●	●		
3	6	3	0.3		●	●	●	●	●	●	●	●	●	●	●
3.2	6	3	0.3		●	●	●	●	●	●	●	●	●	●	●
3.5	7	3	0.3		●	●	●	●	●	●	●	●	●	●	●
3.7	7	3	0.3		●	●	●	●	●	●	●	●	●	●	●
4	8	3	0.3		●	●	●	●	●	●	●	●	●	●	●
4.2	8	3	0.3		●	●	●	●	●	●	●	●	●	●	●
4.5	8	3	0.3		●	●	●	●	●	●	●	●	●	●	●
4.7	8	3	0.3		●	●	●	●	●	●	●	●	●	●	●

**Ordering Code (example):**


Ejector pin, hardened, DIN 1530-1 Shape A	=237.1.
Shaft diameter $d_1$	5 mm = 0500.
Length $l_1$	40 mm = 040
Order No	=237.1. 0500. 040

# EJECTOR PIN, HARDENED, DIN 1530-1 SHAPE A

## Material:

WS  
 Order No 237.1.  
 Hardness:  
 Shaft  $60 \pm 2$  HRC  
 Head  $45 \pm 5$  HRC

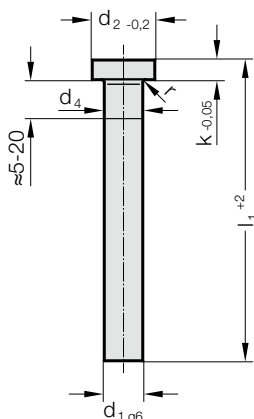
237.1.

 Description of FIBRO materials for tool and die components see at the beginning of Chapter E.

## Execution:

Shaft precision ground, hardened.  
 Head hot dipped and tempered.  
 The compression thickening below the head is omitted depending on the manufacturing process.

$d_4$ : For  $d_1 < 5$  mm,  $d_4 = d_1 + 0.03$   
 For  $d_1 \geq 5$  mm,  $d_4 = d_1 + 0.04$   
 for  $d_1 \geq 18$  mm,  $d_4 = d_1 + 0.07$



## 237.1. Ejector pin, hardened, DIN 1530-1 Shape A

$d_1$	$d_2$	$k$	$r$	$l_1$	40	63	80	100	125	160	200	250	315	400	500	630	800
5	10	3	0.3		●	●	●	●	●	●	●	●	●	●	●	●	●
5.2	10	3	0.3					●	●	●	●	●	●	●	●		
5.5	10	3	0.3					●	●	●	●	●	●	●	●		
6	12	5	0.5		●	●	●	●	●	●	●	●	●	●	●	●	●
6.2	12	5	0.5					●	●	●	●	●	●	●	●	●	●
6.5	12	5	0.5					●	●	●	●	●	●	●	●	●	●
7	12	5	0.5					●	●	●	●	●	●	●	●	●	●
8	14	5	0.5			●	●	●	●	●	●	●	●	●	●	●	●
8.2	14	5	0.5					●	●	●	●	●	●	●	●	●	●
8.5	14	5	0.5					●	●	●	●	●	●	●	●	●	●
9	14	5	0.5					●	●	●	●	●	●	●	●	●	●
10	16	5	0.5				●	●	●	●	●	●	●	●	●	●	●
10.2	16	5	0.5					●	●	●	●	●	●	●	●	●	●
10.5	16	5	0.5					●	●	●	●	●	●	●	●	●	●
11	16	5	0.5					●	●	●	●	●	●	●	●	●	●
12	18	7	0.8				●	●	●	●	●	●	●	●	●	●	●
12.2	18	7	0.8					●	●	●	●	●	●	●	●	●	●
12.5	18	7	0.8					●	●	●	●	●	●	●	●	●	●
14	22	7	0.8				●	●	●	●	●	●	●	●	●	●	●
16	22	7	0.8					●	●	●	●	●	●	●	●	●	●
18	24	7	0.8					●	●	●	●	●	●	●	●	●	●
20	26	8	1					●	●	●	●	●	●	●	●	●	●

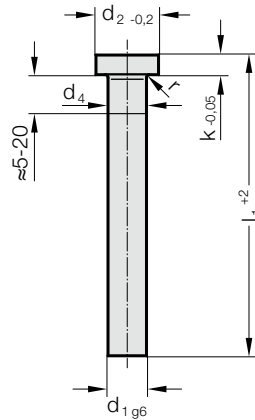
## Ordering Code (example):

Ejector pin, hardened, DIN 1530-1 Shape A =237.1.  
 Shaft diameter  $d_1$  5 mm = 0500.  
 Length  $l_1$  40 mm = 040  
 Order No =237.1. 0500. 040

# EJECTOR PIN, NITRIDED, DIN 1530-1 SHAPE A



237.8.



**Material:**

NWA  
 Order No 237.8.  
 Hardness:  
 Shaft\*  $\geq$  950 HV 0,3  
 Head  $45 \pm 5$  HRC  
 Core strength  $> 1400$  N/mm<sup>2</sup>

Description of FIBRO materials for tool and die components see at the beginning of Chapter E.

**Execution:**

Shaft precision ground, nitrided.  
 Head hot dipped and tempered.  
 The compression thickening below the head is omitted depending on the manufacturing process.

$d_4$ : For  $d_1 < 5$  mm,  $d_4 = d_1 + 0,03$   
 For  $d_1 \geq 5$  mm,  $d_4 = d_1 + 0,04$   
 for  $d_1 \geq 18$  mm,  $d_4 = d_1 + 0,07$

**237.8. Ejector pin, nitrided, DIN 1530-1 Shape A**

$d_1$	$d_2$	k	r	$l_1$	100	125	160	200	250	315	400	500	630	800
1.5	3	1.5	0.2		●	●	●	●						
2	4	2	0.2		●	●	●	●	●					
2.2	4	2	0.2		●	●	●	●						
2.4	5	2	0.2		●	●	●	●	●	●				
2.5	5	2	0.3		●	●	●	●	●	●				
2.7	5	2	0.3		●	●	●	●						
2.9	5	2	0.3		●	●	●	●	●	●				
3	6	3	0.3		●	●	●	●	●	●	●	●		
3.2	6	3	0.3		●	●	●	●	●	●	●	●		
3.4	6	3	0.3		●	●	●	●	●	●				
3.5	7	3	0.3		●	●	●	●	●	●	●			
3.7	7	3	0.3		●	●	●	●	●	●	●			
3.9	7	3	0.3		●	●	●	●	●	●				
4	8	3	0.3		●	●	●	●	●	●	●	●		
4.2	8	3	0.3		●	●	●	●	●	●	●			
4.4	8	3	0.3		●	●	●	●	●	●				
4.5	8	3	0.3		●	●	●	●	●	●	●			
4.7	8	3	0.3		●	●	●	●	●	●				
4.9	8	3	0.3		●	●	●	●	●	●				
5	10	3	0.3		●	●	●	●	●	●	●	●	●	●
5.2	10	3	0.3		●	●	●	●	●	●	●	●	●	●
5.4	10	3	0.3		●	●	●	●	●	●				
5.5	10	3	0.3		●	●	●	●	●	●	●	●		
5.7	10	3	0.3		●	●	●	●	●	●				
5.9	10	3	0.3		●	●	●	●	●	●				

**Ordering Code (example):**

Ejector pin, nitrided, DIN 1530-1 Shape A	=237.8.
Shaft diameter $d_1$	6.2 mm = 0620.
Length $l_1$	100 mm = 100
Order No	=237.8. 0620. 100

# EJECTOR PIN, NITRIDED, DIN 1530-1 SHAPE A

## Material:

NWA  
 Order No 237.8.  
 Hardness:  
 Shaft\*  $\geq 950$  HV 0,3  
 Head  $45 \pm 5$  HRC  
 Core strength  $> 1400$  N/mm<sup>2</sup>

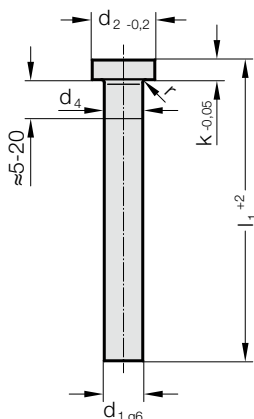
Description of FIBRO materials for tool and die components see at the beginning of Chapter E.

## Execution:

Shaft precision ground, nitrated.  
 Head hot dipped and tempered.  
 The compression thickening below the head is omitted depending on the manufacturing process.

$d_4$ : For  $d_1 < 5$  mm,  $d_4 = d_1 + 0,03$   
 For  $d_1 \geq 5$  mm,  $d_4 = d_1 + 0,04$   
 for  $d_1 \geq 18$  mm,  $d_4 = d_1 + 0,07$

237.8.



## 237.8. Ejector pin, nitrided, DIN 1530-1 Shape A

$d_1$	$d_2$	$k$	$r$	$l_1$	100	125	160	200	250	315	400	500	630	800	1000
6	12	5	0.5		●	●	●	●	●	●	●	●	●	●	
6.2	12	5	0.5		●	●	●	●	●	●	●	●	●	●	
6.5	12	5	0.5		●	●	●	●	●	●	●	●	●	●	
6.7	12	5	0.5		●	●	●	●	●	●	●	●	●	●	
6.9	12	5	0.5		●	●	●	●	●	●	●	●	●	●	
7	12	5	0.5		●	●	●	●	●	●	●	●	●	●	
7.2	12	5	0.5		●	●	●	●	●	●	●	●	●	●	
7.8	12	5	0.5		●	●	●	●	●	●	●	●	●	●	
8	14	5	0.5		●	●	●	●	●	●	●	●	●	●	●
8.2	14	5	0.5		●	●	●	●	●	●	●	●	●	●	●
8.4	14	5	0.5		●	●	●	●	●	●	●	●	●	●	●
8.5	14	5	0.5		●	●	●	●	●	●	●	●	●	●	●
9	14	5	0.5		●	●	●	●	●	●	●	●	●	●	●
9.7	14	5	0.5		●	●	●	●	●	●	●	●	●	●	●
10	16	5	0.5		●	●	●	●	●	●	●	●	●	●	●
10.2	16	5	0.5		●	●	●	●	●	●	●	●	●	●	●
10.5	16	5	0.5		●	●	●	●	●	●	●	●	●	●	●
11	16	5	0.5		●	●	●	●	●	●	●	●	●	●	●
12	18	7	0.8		●	●	●	●	●	●	●	●	●	●	●
12.2	18	7	0.8		●	●	●	●	●	●	●	●	●	●	●
12.5	18	7	0.8		●	●	●	●	●	●	●	●	●	●	●
14	22	7	0.8		●	●	●	●	●	●	●	●	●	●	●
16	22	7	0.8		●	●	●	●	●	●	●	●	●	●	●
18	24	7	0.8		●	●	●	●	●	●	●	●	●	●	●
20	26	8	1		●	●	●	●	●	●	●	●	●	●	●
25	32	10	1		●	●	●	●	●	●	●	●	●	●	●
32	40	10	1		●	●	●	●	●	●	●	●	●	●	●

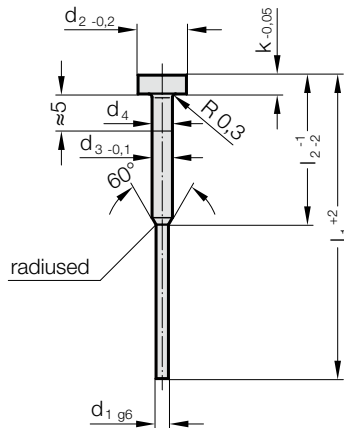
## Ordering Code (example):

Ejector pin, nitrided, DIN 1530-1 Shape A =237.8.  
 Shaft diameter  $d_1$  6.2 mm = 0620.  
 Length  $l_1$  100 mm = 100  
 Order No =237.8. 0620. 100

# EJECTOR PIN, HARDENED, ROUND STEPPED, DIN 1530-2 SHAPE C



238.1.



## Material:

WS  
Order No 238.1.  
Hardness:  
Shaft  $60 \pm 2$  HRC  
Head  $45 \pm 5$  HRC

Description of FIBRO materials for tool and die components see at the beginning of Chapter E.

## Execution:

Shaft precision ground, hardened.  
Head hot dipped and tempered.  
The compression thickening below the head is omitted depending on the manufacturing process.

$d_4$ : For  $d_3 < 5$  mm,  $d_4 = d_3 + 0,03$   
For  $d_3 \geq 5$  mm,  $d_4 = d_3 + 0,04$   
for  $d_3 \geq 18$  mm,  $d_4 = d_3 + 0,07$

## 238.1. Ejector pin, hardened, round stepped, DIN 1530-2 Shape C

$d_1$	$d_2$	$d_3$	k	$l_1$	63	80	100	125	160	200
				$l_2$	30	32	50	50	63	80
0.8	4	2	2		●	●	●	●	●	
0.9	4	2	2		●	●	●	●	●	
1	4	2	2		●	●	●	●	●	●
1.1	4	2	2		●	●	●	●	●	●
1.2	4	2	2		●	●	●	●	●	●
1.3	4	2	2		●	●	●	●	●	●
1.4	4	2	2		●	●	●	●	●	●
1.5	6	3	3		●	●	●	●	●	●
1.6	6	3	3			●	●	●	●	●
1.7	6	3	3			●	●	●	●	●
1.8	6	3	3			●	●	●	●	●
1.9	6	3	3			●	●	●	●	●
2	6	3	3			●	●	●	●	●
2.1	6	3	3				●	●	●	●
2.2	6	3	3				●	●	●	●
2.3	6	3	3				●	●	●	●
2.4	6	3	3				●	●	●	●
2.5	6	3	3				●	●	●	●

## Ordering Code (example):


Ejector pin, hardened, round stepped, DIN 1530-2 Shape C =238.1.  
 Diameter  $d_1$  1.7 mm = 0170.  
 Length  $l_1$  80 mm = 080  
 Order No =238.1. 0170. 080



# EJECTOR PIN, NITRIDED, ROUND STEPPED, DIN 1530-2 SHAPE C

## Material:

NWA  
 Order No 238.8.  
 Hardness:  
 Shaft\*  $\geq 950$  HV 0,3  
 Head  $45 \pm 5$  HRC  
 Core strength  $> 1400$  N/mm<sup>2</sup>

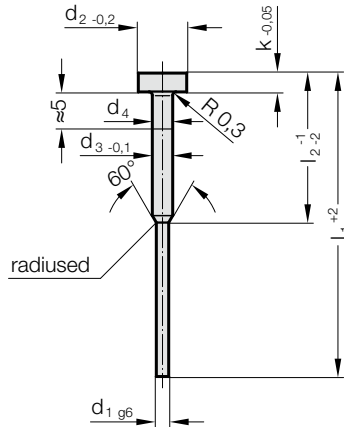
 Description of FIBRO materials for tool and die components see at the beginning of Chapter E.

## Execution:

Shaft precision ground, nitrided.  
 Head hot dipped and tempered.  
 The compression thickening below the head is omitted depending on the manufacturing process.

$d_4$ : For  $d_3 < 5$  mm,  $d_4 = d_3 + 0,03$   
 For  $d_3 \geq 5$  mm,  $d_4 = d_3 + 0,04$   
 for  $d_3 \geq 18$  mm,  $d_4 = d_3 + 0,07$

238.8.



## 238.8. Ejector pin, nitrided, round stepped, DIN 1530-2 Shape C

$d_1$	$d_2$	$d_3$	$k$	$l_1$ $l_2$	63	80	100	125	160	200
					30	32	50	50	63	80
0.8	4	2	2		●	●	●	●	●	
0.9	4	2	2		●	●	●	●	●	
1	4	2	2		●	●	●	●	●	
1.1	4	2	2		●	●	●	●	●	
1.2	4	2	2		●	●	●	●	●	
1.3	4	2	2		●	●	●	●	●	
1.4	4	2	2		●	●	●	●	●	
1.5	6	3	3		●	●	●	●	●	●
1.6	6	3	3			●	●	●	●	●
1.7	6	3	3			●	●	●	●	●
1.8	6	3	3			●	●	●	●	●
1.9	6	3	3			●	●	●	●	●
2	6	3	3			●	●	●	●	●
2.2	6	3	3			●	●	●	●	●
2.5	6	3	3				●	●	●	●

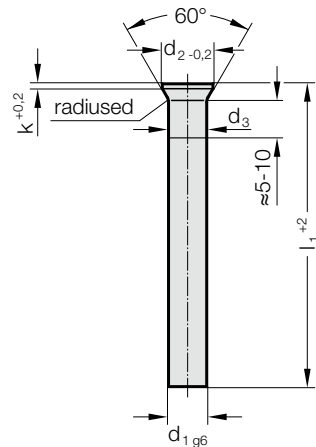
## Ordering Code (example):

Ejector pin, nitrided, round stepped, DIN 1530-2 Shape C	=238.8.
Diameter $d_1$	1.5 mm = 0150.
Length $l_1$	63 mm = 063
Order No	=238.8. 0150. 063

# EJECTOR PIN, HARDENED, DIN 1530-3 SHAPE D



239.1.



### Material:

WS  
Order No 239.1.  
Hardness:  
Shaft  $60 \pm 2$  HRC  
Head  $45 \pm 5$  HRC

Description of FIBRO materials for tool and die components see at the beginning of Chapter E.

### Execution:

Shaft precision ground, hardened.  
Head hot dipped and tempered.  
The compression thickening below the head is omitted depending on the manufacturing process.

$d_3$ : For  $d_1 < 5$  mm,  $d_3 = d_1 + 0,03$   
For  $d_1 \geq 5$  mm,  $d_3 = d_1 + 0.04$   
for  $d_1 \geq 18$  mm,  $d_3 = d_1 + 0.07$

## 239.1. Ejector pin, hardened, DIN 1530-3 Shape D

$d_1$	$d_2$	$k$	$l_1$	40	60	71	80	100	125	160	200	250	315
0.8	1.4	0.5						•	•	•	•		
0.9	1.6	0.5						•	•	•	•		
1	1.8	0.5		•	•	•	•	•	•	•	•		
1.1	1.8	0.5				•	•	•	•	•	•		
1.2	2	0.5				•		•	•	•	•		
1.25	2	0.5				•		•	•	•	•		
1.3	2	0.5				•		•	•	•	•		
1.4	2.2	0.5				•		•	•	•	•		
1.5	2.2	0.5		•	•	•	•	•	•	•	•		
1.6	2.5	0.5				•	•	•	•	•	•		
1.7	2.5	0.5				•		•	•	•	•		
1.75	2.8	0.5				•		•	•	•	•		
1.8	2.8	0.5				•		•	•	•	•		
1.9	2.8	0.5				•		•	•	•	•		
2	3	0.5		•	•	•	•	•	•	•	•	•	
2.1	3.2	0.5				•	•	•	•	•	•		
2.2	3.2	0.5				•		•	•	•	•	•	
2.25	3.2	0.5				•		•	•	•	•		
2.3	3.5	0.5				•		•	•	•	•		
2.4	3.5	0.5				•		•	•	•	•		
2.5	3.5	0.5		•	•	•	•	•	•	•	•	•	
2.6	4	0.5				•		•	•	•	•		
2.7	4	0.5				•		•	•	•	•	•	
2.75	4	0.5				•		•	•	•	•		
2.8	4	0.5				•		•	•	•	•		
2.9	4	0.5				•		•	•	•	•		
3	4.5	0.5		•	•	•	•	•	•	•	•	•	•
3.1	4.5	0.5				•	•	•	•	•	•		
3.2	4.5	0.5				•		•	•	•	•		

### Ordering Code (example):

Ejector pin, hardened, DIN 1530-3 Shape D	=239.1.
Shaft diameter $d_1$	3.2 mm = 0320.
Length $l_1$	71 mm = 071
Order No	=239.1. 0320. 071

# EJECTOR PIN, HARDENED, DIN 1530-3 SHAPE D

## Material:

WS  
 Order No 239.1.  
 Hardness:  
 Shaft  $60 \pm 2$  HRC  
 Head  $45 \pm 5$  HRC

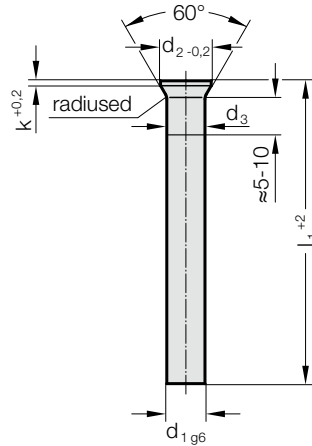
Description of FIBRO materials for tool and die components see at the beginning of Chapter E.

## Execution:

Shaft precision ground, hardened.  
 Head hot dipped and tempered.  
 The compression thickening below the head is omitted depending on the manufacturing process.

$d_3$ : For  $d_1 < 5$  mm,  $d_3 = d_1 + 0.03$   
 For  $d_1 \geq 5$  mm,  $d_3 = d_1 + 0.04$   
 for  $d_1 \geq 18$  mm,  $d_3 = d_1 + 0.07$

239.1.



## 239.1. Ejector pin, hardened, DIN 1530-3 Shape D

$d_1$	$d_2$	$k$	$l_1$	40	60	71	80	100	125	160	200	250	315
3.25	4.5	0.5				●		●		●	●		
3.5	5	0.5				●	●	●	●	●	●	●	●
3.6	5	0.5				●		●	●	●	●		
3.75	5	0.5						●	●	●	●		
4	5.5	0.5		●	●	●	●	●	●	●	●	●	●
4.1	5.5	0.5				●		●	●	●	●		
4.2	5.5	0.5				●		●	●	●	●		
4.25	5.5	0.5						●	●	●	●		
4.5	6	0.5				●		●	●	●	●		
4.6	6	0.5				●		●	●	●	●		
5	6.5	0.5		●	●	●	●	●	●	●	●	●	●
5.1	6.5	0.5				●		●	●	●	●		
5.2	6.5	0.5				●		●	●	●	●		
5.25	6.5	0.5						●	●	●	●		
5.5	7	0.5			●	●	●	●	●	●	●	●	●
6	8	0.5		●	●	●	●	●	●	●	●	●	●
6.2	8	1				●	●	●	●	●	●	●	●
6.5	9	1				●	●	●	●	●	●	●	●
7	9	1				●	●	●	●	●	●	●	●
7.5	10	1				●	●	●	●	●	●	●	●
8	10	1			●	●	●	●	●	●	●	●	●
8.2	10	1						●	●	●	●	●	●
8.5	11	1				●		●	●	●	●	●	●
9	11	1				●		●	●	●	●	●	●
10	12	1				●	●	●	●	●	●	●	●
12	14	1					●	●	●	●	●	●	●
14	16	1.5						●	●	●	●	●	●
16	18	1.5						●	●	●	●	●	●

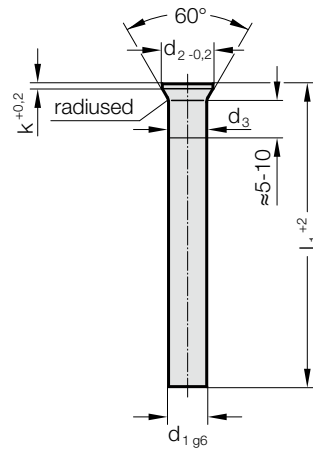
## Ordering Code (example):

Ejector pin, hardened, DIN 1530-3 Shape D	=239.1.
Shaft diameter $d_1$	3.2 mm = 0320.
Length $l_1$	71 mm = 071
Order No	=239.1. 0320. 071

## EJECTOR PIN, NITRIDED, DIN 1530-3 SHAPE D



239.8.



### Material:

NWA  
 Order No 239.8.  
 Hardness:  
 Shaft\*  $\geq 950$  HV 0,3  
 Head  $45 \pm 5$  HRC  
 Core strength  $> 1400$  N/mm<sup>2</sup>

Description of FIBRO materials for tool and die components see at the beginning of Chapter E.

### Execution:

Shaft precision ground, nitrided.  
 Head hot dipped and tempered.  
 The compression thickening below the head is omitted depending on the manufacturing process.

$d_3$ : For  $d_1 < 5$  mm,  $d_3 = d_1 + 0,03$   
 For  $d_1 \geq 5$  mm,  $d_3 = d_1 + 0,04$   
 for  $d_1 \geq 18$  mm,  $d_3 = d_1 + 0,07$

### 239.8. Ejector pin, nitrided, DIN 1530-3 Shape D

$d_1$	$d_2$	$k$	$l_1$	100	125	160	200	250	315
4	5.5	0.5		●	●	●	●	●	●
5	6.5	0.5		●	●	●	●	●	●
6	8	0.5		●	●	●	●	●	●
3	4.5	0.5		●	●	●	●	●	●
8	10	1		●	●	●	●	●	●
16	18	1.5		●	●	●	●	●	●
10	12	1		●	●	●	●	●	●
12	14	1		●	●	●	●	●	●
14	16	1.5		●	●	●	●	●	●

### Ordering Code (example):

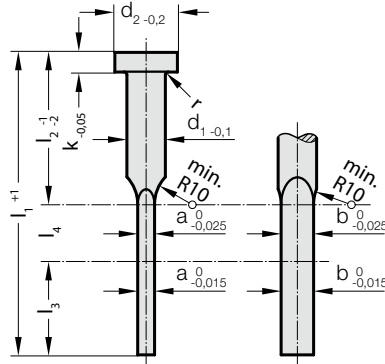
Ejector pin, nitrided, DIN 1530-3 Shape D	=239.8.
Shaft diameter $d_1$	8 mm = 0800.
Length $l_1$	100 mm = 100
Order No	=239.8. 0800. 100



# FLAT EJECTOR PIN, HARDENED, SIMILAR TO DIN ISO 8693



263.1.



**Material:**

WS  
 Order No 263.1.  
 Hardness:  
 Shaft 60 ± 2 HRC  
 Head 45 ± 5 HRC

Description of FIBRO materials for tool and die components see at the beginning of Chapter E.

**Execution:**

Shank hardened and precision ground.  
 Head hot upset-forged.

**Note:**

Special dimensions a and b available on request.

263.1. Flat ejector pin, hardened, similar to DIN ISO 8693

d <sub>1</sub>	4	4.2	4.2	4.2	5	5	5	6	6	6	6	8	8	8	10	10	12	12				
d <sub>2</sub>	8	8	8	8	10	10	10	12	12	12	12	14	14	14	16	16	18	18				
k	3	3	3	3	3	3	3	5	5	5	5	5	5	5	5	5	7	7				
r	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8				
a	1	1	0.8	1.2	1	1.2	1.5	1	2	1.5	1.2	1.2	1.5	2	1.5	2	2	2.5				
b	3.5	3.8	3.8	3.8	4.5	4.5	4.5	5.5	5.5	5.5	5.5	7.5	7.5	7.5	9.5	9.5	11.5	11.5				
l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>																			
63	30	25	10	●	●	●													●			
80	40	30	10	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
100	50	40	10	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
125	60	50	15	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
160	80	50	30	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
200	100	60	40	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
250	125	60	65	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
315	160	70	85	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			

**Ordering Code (example):**

Flat ejector pin, hardened, similar to DIN ISO 8693	=263.1.
Width a	1.5 mm = 15.
Length b	5.5 mm = 055.
Length l <sub>1</sub>	100 mm = 100
Order No	=263.1. 15. 055. 100

# FLAT EJECTOR PIN, NITRIDED, SIMILAR TO DIN ISO 8693

## Material:

NWA  
 Order No 263.8.  
 Hardness:  
 Shaft\*  $\geq 950$  HV 0,3  
 Head  $45 \pm 5$  HRC  
 Core strength  $> 1400$  N/mm<sup>2</sup>

Description of FIBRO materials for tool and die components see at the beginning of Chapter E.

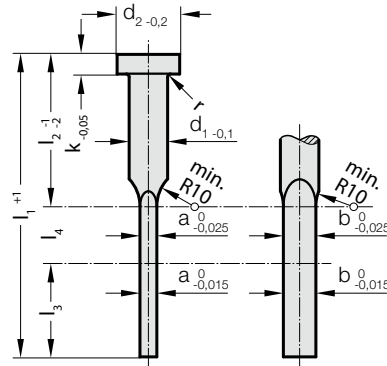
## Execution:

Shank nitrided and precision ground.  
 Head hot upset-forged.

## Note:

\*Owing to thinness of nitrided skin, hardness testing on shank restricted to Vickers only. Test load = 3 N max.  
 Special dimensions a and b available on request.

263.8.



## 263.8. Flat ejector pin, nitrided, similar to DIN ISO 8693

$d_1$	4	4.2	4.2	4.2	5	5	5	6	6	6	6	8	8	8	10	10	12	12	16	16
$d_2$	8	8	8	8	10	10	10	12	12	12	12	14	14	14	16	16	18	18	22	22
k	3	3	3	3	3	3	3	5	5	5	5	5	5	5	5	5	7	7	7	7
r	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8	0.8	0.8
a	1	1	0.8	1.2	1	1.2	1.5	1.2	1	1.5	2	1.2	1.5	2	1.5	2	2	2.5	2	2.5
b	3.5	3.8	3.8	3.8	4.5	4.5	4.5	5.5	5.5	5.5	5.5	7.5	7.5	7.5	9.5	9.5	11.5	11.5	15.5	15.5
$l_1$	63	80	100	125	160	200	250	315	400											
$l_2$	30	40	50	60	80	100	125	160	200											
$l_3$	25	30	40	50	50	60	70	85	95											
$l_4$	10	10	10	15	30	40	65	85	105											

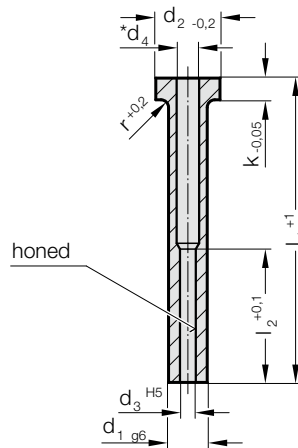
## Ordering Code (example):

Flat ejector pin, nitrided, similar to DIN ISO 8693	=263.8.
Width a	2 mm = 20.
Length b	5.5 mm = 055.
Length $l_1$	125 mm = 125
Order No	=263.8. 20. 055. 125

# EJECTOR SLEEVE, HARDENED, DIN ISO 8405



264.1.



### Material:

WS  
Order No 264.1.  
Hardness:  
Shaft 60 ± 2 HRC  
Head 45 ± 5 HRC

Description of FIBRO materials for tool and die components see at the beginning of Chapter E.

### Execution:

Shank hardened and precision ground.  
Head hot upset-forged.  
Guide bore precision ground and honed.  
\*up to  $\varnothing d_4 = 4,5$  tolerance +0,2/-0,1  
\*from  $\varnothing d_4 = 5$  tolerance +0,3/-0,1

## 264.1. Ejector sleeve, hardened, DIN ISO 8405

d <sub>1</sub>	d <sub>3</sub>	d <sub>4</sub>	d <sub>2</sub>	k	r	l <sub>2</sub>	l <sub>1</sub>	70	75	80	90	100	125	150	175	200	225	250	275
2,5	1,25	1,6	5	2	0,3	20		●		●		●							
3	1,5	1,8	6	3	0,3	35			●			●	●	●					
3	1,6	1,9	6	3	0,3	35			●			●	●	●	●				
4	2	2,5	8	3	0,3	35			●			●	●	●	●	●	●		
4	2,2	2,4	8	3	0,3	35			●			●	●	●	●	●	●		
5	2,5	3	10	3	0,3	35			●			●	●	●	●	●	●		
5	2,7	3	10	3	0,3	45			●			●	●	●	●	●	●		
5	3	3,5	10	3	0,3	45			●			●	●	●	●	●	●	●	
5	3,2	3,5	10	3	0,3	45			●			●	●	●	●	●	●	●	
6	3,5	4	12	5	0,5	45			●			●	●	●	●	●	●	●	
6	3,7	4	12	5	0,5	45			●			●	●	●	●	●	●	●	
6	4	4,3	12	5	0,5	45			●			●	●	●	●	●	●	●	
8	4,2	5	14	5	0,5	45			●			●	●	●	●	●	●	●	●
8	5	5,5	14	5	0,5	45			●			●	●	●	●	●	●	●	●
8	5,2	5,5	14	5	0,5	45			●			●	●	●	●	●	●	●	●
10	6	6,5	16	5	0,5	45			●			●	●	●	●	●	●	●	●
10	6,2	6,5	16	5	0,5	45			●			●	●	●	●	●	●	●	●
12	8	8,5	20	7	0,8	45			●			●	●	●	●	●	●	●	●
12	8,2	8,5	20	7	0,8	45			●			●	●	●	●	●	●	●	●
14	10	10,5	22	7	0,8	45			●			●	●	●	●	●	●	●	●
14	10,5	11	22	7	0,8	45			●			●	●	●	●	●	●	●	●
16	12	12,5	22	7	0,8	45			●			●	●	●	●	●	●	●	●
16	12,5	13	22	7	0,8	45			●			●	●	●	●	●	●	●	●

### Ordering Code (example):

Ejector sleeve, hardened, DIN ISO 8405 =264.1.

Ejector diameter d<sub>3</sub> 4 mm = 0400.

Length l<sub>1</sub> 75 mm = 075

Order No =264.1. 0400. 075




# EJECTOR SLEEVE, NITRIDED, DIN ISO 8405

## Material:

NWA  
 Order No 264.8.  
 Hardness:  
 Shaft\*\*  $\geq 950$  HV 0,3  
 Head  $45 \pm 5$  HRC  
 Tensile Strength (core)  $> 1400$  N/mm<sup>2</sup>

**264.8.**

 Description of FIBRO materials for tool and die components see at the beginning of Chapter E.

## Execution:

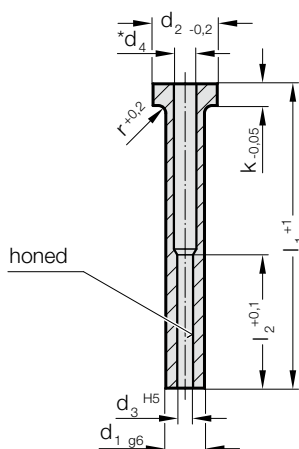
Shank nitrided and precision ground.  
 Head hot upset-forged.  
 Guide bore precision ground and honed.

\*up to  $\varnothing d_4 = 4,5$  tolerance  $+0,2/-0,1$

\*from  $\varnothing d_4 = 5$  tolerance  $+0,3/-0,1$

## Note:

\*\*Owing to thinness of nitrided skin, hardness testing on shank restricted to Vickers only. Test load = 3 N max.



## 264.8. Ejector sleeve, nitrided, DIN ISO 8405

d <sub>1</sub>	d <sub>3</sub>	d <sub>4</sub>	d <sub>2</sub>	k	r	l <sub>2</sub>	l <sub>1</sub>	75	100	125	150	175	200	225	250	275
3	1.5	1.8	6	3	0.3	35		●	●	●	●					
3	1.6	1.9	6	3	0.3	35		●	●	●	●					
4	2	2.5	8	3	0.3	35		●	●	●	●					
4	2.2	2.4	8	3	0.3	35		●	●	●	●					
5	2.5	3	10	3	0.3	35		●	●	●	●					
5	2.7	3	10	3	0.3	45		●	●	●	●					
5	3	3.5	10	3	0.3	45		●	●	●	●	●				
5	3.2	3.5	10	3	0.3	45		●	●	●	●	●				
6	3.5	4	12	5	0.5	45		●	●	●	●	●				
6	3.7	4	12	5	0.5	45		●	●	●	●	●				
6	4	4.3	12	5	0.5	45		●	●	●	●	●	●			
8	4.2	5	14	5	0.5	45		●	●	●	●	●	●			
8	5	5.5	14	5	0.5	45		●	●	●	●	●	●			
8	5.2	5.5	14	5	0.5	45		●	●	●	●	●	●			
10	6	6.5	16	5	0.5	45		●	●	●	●	●	●	●		
10	6.2	6.5	16	5	0.5	45		●	●	●	●	●	●	●	●	
12	8	8.5	20	7	0.8	45		●	●	●	●	●	●	●	●	●
12	8.2	8.5	20	7	0.8	45		●	●	●	●	●	●	●	●	●
14	10	10.5	22	7	0.8	45		●	●	●	●	●	●	●	●	●
14	10.2	10.5	22	7	0.8	45		●	●	●	●	●	●	●	●	●
16	12	12.5	22	7	0.8	45		●	●	●	●	●	●	●	●	●

## Ordering Code (example):

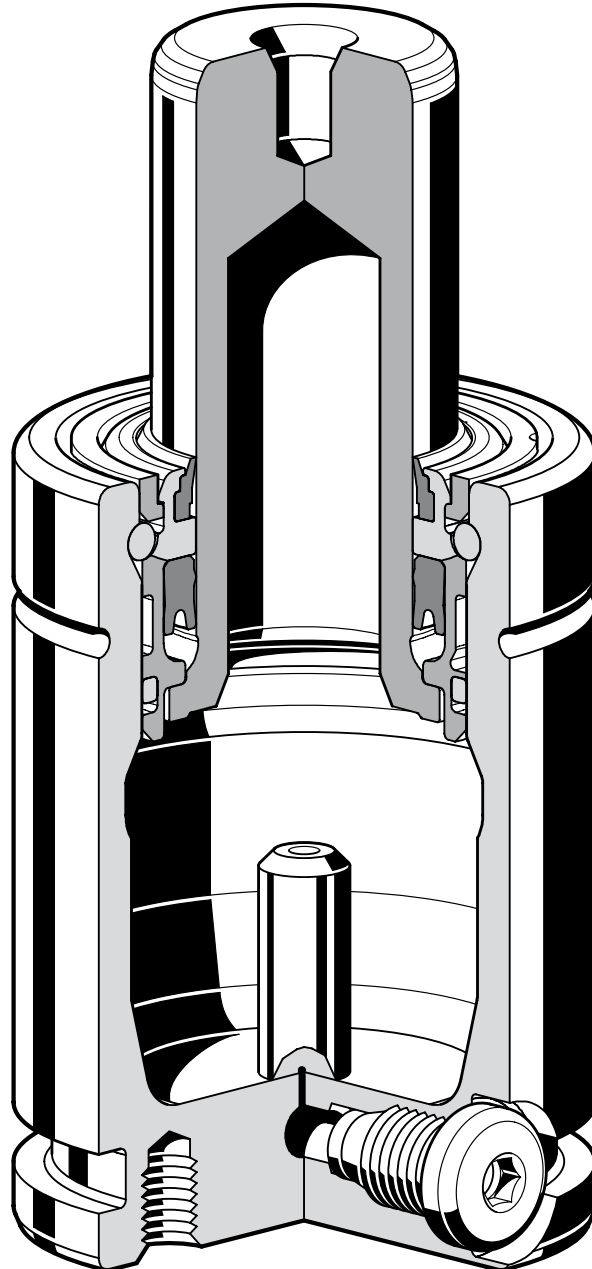
Ejector sleeve, nitrided, DIN ISO 8405 =264.8.  
 Ejector diameter d<sub>3</sub> 4 mm = 0400.  
 Length l<sub>1</sub> 75 mm = 075  
 Order No =264.8. 0400. 075



# SPRING ELEMENTS



# MOULD LINE GAS SPRING - DESCRIPTION



## MOULD LINE GAS SPRING - DESCRIPTION

### MOULD LINE gas springs

Gas springs MOULD LINE are an ideal supplement to and expansion of the traditional FIBRO product lines of helical, disc and elastomer springs for manufacturing tools, devices, moulds and machines.

Gas springs can be used for all applications where lift movements are required in parallel to mould opening.

Gas springs MOULD LINE, which were specially developed for mould making, are characterised by their high force, small size, long service life and a constant operating temperature of 120°C.

Of course, gas springs MOULD LINE are approved as per European Pressure Equipment Directive 2014/68/EU (14th GSGV ordinance on pressure vessels). Gas springs MOULD LINE are filled with nitrogen and do not require any pressure space that is positioned externally or in tool plates. They also require no gas supply lines.

In certain special cases, however, monitoring of charge pressure in the installed state is required. These may be found in the list of accessory products if needed. As long as all mounting details are laid out with due circumspection, it is no problem at all to remove and install gas springs MOULD LINE.

Operating instructions are included with every delivery of gas springs MOULD LINE. Application examples are shown on the following pages.

### Functioning

The pressure medium is a commercially available, environment-friendly nitrogen. MOULD LINE gas springs have a standard charge pressure of max. 150 bar.

### Pressure build-up

In operation the piston rod enters the spring space whose volume is progressively reduced. With an increasing stroke length, the volume of the pressure chamber is reduced. The resulting increase in pressure can be read from the diagram of the spring size as a factor. The final force is therefore the initial spring force x pressure build-up factor.

### Operating temp.

The spring temperature should not exceed +120 °C..

### Charge pressure

Modification of charge pressure allows variation of the force rating and can be predetermined from the spring diagram.

### Installation recommendations

MOULD LINE gas springs can be used in any installation position. Whether or not external forces act on them when at rest is of no consequence and can therefore be calculated easily.

## ALL FIBRO GAS SPRINGS MEET THE REQUIREMENTS OF THE PRESSURE EQUIPMENT DIRECTIVE 2014/68/EU

The Pressure Equipment Directive (2014/68/EU) was ratified by the European parliament and the Council of Europe in May 1997. The requirements of the pressure equipment directive came into force throughout the EU on 29 May 2002.

The directive defines pressure equipment as vessels, pipework, safety devices and pressure accessories. In terms of the directive a vessel is a casing which is designed and manufactured to contain fluids under pressure.

It follows from this definition that nitrogen gas springs of all sizes are deemed to be pressure vessels and must in this respect comply with the pressure equipment directive (2014/68/EU) from 29 May 2002.

## MOULD LINE GAS SPRING - DESCRIPTION

### Maintenance

MOULD LINE gas springs are designed for long-term maintenance-free operation. We recommend lightly oiling the piston rod before using. Sealing and guide elements can be replaced easily in very little time. They are available in a spare parts kit. Each spare parts kit comes with detailed instructions for maintenance of gas springs.

### Caution

Gas springs may only be charged with commercial grade 5.0 nitrogen gas.

### Accessories

The range of accessories for gas springs includes fastening devices, charging and control units, screw connections and lines for setting up compound systems.

### Advantages of the FIBRO MOULD LINE range:

- Very little calibration work required in the tool
- No lubrication required
- No maintenance required for up to 1.000.000 strokes<sup>1)</sup>
- Variably adjustable forces
- for mould temperatures of up to 120°C
- Approved as per the European Pressure Equipment Directive 2014/68/EU (14th GSGV regulation for pressure vessels)
- Standard safety features (FIBRO Safer Choice)<sup>2)</sup>
- Safety piston rod
- Excess pressure protection
- Overstroke protection
- A pressure monitoring system makes it possible to recognise an impending failure at an early point (prevention)
- No tool breakage if the 2nd separation level is locked (the plate comes to a standstill; after the jam is removed, production can be resumed)
- Used worldwide in one million FIBRO gas springs
- Cost savings: approximately 60-70%
- (e.g. compared to a latch-locking unit)

1) At 80°C to 120°C/ 500.000 strokes 2) Depending on type of spring

### Warning signs

The signs should be affixed near the springs in as prominent a position as possible.

**WARNING**

This tool is equipped with  
\_\_\_ Gas Springs with a max. pressure of  
150 or 180 bar, depending on spring type.  
Working pressure \_\_\_ bar.

**Read maintenance instructions  
before working on gas springs.**

**FIBRO**

Business Area Standard Parts  
D-74851 Hassmersheim · Postfach 1120  
T +49 (0) 6266-73-0\* · F +49 (0) 6266-73-237

### Size 35 x 50 mm

Language	Order No.
German	2480.00.035.050.1
English	2480.00.035.050.2
French	2480.00.035.050.3
Italian	2480.00.035.050.4
Spanish	2480.00.035.050.5
Polish	2480.00.035.050.PL
Czech	2480.00.035.050.CZ
Turkish	2480.00.035.050.TR
Chinese	2480.00.035.050.CN

**WARNING**

This tool is equipped with \_\_\_ Gas Springs with a  
max. pressure of 150 or 180 bar, depending on spring type.

No. pcs.	spring type	fill.press./bar	force/daN
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____

Read maintenance instructions **before** working on gas springs.

**FIBRO**

Business Area Standard Parts  
D-74851 Hassmersheim · Postfach 1120  
T +49 (0) 6266-73-0\* · F +49 (0) 6266-73-237

### Size 75 x 105 mm

Language	Order No.
German	2480.00.075.105.1
English	2480.00.075.105.2
French	2480.00.075.105.3
Italian	2480.00.075.105.4
Spanish	2480.00.075.105.5
Polish	2480.00.075.105.PL
Czech	2480.00.075.105.CZ
Turkish	2480.00.075.105.TR
Chinese	2480.00.075.105.CN

### Size 110 x 150 mm

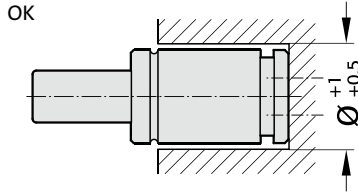
Language	Order No.
German	2480.00.110.150.1
English	2480.00.110.150.2
French	2480.00.110.150.3
Italian	2480.00.110.150.4
Spanish	2480.00.110.150.5
Polish	2480.00.110.150.PL
Czech	2480.00.110.150.CZ
Turkish	2480.00.110.150.TR
Chinese	2480.00.110.150.CN

# MOULD LINE GAS SPRING - INSTALLATION GUIDELINES

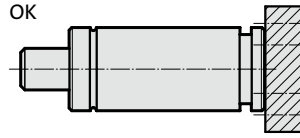
## Mounting examples

Mounting possibilities for gas springs are listed below.

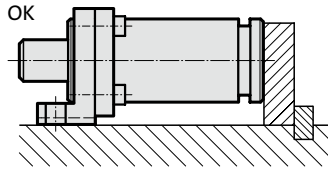
For additional information on mounting, see the corresponding pages in the catalogue.



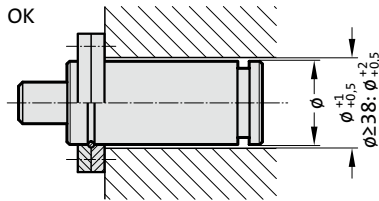
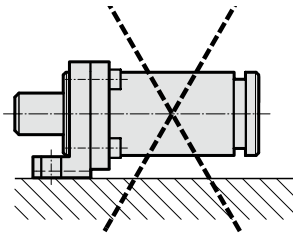
Screw mounted at the base



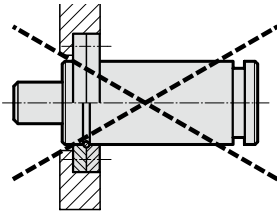
Screw mounted at the base with 2480.011.



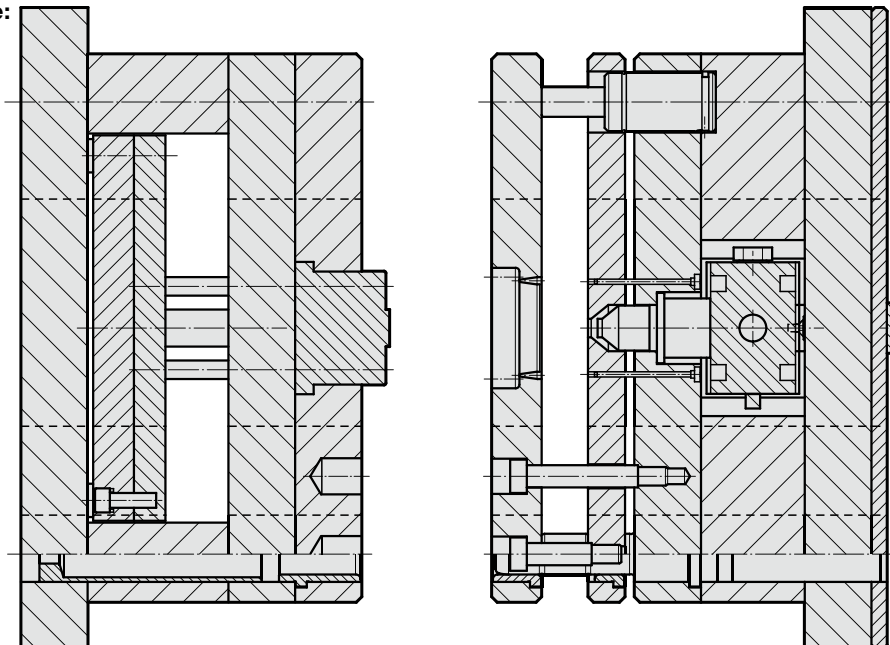
fastened with 2480.044./045./047.



fastened with 2480.055./057./064.



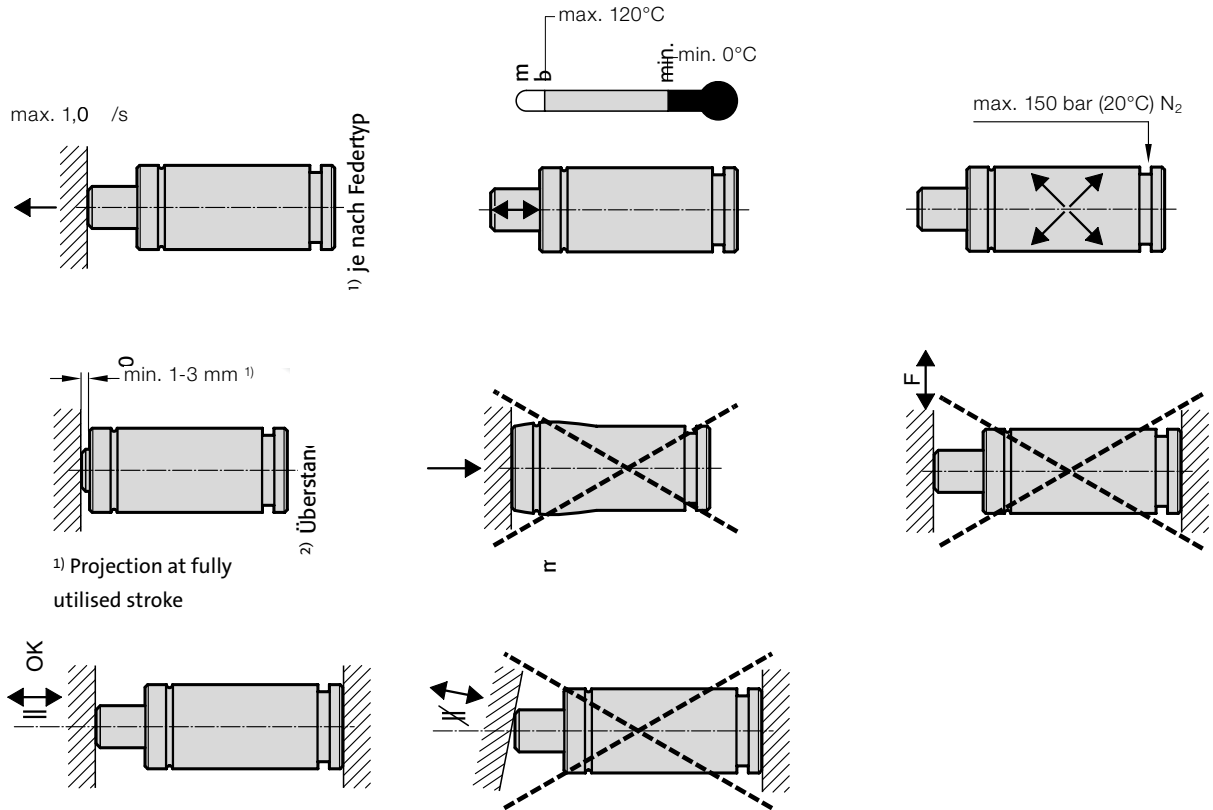
## Installation principle:



# MOULDING GAS SPRING - INSTALLATION GUIDELINES

To achieve the best possible service-life and safety from the gas spring, the directions below must be followed.

## MOUNTING INSTRUCTIONS



- Before inserting the gas springs, check the corresponding filling pressure.
- Secure the gas spring to the tool/machine whenever possible, using the threaded hole(s) in the base of the gas spring or a suitable flange.  
 Never exceed the maximum torque values for the threads in the base of the gas spring: (M6 = 10 Nm; M8 = 24 Nm; M10 = 45 Nm; M12 = 80 Nm)
- The threaded hole in the piston rod top should not be used for mounting purposes. It is only to be used when carrying and servicing the gas spring.
- Do not use the gas spring in such a way that the piston rod is realised freely from its compressed position, as this could cause internal damage to the gas spring.
- Make sure the gas spring is mounted parallel to the direction of the compression stroke.
- Ensure the contact surface of the piston rod top is perpendicular to the direction of the compression stroke and is sufficiently hardened.
- The gas spring should not be subjected to the side loads.
- Protect the piston rod against mechanical damage and contact with fluids.
- We recommend providing a stroke reserve of 10% of the nominal stroke length or 5 mm.
- The maximum charging pressure as a function of the working temperature must not be exceeded as it may affect the safety of the product.
- Exceeding the gas spring's recommended operating temperature will shorten the service-life of the gas spring.
- The entire contact surface of the piston rod / piston should be used.



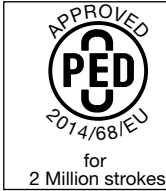


# FIBRO GAS SPRINGS – THE SAFER CHOICE

## OPTIMUM SAFETY FOR TOOLS AND OPERATORS

At FIBRO, safety and reliability are paramount. Particularly when it comes to our gas springs. With their unique range of safety features, FIBRO gas springs are one of the safest on the market.

### FIBRO safety features 1)



#### PED approval for 2 million strokes

FIBRO gas springs are developed, manufactured and tested for a minimum of 2 million\* full strokes in accordance with PED 2014/68/EU. The springs deliver their full performance at the maximum permissible limits in terms of filling pressure and operating temperature – even when combined with any of the various mounting types available.

\* Calculation value for durability



Normellen - Standard Parts - DE-74855 Hassmersheim **FIBRO**  
 T +49(0)6296-73-0 · F +49(0)6296-73-237

Bestell-Nr. **2480.13.05000.050**  
 Order-No. **2480.13.05000.050**  
 Fülldruck Federkraft  
 Filling pressure: **150 bar** Spring Force: **5000 daN**

PED-zugelassen für 2.000.000 Hübe bei voller Hubauslastung.  
 PED-approved for 2.000.000 strokes at full stroke load.

**Gasdruckfeder – Warnung!** Nicht öffnen - hoher Druck; Fülldruck max. 150 bar, Bitte Bedienungsanleitung beachten!  
**Gas Spring – Warning!** Do not open-high pressure; filling pressure max. 150 bar. Please follow instructions for use!

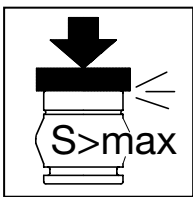
**Ressort à gaz – Attention!** Ne pas ouvrir - haute pression; pression de remplissage max. 15 MPa. Veuillez observer les instructions d'emploi!

**Molle a gas – Attenzione!** Non aprire - pressione alta massima; pressione di riempimento max. 150 bar. Si prega di osservare le istruzioni per l'uso!

**¡Muelle de gas – Atención!** No abrir - alta presión; cargado a máx. 150 bar. ¡Por favor observar las instrucciones!

**The benefit for you:** **Guaranteed safety and reliability for the entire service life of the spring**

Repair kits and qualified training sessions available through FIBRO Service offer increased effectiveness and process reliability.

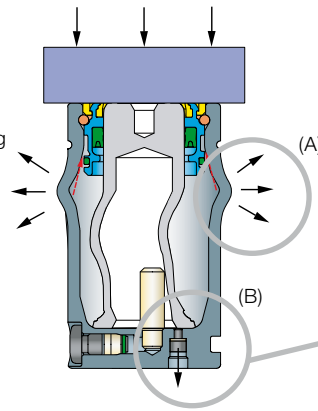


#### Overstroke protection

Conventional gas springs may burst in the event of an over-extended stroke. Components may come loose and be ejected.

FIBRO gas springs are different:

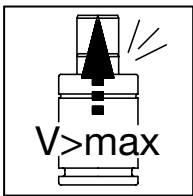
in the event of an overstroke and depending on the spring type the patented protection system will ensure that either the cylinder wall of the gas spring is deformed in a predefined manner (A) or the piston rod destroys a rupture bolt in the floor of the cylinder (B), thereby allowing the gas to escape into the atmosphere.



**The benefit for you:** **No risk of parts flying around in the event of an overstroke**

Possible causes of triggering:

Lack of stroke limitations in the tool/machine and placing the piston rods under a load (e.g. sheet-metal holder, slide reset, etc.), double sheet, incorrect installation position, etc.

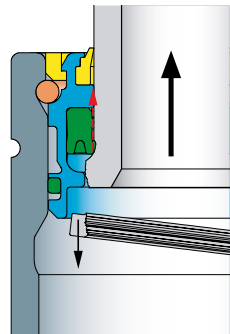


#### Return stroke protection

If, for any reason, tool components should get stuck and the piston rod should be freely released from its compressed position, conventional gas springs may pose a safety risk as the piston may not be retained in the gas spring.

FIBRO gas springs are different:

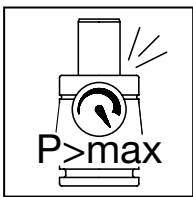
special guides and a patented safety stop in the piston rods ensure your safety. If the speed is too high during the return stroke, the collar on the piston rod will automatically break. The integrated safety stop then destroys the seal, which allows the gas to escape into the atmosphere and the gas spring to become depressurised.



**The benefit for you:** **No risk of a piston rod firing out if the return stroke is too fast**

Possible causes of triggering:

Sudden loosening of jammed components, such as sheet-metal holder, slide, ejector, scraper function, etc.

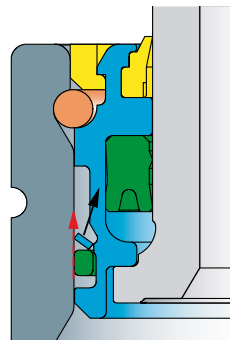


#### Overpressure protection

Conventional gas springs can burst if the internal pressure rises above a maximum permitted value. If this happens, parts flying around can become dangerous projectiles.

FIBRO gas springs are different:

if the pressure rises above the maximum permitted value, the safety collar on the sealing set is automatically destroyed. The gas then escapes into the atmosphere and the gas spring is depressurised.



**The benefit for you:** **No risk of bursting parts in the event of overpressure**

Possible causes of triggering:

Incorrect filling (max. filling pressure 150 or 180 bar, nitrogen), infed of liquid operating material, etc.

After a protection function is triggered, the spring cannot be repaired and can no longer be used. It must be replaced completely.

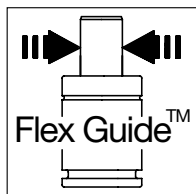
1) The safety features mentioned here have been implemented – with few exceptions – on all FIBRO gas springs.

Please refer to the relevant data sheets to check the current safety equipment which is provided with the gas spring you are interested in, or contact FIBRO GmbH directly for more information. For the safe handling of gas springs and other nitrogen products, the safety regulations must be observed. Maintenance work on the product may only be done, if nitrogen gas is no longer contained in the gas spring.

# FIBRO GAS SPRINGS – THE SAFER CHOICE

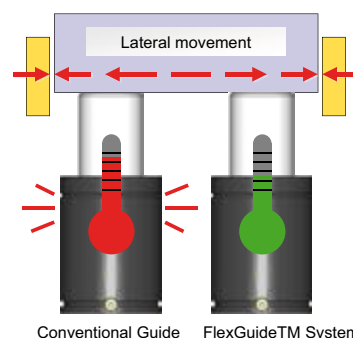
## OPTIMUM SAFETY FOR TOOLS AND OPERATORS

### FIBRO reliability features



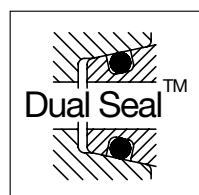
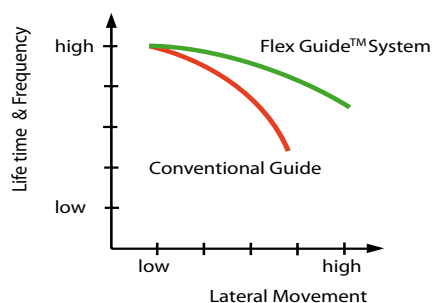
#### Flexible guides: The Flex Guide™ System

The Flex Guide™ System is a flexible guide in the gas spring which absorbs lateral movements of the piston rod. It minimises friction and lowers the operating temperature.



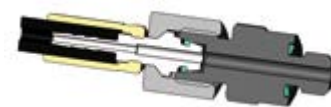
The benefits for you:

- ▶ **Extended service life**
- ▶ **Increased stroke frequency, i.e. more strokes per minute**



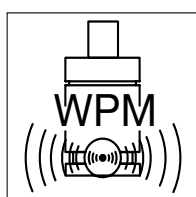
#### Safe hose connections: The Dual Seal™ System

The FIBRO Dual Seal™ System combines a metal seal with a soft elastomer seal. On hose connection systems, the system provides two leak-tight connections and prevents rotation.



The benefits for you:

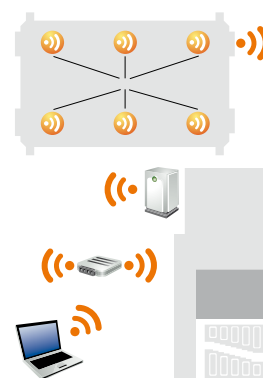
- ▶ **Leak-tight connection, even under vibrations**
- ▶ **High process reliability**
- ▶ **Minimised tool down time**
- ▶ **Simple installation thanks to anti-rotation function**



#### Wireless monitoring:

##### The Wireless Pressure Monitoring (WPM) System

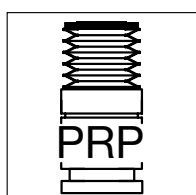
The optional Wireless Pressure Monitoring System (WPM) (patent pending) wirelessly monitors the pressure and temperature of FIBRO gas springs. Before a defective part is produced, the press operator receives a message from the WPM and can take appropriate action.



The benefits for you:

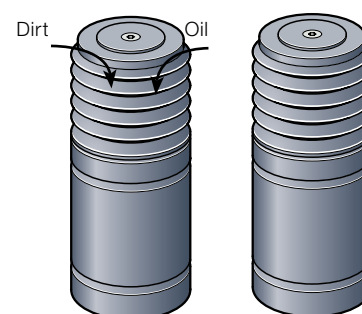
- ▶ **Preventative quality assurance**
- ▶ **High process reliability**
- ▶ **Minimised tool down time**
- ▶ **Reduced maintenance and costs**

Potential faults are individually displayed. As a result, service intervals can be extended. Maintenance and repair costs are reduced.



#### Protected piston rods: FIBRO Concertina Shrouds

The FIBRO Piston Rod Protection (patented) reliably protects the piston rods in gas springs against dirt, oil and emulsion. In this way, the system prevents damage to the piston rod surface and leaks at internal seals.



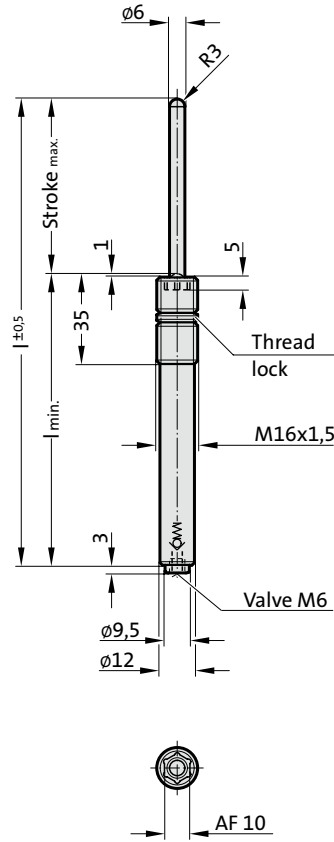
The benefit for you:

- ▶ **Significantly longer service life for gas springs under harsh operating conditions**

# GAS SPRING (SPRING PLUNGER) MOULD LINE, WITH HEXAGON SOCKET



3479.030.



## Description:

Spring plungers are used as ejectors, damper pins, fixing and retaining pins in many sectors of the tool-, jig- and fixture-making industries. Assembly requires the use of special FIBRO insertion tool (2470.12.010.017).

## Note:

Worn gas springs cannot be repaired, they have to be replaced completely.

Pressure medium: Nitrogen - N<sub>2</sub>

Max. filling pressure depends on working temperature:

150 bar (20°C) at 0°C-80°C

125 bar (20°C) at 80°C-100°C

115 bar (20°C) at 100°C-120°C

Min. filling pressure: 25 bar (20°C)

Working temperature: 0°C to +120°C

Temperature related force increase:  $\pm 0.3\%/^{\circ}\text{C}$

Max. recommended extensions per minute:

20 (at 0°C-80°C)

15 (at 80°C-100°C)

10 (at 100°C-120°C)

Max. piston speed: 1.0 m/s

2) Hexagon nut order supplementary:

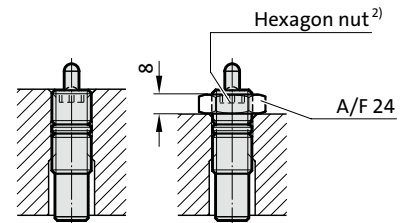
2480.004.00040.1 (M16 x 1,5)



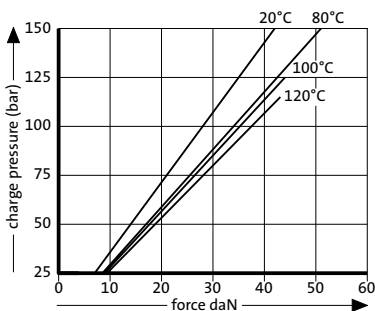
3479.030.

Gas spring (Spring plunger) MOULD LINE, with hexagon socket

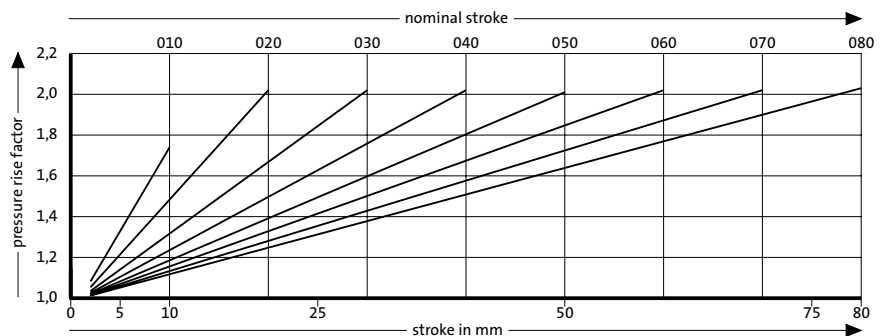
Order No	Stroke <sub>max.</sub> (s)	l <sub>min.</sub>	l
3479.030.00040.010	10	55	65
3479.030.00040.020	20	65	85
3479.030.00040.030	30	75	105
3479.030.00040.040	40	85	125
3479.030.00040.050	50	95	145
3479.030.00040.060	60	105	165
3479.030.00040.070	70	115	185
3479.030.00040.080	80	125	205



Initial spring force versus charge pressure



Spring force Diagram displacement versus stroke rise



Pressure rise factor accounts for displacement but not external influences!

# GAS SPRING (SPRING PLUNGER) MOULD LINE, WITH HEXAGON SOCKET

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150 bar (20°C) at 0°C-80°C

125 bar (20°C) at 80°C-100°C

115 bar (20°C) at 100°C-120°C

Min. filling pressure: 25 bar (20°C)

Working temperature: 0°C to +120°C

Temperature related force increase: ± 0.3%/°C

Max. recommended extensions per minute:

20 (at 0°C-80°C)

15 (at 80°C-100°C)

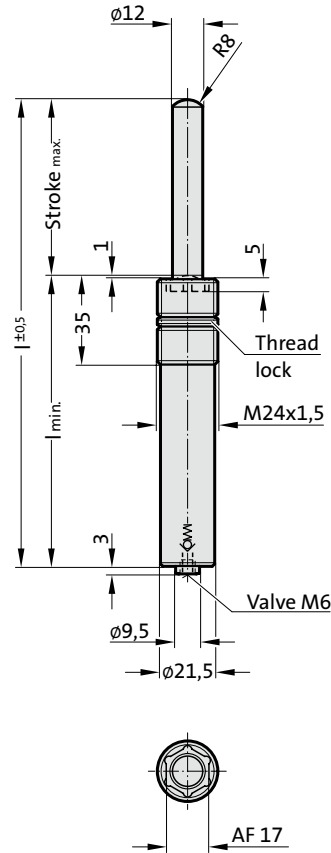
10 (at 100°C-120°C)

Max. piston speed: 1.0 m/s

2) Hexagon nut order supplementary:

2480.004.00170

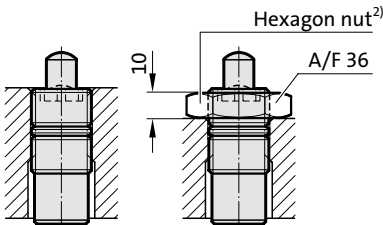
3479.032.



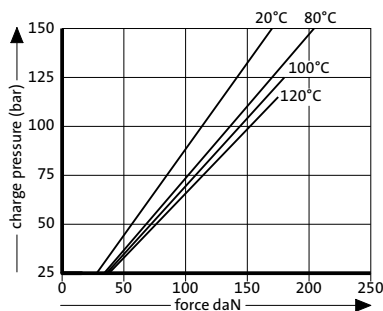
3479.032.

Gas spring (Spring plunger) MOULD LINE, with hexagon socket

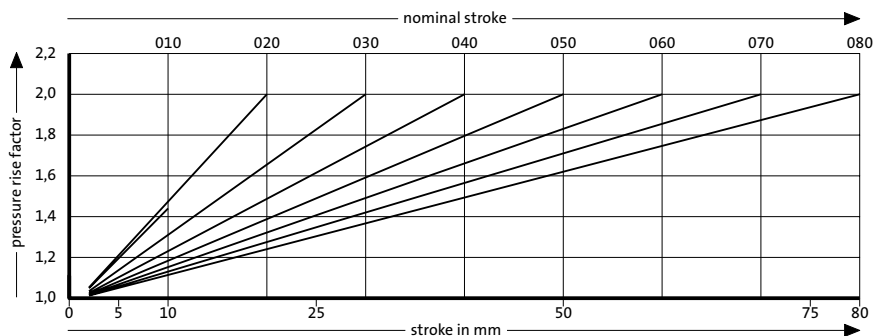
Order No	Stroke <sub>max</sub> (s)	I <sub>min</sub>	I
3479.032.00170.010	10	55	65
3479.032.00170.020	20	65	85
3479.032.00170.030	30	75	105
3479.032.00170.040	40	85	125
3479.032.00170.050	50	95	145
3479.032.00170.060	60	105	165
3479.032.00170.070	70	115	185
3479.032.00170.080	80	125	205



Initial spring force versus charge pressure





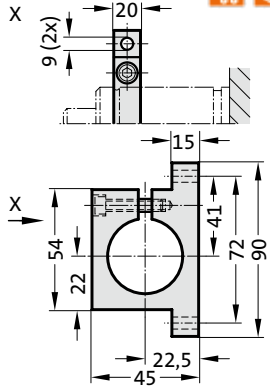
Spring force Diagram displacement versus stroke rise





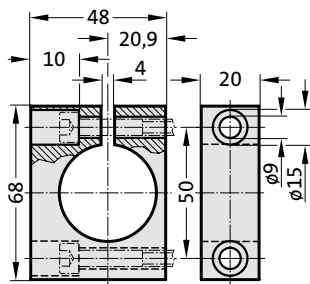
Pressure rise factor accounts for displacement but not external influences!



# GAS SPRING MOUNTING VARIATIONS

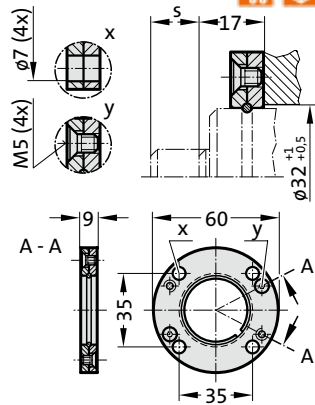
2480.044.00150<sup>2)</sup>  





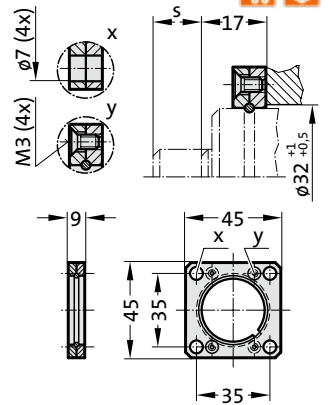
2480.044.03.00150<sup>2)</sup>  



2480.055.00150  



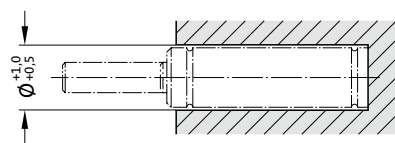
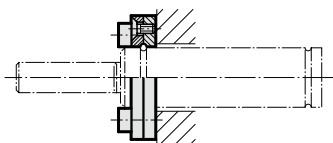
2480.057.00150  



**Note:**

<sup>2)</sup> Attention:  
The spring force must be absorbed  
by the stop Surface!

**Mounting examples:**



# GAS SPRING MOULD LINE

**Note:**

Initial spring force at 150 bar/20°C is 300 daN

Order No. for spare parts kit: 3487.12.00300

Pressure medium: Nitrogen - N<sub>2</sub>

Max. filling pressure depends on working temperature:

150 bar (20°C) at 0°C-80°C

125 bar (20°C) at 80°C-100°C

115 bar (20°C) at 100°C-120°C

Min. filling pressure: 25 bar (20°C)

Working temperature: 0°C to +120°C

Temperature related force increase: ± 0.3%/°C

Max. recommended extensions per minute:

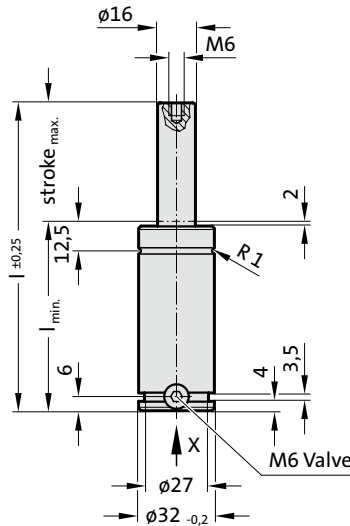
20 (at 0°C-80°C)

15 (at 80°C-100°C)

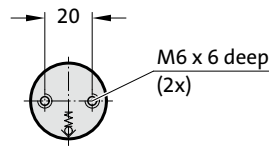
10 (at 100°C-120°C)

Max. piston speed: 1.0 m/s

3487.12.00300.



„X”

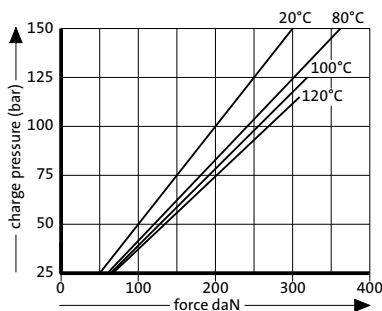


3487.12.00300.

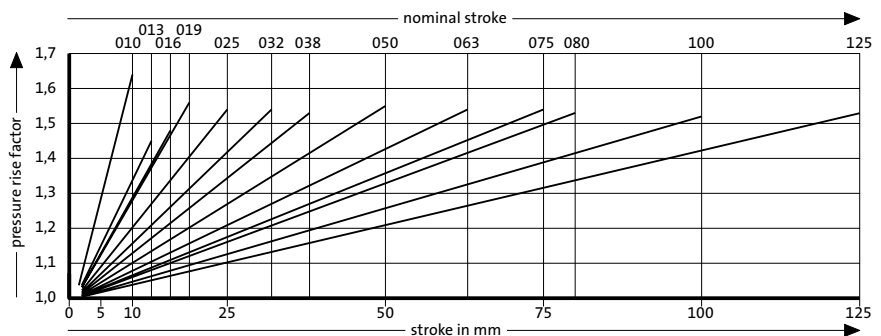
**Gas spring MOULD LINE**

Order No	Stroke <sub>max</sub> (s)	l <sub>min</sub>	l
3487.12.00300.010	10	40	50
3487.12.00300.013	13	43	56
3487.12.00300.016	16	46	62
3487.12.00300.019	19	49	68
3487.12.00300.025	25	55	80
3487.12.00300.032	32	62	94
3487.12.00300.038	38	68	106
3487.12.00300.050	50	80	130
3487.12.00300.063	63	93	156
3487.12.00300.075	75	105	180
3487.12.00300.080	80	110	190
3487.12.00300.100	100	130	230
3487.12.00300.125	125	155	280

Initial spring force versus charge pressure





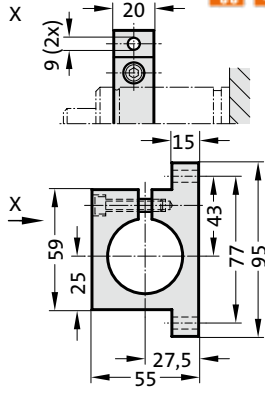
Spring force Diagram displacement versus stroke rise





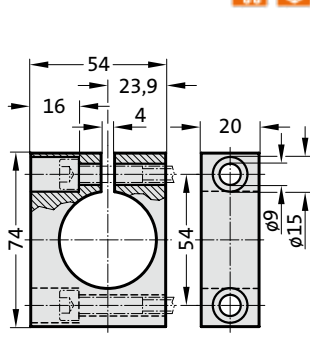
Pressure rise factor accounts for displacement but not external influences!



# GAS SPRING MOUNT LINE MOUNTING VARIATIONS

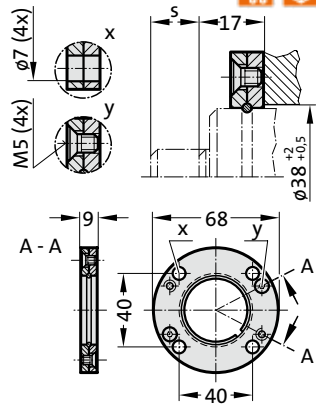
2480.044.00250<sup>2)</sup>  





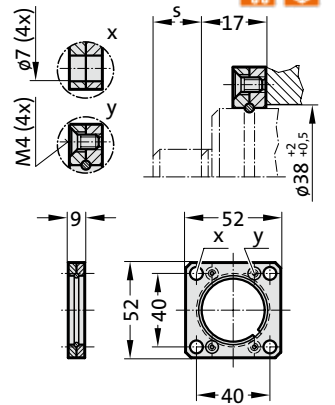
2480.044.03.00250<sup>2)</sup>  



2480.055.00250  



2480.057.00250  



**Note:**  
<sup>2)</sup> Attention:  
 The spring force must be absorbed  
 by the stop Surface!



# GAS SPRING MOULD LINE

**Note:**

Initial spring force at 150 bar/20°C is 500 daN

Order No. for spare parts kit: 3487.12.00500

Pressure medium: Nitrogen - N<sub>2</sub>

Max. filling pressure depends on working temperature:

150 bar (20°C) at 0°C-80°C

125 bar (20°C) at 80°C-100°C

115 bar (20°C) at 100°C-120°C

Min. filling pressure: 25 bar (20°C)

Working temperature: 0°C to +120°C

Temperature related force increase: ± 0.3%/°C

Max. recommended extensions per minute:

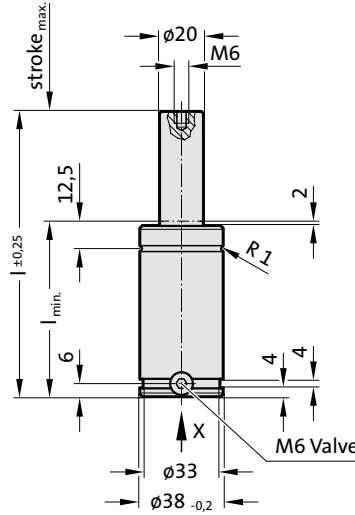
20 (at 0°C-80°C)

15 (at 80°C-100°C)

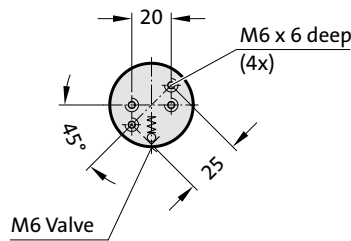
10 (at 100°C-120°C)

Max. piston speed: 1.0 m/s

3487.12.00500.



„X”

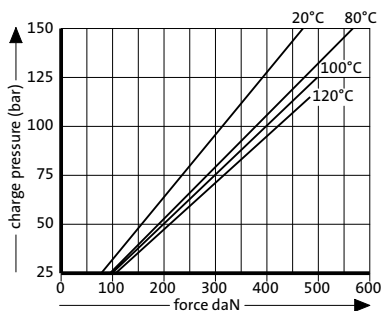


3487.12.00500.

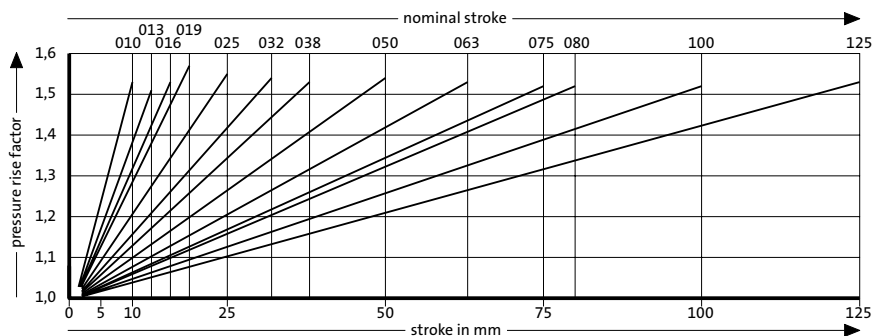
Gas spring MOULD LINE

Order No	Stroke <sub>max.</sub> (s)	l <sub>min.</sub>	l
3487.12.00500.010	10	40	50
3487.12.00500.013	13	43	56
3487.12.00500.016	16	46	62
3487.12.00500.019	19	49	68
3487.12.00500.025	25	55	80
3487.12.00500.032	32	62	94
3487.12.00500.038	38	68	106
3487.12.00500.050	50	80	130
3487.12.00500.063	63	93	156
3487.12.00500.075	75	105	180
3487.12.00500.080	80	110	190
3487.12.00500.100	100	130	230
3487.12.00500.125	125	155	280

Initial spring force versus charge pressure



Spring force Diagram displacement versus stroke rise

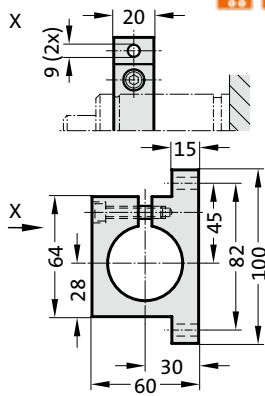


Pressure rise factor accounts for displacement but not external influences!

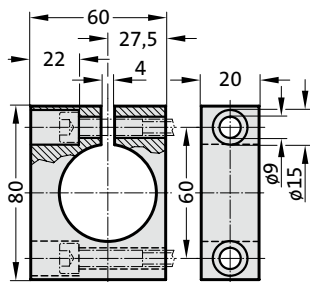
# GAS SPRING MOUNT LINE

## MOUNTING VARIATIONS

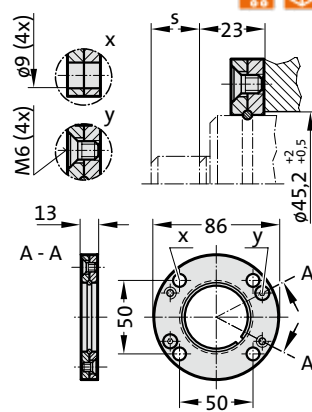
2480.044.00500<sup>2)</sup>



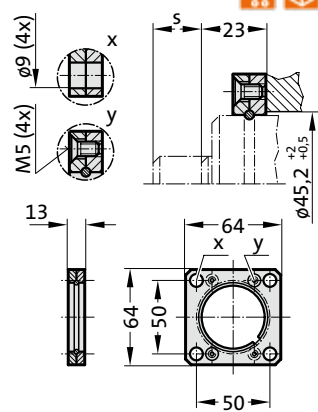
2480.044.03.00500<sup>2)</sup>



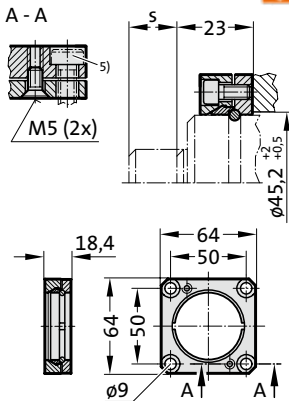
2480.055.00500



2480.057.00500



2480.064.00500<sup>4)</sup>





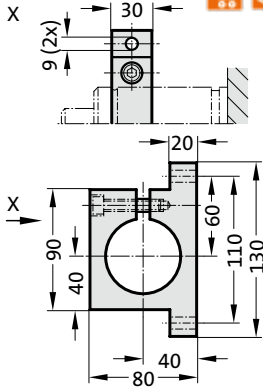
### Note:



- <sup>2)</sup> Attention:  
The spring force must be absorbed by the stop Surface!
- <sup>4)</sup> Square collar flange, non-rotating, fixing for composite connection.
- <sup>5)</sup> Machine screws with hexagonal socket (compact head recommended)

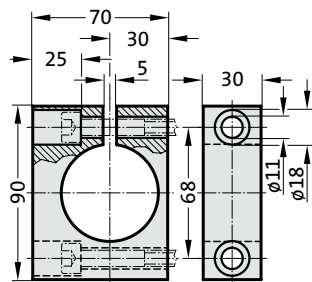




# GAS SPRING MOUNT LINE MOUNTING VARIATIONS

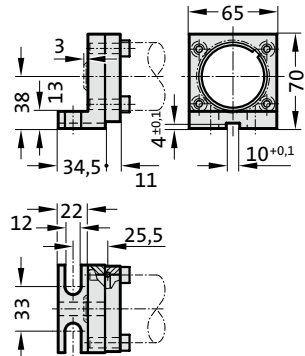
2480.044.00750<sup>2)</sup>  





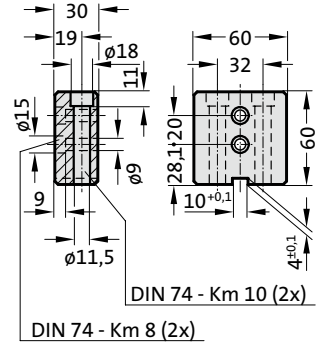
2480.044.03.00750<sup>2)</sup>  





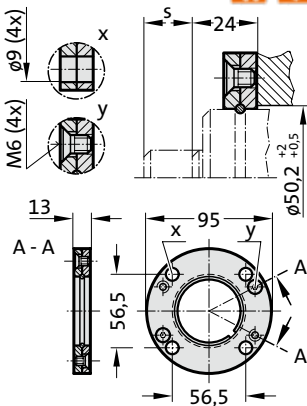
2480.045.00750<sup>2)</sup>  





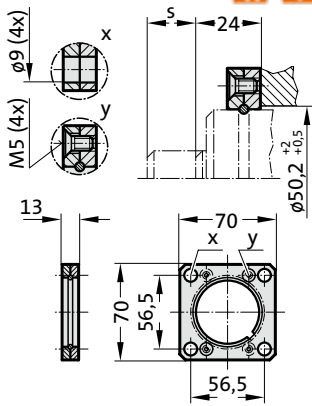
2480.047.00750<sup>2)</sup>  





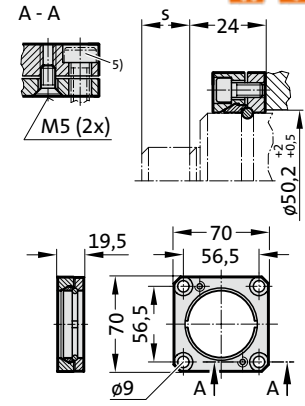
2480.055.00750  



2480.057.00750  



2480.064.00750<sup>4)</sup>  



## Note:

- <sup>2)</sup> Attention:  
The spring force must be absorbed by the stop Surface!
- <sup>4)</sup> Square collar flange, non-rotating, fixing for composite connection.
- <sup>5)</sup> Machine screws with hexagonal socket (compact head recommended)



# GAS SPRING ACCESSORIES

see registry F:

Gas spring accessories



# AUXILIARY EQUIPMENT

see registry H: Chemical tooling aids

see registry J: Peripheral equipment

