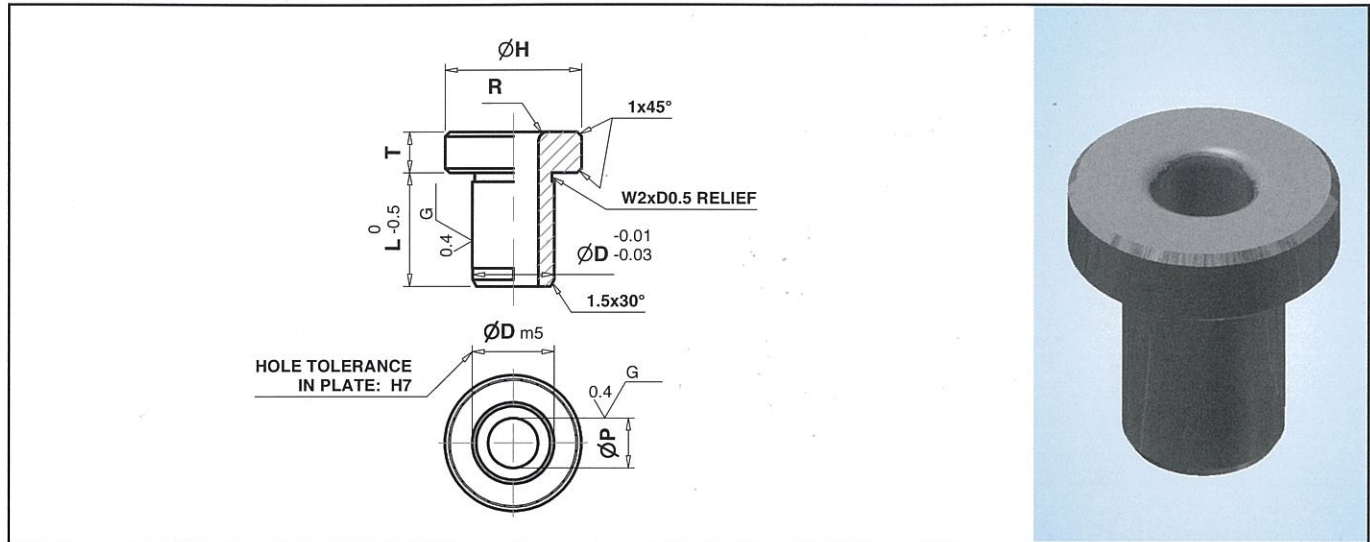


SOLID CARBIDE PRESS FIT DRILL BUSHINGS



- TYPE P FOR PRECISION DRILLING (**CFAP**)
- TYPE N FOR NORMAL DRILLING (**CFAN**)
- TYPE R FOR REAMING (**CFAR**)
- TiCN COATING (**TFAP/TFAN/TFAR**)



I.D.(P)	1.6 – 3.0	3.1 – 6.0	6.1 – 10.0	10.1 – 18.0	18.0 – 30.0	30.1 – 42.0
Type - P	+0.008 +0.002	+0.012 +0.004	+0.014 +0.005	+0.017 +0.006	+0.020 +0.007	+0.025 +0.009
Type - N	+0.025 +0.002	+0.030 +0.004	+0.036 +0.005	+0.043 +0.006	+0.052 +0.007	+0.062 +0.009
Type - R	+0.014 +0.008	+0.020 +0.012	+0.024 +0.015	+0.029 +0.018	+0.034 +0.021	+0.041 +0.025

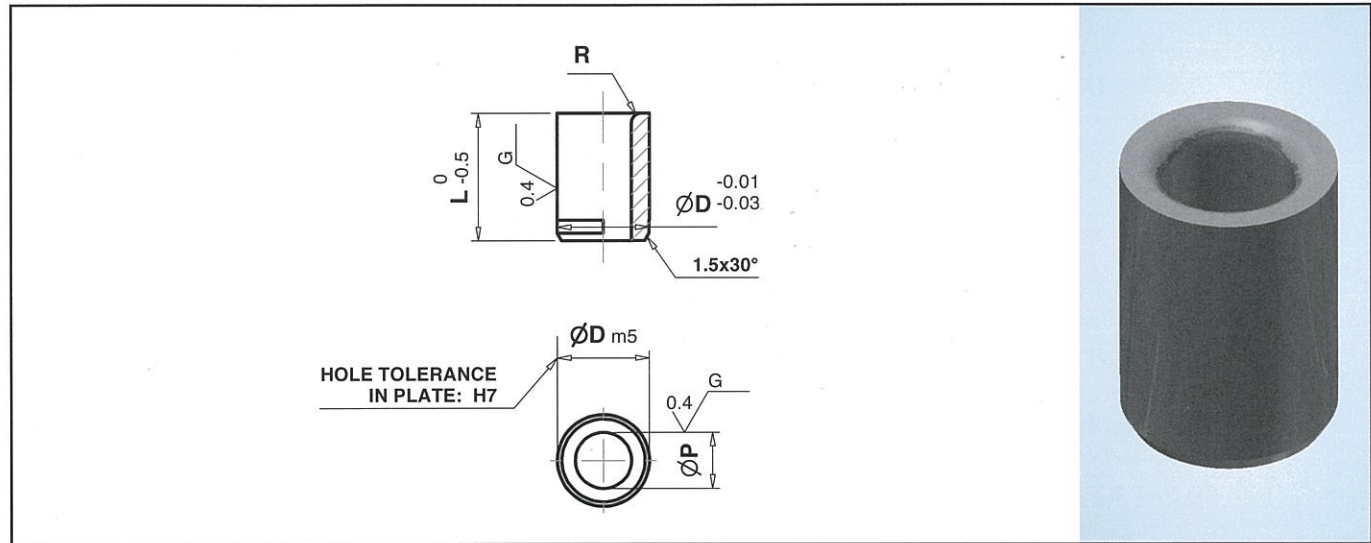
I.D.(P)	D (m5)	H	T	R	T (Under Head)							
					12	16	20	25	30	35	45	
1.6 – 2.0	8	+0.012 +0.006	11	8	1	•						
2.1 – 3.0	8		11	8	1	•						
3.1 – 4.0	8		11	8	1	•	•					
4.1 – 6.0	10		13	8	1	•	•					
6.1 – 8.0	12	+0.015 +0.007	15	8	2		•	•				
8.1 – 10.0	15		18	9	2		•	•				
10.1 – 12.0	18		22	9	2			•	•			
12.1 – 15.0	22	+0.017 +0.008	26	12	2			•	•			
15.1 – 18.0	26		30	12	2				•	•		
18.1 – 22.0	30		34	12	2				•	•		
22.1 – 26.0	35	+0.020 +0.009	39	15	2					•	•	
26.1 – 30.0	42		46	15	2					•	•	
30.1 – 35.0	48		52	15	3						•	•
35.1 – 42.0	55	+0.024 +0.011	59	15	3						•	•

Note: Other Dimension Not Listed above can be ground to your specifications.
 If in doubt please send us your drawing. 'D' tolerance is m5 or +0.005.
 Unless otherwise specified by customer all outside corners will be sharp.

How to order : **CFAP – P – T**
 Example : **TFAR – P1.6 – T12**

SOLID CARBIDE STRAIGHT PRESS FIT DRILL BUSHINGS

- TYPE P FOR PRECISION DRILLING (**CFBP**)
- TYPE N FOR NORMAL DRILLING (**CFBN**)
- TYPE R FOR REAMING (**CFBR**)
- TiCN COATING (**TFBP/TFBN/TFBR**)



I.D.(P)	1.6 – 3.0	3.1 – 6.0	6.1 – 10.0	10.1 – 18.0	18.0 – 30.0	30.1 – 42.0
Type - P	+0.008 +0.002	+0.012 +0.004	+0.014 +0.005	+0.017 +0.006	+0.020 +0.007	+0.025 +0.009
Type - N	+0.025 +0.002	+0.030 +0.004	+0.036 +0.005	+0.043 +0.006	+0.052 +0.007	+0.062 +0.009
Type - R	+0.014 +0.008	+0.020 +0.012	+0.024 +0.015	+0.029 +0.018	+0.034 +0.021	+0.041 +0.025

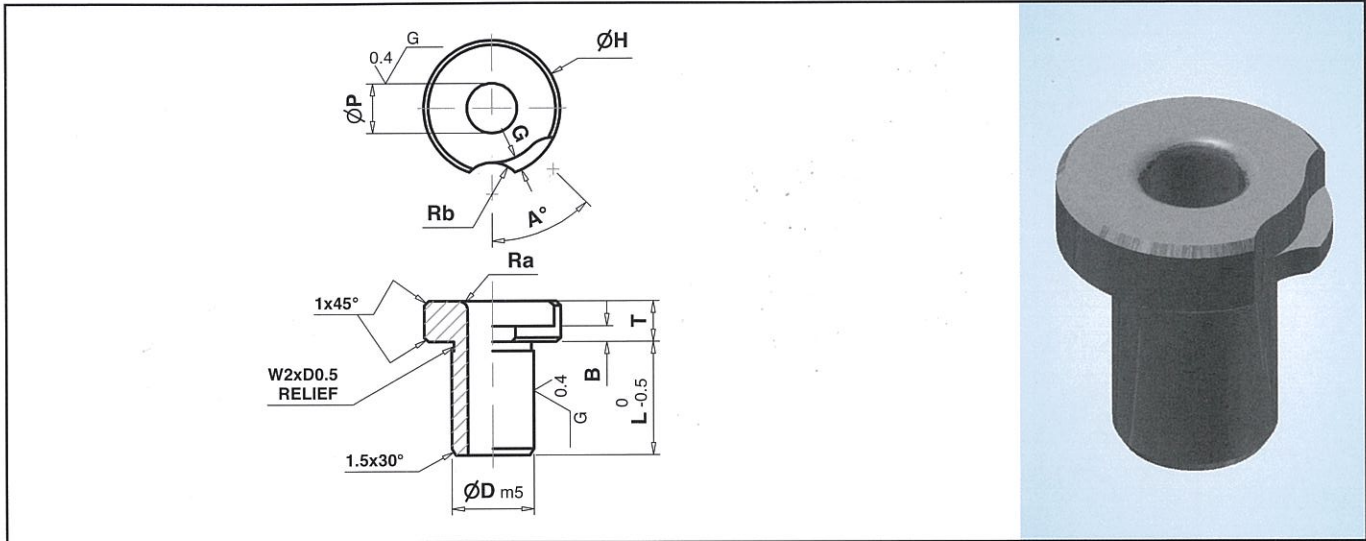
I.D.(P)	D (m5)		R	L (Under Head)						
				12	16	20	25	30	35	45
1.6 – 2.0	8	+0.012 +0.006	1	•						
2.1 – 3.0	8		1	•						
3.1 – 4.0	8		1	•	•					
4.1 – 6.0	10		1	•	•					
6.1 – 8.0	12	+0.015 +0.007	2		•	•				
8.1 – 10.0	15		2		•	•				
10.1 – 12.0	18		2			•	•			
12.1 – 15.0	22	+0.017 +0.008	2			•	•			
15.1 – 18.0	26		2				•	•		
18.1 – 22.0	30		2				•	•		
22.1 – 26.0	35	+0.020 +0.009	2					•	•	
26.1 – 30.0	42		2					•	•	
30.1 – 35.0	48		3						•	•
35.1 – 42.0	55	+0.024 +0.011	3						•	•

Note: Other Dimension Not Listed above can be ground to your specifications.
 If in doubt please send us your drawing. 'D' tolerance is m5 or +0.005.
 Unless otherwise specified by customer all outside corners will be sharp.

How to order : **CFBP – P – T**
 Example : **TFBR – P1.6 – T12**

SOLID CARBIDE ROUND RIGHT SLIP DRILL BUSHINGS

- TYPE P FOR PRECISION DRILLING (**CFCP**)
- TYPE N FOR NORMAL DRILLING (**CFCN**)
- TYPE R FOR REAMING (**CFCR**)
- TiCN COATING (**TFCP/TFCN/TFCR**)



I.D.(P)	1.6 – 3.0	3.1 – 6.0	6.1 – 10.0	10.1 – 18.0	18.0 – 30.0	30.1 – 42.0
Type - P	+0.008 +0.002	+0.012 +0.004	+0.014 +0.005	+0.017 +0.006	+0.020 +0.007	+0.025 +0.009
Type - N	+0.025 +0.002	+0.030 +0.004	+0.036 +0.005	+0.043 +0.006	+0.052 +0.007	+0.062 +0.009
Type - R	+0.014 +0.008	+0.020 +0.012	+0.024 +0.015	+0.029 +0.018	+0.034 +0.021	+0.041 +0.025

I.D.(P)	D (m5)	T	H	B	Ra	G	A°	Rb	Suitable Lock Screw or Round Clamp	L (Under Head)							
										12	16	20	25	30	35	45	
1.6 – 2.0	8	+0.012 +0.006	8	16	3.5	0.8	3	60	7	LSM-1 or 2 RCM-1 or 2	•						
2.1 – 3.0	8		8	16	3.5	0.8	3	60	7	LSM-1 or 2 RCM-1 or 2	•						
3.1 – 4.0	8		8	16	3.5	1	3	60	7	LSM-1 or 2 RCM-1 or 2	•	•					
4.1 – 6.0	10		8	19	3.5	1	3	60	7	LSM-1 or 2 RCM-1 or 2	•	•					
6.1 – 8.0	12	+0.015 +0.007	8	22	3.5	2	3	60	9	LSM-3 or 4 RCM-3 or 4		•	•				
8.1 – 10.0	15		9	26	3.5	2	3	60	9	LSM-3 or 4 RCM-3 or 4		•	•				
10.1 – 12.0	18		9	30	3.5	2	3	45	9	LSM-3 or 4 RCM-3 or 4			•	•			
12.1 – 15.0	22	+0.017 +0.008	12	35	5	2	4	45	11	LSM-5 or 6 RCM-5 or 6			•	•			
15.1 – 18.0	26		12	40	5	2	4	45	11	LSM-5 or 6 RCM-5 or 6				•	•		
18.1 – 22.0	30		12	47	5	3	4	40	11	LSM-5 or 6 RCM-5 or 6				•	•		
22.1 – 26.0	35	+0.020 +0.009	15	55	6	3	5	40	11	LSM-5 or 6 RCM-5 or 6					•	•	
26.1 – 30.0	42		15	62	6	3	5	35	11	LSM-5 or 6 RCM-5 or 6					•	•	
30.1 – 35.0	48		15	69	6	4	5	35	13	LSM-7 or 8 RCM-7 or 8						•	•
35.1 – 42.0	55	+0.024 +0.011	15	77	6	4	5	35	13	LSM-7 or 8 RCM-7 or 8						•	•

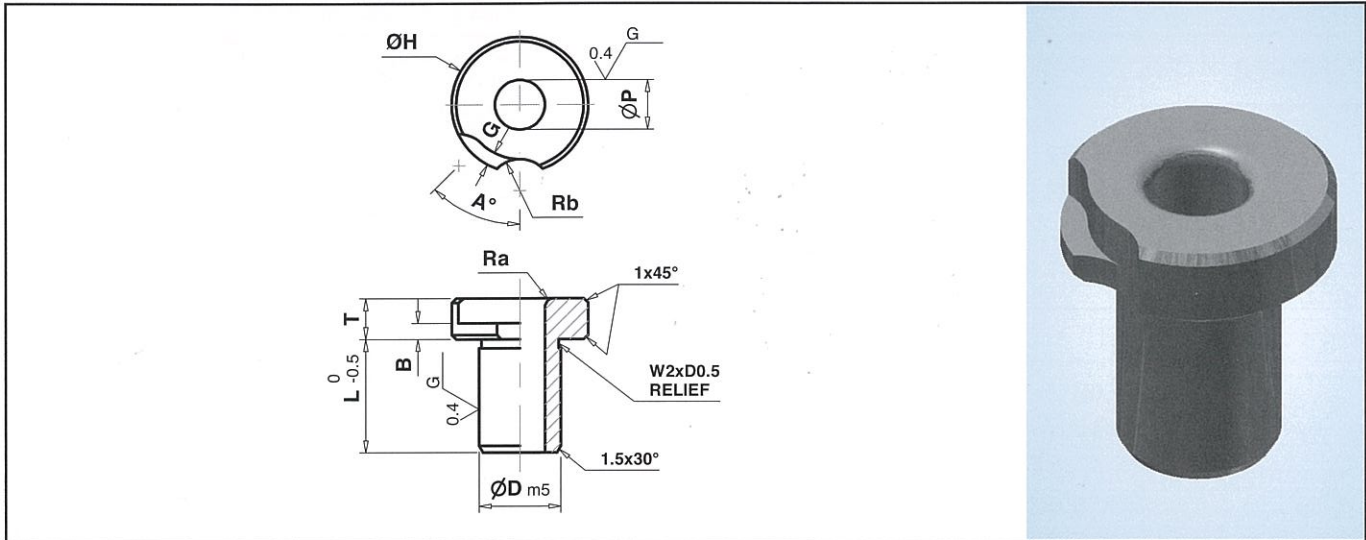
Note: Other Dimension Not Listed above can be ground to your specifications.
 If in doubt please send us your drawing. 'D' tolerance is m5 or +0.005.
 Unless otherwise specified by customer all outside corners will be sharp.

How to order : **CFCP – P – T**
 Example : **TFCR – P1.6 – T12**

SOLID CARBIDE ROUND LEFT SLIP DRILL BUSHINGS



- TYPE P FOR PRECISION DRILLING (**CFDP**)
- TYPE N FOR NORMAL DRILLING (**CFDN**)
- TYPE R FOR REAMING (**CFDR**)
- TiCN COATING (**TFDP/TFDN/TFDR**)



I.D.(P)	1.6 – 3.0	3.1 – 6.0	6.1 – 10.0	10.1 – 18.0	18.0 – 30.0	30.1 – 42.0
Type - P	+0.008 +0.002	+0.012 +0.004	+0.014 +0.005	+0.017 +0.006	+0.020 +0.007	+0.025 +0.009
Type - N	+0.025 +0.002	+0.030 +0.004	+0.036 +0.005	+0.043 +0.006	+0.052 +0.007	+0.062 +0.009
Type - R	+0.014 +0.008	+0.020 +0.012	+0.024 +0.015	+0.029 +0.018	+0.034 +0.021	+0.041 +0.025

I.D.(P)	D (m5)	T	H	B	Ra	G	A°	Rb	Suitable Lock Screw or Round Clamp	L (Under Head)							
										12	16	20	25	30	35	45	
1.6 – 2.0	8	+0.012 +0.006	8	16	3.5	0.8	3	60	7	LSM-1 or 2 RCM-1 or 2	•						
2.1 – 3.0	8		8	16	3.5	0.8	3	60	7	LSM-1 or 2 RCM-1 or 2	•						
3.1 – 4.0	8		8	16	3.5	1	3	60	7	LSM-1 or 2 RCM-1 or 2	•	•					
4.1 – 6.0	10		8	19	3.5	1	3	60	7	LSM-1 or 2 RCM-1 or 2	•	•					
6.1 – 8.0	12	+0.015 +0.007	8	22	3.5	2	3	60	9	LSM-3 or 4 RCM-3 or 4		•	•				
8.1 – 10.0	15		9	26	3.5	2	3	60	9	LSM-3 or 4 RCM-3 or 4		•	•				
10.1 – 12.0	18		9	30	3.5	2	3	45	9	LSM-3 or 4 RCM-3 or 4			•	•			
12.1 – 15.0	22	+0.017 +0.008	12	35	5	2	4	45	11	LSM-5 or 6 RCM-5 or 6			•	•			
15.1 – 18.0	26		12	40	5	2	4	45	11	LSM-5 or 6 RCM-5 or 6				•	•		
18.1 – 22.0	30		12	47	5	3	4	40	11	LSM-5 or 6 RCM-5 or 6				•	•		
22.1 – 26.0	35	+0.020 +0.009	15	55	6	3	5	40	11	LSM-5 or 6 RCM-5 or 6					•	•	
26.1 – 30.0	42		15	62	6	3	5	35	11	LSM-5 or 6 RCM-5 or 6					•	•	
30.1 – 35.0	48		15	69	6	4	5	35	13	LSM-7 or 8 RCM-7 or 8						•	•
35.1 – 42.0	55	+0.024 +0.011	15	77	6	4	5	35	13	LSM-7 or 8 RCM-7 or 8						•	•

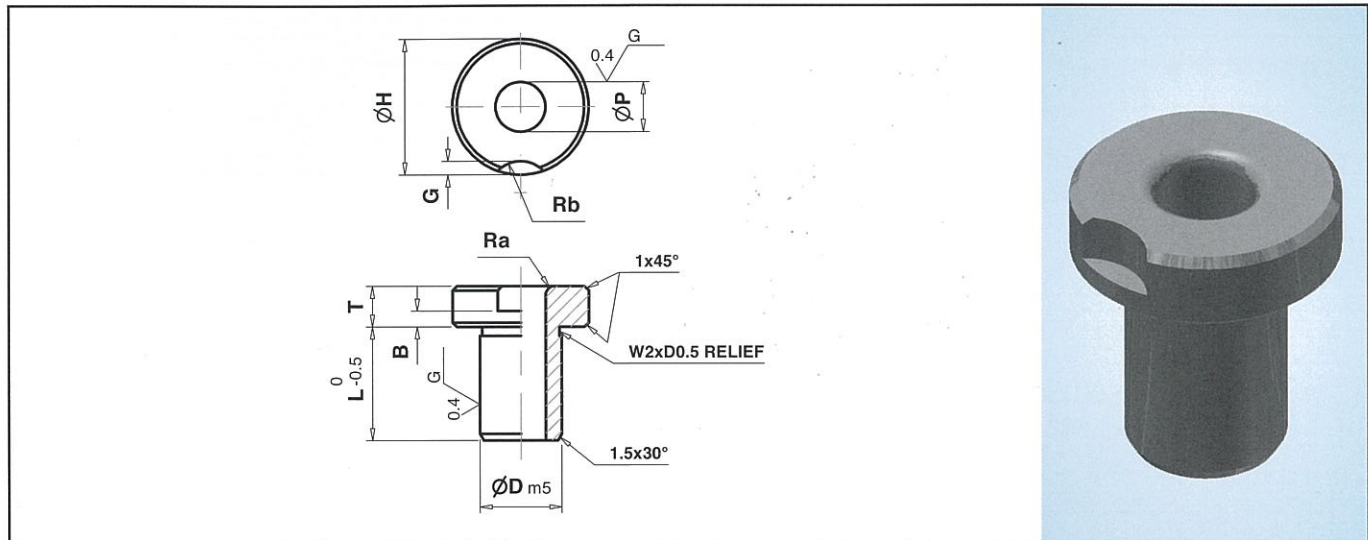
Note: Other Dimension Not Listed above can be ground to your specifications.
 If in doubt please send us your drawing. 'D' tolerance is m5 or +0.005.
 Unless otherwise specified by customer all outside corners will be sharp.

How to order : **CFDP – P – T**
 Example : **TFDR – P1.6 – T12**

SOLID CARBIDE ROUND FIXED DRILL BUSHINGS



- TYPE P FOR PRECISION DRILLING (CFEP)
- TYPE N FOR NORMAL DRILLING (CFEN)
- TYPE R FOR REAMING (CFER)
- TiCN COATING (TFEP/TFEN/TFER)



I.D.(P)	1.6 – 3.0	3.1 – 6.0	6.1 – 10.0	10.1 – 18.0	18.0 – 30.0	30.1 – 42.0
Type - P	+0.008 +0.002	+0.012 +0.004	+0.014 +0.005	+0.017 +0.006	+0.020 +0.007	+0.025 +0.009
Type - N	+0.025 +0.002	+0.030 +0.004	+0.036 +0.005	+0.043 +0.006	+0.052 +0.007	+0.062 +0.009
Type - R	+0.014 +0.008	+0.020 +0.012	+0.024 +0.015	+0.029 +0.018	+0.034 +0.021	+0.041 +0.025

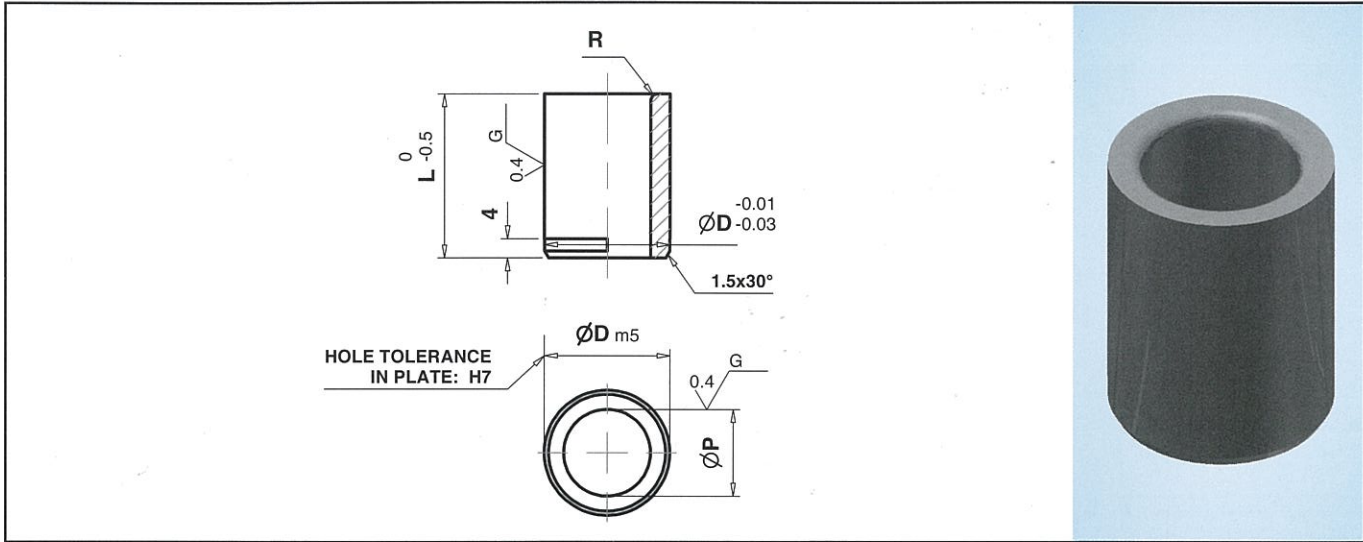
I.D.(P)	D (m5)		T	H	B	Ra	G	Rb	Suitable Lock Screw or Round Clamp	L (Under Head)						
										12	16	20	25	30	35	45
1.6 – 2.0	8	+0.012 +0.006	8	16	3.5	0.8	3	7	LSM-1 or 2 RCM-1 or 2	•						
2.1 – 3.0	8		8	16	3.5	0.8	3	7	LSM-1 or 2 RCM-1 or 2	•						
3.1 – 4.0	8		8	16	3.5	1	3	7	LSM-1 or 2 RCM-1 or 2	•	•					
4.1 – 6.0	10		8	19	3.5	1	3	7	LSM-1 or 2 RCM-1 or 2	•	•					
6.1 – 8.0	12	+0.015 +0.007	8	22	3.5	2	3	9	LSM-3 or 4 RCM-3 or 4		•	•				
8.1 – 10.0	15		9	26	3.5	2	3	9	LSM-3 or 4 RCM-3 or 4		•	•				
10.1 – 12.0	18		9	30	3.5	2	3	9	LSM-3 or 4 RCM-3 or 4			•	•			
12.1 – 15.0	22	+0.017 +0.008	12	35	5	2	4	11	LSM-5 or 6 RCM-5 or 6			•	•			
15.1 – 18.0	26		12	40	5	2	4	11	LSM-5 or 6 RCM-5 or 6				•	•		
18.1 – 22.0	30		12	47	5	3	4	11	LSM-5 or 6 RCM-5 or 6				•	•		
22.1 – 26.0	35	+0.020 +0.009	15	55	6	3	5	11	LSM-5 or 6 RCM-5 or 6					•	•	
26.1 – 30.0	42		15	62	6	3	5	11	LSM-5 or 6 RCM-5 or 6					•	•	
30.1 – 35.0	48		15	69	6	4	5	13	LSM-7 or 8 RCM-7 or 8						•	•
35.1 – 42.0	55	+0.024 +0.011	15	77	6	4	5	13	LSM-7 or 8 RCM-7 or 8						•	•

Note: Other Dimension Not Listed above can be ground to your specifications.
 If in doubt please send us your drawing. 'D' tolerance is m5 or +0.005.
 Unless otherwise specified by customer all outside corners will be sharp.

How to order : **CFEP – P – T**
 Example : **TFER – P1.6 – T12**

SOLID CARBIDE ROUND HEADLESS LINER BUSHINGS

- PRESS FIT RENEWABLE (CFF)



I.D.(P)	12	15	18	22	26	30	35	42	48	55	62	70
Tolerance H7	+0.018 0		+0.020 0			+0.025 0			+0.030 0			

I.D.(P)		D (p6)		R	L (overall length)							
					12	16	20	25	30	35	45	
8	+0.032	12	+0.029	2	•	•						
10	+0.023	15	+0.018	2	•	•						
12	+0.036	18	+0.029	2		•	•					
15	+0.025	22	+0.035 +0.022	2		•	•					
18	+0.037	26		2			•	•				
22	+0.040	30		3			•	•				
26	+0.027	35		3				•	•			
30	+0.041	42	+0.042 +0.026	3				•	•			
35	+0.045 +0.029	48	+0.051 +0.032	4					•	•		
42		55		4					•	•		
48		62		4							•	•
55	+0.053 +0.034	70		4							•	•

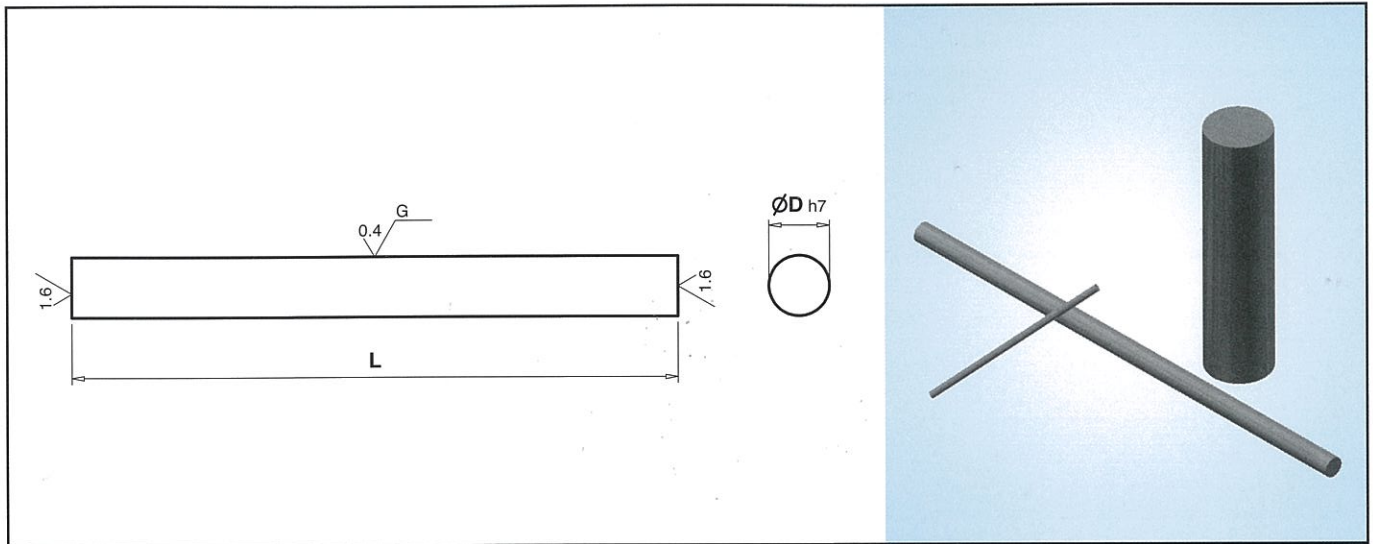
How to order : **CFF-P-L**
Example : **TFF-P8-L12**

Note: Other Dimension Not Listed above can be ground to your specifications.
If in doubt please send us your drawing. 'D' tolerance is m5 or +0.005.
Unless otherwise specified by customer all outside corners will be sharp.

SOLID CARBIDE ROD/MINI ROD



- PRECISION GROUND ROD, MINUS TOLERANCE TYPE (CGAA)
- PRECISION GROUND ROD, MINUS TOLERANCE TYPE WITH TiCN COATING (TGAA)



D Body Dia.(1mm increment)	L Length
2.0 – 25.0	50 - 300

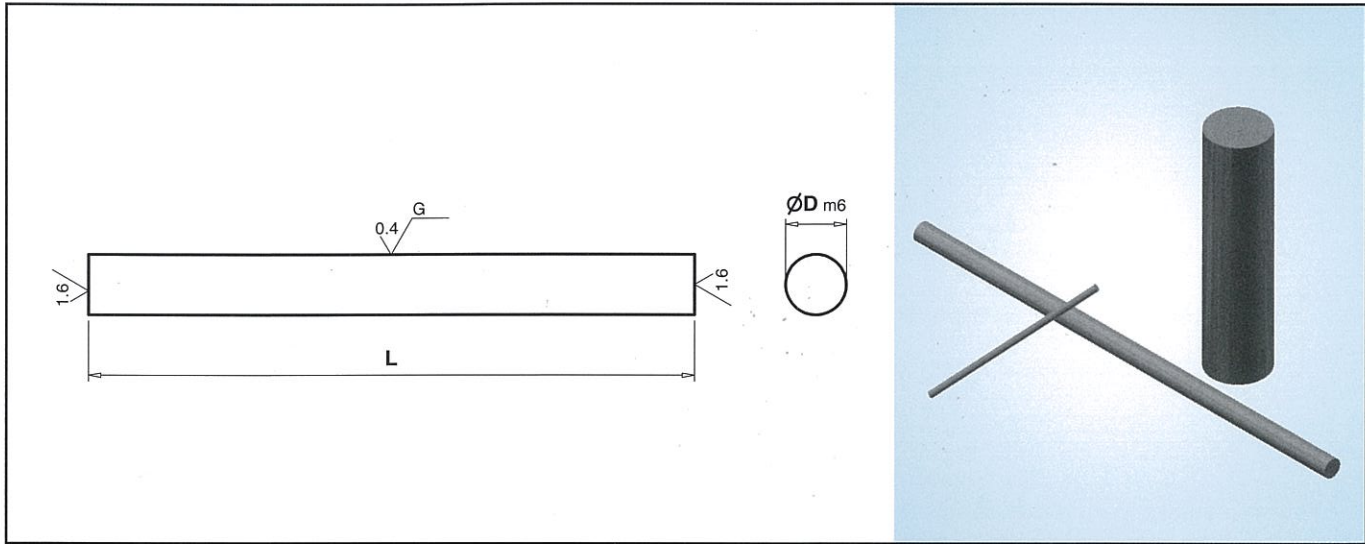
D Body Dia.(0.05mm increment)	L Length
0.25 – 1.95	25 – max(D x 400)

Note: Other Dimension Not Listed above can be ground to your specifications.
 If in doubt please send us your drawing. 'D' tolerance is m5 or +0.005.
 Unless otherwise specified by customer all outside corners will be sharp.

How to order : **CGAA – D – L**
 Example : **TGAA – D2.0 – L50**

SOLID CARBIDE ROD/MINI ROD

- PRECISION GROUND ROD, PLUS TOLERANCE TYPE (**CGAB**)
- PRECISION GROUND ROD, PLUS TOLERANCE TYPE WITH TiCN COATING (**TGAB**)



D Body Dia.(1mm increment)	L Length
2.0 – 25.0	50 - 300

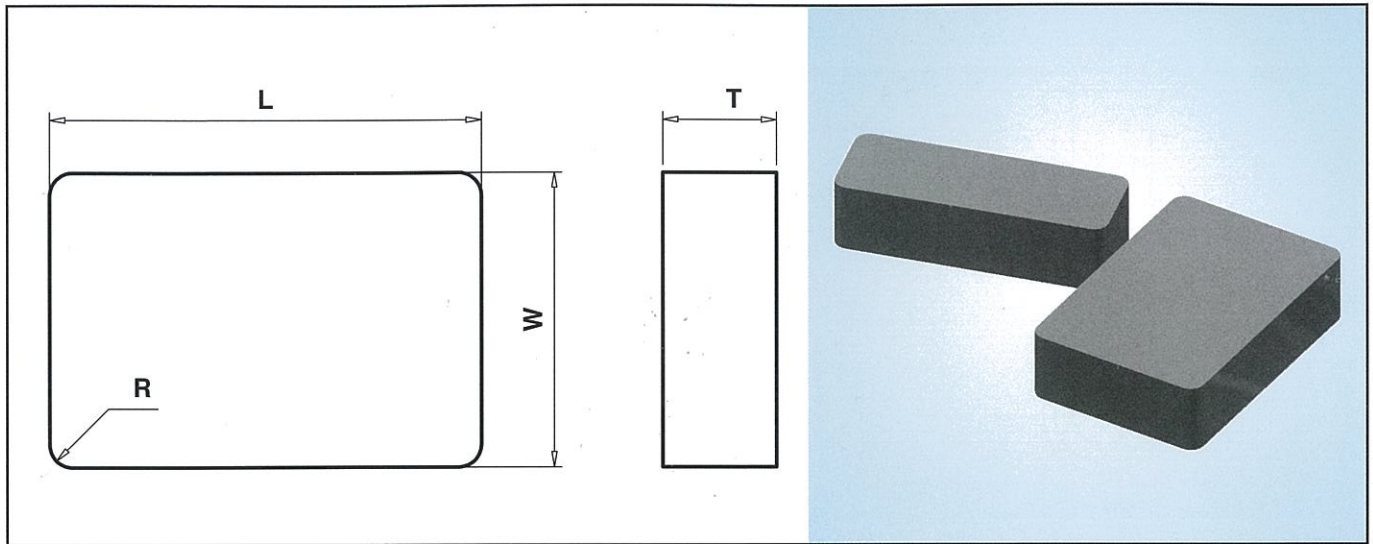
D Body Dia.(0.05mm increment)	L Length
0.25 – 1.95	25 – max(D x 400)

Note: Other Dimension Not Listed above can be ground to your specifications.
 If in doubt please send us your drawing. 'D' tolerance is m5 or +0.005.
 Unless otherwise specified by customer all outside corners will be sharp.

How to order : **CGAB – D – L**
 Example : **TGAB – D2.0 – L50**

SOLID CARBIDE BLOCK

GROUND BLANK TYPE (CGB)



STANDARD STOCKS DIE BLOCKS (NOMINAL SIZE)

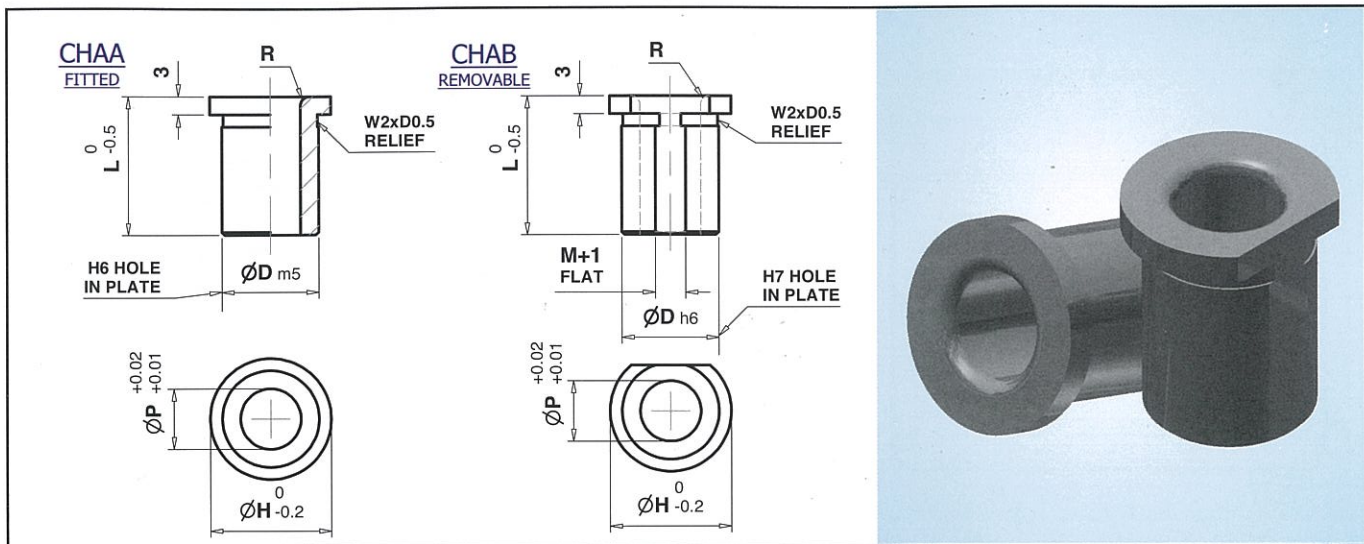
W	L	T	R
25	65	20	5
70	85	25	5
70	90	25	5
70	100	25	5
90	90	25	5

Note: Custom sizes available to your specifications.
 Unless otherwise specified by customer all outside corners will be sharp.
 For sharp corner orders R = 0

How to order : **CGB - L - W - T - R**
 Example : **CGB - L80 - W60 - T15 - R5**

SOLID CARBIDE FIXTURE BUSHINGS

- FLANGED TYPE, NORMAL (CHAA)
- FLANGED TYPE, FLAT (CHAB)



H	D	P	R	L
9	5	2	0.8	5 – 12
11	7	3		
12	8	4	1.0	5 – 20
14	10	5		
		10	6	
16	12	8	2.0	5 – 25
19	15	10		
22	18	12		
26	22	13		
30	25	15	3.0	12 – 30
	26	16		
35	30	20	3.0	16 – 25
40	35	25		

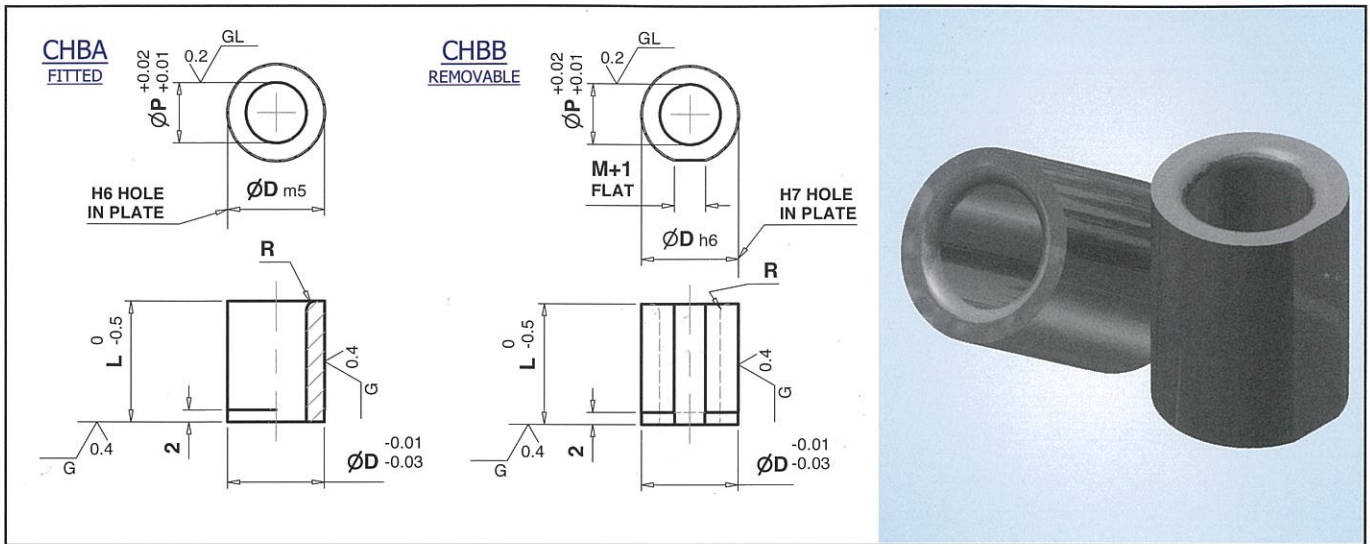
Note: Other Dimension Not Listed above can be ground to your specifications.
 If in doubt please send us your drawing. 'D' tolerance is m5 or +0.005.
 FLAT = M (Locking Screw Diameter) + 1mm

How to order : **CHAA – P – L**
 Example : **CHAB – P2 – L5 – M2**

SOLID CARBIDE FIXTURE BUSHINGS



- STRAIGHT TYPE, NORMAL (CHBA)
- STRAIGHT TYPE, FLAT (CHBB)



D	P	R	L
5	2	0.8	5 – 12
7	3		
8	4	1.0	5 – 20
10	5		
10	6		
12	8	2.0	5 – 25
15	10		
18	12		
22	13		
25	15	3.0	12 – 30
26	16		
30	20		
35	25		16 – 25

Note: Other Dimension Not Listed above can be ground to your specifications.
 If in doubt please send us your drawing. 'D' tolerance is m5 or +0.005.
 FLAT = M (Locking Screw Diameter) + 1mm

How to order : CHBA – P – L
 Example : CHBB – P2 – L5 – M2