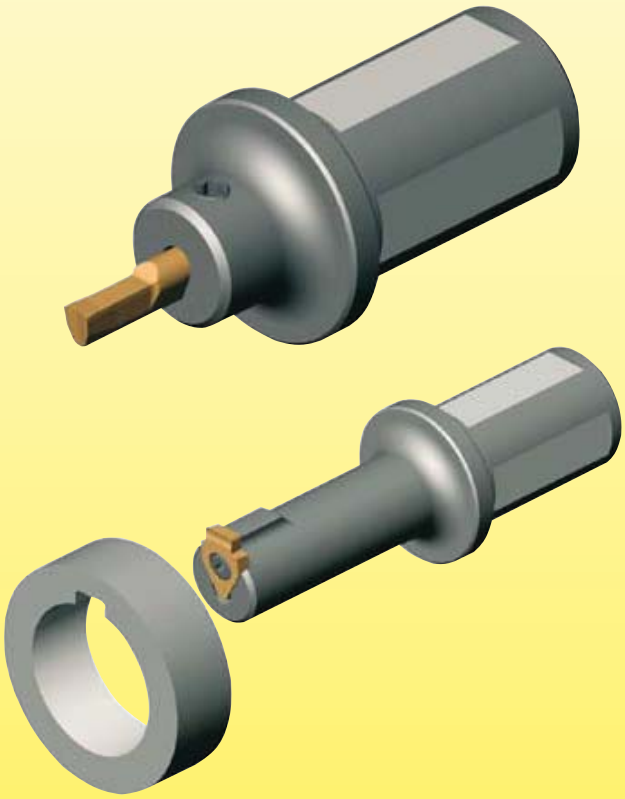
BROACHING on CNC machines

BROACHING TOOLS TYPE SB105, SB110 and SH117



For direct mounting in lathes and mills as well as mounting in a live broaching attachment from the companies:

- **BENZ**
- **EWS**
- **Schwarzer**

HCG - HORN Catalog Guide

KEYWAY BROACHING

R

Keyway Width **Inch**	Bore Ø from									
	.236"	.354"	.551"	.625"	.669"	.866"	1.181"	1.496"	1.496"	
1/16	NU105									
3/32	NU105									
1/8	NU105		SU117	SU117						
5/32	NU105	NU110	SU117	SU117						
3/16		NU110	SU117		SU117					
1/4					SU117					
9/32						SU117				
5/16						SU117				
3/8							SU117			
7/16								SU117		
1/2								SU117		
> 1/2									SU117	

Keyway Width **MM**	Bore Ø from									
	6 mm	6.5 mm	9 mm	14 mm	17 mm	22 mm	27 mm	30 mm	38 mm	65 mm
2.0	N105									
3.0		N105		S117						
4.0		N105	N110	S117						
5.0			N110	S117	S117					
6.0					S117					
7.0							S117			
8.0						S117				
10.0								S117		
12.0									S117	
> 12.0										S117

HEXAGON BROACHING

Hexagon SW **MM**	Pilot Ø equals		
	SW	SW+0.1	SW+0.2
2.5 - 2.9	N105		
2.9 - 3.5	N105		
3.5 - 4.0	N105		
4.0 - 4.5	N105		
4.5 - 5.0	N105		
5.0 - 6.0		N105	
8.0 - 10.0		N105	
10.0 - 14.0		N110	
14.0 - 16.5		N110	
16.5 - 18.0			N110

TORX BROACHING

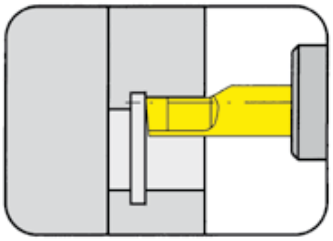
Torx **MM**	Pilot Ø equals			
	2.41	2.85	3.24	4.03
T15	N105			
T20		N105		
T25			N105	
T30				N105

Special tools upon request

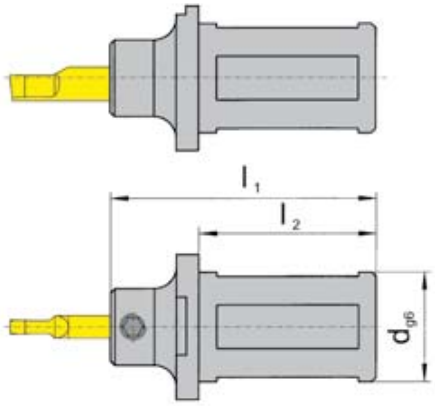
BROACHING 105 / 110 / 117 R

R

TOOLHOLDER Type SBU105



Bore Ø from	.236″



for use with Insert

Type N105
NU105

Part number	d	l_1	l_2	D_{min}
SBU105.0750.1.01	.750	2.375	1.575	**.236**
SBU105.1000.1.01	1.000	2.375	1.575	**.236**

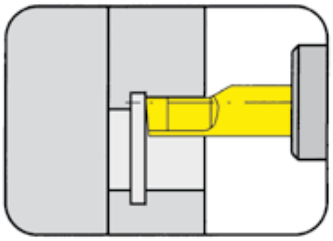
Further sizes upon request

Dimensions in inch

Spare parts

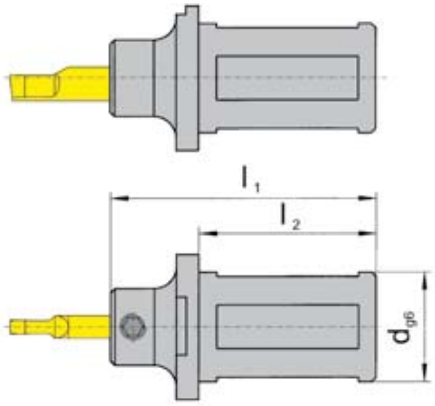
Toolholder	Screw	TORX PLUS® Wrench
SBU105....	**6.075T15P**	**T15PQ**

TOOLHOLDER Type SB105



R

Bore Ø from	.236″ (6.0 mm)



for use with Insert

Type N105
NU105

Part number	d	l_1	l_2	D_{min}
SB105.0020.1.01	20	60	40	**6**
SB105.0022.1.01	22	60	40	**6**
SB105.0025.1.01	25	60	40	**6**

Further sizes upon request

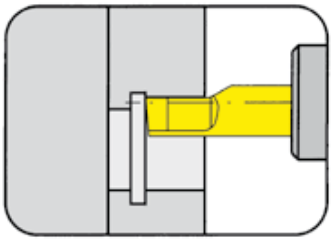
Dimensions in mm

Spare parts

Toolholder	Screw	TORX PLUS® Wrench
SB105.002...	**6.075T15P**	**T15PQ**

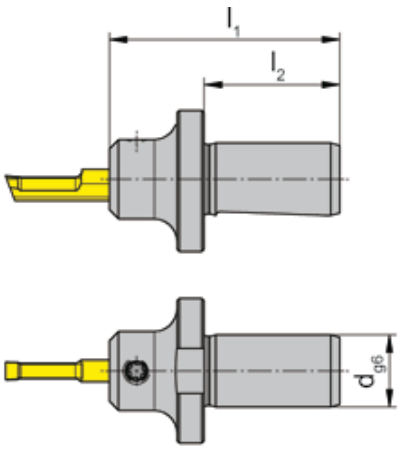
R

TOOLHOLDER Type SB105



Bore Ø from	.236″ (6.0 mm)

only usable for broaching devices EWS-Slot and BENZ LinA



for use with Insert

Type N105
NU105

Part number	d	l_1	l_2	D_{min}
SB105.0016.E1.01	16	51	30	**6**

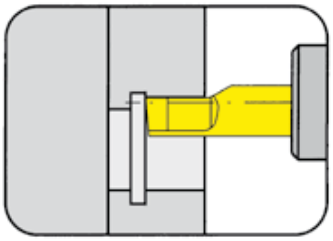
Further sizes for other device interfaces upon request

Dimensions in mm

Spare parts

Toolholder	Screw	TORX PLUS® Wrench
SB105.0016.E1.01	**6.075T15P**	**T15PQ**

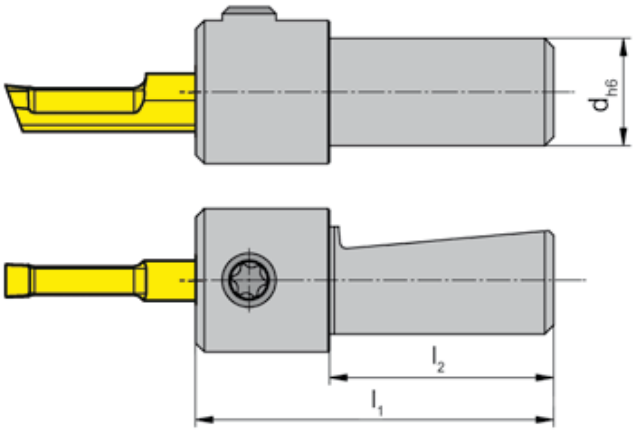
TOOLHOLDER Type B105



R

Bore Ø from	.236″ (6.0 mm)

for broaching device Schwarzer



for use with Insert

Type N105
NU105

Part number	d	l_1	l_2	D_{min}
B105.0012.0220	12	40	25	**6**

Further sizes for other device interfaces upon request

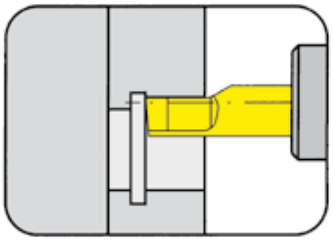
Dimensions in mm

Spare parts

Toolholder	Screw	TORX PLUS® Wrench
B105.0012.0220	**6.075T15P**	**T15PQ**

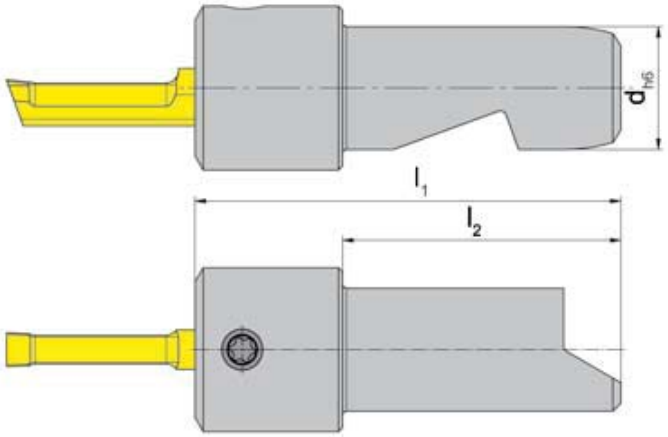
R

TOOLHOLDER Type SB105



Bore Ø from	.236″ (6.0 mm)

for broaching device Schwarzer "2in1"



for use with Insert

Type N105
NU105

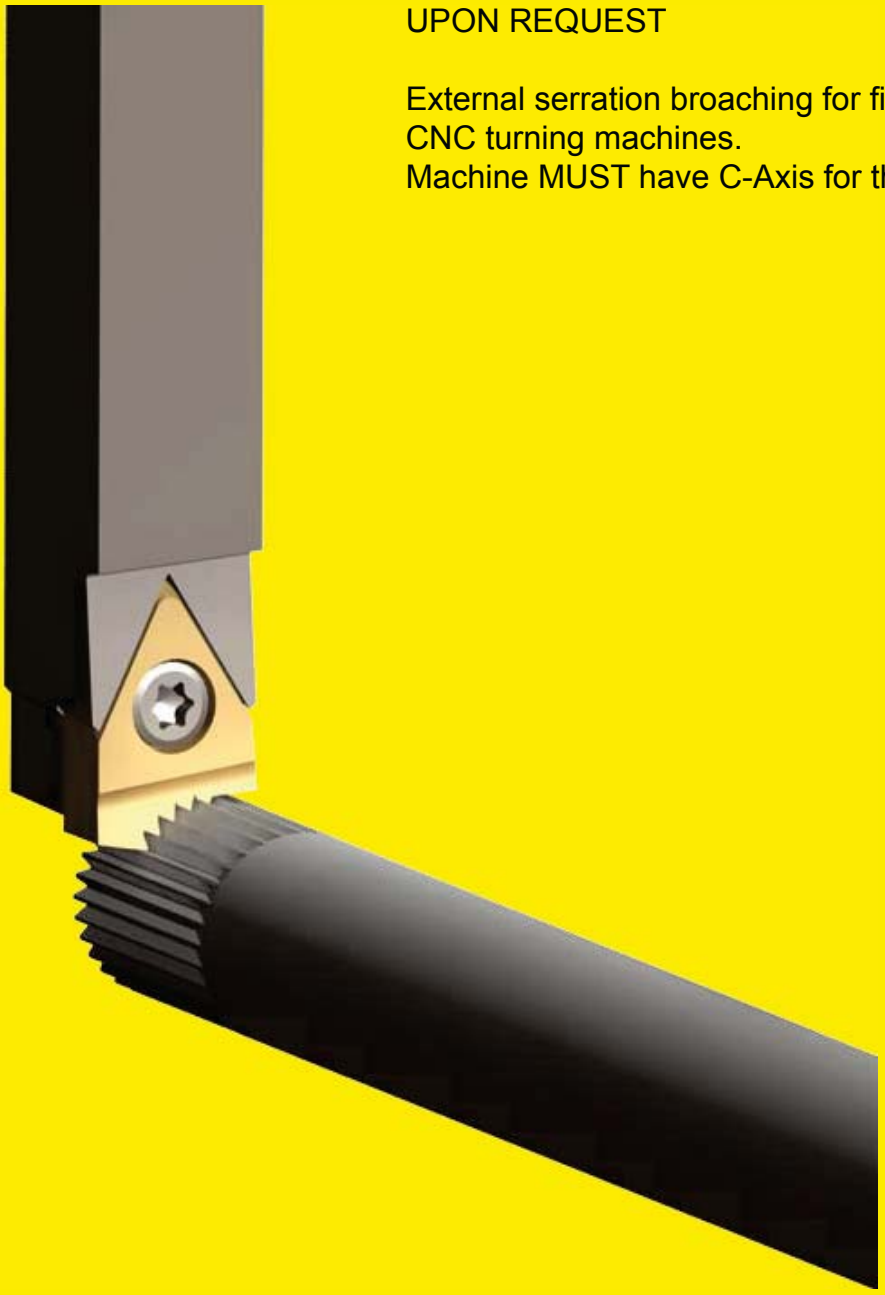
Part number	d	l_1	l_2	D_{min}
SB105.0015.S1.01	15	52	34	**6**

Further sizes for other device interfaces upon request

Dimensions in mm

Spare parts

Toolholder	Screw	TORX PLUS® Wrench
SB105.0015.S1.01	**6.075T15P**	**T15PQ**

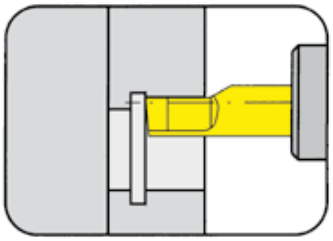


UPON REQUEST

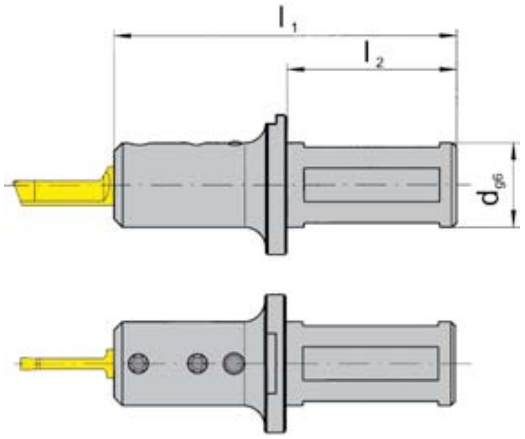
External serration broaching for finish machining on CNC turning machines.
Machine MUST have C-Axis for this application!

R

TOOLHOLDER Type SBU110



Bore Ø from	.354″



for use with Insert

Type N110
NU110

Part number	d	l_1	l_2	D_{min}
SBU110.0750.1.02	.750	3.200	1.575	**.354**
SBU110.1000.1.02	1.000	3.200	1.575	**.354**
SBU110.1250.1.02	1.250	3.200	1.575	**.354**

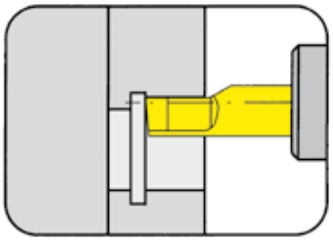
Further sizes upon request

Dimensions in inch

Spare parts

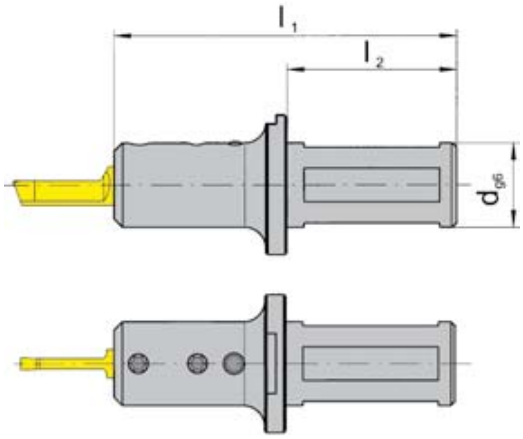
Toolholder	Screw	TORX PLUS® Wrench
SBU110....	**6.075T15P**	**T15PQ**

TOOLHOLDER Type SB110



R

Bore Ø from	.354″ (9.0 mm)



for use with Insert

Type N110
NU110

Part number	d	l_1	l_2	D_{min}
SB110.0020.1.02	20	81	40	**9**
SB110.0025.1.02	25	81	40	**9**
SB110.0032.1.02	32	81	40	**9**

Further sizes upon request

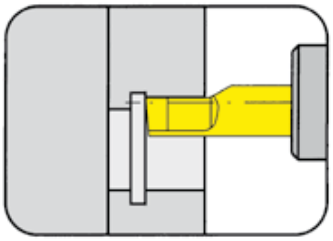
Dimensions in mm

Spare parts

Toolholder	Screw	TORX PLUS® Wrench
SB110.00...	**6.075T15P**	**T15PQ**

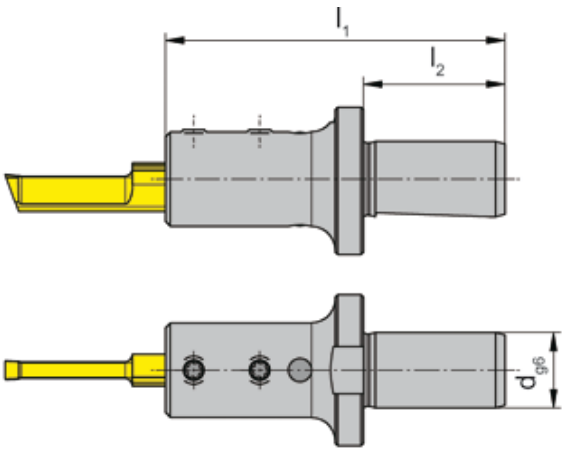
R

TOOLHOLDER Type SB110



Bore Ø from	.354″ (9.0 mm)

only usable for broaching devices EWS-Slot and BENZ LinA



for use with Insert

Type N110
NU110

Part number	d	l_1	l_2	D_{min}
SB110.0016.E1.02	16	72	30	**9**

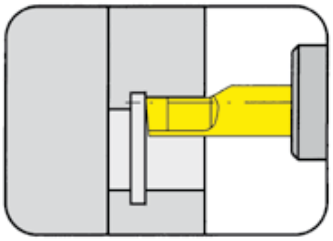
Further sizes for other device interfaces upon request

Dimensions in mm

Spare parts

Toolholder	Screw	TORX PLUS® Wrench
SB110.0016.E1.02	**6.075T15P**	**T15PQ**

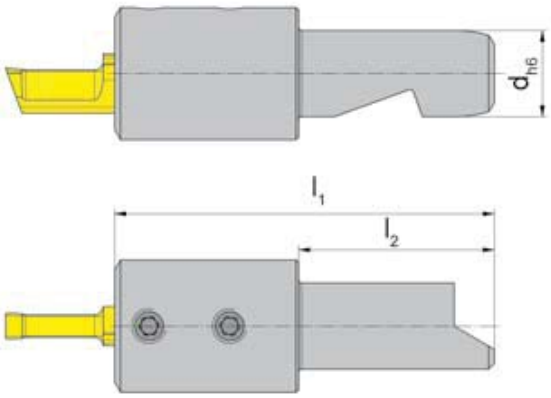
TOOLHOLDER Type SB110



R

Bore Ø from	.354″ (9.0 mm)

for broaching device Schwarzer "2in1"



for use with Insert

Type N110
NU110

Part number	d	l_1	l_2	D_{min}
SB110.0015.S1.02	15	66	34	**9**

Further sizes for other device interfaces upon request

Dimensions in mm

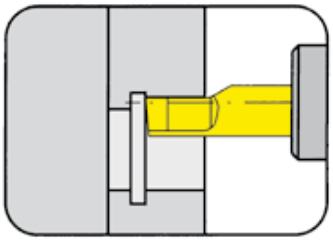
Spare parts

Toolholder	Screw	TORX PLUS® Wrench
SB110.0015.S1.02	**6.075T15P**	**T15PQ**

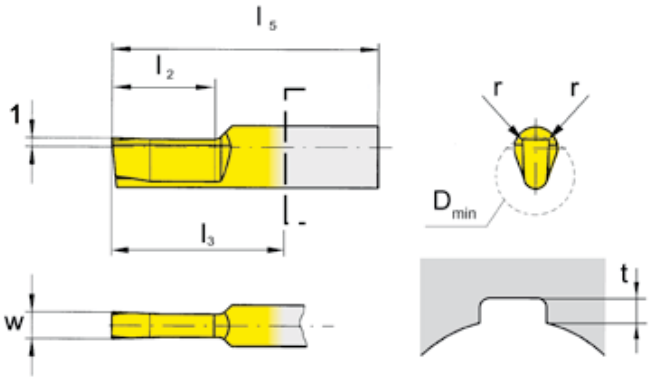
R

INSERT type

NU105/NU110



Bore Ø from .236" (6.0 mm)



for use with Toolholder

type SB105
SB110
SBU105
SBU110

Keyways according to Inch Standards

Part number	Fractional size	w	r	l_5	l_2	l_3	D_{min}	Toolholder
NU105.0625.04.01	1/16"	.0635	.004	1.181	.472	.709	.236	**SB105 SBU105**
NU105.0937.04.01	3/32"	.0948		1.181	.472	.709	.256	
NU105.1250.04.01	1/8"	.1260		1.378	.591	.906	.256	
NU105.1562.04.01	5/32"	.1572		1.378	.591	.906	.256	
NU110.1562.08.04	5/32"	.1572	.008	2.362	.984	1.339	.354	**SB110 SBU110**
NU110.1562.08.07	5/32"	.1572		2.953	1.575	2.126		
NU110.1875.08.04	3/16"	.1885		2.362	.984	1.339		
NU110.1875.08.07	3/16"	.1885		2.953	1.575	2.126		

	MG12	TA45	TI25
		▲	
		▲	
		▲	
		▲	
		▲	
		▲	
		▲	
		▲	

▲ on stock Δ 4 weeks
● main recommendation
o alternative recommendation
uncoatet grades
coatet grades
brazed/Cermet

P		•
M		•
K		•
S		
N		•
H		

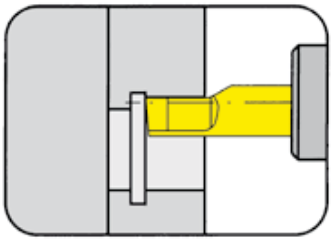
Dimensions in mm

Carbide Grades

INSERT type

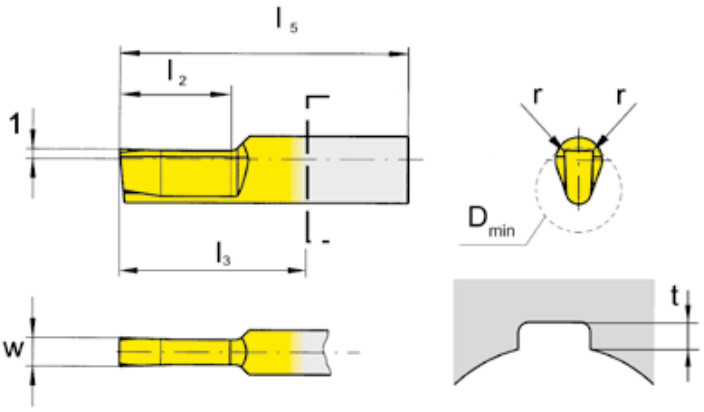
N105/N110

Tolerance grade P9



R

Bore Ø from .236" (6.0 mm)



for use with Toolholder

type SB105
SB110
SBU105
SBU110

Keyways according to DIN138

Part number	Dimensions of groove DIN			w	r	l_5	l_2	l_3	usable from Ø	Toolholder		MG12	TA45	TI25
	Width P9	D_{min}	t											
N105.0198.01.01	2	**6**	1.1	1.98	0.1	30	12	18	6.0	**SB105 / SBU105**			▲	
N105.0298.01.01	3	**8**	1.5	2.98		30	12	18	6.5				▲	
N105.0397.01.01	4	**10**	1.9	3.98		35	15	23	6.5				▲	
N110.0397.02.04	4	**10**	1.9	3.98	0.2	60	25	34	9.0	**SB110 / SBU110**			▲	
N110.0397.02.07	4	**10**	1.9	3.98		75	40	49					▲	
N110.0497.02.04	5	**12**	2.4	4.98		60	25	34					▲	
N110.0497.02.07	5	**12**	2.4	4.98		75	40	49					▲	

▲ on stock Δ 4 weeks
● main recommendation
o alternative recommendation
uncoatet grades
coatet grades
brazed/Cermet

	MG12	TA45	TI25
P		•	
M		•	
K		•	
S			
N		•	
H			

Dimensions in mm

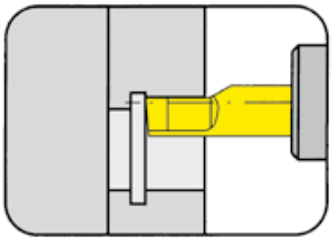
Carbide Grades

R

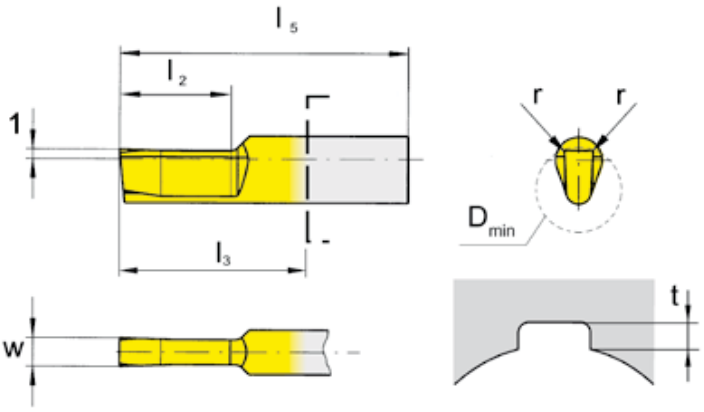
INSERT type

N105/N110

Tolerance grade JS9



Bore Ø from	.236" (6.0 mm)



for use with Toolholder

type SB105
SB110
SBU105
SBU110

Keyways according to DIN138

Part number	Dimensions of groove DIN			w	r	l_5	l_2	l_3	usable from Ø	Toolholder	MG12	TA45	TI25
	Width JS9	D_{min}	t										
N105.0200.01.01	2	**6**	1.1	2	0.1	30	12	18	6.0	**SB105 / SBU105**		▲	
N105.0300.01.01	3	**8**	1.5	3	0.1	30	12	18	6.5			▲	
N105.0400.01.01	4	**10**	1.9	4	0.1	35	15	23	6.5			▲	
N105.0400.02.01	4	**10**	1.9	4	0.2	35	15	23	6.5			▲	
N110.0400.02.04	4	**10**	1.9	4	0.2	60	25	34	9.0	**SB110 / SBU110**		▲	
N110.0400.02.07	4	**10**	1.9	4		75	40	49				▲	
N110.0500.02.04	5	**12**	2.4	5		60	25	34				▲	
N110.0500.02.07	5	**12**	2.4	5		75	40	49				▲	

▲ on stock Δ 4 weeks
● main recommendation
o alternative recommendation
uncoatet grades
coatet grades
brazed/Cermet

	MG12	TA45	TI25
P		•	
M		•	
K		•	
S			
N		•	
H			

Dimensions in mm

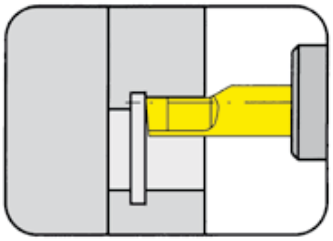
Carbide Grades

R

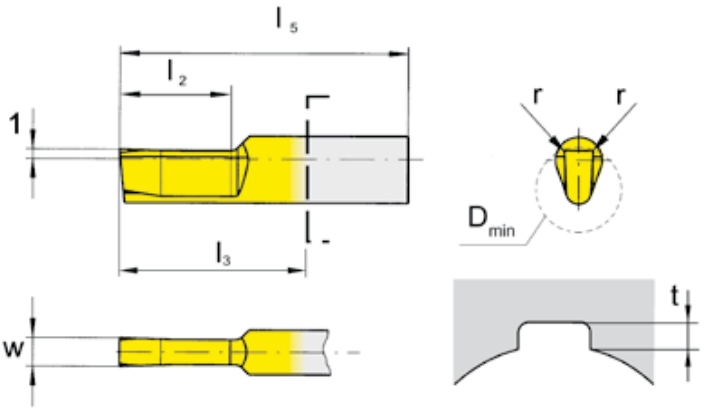
INSERT type

N105/N110

Tolerance grade C11



Bore Ø from	.236" (6.0 mm)



for use with Toolholder

type SB105
SB110
SBU105
SBU110

Keyways according to DIN138

Part number	Dimensions of groove DIN Width C11	D_{min}	t	w	r	l_5	l_2	l_3	usable from Ø	Toolholder	MG12	TA45	TI25
N105.0210.2.08	2	**8.0**	1.0	2.11	0.35			18	6.0			▲	
N105.0310.2.10	3	**10.0**	1.8	3.11	0.35	30	12	18	6.5	**SB105 / SBU105**		▲	
N105.0310.2.13	3	**13.0**	1.8	3.11	0.50			18	6.5			▲	
N105.0410.2.16	4	**16.0**	2.0	4.13	0.50			23	6.5			▲	
N110.0410.05.04	4	**9.0**	2.0	4.13		60	25	34				▲	
N110.0410.05.07	4	**9.0**	2.0	4.13	0.50	75	40	49	9.0	**SB110 / SBU110**		▲	
N110.0510.05.04	5	**9.0**	-	5.13		60	25	34				▲	
N110.0510.05.07	5	**9.0**	-	5.13		75	40	49				▲	
											P	•	
											M	•	
											K	•	
											S		
											N	•	
											H		

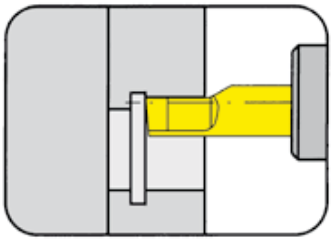
▲ on stock Δ 4 weeks
● main recommendation
o alternative recommendation
uncoatet grades
coatet grades
brazed/Cermet

Dimensions in mm

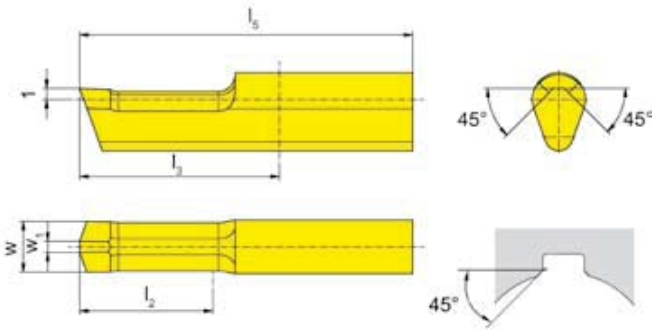
Carbide Grades

R

INSERT type **N105/N110**



Bore Ø from .236" (6.0 mm)



for use with Toolholder

type SB105
SB110
SBU105
SBU110

Chamfering

Part number	Chamfer	w	w_1	l_5	l_2	l_3	usable from Ø	Toolholder	MG12	TA45	TI25
N105.4545.2.6	45°	4.5	1	30	12	18	6	**SB105 /**		▲	
N105.4545.3.6				35	20	23		**SBU105**		▲	
N110.4545.4.9	45°	6.3	2	60	25	34	9	**SB110**		▲	
N110.4545.7.9				75	40	49		**SBU110**		▲	

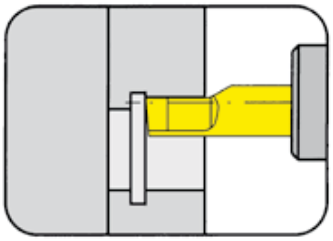
▲ on stock Δ 4 weeks
● main recommendation
o alternative recommendation
uncoatet grades
coatet grades
brazed/Cermet

P		•	
M		•	
K		•	
S			
N		•	
H			

Dimensions in mm

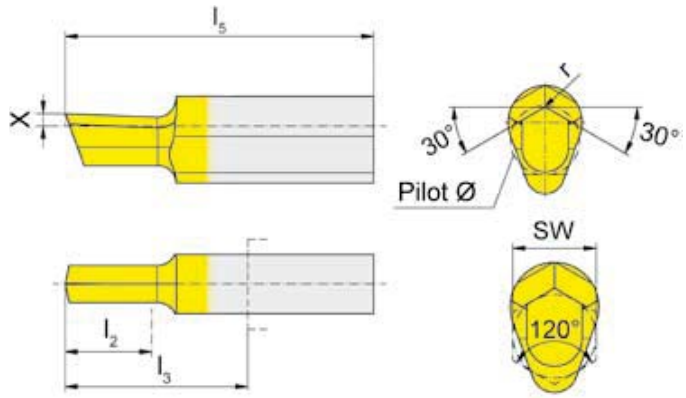
Carbide Grades

INSERT Type **N105/N110**



R

Hexagon socket from SW 2.5



for use with Toolholder

Type SB105
SB110
SBU105
SBU110

Hexagon socket

Part number	SW	r	l_2	l_3	l_5	Pilot Ø	X	Toolholder	MG12	TA45	TI25
N105.SW25.25.01	2.5-2.9	0.05	4.0	13	25	SW				▲	
N105.SW30.30.01	2.9-3.5	0.05	4.5	13	25	SW				▲	
N105.SW35.35.01	3.5-4.0	0.05	5.5	13	25	SW				▲	
N105.SW40.40.01	4.0-4.5	0.10	6.0	13	25	SW	1.0	**SB105**		▲	
N105.SW45.45.01	4.5-5.0	0.10	7.0	13	25	SW				▲	
N105.SW56.56.01	5.0-8.0	0.10	9.0	13	25	SW+0.1				▲	
N105.SW80.80.01	8.0-10.0	0.10	12.0	18	30	SW+0.1				▲	
N110.SW14.14.03	10.0-14.0	0.20	20.0	29	55	SW+0.1	1.5	**SB110**		Δ	
N110.SW16.16.04	14.0-16.5/ 16.5-18.0	0.20	25.0	29	55	SW+0.1/ SW+0.2	2.0	**SB110**		Δ	

▲ on stock Δ 4 weeks
● main recommendation
o alternative recommendation
uncoated grades
coated grades
brazed/Cermet

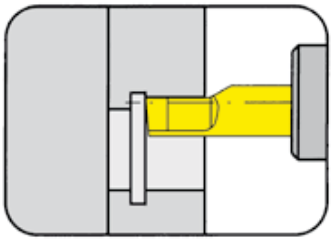
	MG12	TA45	TI25
P		•	
M		•	
K		•	
S		•	
N		•	
H			

Dimensions in mm

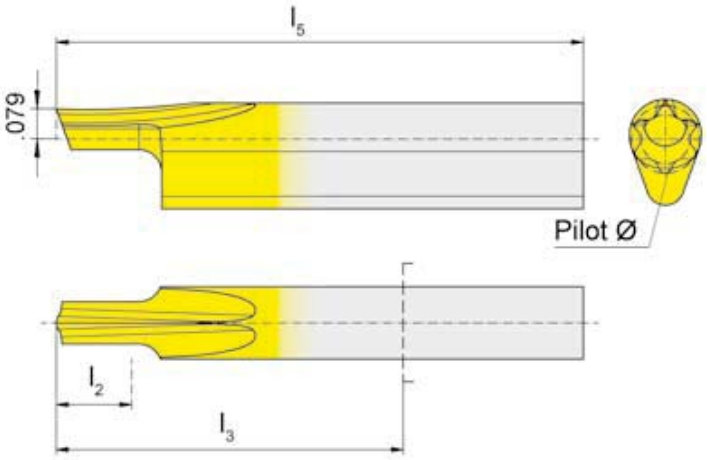
Carbide grades

R

INSERT Type **N105**



Torx from	T15



for use with Toolholder

Type SB105
SBU105

Torx

Part number	Torx	l_2	l_3	l_5	Pilot Ø	Toolholder	MG12	TA45	TI25
N105.TX15.24.03	T15	4	23	35	2.41	**SB105**		Δ	
N105.TX20.28.03	T20	4			2.85			Δ	
N105.TX25.32.03	T25	5			3.24			Δ	
N105.TX30.40.03	T30	5			4.03			Δ	

▲ on stock Δ 4 weeks
● main recommendation
o alternative recommendation
uncoated grades
coated grades
brazed/Cermet

P		•
M		•
K		•
S		•
N		•
H		

Dimensions in mm

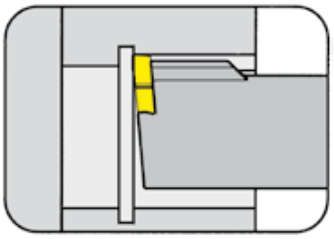
Carbide grades

Type SB105/SB110 -
Holder can be located directly in the turret and m/c spindle

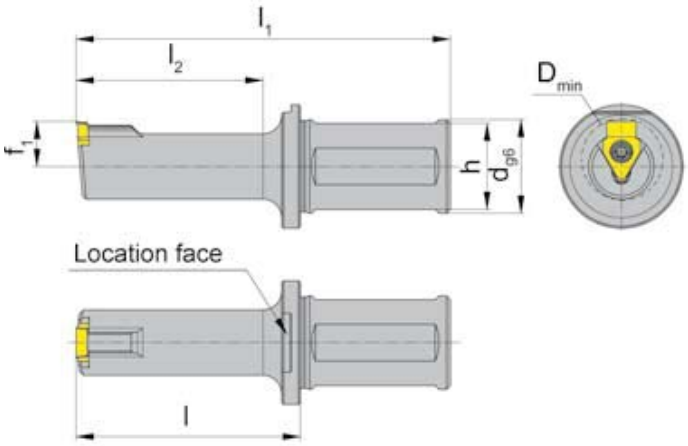
Dimensions DIN				Broaching			Chamfering	
Width	Tolerance grade	D_{min}	t	Inserts	l_2	Toolholder	Inserts	Toolholder
2	C11	8	1,0	N105.0210.2.08	12			
3	C11	10	1,8	N105.0310.2.10	12	SB105.0020.1.01 SB105.0025.1.01	N105.4545.2.6	SB105.0020.1.01 SB105.0025.1.01
3	C11	13	1,8	N105.0310.2.13	12			
4	C11	16	2,0	N105.0410.2.16	12			
4	C11	16	2,0	N110.0410.05.04	25	SB110.0025.1.02	N110.4545.4.9	SB110.0025.1.02
4	C11	16	2,0	N110.0410.05.07	40	SB110.0032.1.02	N110.4545.7.9	SB110.0032.1.02
5	C11	-	-	N110.0510.05.04	25	SB110.0025.1.02	N110.4545.4.9	SB110.0025.1.02
5	C11	-	-	N110.0510.05.07	40	SB110.0032.1.02	N110.4545.7.9	SB110.0032.1.02
2	P9	6	1,1	N105.0198.01.01	12		N105.4545.2.6	SB105.0020.1.01
3	P9	8	1,5	N105.0298.01.01	12	SB105.0020.1.01		
4	P9	10	1,9	N105.0397.01.01	15	SB105.0025.1.01	N105.4545.3.6	SB105.0025.1.01
4	P9	10	1,9	N110.0397.02.04	25		N110.4545.4.9	
4	P9	10	1,9	N110.0397.02.07	40	SB110.0025.1.02 SB110.0032.1.02	N110.4545.7.9	SB110.0025.1.02 SB110.0032.1.02
5	P9	12	2,4	N110.0497.02.04	25		N110.4545.4.9	
5	P9	12	2,4	N110.0497.02.07	40		N110.4545.7.9	
2	JS9	6	1,1	N105.0200.01.01	12			
3	JS9	8	1,5	N105.0300.01.01	12	SB105.0020.1.01 SB105.0025.1.01	N105.4545.2.6	SB105.0020.1.01 SB105.0025.1.01
4	JS9	10	1,9	N105.0400.01.01	12			
4	JS9	10	1,9	N105.0400.02.01	15		N105.4545.3.6	
4	JS9	10	1,9	N110.0400.02.04	25		N110.4545.4.9	
4	JS9	10	1,9	N110.0400.02.07	40	SB110.0025.1.02 SB110.0032.1.02	N110.4545.7.9	SB110.0025.1.02 SB110.0032.1.02
5	JS9	12	2,4	N110.0500.02.04	25		N110.4545.4.9	
5	JS9	12	2,4	N110.0500.02.07	40		N110.4545.7.9	

R

TOOLHOLDER Type SHU117



Bore Ø from	.551″



for use with Insert

Type S117
SU117

Part number	d	h	l	l_1	l_2	D_{min}	f_1	Form
SHU117.1410.1.3.08	1.000	.921	1.260	2.835	.787	.551	.378	G
SHU117.1410.1.08 **SHU117.1410.2.08**	1.000	.921	1.654 2.047	3.228 3.622	1.181 1.575	.551	.378	F
SHU117.0610.1.10	1.000	.921	1.898	3.472	1.575	.625	.425	A1
SHU117.0100.1.10 **SHU117.0100.2.10** **SHU117.0910.1.10** **SHU117.0910.2.10**	1.000	.921	1.976 2.567 2.433 3.220	3.551 4.142 4.008 4.795	1.575 2.165 1.969 2.756	.669 .669 .866 .866	.374 .374 .472 .472	A
SHU117.1000.1.10 **SHU117.1000.2.10**	1.000	.921	2.433 3.220	4.008 4.795	1.969 2.756	.866	.472	B
SHU117.0125.1.16 **SHU117.0125.2.16** **SHU117.0125.3.16**	1.250	1.171	2.433 3.374 4.358	4.008 4.949 6.720	1.969 2.953 3.937	1.181	.659	C
SHU117.1250.1.16 **SHU117.1250.2.16** **SHU117.1250.3.16**	1.250	1.171	2.433 3.374 4.358	4.008 4.949 6.720	1.969 2.953 3.937	1.496	.866	D

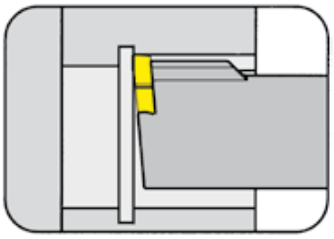
Further sizes upon request

Dimensions in inch

Spare parts

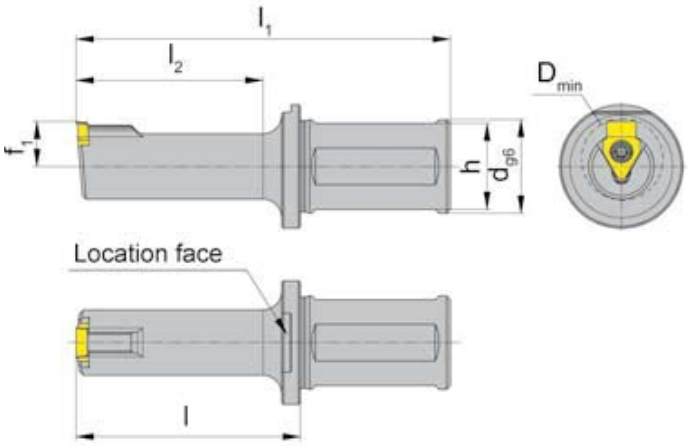
Toolholder	Screw	TORX PLUS® Wrench
SHU117....10	**4.09T15P**	**T15PQ**
SHU117....16	**5.12T20P**	**T20PQ**
SHU117.1410....08	**030.3509.T15P**	**T15PQ**

TOOLHOLDER Type SH117



R

Bore Ø from .551″ (14.0 mm)



for use with Insert

Type S117
SU117

Part number	d	h	l	l_1	l_2	D_{min}	f_1	Form
SH117.1425.1.3.08	25	23	32	72	20	**14**	9.6	G
SH117.1425.1.08 **SH117.1425.2.08**	25	23	42 52	82 92	30 40	**14**	9.6	F
SH117.1725.1.10 **SH117.1725.2.10**	25	23	50 65	90 105	40 55	**17**	9.5	A
SH117.0025.1.10 **SH117.0025.2.10**	25	23	60 80	100 120	50 70	**22**	12.0	B
SH117.3032.1.16 **SH117.3032.2.16** **SH117.3032.3.16**	32	30	60 85 110	100 125 170	50 75 100	**30**	16.5	C
SH117.0032.1.16 **SH117.0032.2.16** **SH117.0032.3.16**	32	30	60 85 110	100 125 170	50 75 100	**38**	22.0	D
SH117.4032.1.16 **SH117.4032.2.16** **SH117.4032.3.16**	32	30	62 87 112	122 147 172	50 75 100	**40**	21.5	E

Further sizes upon request

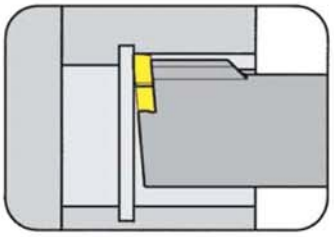
Dimensions in mm

Spare parts

Toolholder	Screw	TORX PLUS® Wrench
SH117....10	**4.09T15P**	**T15PQ**
SH117....16	**5.12T20P**	**T20PQ**
SH117.1425....08	**030.3509.T15P**	**T15PQ**

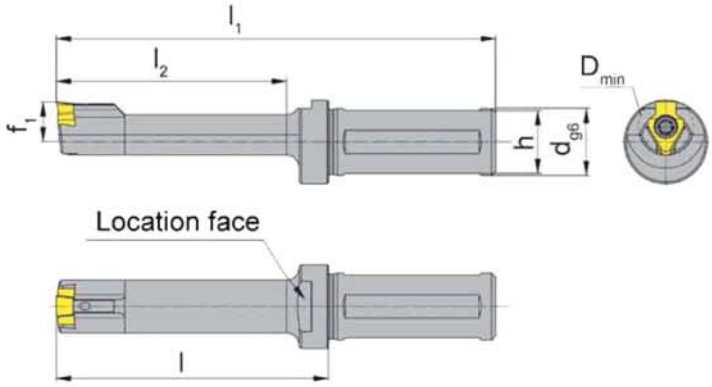
R

TOOLHOLDER Type SHM117



Bore Ø from	.551" (14.0 mm)

Material of shank: Carbide - Giving a good vibration resistance



for use with Insert

Type S117
SU117

with through coolant supply

Part number	d	h	l	l_1	l_2	D_{min}	f_1	Form
SHM117.1416.3.08	16	15	65	105	55	14	9.6	F
SHMU117.1462.3.08	.625	.586	2.559	4.134	2.165	.551	.378	F

Further sizes upon request

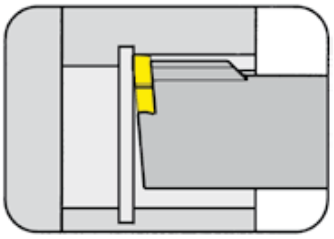
Dimensions in mm / inch

Toolholders with damaged seating can be repaired by HORN.

Spare parts

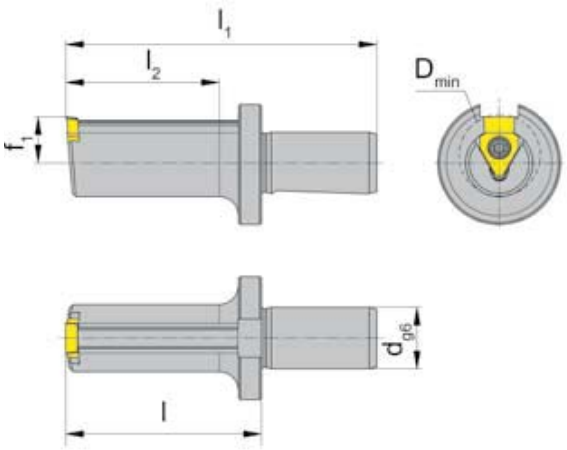
Toolholder	Screw	TORX PLUS® Wrench
SHM117.1425.3.08	**030.3509.T15P**	**T15PQ**

TOOLHOLDER Type SH117



Bore Ø from	.551″ (14.0 mm)

only usable for broaching devices EWS-Slot and BENZ LinA



for use with Insert

Type S117
SU117

Part number	d	l	l_1	l_2	D_{min}	f_1	Form
SH117.1416.E1.08	16	41	71	30	**14**	9.6	F
SH117.1716.E1.10 **SH117.1716.E2.10**	16	41 51	71 81	30 40	**17**	9.5	A
SH117.0016.E1.10 **SH117.0016.E2.10**	16	41 51	71 81	30 40	**22**	12.0	B

Further sizes for other device interfaces upon request

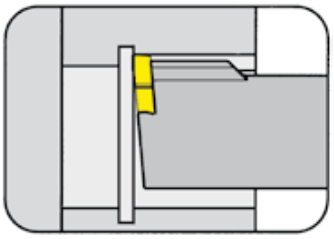
Dimensions in mm

Spare parts

Toolholder	Screw	TORX PLUS® Wrench
SH117....10	**4.09T15P**	**T15PQ**
SH117.1416.E1.08	**030.3509.T15P**	**T15PQ**

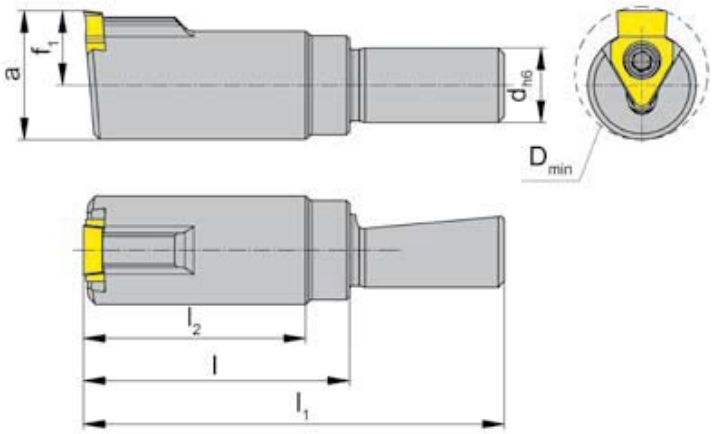
R

TOOLHOLDER Type H117



Bore Ø from	.669″ (17.0 mm)

for broaching device Schwarzer



for use with Insert

Type S117
SU117

Part number	d	l	l_1	l_2	D_{min}	f_1	a	Form
H117.1712.1439 **H117.1712.1407**	12	33 43	58 68	25 35	**17**	9.5	16.00	A
H117.2212.1441 **H117.2212.1442**	12	33 43	58 68	25 35	**22**	12.0	20.75	B
H117.3012.1440 **H117.3012.1419**	12	33 43	58 68	25 35	**30**	16.5	28.50	C

Further sizes for other device interfaces upon request

Dimensions in mm

Spare parts

Toolholder	Screw	TORX PLUS® Wrench
H117....1407/1439/1441/1442	**4.09T15P**	**T15PQ**
H117.3012.1419/1440	**5.12T20P**	**T20PQ**

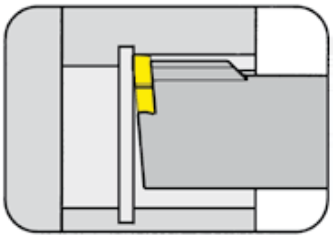
HORN

R

TOOLHOLDER Type

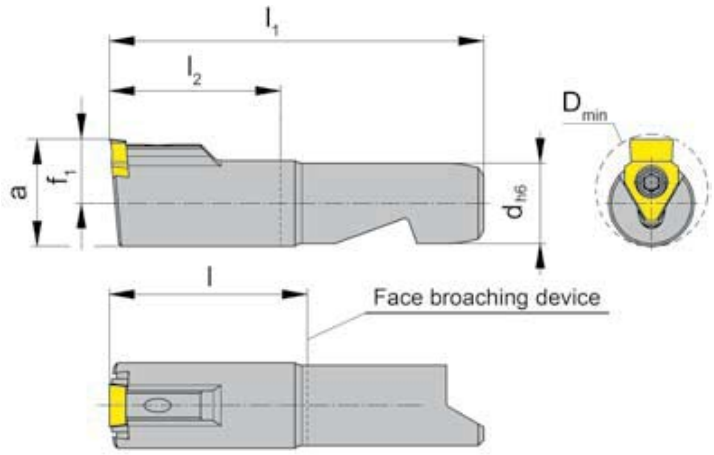
SH117

with through coolant supply



Bore Ø from	.551″ (14.0 mm)

for broaching device Schwarzer "2in1"



for use with Insert

Type S117
SU117

Part number	d	l	l_1	l_2	D_{min}	f_1	a	Form
SH117.0932.S.08	15	37	70	32	**14**	9.6	12.8	F
SH117.1412.S1.08	12	33	58	25				
SH117.1412.S2.08	12	43	68	35				
SH117.0932.S.10	15	37	70	32	**17**	9.5	16.0	A
SH117.1532.S.10	15	37	70	32	**22**	12.0	20.0	B
SH117.1538.S.16	15	43	76	38	**30**	15.0	24.0	C
SH117.1544.S.16		49	82	44				

Further sizes for other device interfaces upon request

Dimensions in mm

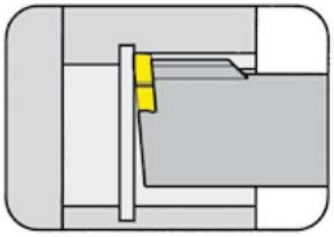
Spare parts

Toolholder	Screw	TORX PLUS® Wrench
SH117....08	**030.3509.T15P**	**T15PQ**
SH117....10	**4.09T15P**	**T15PQ**
SH117.15...16	**5.12T20P**	**T20PQ**

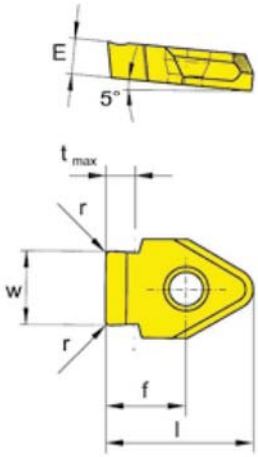
R

INSERT Type

SU117



Bore Ø from	.551″
Depth of groove up to	.335″



for use with Toolholder

Type SH117
SHM117
SHU117

Keyways according to Inch Standards

Part number	Fractional size	w	r	E	l	t_{max}	f	Form	TA45	TN35
SU117.1250.04.08	1/8"	.1260	.004	.157	.512	.071	.236	G	▲	
SU117.1562.04.08	5/32"	.1572	.004	.157	.512	.087	.236	F	▲	
SU117.1875.08.08	3/16"	.1885	.008			.106			▲	
SU117.1250.04.10	1/8"	.1260	.004	.118	.551	.071	.236	A1	▲	
SU117.1562.04.10	5/32"	.1572				.087			▲	
SU117.1875.08.10	3/16"	.1885	.008	.118	.571	.106	.256	A	▲	
SU117.2500.08.10	1/4"	.2510				.134			▲	
SU117.2812.08.10	9/32"	.2828	.008	.118	.630	.161	.315	B	▲	
SU117.3125.08.10	5/16"	.3140							▲	
SU117.3750.12.14	3/8"	.3765	.012	.236	.815	.197	.441	C	▲	
SU117.4375.12.14	7/16"	.4390	.012	.236	.815	.224	.441	D	▲	
SU117.5000.12.14	1/2"	.5015	.012			.260			▲	
SU117.5000.20.14	>1/2"	.5015	.020			.335			▲	

▲ on stock Δ 4 weeks
• main recommendation
o alternative recommendation
uncoated grades
coated grades
brazed/Cermet

	TA45	TN35
P	•	
M	•	
K	•	
S	•	
N	•	
H		

Carbide grades

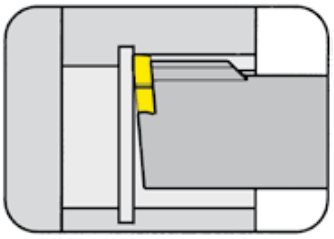
Dimensions in inch

Note:
The insert form must correspond to the holder form.
E.g.: Form A Toolholder = Form A Insert

INSERT Type

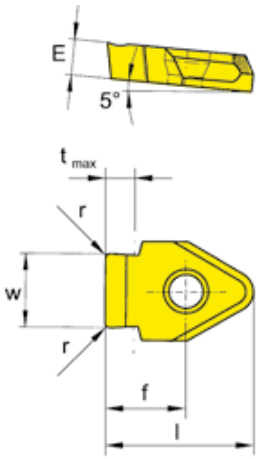
S117

Tolerance grade C11



R

Bore Ø from	.551″ (14.0 mm)
Depth of groove up to	.335″ (8.5 mm)



for use with Toolholder

Type SH117
SHM117
SHU117

Keyways according to DIN138

Part number	Nw	w	r	E	l	t_{max}	f	Form	MG12	TA45	TN35	TI25
S117.0410.05.08	4	4.12	0.50	4	13	2.1	6.0	F		▲		
S117.0610.22	6	6.12	0.85	3	16	2.6	8.0	B		▲		▲
S117.0710.27	7	7.13	0.85			3.3				▲		Δ
S117.0810.32	8	8.13	1.05			3.4				▲		▲
S117.1014.40	10	10.13	1.05	6	21	4.2	11.2	D		▲		Δ
S117.1214.50	12	12.15	1.35			5.1				▲		Δ
S117.1614.70	16	12.15	1.75			6.6				Δ		
S117.2414.100	24	12.15	2.25			8.5				Δ		

▲ on stock Δ 4 weeks
● main recommendation
o alternative recommendation
uncoated grades
coated grades
brazed/Cermet

P		•		•
M		•		•
K		•		•
S		•		•
N		•		•
H				

Dimensions in mm

Carbide grades

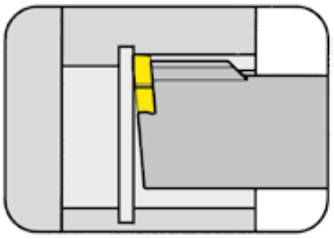
Note:
The insert form must correspond to the holder form.
E.g.: Form A Toolholder = Form A Insert

R

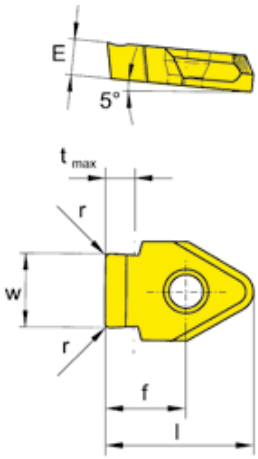
INSERT Type

S117

Tolerance grade P9



Bore Ø from	.551″ (14.0 mm)
Depth of groove up to	.268″ (6.8 mm)



for use with Toolholder

Type SH117
SHM117
SHU117

Keyways according to DIN138

Part number	Nw	w	r	E	l	t_{max}	f	Form	MG12	TA45	TN35	TI25
S117.0298.01.08	3	2.99	0.12	4	13.0	2.0	6.0	G		▲		
S117.0397.01.08	4	3.98	0.12	4	13.0	2.1	6.0	F		▲		
S117.0497.02.08	5	4.98	0.20			2.7				▲		
S117.0497.02.10	5	4.98	0.20	3	14.5	2.7	6.5	A		▲		
S117.0597.02.10	6	5.98				3.4				▲		
S117.0796.02.10	8	7.98	0.20	3	16.0	4.1	8.0	B		▲		
S117.0996.03.14	10	9.98	0.30	6	21.0	4.2	11.2	C		▲		
S117.1196.03.14	12	11.97	0.30	6	21.0	5.7	11.2	D		▲		
S117.1396.03.16	14	13.97	0.30	6	21.0	6.8	11.2	E		▲		

▲ on stock Δ 4 weeks
● main recommendation
o alternative recommendation
uncoated grades
coated grades
brazed/Cermet

	MG12	TA45	TN35	TI25
P		•		
M		•		
K		•		
S		•		
N		•		
H				

Dimensions in mm

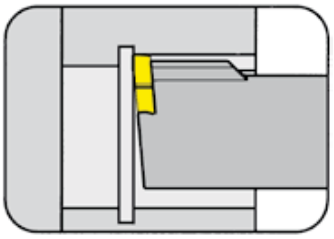
Carbide grades

Note:
The insert form must correspond to the holder form.
E.g.: Form A Toolholder = Form A Insert

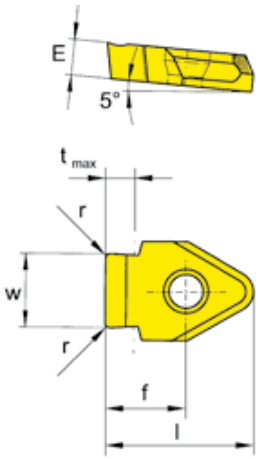
INSERT Type

S117

Tolerance grade JS9



Bore Ø from	.551″ (14.0 mm)
Depth of groove up to	.335″ (8.5 mm)



for use with Toolholder

Type SH117
SHM117
SHU117

Keyways according to DIN138

Part number	Nw	w	r	E	l	t_{max}	f	Form	MG12	TA45	TN35	TI25
S117.0300.01.08	3	3.01	0.12	4	13.0	2.0	6.0	G		▲		
S117.0400.01.08	4	4.01	0.12	4	13.0	2.1	6.0	F		▲		
S117.0500.02.08	5	5.01	0.20			2.7				▲		
S117.0500.02.10	5	5.01	0.20	3	14.5	2.7	6.5	A		▲		
S117.0600.02.10	6	6.01				3.4				▲		
S117.0800.02.10	8	8.01	0.20	3	16.0	4.1	8.0	B		▲		
S117.1000.03.14	10	10.01	0.30	6	21.0	4.2	11.2	C		▲		
S117.1200.03.14	12	12.01	0.30	6	21.0	5.7	11.2	D		▲		
S117.1200.05.14		12.00	0.50			8.5				▲		
S117.1400.03.16	14	14.01	0.30	6	21.0	6.8	11.2	E		▲		

▲ on stock Δ 4 weeks
● main recommendation
o alternative recommendation
uncoated grades
coated grades
brazed/Cermet

	MG12	TA45	TN35	TI25
P		•		
M		•		
K		•		
S		•		
N		•		
H				

Dimensions in mm

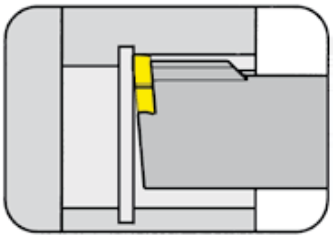
Carbide grades

Note:
The insert form must correspond to the holder form.
E.g.: Form A Toolholder = Form A Insert

R

INSERT Type

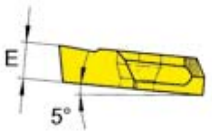
S117

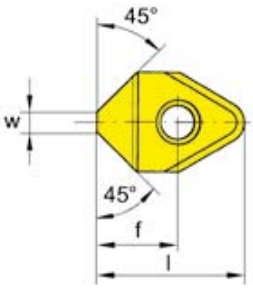


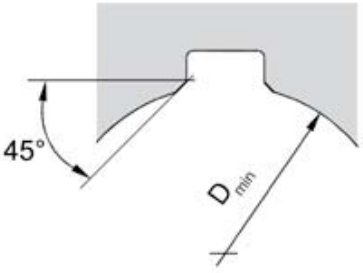
Bore Ø from .551″

for use with Toolholder

Type SH117
SHM117
SHU117







Chamfering

Part number	Nw	w	l	f	Form	MG12	TA45	TN35	TI25
S117.2445.08	.094	.094	.512	.236	F		▲		
S117.1545.10	.079	.059	.630	.315	A		▲		
S117.3045.10	.118	.118	.630	.315	B		▲		
S117.6045.14	.236	.236	.827	.441	C/D		▲		
P							•		
M							•		
K							•		
S							•		
N							•		
H									

▲ on stock Δ 4 weeks
● main recommendation
o alternative recommendation
uncoated grades
coated grades
brazed/Cermet

Dimensions in mm

Carbide grades

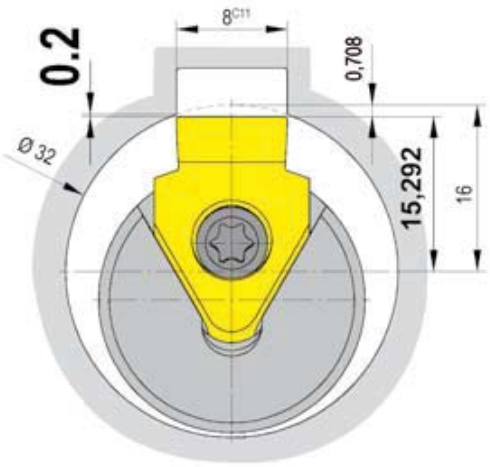
Note:
The insert form must correspond to the holder form.
E.g.: Form A Toolholder = Form A Insert

Type SH117 - Holder can be located directly in the turret and m/c spindle

Dimensions DIN				Broaching						Chamfering				
Width	Tolerance grade	D_{min}	t	Inserts	w	Toolholder	Tool length l_2 .1.	.2.	.3.	Inserts	Toolholder	Tool length l_2 .1.	.2.	.3.
6	C11	22	2,6	S117.0610.22	6,12	SH117.0025...10	50	70		S117.3045.10	SH117.0025...10	50	70	
7	C11	27	3,3	S117.0710.27	7,13	SH117.0025...10	50	70		S117.3045.10	SH117.0025...10	50	70	
8	C11	32	3,4	S117.0810.32	8,13	SH117.0025...10	50	70		S117.3045.10	SH117.0025...10	50	70	
10	C11	40	4,2	S117.1014.40	10,13	SH117.0032...16	50	75	100	S117.6045.14	SH117.0032...16	50	75	100
12	C11	50	5,1	S117.1214.50	12,15	SH117.0032...16	50	75	100	S117.6045.14	SH117.0032...16	50	75	100
16	C11	70	6,6	S117.1614.70	12,15	SH117.0032...16	50	75	100	S117.6045.14	SH117.0032...16	50	75	100
24	C11	100	8,5	S117.2414.100	12,15	SH117.0032...16	50	75	100	S117.6045.14	SH117.0032...16	50	75	100
5	P9	17	2,7	S117.0497.02.10	4,98	SH117.1725...10	40	55		S117.1545.10	SH117.1725...10	40	55	
6	P9	17	3,4	S117.0597.02.10	5,98	SH117.1725...10	40	55		S117.1545.10	SH117.1725...10	40	55	
8	P9	22	4,1	S117.0796.02.10	7,98	SH117.0025...10	50	70		S117.3045.10	SH117.0025...10	50	70	
10	P9	30	4,2	S117.0996.03.14	9,98	SH117.3032...16	50	75	100	S117.6045.14	SH117.3032...16	50	75	100
12	P9	38	5,7	S117.1196.03.14	11,97	SH117.0032...16	50	75	100	S117.6045.14	SH117.0032...16	50	75	100
14	P9	40	6,8	S117.1396.03.16	13,97	SH117.4032...16	50	75	100	S117.6045.14	SH117.0032...16	50	75	100
5	JS9	17	2,7	S117.0500.02.10	5,01	SH117.1725...10	40	55		S117.1545.10	SH117.1725...10	40	55	
6	JS9	17	3,4	S117.0600.02.10	6,01	SH117.1725...10	40	55		S117.1545.10	SH117.1725...10	40	55	
8	JS9	22	4,1	S117.0800.02.10	8,01	SH117.0025...10	50	70		S117.3045.10	SH117.0025...10	50	70	
10	JS9	30	4,2	S117.1000.03.14	10,01	SH117.3032...16	50	75	100	S117.6045.14	SH117.3032...16	50	75	100
12	JS9	38	5,7	S117.1200.03.14	12,01	SH117.0032...16	50	75	100	S117.6045.14	SH117.0032...16	50	75	100
12	JS9	38	8,5	S117.1200.05.14	12,00	SH117.0032...16	50	75	100	S117.6045.14	SH117.0032...16	50	75	100
14	JS9	40	6,8	S117.1400.03.16	14,01	SH117.4032...16	50	75	100	S117.6045.14	SH117.0032...16	50	75	100

Application Tips:
- It is important to use a machine with mechanical spindle lock.
- The use of proper coolant is key to a good surface finish, long tool life as well as chip evacuation.
- A relief groove or the possibility for a "ramp down" exit out of the cut is necessary at the end of the broached groove.
- Setting of the tool if very important. Double check the component diameter before taking the first pass.
- The tool should be set at the 12 o'clock position to ensure that chips fall away from the groove.
- Take an accurate measurement of the insert and program the dimension into the machine tool parameter.
- Position the tool at the start position of the first stroke and program a stop to perform a visual check to assure a collision free first pass of the tool.

Machining example:
Bore diameter 32 mm, groove width 8 mm:
At a radius of 16 mm and with a clearance of 0,2 mm for safety at the r 0,2 mm corner radii, the tool has to be set at 15,292 mm in X-axis to avoid any collision at the beginning of the process.



Calculation of the start position b_1:

$c^2 = a^2 + b^2$

$b^2 = c^2 - a^2$

$b = \sqrt{c^2 - a^2}$

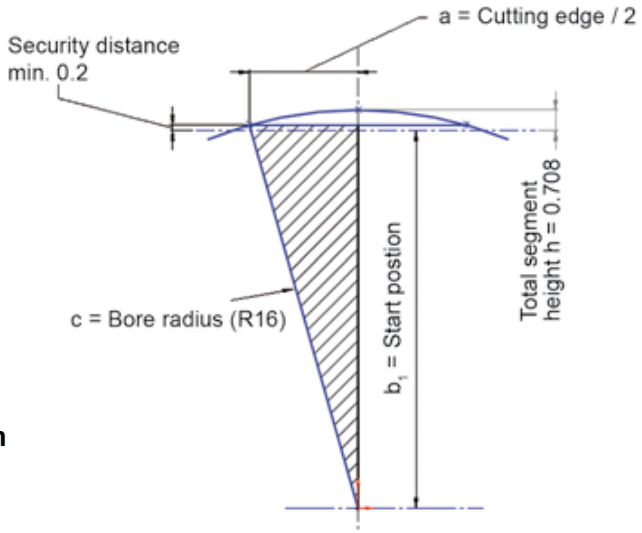
$b = \sqrt{16^2 - 4^2}$

$b = 15{,}491933$

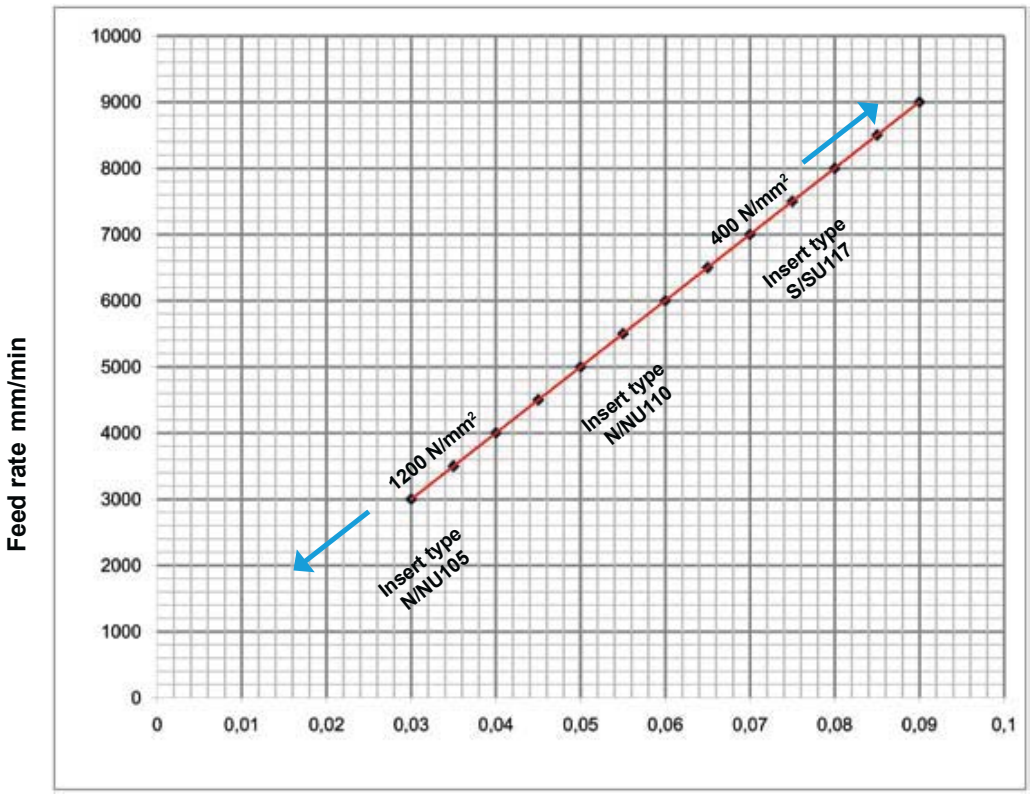
b_1 = b - Clearance distance

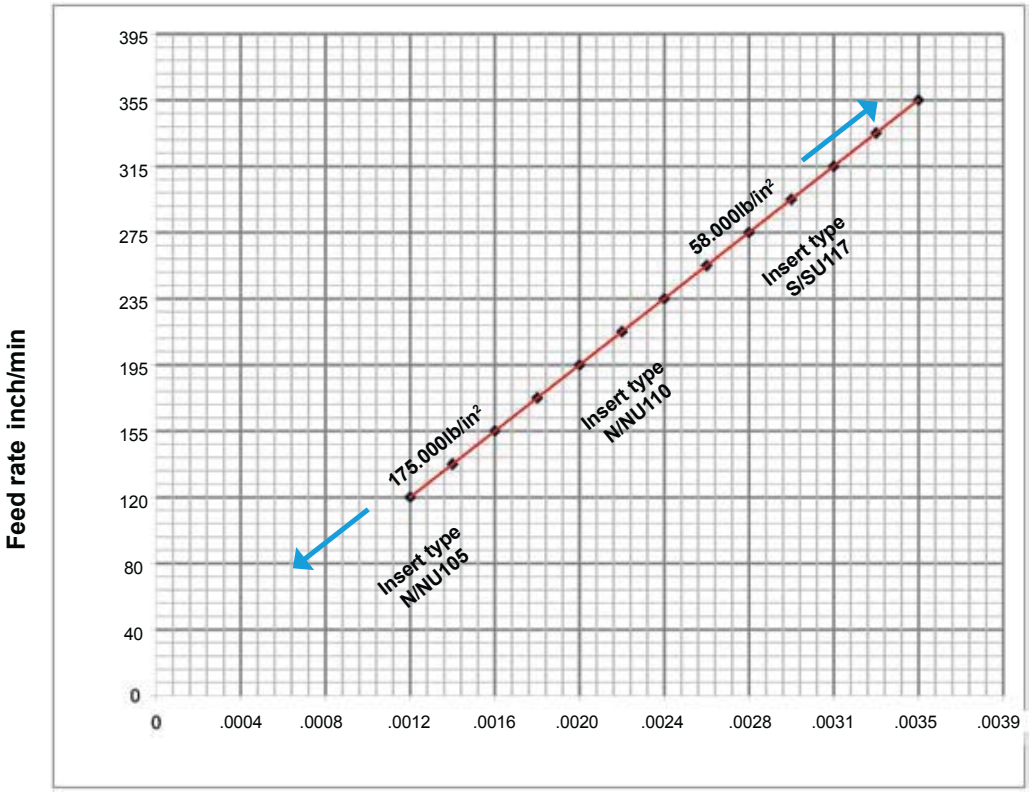
$b_1 = 15{,}492 - 0{,}2 = 15{,}292$ mm

→ **equals as a start position at Ø 30.584 mm**



Dimensions in mm





Example for broaching on a TRAUB TNA 400 with C-Axis

NC - Program

N……(BROACHING)	Sequence Number and Application
G97 T…… M5	constant RPM, Tool callout, Spindle Stop
M17	C - axis ON
G94	Feed Rate in mm/min
L1 = 30.584	choose Parameter for start Ø
M8 M19	Coolant ON, Spindle Break ON
N100	Sequence Number for repetition START
G0 XL1 Z5	Start position in X and Z in front of part
G1 Z-25 F8000	Linear move in Z at feed rate of 8000 mm/min
G0 X30.584	Rapid move in X to start Ø i.e. drop down position
G0 Z5	Rapid move in Z to start position.
L1 = L1+0.16	As Ø programming is in effect the depth of cut must be doubled (Depth of Cut is 0.08 mm)
N200	Sequence Number of repetition END.
G22 P100 Q200 H45	Repetition Cycle with Sequence Number from START to END and Number of repetitions

Example:

- Groove according to table in bore **Ø 32 mm**
- Groove width **8^{C11}**
- Depth of Cut per Stroke 0.08 mm
- The **Number of Strokes** resulted out of complete cutting depth from start position to the bottom of the groove divided by depth of cut per stroke
- This Value must then be multiplied by 2 (because Ø Programming) and Value is programmed as the Number of Strokes in the NC-Programme.

Calculation:

- Starting Position = Security Distance + Distance from Ø 32 mm to Cutting Edge (see Example on Page R34) equals a segment height of **0.508 mm** + Security Distance of **0.20 mm** to a total of **0.708 mm**.
- Starting Position = **30.584 mm** (32 - [0.708 x 2] = 30.584 mm.
- The groove depth of **2.90 mm** added to the **0.708 mm = 3.608 mm**.
- This is the dimension from the starting position to the bottom of the groove and in order to program this on the Ø, the **3.608 mm** dimension must be **multiplied by 2** which will equal the sum of **7.216 mm**.
- When the **7.216 mm** is divided by **(2 x 0.08 mm) = 0.16 mm** depth per stroke the Result will be **45.1 Strokes** and therefore **45 total Strokes** are programmed.

The remainder of 0.1 Strokes to achieve the finish dimension must be programmed using the fine correction.

Attention: The true depth of cut for the insert will be 0.08 mm.

Example for broaching on SIEMENS Control Machines with lockable Spindle

NC - Program

N……(BROACHING)	Sequence Number and Application
T…… M5 LF	Tool callout, Spindle Stop
M…… LF	Brake ON
G94 LF	Feed Rate in mm/min
R1 = 30.584 LF	choose Parameter for start Ø
M8 LF	Coolant ON
N100 LF	Sequence Number for repetition START
G0 XR1 Z5 LF	Start position in X and Z in front of part
G1 Z-25 F8000 LF	Linear move in Z at feed rate of 8000 mm/min
G0 X30.584	Rapid move in X to start Ø i.e. drop down position
G0 Z5	Rapid move in Z to start position.
R1 = R1+0.16	As Ø programming is in effect the depth of cut must be doubled (Depth of Cut is 0.08 mm)
N200	Sequence Number of repetition END.
……..LF	Repetition Cycle with Sequence Number from START to END and Number of repetitions.

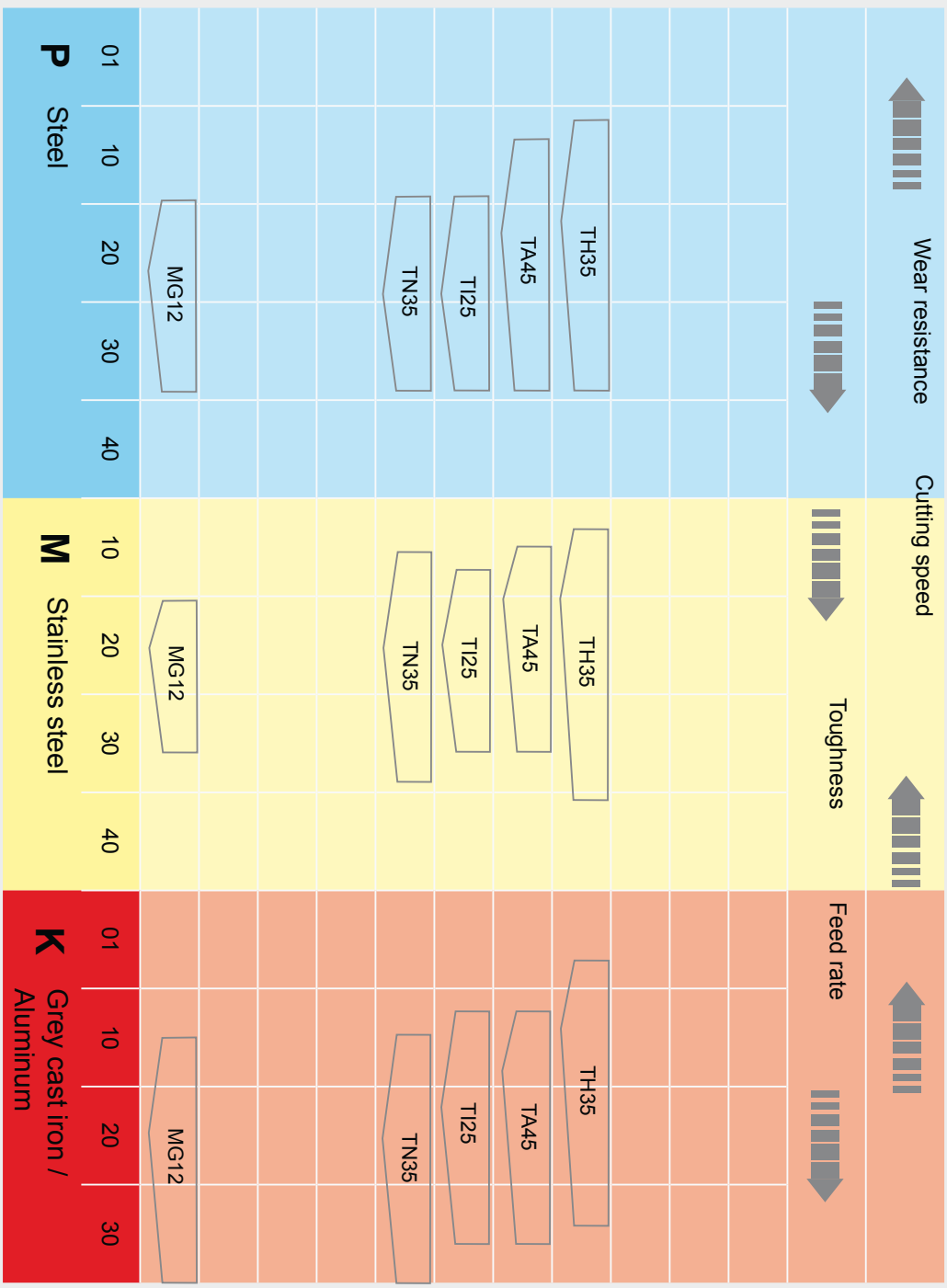
Example:

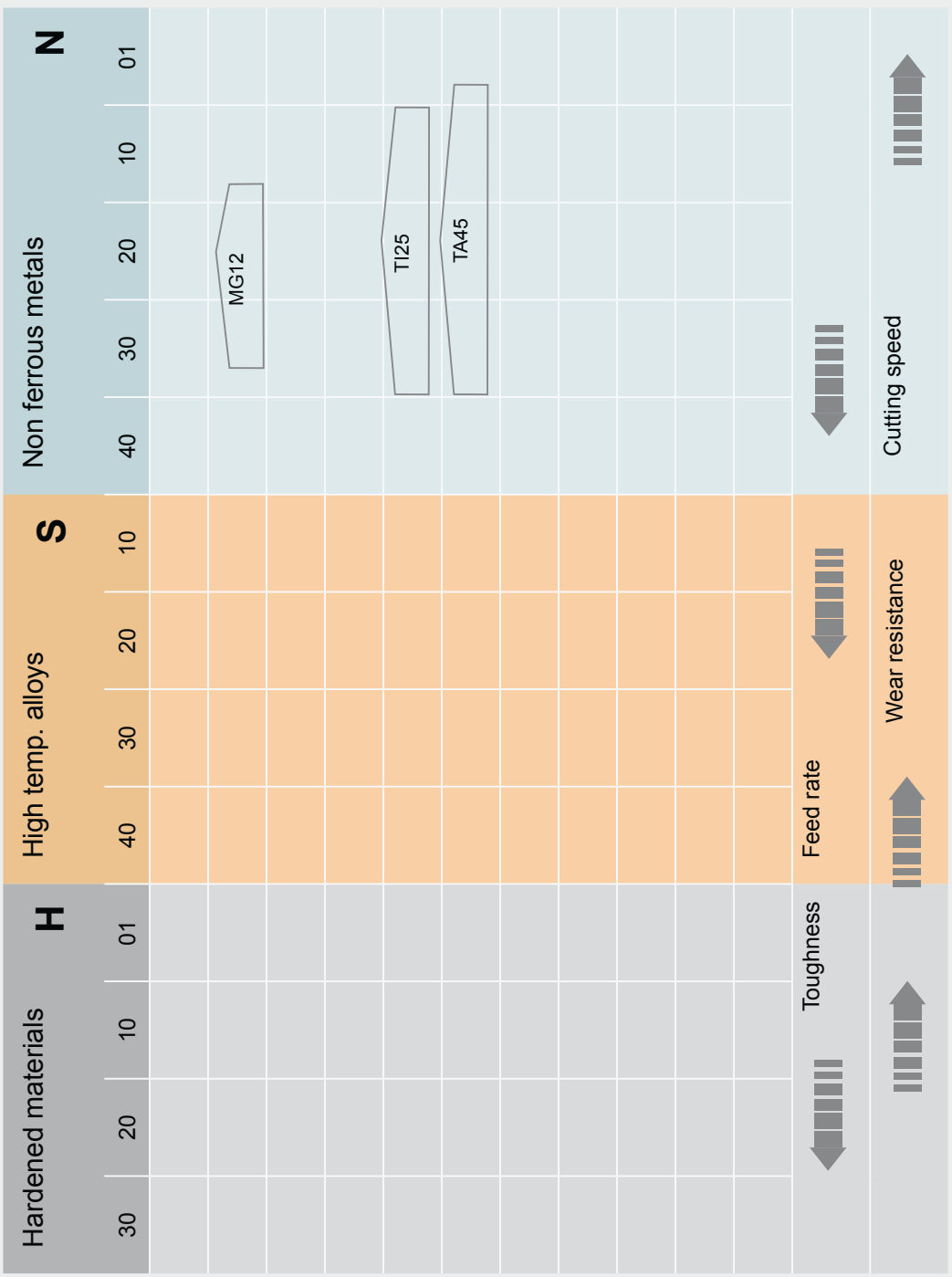
- Groove according to table in bore **Ø 32 mm**
- Groove width **8**^{C11}
- Depth of Cut per Stroke 0.08 mm
- The **Number of Strokes** resulted out of complete cutting depth from start position to the bottom of the groove divided by depth of cut per stroke
- This Value must then be multiplied by 2 (because Ø Programming) and Value is programmed as the Number of Strokes in the NC-Programme.

Calculation:

- Starting Position = Security Distance + Distance from Ø 32 mm to Cutting Edge (see Example on Page R34) equals a segment height of **0.508 mm** + Security Distance of **0.20 mm** to a total of **0.708 mm**.
- Starting Position = **30.584 mm** (32 - [0.708 x 2] = 30.584 mm.
- The groove depth of **2.90 mm** added to the **0.708 mm = 3.608 mm**.
- This is the dimension from the starting position to the bottom of the groove and in order to program this on the Ø, the **3.608 mm** dimension must be **multiplied by 2** which will equal the sum of **7.216 mm**.
- When the **7.216 mm** is divided by **(2 x 0.08 mm) = 0.16 mm** depth per stroke the Result will be **45.1 Strokes** and therefore **45 total Strokes** are programmed.

The remainder of 0.1 Strokes to achieve the finish dimension must be programmed using the fine correction.





R

UNCOATED GRADES

MG12 - a universal grade with good wear resistance. Used at low or medium cutting speeds for machining steel, cast iron and non ferrous materials

COATED GRADES

TN35 - a very popular grade TiN coated used to low or medium cutting speeds. Also recommanded for machining stainless steel or exotic alloyed materials

TI25 - a TiCN coated grade with high abrasion resistance. Recommended for machining steel and non ferrous materials at medium cutting speeds

TA45 - a TiAlN coated grade. This coating has a very high temperature stability and high hardness.

TH35 - new standard grade - extreme Oxidation resistance with high hardness and very good coefficient of friction.