

HCG - Horn Catalog Guide

PROFILING

Width of profile	PRODUCT LINE								
	.0010.	.0012.	.0014.	.0016.	.0018.	.0020.	.0026.	.0032.	.0045.



up to .394" (10 mm)	•								
up to .472" (12 mm)		•							
up to .551" (14 mm)			•						
up to .630" (16 mm)				•					
up to .709" (18 mm)					•				
up to .787" (20 mm)						•			
up to 1.024" (26 mm)							•		
up to 1.260" (32 mm)								•	
up to 1.771" (45 mm)									•



Depth of profile	PRODUCT LINE								
	.0010.	.0012.	.0014.	.0016.	.0018.	.0020.	.0026.	.0032.	.0045.

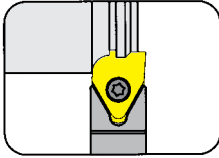
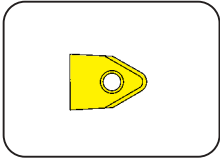
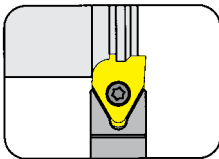
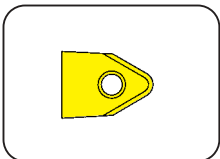
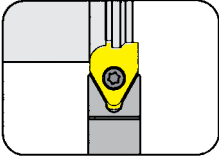
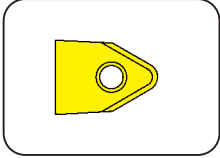
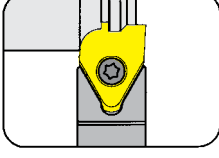
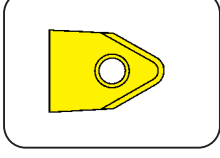
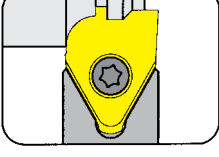
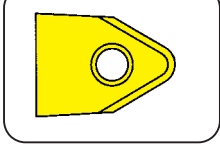
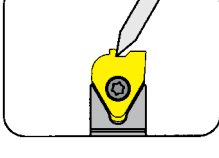
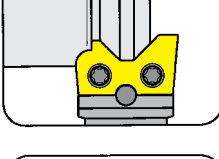
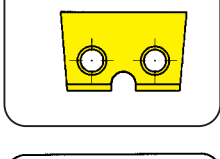
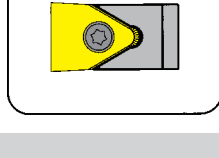
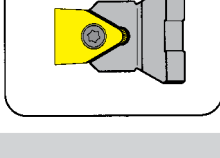


up to .138 (3.5 mm)	•								
up to .177" (4.5 mm)		•							
up to .236" (6.0 mm)			•	•					
up to .256" (6.5 mm)								•	•
up to .354" (9.0 mm)					•	•			
up to .394" (10.0 mm)							•		



Chapter	O
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FORM GROOVING O

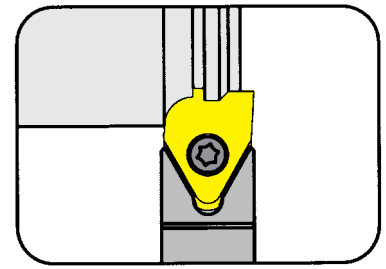
Width / Depth of profile	TOOLHOLDER	INSERT
.394" / .138" 10 mm / 3.5 mm	 Page O2	 Page O2
.472" / .177" 12 mm / 4.5 mm	 Page O3	 Page O3
.551 - .630" / .236" 14 - 16 mm / 6 mm	 Page O4	 Page O4
.708 - .787" / .354" 18 - 20 mm / 9 mm	 Page O5	 Page O5
1.024" / .394" 26 mm / 10 mm	 Page O6	 Page O6
Grinding Device	 Page O7	
1.260 - 1.771" / .256" 32 - 45 mm / 6.5 mm	 Page O8	 Page O9
PWP / AWN	 Page O10	 Page O11
Technical Instructions		Page O12-O16

GROOVING (Form-External)

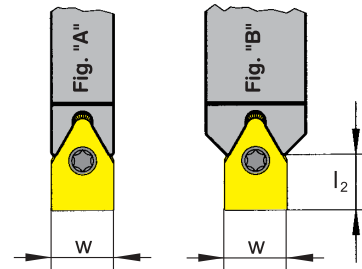
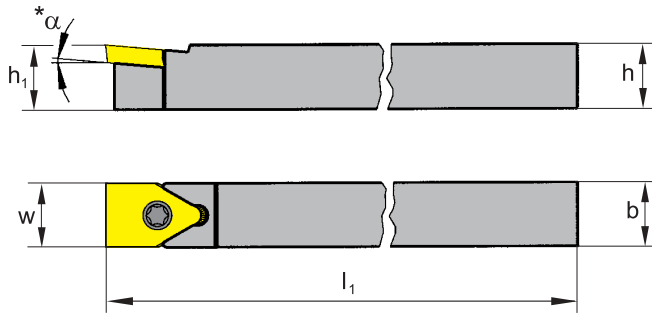


TOOLHOLDER type

HU/H117...10



Depth of form up to .138" (3.5 mm)
Width of form up to .394" (10 mm)



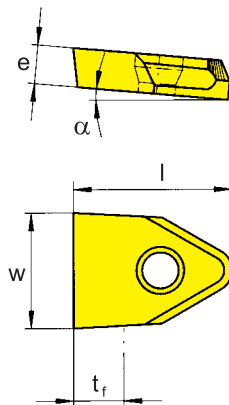
Part number	* α	Fig.	h	h ₁	b	l ₁	l ₂	w	Semi Finished Insert
Inch Toolholder									
HU117.0375.10	5°	A	.375	.375	.375	4.000	-		
HU117.0500.10	5°	B	.500	.500	.500	5.000	.354	.394	S117.0010.00
HU117.0625.10	5°	B	.625	.625	.625	6.000	.354		
Metric Toolholder in mm									
H117.1010.10	5°	A	10	10	10	100	-		
H117.1212.10	5°	B	12	12	12	125	9	10	S117.0010.00
H117.1616.10	5°	B	16	16	16	125	9		

* α Further angles upon request
Dimensions in inch/mm

Spare parts

for Toolholder	Screw	Torx Screw Driver
HU/H117.....10	4.09 T15	T15

INSERT type



S117.0010.00

Attention!
Semi Finished Insert. Only contact areas and main cutting edge ground.

- Standard
- Semistandard

Carbide grades			
Material Class	P	M	K
	MG12	MG12	MG12
	●	●	●

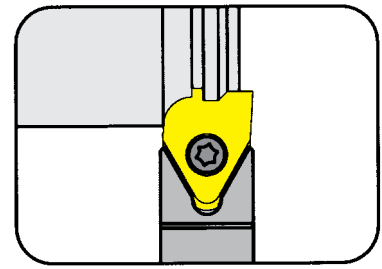
Part number	w	e	l	t _f	Toolholder type
S117.0010.00	.394 (10)	.118	.630	.138	H117...10

GROOVING (Form-External)

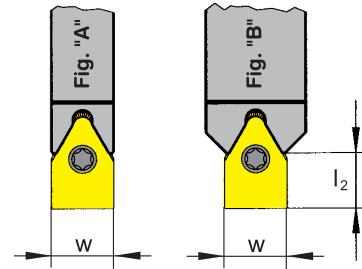
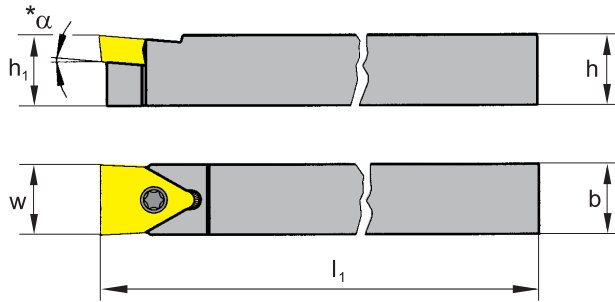


TOOLHOLDER type

HU/H117...12



Depth of form up to .177" (4.5 mm)
Width of form up to .472" (12 mm)



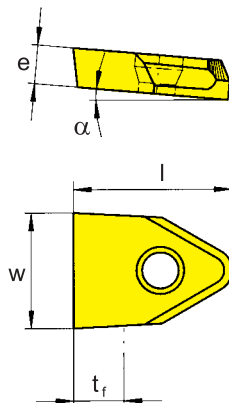
Part number	* α	Fig.	h	h ₁	b	l ₁	l ₂	w	Semi Finished Insert
Inch Toolholder									
HU117.0500.12	5°	A	.500	.500	.500	5.000	-		
HU117.0625.12	5°	B	.625	.625	.625	5.000	.315	.472	S117.0012.00
HU117.0750.12	5°	B	.750	.750	.750	6.000	.315		
Metric Toolholder in mm									
H117.1212.12	5°	A	12	12	12	125	-		
H117.1414.12	5°	B	14	14	14	125	8		
H117.1612.12	5°	A	16	16	16	125	-	12	S117.0012.00
H117.1616.12	5°	B	16	16	16	125	8		
H117.2020.12	5°	B	20	20	20	150	8		

Spare parts

* α Further angles upon request
Dimensions in inch/mm

for Toolholder	Screw	Torx Screw Driver
HU/H117.....12	4.09 T15	T15

INSERT type



S117.0012.00

Attention!
Semi Finished Insert. Only contact areas and main cutting edge ground.

- Standard
- Semistandard

Carbide grades			
Material Class	P	M	K
	MG12	MG12	MG12
	●	●	●

Part number	w	e	l	t _f	Toolholder
S117.0012.00	.472 (12)	.177	.669	.177	H117...12

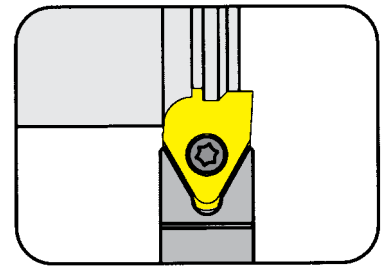
Dimensions in inch(mm)

GROOVING (Form-External)

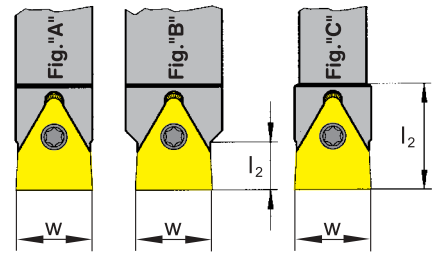
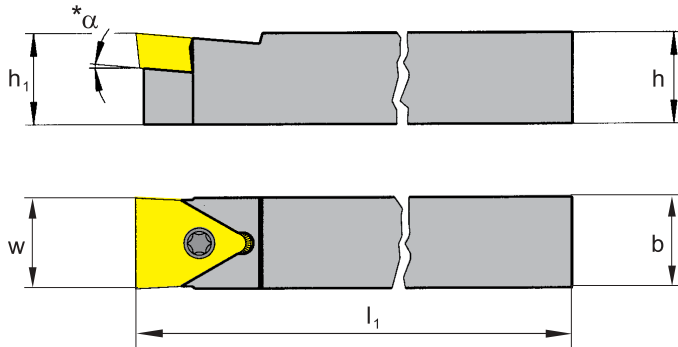


TOOLHOLDER type

HU/H117...16



Depth of form up to .236" (6 mm)
Width of form .551 - .630" (14 -16 mm)



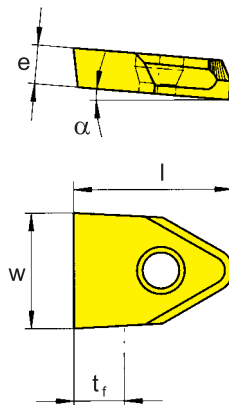
Part number	* α	Fig.	h	h ₁	b	l ₁	l ₂	w	Semi Finished Insert
Inch Toolholder HU117.0500.16	5°	C	.500	.500	.500	5.000	.866	.551 .630	S117.0014.00 S117.0016.00
HU117.0625.16	5°	B A	.625	.625	.625	5.000	.393 -	.551 .630	
HU117.0750.16	5°	B	.750	.750	.750	6.000	.393 .433	.551 .630	
Metric Toolholder in mm H117.1414.16	5°	C	14	14	14	125	22	14 16	S117.0014.00 S117.0016.00
H117.1616.16	5°	B A	16	16	16	125	10 -	14 16	
H117.2020.16	5°	B	20	20	20	150	10 11	14 16	

Spare parts

for Toolholder	Screw	Torx Screw Driver
HU/H117.....16	5.12 T20	T20

* α Further angles upon request
Dimensions in inch/mm

INSERT type



S117.0014.00

S117.0016.00

Attention!
Semi Finished Insert. Only contact areas and main cutting edge ground.

- Standard
- Semistandard

Carbide grades			
Material Class	P	MG12	●
	M	MG12	●
	K	MG12	●

Part number	w	e	l	t _f	Toolholder type
S117.0014.00 S117.0016.00	.551 (14) .630 (16)	6.236	.827	.236	H117...16

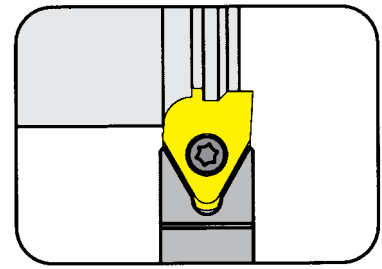
Dimensions in inch (mm)

GROOVING (Form-External)

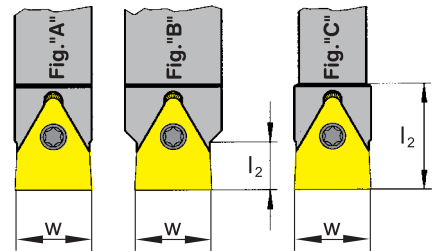
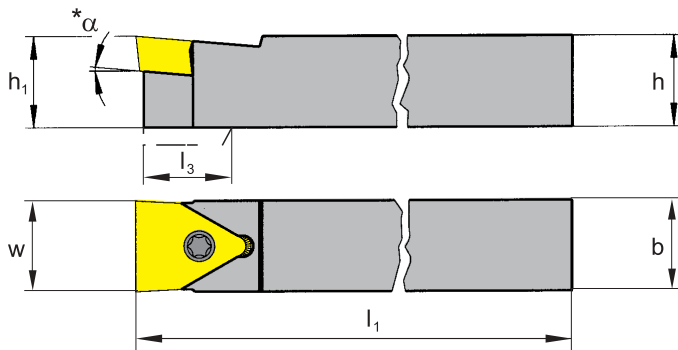


TOOLHOLDER type

HU/H117...20



Depth of form up to .354" (9 mm)
Width of form .708 - .787" (18 -20 mm)



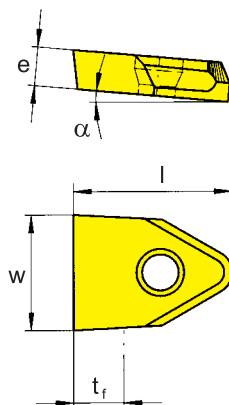
Part number	*α	Fig.	h	h ₁	b	l ₁	l ₂	l ₃	w	Semi Finished Insert
Inch Toolholder HU117.0625.20	5°	C	.625	.625	.625	5.000	1.181	.906	.708 .787	S117.0018.00 S117.0020.00
HU117.0750.20	5°	B A	.750	.750	.750	6.000	.591 -	- -	.708 .787	
HU117.1000.20	5°	B	1.000	1.000	1.000	6.000	.591 .630	- -	.708 .787	
Metric Toolholder H117.1616.20	5°	C	16	16	16	125	30	23	18 20	
H117.2020.20	5°	B A	20	20	20	150	15 -	- -	18 16	S117.0018.00 S117.0020.00
H117.2525.20	5°	B	25	25	25	150	15 16	- -	18 20	

Spare parts

for Toolholder	Screw	Torx Screw Driver
HU/H117.....20	6.17 T20	T20

* α Further angles upon request
Dimensions in inch/mm

INSERT type



S117.0018.00

S117.0020.00

Attention!
Semi Finished Insert. Only contact areas and main cutting edge ground.

- Standard
- Semistandard

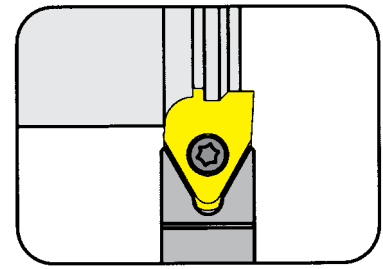
Carbide grades			
Material Class	P	MG12	●
	M	MG12	●
	K	MG12	●

Part number	w	e	l	t _f	Toolholder type
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S117.0020.00	.787 (20)	.276	1.142	.354	H117...20

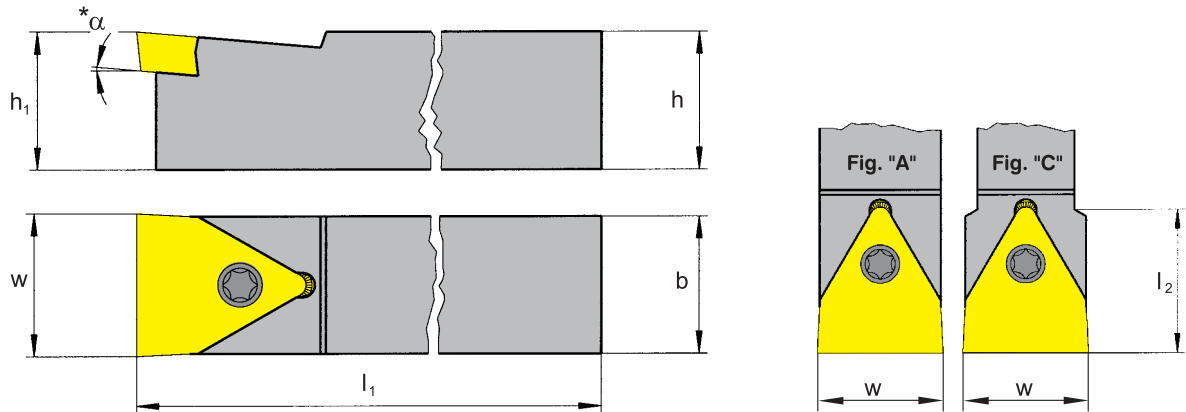
Dimensions in inch (mm)

TOOLHOLDER type

HU/H117...26



Depth of form up to .394" (10 mm)
Width of form up to 1.024" (26 mm)



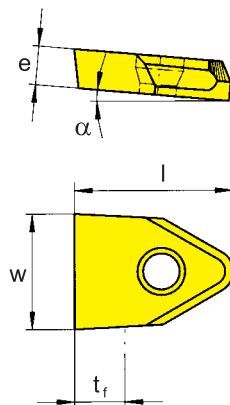
Part number	* α	Fig.	h	h ₁	b	l ₁	l ₂	w	Semi Finished Insert
Inch Toolholder									
HU117.0750.26	5°	C	.750	.750	.750	6.000	1.181	1.024	S117.0026.00
HU117.1000.26	5°	A	1.000	1.000	1.000	6.000	-	1.024	S117.0026.00
Metric Toolholder in mm									
H117.2020.26	5°	C	20	20	20	150	30	26	S117.0026.00
H117.2525.26	5°	A	25	25	25	150	-	26	S117.0026.00

* α Further angles upon request
Dimensions in inch/mm

Spare parts

for Toolholder	Screw	Torx Screw Driver
HU/H117.....26	6.17 T20	T20

INSERT type



S117.0026.00

Attention!
Semi Finished Insert. Only contact areas and main cutting edge ground.

- Standard
- Semistandard

Carbide grades			
Material Class	P	MG12	●
	M	MG12	●
	K	MG12	●

Part number	w	e	l	t _f	Toolholder type
S117.0026.00	1.024 (26)	.278	1.260	.394	H117...26

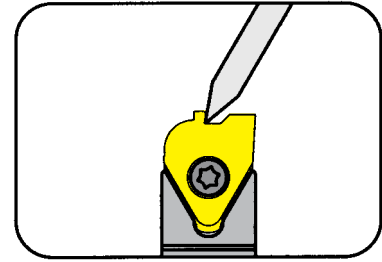
Dimensions in inch (mm)

GROOVING (Form-External)

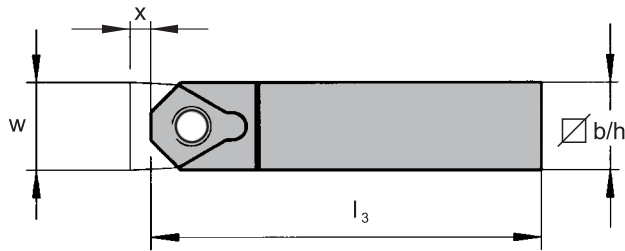


GRINDING DEVICE

MU/M117





Toolholder only for manufacturing special profiles.



Part number	w Insert	l_3	∇ b/h	x	Semi Finished Insert
Inch Toolholder MU117.0500.12	.472	4.750	.500	.177	S117.0012.00
MU117.0625.16	.630	4.675	.625	.236	S117.0016.00
MU117.0750.20	.826	5.500	.750	.354	S117.0020.00
Metric Toolholder in mm					
M117.1212.10	10	120	12	3.5	S117.0010.00
M117.1612.12	12	120	12 16	4.5	S117.0012.00
M117.1616.16	16	119	16	6.0	S117.0014.00 S117.0016.00
M117.2020.20	20	140	20	9.0	S117.0018.00
M117.2525.26	26	140	25	10.0	S117.0020.00 S117.0026.00

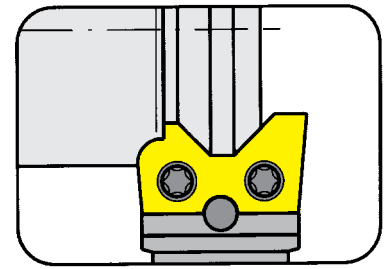
Dimensions in inch/mm

Spare parts

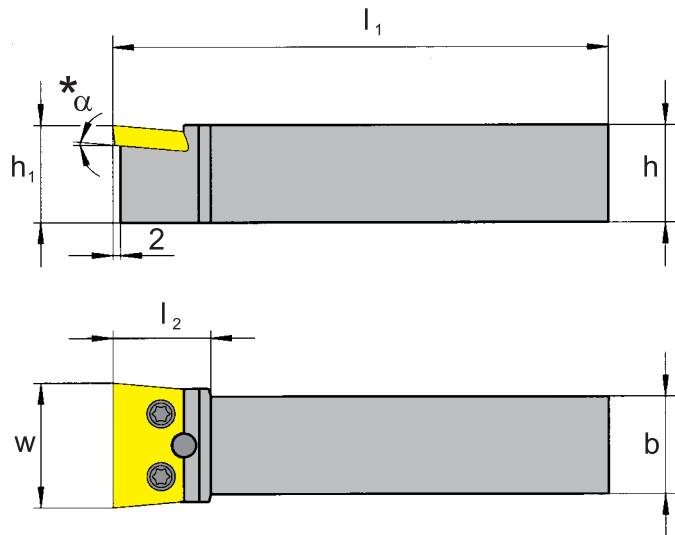
for Toolholder	Screw 	Torx Screw Driver 
MU/M117...10-12	4.09 T15	T15
MU/M117...16	5.12 T20	T20
MU/M117...20	6.17 T20	T20
M117.2525.26	6.17 T20	T20

TOOLHOLDER type

HU/H117



Depth of form up to .256" (6.5 mm)
 Width of form 1.260 - 1.771" (32 -45 mm)



for use with insert

- type S117

Part number	* α	w	h	h_1	b	l_1	l_2	Semi Finished Insert
Inch Toolholder								
HU117.0750.32	5°	1.260	.750	.750	.750	5.000	1.000	S117.0032.00
HU117.1000.32	5°	1.260	1.000	1.000	1.000	5.000	1.000	
HU117.1000.45	5°	1.771	1.000	1.000	1.000	5.000	1.063	S117.0045.00
HU117.1250.45	5°	1.771	1.250	1.250	1.250	5.000	1.063	
Metric Toolholder in mm								
H117.2020.32	5°	32	20	20	20	150	25	S117.0032.00
H117.2525.32	5°	32	25	25	25	150	25	
H117.2525.45	5°	45	25	25	25	150	27	S117.0045.00
H117.3232.45	5°	45	32	32	32	170	27	

* α . Further angles upon request
 Dimensions in inch/mm

Spare parts

for Toolholder	Screw	Torx Screw Driver
HU/H117.....32	5.12 T20	T20

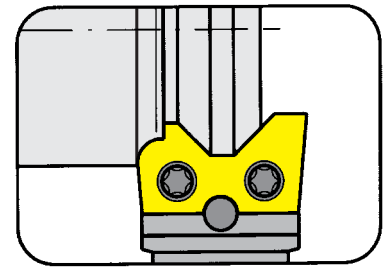
GROOVING (Form-External)



INSERT type

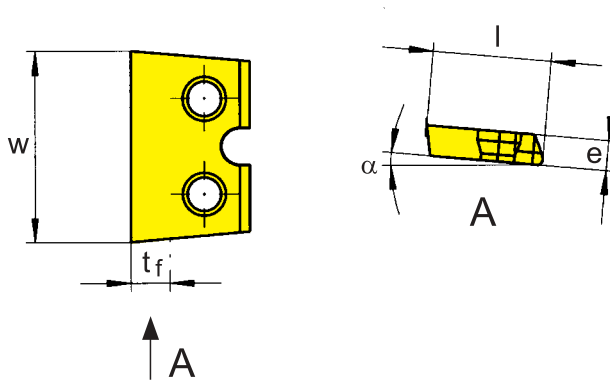
S117

Depth of form up to .256" (6.5 mm)
 Width of form 1.260 - 1.771" (32 -45 mm)



for use with toolholder

- type HU/H117...32/45



Part number	w	e	l	t _f	Toolholder type
S117.0032.00	1.260 (32)	.196	.688	.255	H117...32
S117.0045.00	1.771 (45)	.196	.688	.255	H117...45

Dimensions in inch (mm)

Material Class	Carbide grades		
	P	M	K
MG12	●	○	○
MG12	○	●	○
MG12	○	○	●

- Standard
- Semistandard

Attention!
 Semi Finished Insert. Only contact areas and main cutting edge ground.
 Profile inserts upon request.

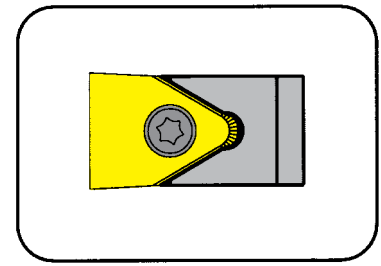


GROOVING (Form-External)

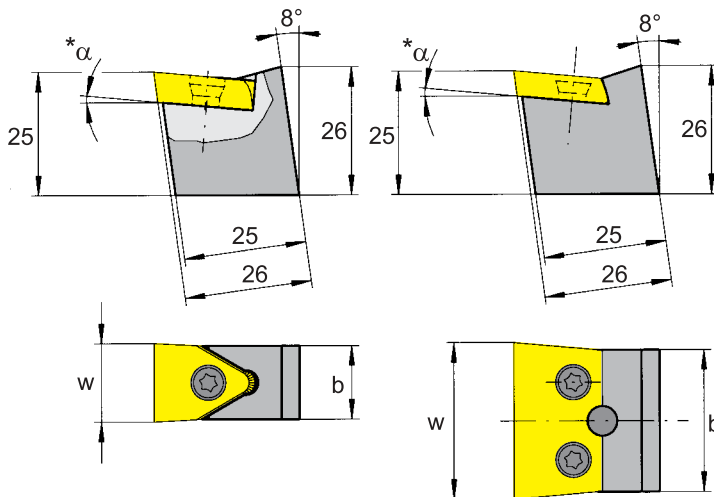


TOOLHOLDER type

H117



Depth of form up to .256" (6.5 mm)
Width of form up to 1.771" (45 mm)



for use with Insert

- type S117

With PWP-System.

Part number	* α	w	b	Semi Finished Insert
Metric Toolholder				
H117.PWP.10	5°	.394 (10)	.394 (10)	S117.0010.00
H117.PWP.12	5°	.472 (12)	.472 (12)	S117.0012.00
H117.PWP.16	5°	.551 (14) .630 (16)	.630 (16)	S117.0014.00 S117.0016.00
H117.PWP.32	5°	1.260 (32)	1.102 (28)	S117.0032.00
H117.PWP.45	5°	1.771 (45)	1.654 (42)	S117.0045.00

Further shank sizes upon request.

* α Further angles upon request
Dimensions in inch (mm)

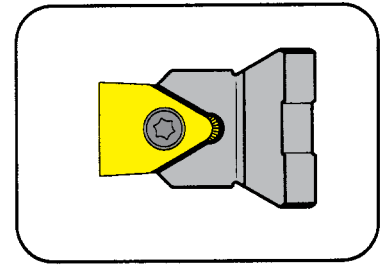
Spare parts

for Toolholder	Screw	Torx Screw Driver
H117.....10-12	4.09 T15	T15
H117.....16	5.12 T20	T20
H117.....32-45	5.12 T20	T20

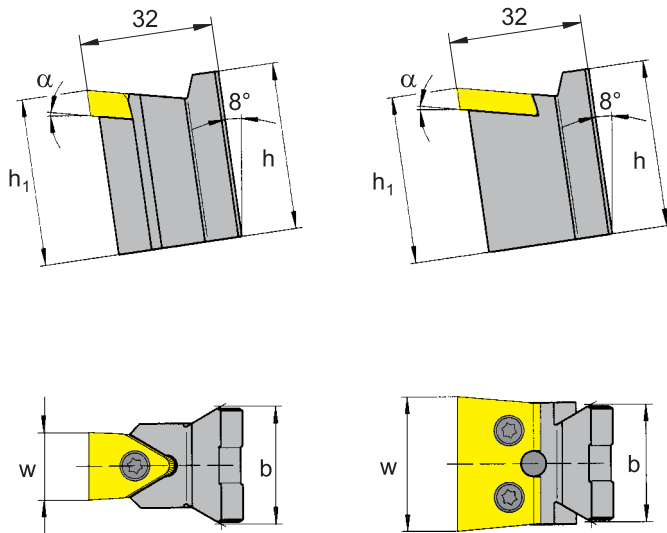
O10

TOOLHOLDER type

H117



Depth of form up to .354" (9 mm)
Width of form up to 1.771" (45 mm)



for use with Insert

- type S117

With AWN-System.

Part number	α	w	h	h_1	b	t_{max}	Semi Finished Insert
Metric Toolholder							
H117.AW20.10	5°	.394 (10)	1.417 (36)	1.575 (40)	.787 (20)	.138 (3.5)	S117.0010.00
H117.AW20.12		.472 (12)				.177 (4.5)	S117.0012.00
H117.AW20.16	5°	.551 (14)	1.417 (36)	1.575 (40)	.787 (20)	.256 (6.5)	S117.0014.00
		.630 (16)					S117.0016.00
H117.AW28.10	5°	.394 (10)	1.417 (36)	1.575 (40)	1.102 (28)	.138 (3.5)	S117.0010.00
H117.AW28.12		.472 (12)				.177 (4.5)	S117.0012.00
H117.AW28.16	5°	.551 (14)	1.417 (36)	1.575 (40)	1.102 (28)	.256 (6.5)	S117.0014.00
		.630 (16)					S117.0016.00
H117.AW28.20	5°	.709 (18)	1.417 (36)	1.575 (40)	1.102 (28)	.354 (9.0)	S117.0018.00
		.787 (20)					S117.0020.00
H117.AW28.32	5°	1.260 (32)	1.417 (36)	1.575 (40)	1.102 (28)	.256 (6.5)	S117.0032.00
H117.AW40.45	5°	1.771 (45)	1.969 (50)	1.969 (50)	1.575 (40)	.256 (6.5)	S117.0045.00

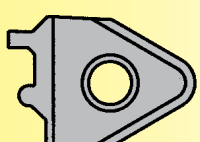
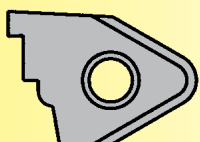
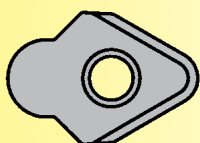
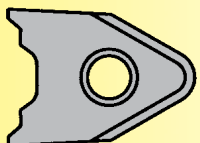
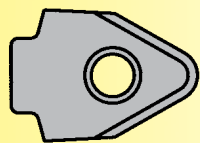
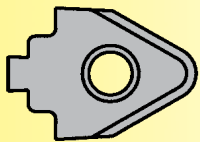
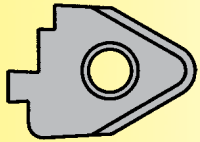
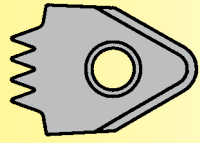
Further shank sizes upon request.

* α Further angles upon request
Dimensions in inch (mm)

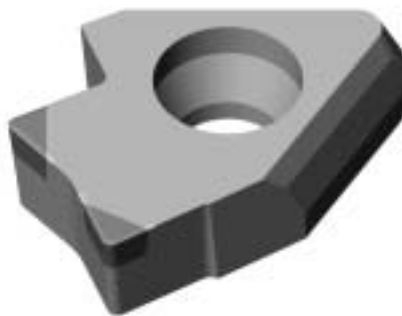
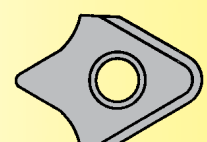
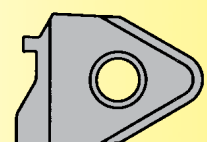
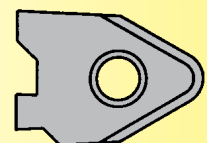
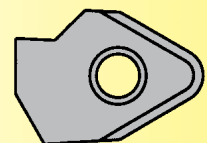
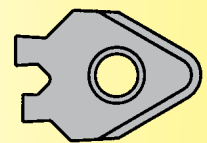
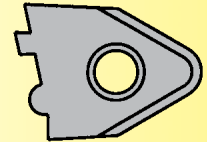
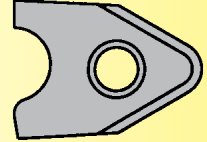
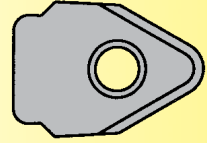
Spare parts

for Toolholder	Screw	Torx Screw Driver
H117.....10-12	4.09 T15	T15
H117.....16	5.12 T20	T20
H117.....32-45	5.12 T20	T20

Examples of profiles



Profiled inserts are manufactured according to customer special requirements. It is also possible to supply inserts with different relief angles. If the customer wants to regrind or sharpen the insert, we recommend to use small relief angles around the cutting edge profile. How many times the customer can regrind the insert, depends on the condition (wear and breakages) of each individual insert.



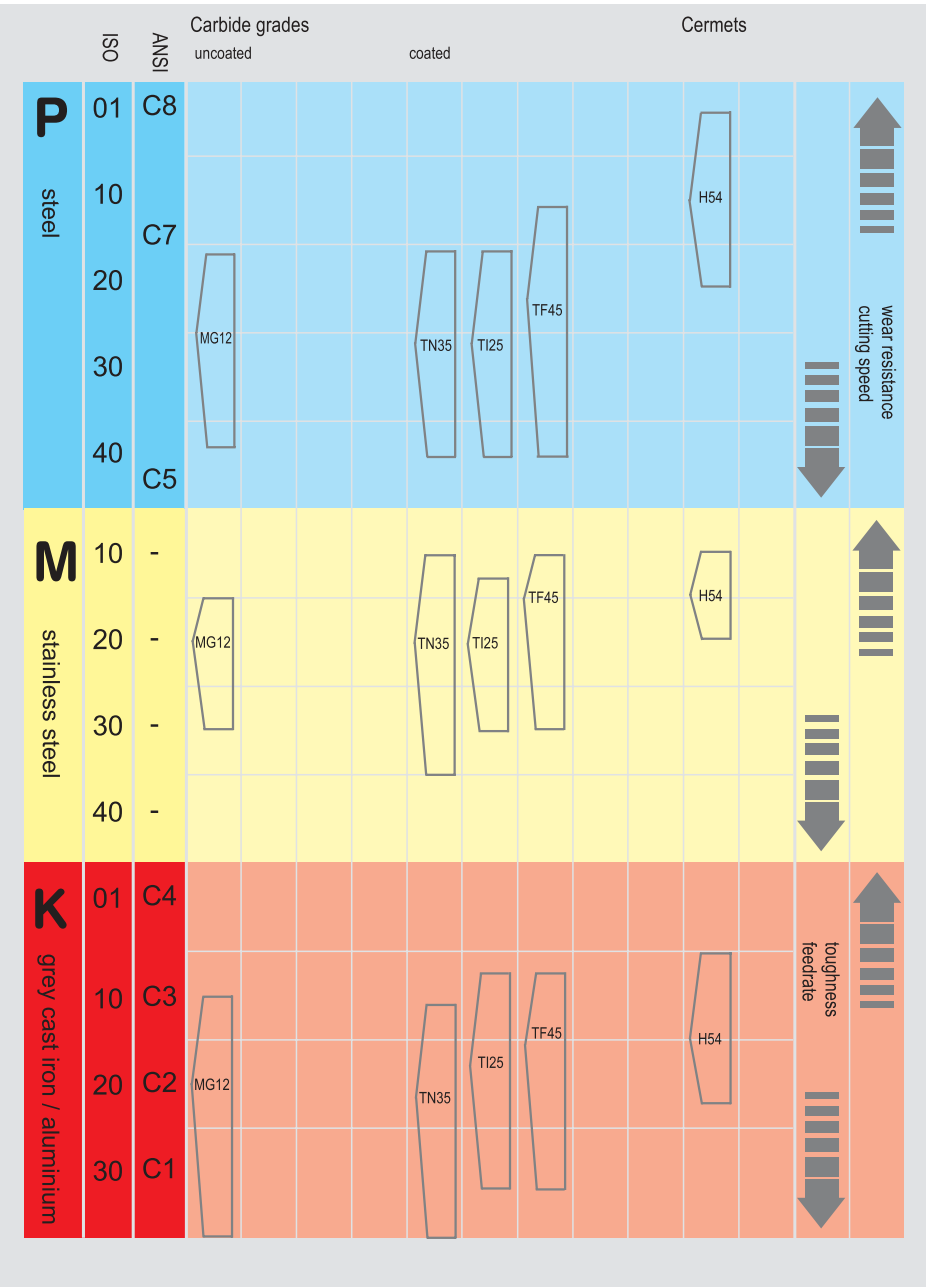
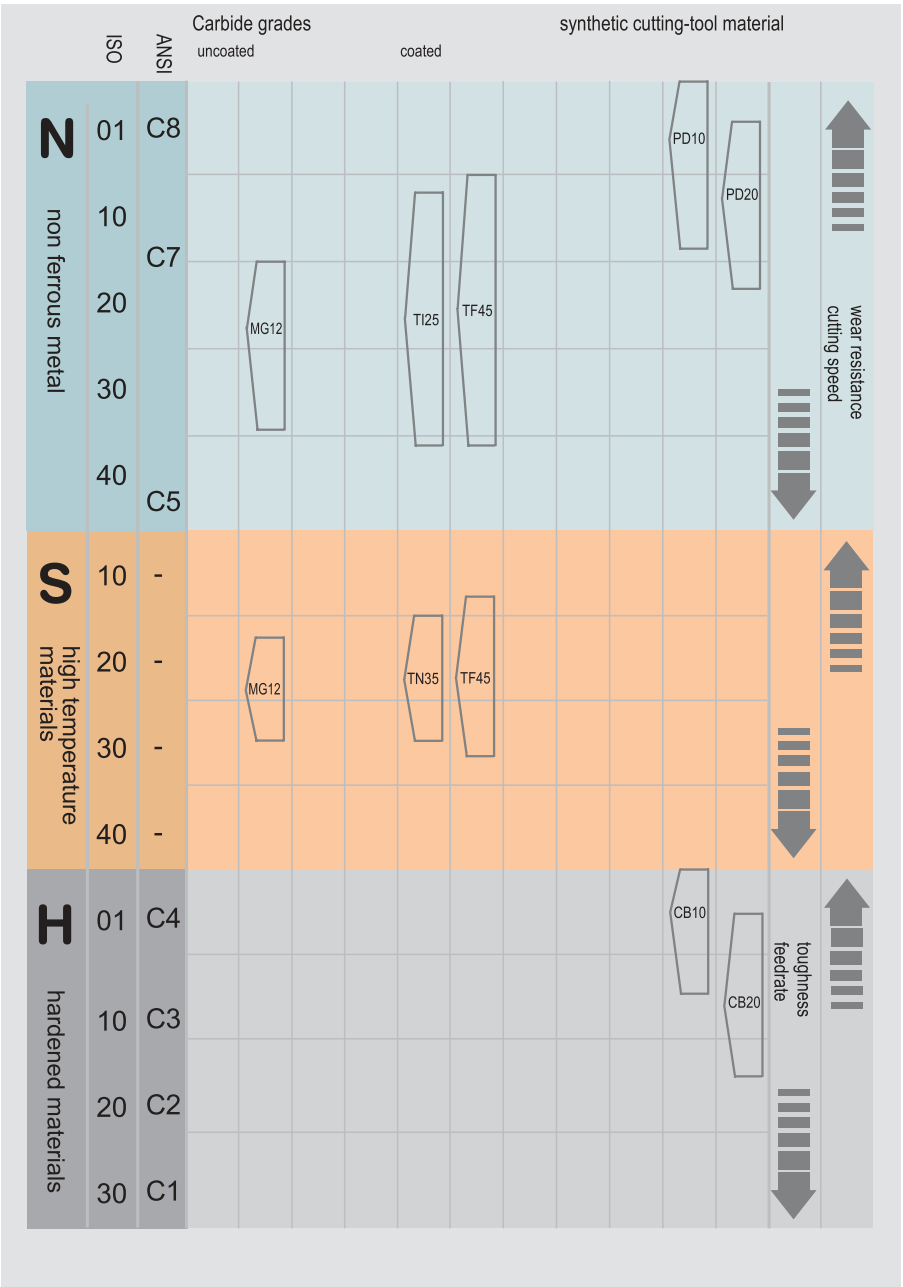
PCD- or CBN-tipped inserts upon request.

HORN-grades	ISO	Properties	Workpiece material	Recommended applications
H54	(HT) P05-P20	Cermet	carbon steels low alloyd steels cast steel, stainless steels exotic alloys	for grooving and finishing, for best surface qualities, no tendency to built up edge, resistant to wear
TN35	(HC) P20-P35 K10-K20	TiN-Coating	steel, cast steel, malleable cast iron, martensic stainless steel	for grooving and finishing at low up to moderate cutting speed, thread cutting, unfavourable conditions
TI25	(HC) P15-P35 K10-K20	TiCN-Coating	steel, cast steel, malleable cast iron, martensic stainless steel	for grooving and finishing at low cutting speed, thread cutting, unfavourable conditions
TF45	(HC) P10-P35 K10-K20	TiAlN-Coating	steel, cast steel, malleable cast iron, martensic stainless steel	for grooving and finishing at low cutting speed, cooling with oil
MG12	(HW) K10-K30	uncoated carbide (micro grain)	grey cast iron, malleable cast iron, Si-Aluminium and copper alloys heat resistant alloys	for grooving and finishing at low cutting speed, unfavourable conditions

CBN- or PCD-tipped inserts upon request.

Carbide grades on stock are shown in the catalogue or in the price list.





CUTTING DATA for grooving



Material to be machined			Hardness Brinell (HB)	Cutting speed (sfm)										
				K10	MG12	P20	TI22 TN32	TI25 TN35	TF45	TF46	TC92	AL96	H20	H54
P	Non-Alloy Carbon Steel	0,2 % C	140			325-460	425-525	360-460	195-260	460-720	460-720	460-785	460-625	395-525
		0,4 % C	180			295-425	395-460	325-425	165-260	390-655	425-625	395-720	425-590	425-460
		0,6 % C	200			260-395	395-460	260-395		325-625	425-590	360-655	395-555	260-460
	Alloy Steel	annealed	180			260-395	395-460	325-460	165-260		395-525		395-555	325-460
		quenched	280			230-295	295-460	260-360			295-460		325-460	260-460
		quenched and tempered	350			130-195	230-395	195-260			260-360			195-325
	High Alloy Steel (>5%)	annealed	200			195-325	230-325				325-490			195-260
		hardened	-											
	Cast Steel	unalloyed	180				260-360				395-525			
		alloyed	220				195-295				260-460			
M	Stainless Steel annealed	martensitic, ferritic	200		195-260		260-360	165-360		325-525	360-425			
		austenitic	180		195-260			195-260		325-395				
K	Grey cast iron	low tensile strength	180	165-230	165-230				230-360	325-460	325-460			
		high tensile strength	250	165-230	165-230				195-260	195-395	260-395			
	Spheroidal graphite cast iron	ferritic	160				195-295	195-260	195-325	260-460	230-490			
		perlitic	250				195-260	165-195	195-295	230-425	195-395			
	Malleable cast iron	ferritic	125		195-260		325-395	195-260		260-325	360-525			
		perlitic	225		130-195		195-260	165-195		195-260	260-395			
S	Heat resistant Alloys (Fe)	annealed	200		100-130			100-130						
		hardened	275		65-115			65-115						
	Heat resistant Alloys (Ni, Co)	annealed	250		65-80			65-80						
		hardened	350		30-65			30-65						
N	Aluminium Alloys	not heat treatable	30-80	1950-3300	1300-2650			1950-3300						
		heat treatable	80-120	720-1300	655-985			720-1300						
	Aluminium Cast Alloys	not heat treatable	80	1950-3300	1300-2650			1950-3300						
		heat treatable	100	985-1950	820-1300			985-1950						
	Copper Alloys	not heat treatable	90	325-525			425-525	360-625						
		heat treatable	100	260-425			195-425	260-460						



CUTTING DATA for grooving



Material to be machined			Hardness Brinell (HB)	Cutting speed (m/min)										
				K10	MG12	P20	TI22 TN32	TI25 TN35	TF45	TF46	TC92	AL96	H20	H54
P	Non-Alloy Carbon Steel	0,2 % C	140			140-100	160-130	140-110	80-60	220-140	220-140	240-140	190-140	160-120
		0,4 % C	180			130-90	140-120	130-100	80-50	200-120	190-130	220-120	180-130	140-100
		0,6 % C	200			120-80	140-120	120-80		190-100	180-130	200-100	170-120	140-80
	Alloy Steel	annealed	180			120-80	140-120	140-100	80-50	190-80	160-120	200-80	170-120	140-100
		quenched	280			90-70	140-90	110-80		170-80	140-90	180-80	140-100	140-80
		quenched and tempered	350			60	120-70	80-60		140-60	110-80	160-70	120-60	100-60
	High Alloy Steel (>5%)	annealed	200			100-60	100-70			160-120	150-100	180-120	110-80	80-60
		hardened	-											
	Cast Steel	unalloyed	180				110-80				160-120	160-120	140-100	
		alloyed	220				90-60				140-80	120-80	120-80	
M	Stainless Steel annealed	martensitic, ferritic	200		80-60		110-80	110-50		160-100	130-110	150-120	150-100	
		austenitic	180		60-60			80-60		120-100		110-80	140-100	
K	Grey cast iron	low tensile strength	180	70-50	70-50				110-70	140-100	140-100	160-100		
		high tensile strength	250	70-50	70-50				80-60	120-180	120-80	140-100		
	Spheroidal graphite cast iron	ferritic	160				90-60	80-60	100-60	140-80	150-70	150-110		
		perlitic	250				80-60	60-50	90-60	130-70	120-60	140-100		
	Malleable cast iron	ferritic	125		80-60		120-100	80-60		100-80	160-110	180-100		
		perlitic	225		60-40		80-60	60-50		80-60	120-80	150-180		
S	Heat resistant Alloys (Fe)	annealed	200		40-30			40-30						
		hardened	275		35-20			35-20						
	Heat resistant Alloys (Ni, Co)	annealed	250		25-20			25-20						
		hardened	350		20-10			20-10						
N	Aluminium Alloys	not heat treatable	30-80	1000-600	800-400			1000-600						
		heat treatable	80-120	400-220	300-200			400-220						
	Aluminium Cast Alloys	not heat treatable	80	1000-600	800-400			1000-600						
		heat treatable	100	600-300	400-250			600-300						
	Copper Alloys	not heat treatable	90	160-100			160-130	190-110						
		heat treatable	100	130-80			130-60	140-80						

Hardturning on Gear wheel

Special **CBN-tipped insert** type S117 is used to finish the width of the groove. The stock removal is approximately .006" - .008" (0.15 - 0.2 mm). The insert is ground to find width of the groove.

Both flanks are machined at the same time ($R_z = 2.3\mu\text{m}$). To obtain a high surface finish, the insert has a wiper flat on both side cutting edges. Stable machining conditions are imperative. Stable machining conditions are imperative.

No coolant.

Material: 5115-case hardened 58-62 HRC

Cutting data:

$V_c = 460 \text{ SFM (140 m/min)}$

$V_f = .003 \text{ (0.08 mm)}$

