



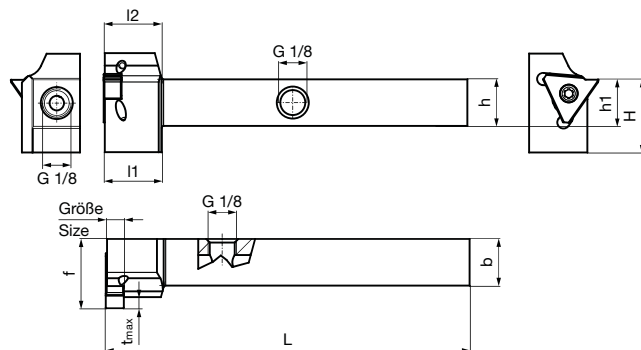
Square shank holder 90° offset, external machining, with IC

Series no. **25358**

- grooving depth up to 3.5 mm
- with internal coolant delivery from above and below

Type **GH 305**

for indexable inserts type 305 see from page 200



Right hand version shown
Left hand version mirror image



version right-hand

Code no.	Description	t max	h=b	h=b	L	h1	H	l1	l2	f	Size
		mm	mm	inch	mm	mm	mm	mm	mm	mm	
12.014	GH305.1212.125.90.04.R.IK	3.50	12.00		125.00	12.00	21.00	21.60	21.60	23.80	04
12.033	GH305.0500.500.90.04.R.IK	3.50		1/2	127.00	12.70	21.70	19.92	19.92	22.70	04
12.021	GH305.0625.500.90.04.R.IK	3.50		5/8	127.00	15.87	24.87	19.92	19.92	24.12	04
12.001	GH305.1616.125.90.04.R.IK	3.50	16.00		125.00	16.00	25.00	19.60	19.60	23.80	04
12.022	GH305.0750.500.90.04.R.IK	3.50		3/4	127.00	19.05	24.05	19.92	19.92	22.85	04
12.002	GH305.2020.125.90.04.R.IK	3.50	20.00		125.00	20.00	25.00	19.60	19.60	23.80	04
12.003	GH305.2525.150.90.04.R.IK	3.50	25.00		150.00	25.00	30.00	19.60	19.60	28.80	04
12.023	GH305.1000.600.90.04.R.IK	3.50		1"	152.40	25.40	30.40	19.92	19.92	29.20	04
12.016	GH305.1212.125.90.06.R.IK	3.50	12.00		125.00	12.00	21.00	21.60	21.60	23.80	06
12.034	GH305.0500.500.90.06.R.IK	3.50		1/2	127.00	12.70	21.70	19.92	19.92	22.70	06
12.024	GH305.0625.500.90.06.R.IK	3.50		5/8	127.00	15.87	24.87	19.92	19.92	24.12	06
12.004	GH305.1616.125.90.06.R.IK	3.50	16.00		125.00	16.00	25.00	19.60	19.60	23.80	06
12.025	GH305.0750.500.90.06.R.IK	3.50		3/4	127.00	19.05	24.05	19.92	19.92	22.85	06
12.005	GH305.2020.125.90.06.R.IK	3.50	20.00		125.00	20.00	25.00	19.60	19.60	23.80	06
12.006	GH305.2525.150.90.06.R.IK	3.50	25.00		150.00	25.00	30.00	19.60	19.60	28.80	06
12.026	GH305.1000.600.90.06.R.IK	3.50		1"	152.40	25.40	30.40	19.92	19.92	29.20	06
12.018	GH305.1212.125.90.08.R.IK	3.50	12.00		125.00	12.00	21.00	23.60	23.60	23.80	08
12.035	GH305.0500.500.90.08.R.IK	3.50		1/2	127.00	12.70	21.70	19.92	21.92	22.70	08
12.027	GH305.0625.500.90.08.R.IK	3.50		5/8	127.00	15.87	24.87	21.92	21.92	24.12	08
12.007	GH305.1616.125.90.08.R.IK	3.50	16.00		125.00	16.00	25.00	19.60	19.60	23.80	08
12.028	GH305.0750.500.90.08.R.IK	3.50		3/4	127.00	19.05	24.05	19.92	19.92	22.85	08
12.008	GH305.2020.125.90.08.R.IK	3.50	20.00		125.00	20.00	25.00	19.60	19.60	23.80	08
12.009	GH305.2525.150.90.08.R.IK	3.50	25.00		150.00	25.00	30.00	19.60	19.60	28.80	08
12.029	GH305.1000.600.90.08.R.IK	3.50		1"	152.40	25.40	30.40	19.92	19.92	29.20	08
12.020	GH305.1212.125.90.12.R.IK	3.50	12.00		125.00	12.00	21.00	27.60	27.60	23.80	12
12.036	GH305.0500.500.90.12.R.IK	3.50		1/2	127.00	12.70	21.70	19.92	25.92	22.70	12
12.030	GH305.0625.500.90.12.R.IK	3.50		5/8	127.00	15.87	24.87	25.92	25.92	24.12	12
12.010	GH305.1616.125.90.12.R.IK	3.50	16.00		125.00	16.00	25.00	27.60	27.60	23.80	12
12.031	GH305.0750.500.90.12.R.IK	3.50		3/4	127.00	19.05	24.05	25.92	25.92	24.12	12
12.011	GH305.2020.125.90.12.R.IK	3.50	20.00		125.00	20.00	25.00	27.60	27.60	23.80	12
12.012	GH305.2525.150.90.12.R.IK	3.50	25.00		150.00	25.00	30.00	27.60	27.60	28.80	12
12.032	GH305.1000.600.90.12.R.IK	3.50		1"	152.40	25.40	30.40	25.92	25.92	29.20	12

Series no. **25359**

version left-hand

Code no.	Description	t max	h=b	h=b	L	h1	H	l1	l2	f	Size
		mm	mm	inch	mm	mm	mm	mm	mm	mm	
12.014	GH305.1212.125.90.04.L.IK	3.50	12.00		125.00	12.00	21.00	21.60	21.60	23.80	04
12.033	GH305.0500.500.90.04.L.IK	3.50		1/2	127.00	12.70	21.70	19.92	19.92	22.70	04
12.021	GH305.0625.500.90.04.L.IK	3.50		5/8	127.00	15.87	24.87	19.92	19.92	24.12	04
12.001	GH305.1616.125.90.04.L.IK	3.50	16.00		125.00	16.00	25.00	19.60	19.60	23.80	04
12.022	GH305.0750.500.90.04.L.IK	3.50		3/4	127.00	19.05	24.05	19.92	19.92	22.85	04
12.002	GH305.2020.125.90.04.L.IK	3.50	20.00		125.00	20.00	25.00	19.60	19.60	23.80	04
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12.023	GH305.1000.600.90.04.L.IK	3.50		1"	152.40	25.40	30.40	19.92	19.92	29.20	04
12.016	GH305.1212.125.90.06.L.IK	3.50	12.00		125.00	12.00	21.00	21.60	21.60	23.80	06
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12.004	GH305.1616.125.90.06.L.IK	3.50	16.00		125.00	16.00	25.00	19.60	19.60	23.80	06
12.025	GH305.0750.500.90.06.L.IK	3.50		3/4	127.00	19.05	24.05	19.92	19.92	22.85	06
12.005	GH305.2020.125.90.06.L.IK	3.50	20.00		125.00	20.00	25.00	19.60	19.60	23.80	06
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12.007	GH305.1616.125.90.08.L.IK	3.50	16.00		125.00	16.00	25.00	19.60	19.60	23.80	08
12.028	GH305.0750.500.90.08.L.IK	3.50		3/4	127.00	19.05	24.05	19.92	19.92	22.85	08
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12.029	GH305.1000.600.90.08.L.IK	3.50		1"	152.40	25.40	30.40	19.92	19.92	29.20	08
12.020	GH305.1212.125.90.12.L.IK	3.50	12.00		125.00	12.00	21.00	27.60	27.60	23.80	12
12.036	GH305.0500.500.90.12.L.IK	3.50		1/2	127.00	12.70	21.70	19.92	25.92	22.70	12
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12.012	GH305.2525.150.90.12.L.IK	3.50	25.00		150.00	25.00	30.00	27.60	27.60	28.80	12
12.032	GH305.1000.600.90.12.L.IK	3.50		1"	152.40	25.40	30.40	25.92	25.92	29.20	12

System 305

Spare parts

Series no.	Clamping screw	Tightening torque	Size
25901		Nm	
Code 4.000	M4x15x15IP	4-4.5	04 - 08
Code 4.003	M4x17x15IP	4-4.5	12

Series no.	Torx-Plus Wrench
25904	
Code 15.000	T15IP T-handle

305





SYSTEM 305

GROOVING AND PARTING OFF



Square shank holder straight
with and without IC
from page 184



Square shank holder, 90°
offset with and without IC
from page 190

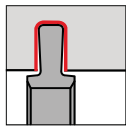


Square shank holder, 45°
offset with and without IC
from page 194

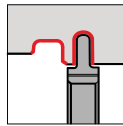


Round shank holder
with and without IC
from page 196

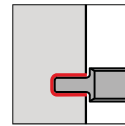
Tool holder



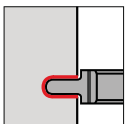
Radial grooving
straight slots, Type GE
from page 200



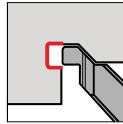
Radial grooving
full radius slots, Type GE
from page 202



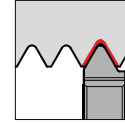
Axial grooving,
straight slots, Type GA
page 203



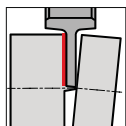
Axial grooving,
full radius slots, Type GA
page 204



Grooving axial recesses,
Type GA
page 205



External thread turning,
Type GG
from page 206



Parting off,
Type GZ
from page 210

Indexable inserts



SYSTEM 305

	Feed rate f (IPR)		Feed rate f (IPR)	General formulas
	↓ 0.0012 - 0.0059 ↔ 0.0008 - 0.0047 ap = 0.0039 - 0.0197 in		↓ 0.0012 - 0.0059 ↔ 0.0008 - 0.0047 ap = 0.0039 - 0.0197 in	
Geometry .BA ground round chip breaker		Geometry .AA ground flat chip breaker		
				Cutting speed (SFM) RPM x Dia. / 3.82 = SFM
				Revolutions per minute (RPM) SFM x 3.82 / Dia. = RPM
				Feed rate (IPM) IPR x RPM = IPM

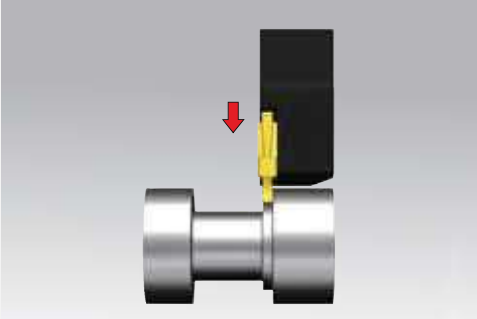
↓ = radial feed direction

↔ = axial feed direction

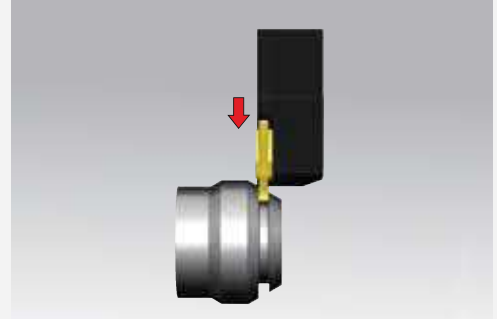
ISO	Material		Material examples/ material number	Tensile strength (N/mm ²)	Brinell hardness (HB)	Cutting speed (surface feet / min)	
						FIREX/nanoFIREX Ⓡ	TiCN Ⓒ
P	Carbon steel	C < = 0.15 %	11SMn30+C / 1.0715 C15 / 1.0401	500 600	150 180	490-720	425-655
		C ≥ 0.15-0.45 %	S235JR (ST37-2) / 1.0037 Ck22 / 1.1151	400 600	120 180		
		C > 0.45 %	S355JO (St52-3) / 1.0553 C60 / 1.0601	600 900	180 270		
	Low-alloyed steel (alloy content ≤ 5%)	annealed	16MnCr5 / 1.7131 18CrNi8 / 1.5920	650 650	200 200	395-560	295-490
		heat-treatable	25CrMoV4 / 1.7218 42CrMo4V / 1.7225	900 1100	270 320		
	High-alloyed steel (alloy content > 5%)	annealed	X37CrMoV5-1 / 1.2343 X153CrMoV12 / 1.2379	750 850	220 250	425-590	-
		heat-treatable	55NiCrMoV7 / 1.2714	1200	350		
	Cast steel	un-alloyed, low-alloyed	GS52 / 1.0552	600	180	425-590	-
		high-alloyed	GX40CrNiSi22-10 / 1.4826	750	220		
M	Stainless steel	martensitic, ferritic, tempered	X14CrMoS17 / 1.4104 X4CrNiMo16-5-1 / 1.4418	800 1000	240 300	295-525	230-460
			X5CrNi18-10 / 1.4301 X2CrNiMo17-12-2 / 1.4404	650	200		
		austenitic, Ni > 8%	X2CrNiMoCuN25-6-3 / 1.4507 X2CrNiMoN25-7-4 / 1.4410	850	250	230-330	165-395
K	Grey cast iron	low tensile strength	EN-GJL-200 (GG20) / 0.6020		180	295-490	-
		high tensile strength	EN-GJL-400 (GG40) / 0.6040		260		
	Spheroidal graphite iron	low tensile strength	EN-GJS-400-15 (GGG40) / 0.7040		160	295-490	230-330
		high tensile strength	EN-GJS-700-2 (GGG70) / 0.7070		260		
	Malleable cast iron	low tensile strength	EN-GJMW-350-4 (GTW35) / 0.8035		125	230-460	165-330
		high tensile strength	EN-GJMB-550-4 (GTS55) / 0.8155		250		
N	Al-alloys	non-heat-treatable <12% Si	EN-AW-2017 (AlCuMg1) / 3.1325		60	-	1640-2625
		heat-treatable <12% Si	EN-AW-6082 (AlMgSi1) / 3.2315		100		
	Al-cast-alloys	non-heat-treatable <12% Si	AlSi9Cu3 / 3.2163		80	-	1640-2625
		heat-treatable <12% Si	AlSi10Mg / 3.2383		100		
	Copper alloys	brass, lead alloy	CuZn39Pb2 (MS58) / 2.0380	400	120	-	435-820
		bronze	CuSn6 / 2.1020	500	150		
S	Heat resistant alloys, super alloys	NiFe-base, annealed	NiCr15Fe (Alloy600) / 2.4816	700		-	100-230
		NiFe-base, hardened		950		-	400-165
		NiCo-base, annealed	NiMo16Cr15W (Alloy C-276) / 2.4819	800		-	100-195
		NiCo-base, cast		1100		-	100-130
		NiCo-base, hardened	NiCr19NbMo (Alloy718) / 2.4668	1200		-	65-100
	Titanium-alloys	annealed	Ti6Al4V / 3.7164	900		-	100-165
		hardened		1200		-	65-100
H	Hardened steels	Heat-treatable steel			> 52 HRC	66-131	-
		Heat-treatable/case hardened steel			> 59 HRC	33-98	-
		Heat-treatable/case hardened steel			> 62 HRC	(CBN)	-

The specified values must be adapted to the machine and machining conditions.

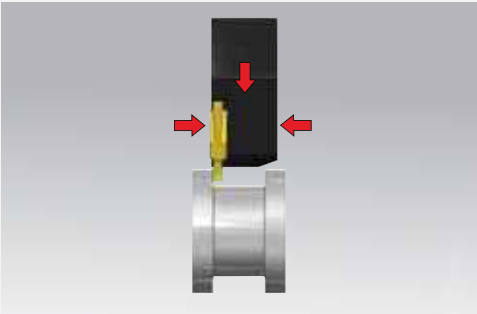
General machining hints



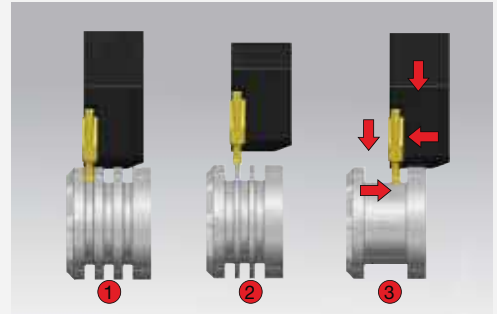
Width of machining should be min. 70% of the width of the cutting edge



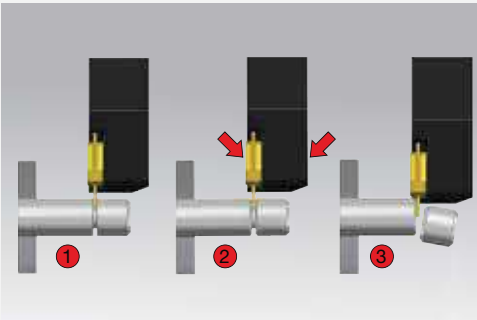
Reduce feed by 20 – 50% when grooving on angled faces



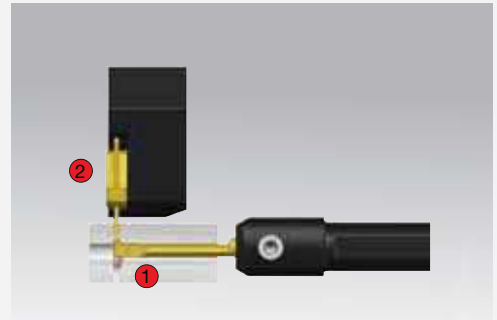
Recessing
- radial in-feed
- turning in axial direction
- leave axial and radial stock for finishing



Process tip for reaming:
1 – pre-grooving “comb”
2 – removing remaining webs
max width of webs: insert width $b - (2xr)$
3 – finishing



Process tip for parting:
1 – pre-grooving
2 – chamfering
3 – parting



Process tip for parting into a central bore:
1 – pre-grooving with tool type GV104
2 – parting with tool type GZ305



Troubleshooting

Subject		Solution											
		Feed	Feed at centre	Cutting speed	RH/LH edge orientation	Corner radius	Wiper	Width of groove	Tool clamping	Workpiece clamping	Tool overhang	Centre height of cutting edge	Coolant
Related to wear	Edge chipping	↓	↓			↑			🔍	🔍	🔍	🔍	
	Build up edge			↑									👍
	Flank wear	🔍	↓	↓		↑						🔍	👍
	Plastic deformation	↓	↑	↓		↑							👍
Related to the component	Vibrations	↑		↓		↓		↓	🔍	🔍	↓	🔍	
	Burrs		↓		👍	↓						🔍	👍
	Surface	↓	↓	↑		↑	👍	↑	🔍	🔍	↓	🔍	👍
	Long chips (no chip breakage)	↑		↑									👍
	(too) short chips, compressed chips	↓											

- ↓ decrease values (large impact)
- ↑ increase values (large impact)
- ↓ decrease values (low impact)
- ↑ increase values (low impact)
- 🔍 check
- 👍 apply