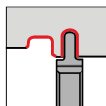




Indexable insert for radial grooving and copying external and internal



- grooving depth up to 5 mm
- Indexable insert applicable in right and left holders
- Geometry .AA ground

for tool holders type GH305/GB305 size 04 see from page 122

Tool material

Solid carbide

Type

GE 305

GE 305

GE 305

Surface

F

C

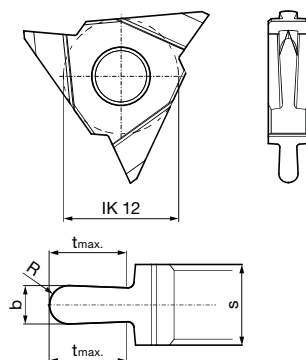
○

FIRE

TiCN

bright

Cutting data page 149



System 305

Series no.

25613

25614

25615

Code no.	Description	b ± 0.02	R	t max	s	Size
		mm	mm	mm	mm	
12.001	GE305.0050.025.AA.04.N	0.50	0.25	1.50	4.20	04
12.002	GE305.0100.050.AA.04.N	1.00	0.50	3.00	4.20	04
12.003	GE305.0110.055.AA.04.N	1.10	0.55	3.00	4.20	04
12.004	GE305.0120.060.AA.04.N	1.20	0.60	3.00	4.20	04
12.005	GE305.0140.070.AA.04.N	1.40	0.70	3.00	4.20	04
12.006	GE305.0150.075.AA.04.N	1.50	0.75	3.00	4.20	04
12.007	GE305.0160.080.AA.04.N	1.60	0.80	4.00	4.20	04
12.008	GE305.0180.090.AA.04.N	1.80	0.90	4.00	4.20	04
12.009	GE305.0200.100.AA.04.N	2.00	1.00	4.00	4.20	04
12.010	GE305.0220.110.AA.04.N	2.20	1.10	5.00	4.20	04
12.011	GE305.0250.125.AA.04.N	2.50	1.25	5.00	4.20	04
12.012	GE305.0280.140.AA.04.N	2.80	1.40	5.00	4.20	04
12.013	GE305.0300.150.AA.04.N	3.00	1.50	5.00	4.20	04
12.014	GE305.0360.180.AA.04.N	3.60	1.80	5.00	4.20	04
12.015	GE305.0400.200.AA.04.N	4.00	2.00	5.00	4.20	04



SYSTEM 305

	Feed rate f (IPR) ↓ 0.0012 - 0.0059 ↔ 0.0008 - 0.0047 ap = 0.0039 - 0.0197 in		Feed rate f (IPR) ↓ 0.0012 - 0.0059 ↔ 0.0008 - 0.0047 ap = 0.0039 - 0.0197 in	General formulas 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

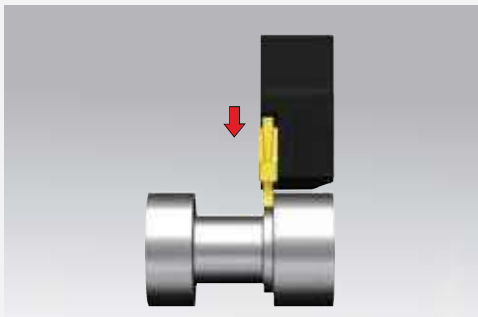
↓ = radial feed direction ↔ = axial feed direction

ISO	Material		Material examples/ material number	Tensile strength (N/mm²)	Brinell hardness (HB)	Cutting speed (surface feet / min)	
						FIREX/nanoFIREX	TiCN
P	Carbon steel	C ≤ 0.15 %	11SMn30+C / 1.0715	500	150	490-720	425-655
			C15 / 1.0401	600	180		
		C ≥ 0.15-0.45 %	S235JR (ST37-2) / 1.0037	400	120		
			Ck22 / 1.1151	600	180		
	Low-alloyed steel (alloy content ≤ 5%)	annealed	S355JO (St52-3) / 1.0553	600	180	425-590	330-525
			C60 / 1.0601	900	270		
		heat-treatable	16MnCr5 / 1.7131	650	200	395-560	295-490
			18CrNi8 / 1.5920	650	200		
	High-alloyed steel (alloy content > 5%)	annealed	25CrMoV4 / 1.7218	900	270	295-490	230-425
			42CrMo4V / 1.7225	1100	320		
		heat-treatable	X37CrMoV5-1 / 1.2343	750	220	425-590	-
			X153CrMoV12 / 1.2379	850	250		
M	Stainless steel	un-alloyed, low-alloyed	GS52 / 1.0552	600	180	425-590	-
		high-alloyed	GX40CrNiSi22-10 / 1.4826	750	220		
		martensitic, ferritic, tempered	X14CrMoS17 / 1.4104	800	240	295-525	230-460
			X4CrNiMo16-5-1 / 1.4418	1000	300		
		austenitic, Ni > 8 %	X5CrNi18-10 / 1.4301	650	200	295-525	230-460
			X2CrNiMo17-12-2 / 1.4404	850	250		
		austenitic, ferritic (Duplex)	X2CrNiMoCuN25-6-3 / 1.4507			230-330	165-395
			X2CrNiMoN25-7-4 / 1.4410				
	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	-	655-1310
	Al-cast-alloys	non-heat-treatable <12% Si	AlSi9Cu3 / 3.2163		80	-	1640-2625
		heat-treatable <12% Si	AlSi10Mg / 3.2383		100	-	655-1310
	Copper alloys	brass, lead alloy	CuZn39Pb2 (MS58) / 2.0380	400	120	-	435-820
		bronze	CuSn6 / 2.1020	500	150	-	330-590
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)	-

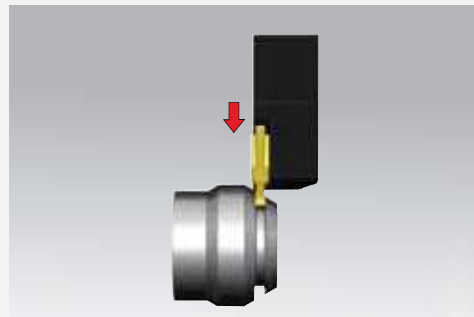
The specified values must be adapted to the machine and machining conditions.



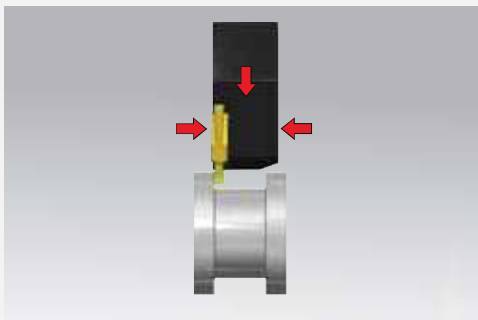
General machining hints



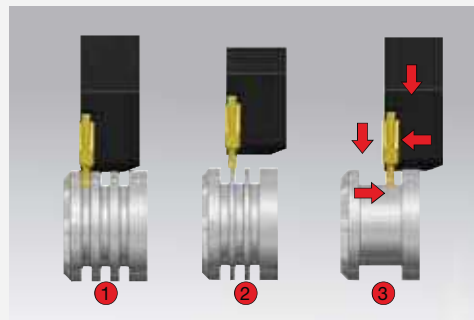
Width of machining should be min. 70% of the width of the cutting edge



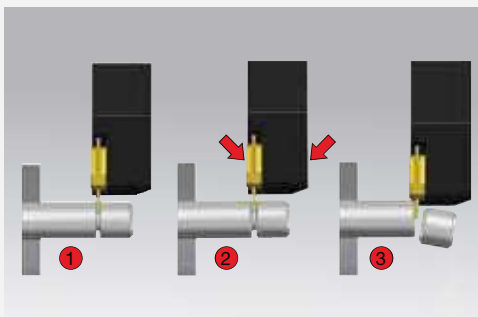
Reduce feed by 20 – 50% when grooving on angled faces



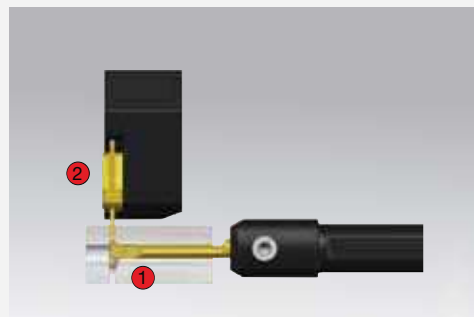
Recessing
- radial in-feed
- turning in axial direction
- leave axial and radial stock for finishing



Process tip for recessing:
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

305





SYSTEM 305

GROOVING AND PARTING OFF



Square shank holder straight
with and without IC
from page 122



Square shank holder, 90°
offset with and without IC
from page 127



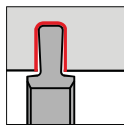
Square shank holder, 45°
offset with and without IC
from page 131



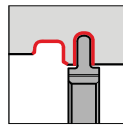
Round shank holder
with and without IC
from page 133

Tool holder

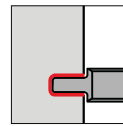
System 305



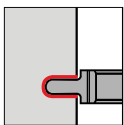
Radial grooving
straight slots, Type GE
from page 137



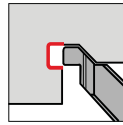
Radial grooving
full radius slots, Type GE
from page 139



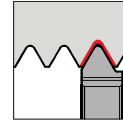
Axial grooving,
straight slots, Type GA
page 140



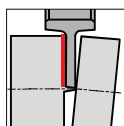
Axial grooving,
full radius slots, Type GA
page 141



Grooving axial recesses,
Type GA
page 142



External thread turning,
Type GG
from page 143



Parting off,
Type GZ
from page 145

Indexable inserts