

**Inserts:**  
Grooving widths .020" ~ .118"  
(0.5 ~ 3.0mm)  
Max Cutting Depth - Up to .197"  
(5mm)  
Right and left hand  
Partial profile threading  
Full radius options (2 & 3mm)

**Chip Breakers:**  
TQJ  
TQS


**Grade:**  
TT4430  
- PVD-AlTiCrN coated  
- Ideal for small parts  
machining  
- Steel, stainless steel,  
titanium

**Holders:**  
.375", .500", .625" & .750"  
Metric also available.  
Refer to e-Catalog.  
With or without COOLBURST  
internal coolant supply

## Grooving Family Expands with a New Series of Smaller Inserts and Holders for Swiss-Type Automatic Lathes

Ingersoll is pleased to introduce a new addition to the GoldFlex 4-edge grooving line. This smaller, 20mm IC insert utilizes the same strong clamping system that has made GoldFlex virtually unmatched in performance. The new inserts are capable of parting or grooving up to a square shoulder and feature new grade TT4430 specifically developed for small parts manufacturing.

### Features & Benefits:

- 4-edge miniature insert for grooving, parting, turning, profiling and threading on Swiss-type lathes
- Inserts are handed so they can part or groove next to a square shoulder
- Grooving width range of .020" ~ .118" (0.5 to 3.0 mm)
- Grooving depth range of .087" ~ .197" (2.2 to 5.0 mm)
- Superior insert position repeatability and strong clamping force results in long tool life
- Holders available with or without  COOLBURST high pressure internal coolant supply
- Inserts feature new PVD-coated grade TT4430 and a sharp cutting edge







**GOLDFLEX™ FEATURES**

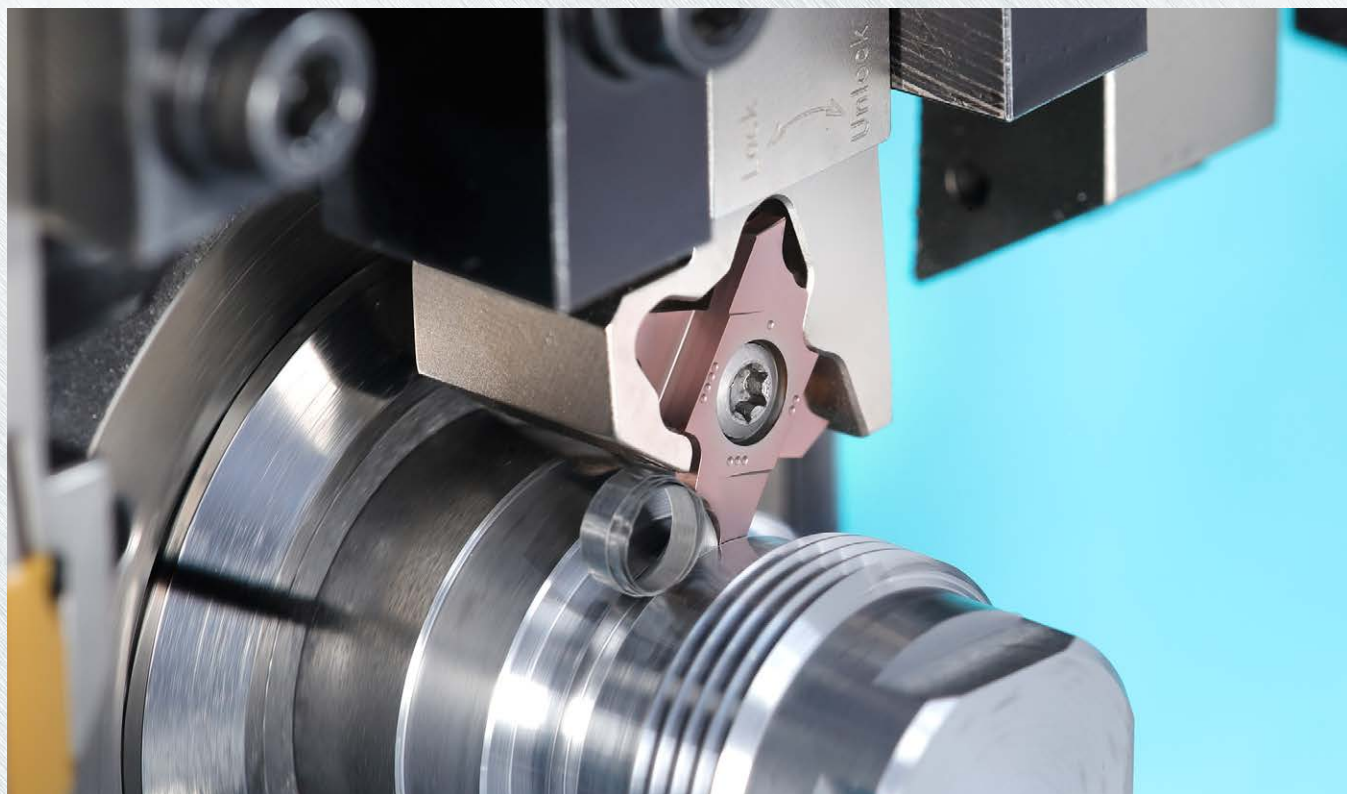
As one of the first companies to introduce a 4-edge grooving insert into the market, Ingersoll is pleased to add a new miniature line of GoldFlex inserts suitable for Swiss type automatic lathes.

The existing GoldFlex families have been expanded to include a new smaller 20mm IC insert, using the same rigid clamping system that protects unused edges from damage during the cut. Available as standard inserts with a grooving width range of .020" ~ .118" (0.5 to 3.0 mm) and a grooving depth of .087" ~ .197" (2.2 to 5.0 mm), the inserts are suitable for smaller diameter workpieces.

Each insert is handed so that it's possible to part and groove up to a square shoulder. All inserts are available in a new grade, TT4430, which was developed specifically for small parts machining. This PVD-AlTiCrN coated grade features a tough, submicron substrate that prevents chipping and provides long tool life and very reliable performance. The sharp cutting edge is ideal for machining small parts in a variety of materials including steel, stainless steel and titanium and minimizes burrs and build-up.

The stable and strong clamping of the entire GoldFlex line provides high performance, long tool life and excellent insert position repeatability. A variety of inserts are capable of a variety of applications including grooving, parting, turning, profiling and threading.

Standard tool holders feature shank sizes of .375", .500", .625" & .750", and have a short head in order to avoid interference in tight spaces. Holders are also available with the **COOLBURST** feature for high-pressure internal coolant up to 4350 psi (300 bar). Metric holders are also available. Refer to Ingersoll's E-Catalog for more information.







**GOLDFLEX™ INSERT SIZE RANGE**



**TQS/J 20**  
Max. cutting depth .197

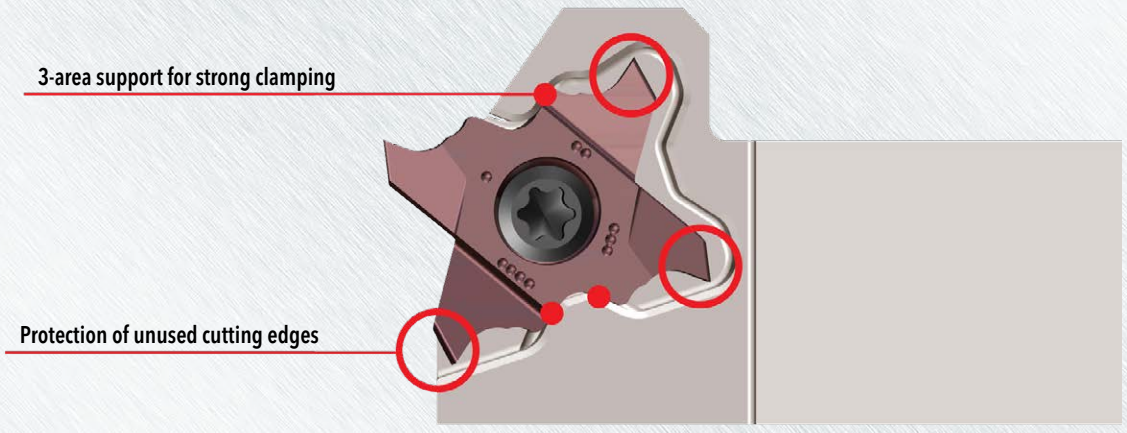


**TQC/J/S 27**  
Max. cutting depth .250



**TQC 34**  
Max. cutting depth .390

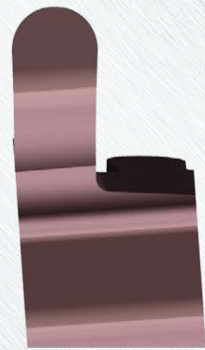
**GOLDFLEX™ 4 CORNER INSERT FOR SHALLOW GROOVING**



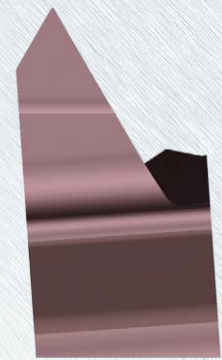
**GOLDFLEX™ 4 CORNER INSERT FOR SHALLOW GROOVING & THREADING**



Parting and Grooving



Profiling



Threading

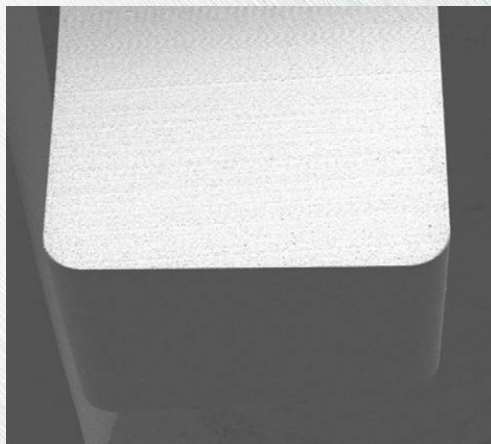




**GOLDFLEX™ MACHINING NEXT TO A SHOULDER**



**GOLDFLEX™ NEW TT4430 PVD COATED GRADE AND EDGE TREATMENT**



**TT4430 PVD Grade**

- Ideal combination of a tough submicron substrate and a multi AlTiCrN coated layer for anti-chipping and reliable performance
- General machining of miniature parts for steel, stainless steel and titanium alloy

**Cutting Edge Geometry**

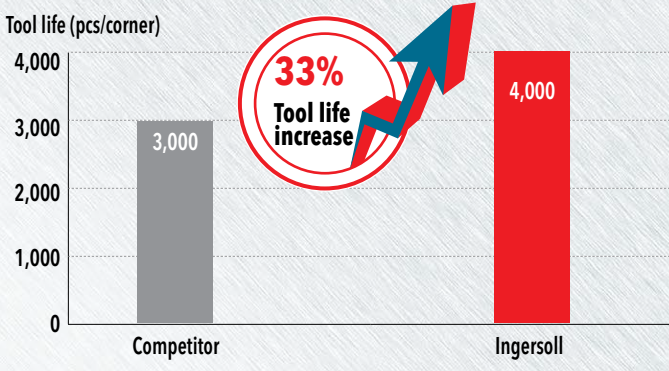
- Sharp cutting edge without micro chipping
- Improved tool life and reduced burrs
- Good workpiece surface finish



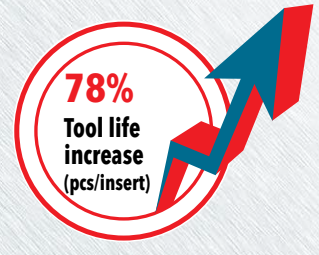


**GOLDFLEX™ CASE STUDY 1**

		Competitor	Ingersoll
Material		AISI 1045	
Operation		External grooving	
Insert		3 corner grooving insert	TQS 20-2.00-0.10-R TT4430
Holder		Grooving holder	TQHR 16-20
Cutting speed	V (sfm)	535	535
Feed rate	f (ipr)	.002	.002
Depth of cut	ap (inch)	.060	.060
Coolant		Wet	Wet
Tool life (pcs/corner)		3,000	4,000

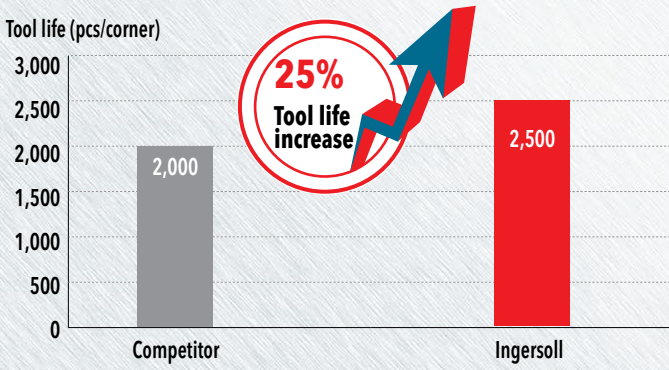


Competitor: 3 corners X 3,000 pcs = 9,000 pcs  
**TQS 20: 4 corners X 4,000 pcs = 16,000 pcs**

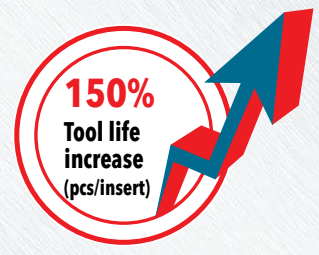


**GOLDFLEX™ CASE STUDY 2**

		Competitor	Ingersoll
Material		AISI 304	
Operation		External grooving	
Insert		Conventional 2 corner grooving insert	TQS 20-1.50-0.10-R TT4430
Holder		Grooving holder	TQHR 16-20
Cutting speed	V (sfm)	335	335
Feed rate	f (ipr)	.001	.001
Depth of cut	ap (inch)	.040	.040
Coolant		Wet	Wet
Tool life (pcs/corner)		2,000	2,500



Competitor: 2 corners X 2,000 pcs = 4,000 pcs  
**TQS 20: 4 corners X 2,500 pcs = 10,000 pcs**

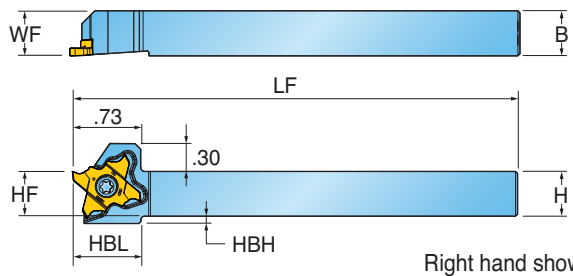
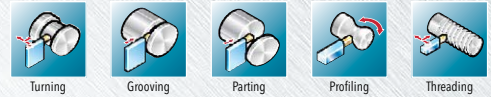






**GOLDFLEX™ SERIES TQHR/L-20**

GROOVING AND TURNING HOLDERS FOR SWISS-TYPE AUTOMATIC LATHES



Right hand shown

Designation	Dimension (inch)							Insert
	H Shank Height	HF Functional Height	B Shank Width	LF Functional Length	WF Functional Width	HBL Head Bottom Offset Length	HBH Head Bottom Offset Height	
TQHR/L 9.5-20	.375	.375	.375	5.0	.375	.73	0.16	TQS 20 TQJ 20
TQHR/L 12.7-20	.500	.500	.500	5.0	.500	.73	0.08	
TQHR/L 15.9-20	.625	.625	.625	5.0	.625	-	-	
TQHR/L 19-20	.750	.750	.750	5.0	.750	-	-	

Spare Parts

Designation	Screw	Wrench	
TQHR/L...20	 TS 40A100L <sup>(1)</sup> TS 40A100 <sup>(2)</sup>	 T-1508/5	

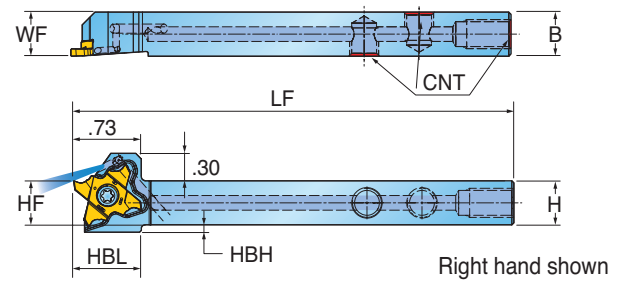
<sup>(1)</sup> For TQHR, <sup>(2)</sup> For TQHL





**GOLDFLEX™ SERIES TQHR/L-20-TB**

GROOVING AND TURNING HOLDERS WITH HIGH PRESSURE COOLANT FOR SWISS-TYPE AUTOMATIC LATHES



Designation	Dimension (inch)							CNT	Insert
	H Shank Height	HF Functional Height	B Shank Width	LF Functional Length	WF Functional Width	HBL Head Bottom Offset Length	HBH Head Bottom Offset Height		
TQHR/L 12.7-20-TB	.500	.500	.500	5.0	.500	.73	0.08	UNF 5/16-24	TQS 20 TQJ 20
TQHR/L 15.9-20-TB	.625	.625	.625	5.0	.625	-	-	UNF 5/16-24	
TQHR/L 19-20-TB	.750	.750	.750	5.0	.750	-	-	1/8 27 NPTF	

Designation	1015 PSI Flow Rate (GPM)	1450 PSI Flow Rate (GPM)	2030 PSI Flow Rate (GPM)
TQHR/L...-TB	2.4-2.9	2.9-3.4	3.2-3.7

**Spare Parts**

Designation	Screw	Wrench	Plug	Plug Wrench	Coolant Accessories (Fittings & Hoses)
	TQHR/L 12.7/15.9-20-TB	TS 40A100L <sup>(1)</sup> TS 40A100 <sup>(2)</sup>	T-1508/5	PLG 5/16 UNF	L-W 4
TQHR/L 19-20-TB	TS 40A100L <sup>(1)</sup> TS 40A100 <sup>(2)</sup>	T-1508/5	NPTF 1/8-TQ19	L-W 3/16	Refer to Ingersoll Website

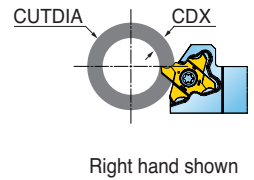
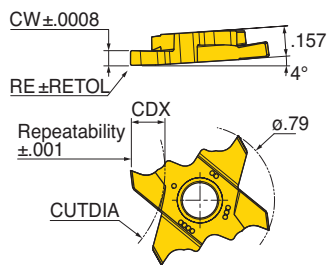
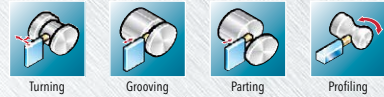
<sup>(1)</sup> For TQHR, <sup>(2)</sup> For TQHL





**GOLDFLEX™ SERIES TQS 20**

**PARTING AND GROOVING - PRECISION INSERTS WITH GROUND CHIP BREAKER**



RE	RETOL
RE ≤ .004	.0008
.004 < RE ≤ .016	.0012
RE > .016	.0020

Designation	Feed (ipr)		Dimension (inch)			CUTDIA (Cutting Diameter)						Grade
	Cutting Feed Min.	Cutting Feed Max.	CW Cutting Width	RE Corner Radius	CDX Cutting Depth Max.	CDX ≤ .087	CDX ≤ .106	CDX ≤ .138	CDX ≤ .157	CDX ≤ .177	CDX ≤ .197	
TQS20-0.50-0.05-R/L	.0010	.0030	0.020	0.002	0.087	N.L.	-	-	-	-	-	•
TQS20-1.00-0.10-R/L	.0010	.0030	0.039	0.004	0.106	N.L.	N.L.	-	-	-	-	•
TQS20-1.50-0.10-R/L	.0010	.0040	0.059	0.004	0.197	N.L.	N.L.	2.75	1.96	1.18	0.63	•
TQS20-2.00-0.10-R/L	.0010	.0040	0.079	0.004	0.197	N.L.	N.L.	2.75	1.96	1.18	0.63	•
TQS20-2.00-1.00-R/L*	.0015	.0055	0.079	0.039	0.197	N.L.	N.L.	2.75	1.96	1.18	0.63	•
TQS20-2.50-0.10-R/L	.0020	.0050	0.098	0.004	0.197	N.L.	N.L.	2.75	1.96	1.18	0.63	•
TQS20-3.00-0.10-R/L	.0015	.0060	0.118	0.004	0.197	N.L.	N.L.	2.75	1.96	1.18	0.63	•
TQS20-3.00-1.50-R/L*	.0015	.0060	0.118	0.059	0.197	N.L.	N.L.	2.75	1.96	1.18	0.63	•

N.L. : No Limit  
Full Radius Insert

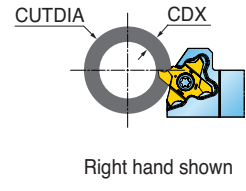
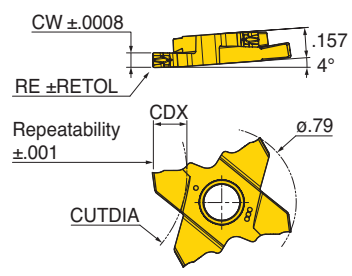
•: Standard items





**GOLDFLEX™ SERIES TQJ 20**

PARTING AND GROOVING - PRECISION INSERTS WITH GROUND CHIP BREAKER



RE	RETOL
RE ≤ .004	.0008
.004 < RE ≤ .016	.0012
RE > .016	.0020

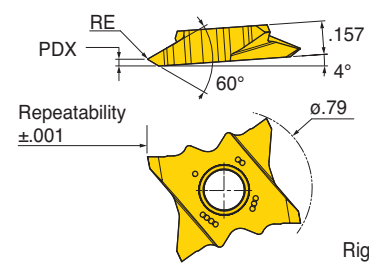
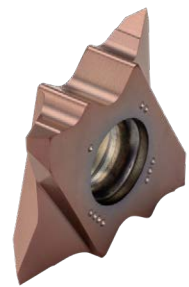
Designation	Feed (ipr)		Dimension (inch)			CUTDIA (Cutting Diameter)					Grade
	Cutting Feed Min.	Cutting Feed Max.	CW Cutting Width	RE Corner Radius	CDX Cutting Depth Max.	CDX ≤ .106	CDX ≤ .138	CDX ≤ .157	CDX ≤ .177	CDX ≤ .197	
TQJ20-1.00-0.10-R/L	.0010	.0030	0.039	0.004	0.106	N.L.	-	-	-	-	•
TQJ20-1.50-0.20-R/L	.0010	.0030	0.059	0.008	0.197	N.L.	2.75	1.96	1.18	0.63	•
TQJ20-2.00-0.20-R/L	.0015	.0040	0.079	0.008	0.197	N.L.	2.75	1.96	1.18	0.63	•

N.L. : No Limit

•: Standard items

**GOLDFLEX™ SERIES TQS 20-MT**

PARTIAL PROFILE 60° THREADING INSERTS



Right hand shown

Designation	Dimension (inch)						Grade
	TPN Thread Pitch Min. (mm)	TPX Thread Pitch Max. (mm)	TPIN Threads Per Inch Min.	TPIX Threads Per Inch Max.	RE Corner Radius	PDX Profile Distance Ex.	
TQS20-MT-0.05-R/L	0.30	1.75	48	14	.002	.031	•

•: Standard items





PARTING & GROOVING PRODUCTS

**GOLDFLEX™ OPERATING GUIDELINES**

ISO	Material		Condition	Tensile Strength (Kpsi)	Hardness (HB)	Material No.	Cutting Speed Vc (SFM)
							TT4430
P	Non-alloy steel & cast steel, free cutting steel	<0.25%C	Annealed	61	125	1	395-720
		>=0.25%C	Annealed	94	190	2	330-625
		<0.55%C	Quenched & Tempered	123	250	3	260-560
		>=0.25%C	Annealed	109	220	4	260-625
			Quenched & Tempered	145	300	5	230-460
	Low alloy steel & cast steel (less than 5% alloying elements)		Annealed	87	200	6	260-360
			Quenched & Tempered	135	275	7	260-460
			Quenched & Tempered	145	300	8	230-360
			Quenched & Tempered	174	350	9	165-330
	High alloy steel, cast steel, & tool steel		Annealed	99	200	10	200-395
			Quenched & Tempered	160	325	11	130-200
M	Stainless steel & cast steel		Ferritic/martensitic	99	200	12	200-495
			Martensitic	119	240	13	200-395
			Austenitic	87	180	14	260-490
K	Grey Cast Iron (GG)		Ferritic		160	15	
			Pearlitic		250	16	
	Cast Iron Nodular (GGG)		Ferritic		180	17	
			Pearlitic		260	18	
	Malleable Cast Iron		Ferritic		130	19	
			Pearlitic		230	20	
N	Aluminum - wrought alloy		Not cureable		60	21	
			Cured		100	22	
	Aluminum - cast, alloyed	<= 12% Si	Not cureable		75	23	
			Cured		90	24	
	> 12% Si		High temperature		130	25	
			Free cutting		110	26	
	Copper alloys		Brass		90	27	
			Electrolytic copper		100	28	
	Non-metallic		Duro plastics fiber plastics			29	
			Hard rubber			30	
S	High Temp Alloys	Fe based	Annealed		200	31	100-200
			Cured		280	32	85-140
		Ni or Co based	Annealed		250	33	85-100
			Cured		350	34	40-70
			Cast		320	35	40-90
	Titanium, Ti alloys			Rm 58		36	275-500
			Alpha+beta alloys cured	Rm 152		37	85-175
H	Hardened steel		Hardened		55 HRC	38	
			Hardened		60 HRC	39	
	Chilled cast iron		Cast		400	40	
	Cast iron nodular		Hardened		55 HRC	41	



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