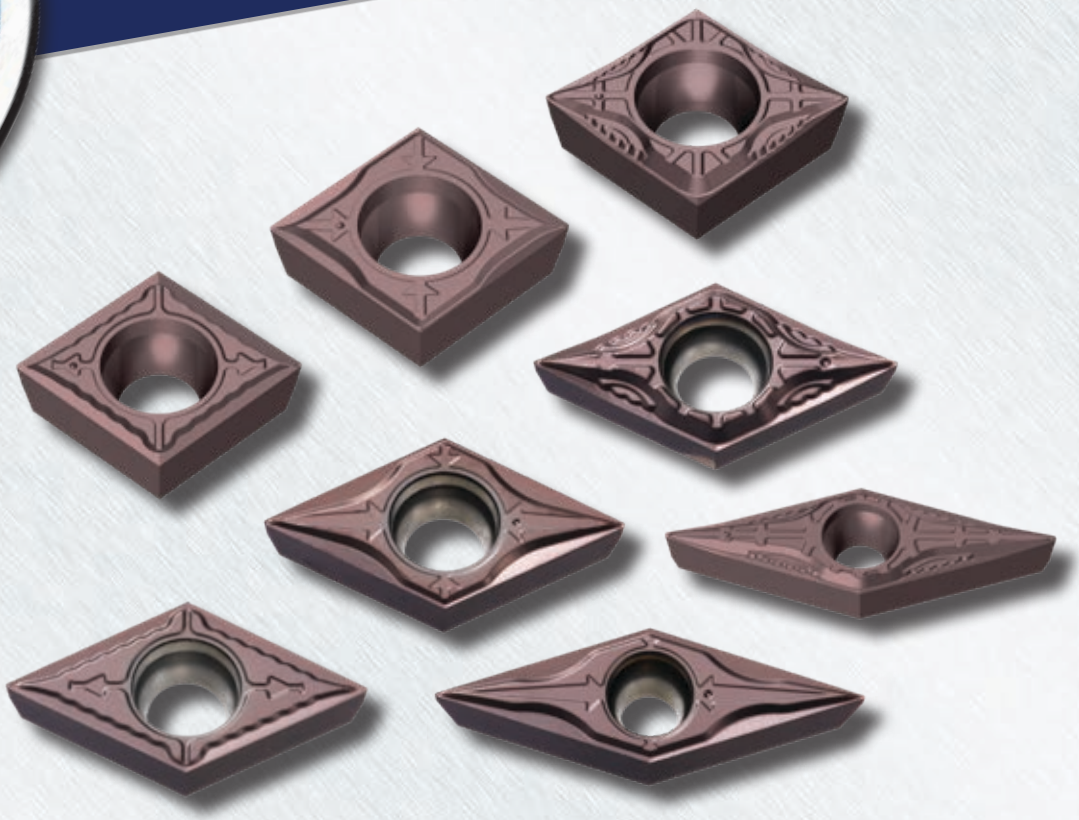
INDUSTRY 4.0
NEW PRODUCT ANNOUNCEMENT
2020

MINITURN™

TURNING PRODUCTS



Insert Styles:
- CCGT 21.5 / 32.5
- DCGT 21.5 / 32.5
- VBGT 22
- VCGT 22

Corner Radii:
- .004", .008", .016"

Chip Breakers:
- SL – Low DOC & Feed
- SM – First Choice
- SH – Large DOC and stronger edge

Grades:
- TT4410
  PVD-AlTiCrN
  P05-P25; M05-M25; S05-S25
  Maximum wear resistance
- TT4430
  PVD-AlTiCrN
  P20-P40; M20-M40; S20-S40
  General purpose, first choice

New Turning Grades and Chip Breakers for Swiss Type Lathes and Finish Bore Applications

Ingersoll is expanding its offering of high accuracy inserts commonly used in Swiss machine and precision boring applications. Two new grades, TT4410 and TT4430, have been developed using superfine substrates and new PVD coating technology that improves adhesion. Three new chip breakers, SL, SM & SH, have also been added to provide options to control chips in all applications from .001" to .138" depth of cut.

Features & Benefits:
- Two new grades reduce peeling, flaking & chipping while offering longer tool life than existing grades.
- Three new chip breakers dramatically expand our comprehensive program of precision inserts and provide options to control chips in virtually any application
- Accurate "G" tolerance inserts provide high precision and excellent surface finish
- Inserts are also ideal for precision boring applications
- Neutral designed inserts offer a single solution for either right or left-handed tools

Member IMC Group
Ingersoll Cutting Tools

MINITURN™ FEATURES

When machining small components using Swiss type lathes, long tool life, good chip control and excellent surface finish are required under generally low machining conditions. Furthermore, when machining a variety of workpiece materials it's often beneficial and more efficient to use insert grades that have wide application ranges in order to reduce tool changes. In line with these demands, Ingersoll has developed two new PVD-coated grades along with three new chip breakers that can be applied to a wide variety of materials and cutting conditions.

New grades TT4410 and TT4430 offer more wear resistance, long tool life, and excellent surface finish and dimensional precision in a variety of materials typically used for small component machining, particularly under low cutting speeds and feeds. The superfine substrate is combined with a PVD-AlTiCrN coating with excellent adhesion to the precision ground surface of the insert, resulting in less peeling and chipping and more consistent tool life. This coating also resists workpiece build up on the insert.

The SL chip breaker is intended for super-finishing applications. It excels at breaking chips and providing accurate results at very light cutting depths, from .001" to .010". By minimizing chip control problems during machining, a more uniform and accurate workpiece surface finish is achieved.

The general-purpose and first-choice SM chip breaker produces very low cutting forces due to the high positive rake face geometry. The chip control is outstanding over a wide range of cutting depths up to .060". It, too, ensures very good surface finish and dimensional precision.

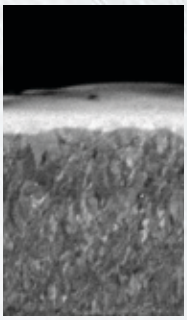
The SH chip breaker has a wider groove width that is particularly suitable for processing automotive parts. This stronger geometry still generates relatively low cutting forces and produces very good machining results at higher cutting depths, up to .138".

All inserts within this new series include a suffix at the end of the part description. The "–F" designation indicates the presence of a sharp edge for the lowest possible cutting forces and excellent surface finish, while the "–E" designation indicates a micro-honed edge that prevents chipping in more demanding or unstable applications.

MINITURN™ GRADES

TT4410

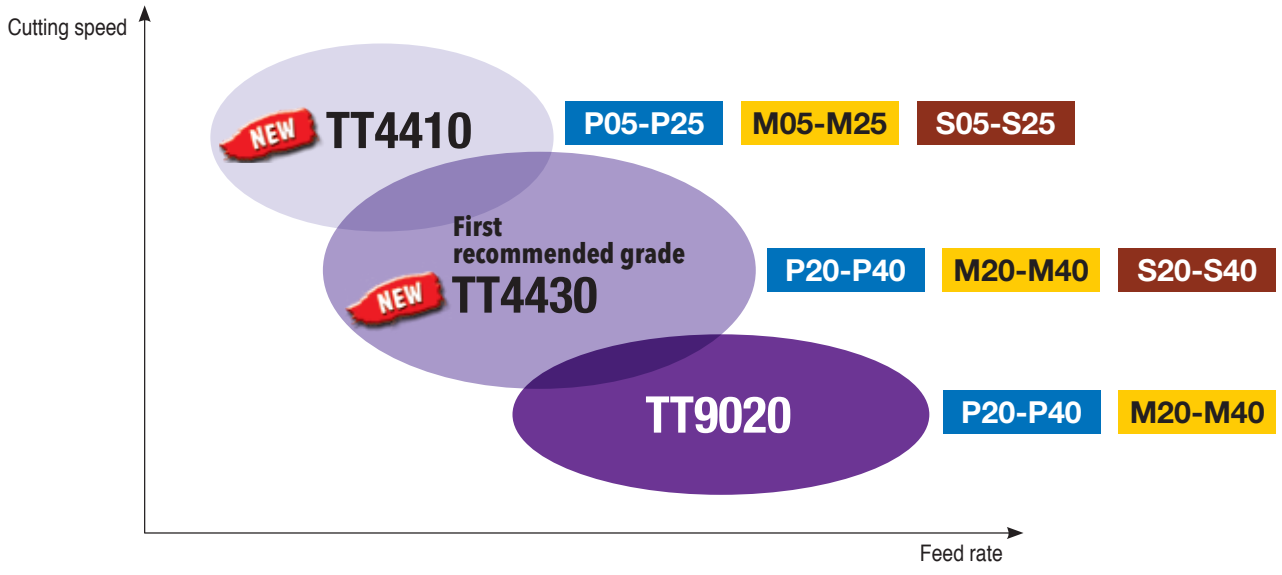
- High wear resistant micro-alloy substrate with excellent ground surface
- Multi AlTiCrN coating layer with improved bonding on substrate and anti-adhesion of workpiece material
- Suitable for steel, stainless steel, heat-resistant super alloy and Ti-alloy in high-speed continuous cutting
- Suitable for hardened steel in low-speed continuous cutting
- Dark brown color



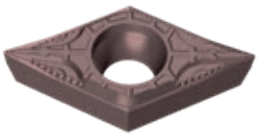
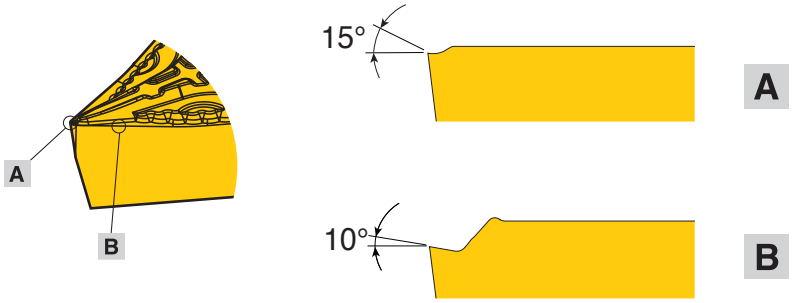
TT4430

- Toughened micro-alloy substrate
- Multi AlTiCrN coating layer with stabilized edge, anti-adhesion of workpiece material and high chipping resistance
- Suitable for steel, stainless steel, heat-resistant super alloy and Ti-alloy. Ideal for low-medium speed continuous cutting and light interrupted cutting
- Dark brown color

MINITURN™ APPLICATION RANGE

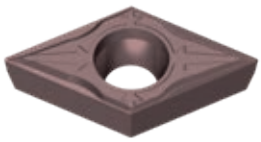
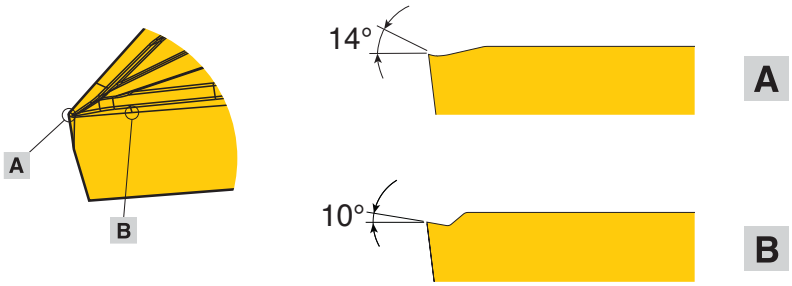


MINITURN™ SL CHIP BREAKER NEW

Chip breaker	Edge geometry
 SM	

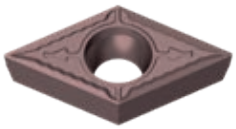
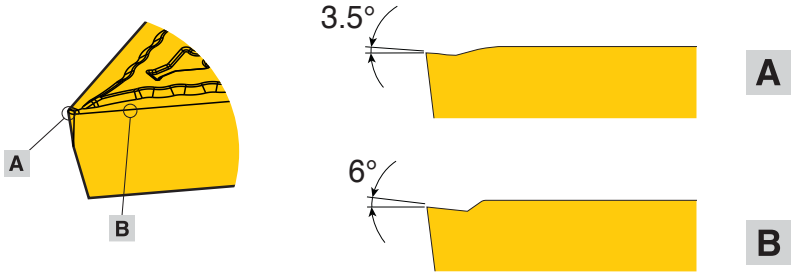
- High performance in low depth of cut and low feed machining
- Excellent chip control due to wave geometry edge and special inclined design
- Recommended depth of cut: .001"-.010"

MINITURN™ SM CHIP BREAKER NEW

Chip breaker	Edge geometry
 SM	

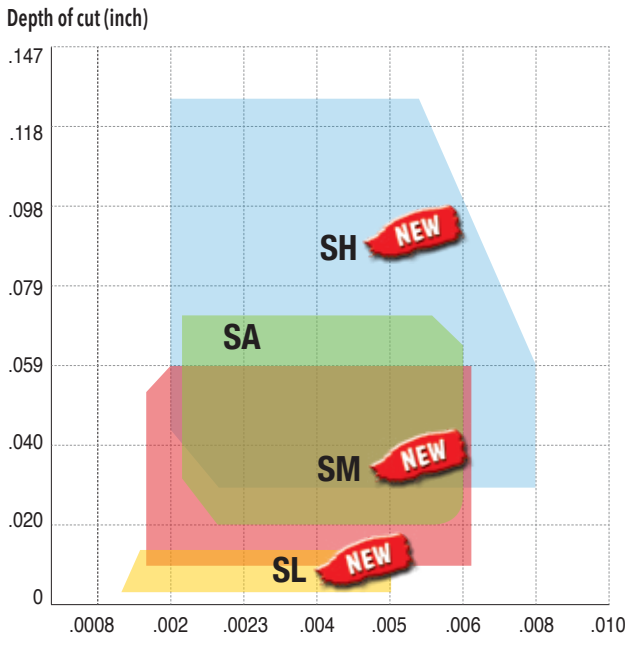
- 1st recommended chip breaker for Swiss type automatic lathes
- Stable cutting edge and low cutting force
- Long tool life and good surface finish
- Recommended depth of cut: .008"-.059"

MINITURN™ SH CHIP BREAKER NEW

Chip breaker	Edge geometry
 SH	

- Suitable for deep depth of cut machining
- Excellent chip control in a wide machining range
- A well balanced cutting edge combining sharpness and strength
- Recommended depth of cut: .027"-.138"

CHIP BREAKER RANGE



- Insert : DCGT 32.50.5
- Cutting speed : 260 SFM
- Material: Stainless steel (AISI 304)

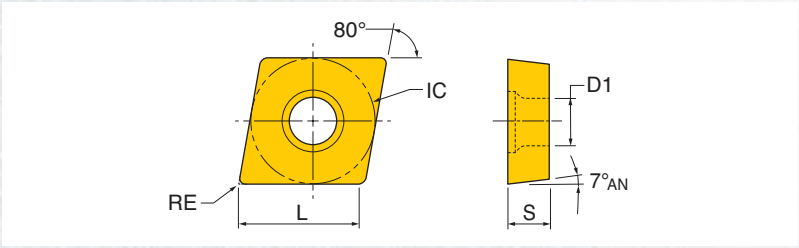
INSERT DESIGNATION SYSTEM

DCGT 32.50.5M SH-F
1 2 3

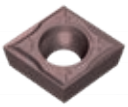
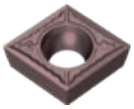
1. M: Corner radius minus tolerance
   (ex 0.5 radius designation will not exceed .008")
2. Chip breaker
   - SL: Low depth of cut chip breaker for Swiss type lathes
   - SM: Medium depth of cut chip breaker for Swiss type lathes
   - SH: Deep depth of cut chip breaker for Swiss type lathes
3. Edge specification
   - F: Sharp edge
   - E: Micro honed edge

MINITURN™ CCGT INSERTS

Positive 7° clearance 80° rhombic inserts



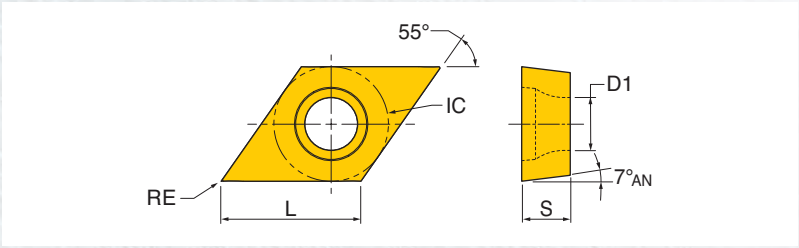
Size	Dimension (inch)				
	IC Inscribed Circle	S Thickness	RE Corner Radius	L Edge Length	D1 Hole Diameter
21.50.5	.250	.094	.008	.254	.110
32.50	.375	.156	.004	.382	.173
32.50.5	.375	.156	.008	.382	.173
32.51	.375	.156	.016	.382	.173

Insert	Designation		fn Cutting Feed		ap Cutting Depth		PVD coated	
	ANSI Number	ISO Number	Min	Max	Min	Max	TT4410	TT4430
 SL	CCGT 21.50.5M-SL-F	CCGT 060202M-SL-F	.0008	.0039	.001	.010	●	●
	32.50M-SL-F	09T301M-SL-F	.0006	.0039	.001	.010	●	●
	32.50.5M-SL-F	09T302M-SL-F	.0008	.0039	.001	.010	●	●
 SM	CCGT 21.50.5M-SM-F	CCGT 060202M-SM-F	.0008	.0047	.001	.059	●	●
	32.50M-SM-F	09T301M-SM-F	.0008	.0047	.001	.059	●	●
	32.50.5M-SM-F	09T302M-SM-F	.0008	.0047	.001	.059	●	●
	32.51M-SM-F	09T304M-SM-F	.0012	.0047	.001	.059	●	●
 SH	CCGT 32.51M-SH-F	CCGT 09T304M-SH-F	.0028	.0067	.028	.138	●	●

● : Standard items

MINITURN™ DCGT INSERTS

Positive 7° clearance 55° rhombic inserts



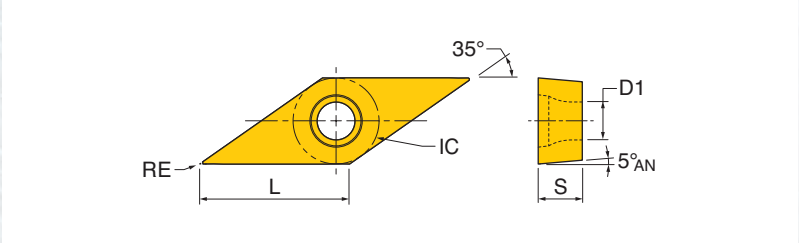
Size	Dimension (inch)				
	IC Inscribed Circle	S Thickness	RE Corner Radius	L Edge Length	D1 Hole Diameter
21.50	.250	.094	.004	.303	.110
21.50.5	.250	.094	.008	.303	.110
21.51	.250	.094	.016	.303	.110
32.50	.375	.156	.004	.457	.173
32.50.5	.375	.156	.008	.457	.173
32.51	.375	.156	.016	.457	.173

Insert	Designation		fn Cutting Feed		ap Cutting Depth		PVD coated	
	ANSI Number	ISO Number	Min	Max	Min	Max	TT4410	TT4430
 SL	DCGT 21.50M-SL-F	DCGT 070201M-SL-F	.0006	.0039	.001	.010	●	●
	21.50.5M-SL-F	070202M-SL-F	.0008	.0039	.001	.010	●	●
	32.50M-SL-F	11T301M-SL-F	.0006	.0039	.001	.010	●	●
	32.50.5M-SL-F	11T302M-SL-F	.0008	.0039	.001	.010	●	●
 SM	DCGT 21.50M-SM-F	DCGT 070201M-SM-F	.0008	.0047	.001	.059	●	●
	21.50.5M-SM-F	070202M-SM-F	.0008	.0047	.001	.059	●	●
	21.51M-SM-F	070204M-SM-F	.0012	.0047	.001	.059	●	●
	32.50M-SM-F	11T301M-SM-F	.0008	.0047	.001	.059	●	●
	32.50.5M-SM-F	11T302M-SM-F	.0008	.0047	.001	.059	●	●
	32.51M-SM-F	11T304M-SM-F	.0012	.0047	.001	.059	●	●
 SH	DCGT 32.50.5M-SH-F	DCGT 11T302M-SH-F	.0020	.0059	.028	.138	●	●
	32.51M-SH-F	11T304M-SH-F	.0028	.0067	.028	.138	●	●
	32.50.5M-SH-E	11T302M-SH-E	.0020	.0059	.028	.138	●	●

● : Standard items

MINITURN™ VBGT INSERTS

Positive 5° clearance 35° rhombic inserts



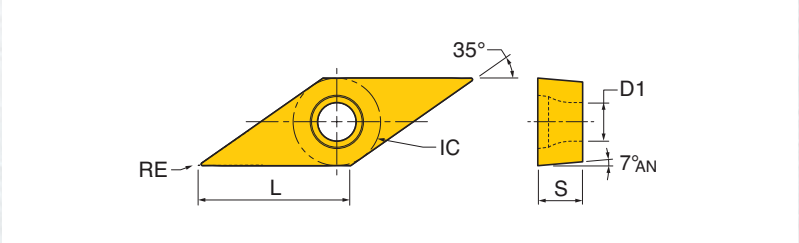
Size	Dimension (inch)				
	IC Inscribed Circle	S Thickness	RE Corner Radius	L Edge Length	D1 Hole Diameter
220	.25	.125	.004	.437	.110
220.5	.25	.125	.008	.437	.110
221	.25	.125	.016	.437	.110

Insert	Designation		fn Cutting Feed		ap Cutting Depth		PVD coated	
	ANSI Number	ISO Number	Min	Max	Min	Max	TT4410	TT4430
 SL	VBGT 220.5M-SL-F	VBGT 110302M-SL-F	.0008	.0039	.001	.010	●	●
 SM	VBGT 220M-SM-F	VBGT 110301M-SM-F	.0008	.0047	.001	.059	●	●
	220.5M-SM-F	110302M-SM-F	.0008	.0047	.001	.059	●	●
	221M-SM-F	110304M-SM-F	.0012	.0047	.001	.059	●	●

● : Standard items

MINITURN™ VCGT INSERTS

Positive 7° clearance 35° rhombic inserts



Size	Dimension (inch)				
	IC Inscribed Circle	S Thickness	RE Corner Radius	L Edge Length	D1 Hole Diameter
220	.25	.125	.004	.437	.110
220.5	.25	.125	.008	.437	.110
221	.25	.125	.016	.437	.110

Insert	Designation		fn Cutting Feed		ap Cutting Depth		PVD coated	
	ANSI Number	ISO Number	Min	Max	Min	Max	TT4410	TT4430
 SL	VCGT 220.5M-SL-F	VCGT 110302M-SL-F	.0008	.0039	.001	.010	●	●
 SM	VCGT 220M-SM-F	VCGT 110301M-SM-F	.0008	.0047	.001	.059	●	●
	220.5M-SM-F	110302M-SM-F	.0008	.0047	.001	.059	●	●
	221M-SM-F	110304M-SM-F	.0012	.0047	.001	.059	●	●

● : Standard items

MINITURN™ OPERATING GUIDELINES

Machining data for turning grades

DIN ISO 513	Material		Condition	Tensile strength (Kpsi)	Hardness HB	Material Group # VDI 3323	Cutting speed (SFM)	
							Coated	
							TT4410	TT4430
P	Non-alloy steel, cast steel, free cutting steel	<0.25%C	Annealed	61	125	1	560-1245	525-1215
		>=0.25%C	Annealed	94	190	2	560-1115	525-1115
		<0.55%C	Quenched and tempered	123	250	3	490-885	460-885
		>=0.55%C	Annealed	109	220	4	560-885	525-885
			Quenched and tempered	145	300	5	490-820	460-820
	Low alloy steel and cast steel (less than 5% of alloying elements)		Annealed	87	200	6	490-885	460-885
			Quenched and tempered	135	275	7	195-425	195-425
				145	300	8	165-330	165-330
				174	350	9	100-330	100-330
	High alloy steel, cast steel and tool steel		Annealed	99	200	10	195-590	195-590
			Quenched and tempered	160	325	11	130-260	130-260
M	Stainless steel and cast steel		Ferritic / martensitic	99	200	12	490-1245	395-885
			Martensitic	119	240	13	490-885	395-820
			Austenitic	87	180	14	295-785	295-720
K	Gray cast iron (GG)		Ferritic		180	15		
			Pearlitic		260	16		
	Cast iron nodular (GGG)		Ferritic		160	17		
			Pearlitic		250	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 temp.		130	25		
	Copper alloys	>1% Pb	Free cutting		110	26		
			Brass		90	27		
			Electrolitic copper		100	28		
	Non-metallic		Duroplastics, fiber plastics			29		
			Hard rubber			30		
S	High temp. alloys	Fe based	Annealed		200	31	130-560	130-525
			Cured		280	32	130-490	100-425
		Ni or Co based	Annealed		250	33	150-295	115-260
			Cured		350	34	100-260	100-230
			Cast		320	35	100-260	100-195
	Titanium, Ti alloys			Rm 58		36	360-625	295-590
			Alpha+beta alloys cured	Rm 152		37	165-295	130-260
H	Hardened steel		Hardened		55 HRc	38		
			Hardened		60 HRc	39		
	Chilled cast iron		Cast		400	40		
	Cast iron nodular		Hardened		55 HRc	41		

Steel | Stainless steel | Cast iron | Nonferrous | High temp. alloys | Hardened steel