

# frese TS
























CATALOGO / CATALOGUE 2.0

**ACCIAIO SINTERIZZATO**

SYNTETIC STEEL



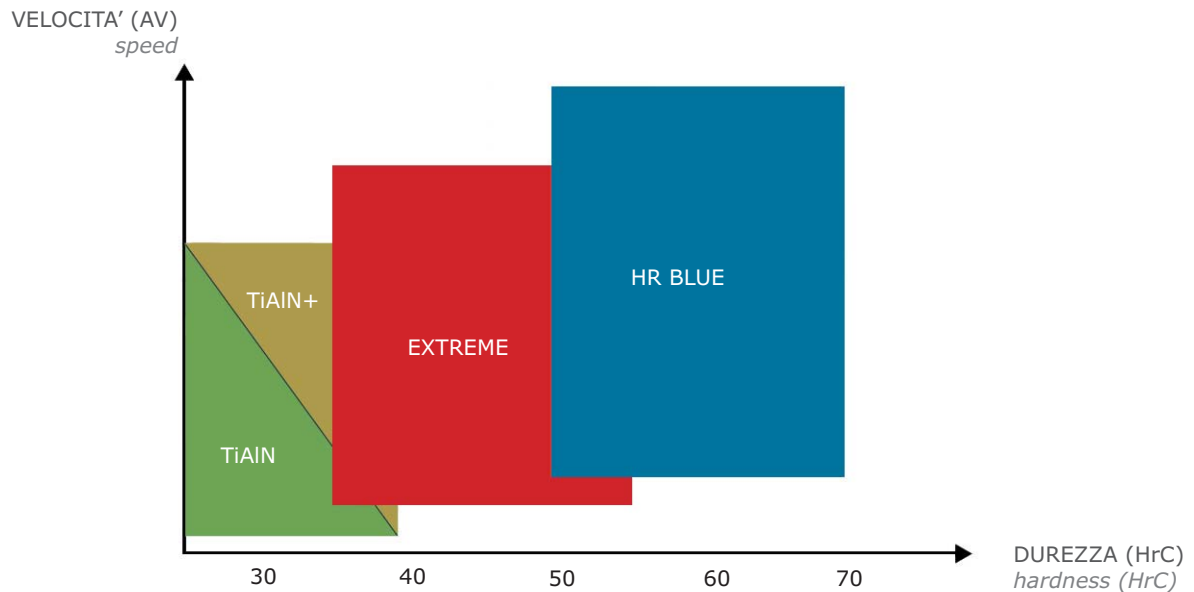
**WT** *ultimate*®




MATERIALE <i>material</i>	RIVESTIMENTO <i>coating</i>	NUMERO TAGLIANTI <i>flutes number</i>	ANGOLO ELICA <i>helix angle</i>	ANGOLO D'ENTRATA <i>entry angle</i>	GAMBO <i>shank</i>
 <b>MD Nano Grano</b> <i>HM nano grain carbide</i>	 <b>Blue</b>	 <b>2 Taglienti</b> <i>2 flutes</i>	 <b>30° Elica</b> <i>30° helix</i>	 <b>140° d'entrata</b> <i>140° entrance</i>	 <b>Gambo Cilindrico</b> <i>plain shank</i>
 <b>MD Micro Grano</b> <i>HM micro grain</i>	 <b>Extreme</b>	 <b>3 Taglienti</b> <i>3 flutes</i>			 <b>Gambo Weldon</b> <i>flat shank</i>
 <b>MD Sub Micro Grano</b> <i>HM sub micro grain</i>	 <b>TiAIN Extra</b>	 <b>4 Taglienti</b> <i>4 flutes</i>			 <b>Gambo Cono Morse</b> <i>morse taper shank</i>
 <b>Acciaio Sinterizzato</b> <i>syntetic steel</i>	 <b>TiAIN</b>	 <b>6 Taglienti</b> <i>6 flutes</i>			
 <b>Acciaio Super Rapido</b> <i>high speed steel</i>	 <b>TiCN</b>	 <b>Multitagliente</b> <i>multi flutes</i>			
	 <b>TiN</b>				
	 <b>Diamond</b>				
	 <b>Vaporizzato</b> <i>steam homo</i>				

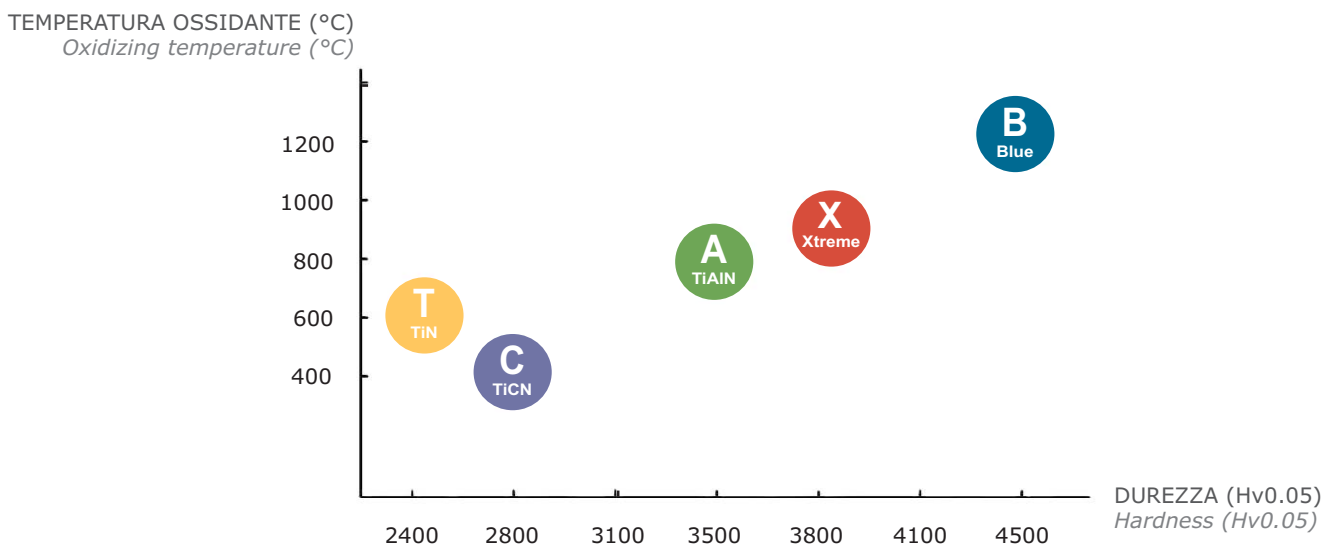
● **A Magazzino**  
On Stock

○ **Su Richiesta**  
On Request

**SCelta CONSIGLIATA IN BASE ALLA DUREZZA DEL MATERIALE DA LAVORARE**  
*tool choice based on material hardness*



-  materiale: acciai fino 45HrC, acciai per utensili, acciai resistenti al calore, acciai al carbonio, inox, ghisa  
*material: steels up to 45HrC, tool steels, heat resistant steels, carbon steels, stainless steels, cast iron*
-  materiale: acciai fino 60HrC, acciai legati, acciai temprati, inox, ghisa, alluminio, titanio  
*material: steels up to 60HrC, alloy steels, hardened steels, stainless steels, cast iron, aluminium, titanium*
-  materiale: acciai fino 70HrC, acciai legati, acciai resistenti al calore, acciai temprati, rame  
*material: steels up to 70HrC, alloy steels, prehardened steels, hardened steels, copper*





<b>codice</b> <b>code</b>	<b>gamma prodotti</b> <b>product range</b>	<b>pagina</b> <b>page</b>
<b>TS222</b>	FRESA 2 TAGLIENTI CORTA 2 FLUTE SHORT LENGTH END MILLS	6
<b>TS380</b>	FRESA 3 TAGLIENTI EXTRACORTA 3 FLUTE STUB LENGTH END MILLS	7
<b>TS458</b>	FRESA 4 TAGLIENTI CORTA 4 FLUTE SHORT LENGTH END MILLS	8
<b>TS782</b>	FRESA MULTITAGLIENTE CORTA PER SGROSSATURA PASSO FINE MULTI FLUTE SHORT LENGTH FINE PITCH ROUGHING END MILLS	9
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## FRESA 2 TAGLIENTI, CORTA 2 flute short length end mills



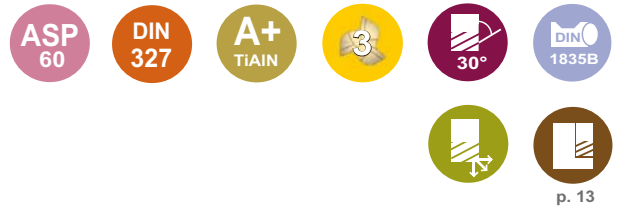
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CODICE ARTICOLO  <i>article no</i>	DIAMETRO		LUNGHEZZA		STOCK  <i>stock</i>  ● / ○
	FRESA	GAMBO	UTILE	TOTALE	
	<i>mill</i> <b>e8</b>	<i>shank</i> <b>h6</b>	<i>of cut</i> <i>length</i>	<i>overall</i>	
TS222.0010A	1	6	2.5	47	○
TS222.0020A	2	6	4.0	48	●
TS222.0030A	3	6	5.0	49	●
TS222.0040A	4	6	7.0	51	●
TS222.0050A	5	6	8.0	52	●
TS222.0060A	6	6	8.0	52	●
TS222.0070A	7	10	10.0	60	○
TS222.0080A	8	10	11.0	61	●
TS222.0090A	9	10	11.0	61	○
TS222.0100A	10	10	13.0	63	●
TS222.0120A	12	12	16.0	73	●
TS222.0140A	14	12	16.0	73	○
TS222.0160A	16	16	19.0	79	●
TS222.0180A	18	16	19.0	79	○
TS222.0200A	20	20	22.0	88	●
TS222.0220A	22	20	22.0	88	○
TS222.0250A	25	25	26.0	102	○

Tolleranze a DIN 7160 & 7161  
Tolerances according to DIN 7160 & 7161

Raggio tolleranza in µm / Tolerance range in µm					
Diametro nominale in mm / Nominal-Diameter in mm					
	da 1 a 3 from 1 to 3	oltre 3 a 6 over 3 to 6	oltre 6 a 10 over 6 to 10	oltre 10 a 18 over 10 to 18	oltre 18 a 30 over 18 to 30
<b>e8</b>	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73
<b>h6</b>	0 -6	0 -8	0 -9	0 -11	0 -13

**FRESA 3 TAGLIENTI, EXTRACORTA**  
*3 flute stub length end mills*



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CODICE ARTICOLO  <i>article no</i>	DIAMETRO		LUNGHEZZA		STOCK  <i>stock</i>  ● / ○
	FRESA  <i>mill</i>  e8	GAMBO  <i>shank</i>  h6	UTILE  <i>of cut</i>	TOTALE  <i>overall</i>	
	<i>diameter</i>		<i>length</i>		
TS380.0010A	1	6	2.5	47	○
TS380.0020A	2	6	4.0	48	●
TS380.0030A	3	6	5.0	49	●
TS380.0040A	4	6	7.0	51	●
TS380.0050A	5	6	8.0	52	●
TS380.0060A	6	6	8.0	52	●
TS380.0070A	7	10	10.0	60	○
TS380.0080A	8	10	11.0	61	●
TS380.0090A	9	10	11.0	61	○
TS380.0100A	10	10	13.0	63	●
TS380.0120A	12	12	16.0	73	●
TS380.0140A	14	12	16.0	73	○
TS380.0160A	16	16	19.0	79	●
TS380.0180A	18	16	19.0	79	○
TS380.0200A	20	20	22.0	88	●
TS380.0220A	22	20	22.0	88	○
TS380.0250A	25	25	26.0	102	○

Tolleranze a DIN 7160 & 7161  
 Tolerances according to DIN 7160 & 7161

Raggio tolleranza in µm / Tolerance range in µm					
Diametro nominale in mm / Nominal-Diameter in mm					
	da 1 a 3 from 1 to 3	oltre 3 a 6 over 3 to 6	oltre 6 a 10 over 6 to 10	oltre 10 a 18 over 10 to 18	oltre 18 a 30 over 18 to 30
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73
h6	0 -6	0 -8	0 -9	0 -11	0 -13

## FRESA 4 TAGLIENTI, CORTA 4 flute short length end mills



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CODICE ARTICOLO  <i>article no</i>	DIAMETRO		LUNGHEZZA		STOCK  <i>stock</i>  ● / ○
	FRESA  <i>mill</i>  +0.03/0	GAMBO  <i>shank</i>  h6	UTILE  <i>of cut</i>	TOTALE  <i>overall</i>	
	<i>diameter</i>		<i>length</i>		
TS458.0010A	1	6	3	49	○
TS458.0020A	2	6	7	51	●
TS458.0030A	3	6	8	52	○
TS458.0040A	4	6	11	55	●
TS458.0050A	5	6	13	57	○
TS458.0060A	6	6	13	57	●
TS458.0070A	7	10	16	66	○
TS458.0080A	8	10	19	69	●
TS458.0090A	9	10	19	69	○
TS458.0100A	10	10	22	72	●
TS458.0120A	12	12	26	83	●
TS458.0140A	14	12	26	83	○
TS458.0160A	16	16	32	92	●
TS458.0180A	18	16	32	92	○
TS458.0200A	20	20	38	104	●
TS458.0220A	22	20	38	104	○
TS458.0250A	25	25	45	121	○

### Tolleranza / Tolerance

Diam Fresa / Mill Diam	+0.03 ~ 0
Diam Gambo / Shank Diam	h6

**FRESA MULTITAGLIENTE, CORTA, PER SGROSSATURA**  
*multi flute short length roughing end mills*



p. 14

CODICE ARTICOLO <i>article no</i>	DIAMETRO		LUNGHEZZA		NUMERO TAGLIENTI <i>flute number</i>	STOCK <i>stock</i> ● / ○
	FRESA <i>mill</i> js12	GAMBO <i>shank</i> h6	UTILE <i>of cut</i>	TOTALE <i>overall</i>		
TS782.0060A	6.0	6	13	57	3	●
TS782.0070A	7.0	10	16	66	3	○
TS782.0080A	8.0	10	19	69	3	●
TS782.0090A	9.0	10	19	69	3	○
TS782.0100A	10.0	10	22	72	4	●
TS782.0120A	12.0	12	26	83	4	●
TS782.0140A	14.0	12	26	83	4	○
TS782.0160A	16.0	16	32	92	4	●
TS782.0180A	18.0	16	32	92	4	○
TS782.0200A	20.0	20	38	104	4	●
TS782.0220A	22.0	20	38	104	5	○
TS782.0250A	25.0	25	45	121	5	○

Tolleranze a DIN 7160 & 7161  
 Tolerances according to DIN 7160 & 7161

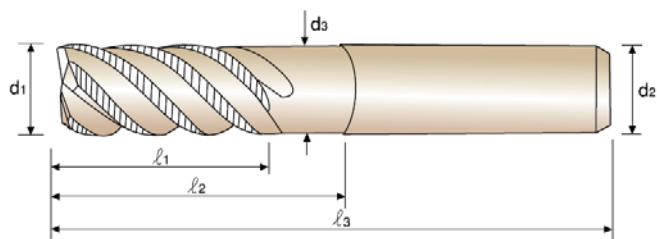
Raggio tolleranza in µm / Tolerance range in µm						
Diametro nominale in mm / Nominal-Diameter in mm						
	da 1 a 3 from 1 to 3	oltre 3 a 6 over 3 to 6	oltre 6 a 10 over 6 to 10	oltre 10 a 18 over 10 to 18	oltre 18 a 30 over 18 to 30	oltre 30 a 50 over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16

## FRESA MULTITAGLIANTE, CORTA, PER SGROSSATURA multi flute short length 45° helix roughing end mills



p. 14

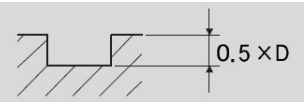
CODICE ARTICOLO <i>article no</i>	DIAMETRO			LUNGHEZZA			NUMERI TAGLIANTI <i>flute number</i>	STOCK <i>stock</i> ● / ○
	FRESA <i>mill js12</i>	GAMBO <i>diameter shank h6</i>	COLLO <i>neck</i>	UTILE <i>of cut L1</i>	EFFETTIVA <i>length effective L2</i>	TOTALE <i>overall L3</i>		
TS810.0040A	4	6	-	11	-	57	3	●
TS810.0050A	5	6	-	13	-	57	4	○
TS810.0060A	6	6	-	13	-	57	4	●
TS810.0070A	7	10	-	16	-	66	4	○
TS810.0080A	8	10	-	19	-	69	4	●
TS810.0090A	9	10	-	19	-	69	4	○
TS810.0100A	10	10	9.5	22	31	72	4	●
TS810.0120A	12	12	11.5	26	37	83	4	●
TS810.0140A	14	12	-	26	-	83	5	○
TS810.0160A	16	16	15.0	32	44	92	5	●
TS810.0180A	18	16	-	32	-	92	6	○
TS810.0200A	20	20	19.0	38	54	104	6	●
TS810.0250A	25	25	24.0	45	63	121	6	○



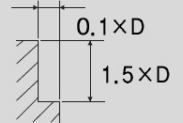
Tolleranze a DIN 7160 & 7161  
Tolerances according to DIN 7160 & 7161

Raggio tolleranza in $\mu\text{m}$ / Tolerance range in $\mu\text{m}$						
Diametro nominale in mm / Nominal-Diameter in mm						
	da 1 a 3 from 1 to 3	oltre 3 a 6 over 3 to 6	oltre 6 a 10 over 6 to 10	oltre 10 a 18 over 10 to 18	oltre 18 a 30 over 18 to 30	oltre 30 a 50 over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16





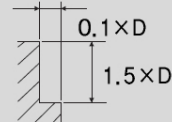
MATERIALE material	ACCIAI DA COSTRUZIONE ACCIAI AL CARBONIO structural steels carbon steels		ACCIAI DA COSTRUZIONE ACCIAI AL CARBONIO GHISA structural steels carbon steels, cast iron		ACCIAI AL CARBONIO ACCIAI LEGATI ACCIAI PER UTENSILI carbon steels alloy steels, tool steels		ACCIAI RESISTENTI AL CALORE, ACCIAI LEGATI ACCIAI PER UTENSILI prehardened steels alloy steels, tool steels		ACCIAI LEGATI, ACCIAI PER UTENSILI, INOX alloy steels, tool steels austenitic stainless steels	
	DUREZZA hardness	< 500N/mm2	< Hrc 20 500 < 800N/mm2		Hrc 20 < Hrc 30 800 < 1000N/mm2		Hrc 30 < Hrc 35 1000 < 1100N/mm2		Hrc 35 < Hrc 40 1100 < 1300N/mm2	
Ø	G/MIN	AV	G/MIN	AV	G/MIN	AV	G/MIN	AV	G/MIN	AV
2	7000	115	5900	90	4900	80	3150	65	2000	40
3	5000	160	4100	135	3350	115	2300	80	1800	62
4	4300	230	3600	175	3150	160	2000	92	1600	75
5	3900	255	3250	200	2600	185	1700	102	1350	75
6	3500	265	2900	210	2300	190	1450	110	1150	85
8	2600	275	2200	240	1800	200	1150	115	890	85
10	2100	300	1800	265	1450	230	900	125	700	102
12	1800	275	1450	240	1150	210	740	115	580	85
14	1600	265	1250	210	1000	195	630	110	500	80
16	1350	265	1150	195	890	180	560	102	440	80
18	1150	240	950	195	790	160	500	100	400	75
20	950	220	780	165	700	150	440	92	360	70
22	840	185	710	150	600	125	400	80	320	55
25	750	155	630	140	490	115	360	75	250	52



MATERIALE material	ACCIAI DA COSTRUZIONE ACCIAI AL CARBONIO structural steels carbon steels		ACCIAI DA COSTRUZIONE ACCIAI AL CARBONIO GHISA structural steels carbon steels, cast iron		ACCIAI AL CARBONIO ACCIAI LEGATI ACCIAI PER UTENSILI carbon steels alloy steels, tool steels		ACCIAI RESISTENTI AL CALORE, ACCIAI LEGATI ACCIAI PER UTENSILI prehardened steels alloy steels, tool steels		ACCIAI LEGATI, ACCIAI PER UTENSILI, INOX alloy steels, tool steels austenitic stainless steels	
	DUREZZA hardness	< 500N/mm2	< Hrc 20 500 < 800N/mm2		Hrc 20 < Hrc 30 800 < 1000N/mm2		Hrc 30 < Hrc 35 1000 < 1100N/mm2		Hrc 35 < Hrc 40 1100 < 1300N/mm2	
Ø	G/MIN	AV	G/MIN	AV	G/MIN	AV	G/MIN	AV	G/MIN	AV
2	9200	290	8400	240	6100	170	4100	125	3300	85
3	6600	410	6000	350	4400	250	2700	180	2400	125
4	5300	480	4700	400	3600	300	2300	200	2000	150
5	4400	510	4000	420	2900	320	2000	220	1700	160
6	3900	540	3600	450	2600	330	1800	230	1450	180
8	3100	570	2600	480	2000	370	1400	240	1150	185
10	2300	630	2100	530	1600	380	1000	265	890	200
12	2000	570	1800	480	1400	370	890	240	720	185
14	1800	550	1600	460	1100	350	790	230	630	170
16	1600	510	1400	430	1000	340	680	220	550	165
18	1500	460	1250	400	890	310	630	195	500	150
20	1250	440	1050	370	780	275	530	175	440	140
22	1050	410	950	320	680	255	470	160	400	130
25	1000	370	840	305	630	230	420	150	360	125

# TS380

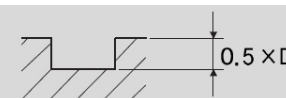
## FRESATURA SUL FIANCO side cutting



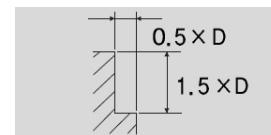
MATERIALE material	ACCIAI DA COSTRUZIONE ACCIAI AL CARBONIO structural steels carbon steels		ACCIAI DA COSTRUZIONE ACCIAI AL CARBONIO GHISA structural steels carbon steels, cast iron		ACCIAI AL CARBONIO ACCIAI LEGATI ACCIAI PER UTENSILI carbon steels alloy steels, tool steels		ACCIAI RESISTENTI AL CALORE, ACCIAI LEGATI ACCIAI PER UTENSILI prehardened steels alloy steels, tool steels		ACCIAI LEGATI, ACCIAI PER UTENSILI, INOX alloy steels, tool steels austenitic stainless steels	
	DUREZZA hardness < 500N/mm2		< Hrc20 500 < 800N/mm2		Hrc20 < Hrc30 800 < 1000N/mm2		Hrc30 < Hrc35 1000 < 1100N/mm2		Hrc35 < Hrc40 1100 < 1300N/mm2	
Ø	G/MIN	AV	G/MIN	AV	G/MIN	AV	G/MIN	AV	G/MIN	AV
2	8200	100	6800	80	5500	65	3800	50	2400	40
3	5800	145	4800	120	3800	75	2700	65	2200	65
4	5200	185	4400	155	3500	110	2300	75	1900	75
5	4700	210	4000	175	2900	125	2000	85	1700	75
6	4200	300	3600	250	2600	190	1800	125	1500	100
8	3200	330	2600	270	2000	200	1300	140	1100	115
10	2500	350	2100	290	1600	210	1000	150	890	125
12	2100	350	1800	300	1400	230	900	150	740	125
14	1800	350	1500	285	1150	210	780	140	630	120
16	1600	330	1300	275	1000	200	660	140	550	115
18	1350	310	1150	265	890	195	580	130	500	110
20	1250	300	1050	255	780	190	520	125	440	110
22	1150	310	950	265	740	195	470	130	400	110
25	1000	330	840	275	630	210	420	130	360	120

# TS380

## TAGLIO PIENO slotting



MATERIALE material	ACCIAI DA COSTRUZIONE ACCIAI AL CARBONIO structural steels carbon steels		ACCIAI DA COSTRUZIONE ACCIAI AL CARBONIO GHISA structural steels carbon steels, cast iron		ACCIAI AL CARBONIO ACCIAI LEGATI ACCIAI PER UTENSILI carbon steels alloy steels, tool steels		ACCIAI RESISTENTI AL CALORE, ACCIAI LEGATI ACCIAI PER UTENSILI prehardened steels alloy steels, tool steels		ACCIAI LEGATI, ACCIAI PER UTENSILI, INOX alloy steels, tool steels austenitic stainless steels	
	DUREZZA hardness < 500N/mm2		< Hrc20 500 < 800N/mm2		Hrc20 < Hrc30 800 < 1000N/mm2		Hrc30 < Hrc35 1000 < 1100N/mm2		Hrc35 < Hrc40 1100 < 1300N/mm2	
Ø	G/MIN	AV	G/MIN	AV	G/MIN	AV	G/MIN	AV	G/MIN	AV
2	6500	70	5500	55	4800	45	3000	35	1900	28
3	4600	102	3900	85	3350	52	2200	45	1800	45
4	4300	140	3600	115	3000	80	1900	52	1500	55
5	3800	160	3200	130	2600	92	1700	62	1300	55
6	3350	230	2800	190	2300	140	1450	92	1100	75
8	2600	240	2200	210	1800	150	1150	102	890	85
10	2100	250	1800	210	1400	160	890	115	680	92
12	1800	275	1450	230	1200	170	740	115	580	92
14	1600	250	1350	220	1000	160	660	110	500	85
16	1350	240	1150	210	890	150	560	102	440	85
18	1150	240	890	190	790	150	500	95	400	80
20	950	230	790	190	700	140	440	92	360	80
22	840	230	730	195	600	150	400	95	315	85
25	750	240	630	210	490	160	360	102	250	85



MATERIALE material	ACCIAI DA COSTRUZIONE ACCIAI AL CARBONIO structural steels carbon steels		ACCIAI DA COSTRUZIONE ACCIAI AL CARBONIO, GHISA structural steels carbon steels, cast iron		ACCIAI AL CARBONIO ACCIAI LEGATI ACCIAI PER UTENSILI carbon steels alloy steels, tool steels		ACCIAI RESISTENTI AL CALORE, ACCIAI LEGATI ACCIAI PER UTENSILI prehardened steels alloy steels, tool steels	
	< 500N/mm2		< Hrc20 500 < 800N/mm2		Hrc20 < Hrc30 800 < 1000N/mm2		Hrc30 < Hrc40 1000 < 1300N/mm2	
Ø	G/MIN	AV	G/MIN	AV	G/MIN	AV	G/MIN	AV
6	2800	230	2200	180	1600	115	1300	105
8	2400	290	1900	230	1400	160	1050	125
10	1900	415	1500	315	1050	195	890	160
12	1600	415	1200	330	900	230	740	180
14	1400	415	1050	330	760	230	630	180
16	1200	415	950	330	660	230	550	180
18	1050	415	890	330	610	230	490	180
20	960	425	760	330	530	230	440	180
22	890	425	650	330	470	230	400	180
25	790	415	600	315	420	220	360	180



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