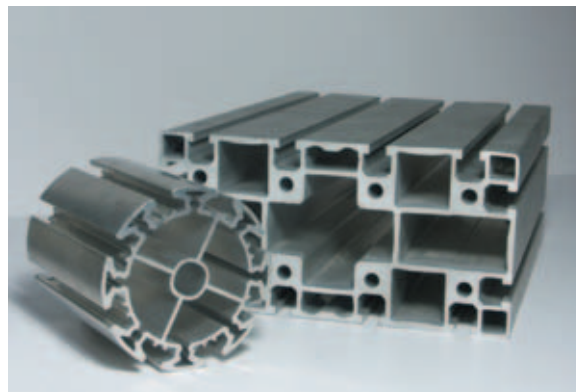




Frese monotagliente ad elica sinistra e destra per la lavorazione di alluminio e sue leghe, materie plastiche e materiali non ferrosi. L'impiego di questi utensili è consigliato **nella lavorazione di profilati e scatolati**. La geometria del vano gola e la sua eccezionale rugosità superficiale, ottenuta con **specifici processi di lappatura**, consentono una ottima evacuazione del truciolo ed evitano i fenomeni di incollaggio del materiale asportato.









Single cut end mills with right or left helix for aluminum alloys, plastics and non-ferrous alloys. Recommended for the machining **of thin wall elements with open or closed shapes**. The flute geometry and its extremely low roughness, obtained with **specific polishing treatments**, allow an easy chip removal and avoid the material sticking on the cutting edge.

Einschneidenfräser, links- oder rechtsspiralig, für die Bearbeitung von Aluminium und dessen Legierungen, Kunststoffen und Nichteisenwerkstoffen. Der Einsatz dieser Werkzeuge ist für die Bearbeitung von offenen und Kastenprofilen zu empfehlen. Die Nutgeometrie und deren besondere Oberflächenrauigkeit, die durch **spezielle Läppprozesse** erzielt wird, erlauben eine ausgezeichnete Spanabfuhr und vermeiden das Verkleben des abgetragenen Werkstoffs.



Frezy jednostrzowe o lewym i prawym kącie pochylenia linii śrubowej do obróbki aluminium i jego stopów, materiałów plastycznych i nieżelaznych. Zastosowanie tych narzędzi jest **zalecane w obróbkach elementów cienkościennych**. Geometria kanału wiórowego i jego gładkość uzyskana za pomocą **odpowiednich procesów polerowania**, pozwala na doskonałe usuwanie wióra i zapobiega jego przylepaniu.

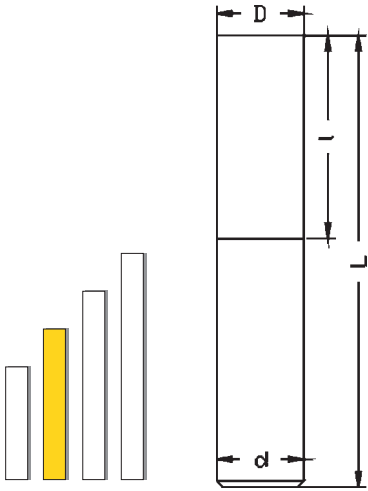
ALU

		Alu & alloys < 6% Si						Alu & alloys > 6% Si							
		HMW 700 - HMW 701						HMW 700 - HMW 701							
															
m/min		Vc 600			Vc 792			Vc 225			Vc 297				
D	fz	F	n	fz	F	n	D	fz	F	n	fz	F	n		
mm	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min
6,0	0,065	2070	31847	0,065	2732	42038		0,065	776	11943	0,065	1025	15764		
8,0	0,094	2240	23885	0,094	2956	31529		0,094	840	8957	0,094	1109	11823		
10,0	0,116	2218	19108	0,116	2928	25223		0,116	832	7166	0,116	1098	9459		
12,0	0,134	2139	15924	0,134	2823	21019		0,134	802	5971	0,134	1059	7882		
16,0	0,163	1948	11943	0,163	2571	15764		0,163	730	4479	0,163	964	5912		
20,0	0,185	1771	9554	0,185	2338	12611		0,185	664	3583	0,185	877	4729		
		Copper & alloys						Thermo Plastics							
		HMW 700 - HMW 701						HMW 700 - HMW 701							
															
m/min		Vc 375			Vc 495			Vc 450			Vc 594				
D	fz	F	n	fz	F	n	D	fz	F	n	fz	F	n		
mm	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min
6,0	0,065	1294	19904	0,065	1708	26274		0,065	1553	23885	0,065	2049	31529		
8,0	0,094	1400	14928	0,094	1848	19705		0,094	1680	17914	0,094	2217	23646		
10,0	0,116	1386	11943	0,116	1830	15764		0,116	1664	14331	0,116	2196	18917		
12,0	0,134	1337	9952	0,134	1764	13137		0,134	1604	11943	0,134	2117	15764		
16,0	0,163	1217	7464	0,163	1607	9853		0,163	1461	8957	0,163	1928	11823		
20,0	0,185	1107	5971	0,185	1461	7882		0,185	1328	7166	0,185	1754	9459		



700 Frese monotagliente Elica Dx

701 Frese monotagliente Elica Sx



- MG Co10**
-
- Silmax Norm**
- λ 30° DX**
-
- 90°**



- MG Co10**
-
- Silmax Norm**
- λ 30° SX**
-
- 90°**



Uncoated X.Alu

Uncoated X.Alu

				700			701				
D	d	L	l	HMO	HMW	Z	HMO	HMW	Z		
h10	h6			€	€		€	€			
2	2	40	10	700020	14,40	22,20	1	701020	14,40	22,20	1
3	3	40	12	700030	15,40	23,20	1	701030	15,40	23,20	1
4	4	40	15	700040	18,60	26,40	1	701040	18,60	26,40	1
5	5	50	16	700050	23,90	33,10	1	701050	23,90	33,10	1
6	6	60	20	700060	27,40	37,00	1	701060	27,40	37,00	1
8	8	63	22	700080	44,40	56,20	1	701080	44,40	56,20	1
10	10	72	25	700100	66,80	81,40	1	701100	66,80	81,40	1
12	12	83	30	700120	88,50	109,10	1	701120	88,50	109,10	1
14	14	83	30	700140	124,90	148,80	1	701140	124,90	148,80	1
16	16	92	35	700160	182,80	209,60	1	701160	182,80	209,60	1
20	20	104	40	700200	245,90	280,30	1	701200	245,90	280,30	1

ALU

		PARAMETRI DI TAGLIO (Cutting data) Pag.62			
		Alu & alloys < 6% Si	Alu & alloys > 6% Si	Copper & alloys	Thermo Plastics
700	MAX MQL AIR	●	●	●	●
	HMW	●	●	●	●
701	MAX MQL AIR	●	●	●	●
	HMW	●	●	●	●
		Vc 600	Vc 225	Vc 375	Vc 450
		Vc 792	Vc 297	Vc 495	Vc 594

Alu & alloys < 6% Si

Alu & alloys < 6% Si															
HMW 175s				HMW 165s				HMW 115s				HMW 765s			
D	fz	F	n	fz	F	n	fz	F	n	fz	F	n	fz	F	n
mm	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min
6,0	0,060	3822	31847	0,060	5045	42038	0,055	4624	42038	0,050	4777	31847	0,050	6306	42038
8,0	0,086	4103	23885	0,086	5416	31529	0,081	5101	31529	0,073	5232	23885	0,073	6906	31529
10,0	0,106	4050	19108	0,106	5346	25223	0,101	5094	25223	0,091	5209	19108	0,091	6876	25223
12,0	0,122	3898	15924	0,122	5145	21019	0,117	4935	21019	0,105	5038	15924	0,105	6650	21019
16,0	0,148	3542	11943	0,148	4675	15764	0,143	4517	15764	0,128	4603	11943	0,128	6076	15764
20,0	0,168	3217	9554	0,168	4246	12611	0,163	4120	12611	0,146	5592	9554	0,146	7381	12611

Alu & alloys > 6% Si

Alu & alloys > 6% Si															
HMW 175s				HMW 165s				HMW 115s				HMW 765s			
D	fz	F	n	fz	F	n	fz	F	n	fz	F	n	fz	F	n
mm	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min
6,0	0,060	1433	11943	0,060	1892	15764	0,055	1734	15764	0,050	1194	11943	0,050	2365	15764
8,0	0,086	1539	8957	0,086	2031	11823	0,081	1913	11823	0,073	1308	8957	0,073	2590	11823
10,0	0,106	1519	7166	0,106	2005	9459	0,101	1910	9459	0,091	1302	7166	0,091	2578	9459
12,0	0,122	1462	5971	0,122	1929	7882	0,117	1850	7882	0,105	1259	5971	0,105	2494	7882
16,0	0,148	1328	4479	0,148	1753	5912	0,143	1694	5912	0,128	1151	4479	0,128	2278	5912
20,0	0,168	1206	3583	0,168	1592	4729	0,163	1545	4729	0,146	1048	3583	0,146	2768	4729

Copper & alloys

Copper & alloys															
HMW 175s				HMW 165s				HMW 115s				HMW 765s			
D	fz	F	n	fz	F	n	fz	F	n	fz	F	n	fz	F	n
mm	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min
6,0	0,060	2389	19904	0,060	3153	26274	0,055	2890	26274	0,050	2986	19904	0,050	3941	26274
8,0	0,086	2564	14928	0,086	3385	19705	0,081	3188	19705	0,073	3270	14928	0,073	4316	19705
10,0	0,106	2531	11943	0,106	3341	15764	0,101	3184	15764	0,091	3256	11943	0,091	4297	15764
12,0	0,122	2436	9952	0,122	3215	13137	0,117	3084	13137	0,105	3148	9952	0,105	4156	13137
16,0	0,148	2213	7464	0,148	2922	9853	0,143	2823	9853	0,128	2877	7464	0,128	3797	9853
20,0	0,168	2011	5971	0,168	2654	7882	0,163	2575	7882	0,146	3495	5971	0,146	4613	7882

Thermo Plastics

Thermo Plastics															
HMW 175s				HMW 165s				HMW 115s				HMW 765s			
D	fz	F	n	fz	F	n	fz	F	n	fz	F	n	fz	F	n
mm	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min	mm/z	mm/min	min
6,0	0,060	2866	23885	0,060	3783	31529	0,055	3468	31529	0,050	3583	23885	0,050	4729	31529
8,0	0,086	3077	17914	0,086	4062	23646	0,081	3826	23646	0,073	3924	17914	0,073	5180	23646
10,0	0,106	3037	14331	0,106	4009	18917	0,101	3820	18917	0,091	3907	14331	0,091	5157	18917
12,0	0,122	2923	11943	0,122	3859	15764	0,117	3701	15764	0,105	3778	11943	0,105	4987	15764
16,0	0,148	2656	8957	0,148	3506	11823	0,143	3388	11823	0,128	3452	8957	0,128	4557	11823
20,0	0,168	2413	7166	0,168	3185	9459	0,163	3090	9459	0,146	4194	7166	0,146	5536	9459

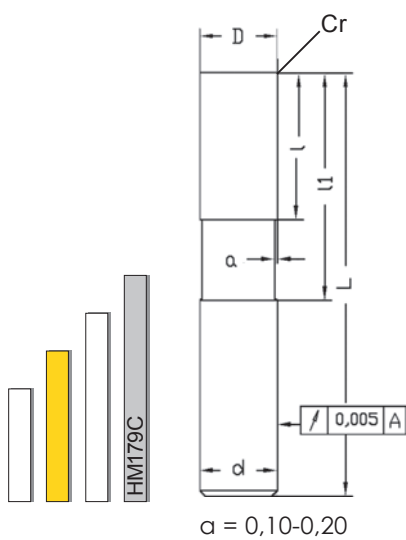
SERIE LUNGA , Long, Lang, Długa (F , n)

-15%	HMW179C	HMW179C													
------	---------	---------	--	--	--	--	--	--	--	--	--	--	--	--	--



175s Frese a due taglienti

175s Cr Frese a due taglienti con Corner Radius



- MG Co10
- 6527L 6528
- $\lambda 35^\circ$
- 90°



- MG Co10
- 6527L 6528
- $\lambda 35^\circ$
- Cr



D	d	L	l	ll	175s		z	Cr		z		
					Uncoated HMO	X.Alu HMW		Uncoated HMO	X.Alu HMW			
h6	h6				€	€						
2	3	50	6	13	175020	26,30	34,80	2	..Cr0,3	29,80	38,20	2
3	3	50	7	18	175030	27,30	35,80	2	..Cr0,3	30,80	39,20	2
4	4	50	8	19	175040	26,50	35,00	2	..Cr0,3	30,80	39,20	2
					" "				..Cr0,5	30,80	39,20	2
5	5	50	10	21	175050	27,10	36,30	2	..Cr0,5	31,40	40,70	2
6	6	57	10	21	175060	24,60	34,20	2	..Cr0,5	28,90	38,40	2
8	8	63	16	27	175080	38,10	49,90	2	..Cr0,5	41,80	53,60	2
					" "				..Cr0,8	41,80	53,60	2
10	10	72	19	30	175100	57,90	72,50	2	..Cr0,5	61,50	76,00	2
					" "				..Cr1,0	61,50	76,00	2
12	12	83	22	38	175120	77,20	97,80	2	..Cr1,0	82,00	102,60	2
					" "				..Cr1,5	82,00	102,60	2
14	14	83	22	38	175140	105,40	129,30	2	..Cr1,5	110,40	134,30	2
16	16	92	26	42	175160	137,80	164,60	2	..Cr1,0	142,60	169,40	2
					" "				..Cr1,5	142,60	169,40	2
20	20	104	32	54	175200	237,90	272,30	2	..Cr2,0	244,00	278,40	2

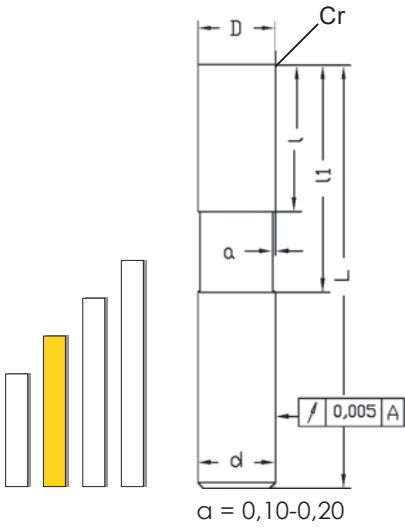
ALU

175s	MAX MQL AIR	PARAMETRI DI TAGLIO (Cutting data) Pag.64			
		Alu & alloys < 6% Si	Alu & alloys > 6% Si	Copper & alloys	Thermo Plastics
		Vc 600	Vc 225	Vc 375	Vc 450
		Vc 792	Vc 297	Vc 495	Vc 594



115s Frese a tre taglienti

115s Cr Frese a tre taglienti con Corner Radius



- MG Co10
- 6527L 6528
- $\lambda 55^\circ$
- 90°



- MG Co10
- 6527L 6528
- $\lambda 55^\circ$
- Cr



Uncoated X.Alu

Uncoated X.Alu

D	d	L	l	ll	115s	HMO	HMW	z	Cr	HMO	HMW	z
h6	h6					€	€			€	€	
4	4	50	8	19	115040	30,80	39,20	3	..Cr0,3	37,10	45,50	3
5	5	50	10	21	115050	31,40	40,70	3	..Cr0,3	37,80	47,00	3
6	6	57	10	21	115060	27,00	36,50	3	..Cr0,3	33,40	43,00	3
7	7	60	13	24	115070	40,00	51,80	3	..Cr0,3	45,40	57,20	3
8	8	63	16	27	115080	42,40	54,20	3	..Cr0,3	48,00	59,80	3
9	9	67	16	27	115090	51,50	64,80	3	..Cr0,5	56,90	70,10	3
10	10	72	19	30	115100	62,70	77,20	3	..Cr0,5	68,00	82,60	3
12	12	83	22	38	115120	85,10	105,70	3	..Cr0,5	92,40	113,00	3
14	14	83	22	38	115140	116,40	140,30	3	..Cr1,0	123,90	147,80	3
16	16	92	26	42	115160	159,00	185,80	3	..Cr1,0	166,20	193,10	3
20	20	104	32	54	115200	270,20	304,60	4	..Cr1,0	279,40	313,70	4

115s	HMW	PARAMETRI DI TAGLIO (Cutting data) Pag.64			
		Alu & alloys < 6% Si	Alu & alloys > 6% Si	Copper & alloys	Thermo Plastics
		Vc 600	Vc 225	Vc 375	Vc 450
		Vc 792	Vc 297	Vc 495	Vc 594

ALU

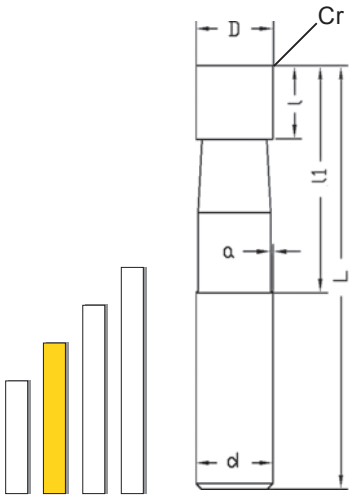


165s

Frese a due tagli con Corner Radius

765s

Frese semisferiche



- MG Co10**
-
- Silmax Norm**
- $\lambda 35^\circ$
-
- Cr**



- MG Co10**
-
- Silmax Norm**
- $\lambda 50^\circ$
-
-



D	d	L	l	a	l1	165s				765s					
						Uncoated HMO	X.Alu HMW	Cr	Z	Uncoated HMO	X.Alu HMW	r	Z		
h6						€	€			€	€	f8			
3	3	50	3	0,15	22					765030	33,20	41,70	1,5	2	
4	4	50	4	0,20	22					765040	37,00	45,40	2,0	2	
5	5	50	5	0,20	22					765050	40,40	49,70	2,5	2	
6	6	57	6	0,25	21	165060	39,90	49,40	1,5	2	765060	42,70	52,20	3,0	2
8	8	63	8	0,35	27	165080	54,70	66,50	2,0	2	765080	56,90	68,70	4,0	2
10	10	72	10	0,50	32	165100	71,60	86,10	2,5	2	765100	73,50	88,00	5,0	2
12	12	83	12	0,50	38	165120	93,30	113,80	3,0	2	765120	95,70	116,30	6,0	2
16	16	92	16	0,80	44	165160	152,00	178,80	4,0	2	765160	159,50	186,30	8,0	2
20	20	104	20	0,90	54	165200	252,80	287,20	5,0	2	765200	255,20	289,60	10,0	2

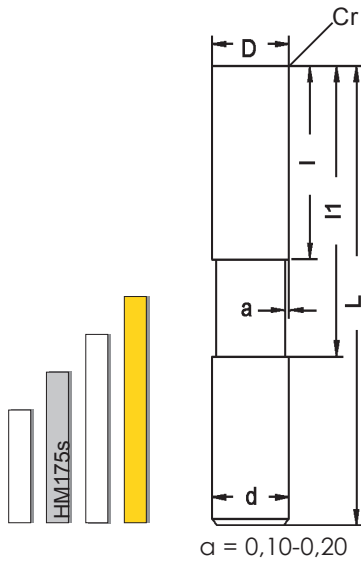
ALU

MAX MQL AIR	Pag.251	PARAMETRI DI TAGLIO (Cutting data) Pag.64			
		Alu & alloys < 6% Si	Alu & alloys > 6% Si	Copper & alloys	Thermo Plastics
765s 165s	HMW	●			
		Vc 792	Vc 297	Vc 495	Vc 594
765s 765s	HMW		●		
		Vc 792	Vc 297	Vc 495	Vc 594



179C Frese a due taglienti serie lunga

739C Frese raggiate a due taglienti serie lunga



- MG Co10
- Silmax Norm
- $\lambda 35^\circ$
- Cr



- MG Co10
- Silmax Norm
- $\lambda 35^\circ$
- Cr



D	d	L	l	ll	179C				739C					
					Uncoated HMO	X.Alu HMW	Cr	z	Uncoated HMO	X.Alu HMW	r	z		
h10	h6				€	€			€	€				
2	3	62	4	20	179020C	27,60	37,40	0,3	2	739020C	30,60	40,40	1,0	2
3	3	62	6	20	179030C	22,60	32,40	0,3	3	739030C	25,60	35,40	1,5	2
4	4	80	8	26	179040C	36,00	45,80	0,3	2	739040C	33,60	43,40	2,0	2
5	5	100	10	38	179050C	45,20	58,40	0,5	2	739050C	50,40	63,60	2,5	2
6	6	100	12	50	179060C	47,20	60,40	0,5	2	739060C	54,60	67,80	3,0	2
8	8	100	16	50	179080C	62,20	75,80	0,5	2	739080C	68,00	81,60	4,0	2
10	10	150	20	100	179100C	102,80	131,00	0,5	2	739100C	114,00	142,20	5,0	2
12	12	150	24	100	179120C	134,60	167,60	1,0	2	739120C	140,20	173,20	6,0	2

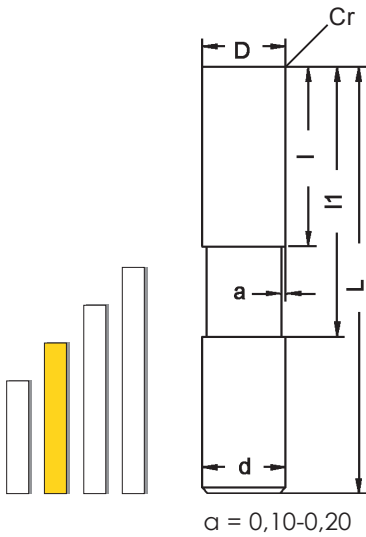
ALU

MAX MQL AIR	Pag.251	PARAMETRI DI TAGLIO (Cutting data) Pag.64			
		Alu & alloys < 6% Si	Alu & alloys > 6% Si	Copper & alloys	Thermo Plastics
739C 179C	HMW	●	●		
739C 369C	HMW		●		



015s

Frese a sgrossare con rompitruciolo



- Ultra Fine
-
- Silmax Norm
- $\lambda 40^\circ$
-
- Cr



Uncoated X.Alu

D	d	L	l	ll	Cr	015s	HMO	HMW	Z
h10	h6						€	€	
10	10	72	15	30	1,0	015100	82,60	100,10	3
12	12	81	18	36	1,0	015120	106,80	131,40	3
16	16	92	24	42	1,0	015160	180,00	212,10	3
20	20	104	30	52	1,0	015200	290,10	332,50	3

Vano gola sagomato progettato per la massima efficienza di evacuazione e rigidità dell'utensile. Adatto per lavorazioni in cava DxD.

Geometry of the core and the flutes especially developed in order to provide a good chip removal. Recommended for slotting D x D.

Spezielle Nutgeometrie für die optimale Spanabfuhr und Steifigkeit des Werkzeugs. Geeignet für Nutenbearbeitung bis DxD.

Geometria rdzenia i krawędzi skrawającej zaprojektowana została do jak najlepszego usuwania materiału przy zachowaniu jak największej sztywności narzędzia. Doskonale nadaje się do obróbki rowków DxD

015s

Alu & alloys < 6% Si



m/min		Vc 600			Vc 880		
D	fz	F	n	fz	F	n	
mm	mm/z	mm/min	min	mm/z	mm/min	min	
10,0	0,151	8667	19108	0,141	11871	28025	
12,0	0,171	8181	15924	0,161	11298	23355	
16,0	0,203	7269	11943	0,193	10136	17516	
20,0	0,227	6519	9554	0,217	9141	14013	

ALU

MAX MQL AIR				PARAMETRI DI TAGLIO (Cutting data) Pag.69			
015s		HMW		Alu & alloys < 6% Si			
				Vc 600			
				Vc 880			



Alluminio e Leghe Leggere

Alu e Light alloys, Alu und Leichtlegierungen, Obróbka aluminium i stopów lekkich

Gruppo	Nr	DIN	Gruppo	Nr	DIN	
Alu & alloys <6% Si	Alluminio puro	3.0205	Al99	Leghe malleabili indurite (70-150HB)	3.0615	AlMgSiPb
	Leghe malleabili non indurite (30-80HB)	3.0505	AlMn0.5Mg0.5		3.1255	AlCuSiMn
		3.0506	AlMn0.6		3.1305	AlCu2.5Mg0.5
		3.0515	AlMn1		3.1325	AlCuMg1
		3.0517	AlMnCu		3.1355	AlCuMg2
		3.0525	AlMn1Mg0.5		3.1645	AlCuMgPb
		3.0526	AlMn1Mg1		3.1655	AlCuBiPb
		3.0915	AlFeSi		3.2307	Al99.85MgSi
		3.3307	Al99.85Mg0.5		3.2315	AlMgSi1
		3.3308	Al99.5Mg0.5		3.3206	AlMgSi0.5
		3.3315	AlMg1		3.3208	Al99.9MgSi
		3.3316	AlMg1.5		3.3210	AlMgSi0.7
		3.3317	Al99.85Mg1		3.3211	AlMg1SiCu
		3.3318	Al99.9Mg1		3.4335	AlZn4.5Mg1
		3.3326	AlMg1.8		3.4337	Al99.8ZnMg
		3.3345	AlMg4.5		3.4345	AlZnMgCu0.5
		3.3523	AlMg2.5		3.4365	AlZnMgCu1.5
		3.3525	AlMg2Mn03		3.1371	G-AlCu4TiMg
		3.3527	AlMg2Mn0.8			
		3.3535	AlMg3			
		3.3537	AlMg2.7Mn			
		3.3545	AlMg4Mn			
		3.3547	AlMg4.5Mn			
		3.3549	AlMg5Mn			
		3.3555	AlMg5			
Alu & alloys >6% Si	Getti 6-12%Si	3.2151	G-AlSi6Cu4			
		3.2161	G-AlSi8Cu3			
		3.2341	G-AlSi5Mg			
		3.2371	G-AlSi7Mg			
		3.2373	G-AlSi9Mg			
		3.2381	G-AlSi10Mg			
		3.2383	G-AlSi10Mg(Cu)			
Copper & alloys	Non legati	2.0040	0F-Cu	A truciolo lungo	2.0220	CuZn5
	Leghe malleabili non indurite	2.0205	CuZn0.5	A truciolo corto	2.0331	CuZn36Pb1.5
		Leghe malleabili indurite	2.0850	CuNi2Be	Leghe a base CuNi	2.0830
	Leghe CuNiZn a truciolo corto				2.0730	CuNi12Zn24
Thermo Plastics	Thermo Plastica	PE	Baylon	Thermo Plastica	PUR	Baydur
		PP	Daplen		SI	Baysilon
		PVC	Coroplast		UP	Alpolit
		PS	Hostyron		UP	Viapal
		PMMA	Acrylglas		EP	Araldit
		PTFE	Hostaflon		AFK	Kevlar
		PA	Akulon		BFK	
		PC	Makralon		CFK	
		PI			GFK	
		PF	Alberit		MFK	
		MF	Albanit		SFK	
		UF	Bakelite			