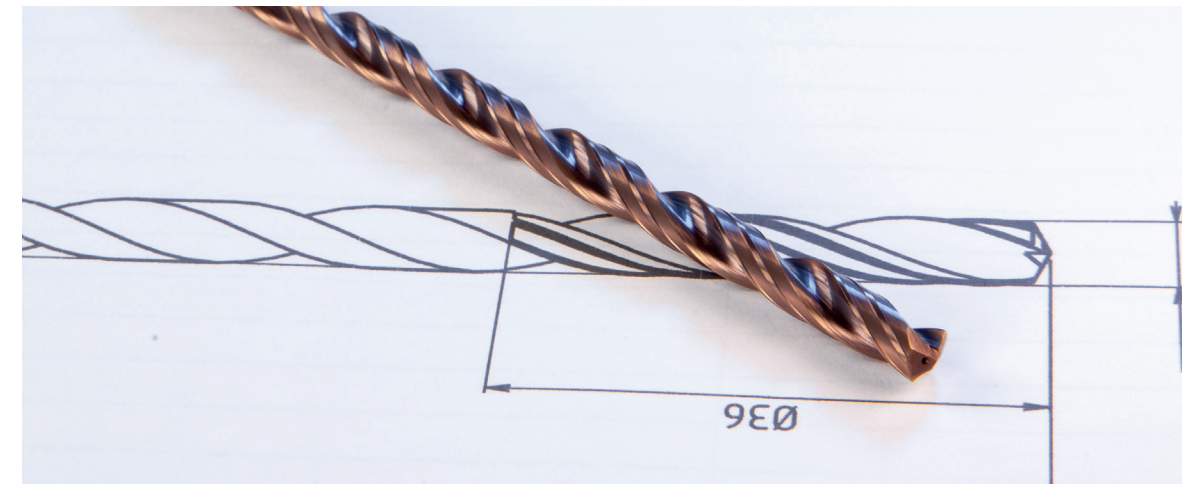


PIG

TECNOLOGIA DI FORATURA PUNTE

DRILLING TECHNOLOGY TIPS



Con le punte PIG di IGUTENSILI le lavorazioni di foratura vengono eseguite rapidamente e in modo produttivo senza rinunciare alla qualità della lavorazione.

Questi utensili sono impiegabili su di una vastissima gamma di macchinari a controllo numerico e/o tradizionali come CENTRI di LAVORO, CENTRI di TORNITURA, TRANSFER ed anche su LINEE DI PRODUZIONE AVANZATA. PIG è in grado di forare profondità da 3xD fino a 30xD, l'utensile è dotato di REFRIGERAZIONE forzata INTERNA alla TESTA, garantendo in questo modo un'ottima lubrificazione nel punto di taglio ed una eccellente evacuazione del truciolo.

Gli utensili PIG, sono rivestiti NF o ALU in funzione del materiale da lavorare, raggiungono alti valori di taglio e lunga durata, garantendo sempre la massima stabilità del ciclo produttivo, è possibile eseguire operazione di affilatura e rivestimento, donando all'utensile stesso nuova vita con rendimenti eccellenti.

Da non sottovalutare la possibilità di produrre Punta PIG multi diametri speciali a disegno, con lo stesso utensile potremo eseguire foratura di cavità a gradini.

With the PIG tips by IGUTENSILI, drilling operations are carried out quickly and productively without sacrificing the quality of processing.

These tools can be used on a very wide range of CNC machines and/or traditional machinery such as WORK CENTRES, TURNING CENTRES, TRANSFER and even ADVANCED PRODUCTION LINES. PIG is able to drill depths from 3xD up to 30xD, the tool is equipped with forced INTERNAL COOLANT, thus ensuring excellent lubrication at the drilling point and excellent chip evacuation.

PIG tools are NF or ALU coated according to the material to be processed, reaching high cutting values and long life, always guaranteeing maximum stability of the production cycle; it is possible to perform sharpening and coating operations, giving the tool a new life with excellent returns.

Not to underestimate the possibility of producing special multi-diameter customised PIG tips, with the same tool we will be able to drill stepped holes.

I valori di velocità di taglio / periferica (vc in m/min) qui elencati sono puramente indicativi e devono essere adattati alle condizioni d'impiego (materiale, lubrificante, macchina utensile ecc.). Confronto internazionale dei materiali, vedere pagina Z • 21

The cutting speeds (v_c in m/min) listed in the respective columns are standard values which have to be adjusted to individual work conditions (material, lubrication, machine etc.). International comparison of materials, see page Z • 21

V = Velocità (m/min)

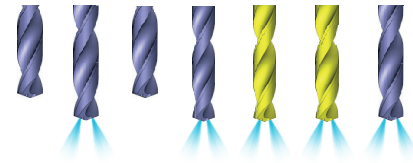
V = Speed (m/min)

F = Avanzamento (mm)

F = Feed (mm)

3xD Piena - 3xD Full drill
5xD Piena - 5xD Full drill
3xD Forata - 3xD with interior cooling
5xD Forata - 5xD with interior cooling
5xD Forata Alluminio - 5xD with interior cooling for aluminium
8xD Forata Alluminio - 8xD with interior cooling for aluminium
8xD Forata - 8xD with interior cooling

	Material	Material examples	Mat. numbers		
P	Acciai	Steel materials			
	1.1 Acciai estrusi a freddo	Cold-extrusion steel	Cq15	1.1132	
	Acciai da costruzione	Costruction steels	S235JR (St37-2)	1.0037	
	Acciai alta velocità	Free-cutting steel, etc.	10SPb20	1.0722	
	Acciai da costruzione	Costruction steels	E360 (St70-2)	1.0070	
	2.1 Acciai da cementazione	Cementation steel	16MnCr5	1.7131	
	Fusione d'acciaio, ecc.	Steel casting, etc.	GS-25CrMo4	1.7218	
	Acciai da cementazione	Cementation steel	20MoCr3	1.7320	
	3.1 Acciai da bonifica	Heat-treatable steels	42CrMo4	1.7225	
	Acciai per lavorazioni a freddo, ecc.	Cold work steels, etc.	102Cr6	1.2067	
M	Acciai da bonifica	Heat-treatable steels	50CrMo4	1.7228	
	4.1 Acciai per lavorazioni a freddo	Cold work steels	X45NiCrMo4	1.2767	
	Acciai da nitrazione, ecc.	Nitriding steels, etc.	31CrMo12	1.8515	
	Acciai fortemente legati	High-alloyed steels	X38CrMoV5-3	1.2367	
	5.1 Acciai per lavorazioni a freddo	Cold work steels	X100CrMoV8-1-1	1.2990	
	Acciai per lavorazioni a caldo, ecc.	Hot work steels, etc.	X40CrMoV5-1	1.2344	
	Acciai inossidabili	Stainless steel materials			
	1.1 Ferritici, martensitici	Ferritic, martensitic	X2CrTi12	1.4512	
	2.1 Austenitici	Austenitic	X6CrNiMoTi17-12-2	1.4571	
	3.1 Austenitici-ferritici (Duplex)	Austenitic-ferritic (Duplex)	X2CrNiMoN22-5-3	1.4462	
K	4.1 Austenitici-ferritici resistenti al calore (Super Duplex)	Austenitic-ferritic heat-resistant (Super Duplex)	X2CrNiMoN25-7-4	1.4410	
	Ghise	Cast materials			
	1.1 Ghise con grafite lamellare (GJL)	Cast iron with lamellar graphite (GJL)	100-250 N/mm2	EN-GJL-200 (GG20)	EN-JL-1030
	1.2 Ghise con grafite lamellare (GJL)	Cast iron with lamellar graphite (GJL)	250-450 N/mm2	EN-GJL-300 (GG30)	EN-JL-1050
	2.1 Ghise con grafite nodulare (GJS)	Cast iron with nodular graphite (GJS)	350-500 N/mm2	EN-GJS-400-15 (GGG40)	EN-JS-1030
	2.2 Ghise con grafite nodulare (GJS)	Cast iron with nodular graphite (GJS)	500-900 N/mm2	EN-GJS-700-2 (GGG70)	EN-JS-1070
	3.1 Ghise con grafite vermicolare (GJV)	Cast iron with vermicular graphite (GJV)	300-400 N/mm2	GJV 300	
	3.2 Ghise con grafite vermicolare (GJV)	Cast iron with vermicular graphite (GJV)	400-500 N/mm2	GJV 450	
	4.1 Ghise malleabili (GTMW, GTMB)	Malleable cast iron (GTMW, GTMB)	250-500 N/mm2	EN-GJMW-350-4 (GTW-35)	EN-JM-1010
	4.2 Ghise malleabili (GTMW, GTMB)	Malleable cast iron (GTMW, GTMB)	500-800 N/mm2	EN-GJMB-450-6 (GTS-45)	EN-JM-1140
N	Materiali non ferrosi	Non ferrous materials			
	Leghe di alluminio	Aluminium alloys			
	1.1 Leghe di alluminio	Aluminium alloys	≤ 200 N/mm2	EN AW-AlMn1	EN AW-3103
	1.2 Leghe di alluminio malleabili	Aluminium wrought alloys	≤ 350 N/mm2	EN AW-AlMgSi	EN AW-6060
	1.3 Leghe di alluminio	Aluminium alloys	≤ 550 N/mm2	EN AW-AlZn5Mg3Cu	EN AW-7022
	1.4 Leghe di alluminio	Aluminium alloys	Si ≤ 7%	EN AC-AlMg5	EN AC-51300
	1.5 Leghe fuse di alluminio	Aluminium cast alloys	7% < Si ≤ 12%	EN AC-ALSi9Cu3	EN AC-46500
	1.6 Leghe fuse di alluminio	Aluminium cast alloys	12% < Si ≤ 17%	GD-ALSi17Cu4FeMg	
	Leghe di rame	Copper alloys			
	2.1 Rame puro, Rame poco legato	Pure copper, low-alloyed copper	≤ 400 N/mm2	E-Cu 57	EN CW 004 A
S	2.2 Leghe rame-zinco (ottone, truciolo lungo)	Copper-zinc alloys (brass, long-chipping)	≤ 550 N/mm2	CuZn37 (Ms63)	EN CW 508 L
	2.3 Leghe rame-zinco (ottone, truciolo corto)	Copper-zinc alloys (brass, short-chipping)	≤ 550 N/mm2	CuZn36Pb3 (Ms58)	EN CW 603 N
	2.4 Leghe rame-alluminio (alubronzo, truciolo lungo)	Copper-aluminium alloys (alu bronze, long-chipping)	≤ 800 N/mm2	CuAl10Ni5Fe4	EN CW 307 G
	2.5 Leghe rame-stagno (bronzio, truciolo lungo)	Copper-tin alloys (tin bronze, long-chipping)	≤ 700 N/mm2	CuSn8P	EN CW 459 K
	2.6 Leghe rame-stagno (bronzio, truciolo corto)	Copper-tin alloys (tin bronze, short-chipping)	≤ 400 N/mm2	CuSn7 ZnPb (Rg7)	2.1090
	2.7 Leghe di rame speciali	Special copper alloys	≤ 600 N/mm2	(AMPCO® 8)	
	2.8 Leghe di rame speciali	Special copper alloys	≤ 1400 N/mm2	(AMPCO® 45)	
	Leghe di magnesio	Magnesium alloys			
	3.1 Leghe di magnesio malleabili	Magnesium wrought alloys	≤ 500 N/mm2	MgAl6Zn	3.5612
	3.2 Leghe per getti di magnesio	Magnesium cast alloys	≤ 500 N/mm2	EN-MCMgAl9Zn1	EN-MC21120
H	Materie plastiche	Synthetics			
	4.1 Materie plastiche termoindurenti (truciolo corto)	Duroplastics (short-chipping)		Bakelit, Pertinax	
	4.2 Resine termoplastiche (truciolo lungo)	Thermoplastics (long-chipping)		PMMA, POM, PVC	
	4.3 Resine epossidiche (percentuale di fibre ≤ 30%)	Fibre-reinforced synthetics (fibre content ≤ 30%)		GFK, CFK, AFK	
	4.4 Resine epossidiche (percentuale di fibre > 30%)	Fibre-reinforced synthetics (fibre content > 30%)		GFK, CFK, AFK	
	Materiali speciali	Special materials			
	5.1 Grafite	Graphite		C 8000	
	5.2 Leghe tungsteno-rame	Tungsten-copper alloys		W-Cu 80/20	
	5.3 Materiali compositi	Composite materials		Hylite, Alucobond	
	Materiali speciali	Special materials			
S	Leghe di titanio	Titanium alloys			
	1.1 Titanio puro	Pure titanium	≤ 450 N/mm2	Ti1	3.7025
	1.2 Leghe di titanio	Titanium alloys	≤ 900 N/mm2	TiAl6V4	3.7165
	1.3 Leghe di titanio	Titanium alloys	≤ 1250 N/mm2	TiAl4Mo4Sn2	3.7185
	Leghe di nichel, cobalto e ferro	Nickel alloys, cobalt alloys and iron alloys			
	2.1 Nichel puro	Pure nickel	≤ 600 N/mm2	Ni 99.6	2.4060
	2.2 Leghe base nichel	Nickel-base alloys	≤ 1000 N/mm2	Monel 400	2.4360
	2.3 Leghe base nichel	Nickel-base alloys	≤ 1600 N/mm2	Inconel 718	2.4668
	2.4 Leghe base cobalto	Cobalt-base alloys	≤ 1000 N/mm2	Udimet 605	
	2.5 Leghe base cobalto	Cobalt-base alloys	≤ 1600 N/mm2	Haynes 25	2.4964
H	2.6 Leghe base ferro	Iron-base alloys	≤ 1500 N/mm2	Incoloy 800	1.4958
	Materiali duri	Hard materials			
	1.1 Materiali duri	Hard materials	44 - 50 HRC	Weldox 1100	
	1.2 "Acciai ad alta resistenza, Acciai temprati, Ghise in conchiglia	High strength steels, hardened steels, hard castings"	50 - 55 HRC	Hardox 550	
	1.3 "Acciai ad alta resistenza, Acciai temprati, Ghise in conchiglia	High strength steels, hardened steels, hard castings"	55 - 60 HRC	Armox 600T	
	1.4 "Acciai ad alta resistenza, Acciai temprati, Ghise in conchiglia	High strength steels, hardened steels, hard castings"	60 - 63 HRC	Ferro-Titanit	
	1.5 "Acciai ad alta resistenza, Acciai temprati, Ghise in conchiglia	High strength steels, hardened steels, hard castings"	63 - 66 HRC	HSSE	



	1A 11					
	1A 19					
	1A 11					
	1A 19					
	1A 19					
	1A 27					
	1A 27					
	V(mm) Coated NF + Coated TIN	f ø d3 ÷ d5	f ø d5 ÷ d8	f ø d8 ÷ d12	f ø d12 ÷ d16	
	60 ÷ 80	0,10 ÷ 0,15	0,15 ÷ 0,22	0,16 ÷ 0,30	0,20 ÷ 0,35	P
	60 ÷ 80	0,10 ÷ 0,15	0,15 ÷ 0,22	0,16 ÷ 0,30	0,20 ÷ 0,35	2.1
	55 ÷ 70	0,08 ÷ 0,15	0,10 ÷ 0,20	0,15 ÷ 0,28	0,16 ÷ 0,32	3.1
	40 ÷ 60	0,05 ÷ 0,15	0,08 ÷ 0,22	0,12 ÷ 0,26	0,16 ÷ 0,28	4.1
						5.1
						M
						1.1
						2.1
						3.1
						4.1
	70 ÷ 120	0,15 ÷ 0,30	0,20 ÷ 0,35	0,25 ÷ 0,45	0,30 ÷ 0,50	K
						1.1
						1.2
						2.1
						2.2
						3.1
						3.2
						4.1
						4.2
						N
						1.1
						1.2
						1.3
	100 ÷ 140	0,10 ÷ 0,30	0,15 ÷ 0,35	0,15 ÷ 0,35	0,20 ÷ 0,45	1.4
	100 ÷ 140	0,10 ÷ 0,30	0,15 ÷ 0,35	0,15 ÷ 0,35	0,20 ÷ 0,45	1.5
	100 ÷ 140	0,10 ÷ 0,30	0,15 ÷ 0,35	0,15 ÷ 0,35	0,20 ÷ 0,45	1.6
						2.1
						2.2
						2.3
						2.4
						2.5
						2.6
						2.7
						3.1
						3.2
						4.1
						4.2
						4.3
						4.4
						5.1
						5.2
						5.3
						S
						1.1
						1.2
						1.3
						2.1
						2.2
						2.3
						2.4
						2.5
						2.6
						H
						1.1
						1.2
						1.3
						1.4
						1.5

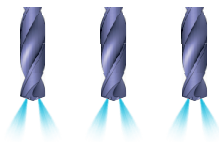
I valori di velocità di taglio / periferica (vc in m/min) qui elencati sono puramente indicativi e devono essere adattati alle condizioni d'impiego (materiale, lubrorefrigerazione, macchina utensile ecc.). Confronto internazionale dei materiali, vedere pagina Z • 21

The cutting speeds (vc in m/min) listed in the respective columns are standard values which have to be adjusted to individual work conditions (material, lubrication, machine etc.). International comparison of materials, see page Z • 21

V = Velocità (m/min) V = Speed (m/min)
F = Avanzamento (mm) F = Feed (mm)

15xD Forata - 15xD with interior cooling
20xD Forata - 20xD with interior cooling
30xD Forata - 30xD with interior cooling

	Materiale		Material	Material examples	Mat. numbers
P	Acciai		Steel materials		
	1.1	Acciai estrusi a freddo	Cold-extrusion steel	Cq15	1.1132
		Acciai da costruzione	Costruction steels	S235JR (St37-2)	1.0037
		Acciai alta velocità	Free-cutting steel, etc.	10SPb20	1.0722
	2.1	Acciai da costruzione	Costruction steels	E360 (St70-2)	1.0070
		Acciai da cementazione	Cementation steel	16MnCr5	1.7131
		Fusione d'acciaio, ecc.	Steel casting, etc.	GS-25CrMo4	1.7218
		Acciai da cementazione	Cementation steel	20MoCr3	1.7320
	3.1	Acciai da bonifica	Heat-treatable steels	42CrMo4	1.7225
		Acciai per lavorazioni a freddo, ecc.	Cold work steels, etc.	102Cr6	1.2067
		Acciai da bonifica	Heat-treatable steels	50CrMo4	1.7228
	4.1	Acciai per lavorazioni a freddo	Cold work steels	X45NiCrMo4	1.2767
		Acciai da nitrurazione, ecc.	Nitriding steels, etc.	31CrMo12	1.8515
		Acciai fortemente legati	High-alloyed steels	X38CrMoV5-3	1.2367
	5.1	Acciai per lavorazioni a freddo	Cold work steels	X100CrMoV8-1-1	1.2990
		Acciai per lavorazioni a caldo, ecc.	Hot work steels, etc.	X40CrMoV5-1	1.2344
		Acciai inossidabili	Stainless steel materials		
	1.1	Ferritici, martensitici	Ferritic, martensitic	X2CrTi12	1.4512
	2.1	Austenitici	Austenitic	X6CrNiMoTi17-12-2	1.4571
	3.1	Austenitici-ferritici (Duplex)	Austenitic-ferritic (Duplex)	X2CrNiMoN22-5-3	1.4462
	4.1	Austenitici-ferritici resistenti al calore (Super Duplex)	Austenitic-ferritic heat-resistant (Super Duplex)	X2CrNiMoN25-7-4	1.4410
K	Ghise		Cast materials		
	1.1	Ghise con grafite lamellare (GJL)	Cast iron with lamellar graphite (GJL)	EN-GJL-200 (GG20)	EN-JL-1030
	1.2			EN-GJL-300 (GG30)	EN-JL-1050
	2.1	Ghise con grafite nodulare (GJS)	Cast iron with nodular graphite (GJS)	EN-GJS-400-15 (GGG40)	EN-JS-1030
	2.2			EN-GJS-700-2 (GGG70)	EN-JS-1070
	3.1	Ghise con grafite vermicolare (GJV)	Cast iron with vermicular graphite (GJV)	GJV 300	
	3.2			GJV 450	
	4.1	Ghise malleabili (GTMW, GTMB)	Malleable cast iron (GTMW, GTMB)	EN-GJMW-350-4 (GTW-35)	EN-JM-1010
	4.2			EN-GJMB-450-6 (GTS-45)	EN-JM-1140
		Materiali non ferrosi	Non ferrous materials		
N	Leghe di alluminio		Aluminium alloys		
	1.1		≤ 200 N/mm2	EN AW-ALMn1	EN AW-3103
	1.2	Leghe di alluminio malleabili	Aluminium wrought alloys	EN AW-ALMgSi	EN AW-6060
	1.3		≤ 550 N/mm2	EN AW-AlZn5Mg3Cu	EN AW-7022
	1.4		Si ≤ 7%	EN AC-ALMg5	EN AC-51300
	1.5	Leghe fuse di alluminio	Aluminium cast alloys	EN AC-ALSi9Cu3	EN AC-46500
	1.6		12% < Si ≤ 17%	GD-ALSi17Cu4FeMg	
		Leghe di rame	Copper alloys		
	2.1	Rame puro, Rame poco legato	Pure copper, low-alloyed copper	E-Cu 57	EN CW 004 A
	2.2	Leghe rame-zinco (ottone, truciolo lungo)	Copper-zinc alloys (brass, long-chipping)	≤ 550 N/mm2 CuZn37 (Ms63)	EN CW 508 L
	2.3	Leghe rame-zinco (ottone, truciolo corto)	Copper-zinc alloys (brass, short-chipping)	≤ 550 N/mm2 CuZn36Pb3 (Ms58)	EN CW 603 N
	2.4	Leghe rame-alluminio (alubronzo, truciolo lungo)	Copper-aluminium alloys (alu bronze, long-chipping)	≤ 800 N/mm2 CuAl10Ni5Fe4	EN CW 307 G
	2.5	Leghe rame-stagno (bronzo, truciolo lungo)	Copper-tin alloys (tin bronze, long-chipping)	≤ 700 N/mm2 CuSn8P	EN CW 459 K
	2.6	Leghe rame-stagno (bronzo, truciolo corto)	Copper-tin alloys (tin bronze, short-chipping)	≤ 400 N/mm2 CuSn7 ZnPb (Rg7)	2.1090
	2.7		≤ 600 N/mm2	(AMPCO® 8)	
	2.8	Leghe di rame speciali	Special copper alloys	≤ 1400 N/mm2	(AMPCO® 45)
		Leghe di magnesio	Magnesium alloys		
	3.1	Leghe di magnesio malleabili	Magnesium wrought alloys	≤ 500 N/mm2 MgAl6Zn	3.5612
	3.2	Leghe per getti di magnesio	Magnesium cast alloys	≤ 500 N/mm2 EN-MCMgAl9Zn1	EN-MC21120
		Materie plastiche	Synthetics		
	4.1	Materie plastiche termoindurenti (truciolo corto)	Duroplastics (short-chipping)		Bakelit, Pertinax
	4.2	Resine termoplastiche (truciolo lungo)	Thermoplastics (long-chipping)		PMMA, POM, PVC
	4.3	Resine epossidiche (percentuale di fibre ≤ 30%)	Fibre-reinforced synthetics (fibre content ≤ 30%)		GFK, CFK, AFK
	4.4	Resine epossidiche (percentuale di fibre > 30%)	Fibre-reinforced synthetics (fibre content > 30%)		GFK, CFK, AFK
		Materiali speciali	Special materials		
	5.1	Grafite	Graphite		C 8000
	5.2	Leghe tungsteno-rame	Tungsten-copper alloys		W-Cu 80/20
	5.3	Materiali compositi	Composite materials		Hylite, Alucobond
		Materiali speciali	Special materials		
		Leghe di titanio	Titanium alloys		
	1.1	Titanio puro	Pure titanium	≤ 450 N/mm2 Ti1	3.7025
	1.2			≤ 900 N/mm2 TiAl6V4	3.7165
	1.3	Leghe di titanio	Titanium alloys	≤ 1250 N/mm2 TiAl4Mo4Sn2	3.7185
		Leghe di nichel, cobalto e ferro	Nickel alloys, cobalt alloys and iron alloys		
	2.1	Nichel puro	Pure nickel	≤ 600 N/mm2 Ni 99,6	2.4060
	2.2			≤ 1000 N/mm2 Monel 400	2.4360
	2.3	Leghe base nichel	Nickel-base alloys	≤ 1600 N/mm2 Inconel 718	2.4668
	2.4			≤ 1000 N/mm2 Udimet 605	
	2.5	Leghe base cobalto	Cobalt-base alloys	≤ 1600 N/mm2 Haynes 25	2.4964
	2.6	Leghe base ferro	Iron-base alloys	≤ 1500 N/mm2 Incoloy 800	1.4958
		Materiali duri	Hard materials		
	1.1			44 - 50 HRC Weldox 1100	
	1.2			50 - 55 HRC Hardox 550	
	1.3	"Acciai ad alta resistenza, Acciai temprati, Ghise in conchiglia	High strength steels, hardened steels, hard castings"	55 - 60 HRC Armox 600T	
	1.4			60 - 63 HRC Ferro-Titanit	
	1.5			63 - 66 HRC HSSE	



	1A 29					
	1A 31					
	1A 33					
	V(mm) Coated NF	f ø d4 ÷ d5	f ø d6 ÷ d8	f ø d10 ÷ d12		
						P
	40 ÷ 60	0,08 ÷ 0,10	0,12 ÷ 0,14	0,16 ÷ 0,18		
	60 ÷ 80	0,10 ÷ 0,12	0,14 ÷ 0,18	0,20 ÷ 0,22		2.1
	55 ÷ 70	0,10 ÷ 0,12	0,14 ÷ 0,18	0,20 ÷ 0,22		3.1
	50 ÷ 70	0,08 ÷ 0,10	0,12 ÷ 0,14	0,16 ÷ 0,18		4.1
						5.1
	40/60	0,08/0,10	0,12/0,14	0,16/0,18		1.1
	40/60	0,08/0,10	0,12/0,14	0,16/0,18		2.1
						3.1
						4.1
	80/100	0,12 ÷ 0,14	0,16 ÷ 0,18	0,20 ÷ 0,25		1.1
						1.2
						2.1
						2.2
						3.1
						3.2
						4.1
						4.2
	120/170	0,10 ÷ 0,14	0,16 ÷ 0,20	0,22 ÷ 0,27		1.1
	120/170	0,10 ÷ 0,14	0,16 ÷ 0,20	0,22 ÷ 0,27		1.2
	120/170	0,10 ÷ 0,14	0,16 ÷ 0,20	0,22 ÷ 0,27		1.3
	120/170	0,10 ÷ 0,14	0,16 ÷ 0,20	0,22 ÷ 0,27		1.4
	120/170	0,10 ÷ 0,14	0,16 ÷ 0,20	0,22 ÷ 0,27		1.5
	100/140	0,10 ÷ 0,14	0,16 ÷ 0,20	0,22 ÷ 0,27		1.6
						2.1
						2.2
						2.3
						2.4
						2.5
						2.6
						2.7
						3.1
						3.2
						4.1
						4.2
						4.3
						4.4
						5.1
						5.2
						5.3
		0,08 ÷ 0,10	0,12 ÷ 0,14	0,16 ÷ 0,18		1.1
		0,08 ÷ 0,10	0,12 ÷ 0,14	0,16 ÷ 0,18		1.2
		0,08 ÷ 0,10	0,12 ÷ 0,14	0,16 ÷ 0,18		1.3
						2.1
						2.2
						2.3
						2.4
						2.5
						2.6
						1.1
						1.2
						1.3
						1.4
						1.5

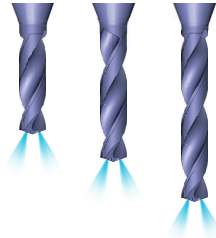
I valori di velocità di taglio / periferica (vc in m/min) qui elencati sono puramente indicativi e devono essere adattati alle condizioni d'impiego (materiale, lubrorefrigerazione, macchina utensile ecc.). Confronto internazionale dei materiali, vedere pagina Z • 21

The cutting speeds (vc in m/min) listed in the respective columns are standard values which have to be adjusted to individual work conditions (material, lubrication, machine etc.). International comparison of materials, see page Z • 21

V = Velocità (m/min) V = Speed (m/min)
F = Avanzamento (mm) F = Feed (mm)

Micro 5xD Forata - 5xD with interior cooling
Micro 8xD Forata - 8xD with interior cooling
Micro 12xD Forata - 12xD with interior cooling

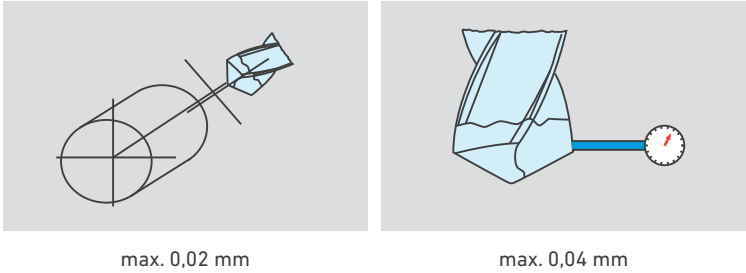
	Materiale		Material	Material examples	Mat. numbers
P	Acciai		Steel materials		
	1.1 Acciai estrusi a freddo		Cold-extrusion steel	Cq15	1.1132
	1.1 Acciai da costruzione	≤ 600 N/mm2	Construction steels	S235JR (St37-2)	1.0037
	1.1 Acciai alta velocità		Free-cutting steel, etc.	10SPb20	1.0722
	2.1 Acciai da costruzione		Construction steels	E360 (St70-2)	1.0070
	2.1 Acciai da cementazione	≤ 800 N/mm2	Cementation steel	16MnCr5	1.7131
	2.1 Fusione d'acciaio, ecc.		Steel casting, etc.	GS-25CrMo4	1.7218
	2.1 Acciai da cementazione		Cementation steel	20MoCr3	1.7320
	3.1 Acciai da bonifica	≤ 1000 N/mm2	Heat-treatable steels	42CrMo4	1.7225
	3.1 Acciai per lavorazioni a freddo, ecc.		Cold work steels, etc.	102Cr6	1.2067
	3.1 Acciai da bonifica		Heat-treatable steels	50CrMo4	1.7228
	4.1 Acciai per lavorazioni a freddo	≤ 1200 N/mm2	Cold work steels	X45NiCrMo4	1.2767
	4.1 Acciai da nitrurazione, ecc.		Nitriding steels, etc.	31CrMo12	1.8515
	4.1 Acciai fortemente legati		High-alloyed steels	X38CrMoV5-3	1.2367
	5.1 Acciai per lavorazioni a freddo	≤ 1400 N/mm2	Cold work steels	X100CrMoV8-1-1	1.2990
M	5.1 Acciai per lavorazioni a caldo, ecc.		Hot work steels, etc.	X40CrMoV5-1	1.2344
	Acciai inossidabili		Stainless steel materials		
	1.1 Ferritici, martensitici	≤ 950 N/mm2	Ferritic, martensitic	X2CrTi12	1.4512
	2.1 Austenitici	≤ 950 N/mm2	Austenitic	X6CrNiMoTi17-12-2	1.4571
	3.1 Austenitici-ferritici (Duplex)	≤ 1100 N/mm2	Austenitic-ferritic (Duplex)	X2CrNiMoN22-5-3	1.4462
K	4.1 Austenitici-ferritici resistenti al calore (Super Duplex)	≤ 1250 N/mm2	Austenitic-ferritic heat-resistant (Super Duplex)	X2CrNiMoN25-7-4	1.4410
	Ghise		Cast materials		
	1.1 Ghise con grafite lamellare (GJL)	100-250 N/mm2	Cast iron with lamellar graphite (GJL)	EN-GJL-200 (GG20)	EN-JL-1030
	1.2 Ghise con grafite lamellare (GJL)	250-450 N/mm2	Cast iron with lamellar graphite (GJL)	EN-GJL-300 (GG30)	EN-JL-1050
	2.1 Ghise con grafite nodulare (GJS)	350-500 N/mm2	Cast iron with nodular graphite (GJS)	EN-GJS-400-15 (GGG40)	EN-JS-1030
N	2.2 Ghise con grafite nodulare (GJS)	500-900 N/mm2	Cast iron with nodular graphite (GJS)	EN-GJS-700-2 (GGG70)	EN-JS-1070
	3.1 Ghise con grafite vermicolare (GJV)	300-400 N/mm2	Cast iron with vermicular graphite (GJV)	GJV 300	
	3.2 Ghise con grafite vermicolare (GJV)	400-500 N/mm2	Cast iron with vermicular graphite (GJV)	GJV 450	
	4.1 Ghise malleabili (GTMW, GTMB)	250-500 N/mm2	Malleable cast iron (GTMW, GTMB)	EN-GJMW-350-4 (GTW-35)	EN-JM-1010
	4.2 Ghise malleabili (GTMW, GTMB)	500-800 N/mm2	Malleable cast iron (GTMW, GTMB)	EN-GJMB-450-6 (GTS-45)	EN-JM-1140
S	Materiali non ferrosi		Non ferrous materials		
	Leghe di alluminio		Aluminium alloys		
	1.1 Leghe di alluminio	≤ 200 N/mm2	Aluminium alloys	EN AW-AlMn1	EN AW-3103
	1.2 Leghe di alluminio malleabili	≤ 350 N/mm2	Aluminium wrought alloys	EN AW-AlMgSi	EN AW-6060
	1.3 Leghe di alluminio malleabili	≤ 550 N/mm2	Aluminium wrought alloys	EN AW-AlZn5Mg3Cu	EN AW-7022
	1.4 Leghe di alluminio malleabili	Si ≤ 7%	Aluminium wrought alloys	EN AC-AlMg5	EN AC-51300
	1.5 Leghe fuse di alluminio	7% < Si ≤ 12%	Aluminium cast alloys	EN AC-AlSi9Cu3	EN AC-46500
	1.6 Leghe fuse di alluminio	12% < Si ≤ 17%	Aluminium cast alloys	GD-AlSi17Cu4FeMg	
	Leghe di rame		Copper alloys		
	2.1 Rame puro, Rame poco legato	≤ 400 N/mm2	Pure copper, low-alloyed copper	E-Cu 57	EN CW 004 A
	2.2 Leghe rame-zinco (ottone, truciolo lungo)	≤ 550 N/mm2	Copper-zinc alloys (brass, long-chipping)	CuZn37 (Ms63)	EN CW 508 L
	2.3 Leghe rame-zinco (ottone, truciolo corto)	≤ 550 N/mm2	Copper-zinc alloys (brass, short-chipping)	CuZn36Pb3 (Ms58)	EN CW 603 N
	2.4 Leghe rame-alluminio (alubronzo, truciolo lungo)	≤ 800 N/mm2	Copper-aluminium alloys (alu bronze, long-chipping)	CuAl10Ni5Fe4	EN CW 307 G
	2.5 Leghe rame-stagno (bronzo, truciolo lungo)	≤ 700 N/mm2	Copper-tin alloys (tin bronze, long-chipping)	CuSn8P	EN CW 459 K
	2.6 Leghe rame-stagno (bronzo, truciolo corto)	≤ 400 N/mm2	Copper-tin alloys (tin bronze, short-chipping)	CuSn7 ZnPb (Rg7)	2.1090
H	2.7 Leghe di rame speciali	≤ 600 N/mm2	Special copper alloys	(AMPCO® 8)	
	2.8 Leghe di rame speciali	≤ 1400 N/mm2	Special copper alloys	(AMPCO® 45)	
	Leghe di magnesio		Magnesium alloys		
	3.1 Leghe di magnesio malleabili	≤ 500 N/mm2	Magnesium wrought alloys	MgAl6Zn	3.5612
	3.2 Leghe per getti di magnesio	≤ 500 N/mm2	Magnesium cast alloys	EN-MCMgAl9Zn1	EN-MC21120
	Materie plastiche		Synthetics		
	4.1 Materie plastiche termoindurenti (truciolo corto)		Duroplastics (short-chipping)	Bakelit, Pertinax	
	4.2 Resine termoplastiche (truciolo lungo)		Thermoplastics (long-chipping)	PMMA, POM, PVC	
	4.3 Resine epossidiche (percentuale di fibre ≤ 30%)		Fibre-reinforced synthetics (fibre content ≤ 30%)	GFK, CFK, AFK	
	4.4 Resine epossidiche (percentuale di fibre > 30%)		Fibre-reinforced synthetics (fibre content > 30%)	GFK, CFK, AFK	
	Materiali speciali		Special materials		
	5.1 Grafite		Graphite	C 8000	
	5.2 Leghe tungsteno-rame		Tungsten-copper alloys	W-Cu 80/20	
	5.3 Materiali compositi		Composite materials	Hylite, Alucobond	
H	Materiali speciali		Special materials		
	Leghe di titanio		Titanium alloys		
	1.1 Titanio puro	≤ 450 N/mm2	Pure titanium	Ti1	3.7025
	1.2 Leghe di titanio	≤ 900 N/mm2	Titanium alloys	TiAl6V4	3.7165
	1.3 Leghe di titanio	≤ 1250 N/mm2	Titanium alloys	TiAl4Mo4Sn2	3.7185
	Leghe di nichel, cobalto e ferro		Nickel alloys, cobalt alloys and iron alloys		
	2.1 Nichel puro	≤ 600 N/mm2	Pure nickel	Ni 99,6	2.4060
	2.2 Leghe base nichel	≤ 1000 N/mm2	Nickel-base alloys	Monel 400	2.4360
	2.3 Leghe base nichel	≤ 1600 N/mm2	Nickel-base alloys	Inconel 718	2.4668
	2.4 Leghe base cobalto	≤ 1000 N/mm2	Cobalt-base alloys	Udimet 605	
	2.5 Leghe base cobalto	≤ 1600 N/mm2	Cobalt-base alloys	Haynes 25	2.4964
	2.6 Leghe base ferro	≤ 1500 N/mm2	Iron-base alloys	Incoloy 800	1.4958
	Materiali duri		Hard materials		
	1.1 Materiali duri	44 - 50 HRC	Hard materials	Weldox 1100	
	1.2 Materiali duri	50 - 55 HRC	Hard materials	Hardox 550	
	1.3 Materiali duri	55 - 60 HRC	Hard materials	Armox 600T	
	1.4 Materiali duri	60 - 63 HRC	Hard materials	Ferro-Titanit	
	1.5 Materiali duri	63 - 66 HRC	Hard materials	HSSE	



	1A 35	1A 37	1A 39		
	V(mm) coated NF	f ø d1 ÷ d1,5	f ø d1,6 ÷ d2	f ø d2,1 ÷ d2,9	
P	15 ÷ 35	0,01 ÷ 0,02	0,02 ÷ 0,04	0,03 ÷ 0,06	
	25 ÷ 80	0,02 ÷ 0,04	0,03 ÷ 0,06	0,04 ÷ 0,08	2.1
	25 ÷ 80	0,02 ÷ 0,04	0,03 ÷ 0,06	0,04 ÷ 0,08	3.1
	20 ÷ 45	0,02 ÷ 0,04	0,03 ÷ 0,05	0,04 ÷ 0,06	4.1
					5.1
M					
					1.1
					2.1
					3.1
					4.1
K	25 ÷ 80	0,10 ÷ 0,20	0,15 ÷ 0,25	0,20 ÷ 0,30	1.1
					1.2
					2.1
					2.2
					3.1
N					3.2
					4.1
					4.2
S	25 ÷ 200	0,02 ÷ 0,06	0,03 ÷ 0,07	0,04 ÷ 0,10	1.1
					1.2
					1.3
					1.4
					1.5
					1.6
					2.1
					2.2
					2.3
					2.4
					2.5
					2.6
					2.7
H					3.1
					3.2
					4.1
					4.2
S	15 ÷ 35	0,01 ÷ 0,02	0,02 ÷ 0,03	0,03 ÷ 0,05	1.1
	15 ÷ 35	0,01 ÷ 0,02	0,02 ÷ 0,03	0,03 ÷ 0,05	1.2
	15 ÷ 35	0,01 ÷ 0,02	0,02 ÷ 0,03	0,03 ÷ 0,05	1.3
					2.1
H					2.2
					2.3
					2.4
					2.5
					2.6
H					
					1.1
					1.2
					1.3
					1.4
					1.5

PRECAUZIONI PER L'UTILIZZO
PRECAUTIONS FOR USE

Concentricità
Run-Out

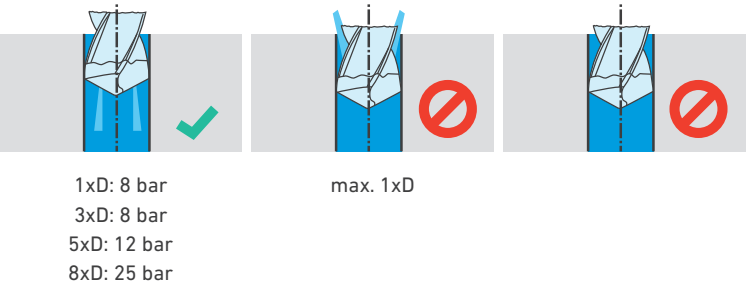


Indicazione relativa al refrigerante

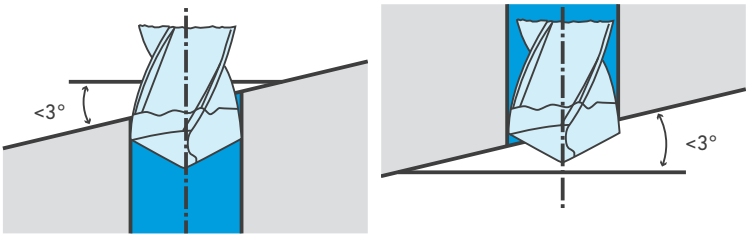
La pressione del refrigerante dipende dalla profondità di foratura.

Indication regarding the coolant

The pressure of the coolant liquid depends on the depth of the drilling.



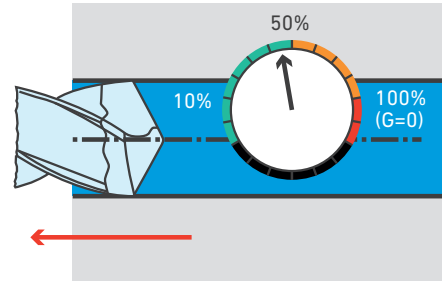
Angolo max di entrata e uscita
Max. angle of entry and exit



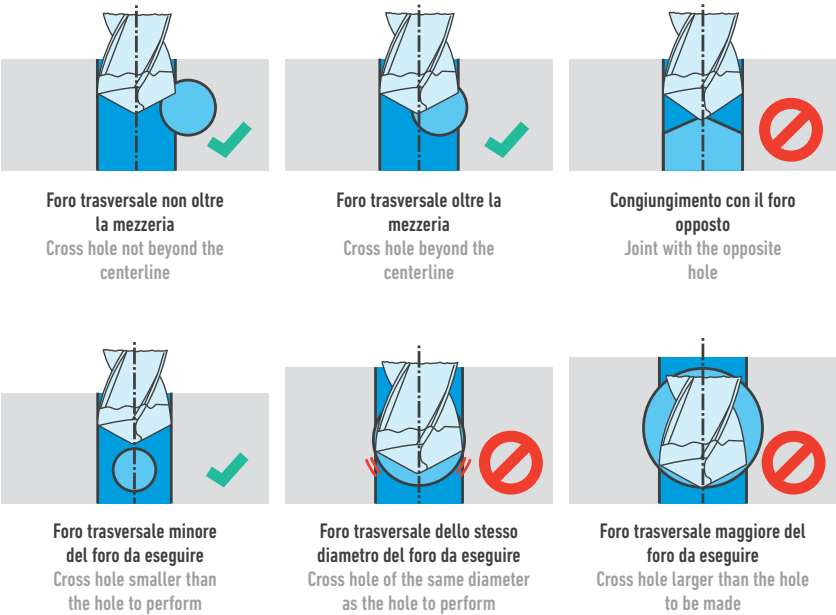
Foro passante
Through hole



Non è possibile la corsa rapida durante la fase di ritorno
Fast run isn't possible during the return phase



Condizioni di lavorazione
Processing conditions



DIN6537

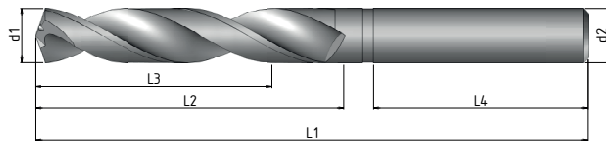
Technical drawing of a double-flute drill bit. The drawing shows the bit's profile with two flutes. Dimensions are indicated as follows: $d1$ is the diameter at the cutting edge, $d2$ is the diameter of the shank, $L1$ is the total length, $L2$ is the length of the cutting edge, $L3$ is the length of the fluted section, and $L4$ is the length of the shank.

1A • 11A • 12

PIG 3xD

DIN6537

**ESECUZIONI SPECIALI A DISEGNO
CUSTOMIZED DESIGN ON REQUEST**

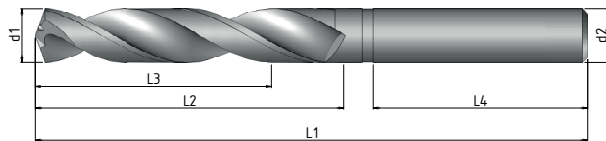


d1	d2	L1	L2	L3	L4		
8.70	10.00	89	47	35	40	PIG531.0870	PIG540.0870
8.73	10.00	89	47	35	40	PIG531.0873	PIG540.0873
8.80	10.00	89	47	35	40	PIG531.0880	PIG540.0880
8.90	10.00	89	47	35	40	PIG531.0890	PIG540.0890
9.00	10.00	89	47	35	40	PIG531.0900	PIG540.0900
9.10	10.00	89	47	35	40	PIG531.0910	PIG540.0910
9.13	10.00	89	47	35	40	PIG531.0913	PIG540.0913
9.20	10.00	89	47	35	40	PIG531.0920	PIG540.0920
9.25	10.00	89	47	35	40	PIG531.0925	PIG540.0925
9.30	10.00	89	47	35	40	PIG531.0930	PIG540.0930
9.40	10.00	89	47	35	40	PIG531.0940	PIG540.0940
9.50	10.00	89	47	35	40	PIG531.0950	PIG540.0950
9.60	10.00	89	47	35	40	PIG531.0960	PIG540.0960
9.70	10.00	89	47	35	40	PIG531.0970	PIG540.0970
9.80	10.00	89	47	35	40	PIG531.0980	PIG540.0980
9.92	10.00	89	47	35	40	PIG531.0992	PIG540.0992
10.00	10.00	89	47	35	40	PIG531.1000	PIG540.1000
10.10	12.00	102	55	40	45	PIG531.1010	PIG540.1010
10.20	12.00	102	55	40	45	PIG531.1020	PIG540.1020
10.30	12.00	102	55	40	45	PIG531.1030	PIG540.1030
10.40	12.00	102	55	40	45	PIG531.1040	PIG540.1040
10.50	12.00	102	55	40	45	PIG531.1050	PIG540.1050
10.60	12.00	102	55	40	45	PIG531.1060	PIG540.1060
10.70	12.00	102	55	40	45	PIG531.1070	PIG540.1070
10.80	12.00	102	55	40	45	PIG531.1080	PIG540.1080
10.90	12.00	102	55	40	45	PIG531.1090	PIG540.1090
11.00	12.00	102	55	40	45	PIG531.1100	PIG540.1100
11.10	12.00	102	55	40	45	PIG531.1110	PIG540.1110
11.20	12.00	102	55	40	45	PIG531.1120	PIG540.1120
11.30	12.00	102	55	40	45	PIG531.1130	PIG540.1130
11.40	12.00	102	55	40	45	PIG531.1140	PIG540.1140
11.50	12.00	102	55	40	45	PIG531.1150	PIG540.1150
11.60	12.00	102	55	40	45	PIG531.1160	PIG540.1160
11.70	12.00	102	55	40	45	PIG531.1170	PIG540.1170
11.80	12.00	102	55	40	45	PIG531.1180	PIG540.1180
11.90	12.00	102	55	40	45	PIG531.1190	PIG540.1190
12.00	12.00	102	55	40	45	PIG531.1200	PIG540.1200
12.10	14.00	107	60	43	45	PIG531.1210	PIG540.1210
12.20	14.00	107	60	43	45	PIG531.1220	PIG540.1220

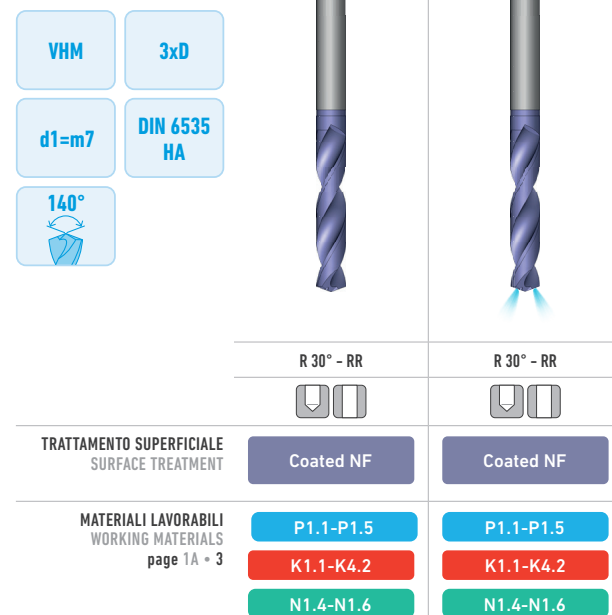
PIG 3xD

DIN6537

**ESECUZIONI SPECIALI A DISEGNO
CUSTOMIZED DESIGN ON REQUEST**



d1	d2	L1	L2	L3	L4		
12.30	14.00	107	60	43	45	PIG531.1230	PIG540.1230
12.40	14.00	107	60	43	45	PIG531.1240	PIG540.1240
12.50	14.00	107	60	43	45	PIG531.1250	PIG540.1250
12.60	14.00	107	60	43	45	PIG531.1260	PIG540.1260
12.70	14.00	107	60	43	45	PIG531.1270	PIG540.1270
12.80	14.00	107	60	43	45	PIG531.1280	PIG540.1280
12.90	14.00	107	60	43	45		PIG540.1290
13.00	14.00	107	60	43	45	PIG531.1300	PIG540.1300
13.10	14.00	107	60	43	45	PIG531.1310	PIG540.1310
13.20	14.00	107	60	43	45		PIG540.1320
13.30	14.00	107	60	43	45		PIG540.1330
13.40	14.00	107	60	43	45		PIG540.1340
13.50	14.00	107	60	43	45	PIG531.1350	PIG540.1350
13.60	14.00	107	60	43	45		PIG540.1360
13.70	14.00	107	60	43	45	PIG531.1370	PIG540.1370
13.80	14.00	107	60	43	45	PIG531.1380	PIG540.1380
13.90	14.00	107	60	43	45		PIG540.1390
14.00	14.00	107	60	43	45	PIG531.1400	PIG540.1400
14.10	16.00	115	65	45	48	PIG531.1410	PIG540.1410
14.20	16.00	115	65	45	48	PIG531.1420	PIG540.1420
14.30	16.00	115	65	45	48	PIG531.1430	PIG540.1430
14.40	16.00	115	65	45	48		PIG540.1440
14.50	16.00	115	65	45	48	PIG531.1450	PIG540.1450
14.60	16.00	115	65	45	48		PIG540.1460
14.70	16.00	115	65	45	48	PIG531.1470	PIG540.1470
14.80	16.00	115	65	45	48		PIG540.1480
14.90	16.00	115	65	45	48		PIG540.1490
15.00	16.00	115	65	45	48	PIG531.1500	PIG540.1500
15.50	16.00	115	65	45	48	PIG531.1550	PIG540.1550
15.70	16.00	115	65	45	48	PIG531.1570	PIG540.1570
16.00	16.00	115	65	45	48	PIG531.1600	PIG540.1600
16.50	18.00	123	73	51	48	PIG531.1650	PIG540.1650
17.00	18.00	123	73	51	48	PIG531.1700	PIG540.1700
17.50	18.00	123	73	51	48	PIG531.1750	PIG540.1750
18.00	18.00	123	73	51	48	PIG531.1800	PIG540.1800
18.50	20.00	131	79	55	50	PIG531.1850	PIG540.1850
19.00	20.00	131	79	55	50	PIG531.1900	PIG540.1900
19.50	20.00	131	79	55	50	PIG531.1950	PIG540.1950
20.00	20.00	131	79	55	50	PIG531.2000	PIG540.2000

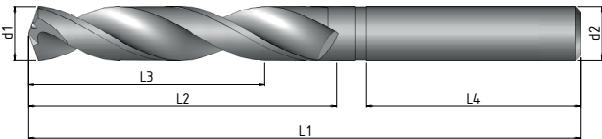
This image shows a full page of white paper with horizontal blue lines. The lines are evenly spaced and run across the width of the page, typical of standard notebook paper. There are no margins, text, or other markings on the page.

PIG

PIG 5xD

DIN6537

ESECUZIONI SPECIALI A DISEGNO
CUSTOMIZED DESIGN ON REQUEST



VHM

5xD

d1=m7

DIN 6535
HA

140°



R 30° - RR



Coated NF

R 30° - RR



Coated NF

TRATTAMENTO SUPERFICIALE
SURFACE TREATMENT

MATERIALI LAVORABILI
WORKING MATERIALS
page 1A - 3

P1.1-P1.5

K1.1-K4.2

N1.4-N1.6

P1.1-P1.5

K1.1-K4.2

N1.4-N1.6

d1	d2	L1	L2	L3	L4		
3.00	6.00	66	28	23	36	PIG532.0300	PIG550.0300
3.10	6.00	66	28	23	36	PIG532.0310	PIG550.0310
3.17	6.00	66	28	23	36	PIG532.0317	PIG550.0317
3.20	6.00	66	28	23	36	PIG532.0320	PIG550.0320
3.25	6.00	66	28	23	36	PIG532.0325	PIG550.0325
3.30	6.00	66	28	23	36	PIG532.0330	PIG550.0330
3.40	6.00	66	28	23	36	PIG532.0340	PIG550.0340
3.50	6.00	66	28	23	36	PIG532.0350	PIG550.0350
3.57	6.00	66	28	23	36	PIG532.0357	PIG550.0357
3.60	6.00	66	28	23	36	PIG532.0360	PIG550.0360
3.70	6.00	66	28	23	36	PIG532.0370	PIG550.0370
3.80	6.00	74	36	29	36	PIG532.0380	PIG550.0380
3.90	6.00	74	36	29	36	PIG532.0390	PIG550.0390
3.97	6.00	74	36	29	36	PIG532.0397	PIG550.0397
4.00	6.00	74	36	29	36	PIG532.0400	PIG550.0400
4.10	6.00	74	36	29	36	PIG532.0410	PIG550.0410
4.20	6.00	74	36	29	36	PIG532.0420	PIG550.0420
4.30	6.00	74	36	29	36	PIG532.0430	PIG550.0430
4.37	6.00	74	36	29	36	PIG532.0437	PIG550.0437
4.40	6.00	74	36	29	36	PIG532.0440	PIG550.0440
4.50	6.00	74	36	29	36	PIG532.0450	PIG550.0450
4.60	6.00	74	36	29	36	PIG532.0460	PIG550.0460
4.65	6.00	74	36	29	36	PIG532.0465	PIG550.0465
4.70	6.00	74	36	29	36	PIG532.0470	PIG550.0470
4.76	6.00	82	44	35	36	PIG532.0476	PIG550.0476
4.80	6.00	82	44	35	36	PIG532.0480	PIG550.0480
4.90	6.00	82	44	35	36	PIG532.0490	PIG550.0490
5.00	6.00	82	44	35	36	PIG532.0500	PIG550.0500
5.10	6.00	82	44	35	36	PIG532.0510	PIG550.0510
5.16	6.00	82	44	35	36	PIG532.0516	PIG550.0516
5.20	6.00	82	44	35	36	PIG532.0520	PIG550.0520
5.30	6.00	82	44	35	36	PIG532.0530	PIG550.0530
5.40	6.00	82	44	35	36	PIG532.0540	PIG550.0540
5.50	6.00	82	44	35	36	PIG532.0550	PIG550.0550
5.55	6.00	82	44	35	36	PIG532.0555	PIG550.0555
5.56	6.00	82	44	35	36	PIG532.0556	PIG550.0556
5.60	6.00	82	44	35	36	PIG532.0560	PIG550.0560
5.70	6.00	82	44	35	36	PIG532.0570	PIG550.0570

PIG



R 30° - RR



Coated ALU

N1.1-N1.6

N2.1-N2.8

N3.1-N3.2

N4.1-N4.4

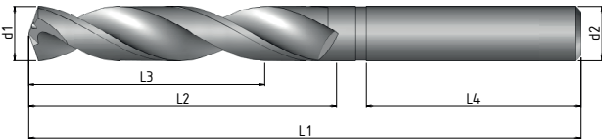
N5.1-N5.2

PIG700.0300
PIG700.0310
PIG700.0330
PIG700.0350
PIG700.0370
PIG700.0380
PIG700.0400
PIG700.0420
PIG700.0450
PIG700.0480
PIG700.0500
PIG700.0510
PIG700.0520
PIG700.0550

PIG 5xD

DIN6537

ESECUZIONI SPECIALI A DISEGNO
CUSTOMIZED DESIGN ON REQUEST



d1	d2	L1	L2	L3	L4		
5.80	6.00	82	44	35	36	PIG532.0580	PIG550.0580
5.90	6.00	82	44	35	36	PIG532.0590	PIG550.0590
5.95	6.00	82	44	35	36	PIG532.0595	PIG550.0595
6.00	6.00	82	44	35	36	PIG532.0600	PIG550.0600
6.10	8.00	91	53	43	36	PIG532.0610	PIG550.0610
6.20	8.00	91	53	43	36	PIG532.0620	PIG550.0620
6.30	8.00	91	53	43	36	PIG532.0630	PIG550.0630
6.35	8.00	91	53	43	36	PIG532.0635	PIG550.0635
6.40	8.00	91	53	43	36	PIG532.0640	PIG550.0640
6.50	8.00	91	53	43	36	PIG532.0650	PIG550.0650
6.60	8.00	91	53	43	36	PIG532.0660	PIG550.0660
6.70	8.00	91	53	43	36	PIG532.0670	PIG550.0670
6.75	8.00	91	53	43	36	PIG532.0675	PIG550.0675
6.80	8.00	91	53	43	36	PIG532.0680	PIG550.0680
6.90	8.00	91	53	43	36	PIG532.0690	PIG550.0690
7.00	8.00	91	53	43	36	PIG532.0700	PIG550.0700
7.10	8.00	91	53	43	36	PIG532.0710	PIG550.0710
7.14	8.00	91	53	43	36	PIG532.0714	PIG550.0714
7.20	8.00	91	53	43	36	PIG532.0720	PIG550.0720
7.30	8.00	91	53	43	36	PIG532.0730	PIG550.0730
7.40	8.00	91	53	43	36	PIG532.0740	PIG550.0740
7.50	8.00	91	53	43	36	PIG532.0750	PIG550.0750
7.54	8.00	91	53	43	36	PIG532.0754	PIG550.0754
7.60	8.00	91	53	43	36	PIG532.0760	PIG550.0760
7.70	8.00	91	53	43	36	PIG532.0770	PIG550.0770
7.80	8.00	91	53	43	36	PIG532.0780	PIG550.0780
7.90	8.00	91	53	43	36	PIG532.0790	PIG550.0790
7.94	8.00	91	53	43	36	PIG532.0794	PIG550.0794
8.00	8.00	91	53	43	36	PIG532.0800	PIG550.0800
8.10	10.00	103	61	49	40	PIG532.0810	PIG550.0810
8.20	10.00	103	61	49	40	PIG532.0820	PIG550.0820
8.30	10.00	103	61	49	40	PIG532.0830	PIG550.0830
8.33	10.00	103	61	49	40	PIG532.0833	PIG550.0833
8.40	10.00	103	61	49	40	PIG532.0840	PIG550.0840
8.50	10.00	103	61	49	40	PIG532.0850	PIG550.0850
8.60	10.00	103	61	49	40	PIG532.0860	PIG550.0860
8.70	10.00	103	61	49	40	PIG532.0870	PIG550.0870
8.73	10.00	103	61	49	40	PIG532.0873	PIG550.0873

IGUTENSILI

VHM

d1=m7

140°

5xD

DIN 6535
HA

R 30° - RR

Coated NF

R 30° - RR

Coated NF

MATERIALI LAVORABILI
WORKING MATERIALS
page 1A - 3

P1.1-P1.5

K1.1-K4.2

N1.4-N1.6

P1.1-P1.5

K1.1-K4.2

N1.4-N1.6

IGUTENSILI

R 30° - RR

Coated ALU

N1.1-N1.6

N2.1-N2.8

N3.1-N3.2

N4.1-N4.4

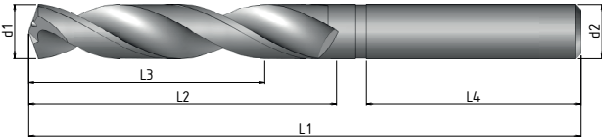
N5.1-N5.2

PIG700.0580
PIG700.0600
PIG700.0630
PIG700.0650
PIG700.0680
PIG700.0700
PIG700.0750
PIG700.0780
PIG700.0800
PIG700.0850

PIG 5xD

DIN6537

ESECUZIONI SPECIALI A DISEGNO
CUSTOMIZED DESIGN ON REQUEST



d1	d2	L1	L2	L3	L4		
8.80	10.00	103	61	49	40	PIG532.0880	PIG550.0880
8.90	10.00	103	61	49	40	PIG532.0890	PIG550.0890
9.00	10.00	103	61	49	40	PIG532.0900	PIG550.0900
9.10	10.00	103	61	49	40	PIG532.0910	PIG550.0910
9.13	10.00	103	61	49	40	PIG532.0913	PIG550.0913
9.20	10.00	103	61	49	40	PIG532.0920	PIG550.0920
9.25	10.00	103	61	49	40	PIG532.0925	PIG550.0925
9.30	10.00	103	61	49	40	PIG532.0930	PIG550.0930
9.40	10.00	103	61	49	40	PIG532.0940	PIG550.0940
9.50	10.00	103	61	49	40	PIG532.0950	PIG550.0950
9.60	10.00	103	61	49	40	PIG532.0960	PIG550.0960
9.70	10.00	103	61	49	40	PIG532.0970	PIG550.0970
9.80	10.00	103	61	49	40	PIG532.0980	PIG550.0980
9.90	10.00	103	61	49	40	PIG532.0990	PIG550.0990
10.00	10.00	103	61	49	40	PIG532.1000	PIG550.1000
10.10	12.00	118	71	56	45	PIG532.1010	PIG550.1010
10.20	12.00	118	71	56	45	PIG532.1020	PIG550.1020
10.30	12.00	118	71	56	45	PIG532.1030	PIG550.1030
10.40	12.00	118	71	56	45	PIG532.1040	PIG550.1040
10.50	12.00	118	71	56	45	PIG532.1050	PIG550.1050
10.60	12.00	118	71	56	45	PIG532.1060	PIG550.1060
10.70	12.00	118	71	56	45	PIG532.1070	PIG550.1070
10.80	12.00	118	71	56	45	PIG532.1080	PIG550.1080
10.90	12.00	118	71	56	45	PIG532.1090	PIG550.1090
11.00	12.00	118	71	56	45	PIG532.1100	PIG550.1100
11.10	12.00	118	71	56	45	PIG532.1110	PIG550.1110
11.20	12.00	118	71	56	45	PIG532.1120	PIG550.1120
11.30	12.00	118	71	56	45	PIG532.1130	PIG550.1130
11.40	12.00	118	71	56	45	PIG532.1140	PIG550.1140
11.50	12.00	118	71	56	45	PIG532.1150	PIG550.1150
11.60	12.00	118	71	56	45	PIG532.1160	PIG550.1160
11.70	12.00	118	71	56	45	PIG532.1170	PIG550.1170
11.80	12.00	118	71	56	45	PIG532.1180	PIG550.1180
11.90	12.00	118	71	56	45	PIG532.1190	PIG550.1190
12.00	12.00	118	71	56	45	PIG532.1200	PIG550.1200
12.10	14.00	124	77	60	45	PIG532.1210	PIG550.1210
12.20	14.00	124	77	60	45	PIG532.1220	PIG550.1220

IGUTENSILI

VHM

d1=m7

140°

5xD

DIN 6535
HA

R 30° - RR

Coated NF

R 30° - RR

Coated NF

MATERIALI LAVORABILI
WORKING MATERIALS
page 1A - 3

P1.1-P1.5

K1.1-K4.2

N1.4-N1.6

P1.1-P1.5

K1.1-K4.2

N1.4-N1.6

IGUTENSILI

R 30° - RR

Coated ALU

N1.1-N1.6

N2.1-N2.8

N3.1-N3.2

N4.1-N4.4

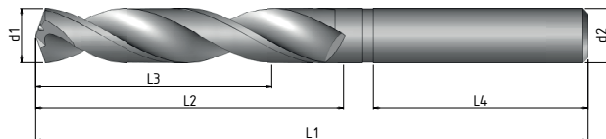
N5.1-N5.2

PIG700.0880
PIG700.0900
PIG700.0920
PIG700.0950
PIG700.0980
PIG700.1000
PIG700.1020
PIG700.1050
PIG700.1080
PIG700.1100
PIG700.1150
PIG700.1180
PIG700.1200

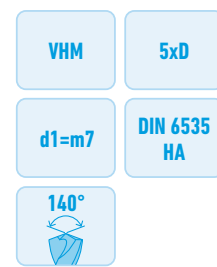
PIG 5xD

DIN6537

**ESECUZIONI SPECIALI A DISEGNO
CUSTOMIZED DESIGN ON REQUEST**



d1	d2	L1	L2	L3	L4		
12.30	14.00	124	77	60	45	PIG532.1230	PIG550.1230
12.40	14.00	124	77	60	45		PIG550.1240
12.50	14.00	124	77	60	45	PIG532.1250	PIG550.1250
12.60	14.00	124	77	60	45	PIG532.1260	PIG550.1260
12.70	14.00	124	77	60	45	PIG532.1270	PIG550.1270
12.80	14.00	124	77	60	45	PIG532.1280	PIG550.1280
12.90	14.00	124	77	60	45	PIG532.1290	PIG550.1290
13.00	14.00	124	77	60	45	PIG532.1300	PIG550.1300
13.10	14.00	124	77	60	45	PIG532.1310	PIG550.1310
13.20	14.00	124	77	60	45		PIG550.1320
13.30	14.00	124	77	60	45		PIG550.1330
13.40	14.00	124	77	60	45		PIG550.1340
13.50	14.00	124	77	60	45		PIG550.1350
13.60	14.00	124	77	60	45		PIG550.1360
13.70	14.00	124	77	60	45	PIG532.1370	PIG550.1370
13.80	14.00	124	77	60	45	PIG532.1380	PIG550.1380
13.90	14.00	124	77	60	45	PIG532.1390	PIG550.1390
14.00	14.00	124	77	60	45	PIG532.1400	PIG550.1400
14.10	16.00	133	83	63	48	PIG532.1410	PIG550.1410
14.20	16.00	133	83	63	48	PIG532.1420	PIG550.1420
14.30	16.00	133	83	63	48		PIG550.1430
14.40	16.00	133	83	63	48		PIG550.1440
14.50	16.00	133	83	63	48	PIG532.1450	PIG550.1450
14.70	16.00	133	83	63	48	PIG532.1470	PIG550.1470
14.80	16.00	133	83	63	48	PIG532.1480	PIG550.1480
14.90	16.00	133	83	63	48		PIG550.1490
15.00	16.00	133	83	63	48	PIG532.1500	PIG550.1500
15.20	16.00	133	83	63	48	PIG532.1520	PIG550.1520
15.50	16.00	133	83	63	48	PIG532.1550	PIG550.1550
15.70	16.00	133	83	63	48	PIG532.1570	PIG550.1570
16.00	16.00	133	83	63	48	PIG532.1600	PIG550.1600
16.50	18.00	143	93	71	48	PIG532.1650	PIG550.1650
17.00	18.00	143	93	71	48	PIG532.1700	PIG550.1700
17.50	18.00	143	93	71	48	PIG532.1750	PIG550.1750
18.00	18.00	143	93	71	48	PIG532.1800	PIG550.1800
18.50	20.00	153	101	77	50	PIG532.1850	PIG550.1850
19.00	20.00	153	101	77	50	PIG532.1900	PIG550.1900
19.50	20.00	153	101	77	50	PIG532.1950	PIG550.1950
20.00	20.00	153	101	77	50	PIG532.2000	PIG550.2000



R 30° - RR



TRATTAMENTO SUPERFICIALE
SURFACE TREATMENT

Coated NF

MATERIALI LAVORABILI
WORKING MATERIALS
page 1A • 3

P1.1-P1.5

K1.1-K4.2

N1.4-N1.6

R 30° - RR



Coated NF

P1.1-P1.5

K1.1-K4.2

N1.4-N1.6



R 30° - RR



Coated ALU

N1.1-N1.6

N2.1-N2.8

N3.1-N3.2

N4.1-N4.4

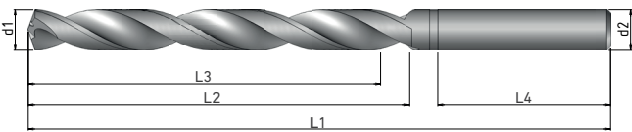
N5.1-N5.2

PIG

PIG 8xD

NORME INTERNE
INTERNAL STATEMENT

ESECUZIONI SPECIALI A DISEGNO
CUSTOMIZED DESIGN ON REQUEST



VHM

d1=m7

140°

8xD

DIN 6535 HA



R 30° - RR



Coated NF

R 30° - RR



Coated ALU

MATERIALI LAVORABILI
WORKING MATERIALS
page 1A - 3

P1.1-P1.5

K1.1-K4.2

N1.4-N1.6

N1.1-N1.6

N2.1-N2.8

N3.1-N3.2

N4.1-N4.4

N5.1-N5.2

d1	d2	L1	L2	L3	L4		
3.50	6.00	72	34	29	36	PIG560.0350	
3.70	6.00	72	34	29	36	PIG560.0370	
3.80	6.00	81	43	36	36	PIG560.0380	
4.00	6.00	81	43	36	36	PIG560.0400	PIG750.0400
4.20	6.00	81	43	36	36	PIG560.0420	PIG750.0420
4.50	6.00	81	43	36	36	PIG560.0450	PIG750.0450
4.80	6.00	95	57	48	36	PIG560.0480	PIG750.0480
5.00	6.00	95	57	48	36	PIG560.0500	PIG750.0500
5.10	6.00	95	57	48	36	PIG560.0510	PIG750.0510
5.20	6.00	95	57	48	36	PIG560.0520	PIG750.0520
5.50	6.00	95	57	48	36	PIG560.0550	PIG750.0550
5.80	6.00	95	57	48	36	PIG560.0580	PIG750.0580
6.00	6.00	95	57	48	36	PIG560.0600	PIG750.0600
6.30	8.00	114	76	64	36	PIG560.0630	PIG750.0630
6.50	8.00	114	76	64	36	PIG560.0650	PIG750.0650
6.80	8.00	114	76	64	36	PIG560.0680	PIG750.0680
7.00	8.00	114	76	64	36	PIG560.0700	PIG750.0700
7.50	8.00	114	76	64	36	PIG560.0750	PIG750.0750
7.80	8.00	114	76	64	36	PIG560.0780	PIG750.0780
8.00	8.00	114	76	64	36	PIG560.0800	PIG750.0800
8.50	10.00	142	95	80	40	PIG560.0850	PIG750.0850
8.80	10.00	142	95	80	40	PIG560.0880	PIG750.0880
9.00	10.00	142	95	80	40	PIG560.0900	PIG750.0900
9.20	10.00	142	95	80	40	PIG560.0920	PIG750.0920
9.50	10.00	142	95	80	40	PIG560.0950	PIG750.0950
9.80	10.00	142	95	80	40	PIG560.0980	PIG750.0980
10.00	10.00	142	95	80	40	PIG560.1000	PIG750.1000
10.20	12.00	162	114	96	45	PIG560.1020	PIG750.1020
10.50	12.00	162	114	96	45	PIG560.1050	PIG750.1050
10.80	12.00	162	114	96	45	PIG560.1080	PIG750.1080
11.00	12.00	162	114	96	45	PIG560.1100	PIG750.1100
11.50	12.00	162	114	96	45	PIG560.1150	PIG750.1150
11.80	12.00	162	114	96	45	PIG560.1180	PIG750.1180
12.00	12.00	162	114	96	45	PIG560.1200	PIG750.1200

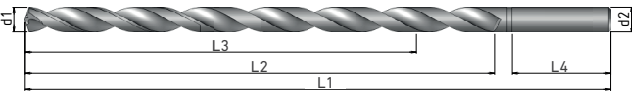
PIG

PIG

PIG 15xD

NORME INTERNE
INTERNAL STATEMENT

ESECUZIONI SPECIALI A DISEGNO
CUSTOMIZED DESIGN ON REQUEST



VHM

15xD

d1=m7

DIN 6535 HA

140°

R 30° – RR

TRATTAMENTO SUPERFICIALE
SURFACE TREATMENT

Coated NF

MATERIALI LAVORABILI
WORKING MATERIALS
page 1A • 5

P1.1-P1.5

K1.1-K4.2

N1.4-N1.6

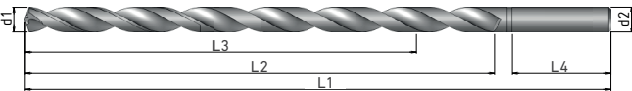
d1	d2	L1	L2	L3	L4	
4.00	6.00	108	68	60	36	PIG580.0400
4.50	6.00	115	78	68	36	PIG580.0450
5.00	6.00	125	84	75	36	PIG580.0500
5.50	6.00	130	92	83	36	PIG580.0550
6.00	6.00	140	100	90	36	PIG580.0600
6.50	8.00	145	108	98	36	PIG580.0650
7.00	8.00	170	130	105	36	PIG580.0700
7.50	8.00	170	130	113	36	PIG580.0750
8.00	8.00	170	130	120	36	PIG580.0800
8.50	10.00	208	163	128	40	PIG580.0850
9.00	10.00	208	163	135	40	PIG580.0900
9.50	10.00	208	163	143	40	PIG580.0950
10.00	10.00	208	163	150	40	PIG580.1000
10.50	12.00	245	195	158	45	PIG580.1050
11.00	12.00	245	195	165	45	PIG580.1100
11.50	12.00	245	195	173	45	PIG580.1150
12.00	12.00	245	195	180	45	PIG580.1200

PIG

PIG 20xD

NORME INTERNE
INTERNAL STATEMENT

ESECUZIONI SPECIALI A DISEGNO
CUSTOMIZED DESIGN ON REQUEST



VHM

20xD

d1=m7

DIN 6535
HA

140°

R 30° – RR

TRATTAMENTO SUPERFICIALE
SURFACE TREATMENT

Coated NF

MATERIALI LAVORABILI
WORKING MATERIALS
page 1A • 5

P1.1-P1.5

K1.1-K4.2

N1.4-N1.6

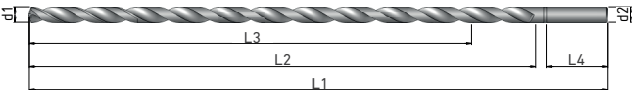
d1	d2	L1	L2	L3	L4	
5.00	6.00	155	116	100	36	PIG590.0500
6.00	6.00	172	135	120	36	PIG590.0600
6.50	8.00	186	145	130	36	PIG590.0650
7.00	8.00	201	160	140	36	PIG590.0700
7.50	8.00	211	170	150	36	PIG590.0750
8.00	8.00	221	181	160	36	PIG590.0800
8.50	10.00	236	192	170	40	PIG590.0850
9.00	10.00	247	203	180	40	PIG590.0900
9.50	10.00	259	214	190	40	PIG590.0950
10.00	10.00	267	225	200	40	PIG590.1000

PIG

PIG 30xD

NORME INTERNE
INTERNAL STATEMENT

ESECUZIONI SPECIALI A DISEGNO
CUSTOMIZED DESIGN ON REQUEST



VHM

20xD

d1=m7

DIN 6535
HA

140°

R 30° - RR

TRATTAMENTO SUPERFICIALE
SURFACE TREATMENT

Coated NF

MATERIALI LAVORABILI
WORKING MATERIALS
page 1A - 5

P1.1-P1.5

K1.1-K4.2

N1.4-N1.6

d1	d2	L1	L2	L3	L4	
3.00	6.00	140	100	90	36	PIG630.0300
3.50	6.00	157	117	105	36	PIG630.0350
4.00	6.00	173	133	120	36	PIG630.0400
4.50	6.00	190	150	135	36	PIG630.0450
5.00	6.00	206	166	150	36	PIG630.0500
5.50	6.00	223	183	165	36	PIG630.0550
6.00	6.00	239	199	180	36	PIG630.0600
7.00	8.00	272	232	210	36	PIG630.0700
8.00	8.00	305	265	240	36	PIG630.0800

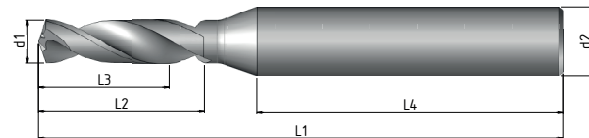
PIG

MICRO 5xD

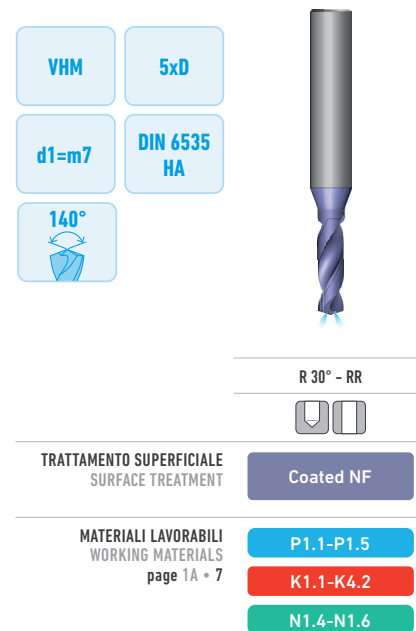
NORME INTERNE

INTERNAL STATEMENT

**ESECUZIONI SPECIALI A DISEGNO
CUSTOMIZED DESIGN ON REQUEST**



d1	d2	L1	L2	L3	L4	
1.00	3.00	55	8	5	28	PIG770.0100
1.10	3.00	55	12	5.5	28	PIG770.0110
1.20	3.00	55	12	6	28	PIG770.0120
1.30	3.00	55	12	6.5	28	PIG770.0130
1.40	3.00	55	12	7	28	PIG770.0140
1.50	3.00	55	12	7.5	28	PIG770.0150
1.60	3.00	65	16	8	28	PIG770.0160
1.70	3.00	65	16	8.5	28	PIG770.0170
1.80	3.00	65	16	9	28	PIG770.0180
1.90	3.00	65	16	9.5	28	PIG770.0190
2.00	3.00	65	16	10	28	PIG770.0200
2.10	3.00	74	20	10.5	28	PIG770.0210
2.20	3.00	74	20	11	28	PIG770.0220
2.30	3.00	74	20	11.5	28	PIG770.0230
2.40	3.00	74	20	12	28	PIG770.0240
2.50	3.00	74	20	12.5	28	PIG770.0250
2.60	3.00	81	23	13	28	PIG770.0260
2.70	3.00	81	23	13.5	28	PIG770.0270
2.80	3.00	81	23	14	28	PIG770.0280
2.90	3.00	81	23	14.5	28	PIG770.0290

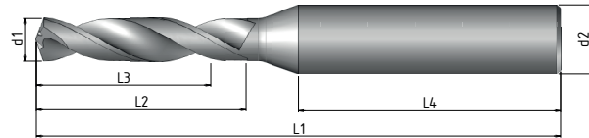
This image shows a single sheet of white paper with horizontal blue lines, resembling notebook paper. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

MICRO 8xD

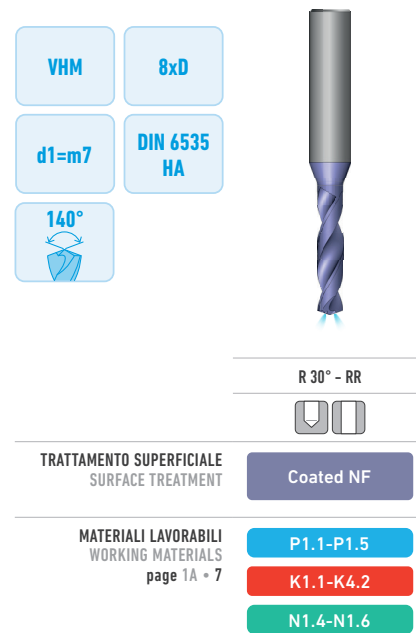
NORME INTERNE

INTERNAL STATEMENT

**ESECUZIONI SPECIALI A DISEGNO
CUSTOMIZED DESIGN ON REQUEST**



d1	d2	L1	L2	L3	L4	
1.00	3.00	55	11	8	28	PIG780.0100
1.10	3.00	55	17	8.8	28	PIG780.0110
1.20	3.00	55	17	9.6	28	PIG780.0120
1.30	3.00	55	17	10.4	28	PIG780.0130
1.40	3.00	55	17	11.2	28	PIG780.0140
1.50	3.00	55	17	12	28	PIG780.0150
1.60	3.00	65	22	12.8	28	PIG780.0160
1.70	3.00	65	22	13.6	28	PIG780.0170
1.80	3.00	65	22	14.4	28	PIG780.0180
1.90	3.00	65	22	15.2	28	PIG780.0190
2.00	3.00	65	22	16	28	PIG780.0200
2.10	3.00	74	28	16.8	28	PIG780.0210
2.20	3.00	74	28	17.6	28	PIG780.0220
2.30	3.00	74	28	18.4	28	PIG780.0230
2.40	3.00	74	28	19.2	28	PIG780.0240
2.50	3.00	74	28	20	28	PIG780.0250
2.60	3.00	81	32	20.8	28	PIG780.0260
2.70	3.00	81	32	21.6	28	PIG780.0270
2.80	3.00	81	32	22.4	28	PIG780.0280
2.90	3.00	81	32	23.2	28	PIG780.0290

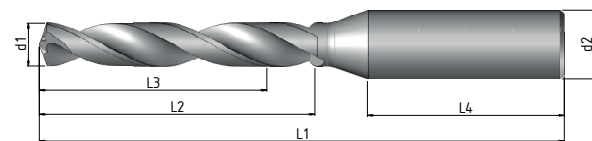
This image shows a single sheet of white paper with horizontal blue lines, resembling notebook paper. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

MICRO 12xD

NORME INTERNE

INTERNAL STATEMENT

**ESECUZIONI SPECIALI A DISEGNO
CUSTOMIZED DESIGN ON REQUEST**



d1	d2	L1	L2	L3	L4	
1.00	3.00	55	15	12	28	PIG790.0100
1.10	3.00	55	23	13.2	28	PIG790.0110
1.20	3.00	55	23	14.4	28	PIG790.0120
1.30	3.00	55	23	15.6	28	PIG790.0130
1.40	3.00	55	23	16.8	28	PIG790.0140
1.50	3.00	55	23	18	28	PIG790.0150
1.60	3.00	65	30	19.2	28	PIG790.0160
1.70	3.00	65	30	20.4	28	PIG790.0170
1.80	3.00	65	30	21.6	28	PIG790.0180
1.90	3.00	65	30	22.8	28	PIG790.0190
2.00	3.00	65	30	24	28	PIG790.0200
2.10	3.00	74	38	25.2	28	PIG790.0210
2.20	3.00	74	38	26.4	28	PIG790.0220
2.30	3.00	74	38	27.6	28	PIG790.0230
2.40	3.00	74	38	28.8	28	PIG790.0240
2.50	3.00	74	38	30	28	PIG790.0250
2.60	3.00	81	44	31.2	28	PIG790.0260
2.70	3.00	81	44	32.4	28	PIG790.0270
2.80	3.00	81	44	33.6	28	PIG790.0280
2.90	3.00	81	44	34.8	28	PIG790.0290

This image shows a blank sheet of white paper designed for writing. It features ten horizontal light blue lines spaced evenly across the page. A single vertical red line runs down the left side, creating a margin. The paper is otherwise empty of any text or markings.

