

NACHI



AQUA Drills **EX** Power Feed

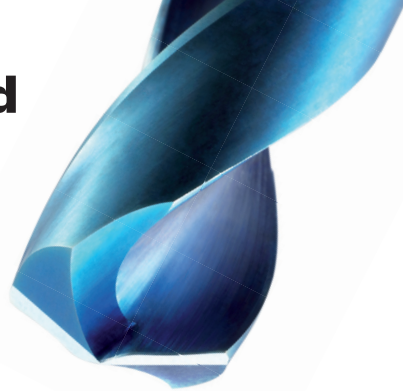
Abbatte le barriere convenzionali!

Utilizza un tagliente ottimizzato e una geometria del vano elica che riducono drasticamente la resistenza al taglio e migliorano l'evacuazione del truciolo. Permette una miglior precisione di foratura e una maggiore durata dell'utensile nella foratura ad alta velocità di avanzamento sia su centri di lavoro che su torni dove è più probabile che si verifichi l'inzeppamento del truciolo.

**NUOVI
DIAMENTRI
DISPONIBILI**

VEGA
INTERNATIONAL
TOOLS

AQUA Drills EX Power Feed



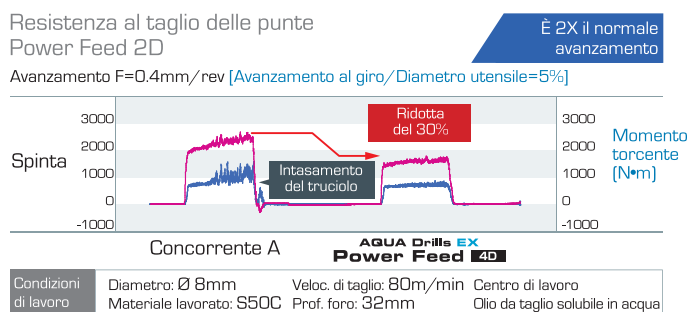
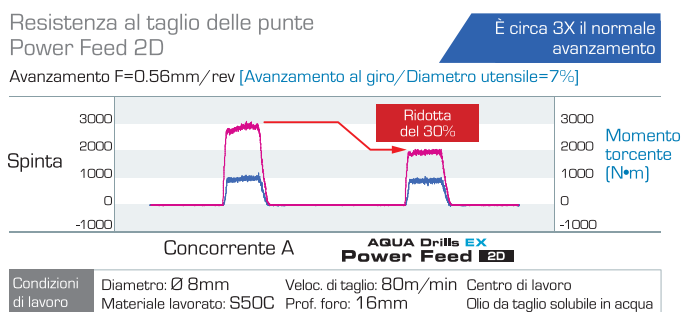
PF2D / PF4D

Permette una miglior precisione e una maggiore durata dell'utensile nella foratura ad alta velocità su centri di lavoro o torni dove è più probabile che si verifichi l'incepimento del truciolo.

- Processo di foratura stabile anche con avanzamenti 3 volte superiori al normale Utilizzando una geometria tagliente e vano elica ottimizzati per ridurre le forze resistenti al taglio e migliorando il controllo e l'evacuazione del truciolo
- Migliorato il controllo del truciolo e la sua evacuazione dal vano elica anche a punta ferma e pezzo rotante come nelle forature su tornio
- Velocità di avanzamento sbalorditive, ma con elevata vita utensile, ripetibilità e precisione di foratura

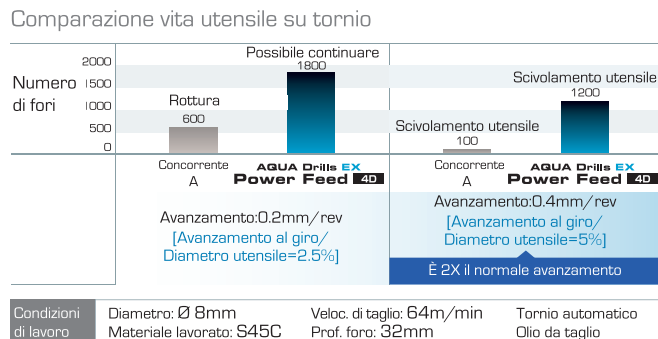
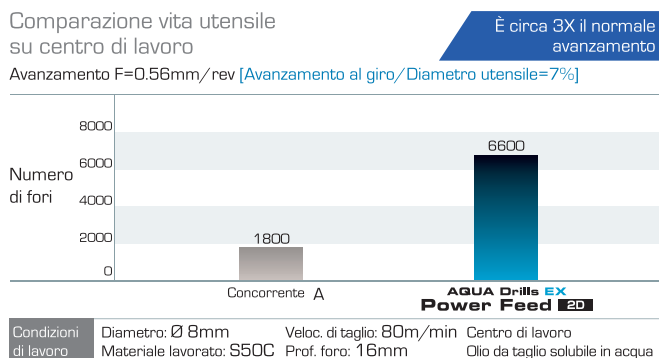
Spinta assiale significativamente ridotta

La spinta assiale è molto ridotta, quindi l'asportazione di truciolo è molto buona anche in caso di avanzamento ad altissima velocità



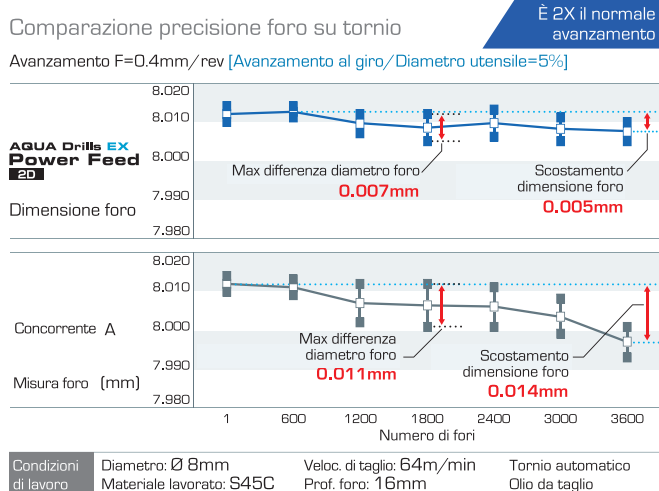
Avanzamento ad altissima velocità abbinato ad una lunga vita utensile

Quando si utilizzano centri di lavoro ad altissima velocità di avanzamento, le punte Power Feed consentono una impressionante vita utensile



Altissime velocità di avanzamento con elevata qualità di foratura

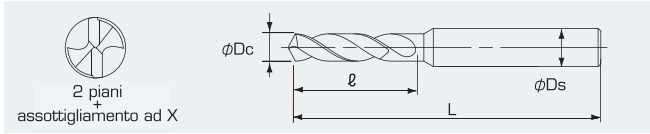
Anche in caso di lavorazioni ad elevatissimo avanzamento gli scostamenti dimensionali del foro restano bassi con una buona qualità della superficie lavorata





PF2D

AQUA Drills EX Power Feed 2D



ARTICOLO 9850

Unità: mm

Diametro Dc	Lunghezza Elica ℓ	Lunghezza Totale L	Diam. del gambo d	Stock
1,0	4,0	45,0	3,0	○
1,1	4,4	45,0	3,0	○
1,2	4,8	45,0	3,0	○
1,3	5,2	45,0	3,0	○
1,4	5,6	45,0	3,0	○
1,5	6,0	45,0	3,0	○
1,6	6,0	45,0	3,0	○
1,7	6,0	45,0	3,0	○
1,8	6,0	45,0	3,0	○
1,9	6,0	45,0	3,0	○
2,0	6,0	45,0	3,0	○
2,1	8,0	45,0	3,0	○
2,2	8,0	45,0	3,0	○
2,3	8,0	45,0	3,0	○
2,4	8,0	45,0	3,0	○
2,5	8,0	45,0	3,0	○
2,6	10,0	45,0	3,0	○
2,7	10,0	45,0	3,0	○
2,8	10,0	45,0	3,0	○
2,9	10,0	45,0	3,0	○
3,0	10,0	45,0	3,0	○
3,1	16,0	54,0	4,0	○
3,2	16,0	54,0	4,0	○
3,3	16,0	54,0	4,0	○
3,4	16,0	54,0	4,0	○
3,5	16,0	54,0	4,0	○
3,6	17,0	54,0	4,0	○
3,7	17,0	54,0	4,0	○
3,8	17,0	54,0	4,0	○
3,9	17,0	54,0	4,0	○
4,0	17,0	54,0	4,0	○
4,1	19,0	61,0	5,0	○
4,2	19,0	61,0	5,0	○
4,3	19,0	61,0	5,0	○
4,4	19,0	61,0	5,0	○
4,5	19,0	61,0	5,0	○
4,6	20,0	61,0	5,0	○
4,7	20,0	61,0	5,0	○
4,8	20,0	61,0	5,0	○
4,9	20,0	61,0	5,0	○
5,0	20,0	61,0	5,0	○
5,1	20,0	65,0	6,0	○
5,2	20,0	65,0	6,0	○
5,3	20,0	65,0	6,0	○
5,4	20,0	65,0	6,0	○
5,5	20,0	65,0	6,0	○
5,6	21,0	65,0	6,0	○
5,7	21,0	65,0	6,0	○
5,8	21,0	65,0	6,0	○
5,9	21,0	65,0	6,0	○
6,0	21,0	65,0	6,0	○
6,1	25,0	73,0	7,0	○
6,2	25,0	73,0	7,0	○
6,3	25,0	73,0	7,0	○
6,4	25,0	73,0	7,0	○
6,5	25,0	73,0	7,0	○
6,6	26,0	73,0	7,0	○
6,7	26,0	73,0	7,0	○
6,8	26,0	73,0	7,0	○
6,9	26,0	73,0	7,0	○
7,0	26,0	73,0	7,0	○
7,1	26,0	78,0	8,0	○
7,2	26,0	78,0	8,0	○
7,3	26,0	78,0	8,0	○
7,4	26,0	78,0	8,0	○
7,5	26,0	78,0	8,0	○
7,6	28,0	78,0	8,0	○
7,7	28,0	78,0	8,0	○
7,8	28,0	78,0	8,0	○
7,9	28,0	78,0	8,0	○
8,0	28,0	78,0	8,0	○
8,1	28,0	82,0	9,0	○
8,2	28,0	82,0	9,0	○
8,3	28,0	82,0	9,0	○
8,4	28,0	82,0	9,0	○
8,5	28,0	82,0	9,0	○

ARTICOLO 9850

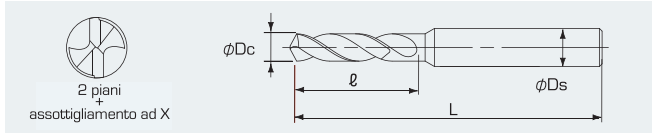
Unità: mm

Diametro Dc	Lunghezza Elica ℓ	Lunghezza Totale L	Diam. del gambo d	Stock
8,6	29,0	82,0	9,0	○
8,7	29,0	82,0	9,0	○
8,8	29,0	82,0	9,0	○
8,9	29,0	82,0	9,0	○
9,0	29,0	82,0	9,0	○
9,1	29,0	87,0	10,0	○
9,2	29,0	87,0	10,0	○
9,3	29,0	87,0	10,0	○
9,4	29,0	87,0	10,0	○
9,5	29,0	87,0	10,0	○
9,6	31,0	87,0	10,0	○
9,7	31,0	87,0	10,0	○
9,8	31,0	87,0	10,0	○
9,9	31,0	87,0	10,0	○
10,0	31,0	87,0	10,0	○
10,1	34,0	93,0	11,0	○
10,2	34,0	93,0	11,0	○
10,3	34,0	93,0	11,0	○
10,4	34,0	93,0	11,0	○
10,5	34,0	93,0	11,0	○
10,6	36,0	93,0	11,0	○
10,7	36,0	93,0	11,0	○
10,8	36,0	93,0	11,0	○
10,9	36,0	93,0	11,0	○
11,0	36,0	93,0	11,0	○
11,1	36,0	100,0	12,0	○
11,2	36,0	100,0	12,0	○
11,3	36,0	100,0	12,0	○
11,4	36,0	100,0	12,0	○
11,5	36,0	100,0	12,0	○
11,6	39,0	100,0	12,0	○
11,7	39,0	100,0	12,0	○
11,8	39,0	100,0	12,0	○
11,9	39,0	100,0	12,0	○
12,0	39,0	100,0	12,0	○
12,1	44,0	100,0	13,0	○
12,2	44,0	100,0	13,0	○
12,3	44,0	100,0	13,0	○
12,4	44,0	100,0	13,0	○
12,5	44,0	100,0	13,0	○
12,6	46,0	100,0	13,0	○
12,7	46,0	100,0	13,0	○
12,8	46,0	100,0	13,0	○
12,9	46,0	100,0	13,0	○
13,0	46,0	100,0	13,0	○
13,1	48,0	105,0	14,0	○
13,2	48,0	105,0	14,0	○
13,3	48,0	105,0	14,0	○
13,4	48,0	105,0	14,0	○
13,5	48,0	105,0	14,0	○
13,6	49,0	105,0	14,0	○
13,7	49,0	105,0	14,0	○
13,8	49,0	105,0	14,0	○
13,9	49,0	105,0	14,0	○
14,0	49,0	105,0	14,0	○
14,1	52,0	108,0	15,0	○
14,2	52,0	108,0	15,0	○
14,3	52,0	108,0	15,0	○
14,4	52,0	108,0	15,0	○
14,5	52,0	108,0	15,0	○
14,6	53,0	108,0	15,0	○
14,7	53,0	108,0	15,0	○
14,8	53,0	108,0	15,0	○
14,9	53,0	108,0	15,0	○
15,0	53,0	108,0	15,0	○
15,1	54,0	112,0	16,0	○
15,2	54,0	112,0	16,0	○
15,3	54,0	112,0	16,0	○
15,4	54,0	112,0	16,0	○
15,5	54,0	112,0	16,0	○
15,6	56,0	112,0	16,0	○
15,7	56,0	112,0	16,0	○
15,8	56,0	112,0	16,0	○
15,9	56,0	112,0	16,0	○
16,0	56,0	112,0	16,0	○



PF4D

AQUA Drills EX Power Feed 4D



ARTICOLO 9852

Unità: mm

Diametro Dc	Lunghezza Elica ℓ	Lunghezza Totale L	Diam. del gambo d	Stock
1,0	7,0	49,0	3,0	○
1,1	7,7	49,0	3,0	○
1,2	8,4	49,0	3,0	○
1,3	9,1	49,0	3,0	○
1,4	9,8	49,0	3,0	○
1,5	10,5	49,0	3,0	○
1,6	11,2	49,0	3,0	○
1,7	11,9	49,0	3,0	○
1,8	12,6	49,0	3,0	○
1,9	13,3	49,0	3,0	○
2,0	15	49,0	3,0	○
2,1	17,0	49,0	3,0	○
2,2	17,0	49,0	3,0	○
2,3	17,0	49,0	3,0	○
2,4	17,0	49,0	3,0	○
2,5	17,0	49,0	3,0	○
2,6	19,0	49,0	3,0	○
2,7	19,0	49,0	3,0	○
2,8	19,0	49,0	3,0	○
2,9	19,0	49,0	3,0	○
3,0	19,0	49,0	3,0	○
3,1	24,0	60,0	4,0	○
3,2	24,0	60,0	4,0	○
3,3	24,0	60,0	4,0	○
3,4	24,0	60,0	4,0	○
3,5	24,0	60,0	4,0	○
3,6	27,0	60,0	4,0	○
3,7	27,0	60,0	4,0	○
3,8	27,0	60,0	4,0	○
3,9	27,0	60,0	4,0	○
4,0	27,0	60,0	4,0	○
4,1	31,0	76,0	5,0	○
4,2	31,0	76,0	5,0	○
4,3	31,0	76,0	5,0	○
4,4	31,0	76,0	5,0	○
4,5	31,0	76,0	5,0	○
4,6	38,0	76,0	5,0	○
4,7	38,0	76,0	5,0	○
4,8	38,0	76,0	5,0	○
4,9	38,0	76,0	5,0	○
5,0	38,0	76,0	5,0	○
5,1	39,0	81,0	6,0	○
5,2	39,0	81,0	6,0	○
5,3	39,0	81,0	6,0	○
5,4	39,0	81,0	6,0	○
5,5	39,0	81,0	6,0	○
5,6	41,0	81,0	6,0	○
5,7	41,0	81,0	6,0	○
5,8	41,0	81,0	6,0	○
5,9	41,0	81,0	6,0	○
6,0	41,0	81,0	6,0	○
6,1	42,0	83,0	7,0	○
6,2	42,0	83,0	7,0	○
6,3	42,0	83,0	7,0	○
6,4	42,0	83,0	7,0	○
6,5	42,0	83,0	7,0	○
6,6	43,0	83,0	7,0	○
6,7	43,0	83,0	7,0	○
6,8	43,0	83,0	7,0	○
6,9	43,0	83,0	7,0	○
7,0	43,0	83,0	7,0	○
7,1	45,0	90,0	8,0	○
7,2	45,0	90,0	8,0	○
7,3	45,0	90,0	8,0	○
7,4	45,0	90,0	8,0	○
7,5	45,0	90,0	8,0	○
7,6	48,0	90,0	8,0	○
7,7	48,0	90,0	8,0	○
7,8	48,0	90,0	8,0	○
7,9	48,0	90,0	8,0	○
8,0	48,0	90,0	8,0	○
8,1	53,0	98,0	9,0	○
8,2	53,0	98,0	9,0	○
8,3	53,0	98,0	9,0	○
8,4	53,0	98,0	9,0	○
8,5	53,0	98,0	9,0	○

ARTICOLO 9852

Unità: mm

Diametro Dc	Lunghezza Elica ℓ	Lunghezza Totale L	Diam. del gambo d	Stock
8,6	55,0	98,0	9,0	○
8,7	55,0	98,0	9,0	○
8,8	55,0	98,0	9,0	○
8,9	55,0	98,0	9,0	○
9,0	55,0	98,0	9,0	○
9,1	58,0	105,0	10,0	○
9,2	58,0	105,0	10,0	○
9,3	58,0	105,0	10,0	○
9,4	58,0	105,0	10,0	○
9,5	58,0	105,0	10,0	○
9,6	60,0	105,0	10,0	○
9,7	60,0	105,0	10,0	○
9,8	60,0	105,0	10,0	○
9,9	60,0	105,0	10,0	○
10,0	60,0	105,0	10,0	○
10,1	66,0	114,0	11,0	○
10,2	66,0	114,0	11,0	○
10,3	66,0	114,0	11,0	○
10,4	66,0	114,0	11,0	○
10,5	66,0	114,0	11,0	○
10,6	68,0	114,0	11,0	○
10,7	68,0	114,0	11,0	○
10,8	68,0	114,0	11,0	○
10,9	68,0	114,0	11,0	○
11,0	68,0	114,0	11,0	○
11,1	71,0	121,0	12,0	○
11,2	71,0	121,0	12,0	○
11,3	71,0	121,0	12,0	○
11,4	71,0	121,0	12,0	○
11,5	71,0	121,0	12,0	○
11,6	73,0	121,0	12,0	○
11,7	73,0	121,0	12,0	○
11,8	73,0	121,0	12,0	○
11,9	73,0	121,0	12,0	○
12,0	73,0	121,0	12,0	○
12,1	76,0	137,0	13,0	○
12,2	76,0	137,0	13,0	○
12,3	76,0	137,0	13,0	○
12,4	76,0	137,0	13,0	○
12,5	76,0	137,0	13,0	○
12,6	78,0	137,0	13,0	○
12,7	78,0	137,0	13,0	○
12,8	78,0	137,0	13,0	○
12,9	78,0	137,0	13,0	○
13,0	78,0	137,0	13,0	○
13,1	84,0	147,0	14,0	○
13,2	84,0	147,0	14,0	○
13,3	84,0	147,0	14,0	○
13,4	84,0	147,0	14,0	○
13,5	84,0	147,0	14,0	○
13,6	86,0	147,0	14,0	○
13,7	86,0	147,0	14,0	○
13,8	86,0	147,0	14,0	○
13,9	86,0	147,0	14,0	○
14,0	86,0	147,0	14,0	○
14,1	89,0	153,0	15,0	○
14,2	89,0	153,0	15,0	○
14,3	89,0	153,0	15,0	○
14,4	89,0	153,0	15,0	○
14,5	89,0	153,0	15,0	○
14,6	91,0	153,0	15,0	○
14,7	91,0	153,0	15,0	○
14,8	91,0	153,0	15,0	○
14,9	91,0	153,0	15,0	○
15,0	91,0	153,0	15,0	○
15,1	94,0	160,0	16,0	○
15,2	94,0	160,0	16,0	○
15,3	94,0	160,0	16,0	○
15,4	94,0	160,0	16,0	○
15,5	94,0	160,0	16,0	○
15,6	96,0	160,0	16,0	○
15,7	96,0	160,0	16,0	○
15,8	96,0	160,0	16,0	○
15,9	96,0	160,0	16,0	○
16,0	96,0	160,0	16,0	○

Condizioni di lavoro standard

PF2D

AQUA DrillsEX Power Feed **2D**

Materiale da lavorare	Acciaio strutturato Acciaio al carbonio Ghisa grigia		Acciaio legato Acciaio trattato termicamente		Acciaio da stampi Acciaio pre temprato		Acciaio ad alta durezza		Ferro duttile	
	SS400 S50C FC250		SCM440 NAK		SKD61 NAK HPM		40~50HRC		FCD400	
	~200HB		20~30HRC		30~40HRC					
Diametro (mm)	Rotazione giri/min	Avanzamento (mm/min)	Rotazione giri/min	Avanzamento (mm/min)	Rotazione giri/min	Avanzamento (mm/min)	Rotazione giri/min	Avanzamento (mm/min)	Rotazione giri/min	Avanzamento (mm/min)
2	12700	660~1540	10500	520~1140	5600	220~460	4000	140~280	9500	500~1170
3	8500		7000		3700		2650		6400	
5	5100		4200		2200		1600		3800	
8	3200		2600		1400		1000		2400	
10	2550		2100		1100		800		1900	

PF4D

AQUA DrillsEX Power Feed **4D**

Materiale da lavorare	Acciaio strutturato Acciaio al carbonio Ghisa grigia		Acciaio legato Acciaio trattato termicamente		Acciaio da stampi Acciaio pre temprato		Acciaio ad alta durezza		Ferro duttile	
	SS400 S50C FC250		SCM440 NAK		SKD61 NAK HPM		40~50HRC		FCD400	
	~200HB		20~30HRC		30~40HRC					
Diametro (mm)	Rotazione giri/min	Avanzamento (mm/min)	Rotazione giri/min	Avanzamento (mm/min)	Rotazione giri/min	Avanzamento (mm/min)	Rotazione giri/min	Avanzamento (mm/min)	Rotazione giri/min	Avanzamento (mm/min)
2	12700	590~1270	10500	460~930	5600	200~400	4000	115~230	9500	440~950
3	8500		7000		3700		2650		6400	
5	5100		4200		2200		1600		3800	
8	3200		2600		1400		1000		2400	
10	2550		2100		1100		800		1900	

Calcolo dei parametri di Taglio

$$\text{Velocità di taglio}(Vt) = \frac{\text{Diametro Utensile} \times \pi \times \text{Nr. di Giri}}{1,000} \text{ (m/min)}$$

$$\text{Avanzamento al Giro} = \frac{\text{Velocità di avanzamento}}{\text{Nr. di Giri}} \text{ (mm/giro)}$$

$$\text{Valore Avanzamento} = \frac{\text{Avanzamento al Giro}}{\text{Diametro Utensile}} \text{ (\%)}$$

Esempio **PF4D** Materiale da lavorare:S50C Rotazione:5,100 giri min
Diametro:ø5mm Avanzamento:590mm/min

$$\text{Velocità di taglio}(Vt) = \frac{5.0 \times \pi \times 5100}{1000} = 80 \text{m/min}$$

$$\text{Avanzamento al Giro} = \frac{590}{5100} = 0.116 \text{ mm/giro}$$

$$\text{Valore Avanzamento} = \frac{0.116}{5} = 2.3\%$$

Condizioni Generali di Lavoro

Materiale da lavorare	Velocità di taglio (mm/min)	Avanzamento Normale (%/Dc)	Avanzamento Punta Power Feed (%/Dc)
Acciaio strutturato Acciaio al carbonio Ghisa grigia	80	2.0~2.5	2.0~6.0
Acciaio legato Acciaio trattato termicamente	65	2.0~2.5	2.0~5.5
Stampi in acciaio Acciaio pre temprato	35	1.5~2.0	1.5~4.0
Acciaio ad alta durezza	25	1.3~1.8	1.3~3.5
Ferro duttile	60	2.0~2.5	2.0~6.0

Note sulle condizioni di lavoro

- Modificare le condizioni di lavoro in funzione della rigidità, dello staffaggio e delle condizioni macchina.
- I parametri di taglio indicati sono calcolati per utilizzo con olio emulsionabile in acqua.
In caso di Olio Intero ridurre giri ed avanzamento del 20%.
- Poco indicate per lavorazione di alluminio, leghe leggere, acciaio inossidabile.
- Le condizioni di lavoro della tabella "PF2D" sono applicabili solo per foratura 2xD.
"PF4D" sono applicabili per forature fino a 4xD. In funzione del materiale da lavorare e delle condizioni di lavoro esiste la possibilità che si generi una difficile evacuazione del truciolo. In queste situazioni utilizzare il ciclo di foratura a Step.
- Nella foratura a Step, il ritorno va eseguito fino a inizio foro.
- Si raccomanda uno Step di foratura pari a 0,5xD/1xD.
- Utilizzare sistemi di fissaggio utensile che permettano un run-out inferiore a 0,02mm, in caso di lavorazioni ad alto avanzamento ridurre il run-out a 0,01mm o meno.
- In caso di ri-affilatura si raccomanda una riduzione sulla lunghezza entro 1xD.
In caso di asportazione maggiore ad 1xD, la capacità di evacuazione del truciolo potrebbe peggiorare.
- In funzione delle geometrie di affilatura le proprietà dell'utensile possono variare, i nostri centri autorizzati sono a vostra disposizione.

NACHI



VEGA INTERNATIONAL TOOLS s.r.l.

Via Asti 9 - 10026 Santena (TO)

Tel. +39 011 94 97 911

Fax +39 011 94 56 380

www.vegaonline.net