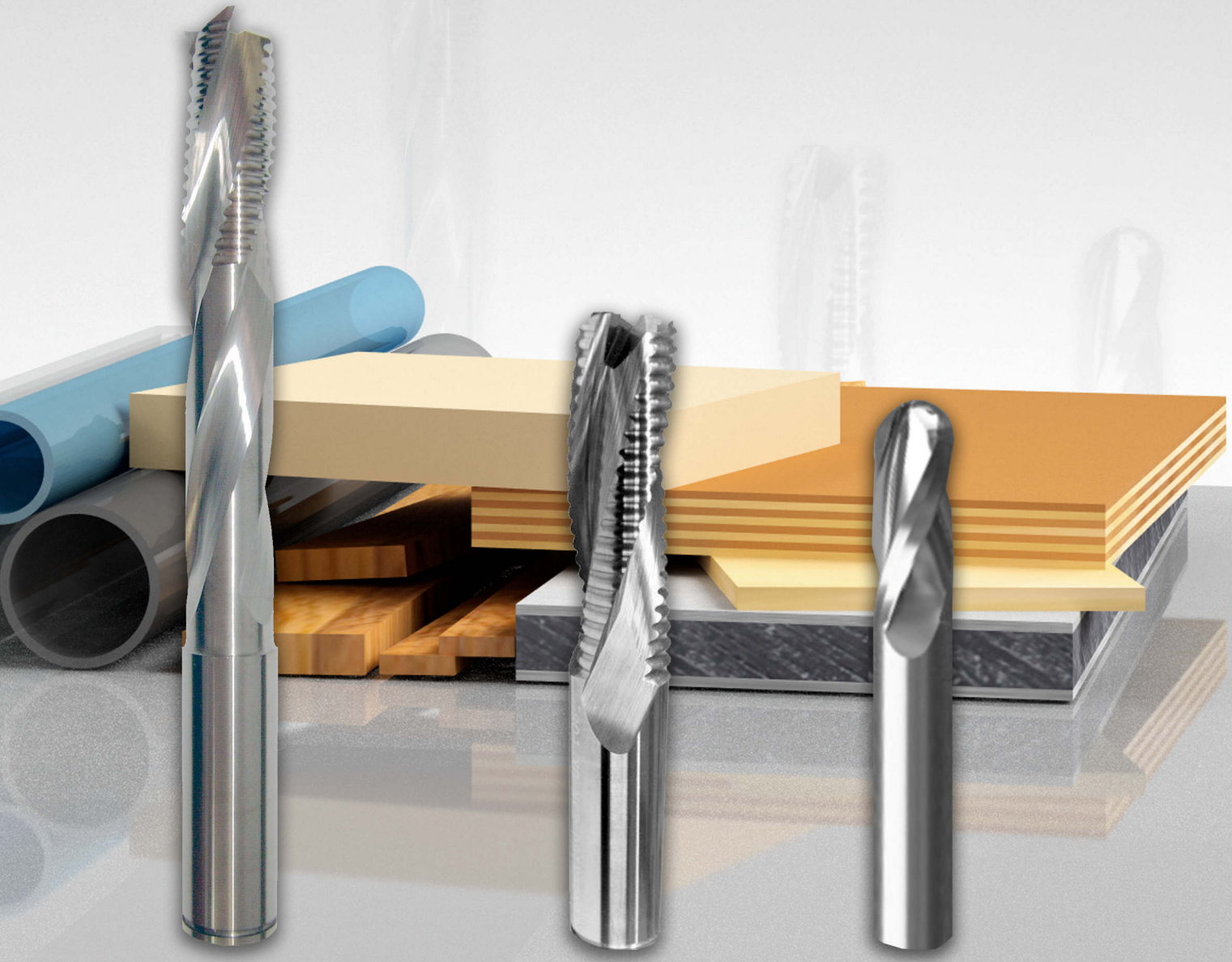
CENTERINOX® S.R.L.

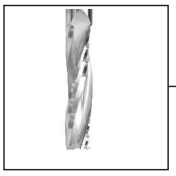


HELICAL CUTTER HWM CATALOGUE (2017)

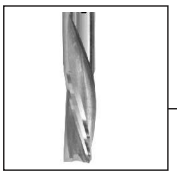
PUNTE IN HM INTEGRALE

HELICAL CUTTER HWM

LINEA LEGNO
WOOD LINE

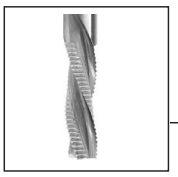


Punta elicoidale in metallo duro integrale positiva Z3 — PHW010
Helical cutter HWM positive spiral Z3 — pag.1

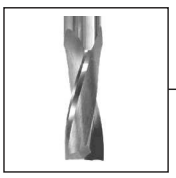


Punta elicoidale in metallo duro integrale negativa Z3 — PHW020
Helical cutter HWM negative spiral Z3 — pag.2

Punta elicoidale in metallo duro integrale positiva Z3 con rompitruciolo — PHW030
Helical cutter HWM positive spiral Z3 with chip breaker — pag.3

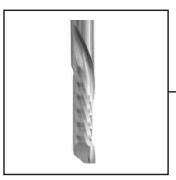


Punta elicoidale in metallo duro integrale negativa Z3 con rompitruciolo — PHW040
Helical cutter HWM negative spiral Z3 with chip breaker — pag.4

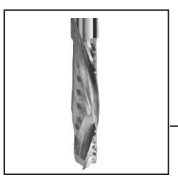


Punta elicoidale in metallo duro integrale positiva Z2 — PHW050
Helical cutter HWM positive spiral Z2 — pag.5

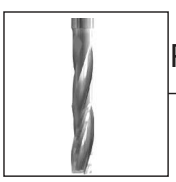
Punta elicoidale in metallo duro integrale negativa Z2 — PHW060
Helical cutter HWM negative spiral Z2 — pag.6



Punta elicoidale in metallo duro integrale elica positiva e negativa Z1+1 — PHW070
Helical cutter HWM positive and negative spiral Z1+1 — pag.7

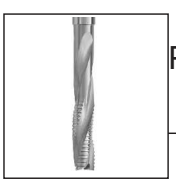


Punta elicoidale in metallo duro integrale elica positiva e negativa Z2+2 — PHW080
Helical cutter HWM positive and negative spiral Z2+2 — pag.8

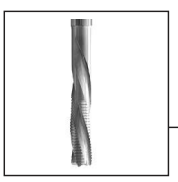


Punta elicoidale in metallo duro integraleelica positiva Z3 per sedi serratura — PHW090
Helical cutter HWM positive spiral Z3 for locks — pag.9

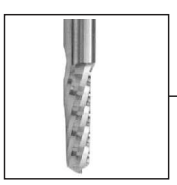
Punta elicoidale in metallo duro integrale elica negativa Z3 per sedi serratura — PHW100
Helical cutter HWM negative spiral Z3 for locks — pag.10



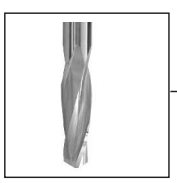
Punta elicoidale in metallo duro integrale elica positiva Z3 con rompitruciolo per sedi serratura — PHW110
Helical cutter HWM positive spiral Z3 with chip breaker for locks — pag.11



Punta elicoidale in metallo duro integrale elica negativa Z3 con rompitruciolo per sedi serratura — PHW120
Helical cutter HWM neg. spiral Z3 with chip breaker for locks — pag.12



Punta elicoidale in metallo duro integrale positiva Z1 — PHW130
Helical cutter HWM positive Z1 — pag.13



Punta elicoidale in metallo duro integrale negativa Z1 — PHW140
Helical cutter HWM negative Z1 — pag.14

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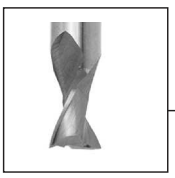
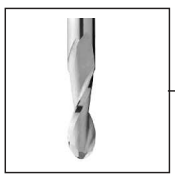
Punta elicoidale in metallo duro integrale positiva Z2 PHW150
Helical cutter HWM positive Z2 pag.15

Punta elicoidale in metallo duro integrale negativa Z2 PHW160
Helical cutter HWM negative Z2 pag.16

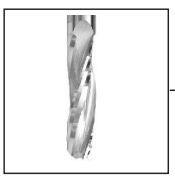
Punta in metallo duro integrale Z2 a taglienti diritti PHW170
Straight milling cutters in solid carbide HWM Z2 pag.17



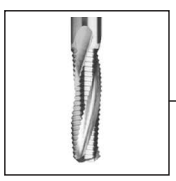
Punta elicoidale in metallo duro integrale a coda di rondine Z2 PHW180
Dovetail helical cutter HWM Z2 pag.18



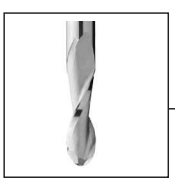
Punta elicoidale in metallo duro integrale Z2 con raggio al vertice PHW190
HWM milling cutters for finishing with top radius Z2 pag.19



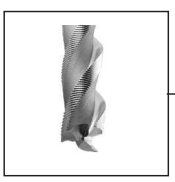
Punta elicoidale in metallo duro integrale con smusso di testa Z3 PHW200
HWM milling cutters with bevel on the top Z3 pag.20



Punta elicoidale in metallo duro integrale con smusso di testa, rompitruciolo Z3 PHW210
HWM milling cutters for finishing with top radius with chip breaker Z3 pag.21



Punta elicoidale in metallo duro integrale con raggio al vertice Z3 PHW220
HWM milling cutters for finishing with top radius Z3 pag.22



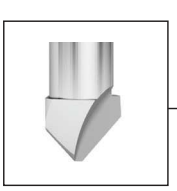
Punta HS per macchina “hundegger” Z3 PHW230
HS router bits for “HUNDEGGER” machines Z3 pag.23

LINEA ALLUMINO
ALUMINUMS LINE

Punta elicoidale in HW integrale Z1 PHW240
HW milling cutters Z1 pag.27

Punta elicoidale in HW integrale Z2 PHW250
HW milling cutters Z2 pag.28

Punta elicoidale in HW integrale con rompitruciolo a finire Z2 PHW260
HW milling cutters with chip-breaker for finishing Z2 pag.29



Punta in HW integrale per Alucobond - Dibond Z2 PHW270
HW milling cutters for Alucobond - Dibond Z2 pag.30

Punta elicoidale in HW integrale per Alucobond - Dibond Z2 PHW280
HW milling cutters for Alucobond - Dibond Z2 pag.31

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LINEA LEGNO

LINE WOOD

CENTERINOX

Tabella per il calcolo della velocità di avanzamento nella lavorazione del legno

Table for calculating feeding rates in the woodworking

TABELLA VELOCITA' DI AVANZAMENTO (mt/min^{-1})					
CODE ART.	**DIAMETRO** DIAMETER	**LEGNO TENERO** SOFTWOOD	**LEGNO DURO** HARDWOOD	**MDF**	**LAMINATO TRUCIOLARE** LAMINATED WOOD
PHW130 - PHW140	3	2,40	2,40	2,40	-
PHW050 - PHW060		3,20	2,60	3,00	-
PHW130 - PHW140	6	3,70	3,60	3,40	-
PHW050 - PHW060		4,00	3,70	3,90	-
PHW130 - PHW140	8	4,30	4,00	3,80	-
PHW050 - PHW060		5,00	4,30	4,90	-
PHW010 - PHW020		6,00	4,60	5,20	5,80
PHW030 - PHW040		8,20	6,60	6,80	-
PHW080		6,60	5,20	5,70	6,50
PHW130 - PHW140	10	4,90	4,90	3,80	-
PHW050 - PHW060		6,20	4,60	5,40	-
PHW010 - PHW020		7,30	5,00	6,10	5,80
PHW030 - PHW040		9,10	6,60	7,40	-
PHW080		6,70	5,10	6,00	6,50
PHW130 - PHW140	12	5,10	4,90	4,20	-
PHW050 - PHW060		6,50	5,20	5,40	-
PHW010 - PHW020		7,90	6,30	6,80	7,40
PHW030 - PHW040		10,20	8,10	8,30	-
PHW080		6,90	5,10	6,00	6,70
PHW050 - PHW060	16	7,70	6,10	6,90	-
PHW010 - PHW020		9,50	7,90	8,10	9,10
PHW030 - PHW040		11,80	9,00	9,50	-
PHW080		7,30	6,00	6,30	6,80
PHW050 - PHW060	20	8,60	7,30	7,90	-
PHW010 - PHW020		10,80	8,50	8,90	10,00
PHW030 - PHW040		15,00	11,00	11,90	-
PHW080		8,00	6,90	7,20	7,00

I DATI SOPRA RIPORTATI SONO OTTENUTI CON I SEGUENTI PARAMETRI DI LAVORO

- Macchinari efficienti ed in ottimo stato;
- lavorazione dal pieno (se non si lavora dal pieno i dati possono essere maggiorati);
- tenuta del pezzo perfetta;
- legno ben evaporato;
- velocità di rotazione 18.000 RPM (ma se si utilizzano velocità diverse, si devono cambiare in proporzione la velocità di rotazione con la velocità di avanzamento)
- profondità di lavoro pari a due volte il diametro della fresa (per profondità pari al diametro della fresa aumentare i valori dle 25%,profondità pari a tre volte il diametro diminuire i valori del 25%)
- frese con rotazione destra elica positiva (traente)
- per utilizzo su frese con elica negativa (spingente) si consiglia un entrata pari a metà del diametro, altrimenti la fresa non ha uno scarico sufficiente;
- in certe lavorazioni quando il vacuum non è potente è meglio utilizzare frese spingenti che aiutano la tenuta del pezzo.

THE RECOMMENDED FEED RATES WERE CALCULATED TAKING IN CONSIDERATION THE FOLLOWING PARAMETERS

- efficient machinery in excellent conditions;
- wood piece perfectly clamped;
- working solid material (if not, parameters can be increased)
- wood piece dry;
- RPM 18.000 (workin at a different rotation speed the feed rate should change accordingly);-
- cutting depth two times the router bit diameter (the feed rate increases by 25% when the cutting depht is like the tool diameter - the feed rate decreases by 25% when the cutting depth is three times the tool diameter);
- router bits up cute style;
- better use down cut router bits if the vacuum clamping in not strong enough;
- using down cut style bits we suggest a maximum cutting depth like the half of the tool diameter, otherwise there is not enough chip flow.

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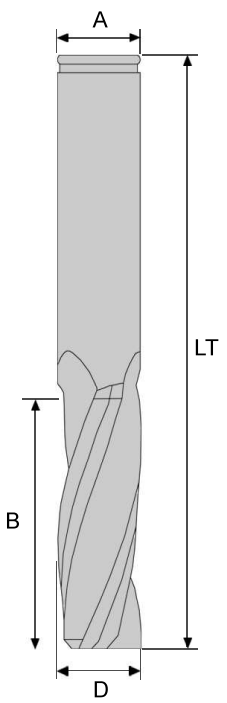
PHW010

Punta elicoidale in metallo duro integrale positiva Z3

Helical cutter HWM positive spiral Z3

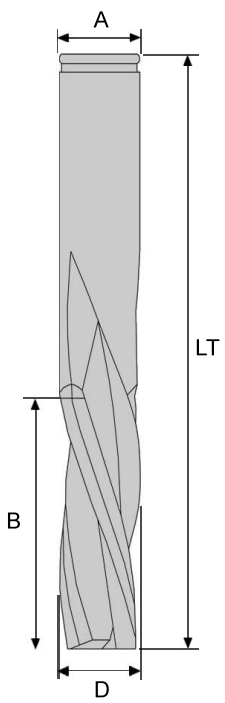


CODE		D	B	LT	A
RIGHT Rot.	LEFT Rot.	mm	mm	mm	mm
PHW010.001R	PHW010.001L	8	22	70	8
PHW010.002R	PHW010.002L	8	32	80	8
PHW010.003R	PHW010.003L	8	42	90	8
PHW010.004R	PHW010.004L	10	32	80	10
PHW010.005R	PHW010.005L	10	42	90	10
PHW010.006R	PHW010.006L	10	52	100	10
PHW010.007R	PHW010.007L	12	32	80	12
PHW010.008R	PHW010.008L	12	42	90	12
PHW010.009R	PHW010.009L	12	52	100	12
PHW010.010R	PHW010.010L	14	32	80	14
PHW010.011R	PHW010.011L	14	42	90	14
PHW010.012R	PHW010.012L	14	52	100	14
PHW010.013R	PHW010.013L	16	42	90	16
PHW010.014R	PHW010.014L	16	52	100	16
PHW010.015R	PHW010.015L	16	72	120	16
PHW010.016R	PHW010.016L	18	52	100	18
PHW010.017R	PHW010.017L	18	72	120	18
PHW010.018R	PHW010.018L	18	102	150	18
PHW010.019R	PHW010.019L	20	52	100	20
PHW010.020R	PHW010.020L	20	72	120	20
PHW010.021R	PHW010.021L	20	102	150	20
PHW010.022R	PHW010.022L	25	42	100	25
PHW010.023R	PHW010.023L	25	62	120	25
PHW010.024R	PHW010.024L	25	102	160	25
PHW010.025R	PHW010.025L	25	120	180	25

PHW020

Punta elicoidale in metallo duro integrale negativa Z3

Helical cutter HWM negative spiral Z3

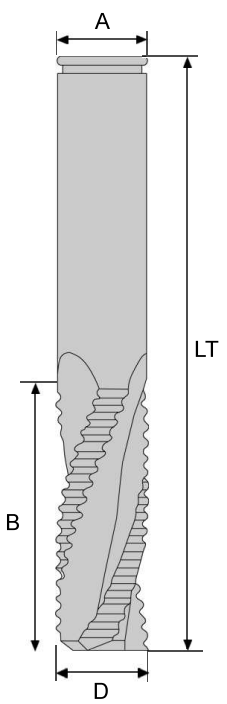


CODE		D	B	LT	A
RIGHT Rot.	LEFT Rot.	mm	mm	mm	mm
PHW020.001R	PHW020.001L	8	22	70	8
PHW020.002R	PHW020.002L	8	32	80	8
PHW020.003R	PHW020.003L	8	42	90	8
PHW020.004R	PHW020.004L	10	32	80	10
PHW020.005R	PHW020.005L	10	42	90	10
PHW020.006R	PHW020.006L	10	52	100	10
PHW020.007R	PHW020.007L	12	32	80	12
PHW020.008R	PHW020.008L	12	42	90	12
PHW020.009R	PHW020.009L	12	52	100	12
PHW020.010R	PHW020.010L	14	32	80	14
PHW020.011R	PHW020.011L	14	42	90	14
PHW020.012R	PHW020.012L	14	52	100	14
PHW020.013R	PHW020.013L	16	42	90	16
PHW020.014R	PHW020.014L	16	52	100	16
PHW020.015R	PHW020.015L	16	72	120	16
PHW020.016R	PHW020.016L	18	52	100	18
PHW020.017R	PHW020.017L	18	72	120	18
PHW020.018R	PHW020.018L	18	102	150	18
PHW020.019R	PHW020.019L	20	52	100	20
PHW020.020R	PHW020.020L	20	72	120	20
PHW020.021R	PHW020.021L	20	102	150	20
PHW020.022R	PHW020.022L	25	42	100	25
PHW020.023R	PHW020.023L	25	62	120	25
PHW020.024R	PHW020.024L	25	102	160	25
PHW020.025R	PHW020.025L	25	120	180	25

PHW030

Punta elicoidale in metallo duro integrale positiva Z3 con rompitruciolo

Helical cutter HWM positive spiral Z3 with chip breaker



CODE		D	B	LT	A
RIGHT Rot.	LEFT Rot.	mm	mm	mm	mm
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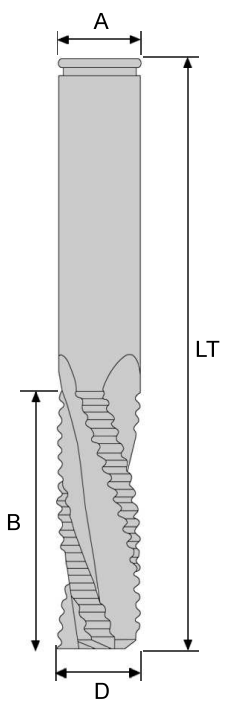
PHW030.002R	PHW030.002L	8	32	80	8
PHW030.003R	PHW030.003L	8	42	90	8
PHW030.004R	PHW030.004L	10	32	80	10
PHW030.005R	PHW030.005L	10	42	90	10
PHW030.006R	PHW030.006L	10	52	100	10
PHW030.007R	PHW030.007L	12	32	80	12
PHW030.008R	PHW030.008L	12	42	90	12
PHW030.009R	PHW030.009L	12	52	100	12
PHW030.010R	PHW030.010L	14	32	80	14
PHW030.011R	PHW030.011L	14	42	90	14
PHW030.012R	PHW030.012L	14	52	100	14
PHW030.013R	PHW030.013L	16	42	90	16
PHW030.014R	PHW030.014L	16	52	100	16
PHW030.015R	PHW030.015L	16	72	120	16
PHW030.016R	PHW030.016L	18	52	100	18
PHW030.017R	PHW030.017L	18	72	120	18
PHW030.018R	PHW030.018L	18	102	150	18
PHW030.019R	PHW030.019L	20	52	100	20
PHW030.020R	PHW030.020L	20	72	120	20
PHW030.021R	PHW030.021L	20	102	150	20
PHW030.022R	PHW030.022L	25	42	100	25
PHW030.023R	PHW030.023L	25	62	120	25
PHW030.024R	PHW030.024L	25	102	160	25
PHW030.025R	PHW030.025L	25	120	180	25

PHW040

Punta elicoidale in metallo duro integrale negativa Z3 con rompitruciolo

Helical cutter HWM negative spiral Z3 with chip breaker



CODE		D	B	LT	A
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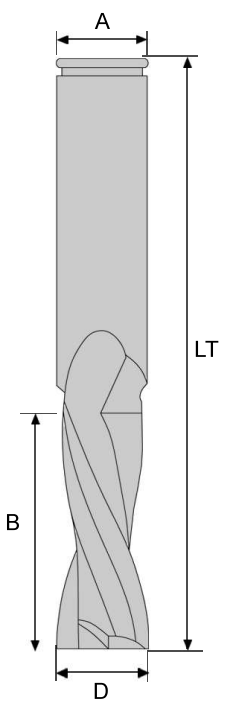
PHW040.002R	PHW040.002L	8	32	80	8
PHW040.003R	PHW040.003L	8	42	90	8
PHW040.004R	PHW040.004L	10	32	80	10
PHW040.005R	PHW040.005L	10	42	90	10
PHW040.006R	PHW040.006L	10	52	100	10
PHW040.007R	PHW040.007L	12	32	80	12
PHW040.008R	PHW040.008L	12	42	90	12
PHW040.009R	PHW040.009L	12	52	100	12
PHW040.010R	PHW040.010L	14	32	80	14
PHW040.011R	PHW040.011L	14	42	90	14
PHW040.012R	PHW040.012L	14	52	100	14
PHW040.013R	PHW040.013L	16	42	90	16
PHW040.014R	PHW040.014L	16	52	100	16
PHW040.015R	PHW040.015L	16	72	120	16
PHW040.016R	PHW040.016L	18	52	100	18
PHW040.017R	PHW040.017L	18	72	120	18
PHW040.018R	PHW040.018L	18	102	150	18
PHW040.019R	PHW040.019L	20	52	100	20
PHW040.020R	PHW040.020L	20	72	120	20
PHW040.021R	PHW040.021L	20	102	150	20
PHW040.022R	PHW040.022L	25	42	100	25
PHW040.023R	PHW040.023L	25	62	120	25
PHW040.024R	PHW040.024L	25	102	160	25
PHW040.025R	PHW040.025L	25	120	180	25

PHW050

Punta elicoidale in metallo duro integrale positiva Z2

Helical cutter HWM positive spiral Z2

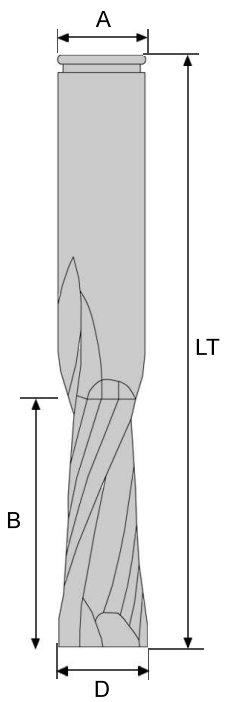


CODE		D	B	LT	A
RIGHT Rot.	LEFT Rot.	mm	mm	mm	mm
PHW050.001R	PHW050.001L	3	12	50	3
PHW050.002R	PHW050.002L	4	12	50	4
PHW050.003R	PHW050.003L	5	17	50	5
PHW050.004R	PHW050.004L	6	22	60	6
PHW050.005R	PHW050.005L	6	27	60	6
PHW050.006R	PHW050.006L	8	22	70	8
PHW050.007R	PHW050.007L	8	32	80	8
PHW050.008R	PHW050.008L	8	42	90	8
PHW050.009R	PHW050.009L	10	32	80	10
PHW050.010R	PHW050.010L	10	42	90	10
PHW050.011R	PHW050.011L	10	52	100	10
PHW050.012R	PHW050.012L	12	32	80	12
PHW050.013R	PHW050.013L	12	42	90	12
PHW050.014R	PHW050.014L	12	52	100	12
PHW050.015R	PHW050.015L	14	32	80	14
PHW050.016R	PHW050.016L	14	52	100	14
PHW050.017R	PHW050.017L	16	42	90	16
PHW050.018R	PHW050.018L	16	52	100	16
PHW050.019R	PHW050.019L	16	72	120	16
PHW050.020R	PHW050.020L	18	72	120	18
PHW050.021R	PHW050.021L	20	52	100	20
PHW050.022R	PHW050.022L	20	72	120	20

PHW060

Punta elicoidale in metallo duro integrale negativa Z2

Helical cutter HWM negative spiral Z2



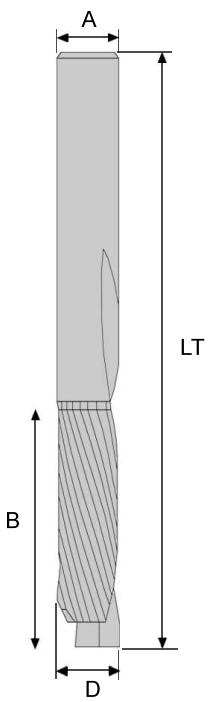
CODE		D	B	LT	A
RIGHT ROT.	LEFT ROT.	mm	mm	mm	mm
PHW060.001R	PHW060.001L	3	12	50	3
PHW060.002R	PHW060.002L	4	12	50	4
PHW060.003R	PHW060.003L	5	17	50	5
PHW060.004R	PHW060.004L	6	22	60	6
PHW060.005R	PHW060.005L	6	27	60	6
PHW060.006R	PHW060.006L	8	22	70	8
PHW060.007R	PHW060.007L	8	32	80	8
PHW060.008R	PHW060.008L	8	42	90	8
PHW060.009R	PHW060.009L	10	32	80	10
PHW060.010R	PHW060.010L	10	42	90	10
PHW060.011R	PHW060.011L	10	52	100	10
PHW060.012R	PHW060.012L	12	32	80	12
PHW060.013R	PHW060.013L	12	42	90	12
PHW060.014R	PHW060.014L	12	52	100	12
PHW060.015R	PHW060.015L	14	32	80	14
PHW060.016R	PHW060.016L	14	52	100	14
PHW060.017R	PHW060.017L	16	42	90	16
PHW060.018R	PHW060.018L	16	52	100	16
PHW060.019R	PHW060.019L	16	72	120	16
PHW060.020R	PHW060.020L	18	72	120	18
PHW060.021R	PHW060.021L	20	52	100	20
PHW060.022R	PHW060.022L	20	72	120	20

PHW070

Punta elicoidale in metallo duro integrale elica positiva e negativa Z1+1

Helical cutter HWM positive and negative spiral Z1+1

CODE		D	B	LT	A
RIGHT Rot.	LEFT Rot.	mm	mm	mm	mm
PHW070.001R	PHW070.001L	4	15	50	4
PHW070.002R	PHW070.002L	5	17	50	5
PHW070.003R	PHW070.003L	6	17	60	6
PHW070.004R	PHW070.004L	6	22	60	6
PHW070.005R	PHW070.005L	8	22	70	8
PHW070.006R	PHW070.006L	8	32	80	8
PHW070.007R	PHW070.007L	10	32	80	10
PHW070.008R	PHW070.008L	8	42	100	8
PHW070.009R	PHW070.009L	10	52	100	10
PHW070.010R	PHW070.010L	12	32	80	12
PHW070.011R	PHW070.011L	12	52	100	12
PHW070.012R	PHW070.012L	12	42	110	12

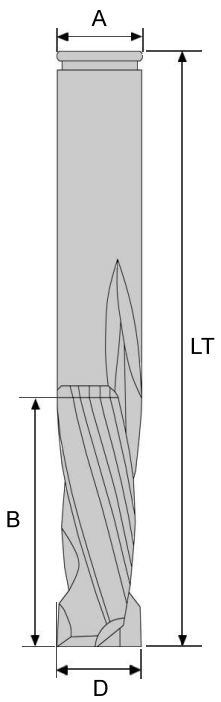


PHW080

Punta elicoidale in metallo duro integrale elica positiva e negativa Z2+2

Helical cutter HWM positive and negative spiral Z2+2

CODE		D	B	LT	A
RIGHT Rot.	LEFT Rot.	mm	mm	mm	mm
PHW080.001R	PHW080.001L	8	22	70	8
PHW080.002R	PHW080.002L	8	32	80	8
PHW080.003R	PHW080.003L	10	32	80	10
PHW080.004R	PHW080.004L	10	42	100	10
PHW080.005R	PHW080.005L	10	52	100	10
PHW080.006R	PHW080.006L	12	32	80	12
PHW080.007R	PHW080.007L	12	42	100	12
PHW080.008R	PHW080.008L	12	52	110	12
PHW080.009R	PHW080.009L	14	42	100	14
PHW080.010R	PHW080.010L	14	52	110	14
PHW080.011R	PHW080.011L	16	42	100	16
PHW080.012R	PHW080.012L	16	52	100	16
PHW080.013R	PHW080.013L	16	72	130	16
PHW080.014R	PHW080.014L	18	52	110	18
PHW080.015R	PHW080.015L	18	72	130	18
PHW080.016R	PHW080.016L	20	52	120	20
PHW080.017R	PHW080.017L	20	72	130	20

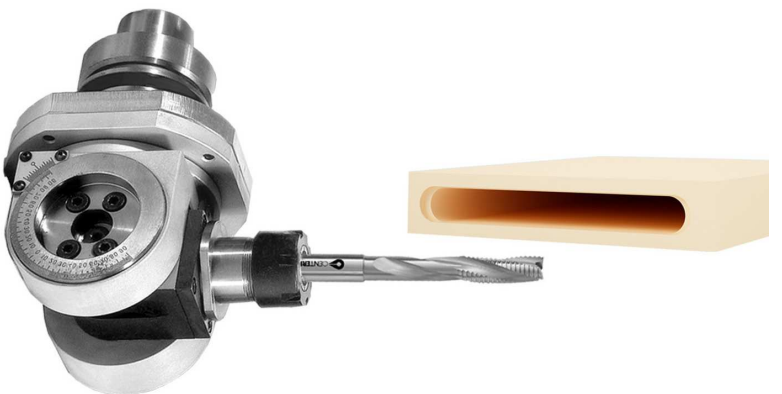


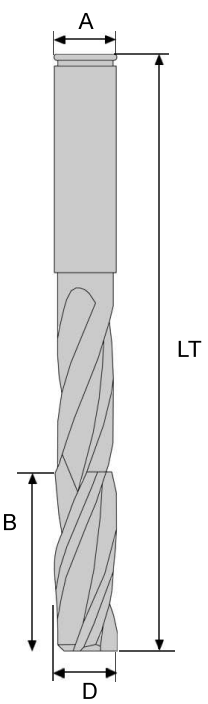
PHW090

Punta elicoidale in metallo duro integrale elica positiva Z3 per sedi serratura

Helical cutter HWM positive spiral Z3 for locks

CODE		D	B	LT	A
RIGHT Rot.	LEFT Rot.	mm	mm	mm	mm
PHW090.001R	PHW090.001L	12	45	150	12
PHW090.002R	PHW090.002L	14	45	150	14
PHW090.003R	PHW090.003L	16	45	150	16
PHW090.004R	PHW090.004L	18	45	150	18
PHW090.005R	PHW090.005L	20	45	150	20



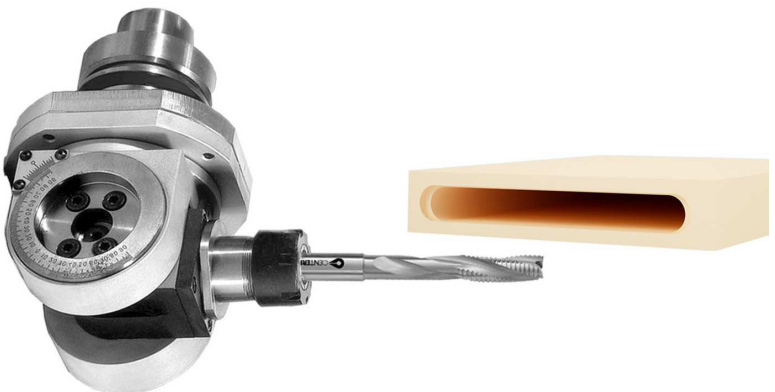


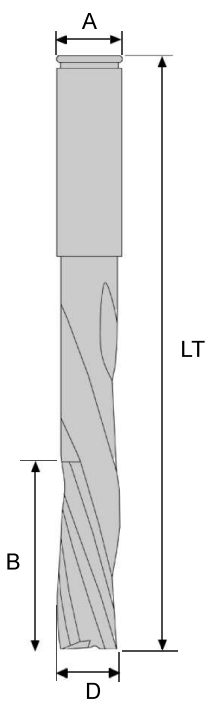
PHW100

Punta elicoidale in metallo duro integrale elica negativa Z3 per sedi serratura

Helical cutter HWM negative spiral Z3 for locks

CODE		D	B	LT	A
RIGHT Rot.	LEFT Rot.	mm	mm	mm	mm
PHW100.001R	PHW100.001L	12	45	150	12
PHW100.002R	PHW100.002L	14	45	150	14
PHW100.003R	PHW100.003L	16	45	150	16
PHW100.004R	PHW100.004L	18	45	150	18
PHW100.005R	PHW100.005L	20	45	150	20



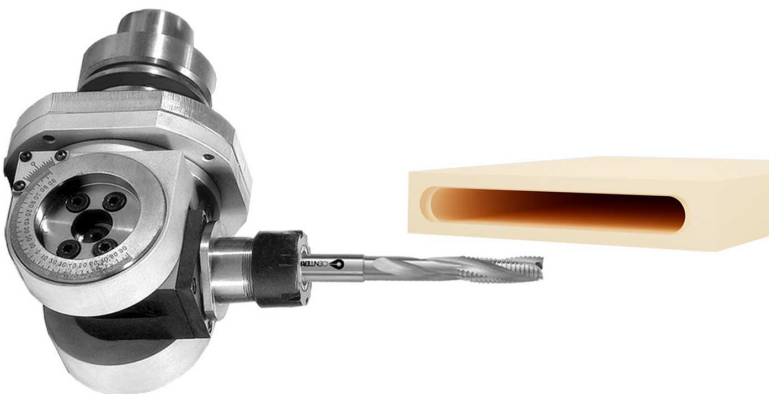


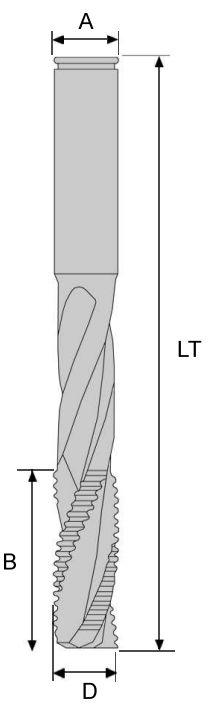
PHW110

Punta elicoidale in metallo duro integrale elica positiva Z3 con rompitruciolo per sedi serratura

Helical cutter HWM positive spiral Z3 with chip breaker for locks

CODE		D	B	LT	A
RIGHT Rot.	LEFT Rot.	mm	mm	mm	mm
PHW110.001R	PHW110.001L	12	45	150	12
PHW110.002R	PHW110.002L	14	45	150	14
PHW110.003R	PHW110.003L	16	45	150	16
PHW110.004R	PHW110.004L	18	45	150	18
PHW110.005R	PHW110.005L	20	45	150	20



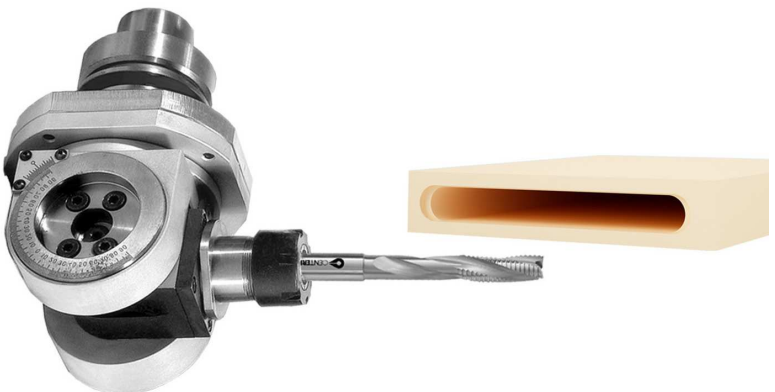


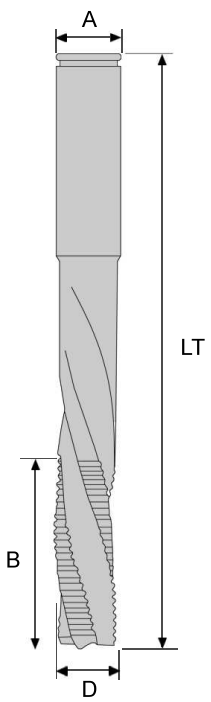
PHW120

Punta elicoidale in metallo duro integrale elica negativa Z3 con rompitruciolo per sedi serratura

Helical cutter HWM negative spiral Z3 with chip breaker for locks

CODE		D	B	LT	A
RIGHT Rot.	LEFT Rot.	mm	mm	mm	mm
PHW120.001R	PHW120.001L	12	45	150	12
PHW120.002R	PHW120.002L	14	45	150	14
PHW120.003R	PHW120.003L	16	45	150	16
PHW120.004R	PHW120.004L	18	45	150	18
PHW120.005R	PHW120.005L	20	45	150	20

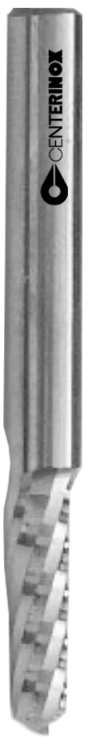




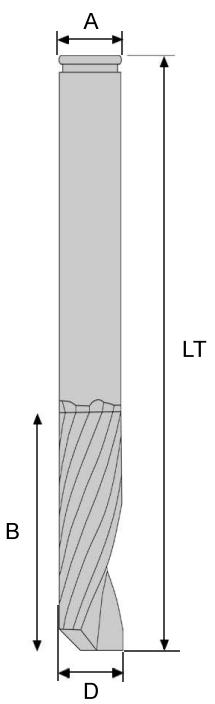
PHW130

Punta elicoidale in metallo duro integrale positiva Z1

Helical cutter HWM positive Z1



CODE		D	B	LT	A
RIGHT Rot.	LEFT Rot.	mm	mm	mm	mm
PHW130.001R	PHW130.001L	3	14	50	3
PHW130.002R	PHW130.002L	4	14	50	4
PHW130.003R	PHW130.003L	4	20	50	4
PHW130.004R	PHW130.004L	5	17	50	5
PHW130.005R	PHW130.005L	5	22	60	5
PHW130.006R	PHW130.006L	6	22	60	6
PHW130.007R	PHW130.007L	6	27	60	6
PHW130.008R	PHW130.008L	8	22	70	8
PHW130.009R	PHW130.009L	8	32	80	8
PHW130.010R	PHW130.010L	10	32	80	10
PHW130.011R	PHW130.011L	10	42	90	10
PHW130.012R	PHW130.012L	12	32	80	12
PHW130.013R	PHW130.013L	12	42	90	12

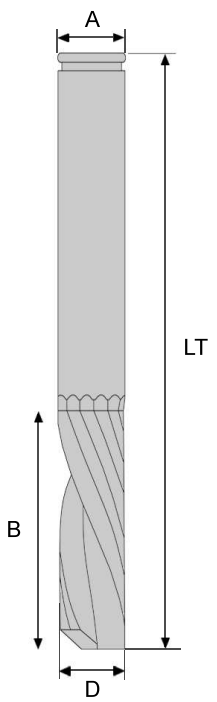


PHW140

Punta elicoidale in metallo duro integrale negativa Z1

Helical cutter HWM negative Z1

CODE		D	B	LT	A
RIGHT ROT.	LEFT ROT.	mm	mm	mm	mm
PHW140.001R	PHW140.001L	3	14	50	3
PHW140.002R	PHW140.002L	4	14	50	4
PHW140.003R	PHW140.003L	4	20	50	4
PHW140.004R	PHW140.004L	5	17	50	5
PHW140.005R	PHW140.005L	5	22	60	5
PHW140.006R	PHW140.006L	6	22	60	6
PHW140.007R	PHW140.007L	6	27	60	6
PHW140.008R	PHW140.008L	8	22	70	8
PHW140.009R	PHW140.009L	8	32	80	8
PHW140.010R	PHW140.010L	10	32	80	10
PHW140.011R	PHW140.011L	10	42	90	10
PHW140.012R	PHW140.012L	12	32	80	12
PHW140.013R	PHW140.013L	12	42	90	12

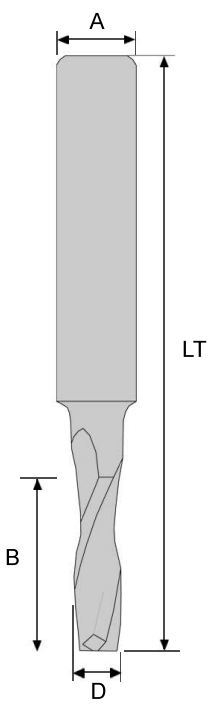


PHW150

Punta elicoidale in metallo duro integrale positiva Z2

Helical cutter HWM positive Z2

CODE		D	B	LT	A
RIGHT Rot.	LEFT Rot.	mm	mm	mm	mm
PHW150.001R	PHW150.001L	2	6	50	6
PHW150.002R	PHW150.002L	3	12	50	6
PHW150.003R	PHW150.003L	3	8	50	6
PHW150.004R	PHW150.004L	4	12	50	6
PHW150.005R	PHW150.005L	5	12	60	6
PHW150.006R	PHW150.006L	5	17	60	6

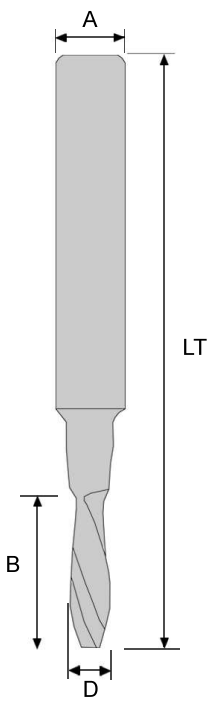


PHW160

Punta elicoidale in metallo duro integrale negativa Z2

Helical cutter HWM negative Z2

CODE		D	B	LT	A
RIGHT ROT.	LEFT ROT.	mm	mm	mm	mm
PHW160.001R	PHW160.001L	2	6	50	6
PHW160.002R	PHW160.002L	3	12	50	6
PHW160.003R	PHW160.003L	3	8	50	6
PHW160.004R	PHW160.004L	4	12	50	6
PHW160.005R	PHW160.005L	5	12	60	6
PHW160.006R	PHW160.006L	5	17	60	6

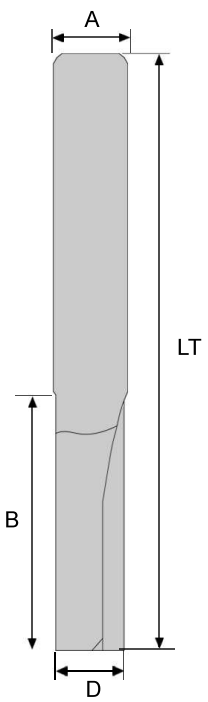


PHW170

Punta in metallo duro integrale Z2 a taglienti diritti

Straight milling cutters in solid carbide HWM Z2

CODE		D	B	LT	A
RIGHT Rot.	LEFT Rot.	mm	mm	mm	mm
PHW170.001R	PHW170.001L	3	10	50	3
PHW170.002R	PHW170.002L	3	10	50	6
PHW170.003R	PHW170.003L	4	10	50	4
PHW170.004R	PHW170.004L	4	10	50	6
PHW170.005R	PHW170.005L	5	12	50	5
PHW170.006R	PHW170.006L	5	12	50	6
PHW170.007R	PHW170.007L	6	15	60	6
PHW170.008R	PHW170.008L	6	20	60	6
PHW170.009R	PHW170.009L	6	25	60	6
PHW170.010R	PHW170.010L	8	20	70	8
PHW170.011R	PHW170.011L	8	25	70	8
PHW170.012R	PHW170.012L	8	32	70	8
PHW170.013R	PHW170.013L	10	20	70	10
PHW170.014R	PHW170.014L	10	25	70	10
PHW170.015R	PHW170.015L	10	32	70	10
PHW170.016R	PHW170.016L	12	25	80	12
PHW170.017R	PHW170.017L	12	40	100	12

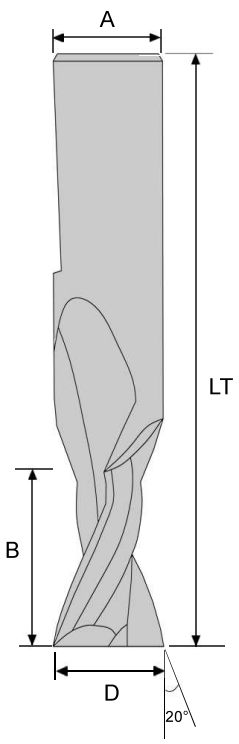


PHW180

Punta elicoidale in metallo duro integrale a coda di rondine Z2

Dovetail helical cutter HWM Z2

CODE		D	B	LT	A
RIGHT Rot.	LEFT Rot.	mm	mm	mm	mm
PHW180.001R	PHW180.001L	12	12	60	14
PHW180.002R	PHW180.002L	14	15	60	14

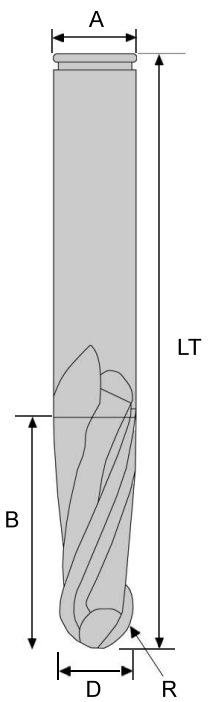


PHW190

Punta elicoidale in metallo duro integrale Z2 con raggio al vertice

HWM milling cutters for finishing with top radius Z2

CODE		D	B	LT	A	R
RIGHT ROT.	LEFT ROT.	mm	mm	mm	mm	
PHW190.001R	PHW190.001L	3	12	50	3	1.5
PHW190.002R	PHW190.002L	4	15	50	4	2
PHW190.003R	PHW190.003L	5	17	50	5	2.5
PHW190.004R	PHW190.004L	6	22	60	6	3
PHW190.005R	PHW190.005L	8	22	70	8	4
PHW190.006R	PHW190.006L	10	32	70	10	5
PHW190.007R	PHW190.007L	10	42	100	10	5
PHW190.008R	PHW190.008L	12	32	80	12	6
PHW190.009R	PHW190.009L	12	42	100	12	6
PHW190.010R	PHW190.010L	14	42	100	14	7
PHW190.011R	PHW190.011L	16	42	100	16	8
PHW190.012R	PHW190.012L	16	52	100	16	8
PHW190.013R	PHW190.013L	18	52	100	18	9
PHW190.014R	PHW190.014L	20	52	100	20	10
PHW190.015R	PHW190.015L	20	72	130	20	10

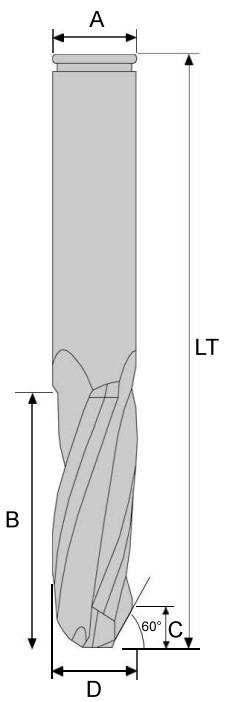


PHW200

Punta elicoidale in metallo duro integrale con smusso di testa Z3

HWM milling cutters with bevel on the top Z3

CODE		D	B	LT	A	C
RIGHT Rot.	LEFT Rot.	mm	mm	mm	mm	mm
PHW200.001R	PHW200.001L	14	62	130	14	7
PHW200.002R	PHW200.002L	16	62	130	16	8

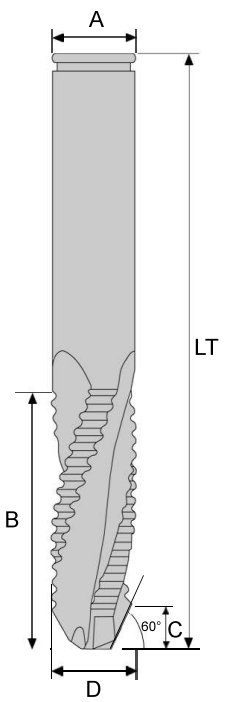


PHW210

Punta elicoidale in metallo duro integrale con smusso di testa, rompitruciolo Z3

HWM milling cutters for finishing with top radius with chip breaker Z3

CODE		D	B	LT	A	C
RIGHT ROT.	LEFT ROT.	mm	mm	mm	mm	mm
PHW210.001R	PHW210.001L	14	62	130	14	7
PHW210.002R	PHW210.002L	16	62	130	16	8

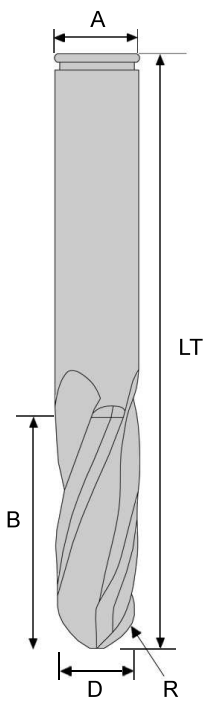


PHW220

Punta elicoidale in metallo duro integrale con raggio al vertice Z3

HWM milling cutters for finishing with top radius Z3

CODE		D	B	LT	A	R
RIGHT Rot.	LEFT Rot.	mm	mm	mm	mm	
PHW220.001R	PHW220.001L	8	22	70	8	4
PHW220.002R	PHW220.002L	10	32	70	10	5
PHW220.003R	PHW220.003L	10	42	100	10	5
PHW220.004R	PHW220.004L	12	32	80	12	6
PHW220.005R	PHW220.005L	12	42	100	12	6
PHW220.006R	PHW220.006L	14	42	100	14	7
PHW220.007R	PHW220.007L	16	42	100	16	8
PHW220.008R	PHW220.008L	16	52	100	16	8
PHW220.009R	PHW220.009L	18	52	100	18	9
PHW220.010R	PHW220.010L	20	52	100	20	10
PHW220.011R	PHW220.011L	20	72	130	20	10

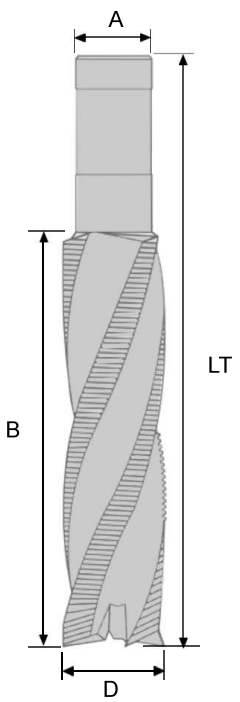


PHW230

Punta HS per macchina “HUNDEGGER” Z3

HS router bits for “HUNDEGGER” machines Z3

CODE RIGHT ROT.	D mm	B mm	LT mm	A mm
PHW230.001R	40	165	235	30
PHW230.002R	50	215	295	30



PHW235

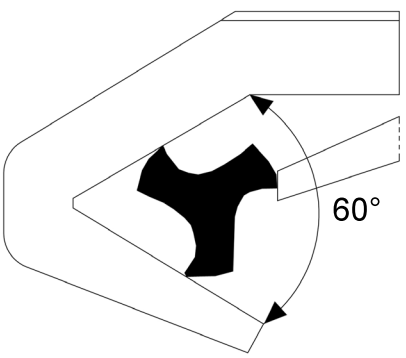
Calibro digitale per misurazione frese Z3

Three point digital caliper for cutters Z3

CODE	Capacità di misura
PHW235	4 - 40mm

- Calibro per la misurazione frese Z3
- Campo di misura: 4,00mm - 40,00mm
- Risoluzione: 0,01mm / 0,0005”
- Accuratezza: +-0,05mm /+- 0,002”
- Ripetibilità: 0,01mm / 0,0005”

- Measuring range: 4mm ÷ 40,00 mm / 0,16’’ ÷ 1,73’’.
- Resolution: 0,01 mm/0,0005’’.
- Accuracy: ± 0,05mm/ ± 0,0002’’.
- Repeatibility: 0,01 mm/0,0005’’.



LINEA ALLUMINIO

ALUMINUMS LINE

CENTERINOX

Classificazione delle materie plastiche

Classification of plastic materials

La seguente tabella aiuta a definire la tipologia di plastica che si sta lavorando
Reference table to identify the type of plastic processed and the right tool to use

SIMBOLO *symbol*	ABBREVIAZIONE *abbreviation*	NOME DEL POLIMERO *name*	MODULO DI RESISTENZA MECCANICA A TRAZIONE(MPa) *tensile strength (MPa)*	ALLUNGAMENTO A ROTTURA (%) *elongation at ruptore (%)*	UTILIZZO *some example for use*
01 PET	PETE PET	polietilene tereftalato o arnite *polyethylene tereph-thalate orarnite*	2300-10300	7	produzione di bottiglie per bevande,tubi,cinghie... *plastic bottles,belts,pipes...*
01 PET	POLIESTERE *polyester*	polietilene tereftalato o arnite *polyethylene tereph-thalate orarnite*	2400	300	arredamento (pavimen-tazione e rivestimento mobili) abbigliamento... *home design,clothing...*
02 PE-HD	HDPE	polietilene ad alta densità *high density polyethylene*	700-1400	15-100	produzione di contenitori di liquidi, imballaggi, finto legno... *bottles,packaging,wood plastic composit..*
03 PVC	PVC V	cloruro di polivinile *polyvinyl chloride*	200-4200	2-30	produzione di tubazione, recinzioni,contenitori non alimentari... *pipes, fencing,containers...*
04 PE-LD	LDPE	polietilene a bassa densità *low density polyethylene*	100-250	50-800	produzione di contenitori vari, materiale plastico di laboratorio... *general purpose containers...*
05 PP	PP	polipropilene o moplen *polyethylene or moplen*	1350	150-600	industria automobilistica e per la produzione di fibre *automotive industry and fibre production*
06 PS	PS	polistirene o polistirolo *polystyrene*	2400-3350	1-4	giocattoli, accessori da uffici, vassoi, pannelli isolanti... *toys,office supllies,trays...*
07 O	NYLON POLIMETILME-TACRILATO *methyl methacrylate resin*	poliammidi sintetiche *synthetic polyamide*	1500-3000	30-150	arredamento, pavimen-tazione, abbigliamen-to... *forniture, flooring,clothing...*
07 O	FIBRA DI VETRO *fiberglass*	poliammidi sintetiche *synthetic polyamide*	4500	40	campo nautico,aerospa ziale,automobilistico... *shipbuilding,aerospace and automotive indu-stry...*

Il termine “plastica” viene genericamente utilizzato per indicare un tipo di materiale che in realtà può essere costituito da innumere-voli varietà di combinazioni di strutture polimere e dimensioni.
Per questo motivo è molto difficile definire con precisione i parametri di lavorazione delle materie plastiche (velocità di avanzamento e n°.di giri).
Per semplificare proponiamo di tenere in considerazione le seguenti linee guida:
lavorazione su pantografo:
- per materiale morbido ed elastico utilizzare frese Z=1, che permettono uno scarico maggiore;
- si consiglia di aumentare il volume di asportazione per evitare un consumo eccessivo dell’utensile;

lavorazione su macchine da taglio:
- per materiali plastici duri è preferibile utilizzare lame con mag-gior numero di denti.

“Plastic” is a generic term used to indicate type of material that can actually be constituted by an innumerable variety of combinations of polymer structures and sizes.
For this reasonit is very hard to define precisely the working parameters (feed rates and RMP) of plastic materials.
here some guidelines that can help:
working with a CNC machine:
- use router bits Z=1 which allow a better chip flow, when working soft or flexible material;
- increase th chip load to avoid tool wear;
working with a table saw:
- use a sawblade with higher number of teeth when working hard materials.

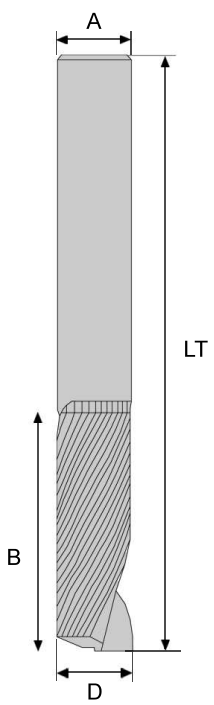
HW milling cutters Z1

POSITIVA

CODE		D	B	LT	A
RIGHT ROT.	LEFT ROT.	mm	mm	mm	mm
PHW240.001R	PHW240.001L	2	6	50	3
PHW240.002R	PHW240.002L	2	8	50	3
PHW240.003R	PHW240.003L	2,5	8	50	3
PHW240.004R	PHW240.004L	2,5	8	60	6
PHW240.005R	PHW240.005L	3	8	50	3
PHW240.006R	PHW240.006L	3	10	60	6
PHW240.007R	PHW240.007L	4	12	50	4
PHW240.008R	PHW240.008L	4	12	60	6
PHW240.009R	PHW240.009L	4	16	60	6
PHW240.010R	PHW240.010L	5	14	50	5
PHW240.011R	PHW240.011L	5	14	60	6
PHW240.012R	PHW240.012L	5	20	60	6
PHW240.013R	PHW240.013L	6	161	60	6
PHW240.014R	PHW240.014L	6	20	60	6
PHW240.015R	PHW240.015L	6	25	60	6
PHW240.016R	PHW240.016L	8	35	80	8
PHW240.017R	PHW240.017L	8	25	100	8
PHW240.018R	PHW240.018L	8	35	100	8
PHW240.019R	PHW240.019L	10	25	100	10
PHW240.020R	PHW240.020L	10	35	100	10
PHW240.021R	PHW240.021L	10	45	100	10
PHW240.022R	PHW240.022L	12	25	100	12
PHW240.023R	PHW240.023L	12	35	100	12
PHW240.024R	PHW240.024L	12	45	100	12
PHW240.025R	PHW240.025L	14	35	100	14
PHW240.026R	PHW240.026L	14	45	100	14
PHW240.027R	PHW240.027L	16	35	100	16
PHW240.028R	PHW240.028L	16	45	100	16

NEGATIVA

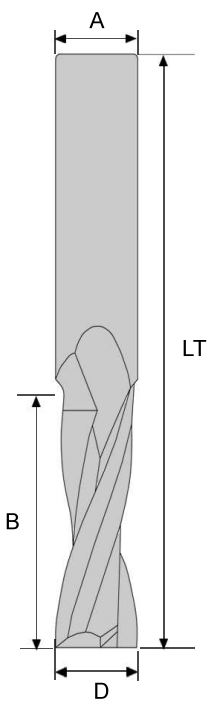
CODE		D	B	LT	A
RIGHT ROT.	LEFT ROT.	mm	mm	mm	mm
PHW240.029R	PHW240.029L	2	6	50	3
PHW240.030R	PHW240.030L	2	8	50	3
PHW240.031R	PHW240.031L	2,5	8	50	3
PHW240.032R	PHW240.032L	2,5	8	60	6
PHW240.033R	PHW240.033L	3	8	50	3
PHW240.034R	PHW240.034L	3	10	60	6
PHW240.035R	PHW240.035L	4	12	50	4
PHW240.036R	PHW240.036L	4	12	60	6
PHW240.037R	PHW240.037L	4	16	60	6
PHW240.038R	PHW240.038L	5	14	50	5
PHW240.039R	PHW240.039L	5	14	60	6
PHW240.040R	PHW240.040L	5	20	60	6
PHW240.041R	PHW240.041L	6	161	60	6
PHW240.042R	PHW240.042L	6	20	60	6
PHW240.043R	PHW240.043L	6	25	60	6
PHW240.044R	PHW240.044L	8	35	80	8
PHW240.045R	PHW240.045L	8	25	100	8
PHW240.046R	PHW240.046L	8	35	100	8
PHW240.047R	PHW240.047L	10	25	100	10
PHW240.048R	PHW240.048L	10	35	100	10
PHW240.049R	PHW240.049L	10	45	100	10
PHW240.050R	PHW240.050L	12	25	100	12
PHW240.051R	PHW240.051L	12	35	100	12
PHW240.052R	PHW240.052L	12	45	100	12
PHW240.053R	PHW240.053L	14	35	100	14
PHW240.054R	PHW240.054L	14	45	100	14
PHW240.055R	PHW240.055L	16	35	100	16
PHW240.056R	PHW240.056L	16	45	100	16



PHW250

Punta elicoidale in HW integrale Z2

HW milling cutters Z2



POSITIVA						NEGATIVA					
CODE		D	B	LT	A	CODE		D	B	LT	A
RIGHT ROT.	LEFT ROT.	mm	mm	mm	mm	RIGHT ROT.	LEFT ROT.	mm	mm	mm	mm
PHW250.001R	PHW250.001L	3	10	50	3	PHW250.029R	PHW250.029L	3	10	50	3
PHW250.002R	PHW250.002L	3	10	60	6	PHW250.030R	PHW250.030L	3	10	60	6
PHW250.003R	PHW250.003L	4	12	50	4	PHW250.031R	PHW250.031L	4	12	50	4
PHW250.004R	PHW250.004L	4	12	60	6	PHW250.032R	PHW250.032L	4	12	60	6
PHW250.005R	PHW250.005L	4	16	60	6	PHW250.033R	PHW250.033L	4	16	60	6
PHW250.006R	PHW250.006L	5	14	50	5	PHW250.034R	PHW250.034L	5	14	50	5
PHW250.007R	PHW250.007L	5	14	60	6	PHW250.035R	PHW250.035L	5	14	60	6
PHW250.008R	PHW250.008L	5	20	60	6	PHW250.036R	PHW250.036L	5	20	60	6
PHW250.009R	PHW250.009L	6	15	60	6	PHW250.037R	PHW250.037L	6	15	60	6
PHW250.010R	PHW250.010L	6	20	60	6	PHW250.038R	PHW250.038L	6	20	60	6
PHW250.011R	PHW250.011L	6	25	60	6	PHW250.039R	PHW250.039L	6	25	60	6
PHW250.012R	PHW250.012L	8	20	80	8	PHW250.040R	PHW250.040L	8	20	80	8
PHW250.013R	PHW250.013L	8	25	80	8	PHW250.041R	PHW250.041L	8	25	80	8
PHW250.014R	PHW250.014L	8	35	100	8	PHW250.042R	PHW250.042L	8	35	100	8
PHW250.015R	PHW250.015L	10	25	100	10	PHW250.043R	PHW250.043L	10	25	100	10
PHW250.016R	PHW250.016L	10	35	100	10	PHW250.044R	PHW250.044L	10	35	100	10
PHW250.017R	PHW250.017L	10	45	100	10	PHW250.045R	PHW250.045L	10	45	100	10
PHW250.018R	PHW250.018L	12	25	100	12	PHW250.046R	PHW250.046L	12	25	100	12
PHW250.019R	PHW250.019L	12	35	100	12	PHW250.047R	PHW250.047L	12	35	100	12
PHW250.020R	PHW250.020L	12	45	100	12	PHW250.048R	PHW250.048L	12	45	100	12
PHW250.021R	PHW250.021L	14	35	100	14	PHW250.049R	PHW250.049L	14	35	100	14
PHW250.022R	PHW250.022L	14	45	100	14	PHW250.050R	PHW250.050L	14	45	100	14
PHW250.023R	PHW250.023L	16	35	100	16	PHW250.051R	PHW250.051L	16	35	100	16
PHW250.024R	PHW250.024L	16	45	100	16	PHW250.052R	PHW250.052L	16	45	100	16
PHW250.025R	PHW250.025L	16	55	110	16	PHW250.053R	PHW250.053L	16	55	110	16
PHW250.026R	PHW250.026L	16	65	130	16	PHW250.054R	PHW250.054L	16	65	130	16
PHW250.027R	PHW250.027L	20	55	110	20	PHW250.055R	PHW250.055L	20	55	110	20
PHW250.028R	PHW250.028L	20	65	130	20	PHW250.056R	PHW250.028L	20	65	130	20

PHW260

Punta elicoidale in HW integrale con rompitruciolo a finire Z2

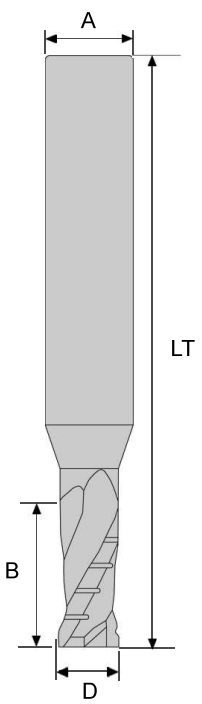
HW milling cutters with chip-breaker for finishing Z2

POSITIVA

CODE		D	B	LT	A
RIGHT ROT.	LEFT ROT.	mm	mm	mm	mm
PHW260.001R	PHW260.001L	6	10	80	12
PHW260.002R	PHW260.002L	6	18	80	12
PHW260.003R	PHW260.003L	8	10	80	12
PHW260.004R	PHW260.004L	8	18	80	12
PHW260.005R	PHW260.005L	10	18	75	16
PHW260.006R	PHW260.006L	10	18	80	12
PHW260.007R	PHW260.007L	12	18	80	12

NEGATIVA

CODE		D	B	LT	A
RIGHT ROT.	LEFT ROT.	mm	mm	mm	mm
PHW260.008R	PHW260.008L	6	10	80	12
PHW260.009R	PHW260.009L	6	18	80	12
PHW260.010R	PHW260.010L	8	10	80	12
PHW260.011R	PHW260.011L	8	18	80	12
PHW260.012R	PHW260.012L	10	18	75	16
PHW260.013R	PHW260.013L	10	18	80	12
PHW260.014R	PHW260.014L	12	18	80	12

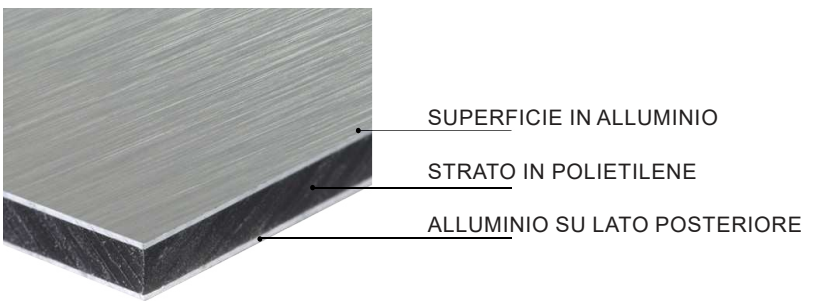


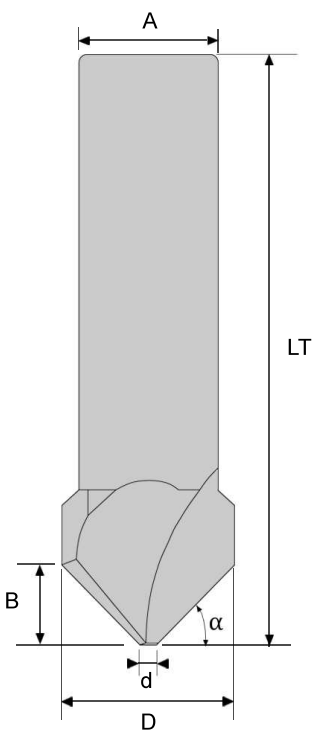
PHW270

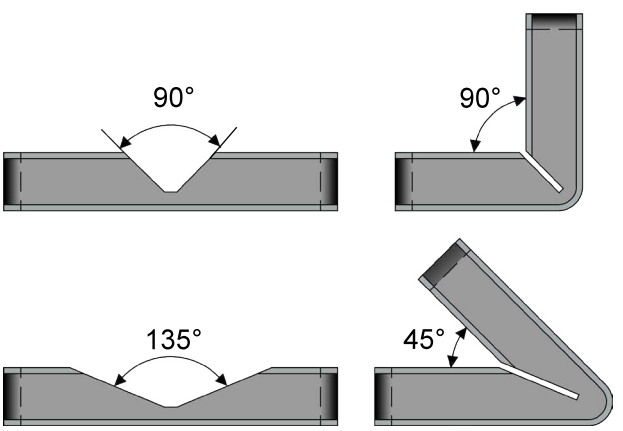
Punta in HW integrale per Alucobond - Dibond Z2

HW milling cutters for Alucobond - Dibond Z2

CODE		D	B	LT	A	d	α
RIGHT ROT.	LEFT ROT.	mm	mm	mm	mm	mm	
PHW270.001R	PHW270.001L	25	11.5	85	20	2	45°
PHW270.002R	PHW270.002L	25	5	80	16	2	22.5°
PHW270.003R	PHW270.003L	12	5	60	12	2	45°





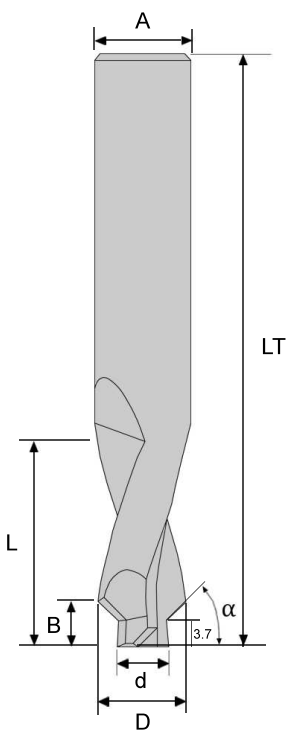


PHW280

Punta elicoidale in HW integrale per Alucobond - Dibond Z2

HW milling cutters for Alucobond - Dibond Z2

CODE		D	B	LT	A	d	L	α
RIGHT Rot.	LEFT Rot.	mm	mm	mm	mm	mm	mm	
PHW280.001R	PHW280.001L	12	6.2	80	12	7	25	45°



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