



FRESAS

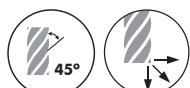
END MILLS

FRESAS MATERIALES EXÓTICOS

EXOTIC MATERIALS END MILLS

Fresa metal duro plana de 3 labios para materiales exóticos (0,2 μm)

3 Fluted solid carbide end mill for exotic materials (0,2 μm)



NI
ALLOYS

TITAN
INCONEL

STEEL
<65
HRC

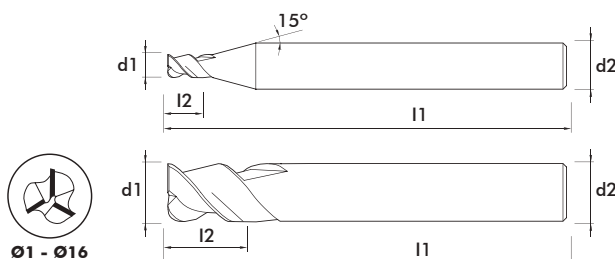
INOX

HG

UNI

Fresa de metal duro plana de 3 labios y hélice de 45° con recubrimiento TiSiN especial para aleaciones de acero, aleaciones con base Ti/Ni, inconel y materiales difíciles de mecanizar. Tiene buena resistencia al desgaste gracias a su recubrimiento PVD con base Si. Proporciona un excelente acabado superficial gracias a los 3 filos de corte y a la fácil evacuación de viruta. Su geometría con hélice de 45° está diseñada para trabajar a alta velocidad de corte y avance. Ofrece un espectacular rendimiento en el mecanizado a altas velocidades gracias a su grado WC ultrafino (0,2 μm).

3 Fluted 45° helix solid carbide end mill with TiSiN coating. Recommended for alloy steel, Ti/Ni base alloys, inconel and hard to cut materials. It has good wear resistance by Si-based PVD coating. Excellent work surface finish by 3 flutes and deep chip pocket. 45° helix design for high speed, feed condition. Outstanding performance at high speed machining by ultrafine (0,2 μm) WC grade.

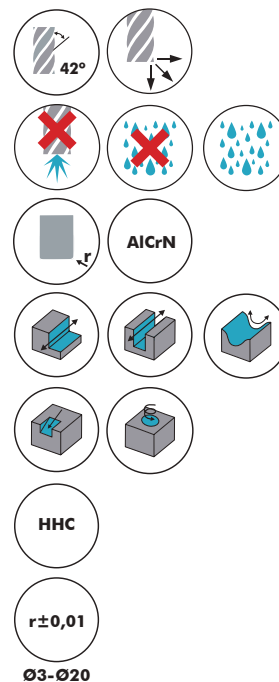
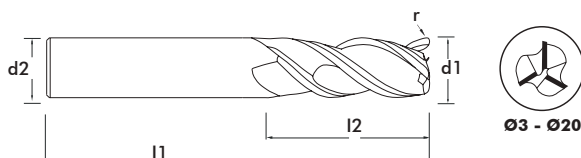


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388010200	1,0	6	45	2,5	3	40,10
388015200	1,5	6	45	4,0	3	40,10
388020200	2,0	6	45	5,0	3	40,10
388030200	3,0	6	45	8,0	3	40,10
388040200	4,0	6	50	10,0	3	42,00
388050200	5,0	6	50	12,0	3	42,00
388060200	6,0	6	50	12,0	3	42,00
388080200	8,0	8	60	19,0	3	62,00
388100200	10,0	10	70	22,0	3	80,20
388120200	12,0	12	80	26,0	3	95,30
388160200	16,0	16	100	36,0	3	255,60

Condiciones de corte | Cutting data pag. 174

3 Fluted solid carbide corner radius variable helixend mill

3 Fluted variable helix solid carbide corner radius end mill with AlCrN coating. Recommended for alloy steel, Ti/Ni base alloys, Inconel and hard to cut materials. Improves wear resistance as well as avoids edge stress. Minimizes chattering by unequal flute spacing design.



Ref.	d1	r	d2	I1	I2	€
468030200	3	0,3	6	57	9	47,80
468040200	4	0,3	6	57	12	47,80
468050200	5	0,3	6	57	15	47,80
468060200	6	0,5	6	57	19	47,80
468080200	8	0,5	8	63	20	60,40
468100200	10	0,5	10	72	27	83,25
468120200	12	0,5	12	83	30	106,65
468160200	16	1,0	16	92	38	167,05
468200200	20	1,0	20	104	46	245,50

Condiciones de corte | Cutting data pag. 174

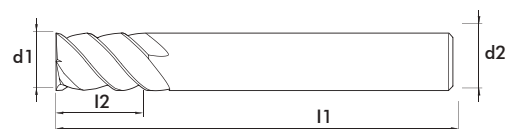
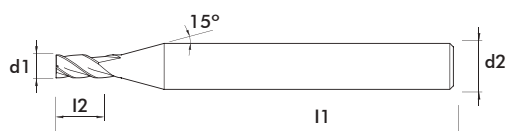
Fresa metal duro plana de 4 labios para materiales exóticos

4 Fluted solid carbide end mill for exotic materials



Fresa de metal duro plana de 4 labios y hélice de 42° con recubrimiento AlCrN especial para aleaciones de acero, aleaciones con base Ti/Ni, iniconel y materiales difíciles de mecanizar. Mejora la resistencia al desgaste evitando el estrés en el filo. Minimiza las vibraciones gracias a su diseño con espacio desigual entre los filos. Proporciona un excelente acabado superficial gracias a los 4 filos de corte y a la fácil evacuación de viruta.

4 Fluted 42° helix solid carbide end mill with AlCrN coating. Recommended for alloy steel, Ti/Ni base alloys, iniconel and hard to cut materials. Improves wear resistance as well as avoids edge stress. Minimizes chattering by unequal flute spacing design. Excellent work surface finish by 4 flutes and deep chip pocket.



Ref.	d1	d2	l1	l2	z	€
488010200	1,0	4	50	1,5	4	38,15
488015200	1,5	4	50	2,5	4	38,15
488020200	2,0	4	50	3,0	4	38,15
488025200	2,5	4	50	3,5	4	38,15
488030200	3,0	6	60	4,5	4	40,70
488040200	4,0	6	60	6,0	4	40,70
488050200	5,0	6	60	7,5	4	42,20
488060200	6,0	6	60	15,0	4	42,20
488080200	8,0	8	70	20,0	4	72,60
488100200	10,0	10	80	25,0	4	103,60
488120200	12,0	12	90	30,0	4	124,30
488160200	16,0	16	100	24,0	4	248,60
488200200	20,0	20	100	30,0	4	352,20

Condiciones de corte | Cutting data pag. 175

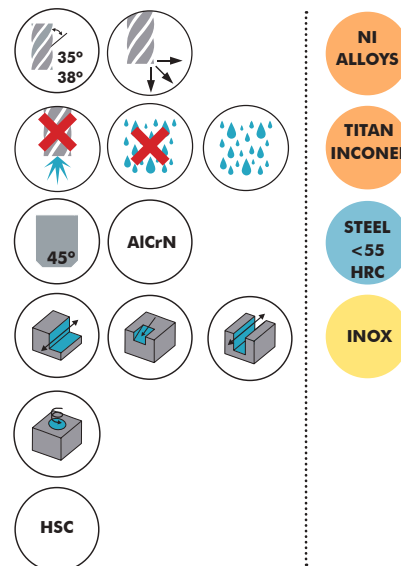
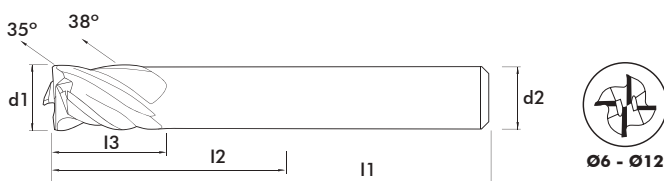
Fresa metal duro alto rendimiento con doble ángulo de hélice

4 Fluted high performance solid carbide end mill with double helix angle



Fresa de metal duro larga de muy alto rendimiento de 4 labios con corte al centro y recubrimiento TiAlN. Ángulo espiral de 35°/38° versión reforzada. Fresa especialmente diseñada para ranurado, contorneado y acabado de materiales exóticos. Permite trabajar con parámetros de corte más altos. La geometría especial conjuntamente con este recubrimiento nos ayudará a tener un corte muy suave y a prolongar la vida del filo de corte. Herramienta para uso general: para materiales hasta 55 HRC.

4 fluted cutting to centre long high performance solid carbide end mill plus TiAlN coating. 35°/38° Spiral angle, reinforced version. Tool specially designed for slotting, contouring and finishing exotic materials. Due to the double helix angle we avoid the vibrations and get extremely high performance. The special geometry together with this coating will help you to get a soft cutting with a very long tool life. Also for universal purpose. For materials up to 55 HRC.

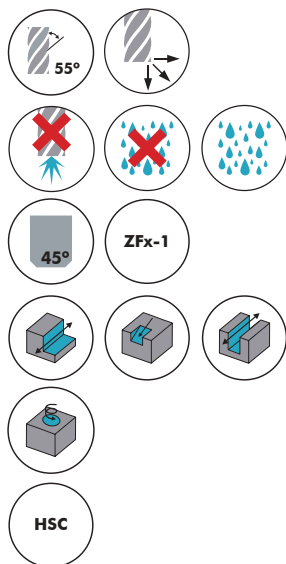


Ref.	d1	d2	l1	l2	l3	z	€
408030200	3	6	57	20	8	4	31,75
408040200	4	6	57	20	11	4	31,75
408050200	5	6	57	21	13	4	31,75
408060200	6	6	57	21	13	4	31,75
408080200	8	8	63	27	19	4	38,80
408100200	10	10	73	32	22	4	56,30
408120200	12	12	83	38	26	4	79,85
408140200	14	14	84	40	30	4	142,40
408160200	16	16	92	44	32	4	142,40
408200200	20	20	104	55	38	4	209,70

Condiciones de corte | Cutting data pag. 175

Fresa metal duro 4 labios para materiales exóticos

4 Fluted high performance solid carbide end mill for exotic materials



NI
ALLOYS

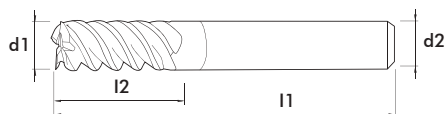
TITAN
INCONEL

INOX

Fresa de metal duro de muy alto rendimiento de 4 labios con corte al centro con recubrimiento ZFx1. Ángulo espiral de 55°. Fresa especialmente diseñada para ranurado, contorneado y acabado de materiales exóticos. La geometría positiva conjuntamente con este recubrimiento nos ayudará a tener un corte muy suave y a prolongar la vida del filo de corte. Herramienta para uso general: para materiales hasta 55 HRC.

4 Fluted cutting to centre high performance solid carbide end mills plus ZFx1 coating. 55° Spiral angle. Tool especially designed for slotting, contouring and finishing of exotic materials. The positive geometry together with this coating will help you to get a soft cutting with a very long tool life.

Also for universal purpose. For materials up to < 55 HRC.



Ref.	d1	d2	l1	l2	z	€
407060200	6	6	57	13	4	46,20
407080200	8	8	63	19	4	48,15
407100200	10	10	72	22	4	73,15
407120200	12	12	83	26	4	84,65
407160200	16	16	92	32	4	190,60

Condiciones de corte | Cutting data pag. 175

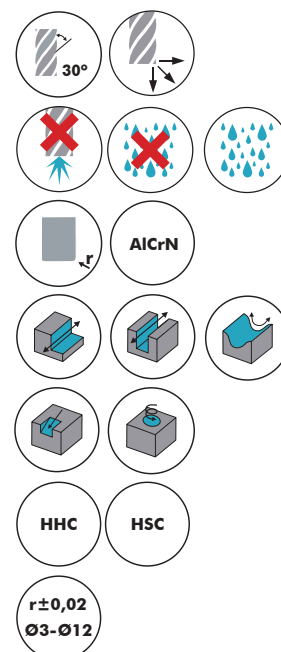
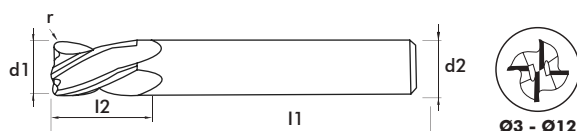
F-479

Fresa metal duro tórica de 4 labios para materiales exóticos

4 Fluted solid carbide corner radius end mill for exotic materials

Fresa de metal duro tórica de 4 labios y hélice de 30° con recubrimiento AlTiN especial para aleaciones de acero, aleaciones con base Ti/Ni, INCONEL y materiales difíciles de mecanizar.

4 Fluted 30° helix solid carbide corner radius end mill with AlTiN coating. Recommended for alloy steel, Ti/Ni base alloys, inconel and hard to cut materials.



NI
ALLOYS

TITAN
INCONEL

STEEL
<55
HRC

GG

INOX

HG

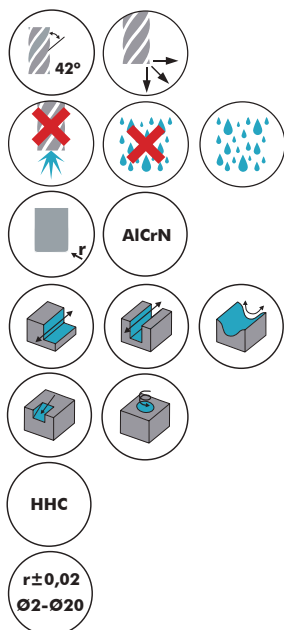
UNI

Ref.	d1	r	d2	l1	l2	z	€
479030200	3	0,2	4	60	8	4	39,60
479030210	3	0,2	6	60	8	4	37,55
479030220	3	0,5	4	60	8	4	39,60
479030230	3	0,5	6	60	8	4	37,55
479040200	4	0,2	4	70	11	4	39,60
479040210	4	0,2	6	70	11	4	37,55
479040220	4	0,5	4	70	11	4	39,60
479040230	4	0,5	6	70	11	4	37,55
479040240	4	1,0	4	70	11	4	39,60
479040250	4	1,0	6	70	11	4	37,55
479050200	5	0,2	6	80	13	4	42,50
479050210	5	0,5	6	80	13	4	42,50
479050220	5	1,0	6	80	13	4	42,50
479060200	6	0,2	6	90	13	4	48,00
479060210	6	0,5	6	90	13	4	48,00
479060220	6	1,0	6	90	13	4	48,00
479080200	8	0,5	8	100	19	4	58,95
479080210	8	1,0	8	100	19	4	58,95
479080220	8	1,5	8	100	19	4	58,95
479080230	8	2,0	8	100	19	4	58,95
479100200	10	0,5	10	100	22	4	85,35
479100210	10	1,0	10	100	22	4	85,35
479100220	10	1,5	10	100	22	4	85,35
479100230	10	2,0	10	100	22	4	85,35
479100240	10	2,5	10	100	22	4	85,35
479120200	12	0,5	12	110	26	4	102,00
479120210	12	1,0	12	110	26	4	102,00
479120220	12	1,5	12	110	26	4	102,00
479120230	12	2,0	12	110	26	4	102,00
479120240	12	2,5	12	110	26	4	102,00
479120250	12	3,0	12	110	26	4	102,00

Condiciones de corte | Cutting data pag. 175

Fresa metal duro tórica de 4 labios para materiales exóticos

4 Fluted solid carbide corner radius end mill for exotic materials



TITAN
INCONEL

STEEL
<55
HRC

INOX

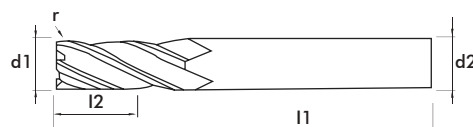
HG

Fresa de metal duro tórica de 4 labios y hélice variable con recubrimiento AlTiN para acero al carbono, aleaciones de acero, inoxidable y materiales difíciles de mecanizar. La hélice variable ofrece alta precisión y excelente calidad superficial y una Ap de 1xD.

4 Fluted variable helix solid carbide corner radius end mill with AlTiN coating. Recommended for carbon steel alloy steel, stainless steel and hard to cut materials. It offers high precision and excellent surface due to variable helix geometry with Ap 1xD.



Ø2 - Ø20



Ref.	d1	r	d2	l1	l2	z	€
477020200	2	0,1	4	45	5	4	35,90
477020210	2	0,2	4	45	5	4	35,90
477030200	3	0,2	6	50	8	4	32,20
477030210	3	0,3	6	50	8	4	32,20
477030220	3	0,5	6	50	8	4	32,20
477040200	4	0,3	6	50	10	4	32,20
477040210	4	0,5	6	50	10	4	32,20
477040220	4	1,0	6	50	10	4	32,20
477050200	5	0,5	6	50	13	4	35,80
477050210	5	1,0	6	50	13	4	35,80
477060200	6	0,5	6	50	13	4	35,80
477060210	6	1,0	6	50	13	4	35,80
477060220	6	1,5	6	50	13	4	35,80
477080200	8	0,5	8	60	19	4	44,55
477080210	8	1,0	8	60	19	4	44,55
477080220	8	1,5	8	60	19	4	44,55
477080230	8	2,0	8	60	19	4	44,55
477100200	10	0,5	10	70	22	4	61,10
477100210	10	1,0	10	70	22	4	61,10
477100220	10	1,5	10	70	22	4	61,10
477100230	10	2,0	10	70	22	4	61,10
477120200	12	0,5	12	75	26	4	81,65
477120210	12	1,0	12	75	26	4	81,70
477120220	12	1,5	12	75	26	4	81,70
477120230	12	2,0	12	75	26	4	81,70
477120240	12	3,0	12	75	26	4	81,70
477160200	16	1,5	16	90	32	4	188,30
477160210	16	2,0	16	90	32	4	188,30
477160220	16	3,0	16	90	32	4	188,30
477200200	20	3,0	20	100	38	4	299,25
477200210	20	4,0	20	100	38	4	314,20
477200220	20	5,0	20	100	38	4	329,90

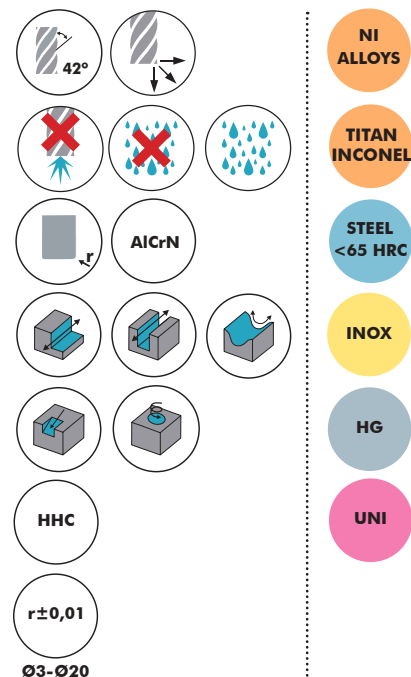
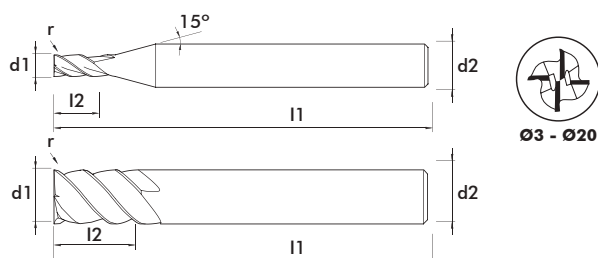
Condiciones de corte | Cutting data pag. 176 - 177

Fresa metal duro tórica de 4 labios para materiales exóticos

4 Fluted solid carbide corner radius end mill for exotic materials

Fresa de metal duro tórica de 4 labios y hélice de 42° con recubrimiento AlCrN especial para aleaciones de acero, aleaciones con base Ti/Ni, INCONEL y materiales difíciles de mecanizar. Mejora la resistencia al desgaste evitando el estrés en el filo. Minimiza las vibraciones gracias a su diseño con espacio desigual entre los filos.

4 Fluted 42° helix solid carbide corner radius end mill with AlCrN coating. Recommended for alloy steel, Ti/Ni base alloys, inconel and hard to cut materials. Improves wear resistance as well as avoids edge stress. Minimizes chatter by unequal flute spacing design.

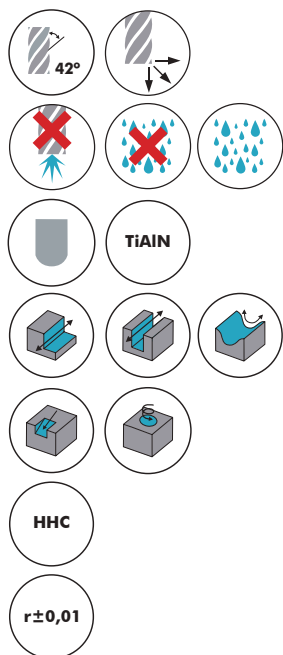


Ref.	d1	r	d2	l1	l2	z	€
478030200	3	0,2	6	60	10	4	55,80
478040200	4	0,2	6	60	12	4	55,80
478050200	5	0,5	6	60	15	4	55,80
478060200	6	0,5	6	60	15	4	55,80
478060210	6	1,0	6	60	15	4	55,80
478080200	8	0,5	8	80	20	4	83,45
478080210	8	1,0	8	80	20	4	83,45
478100200	10	0,5	10	80	25	4	120,05
478100210	10	1,0	10	80	25	4	120,05
478100220	10	1,5	10	80	25	4	120,05
478100230	10	2,0	10	80	25	4	120,05
478120200	12	0,5	12	100	30	4	145,40
478120210	12	1,0	12	100	30	4	145,40
478120220	12	1,5	12	100	30	4	145,40
478120230	12	2,0	12	100	30	4	145,40
478160200	16	1,0	16	110	42	4	284,80
478200200	20	1,0	20	110	48	4	380,65

Condiciones de corte | Cutting data pag. 177 - 178

Fresa metal duro esférica de 2 labios para materiales exóticos

2 Fluted solid carbide ball end mill for exotic materials



NI
ALLOYS

TITAN
INCONEL

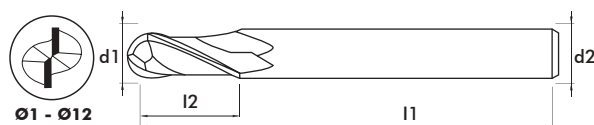
STEEL
<55
HRC

INOX

HG

Fresa de metal duro esférica de 2 labios y hélice de 38° con recubrimiento TiAlN especial para aleaciones de acero, aleaciones con base Ti/Ni, inconel y materiales difíciles de mecanizar.

2 Fluted 38° hélix solid carbide ball end mill with TiAlN coating. Recommended for alloy steel, Ti/Ni base alloys, inconel and hard to cut materials.

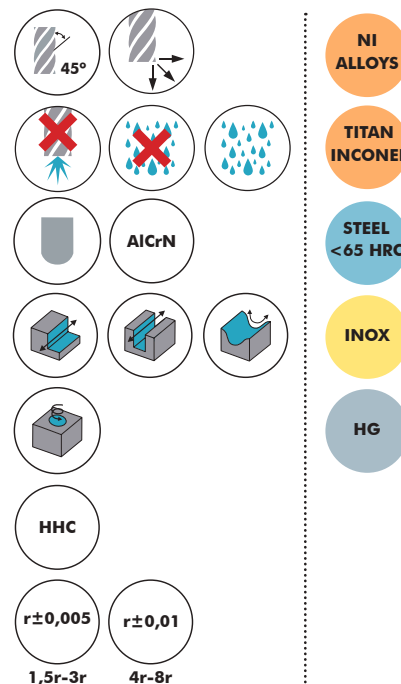
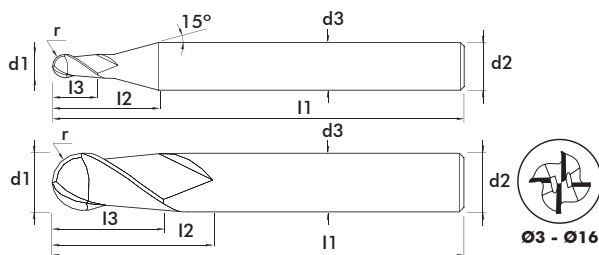


Ref.	d1	d2	l1	l2	z	€
298010200	1	6	50	3	2	32,95
298020200	2	6	50	6	2	32,95
298030200	3	6	50	8	2	32,95
298030210	3	6	70	8	2	34,05
298040200	4	6	50	10	2	34,20
298040210	4	6	70	10	2	35,40
298050200	5	6	50	13	2	36,20
298050210	5	6	80	13	2	38,10
298060200	6	6	50	13	2	36,50
298060210	6	6	90	13	2	38,10
298080200	8	8	60	19	2	50,40
298080210	8	8	100	19	2	55,80
298100200	10	10	70	22	2	56,70
298100210	10	10	100	22	2	72,00
298120200	12	12	75	26	2	83,75
298120210	12	12	110	26	2	95,60

Condiciones de corte | Cutting data pag. 178

4 Fluted solid carbide ball end mill
for exotic materials (0,2 μ m)

4 Fluted 45° hélix solid carbide ball end mill with AlCrN coating. Recommended for alloy steel, Ti/Ni base alloys, inonel and hard to cut materials. Improves wear resistance as well as avoids edge stress. Excellent work surface finish by 4 flutes and deep chip pocket.

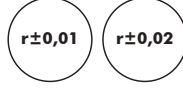
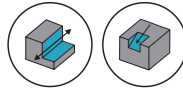
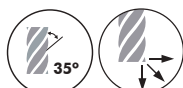


Ref.	d1	r	d2	l1	l2	z	€
498030200	3	1,5	6	60	8	4	56,75
498040200	4	2,0	6	70	8	4	58,70
498050200	5	2,5	6	80	10	4	62,75
498060200	6	3,0	6	90	12	4	67,20
498080200	8	4,0	8	100	14	4	94,70
498100200	10	5,0	10	100	18	4	129,35
498120200	12	6,0	12	110	22	4	169,00
498160200	16	8,0	16	130	30	4	303,20

Condiciones de corte | Cutting data pag. 179

Fresa metal duro cónica con punta esférica de 3 labios

3 Fluted solid carbide taper ball end mill



0,5r-1r 1,5r-3r

NI
ALLOYS

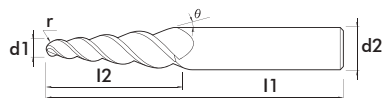
TITAN
INCONEL

Fresa de metal duro cónica de 3 labios y hélice de 35° con punta esférica para el mecanizado de inconel aleaciones de Cr/Ni y aleaciones de Al. Indicada para trabajos en máquinas de 3 y 5 ejes del sector aeronáutico, como aspas de turbina, rotores, impulsores y llantas. Mejora la resistencia al desgaste y evita el estrés en el filo en las diferentes operaciones de mecanizado. Con la misma herramienta se puede hacer desbaste y acabado.

3 Fluted solid carbide taper ball 35° helix end mill for inconel, Al alloys and Cr/Ni alloys. Suitable for special components with 3 axes and 5 axes sector such as impellers, blisks, tire profiles and turbine blades. Improves wear resistance as well as avoids edge stress in various applications. Available for simultaneous machining of roughing and finishing with only one tool.



Ø1 - Ø6



Ref.	d1	r	d2	l1	l2	θ	z	€
591010200	1	0,5	6	60	20	1°	3	85,20
591010210	1	0,5	6	60	20	3°	3	85,20
591010220	1	0,5	6	60	20	5°	3	85,20
591010230	1	0,5	6	60	20	7°	3	85,20
591020200	2	1,0	6	60	20	1°	3	85,20
591020210	2	1,0	6	60	20	3°	3	85,20
591020220	2	1,0	8	75	30	5°	3	114,25
591020230	2	1,0	8	70	25	7°	3	114,25
591030200	3	1,5	6	75	32	1°	3	96,80
591030210	3	1,5	6	80	39	3°	3	104,55
591030220	3	1,5	8	75	30	5°	3	114,25
591030230	3	1,5	10	80	30	7°	3	151,00
591040200	4	2,0	6	75	32	1°	3	96,80
591040210	4	2,0	8	80	32	3°	3	114,25
591040220	4	2,0	10	80	32	5°	3	151,00
591040230	4	2,0	10	80	26	7°	3	143,30
591060200	6	3,0	8	75	32	1°	3	114,25
591060210	6	3,0	10	90	40	3°	3	162,65
591060220	6	3,0	12	80	32	5°	3	178,15
591060230	6	3,0	12	80	27	7°	3	178,15