

F-422
F-442

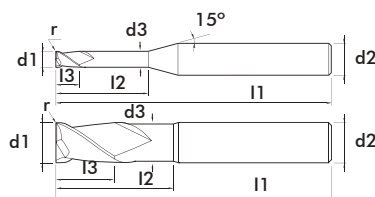
Fresa metal duro tórica 2 labios HSC - HHC <65 HRC

2 Fluted HSC - HHC solid carbide radius end mill <65 HRC



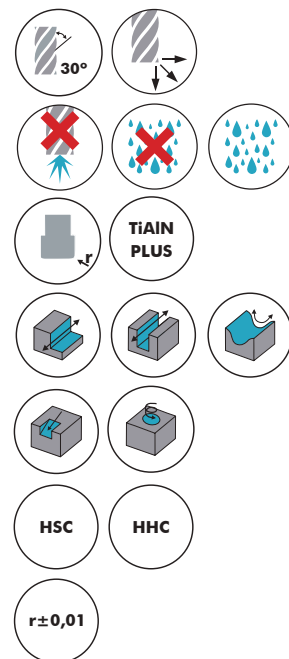
Fresa metal duro de 2 labios tórica y recubrimiento TiAlN. Para mecanizado HSC y HHC. 30° de hélice. La herramienta, material y el recubrimiento están especialmente diseñados para el mecanizado a alta velocidad (HSC) y materiales duros (HHC). Para máquinas CNC con 3 y 5 ejes. También podemos trabajar en seco. Para aceros hasta 65 HRC. También válida para materiales no férricos, materiales termo resistentes, aleaciones exóticas y fundiciones. Fresa especialmente diseñada para trabajos 3D.

2 Fluted solid carbide end mill with corner radius and TiAlN coating for HSC and HHC machining. 30° Spiral angle. Specially for tool maker, mould maker. Also for aircraft / turbine construction. The tool, material and coating are specially designed for HSC and HHC. For CNC machines with 3 and 5 axes. Reduces milling time rapidly. Also for dry milling. Universal purpose for normal and high tense materials, for 3D operations.



Ø2 - Ø5

Ø6 - Ø16



Condiciones de corte | Cutting data pag. 157

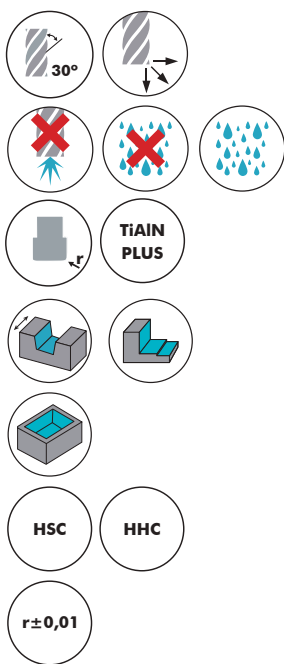
Ref.	d1	r	d2	d3	l1	l2	l3	z
422020200	2	0,2	6	1,8	57	21	4	2
422030200	3	0,3	6	2,8	57	21	6	2
422030210	3	0,5	6	1,8	80	15	4	2
422040200	4	0,4	6	3,6	57	21	6	2
422040210	4	1,0	6	3,6	57	21	6	2
422050200	5	0,2	6	4,7	57	21	6	2
422060200	6	0,3	6	5,5	57	21	7	2
422060210	6	0,5	6	5,5	57	21	7	2
422060220	6	1,0	6	5,5	57	21	7	2
422060230	6	1,5	6	5,5	57	21	7	2
422060240	6	1,6	6	5,5	57	21	7	2
422060250	6	2,0	6	5,5	57	21	7	2
422080200	8	0,5	8	7,4	63	27	9	2
422080210	8	1,0	8	7,4	63	27	9	2
422080220	8	1,5	8	7,4	63	27	9	2
422080230	8	2,0	8	7,4	63	27	9	2
422100200	10	0,5	10	9,2	72	32	11	2
422100210	10	1,05	10	9,2	72	32	11	2
422100220	10	1,5	10	9,2	72	32	11	2
422100230	10	2,0	10	9,2	72	32	11	2
422120200	12	0,5	12	11,0	83	38	12	2
422120210	12	1,0	12	11,0	83	38	12	2
422120220	12	1,5	12	11,0	83	38	12	2
422120230	12	2,0	12	11,0	83	38	12	2
422160200	16	0,5	16	15,0	92	44	16	2
422160210	16	1,0	16	15,0	92	44	16	2

Serie larga | Long series

Ref.	d1	r	d2	l1	l2	l3	z
442030230	3	0,5	6	80	15	15	2
442040200	4	0,2	6	80	20	4	2
442100230	10	1	10	100	45	45	2

Fresa metal duro tórica 2 labios HSC - HHC <62 HRC

2 Fluted HSC - HHC solid carbide radius end mill <62 HRC



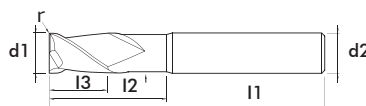
- STEEL <62 HRC
- INOX
- GG
- GGG
- COPPER

Fresa metal duro de 2 labios tórica y recubrimiento TiAlN. Para mecanizado HSC y HHC. 30° de hélice. La herramienta, material y el recubrimiento están especialmente diseñados para el mecanizado a alta velocidad (HSC) y materiales duros (HHC). Para máquinas CNC con 3 y 5 ejes. También podemos trabajar en seco. Para aceros hasta 62 HRC. También válida para materiales no férricos, materiales termo resistentes, aleaciones exóticas y fundiciones. Fresa especialmente diseñada para trabajos 3D.

2 Fluted solid carbide end mill with corner radius and TiAlN coating for HSC and HHC meching. 30° Spiral angle. Specially for tool maker, mould maker. Also for aircraft / turbine construction. The tool, material and coating are specially designed for HSC and HHC. For CNC machines with 3 and 5 axes. Reduces milling time rapidly. Also for dry milling. Universal purpose for normal and high tense materials, for 3D operations.



Ø2 - Ø16



Ref.	d1	r	d2	l1	l2
423020200	2	0,2	6	50	6
423020210	2	0,5	6	50	6
423030200	3	0,2	6	50	8
423030210	3	0,5	6	50	8
423040200	4	0,2	6	50	11
423040210	4	0,5	6	50	11
423040220	4	1,0	6	50	11
423050200	5	0,2	6	50	12
423050210	5	0,5	6	50	12
423050220	5	1,0	6	50	12
423060200	6	0,2	6	50	12
423060210	6	0,5	6	50	13
423060220	6	1,0	6	50	13
423060230	6	1,5	6	50	13
423060240	6	2,0	6	50	13
423080200	8	0,2	8	60	15
423080210	8	0,5	8	60	15
423080220	8	1,0	8	60	15

Ref.	d1	r	d2	l1	l2
423080230	8	1,5	8	60	15
423080240	8	2,0	8	60	15
423100200	10	0,5	10	72	20
423100210	10	1,0	10	72	20
423100220	10	1,5	10	72	20
423100230	10	2,0	10	72	20
423100240	10	3,0	10	72	20
423120200	12	0,5	12	75	24
423120210	12	1,0	12	75	24
423120220	12	1,5	12	75	24
423120230	12	2,0	12	75	24
423120240	12	3,0	12	75	24
423160200	16	0,5	16	92	30
423160210	16	1,0	16	92	30
423160220	16	2,0	16	92	30
423160230	16	3,0	16	92	30
423160240	16	4,0	16	92	30

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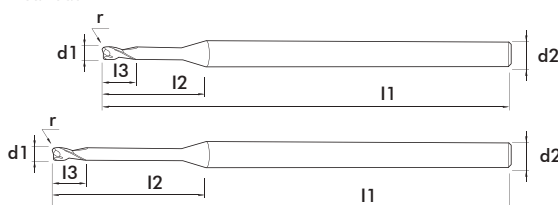
Fresa metal duro tórica 2 labios
HSC/HCC <65 HRC (0,2µm)

2 Fluted solid carbide corner radius end mill for HSC/HCC <65 HRC (0,2µm)



Fresa de metal duro de cuello largo de 2 labios con corte al centro y radio en punta con recubrimiento TiSiN. Ángulo espiral de 30°. La herramienta, material y el recubrimiento están especialmente diseñados para el mecanizado HSC (High Speed Cutting) + HHC (High Hard Cutting) < 65 HRC. También podemos utilizar esta herramienta para aceros y materiales no férricos. El diámetro posterior al corte es menor que el diámetro de punta para evitar el desvío de la herramienta.

Solid carbide miniature end mills with corner radius, 30° spiral angle and TiSiN coating. For universal use, for standard steel and non-ferrous materials. The tool, material and coating are specially designed for dry high speed cutting HSC and high hard cutting HHC < 65 HRC large cone diameter for minimum deflection. With corner radius for minimize the wear out.



30°
TiSiN
HSC HHC
r±0,005 Ø0,6-Ø6
r±0,01 Ø8-Ø12

- STEEL <65 HRC
- INOX
- GG
- COPPER
- NI ALLOYS
- TITAN INCONEL

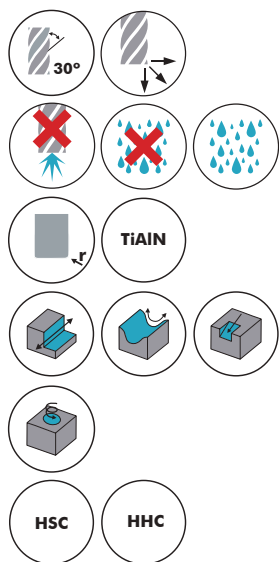
Condiciones de corte | Cutting data pag. 158

Ref.	d1	r	d2	l1	l2	l3
813006200	0,6	0,05	4	45	4	0,7
813006210	0,6	0,05	4	45	6	0,7
813008200	0,8	0,10	4	45	4	1,0
813008210	0,8	0,10	4	45	8	1,0
813010200	1,0	0,20	4	45	4	1,2
813010210	1,0	0,20	4	50	10	1,2
813010220	1,0	0,20	4	50	20	1,2
813012200	1,2	0,20	4	45	6	1,5
813012210	1,2	0,20	4	50	10	1,5
813012220	1,2	0,20	4	50	20	1,5
813015200	1,5	0,20	4	50	10	1,8
813015210	1,5	0,20	4	50	16	1,8
813015220	1,5	0,20	4	50	20	1,8
813015230	1,5	0,20	4	60	25	1,8
813020200	2,0	0,20	4	50	10	2,5
813020210	2,0	0,20	4	50	16	2,5
813020220	2,0	0,20	4	60	20	2,5
813020230	2,0	0,20	4	70	25	2,5
813020240	2,0	0,20	4	50	30	2,5
813025200	2,5	0,20	4	50	10	3,0
813025210	2,5	0,20	4	50	20	3,0
813030200	3,0	0,30	6	50	10	3,5
813030210	3,0	0,30	6	60	20	3,5
813030220	3,0	0,30	6	70	30	3,5
813030230	3,0	0,30	6	80	40	3,5
813040200	4,0	0,50	6	60	20	4,5
813040210	4,0	0,50	6	70	30	4,5
813040220	4,0	0,50	6	80	40	4,5
813050200	5,0	0,20	6	60	15	6,0
813050210	5,0	0,20	6	70	30	6,0
813050220	5,0	0,20	6	80	40	6,0
813050230	5,0	0,50	6	60	15	6,0
813050240	5	0,5	6	70	30	6

Ref.	d1	r	d2	l1	l2	l3
813050250	5	0,5	6	80	40	6
813060200	6	0,3	6	60	20	7
813060210	6	0,3	6	90	40	7
813060220	6	0,5	6	60	20	7
813060230	6	0,5	6	90	40	7
813060240	6	1	6	60	20	7
813060250	6	1	6	90	40	7
813060260	6	1,5	6	60	20	7
813060270	6	1,5	6	90	40	7
813080200	8	0,5	8	100	40	9
813080210	8	1	8	65	22	9
813080220	8	1	8	100	40	9
813080230	8	1,5	8	65	22	9
813080240	8	1,5	8	100	40	9
813100200	10	0,5	10	70	24	11
813100210	10	0,5	10	100	45	11
813100220	10	1	10	70	24	11
813100230	10	1	10	100	45	11
813100240	10	1,5	10	70	24	11
813100250	10	1,5	10	100	45	11
813100260	10	2	10	70	24	11
813100270	10	2	10	100	45	11
813120200	12	0,5	12	80	26	13
813120210	12	0,5	12	110	50	13
813120220	12	1	12	80	26	13
813120230	12	1	12	110	50	13
813120240	12	1,5	12	80	26	13
813120250	12	1,5	12	110	50	13
813120260	12	2	12	80	26	13
813120270	12	2	12	110	50	13
813120280	12	3	12	80	26	13
813120290	12	3	12	110	50	13

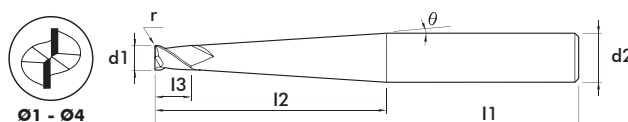
Fresa metal duro de 2 labios tórica con cuello cónico <65 HRC (0,2µm)

2 Fluted taper neck corner radius end mill <65 HRC (0,2µm)



Fresa de alta calidad tórica de 2 labios con recubrimiento Ti-SiN. Ofrece una excelente resistencia al desgaste gracias a su recubrimiento PVD con base de Si. Tolerancia de filo de alta precisión. Espectacular rendimiento en el mecanizado a altas velocidades gracias a su grado WC ultrafino (0,2 µm). Indicada para fresado de aceros pre endurecidos y endurecidos (50-65 HRC).

2 Fluted high quality taper neck corner radius end mill with TiSiN coating. Good wear resistance by Si-based PVD coating. High precise edge tolerance. Outstanding performance at high speed machining by ultrafine (0,2 µm) WC grade. End mill for pre-hardened and hardened steel (HRC 50-65).



Ref.	d1	r	d2	l1	l2	l3	θ	z
216010200	1,0	0,1	4	50	10	1,0	1	2
216010210	1,0	0,1	4	60	20	1,0	1	2
216010220	1,0	0,1	4	70	30	1,0	1	2
216010230	1,0	0,2	4	50	10	1,0	1	2
216010240	1,0	0,2	4	60	20	1,0	1	2
216010250	1,0	0,2	4	70	30	1,0	1	2
216010260	1,0	0,3	4	50	10	1,0	1	2
216010270	1,0	0,3	4	60	20	1,0	1	2
216010280	1,0	0,3	4	70	30	1,0	1	2
216015200	1,5	0,2	4	50	10	1,5	1	2
216015210	1,5	0,2	4	60	20	1,5	1	2
216015220	1,5	0,2	4	70	30	1,5	1	2
216015230	1,5	0,3	4	50	10	1,5	1	2
216015240	1,5	0,3	4	60	20	1,5	1	2
216015250	1,5	0,3	4	70	30	1,5	1	2
216015260	1,5	0,5	4	50	10	1,5	1	2
216015270	1,5	0,5	4	60	20	1,5	1	2
216015280	1,5	0,5	4	70	30	1,5	1	2
216020200	2,0	0,2	4	60	20	2,0	1	2
216020210	2,0	0,2	4	70	30	2,0	1	2
216020220	2,0	0,2	4	80	40	2,0	1	2
216020230	2,0	0,3	4	60	20	2,0	1	2
216020240	2,0	0,3	4	70	30	2,0	1	2
216020250	2,0	0,3	4	80	40	2,0	1	2
216020260	2,0	0,5	4	60	20	2,0	1	2
216020270	2,0	0,5	4	70	30	2,0	1	2
216020280	2,0	0,5	4	80	40	2,0	1	2
216030200	3,0	0,2	6	70	30	3,0	1	2
216030210	3,0	0,2	6	80	40	3,0	1	2
216030220	3,0	0,2	6	90	50	3,0	1	2

Ref.	d1	r	d2	l1	l2	l3	θ	z
216030230	3,0	0,2	6	100	60	3,0	1	2
216030240	3,0	0,3	6	70	30	3,0	1	2
216030250	3,0	0,3	6	80	40	3,0	1	2
216030260	3,0	0,3	6	90	50	3,0	1	2
216030270	3,0	0,3	6	100	60	3,0	1	2
216030280	3,0	0,5	6	70	30	3,0	1	2
216030290	3,0	0,5	6	80	40	3,0	1	2
216030300	3,0	0,5	6	90	50	3,0	1	2
216030310	3,0	0,5	6	100	60	3,0	1	2
216030320	3,0	1,0	6	70	30	3,0	1	2
216030330	3,0	1,0	6	80	40	3,0	1	2
216030340	3,0	1,0	6	90	50	3,0	1	2
216030350	3,0	1,0	6	100	60	3,0	1	2
216040200	4,0	0,2	6	70	30	4,0	1	2
216040210	4,0	0,2	6	80	40	4,0	1	2
216040220	4,0	0,2	6	90	50	4,0	1	2
216040230	4,0	0,2	6	100	60	4,0	1	2
216040240	4,0	0,3	6	70	30	4,0	1	2
216040250	4,0	0,3	6	80	40	4,0	1	2
216040260	4,0	0,3	6	90	50	4,0	1	2
216040270	4,0	0,3	6	100	60	4,0	1	2
216040280	4,0	0,5	6	70	30	4,0	1	2
216040290	4,0	0,5	6	80	40	4,0	1	2
216040300	4,0	0,5	6	90	50	4,0	1	2
216040310	4,0	0,5	6	100	60	4,0	1	2
216040320	4,0	1,0	6	70	30	4,0	1	2
216040330	4,0	1,0	6	80	40	4,0	1	2
216040340	4,0	1,0	6	90	50	4,0	1	2
216040350	4,0	1,0	6	100	60	4,0	1	2

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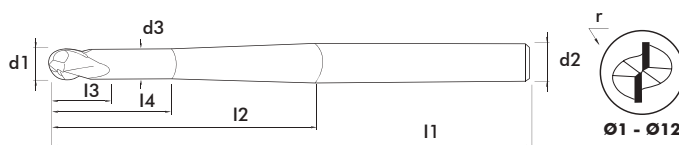
Fresa de metal duro tórica cónica
HSC/HCC <65 HRC

High performance HSC/HCC solid carbide conical
corner radius end mill <65 HRC



Fresa metal duro con 2 labios tórica, mango reforzado y recubrimiento TiAlN. 30° de hélice. La herramienta, material y el recubrimiento están especialmente diseñados para el mecanizado a alta velocidad (HSC) y materiales duros (HCC). Para máquinas CNC con 3 y 5 ejes. También podemos trabajar en seco. Para aceros hasta 65 HRC. También válida para materiales no férricos, materiales termo resistentes, aleaciones exóticas y fundiciones. Fresa especialmente diseñada para trabajos 3D.

2 Fluted solid carbide end mill with corner radius and TiAlN coating. 30° Spiral angle. Specially for tool and mould manufacturers. Also for aircraft and turbine construction. The tool, material and coating are specially designed for HSC and HCC. For CNC machines with 3 and 5 axes. Reduces milling time rapidly. Also for dry milling. Universal purpose for normal and high tense materials, for 3D operations.

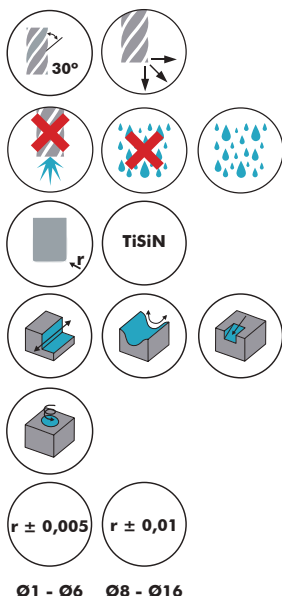


Ref.	d1	r	d2	d3	l1	l2	l3	l4	z
217010200	1	0,25	6	0,8	100	40	2	6	2
217020200	2	0,30	6	1,8	100	40	2	8	2
217020210	2	0,50	6	1,8	100	40	2	8	2
217030200	3	0,50	6	2,8	100	40	2	12	2
217040200	4	0,50	6	3,8	100	40	3	16	2
217040210	4	1,00	6	3,8	100	40	3	16	2
217050200	5	0,50	6	4,8	100	40	4	20	2
217060200	6	1,00	8	4,8	100	50	4	25	2
217060210	6	2,00	8	5,8	100	50	4	25	2
217080200	8	1,00	10	7,8	120	60	4	32	2
217080210	8	2,00	10	0,8	120	60	4	32	2
217100200	10	1,50	12	1,8	160	80	6	40	2
217100210	10	3,00	12	1,8	160	80	6	40	2
217120200	12	1,50	16	2,8	200	100	8	50	2
217120210	12	4,00	16	3,8	200	100	8	50	2

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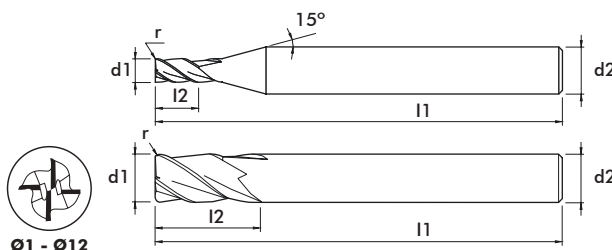
Fresa metal duro tórica 4 labios < 50 HRC

4 Fluted corner radius solid carbide end mill < 50 HRC



Fresa metal duro de 4 labios tórica con recubrimiento TiSiN para acero hasta 50 HRC.

4 Fluted solid carbide end mill with corner radius and TiSiN coating for steel up to 50 HRC.



Ref.	d1	r	d2	l1	l2	z
410010200	1,0	0,05	4	45	2,5	4
410010210	1,0	0,10	4	45	2,5	4
410010220	1,0	0,20	4	45	2,5	4
410010230	1,0	0,30	4	45	2,5	4
410015200	1,5	0,05	4	45	4,0	4
410015210	1,5	0,10	4	45	4,0	4
410015220	1,5	0,20	4	45	4,0	4
410015230	1,5	0,30	4	45	4,0	4
410015240	1,5	0,50	4	45	4,0	4
410020200	2,0	0,05	4	45	6,0	4
410020210	2,0	0,10	4	45	6,0	4
410020220	2,0	0,20	4	45	6,0	4
410020230	2,0	0,30	4	45	6,0	4
410020240	2,0	0,50	4	45	6,0	4
410025200	2,5	0,10	4	50	6,0	4
410025210	2,5	0,20	4	50	6,0	4
410025220	2,5	0,30	4	50	6,0	4
410025230	2,5	0,50	4	50	6,0	4
410030200	3,0	0,10	6	60	8,0	4
410030210	3,0	0,20	6	60	8,0	4
410030220	3,0	0,30	6	60	8,0	4
410030230	3,0	0,50	6	60	8,0	4
410030240	3,0	1,00	6	60	8,0	4
410040200	4,0	0,10	4	60	9,0	4
410040210	4,0	0,10	4	80	9,0	4
410040220	4,0	0,10	6	70	10,0	4
410040230	4,0	0,20	4	60	9,0	4
410040240	4,0	0,20	4	80	9,0	4
410040250	4,0	0,20	6	70	10,0	4
410040260	4,0	0,30	4	60	9,0	4

Ref.	d1	r	d2	l1	l2	z
410040270	4	0,3	4	45	9	4
410040280	4	0,3	6	45	10	4
410040290	4	0,5	4	45	9	4
410040300	4	0,5	4	45	9	4
410040310	4	0,5	6	45	10	4
410040320	4	1,0	4	45	9	4
410040330	4	1,0	4	45	9	4
410040340	4	1,0	6	45	10	4
410050200	5	0,1	6	45	13	4
410050210	5	0,2	6	45	13	4
410050220	5	0,3	6	45	13	4
410050230	5	0,5	6	45	13	4
410050240	5	1,0	6	45	13	4
410060200	6	0,1	6	45	11	4
410060210	6	0,1	6	50	13	4
410060220	6	0,2	6	50	11	4
410060230	6	0,2	6	50	13	4
410060240	6	0,3	6	50	11	4
410060250	6	0,3	6	60	13	4
410060260	6	0,5	6	60	11	4
410060270	6	0,5	6	60	13	4
410060280	6	1,0	6	60	11	4
410060290	6	1,0	6	60	13	4
410060300	6	1,5	6	60	11	4
410060310	6	1,5	6	80	13	4
410060320	6	2,0	6	70	11	4
410060330	6	2,0	6	60	13	4
410080200	8	0,1	8	80	16	4
410080210	8	0,1	8	70	19	4
410080220	8	0,2	8	60	16	4

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ACERO

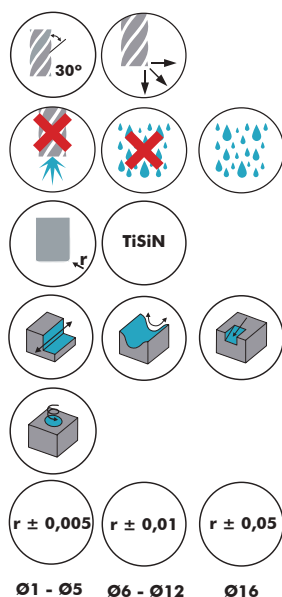
Ref.	d1	r	d2	l1	l2	z
410080230	8	0,2	8	90	19	4
410080240	8	0,3	8	70	16	4
410080250	8	0,3	8	90	19	4
410080260	8	0,5	8	70	16	4
410080270	8	0,5	8	90	19	4
410080280	8	0,5	8	110	19	4
410080290	8	1,0	8	70	16	4
410080300	8	1,0	8	90	19	4
410080310	8	1,0	8	110	19	4
410080320	8	1,5	8	70	16	4
410080330	8	1,5	8	90	19	4
410080340	8	1,5	8	110	19	4
410080350	8	2,0	8	70	16	4
410080360	8	2,0	8	90	19	4
410080370	8	2,0	8	110	19	4
410080380	8	2,5	8	90	19	4
410100200	10	0,1	10	75	19	4
410100210	10	0,1	10	100	22	4
410100220	10	0,2	10	75	19	4
410100230	10	0,2	10	100	22	4
410100240	10	0,3	10	75	19	4
410100250	10	0,3	10	100	22	4
410100260	10	0,5	10	75	19	4
410100270	10	0,5	10	100	22	4
410100280	10	0,5	10	120	22	4
410100290	10	1,0	10	75	19	4
410100300	10	1,0	10	100	22	4
410100310	10	1,0	10	120	22	4
410100320	10	1,5	10	75	19	4
410100330	10	1,5	10	100	22	4
410100340	10	1,5	10	120	22	4
410100350	10	2,0	10	75	19	4
410100360	10	2,0	10	100	22	4

Ref.	d1	r	d2	l1	l2	z
410100370	10	2,0	10	120	22	4
410100380	10	2,5	10	75	19	4
410100390	10	2,5	10	100	22	4
410100400	10	2,5	10	120	22	4
410120200	12	3,0	12	100	22	4
410120210	12	0,2	12	80	22	4
410120220	12	0,2	12	110	26	4
410120230	12	0,3	12	80	22	4
410120240	12	0,3	12	110	26	4
410120250	12	0,5	12	80	22	4
410120260	12	0,5	12	110	26	4
410120270	12	0,5	12	130	26	4
410120280	12	1,0	12	80	22	4
410120290	12	1,0	12	110	26	4
410120300	12	1,0	12	130	26	4
410120310	12	1,5	12	80	22	4
410120320	12	1,5	12	110	26	4
410120330	12	1,5	12	130	26	4
410120340	12	2,0	12	80	22	4
410120350	12	2,0	12	110	26	4
410120360	12	2,0	12	130	26	4
410120370	12	2,5	12	80	22	4
410120380	12	2,5	12	110	26	4
410120390	12	2,5	12	130	26	4
410120400	12	3,0	12	80	22	4
410120410	12	3,0	12	110	26	4
410120420	12	3,0	12	130	26	4
410120430	12	3,5	12	110	26	4
410120440	12	4,0	12	110	26	4
410160200	16	0,5	16	110	32	4
410160210	16	0,5	16	160	32	4
410160220	16	1,0	16	110	32	4
410160230	16	1,0	16	160	32	4

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Fresa metal duro tórica 4 labios < 60 HRC

4 Fluted corner radius solid carbide end mill < 60 HRC

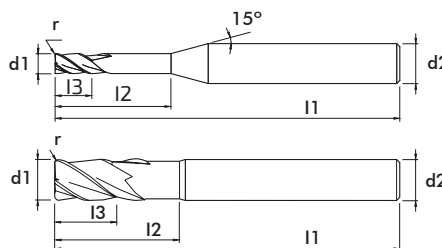


STEEL
< 60 HRC

INOX

Fresa metal duro de 4 labios tórica con recubrimiento TiSiN para acero hasta 60 HRC. Diseñada para trabajar a baja velocidad de corte y alto avance. Es adecuada para aplicaciones de mecanizado pesado y desbaste. Tiene gran resistencia al desgaste gracias a su grado WC ultrafino.

4 Fluted solid carbide end mill with corner radius and TiSiN coating for steel up to 60 HRC. Designed for low speed with high feed condition. Suitable for heavy duty and roughing application. Minimize fracturing at high feed by high TRS ultra fine WC grade.



Ref.	d1	r	d2	I1	I2	I3	z
411010200	1,0	0,2	4	50	2,5	1,0	4
411015200	1,5	0,5	4	50	4,0	1,5	4
411020200	2,0	0,5	6	50	6,0	2,0	4
411030200	3,0	0,5	6	50	8,0	3,0	4
411040200	4,0	0,5	6	60	12,0	4,0	4
411040210	4,0	0,5	6	60	16,0	4,0	4
411040220	4,0	1,0	6	60	12,0	4,0	4
411040230	4,0	1,0	6	60	16,0	4,0	4
411050200	5,0	0,5	6	60	15,0	5,0	4
411050210	5,0	1,0	6	60	15,0	5,0	4
411060200	6,0	0,3	6	60	15,0	6,0	4
411060210	6,0	0,5	6	60	15,0	6,0	4
411060220	6,0	1,0	6	60	15,0	6,0	4
411060230	6,0	1,5	6	60	15,0	6,0	4
411080200	8,0	0,3	8	60	16,0	8,0	4
411080210	8,0	0,5	8	60	16,0	8,0	4
411080220	8,0	0,5	8	80	20,0	8,0	4
411080230	8,0	0,5	8	110	30,0	8,0	4
411080240	8,0	1,0	8	60	16,0	8,0	4
411080250	8,0	1,0	8	80	20,0	8,0	4
411080260	8,0	1,0	8	110	30,0	8,0	4
411080270	8,0	2,0	8	60	16,0	8,0	4
411080280	8,0	2,0	8	80	20,0	8,0	4
411080290	8,0	2,0	8	110	30,0	8,0	4

Ref.	d1	r	d2	I1	I2	I3	z
411100200	10,0	0,3	10	70	20	10	20
411100210	10,0	0,5	10	70	20	10	20
411100220	10,0	0,5	10	90	25	10	25
411100230	10,0	0,5	10	120	30	10	30
411100240	10,0	1,0	10	70	20	10	20
411100250	10,0	1,0	10	90	25	10	25
411100260	10,0	1,0	10	120	30	10	30
411100270	10,0	2,0	10	70	20	10	20
411100280	10,0	2,0	10	90	25	10	25
411100290	10,0	2,0	10	120	30	10	30
411120200	12,0	0,5	12	80	25	12	25
411120210	12,0	0,5	12	100	30	12	30
411120220	12,0	0,5	12	130	35	12	35
411120230	12,0	1,0	12	80	25	12	25
411120240	12,0	1,0	12	100	30	12	30
411120250	12,0	1,0	12	130	35	12	35
411120260	12,0	2,0	12	80	25	12	25
411120270	12,0	2,0	12	100	30	12	30
411120280	12,0	2,0	12	130	35	12	35
411120290	12,0	3,0	12	80	25	12	25
411160200	16,0	1,0	16	110	30	16	30
411160210	16,0	1,0	16	160	40	16	40
411160220	16,0	2,0	16	110	30	16	30
411160230	16,0	2,0	16	160	40	16	40

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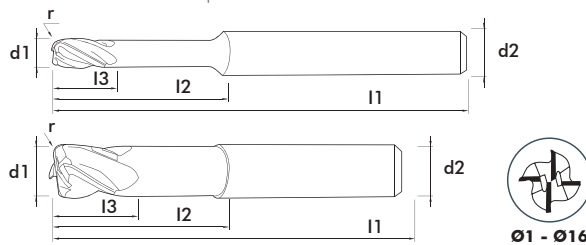
Fresa metal duro tórica 4 labios
HSC-HHC <65 HRC

Corner radius HSC-HHC solid carbide end mill <65 HRC



Fresa metal duro de 4 labios tórica y recubrimiento TiSiN. 30° de hélice. La herramienta, material y el recubrimiento están especialmente diseñados para el mecanizado a alta velocidad (HSC) y materiales duros (HHC). Para máquinas CNC con 3 y 5 ejes. También podemos trabajar en seco. Para aceros hasta 65 HRC. También válida para materiales no férricos, materiales termo resistentes, aleaciones exóticas y fundiciones. Fresa especialmente diseñada para trabajos 3D.

4 Fluted solid carbide end mill with corner radius and TiSiN coating. 30° Spiral angle. Specially for tool maker, mould maker. Also for aircraft / turbine construction. The tool, material and coating are specially designed for HSC and HHC. For CNC machines with 3 and 5 axes. Reduces milling time rapidly. Also for dry milling. Universal purpose for normal and high tense materials for 3D operations.



- STEEL <65 HRC
- INOX
- GG
- GGG

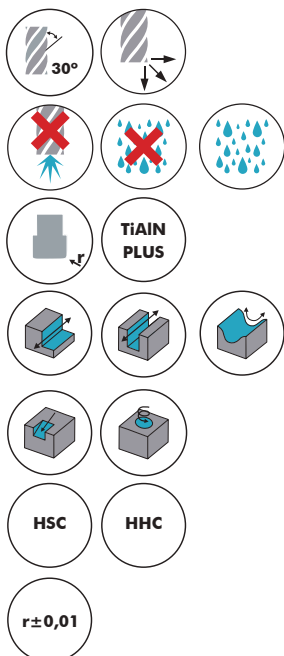
Condiciones de corte | Cutting data pag. 160

Ref.	d1	r	d2	l1	l2	l3	z
412010200	1,0	0,2	4	50	10	1	4
412010210	1,0	0,2	4	50	20	1	4
412012200	1,2	0,2	4	50	10	1,2	4
412012210	1,2	0,2	4	50	20	1,2	4
412015200	1,5	0,2	4	50	10	1,5	4
412015210	1,5	0,2	4	50	20	1,5	4
412020200	2,0	0,2	4	50	10	2	4
412020210	2,0	0,2	4	50	20	2	4
412025200	2,5	0,2	4	50	10	2,5	4
412025210	2,5	0,2	4	50	20	2,5	4
412030200	3,0	0,3	6	50	10	3	4
412030210	3,0	0,3	6	60	20	3	4
412030220	3,0	0,3	6	70	30	3	4
412030230	3,0	0,3	6	80	40	3	4
412040200	4,0	0,5	6	60	20	4	4
412040205	4,0	0,5	6	70	30	4	4
412040210	4,0	0,5	6	80	40	4	4
412040220	4,0	1,0	6	60	20	4	4
412040230	4,0	1,0	6	70	30	4	4
412040240	4,0	1,0	6	80	40	4	4
412050200	5,0	0,2	6	60	16	5	4
412050210	5,0	0,2	6	70	30	5	4
412050220	5,0	0,2	6	80	40	5	4
412050230	5,0	0,5	6	60	16	5	4
412050240	5,0	0,5	6	70	30	5	4
412050250	5,0	0,5	6	80	40	5	4
412060200	6,0	0,3	6	60	20	7	4
412060205	6,0	0,3	6	80	40	7	4
412060206	6,0	0,3	6	100	50	7	4
412060210	6,0	0,5	6	60	20	7	4
412060215	6,0	0,5	6	80	40	7	4
412060216	6,0	0,5	6	100	50	7	4
412060220	6,0	1,0	6	60	20	7	4
412060225	6,0	1,0	6	80	40	7	4

Ref.	d1	r	d2	l1	l2	l3	z
412060226	6,0	1,0	6	100	50	7	4
412060230	6,0	1,5	6	60	20	7	4
412060235	6,0	1,5	6	80	40	7	4
412060236	6,0	1,5	6	100	50	7	4
412060240	6,0	1,6	6	60	20	8	4
412060250	6,0	2,0	6	60	20	8	4
412080200	8,0	0,5	8	65	22	9	4
412080205	8,0	0,5	8	100	40	9	4
412080210	8,0	1,0	8	65	22	9	4
412080215	8,0	1,0	8	100	40	9	4
412080220	8,0	1,5	8	65	22	9	4
412080225	8,0	1,5	8	100	40	9	4
412080230	8,0	2,0	8	65	22	9	4
412100200	10,0	0,5	10	70	24	11	4
412100205	10,0	0,5	10	100	40	11	4
412100210	10,0	1,0	10	70	24	11	4
412100215	10,0	1,0	10	100	40	11	4
412100220	10,0	1,5	10	70	24	11	4
412100225	10,0	1,5	10	100	40	11	4
412100230	10,0	2,0	10	70	24	11	4
412100235	10,0	2,5	10	70	24	11	4
412120200	12,0	0,5	12	80	26	13	4
412120205	12,0	0,5	12	110	40	13	4
412120210	12,0	1,0	12	80	26	13	4
412120215	12,0	1,0	12	110	40	13	4
412120220	12,0	1,5	12	80	26	13	4
412120225	12,0	1,5	12	110	40	13	4
412120230	12,0	2,0	12	80	26	13	4
412120235	12,0	3,0	12	80	26	13	4
412160200	16,0	0,5	16	92	44	16	4
412160210	16,0	1,0	16	92	44	16	4
412160220	16,0	1,5	16	92	44	16	4
412160230	16,0	2,0	16	92	44	16	4
412160240	16,0	3,0	16	92	44	16	4

Fresa de metal duro tórica larga para acabado HSC/HCC <65 HRC

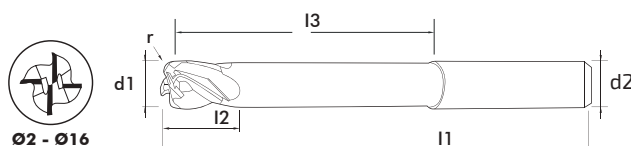
Long HSC-HHC solid carbide corner radius end mill <65 HRC



- STEEL <65 HRC
- INOX
- GG
- GGG

Fresa metal duro con 4 labios larga tórica y recubrimiento TiAlN. 30° de hélice. La herramienta, material y el recubrimiento están especialmente diseñados para el mecanizado a alta velocidad (HSC) y materiales duros (HHC). Para máquinas CNC con 3 y 5 ejes. También podemos trabajar en seco. Para aceros hasta 65 HRC. También válida para materiales no férricos, materiales termo resistentes, aleaciones exóticas y fundiciones. Fresa especialmente diseñada para trabajos 3D.

4 Fluted solid carbide long end mill with corner radius and TiAlN coating. 30° Spiral angle. Specially for tool maker and mould maker. Also for aircraft / turbine construction. The tool, material and coating are specially designed for HSC and HHC. For CNC machines with 3 and 5 axes. Reduces milling time rapidly. Also for dry milling. Universal purpose for normal and high tense materials for 3D operations.



Ref.	d1	r	d2	l1	l2	l3	z
413020200	2	0,2	6	80	2	10	4
413020210	2	0,2	6	80	10	10	4
413020220	2	0,5	6	80	2	10	4
413020230	2	0,5	6	80	10	10	4
413030200	3	0,2	6	80	3	15	4
413030210	3	0,2	6	80	15	15	4
413030220	3	0,5	6	80	3	15	4
413030230	3	0,5	6	80	15	15	4
413040200	4	0,2	6	80	4	20	4
413040210	4	0,2	6	80	20	20	4
413040220	4	0,5	6	80	4	20	4
413040230	4	0,5	6	80	20	20	4
413040240	4	1,0	6	80	4	20	4
413040250	4	1,0	6	80	20	20	4
413050200	5	0,2	6	80	7	25	4
413050210	5	0,2	6	80	25	25	4
413050220	5	0,5	6	80	7	25	4
413050230	5	0,5	6	80	25	25	4
413050240	5	1,0	6	80	7	25	4
413050250	5	1,0	6	80	25	25	4
413060150	6	0,2	6	80	13	13	4
413060160	6	0,2	6	80	25	25	4
413060200	6	0,5	6	80	13	44	4
413060205	6	0,5	6	80	25	25	4
413060210	6	1,0	6	80	13	44	4
413060215	6	1,0	6	80	25	25	4
413060220	6	1,5	6	80	13	44	4
413060230	6	2,0	6	80	13	44	4

Ref.	d1	r	d2	l1	l2	l3	z
413060240	6	2,0	6	80	25	25	4
413080150	8	0,5	8	90	19	54	4
413080160	8	0,5	8	90	35	35	4
413080200	8	1,0	8	90	19	54	4
413080205	8	1,0	8	90	35	35	4
413080210	8	1,5	8	90	19	54	4
413080220	8	2,0	8	90	19	54	4
413080230	8	2,0	8	90	35	35	4
413100150	10	0,5	10	100	22	22	4
413100160	10	0,5	10	100	45	45	4
413100200	10	1,0	10	100	22	60	4
413100205	10	1,0	10	100	45	45	4
413100210	10	1,5	10	100	22	60	4
413100220	10	2,0	10	100	22	60	4
413100230	10	2,0	10	100	45	45	4
413100240	10	3,0	10	100	22	22	4
413100250	10	3,0	10	100	45	45	4
413120150	12	0,5	12	100	26	26	4
413120160	12	0,5	12	100	50	50	4
413120200	12	1,0	12	100	26	75	4
413120205	12	1,0	12	100	50	50	4
413120210	12	2,0	12	100	26	75	4
413120220	12	2,0	12	100	26	75	4
413120230	12	2,0	12	100	50	50	4
413120240	12	3,0	12	100	26	26	4
413120250	12	3,0	12	100	50	50	4
413160200	16	2,0	16	150	75	92	4

Condiciones de corte | Cutting data pag. 160

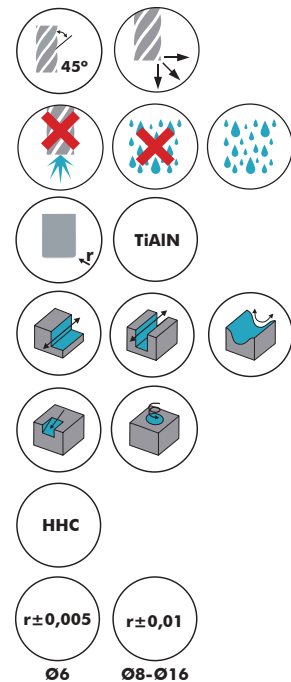
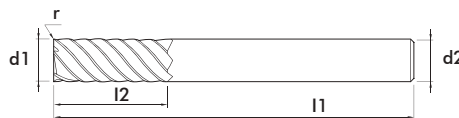
Fresa metal duro tórica 6 labios larga

<50 HRC (0,2µm)

6 Fluted solid carbide corner radius long end mill
<50 HRC (0,2µm)

Fresa de metal duro tórica de 6 labios larga con recubrimiento TiSiN para aceros preendurecidos y endurecidos hasta 50HRC. Ofrece una excelente resistencia al desgaste gracias a su recubrimiento PVD con base de Si. La hélice de 45° está diseñada para optimizar las condiciones de corte. Mejora la resistencia al desgaste gracias a un filo más largo y a la alta calidad superficial. Espectacular rendimiento en el mecanizado a altas velocidades gracias a su grado WC ultrafino (0,2 µm).

6 Fluted solid carbide corner radius long end mill with TiSiN coating for pre-hardened and hardened steel (HRC 50). Good wear resistance by Si-based PVD coating. 45° helix design for high speed and feed condition. Improved wear resistance with longer edge and excellent work surface finish. Outstanding performance at high speed machining by ultrafine (0,2 µm) WC grade.



Ref.	d1	r	d2	l1	l2
620060200	6	0,3	6	60	15
620060210	6	0,3	6	80	15
620060220	6	0,5	6	60	15
620060230	6	0,5	6	80	15
620060240	6	1,0	6	60	15
620060250	6	1,0	6	80	15
620080200	8	0,5	8	70	20
620080210	8	0,5	8	90	20
620080220	8	1,0	8	70	20
620080230	8	1,0	8	90	20
620100200	10	0,5	10	75	25
620100210	10	0,5	10	100	25
620100220	10	1,0	10	75	25
620100230	10	1,0	10	100	25
620120200	12	0,5	12	80	30
620120210	12	0,5	12	110	30
620120220	12	1,0	12	80	30
620120230	12	1,0	12	110	30
620160200	16	0,5	16	110	50
620160210	16	1,0	16	110	50

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