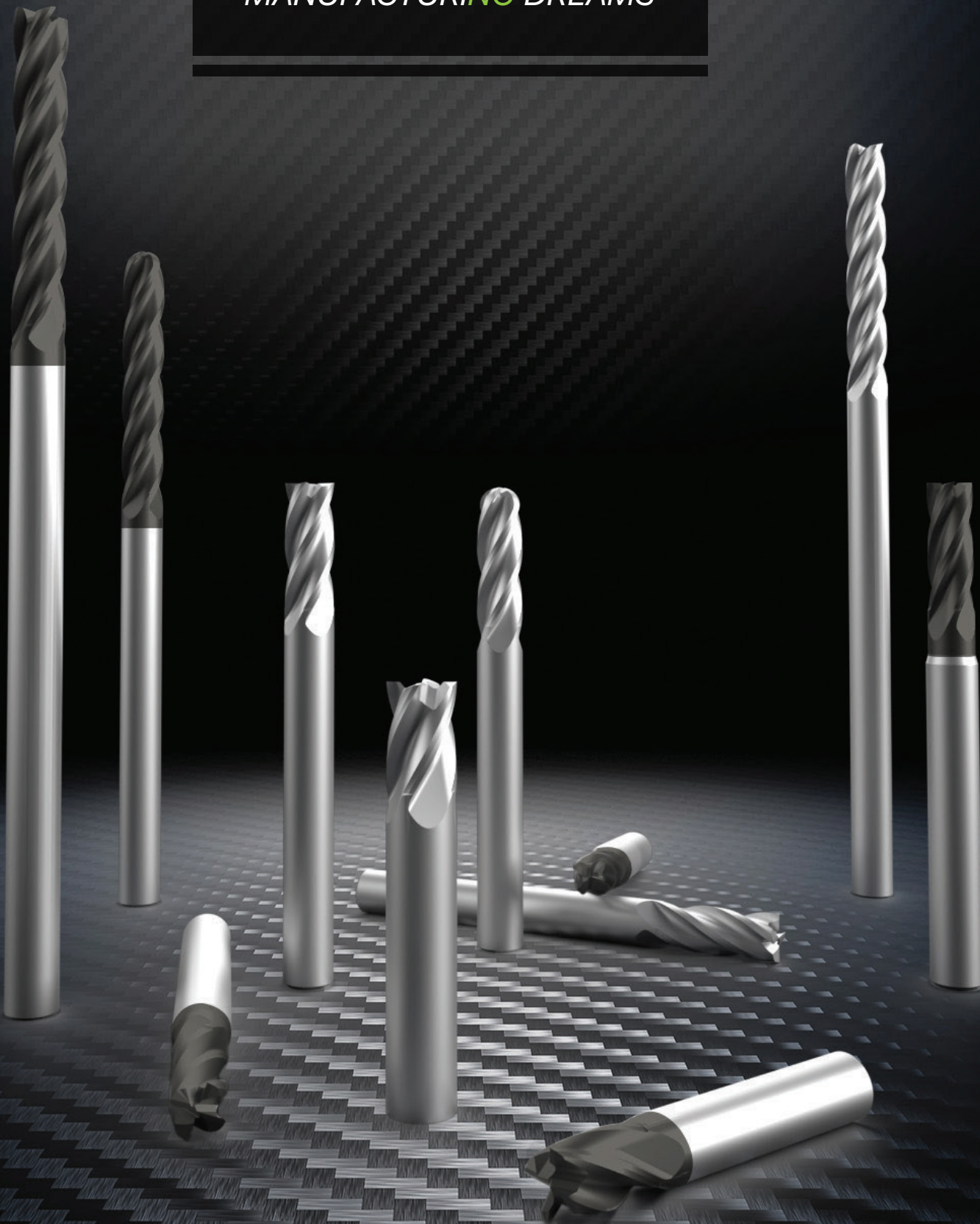
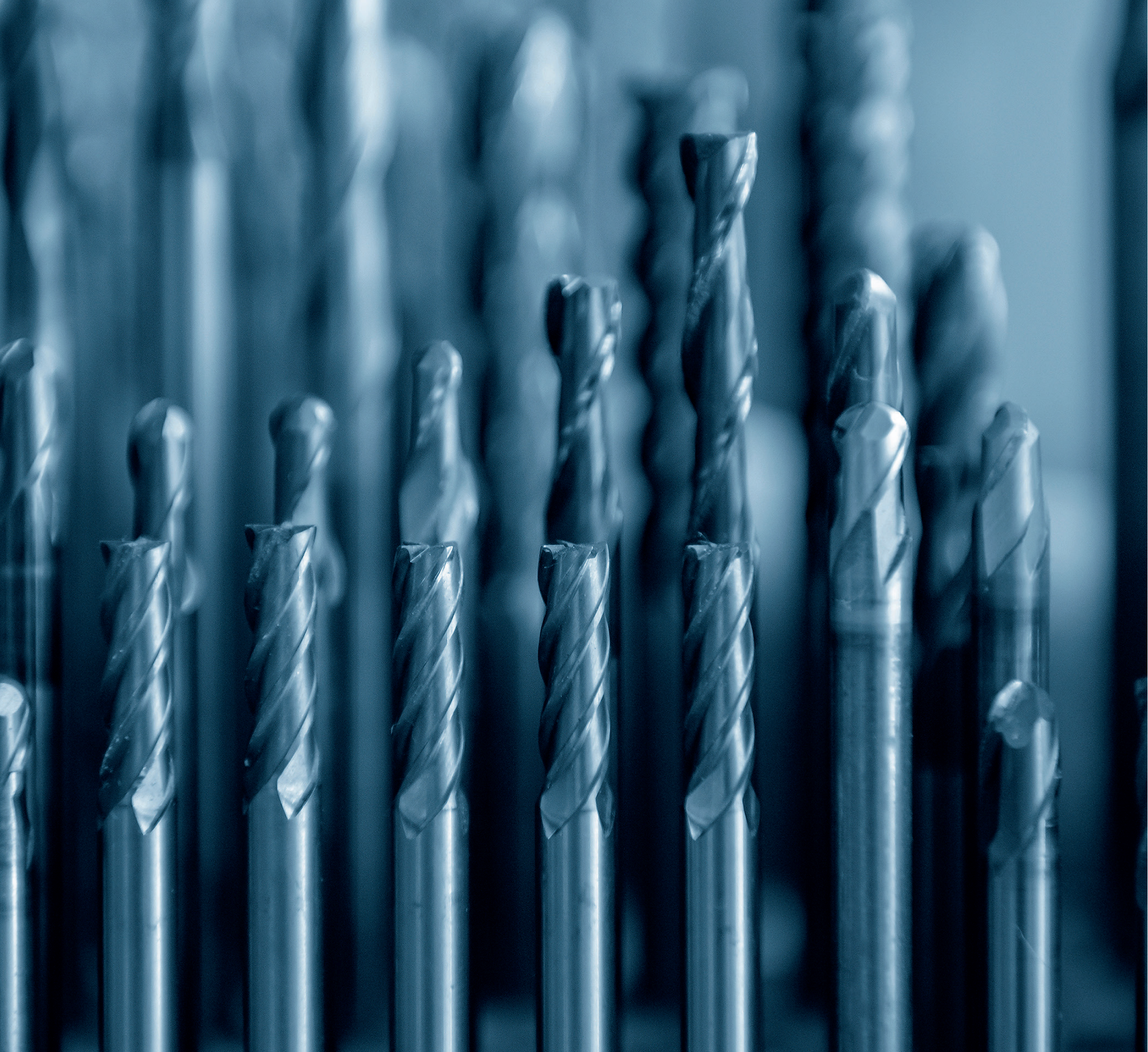




MANUFACTURING DREAMS







ÍNDICE GENERAL

INTRODUCCIÓN	06
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FRESAS RECTAS DE 4 FILOS PARA USO GENERAL

GLOSARIO FRESA RECTA DE 4 FILOS PARA USO GENERAL	12
<i>STB (Fresa corta)</i>	
IMPERIAL NG-100	14
MÉTRICO NG-114	15
<i>STD (Fresa estándar)</i>	
IMPERIAL NG-102	16
MÉTRICO NG-116	18
<i>XL (Fresa extra larga)</i>	
IMPERIAL NG-104	19
MÉTRICO NG-118	21

FRESAS RADIALES DE 4 FILOS PARA USO GENERAL

GLOSARIO FRESA RADIAL DE 4 FILOS PARA USO GENERAL	24
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IMPERIAL NG-106	26
MÉTRICO NG-120	27
<i>STD (Fresa estándar)</i>	
IMPERIAL NG-107	28
MÉTRICO NG-121	30
<i>XL (Fresa extra larga)</i>	
IMPERIAL NG-108	31
MÉTRICO NG-122	33

NG Tooling Solutions es una empresa dedicada al diseño y fabricación de herramientas de corte elaboradas con carburo sólido del más alto nivel de calidad. Dentro de nuestros consumidores principales se encuentran diversas industrias, tales como: aeroespacial, energética, automotriz, médica, electrónica, moldes, entre otros.

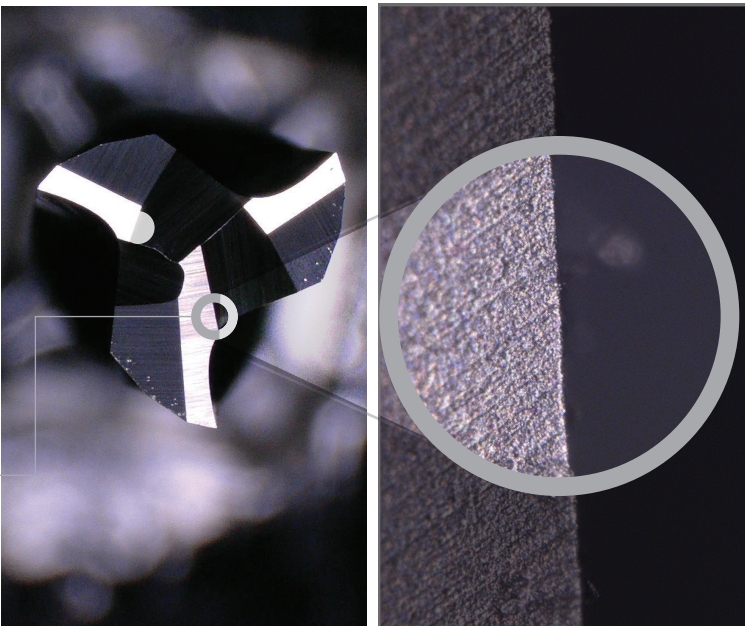
En busca de cubrir las necesidades generales y particulares de la industria manufacturera, se fundó NG TOOL. Una marca con amplia gama de productos que tiene como misión aportar soluciones de trabajo para industrias que exigen el máximo desempeño en el proceso de producción.

Contamos con herramientas de corte como fresas, brocas y cortadores especiales de alta complejidad como el resultado del estudio de las necesidades de cada empresa. Utilizando la experiencia y habilidad de nuestros ingenieros calificados y sumado a nuestros equipos CNC de producción con tecnología de punta somos capaces de diseñar y fabricar herramientas de corte para las aplicaciones más demandantes. Nos comprometemos a trabajar de la mano para ofrecerles el producto que los ayudará a alcanzar sus objetivos de producción.

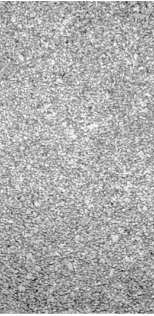
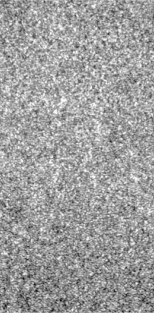
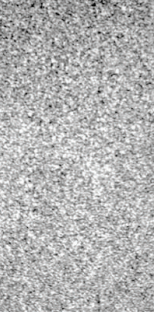
Nuestros equipos de **alta tecnología** nos permiten fabricar herramientas de mayor precisión y grado de complejidad.

Contamos con **equipos especializados** para la inspección de nuestros productos, garantizando que nuestras herramientas estén dentro de las tolerancias óptimas.

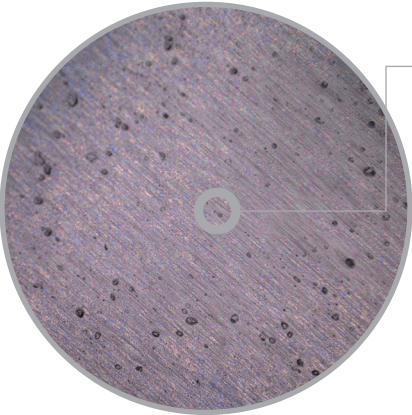
Nuestro minucioso proceso de revisión de las herramientas nos permite visualizar al detalle que se cumplan los **altos estándares de calidad**.



CARBUROS

MICRO ESTRUCTURA	CARBUROS	WC (wt.%)	Co (wt.%)	Otros (wt.%)	Tamaño del Grano	Densidad (g/cm³)	Dureza (HRA)	Resistencia a la Rotura Transversal (psi, min)
	NG-CARB-01	89.4	10	0.6	Submicron 0.7 µm	14.4	91.9	526,000
		Carburo de tamaño de grano submicron. Debido a su gran versatilidad puede ser utilizado para fresado, taladrado y escariado de materiales ferrosos, no ferrosos y materiales refractarios.						
	NG-CARB-02	86.7	12	1.3	Ultrafino 0.4 µm	14.1	92.6	675,000
		Carburo de tamaño de grano ultrafino. Dentro de sus características destacan su mayor resistencia a golpes y al desgaste.						
	NG-CARB-03	89.15	10	0.85	Ultrafino 0.6 µm	14.37	92.3	656,000
		Carburo de tamaño de grano ultrafino. Gracias a su gran porcentaje de cobalto incrementa su resistencia al impacto. Ideal para aplicaciones de desbaste y alta exigencia en materiales no ferrosos.						
	NG-CARB-04	89.9	9	1.1	Nano 0.2 µm	14.44	94	575,000
		Carburo de tamaño de grano ultrafino. Óptimo para el mecanizado de materiales endurecidos de 50 a 65 HRC. Preparado para resistir al desgaste contra materiales como el acero de alta velocidad, acero endurecido y materiales compuestos.						

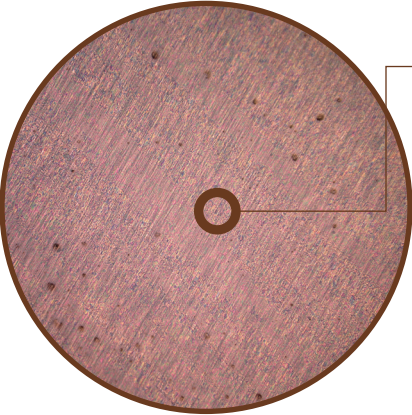
RECUBRIMIENTOS



CRONALUM

Es un recubrimiento para uso general ideal para materiales con base en hierro. Provee a las herramientas una excepcional resistencia al desgaste y altas temperaturas.

Con este recubrimiento se pueden conseguir velocidades de corte mayores dando como resultado un incremento directo en la productividad.



TITRALUM

Este recubrimiento, aún en altas temperaturas, proporciona una resistencia superior al desgaste abrasivo y mayor ductilidad en la herramienta. Gracias a su enorme rendimiento es ideal para las operaciones de mecanizado más exigentes.

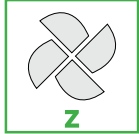
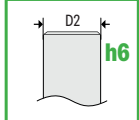
NOTA: Otros recubrimientos se manejan sobre pedido



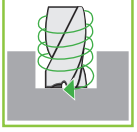
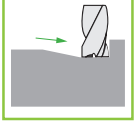
ÍNDICE FRESAS RECTAS PARA USO GENERAL

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GLOSARIO FRESA RECTA DE 4 FILOS PARA USO GENERAL	12
STB (Fresa corta)	
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MÉTRICO NG-118	21

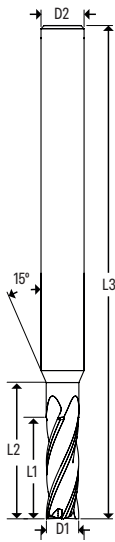
CARACTERÍSTICAS

STB	Fresa corta
STD	Fresa estándar
XL	Fresa extra larga
	Número de flautas
	Corte al centro
	Fresa recta
in	Imperial
mm	Métrico
	Zanco rectificado (h6)
	Hélice de 30°
	Corte mano derecha

APLICACIONES

	Perfilado
	Corte axial
	Corte en rampa
	Ranurado

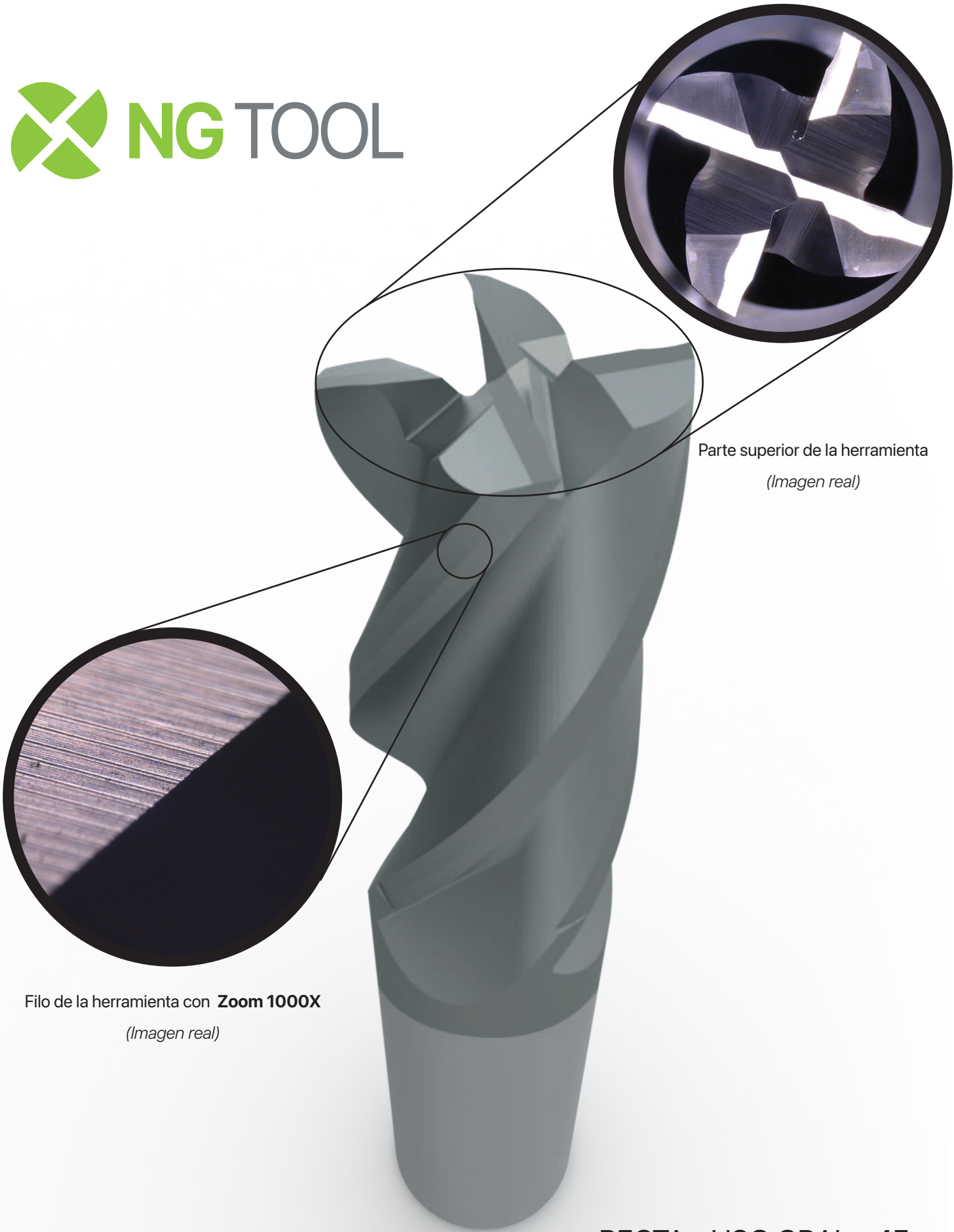
GUÍA DE LA TABLA



- L1: Largo de corte
- L2: Distancia al zanco
- L3: Largo total
- D1: Diámetro de corte
- D2: Diámetro del zanco
- UC: Sin recubrimiento
- CRONALUM: Recubrimiento

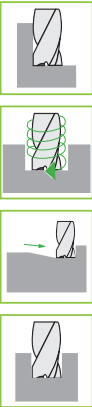
IDENTIFICACIÓN DEL PRODUCTO

NGOXXXXXX
Clave de la empresa Clave de la familia Número de producto

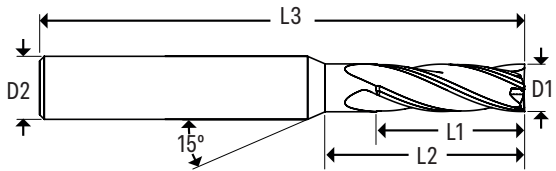


RECTA - USO GRAL - 4F

NG-100

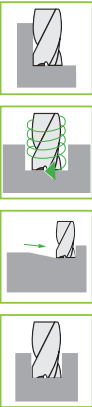


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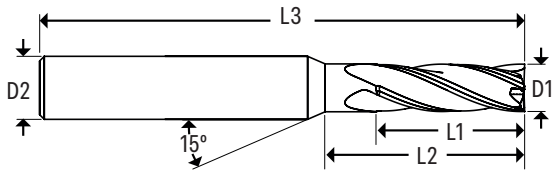


D1	L1	L2	D2	L3	Z	UC	CRONALUM
3/64	1/8	3/16	1/8	1 1/2	4	NG0100002	NG0100019
1/16	1/8	3/16	1/8	1 1/2	4	NG0100003	NG0100020
5/64	1/8	3/16	1/8	1 1/2	4	NG0100004	NG0100021
3/32	3/16	1/4	1/8	1 1/2	4	NG0100005	NG0100022
7/64	3/16	1/4	1/8	1 1/2	4	NG0100006	NG0100023
1/8	1/4	-	1/8	1 1/2	4	NG0100007	NG0100024
5/32	3/8	1/2	3/16	2	4	NG0100008	NG0100025
3/16	3/8	-	3/16	2	4	NG0100009	NG0100026
1/4	1/2	-	1/4	2	4	NG0100010	NG0100027
5/16	1/2	-	5/16	2 1/2	4	NG0100011	NG0100028
3/8	5/8	-	3/8	2 1/2	4	NG0100012	NG0100029
7/16	3/4	-	7/16	2 3/4	4	NG0100013	NG0100030
1/2	3/4	-	1/2	3	4	NG0100014	NG0100031
5/8	1	-	5/8	3 1/2	4	NG0100015	NG0100032
3/4	1	-	3/4	4	4	NG0100016	NG0100033
1	1	-	1	4	4	NG0100017	NG0100034

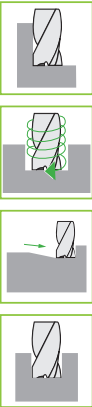
NG-114



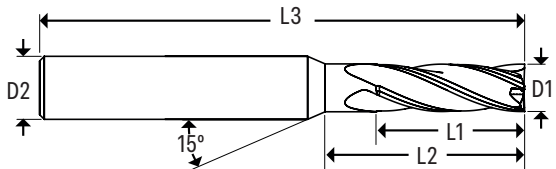
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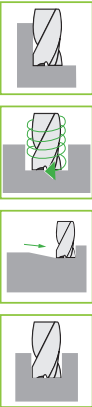
D1	L1	L2	D2	L3	Z	UC	CRONALUM
1	2.5	5	3	38	4	NG0114001	NG0114009
1.5	3	6	3	38	4	NG0114002	NG0114010
2	4	7.5	3	38	4	NG0114003	NG0114011
3	6	-	3	38	4	NG0114004	NG0114012
6	12	-	6	50	4	NG0114005	NG0114013
8	12	-	8	50	4	NG0114006	NG0114014
10	15	-	10	50	4	NG0114007	NG0114015
12	15	-	12	63	4	NG0114008	NG0114016



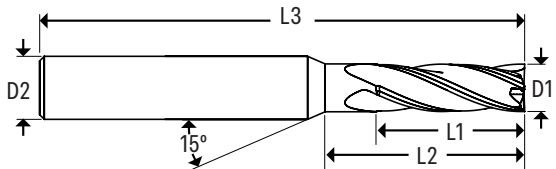
TOL +0.000
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D1	L1	L2	D2	L3	Z	UC	CRONALUM
3/64	3/16	1/4	1/8	1 1/2	4	NG0102003	NG0102045
1/16	1/4	5/16	1/8	1 1/2	4	NG0102004	NG0102046
5/64	1/4	5/16	1/8	1 1/2	4	NG0102005	NG0102047
3/32	3/8	7/16	1/8	1 1/2	4	NG0102006	NG0102048
7/64	1/2	9/16	1/8	1 1/2	4	NG0102007	NG0102049
1/8	1/2	-	1/8	1 1/2	4	NG0102008	NG0102050
9/64	9/16	3/4	3/16	2	4	NG0102009	NG0102051
5/32	9/16	3/4	3/16	2	4	NG0102010	NG0102052
11/64	9/16	3/4	3/16	2	4	NG0102011	NG0102053
3/16	5/8	-	3/16	2	4	NG0102012	NG0102054
13/64	5/8	7/8	1/4	2 1/2	4	NG0102013	NG0102055
7/32	5/8	7/8	1/4	2 1/2	4	NG0102014	NG0102056
15/64	3/4	1	1/4	2 1/2	4	NG0102015	NG0102057
1/4	3/4	-	1/4	2 1/2	4	NG0102016	NG0102058
17/64	7/8	1 1/8	5/16	2 1/2	4	NG0102017	NG0102059
9/32	7/8	1 1/8	5/16	2 1/2	4	NG0102018	NG0102060
19/64	7/8	1 1/8	5/16	2 1/2	4	NG0102019	NG0102061
5/16	7/8	-	5/16	2 1/2	4	NG0102020	NG0102062
21/64	7/8	1 1/8	3/8	2 1/2	4	NG0102021	NG0102063
11/32	7/8	1 1/8	3/8	2 1/2	4	NG0102022	NG0102064

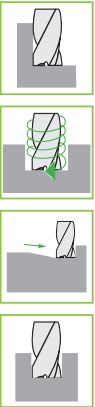


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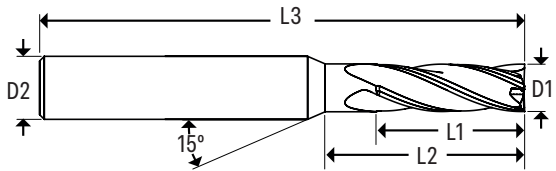


D1	L1	L2	D2	L3	Z	UC	CRONALUM
23/64	1	1 1/4	3/8	2 1/2	4	NG0102023	NG0102065
3/8	1	-	3/8	2 1/2	4	NG0102024	NG0102066
25/64	1	1 1/4	7/16	2 3/4	4	NG0102025	NG0102067
13/32	1	1 1/4	7/16	2 3/4	4	NG0102026	NG0102068
27/64	1	1 1/4	7/16	2 3/4	4	NG0102027	NG0102069
7/16	1	-	7/16	2 3/4	4	NG0102028	NG0102070
29/64	1	1 1/4	1/2	3	4	NG0102029	NG0102071
15/32	1	1 1/4	1/2	3	4	NG0102030	NG0102072
31/64	1	1 1/4	1/2	3	4	NG0102031	NG0102073
1/2	1	-	1/2	3	4	NG0102032	NG0102074
9/16	1 1/4	-	9/16	3 1/2	4	NG0102033	NG0102075
5/8	1 1/2	-	5/8	3 1/2	4	NG0102034	NG0102076
11/16	1 1/2	1 7/8	3/4	4	4	NG0102035	NG0102077
3/4	1 1/2	-	3/4	4	4	NG0102036	NG0102078
7/8	1 1/2	-	7/8	4	4	NG0102037	NG0102079
1	1 1/2	-	1	4	4	NG0102038	NG0102080
1 1/8	2	2 1/2	1 1/4	4 1/2	4	NG0102039	NG0102081
1 1/4	2	-	1 1/4	4 1/2	4	NG0102040	NG0102082
1 3/8	2	-	1 1/4	4 1/2	4	NG0102041*	NG0102083*
1 1/2	2	-	1 1/4	4 1/2	4	NG0102042*	NG0102084*

NG-116

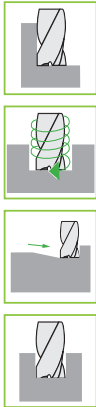


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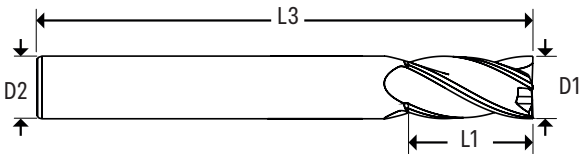


D1	L1	L2	D2	L3	Z	UC	CRONALUM
1	4	4.5	3	38	4	NG0116001	NG0116023
1.5	6	8	3	38	4	NG0116002	NG0116024
2	8	10	3	38	4	NG0116003	NG0116025
2.5	12	14.5	3	38	4	NG0116004	NG0116026
3	12	-	3	38	4	NG0116005	NG0116027
3.5	12	16	4	50	4	NG0116006	NG0116028
4	14	-	4	50	4	NG0116007	NG0116029
4.5	14	18.5	6	51	4	NG0116008	NG0116030
5	16	21	6	64	4	NG0116009	NG0116031
6	20	-	6	64	4	NG0116010	NG0116032
7	22	27.5	8	64	4	NG0116011	NG0116033
8	22	-	8	64	4	NG0116012	NG0116034
9	22	28	10	64	4	NG0116013	NG0116035
10	25	-	10	64	4	NG0116014	NG0116036
11	25	32	12	84	4	NG0116015	NG0116037
12	25	-	12	84	4	NG0116016	NG0116038
14	32	-	14	84	4	NG0116017	NG0116039
16	38	-	16	89	4	NG0116018	NG0116040
18	40	54	20	100	4	NG0116019	NG0116041
20	40	-	20	100	4	NG0116020	NG0116042

NG-104

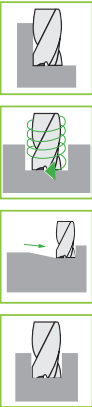


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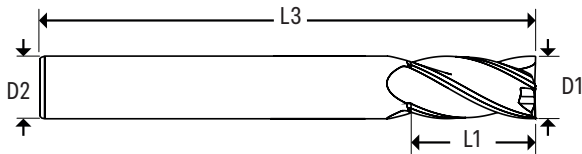


D1	L1	L2	D2	L3	Z	UC	CRONALUM
1/8	3/4	-	1/8	3	4	NG0104001	NG0104042
1/8	1	-	1/8	3	4	NG0104002	NG0104043
3/16	1 1/4	-	3/16	3	4	NG0104003	NG0104044
3/16	1	-	3/16	4	4	NG0104004	NG0104045
1/4	1 1/8	-	1/4	3	4	NG0104005	NG0104046
1/4	1	-	1/4	4	4	NG0104006	NG0104047
1/4	1 1/2	-	1/4	4	4	NG0104007	NG0104048
1/4	1 1/2	-	1/4	6	4	NG0104008	NG0104049
5/16	1 1/8	-	5/16	3	4	NG0104009	NG0104050
5/16	1	-	5/16	4	4	NG0104010	NG0104051
5/16	1 5/8	-	5/16	4	4	NG0104011	NG0104052
5/16	1 1/2	-	5/16	6	4	NG0104012	NG0104053
3/8	1 1/8	-	3/8	3	4	NG0104013	NG0104054
3/8	1	-	3/8	4	4	NG0104014	NG0104055
3/8	1 1/2	-	3/8	4	4	NG0104015	NG0104056
3/8	2	-	3/8	4	4	NG0104016	NG0104057
3/8	1 1/2	-	3/8	6	4	NG0104017	NG0104058
3/8	3	-	3/8	6	4	NG0104018	NG0104059
7/16	1	-	7/16	4	4	NG0104019	NG0104060
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7/16	1 1/2	-	7/16	6	4	NG0104021	NG0104062

NG-104

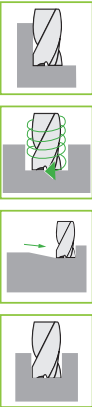


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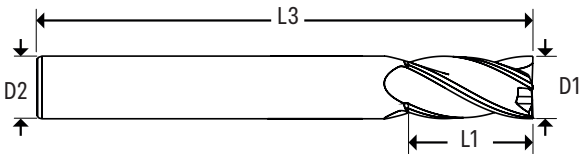


D1	L1	L2	D2	L3	Z	UC	CRONALUM
7/16	3	-	7/16	6	4	NG0104022	NG0104063
1/2	1 1/4	-	1/2	3	4	NG0104023	NG0104064
1/2	1	-	1/2	4	4	NG0104024	NG0104065
1/2	1 1/2	-	1/2	4	4	NG0104025	NG0104066
1/2	2	-	1/2	4	4	NG0104026	NG0104067
1/2	1 1/2	-	1/2	6	4	NG0104027	NG0104068
1/2	3	-	1/2	6	4	NG0104028	NG0104069
5/8	2 1/2	-	5/8	5	4	NG0104029	NG0104070
5/8	1 1/2	-	5/8	6	4	NG0104030	NG0104071
5/8	3	-	5/8	6	4	NG0104031	NG0104072
3/4	2	-	3/4	5	4	NG0104032	NG0104073
3/4	2 1/2	-	3/4	5	4	NG0104033	NG0104074
3/4	1 1/2	-	3/4	6	4	NG0104034	NG0104075
3/4	3	-	3/4	6	4	NG0104035	NG0104076
3/4	4	-	3/4	7	4	NG0104036	NG0104077
1	2	-	1	4 1/2	4	NG0104037	NG0104078
1	2 1/2	-	1	5	4	NG0104038	NG0104079
1	3	-	1	6	4	NG0104039	NG0104080
1	4	-	1	7	4	NG0104040	NG0104081
1 1/4	3	-	1 1/4	6	4	NG0104041	NG0104082

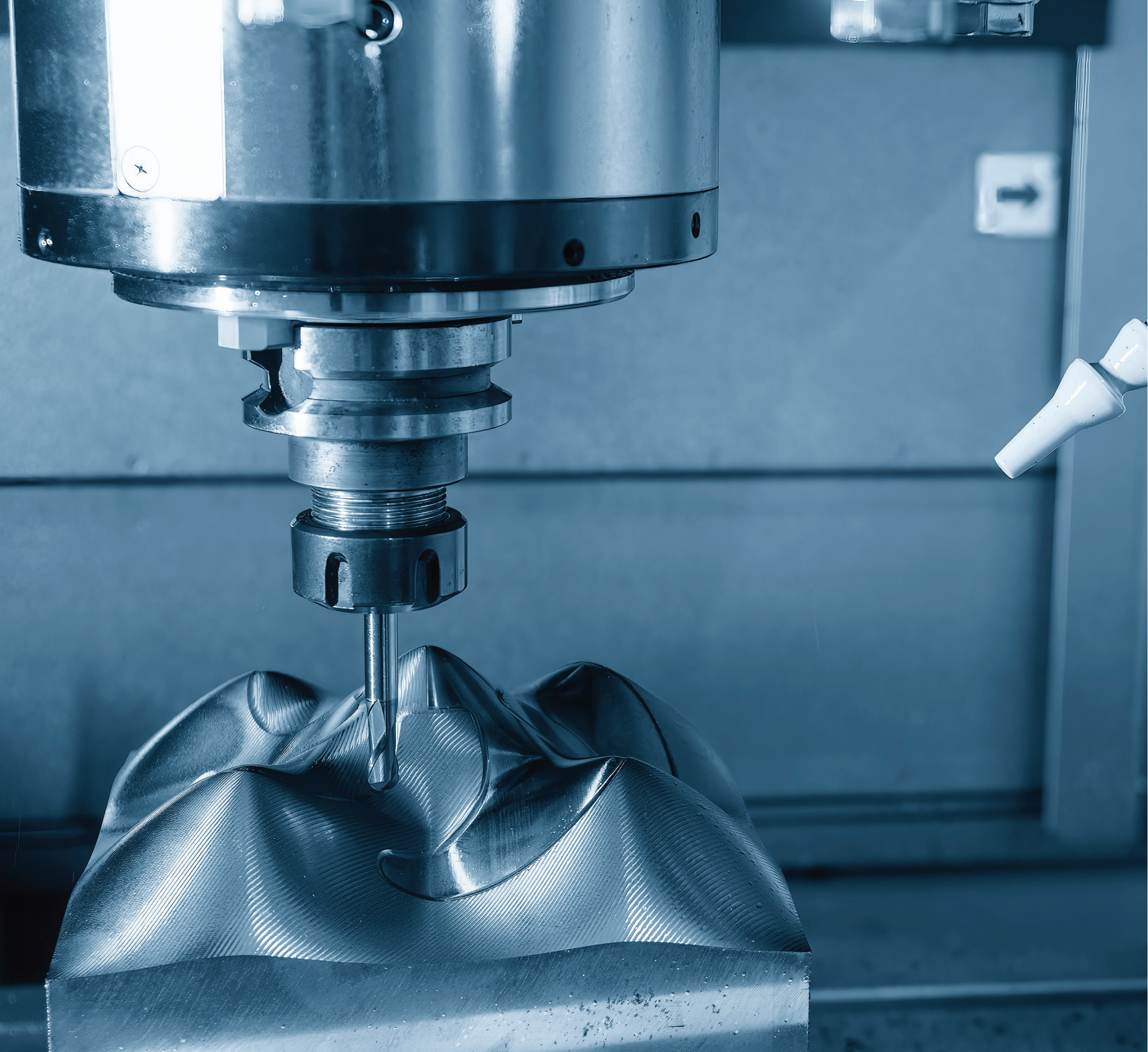
NG-118



TOL +0.000
 -0.050



D1	L1	L2	D2	L3	Z	UC	CRONALUM
3	25	-	3	76	4	NG0118001	NG0118008
6	29	-	6	76	4	NG0118002	NG0118009
8	29	-	8	76	4	NG0118003	NG0118010
10	45	-	10	100	4	NG0118004	NG0118011
12	50	-	12	100	4	NG0118005	NG0118012
16	63	-	16	125	4	NG0118006	NG0118013
20	63	-	20	125	4	NG0118007	NG0118014



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FRESAS RADIALES DE 4 FILOS PARA USO GENERAL

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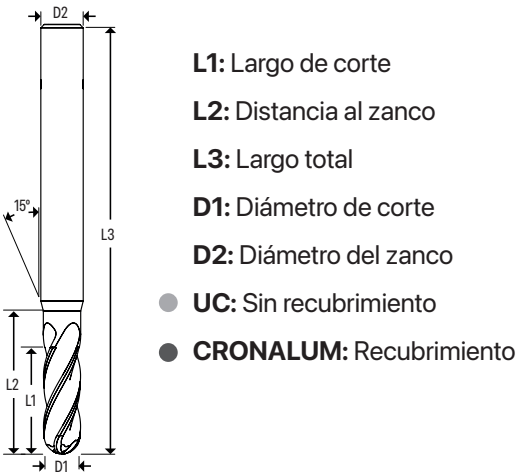
CARACTERÍSTICAS

STB	Fresa corta
STD	Fresa estándar
XL	Fresa extra larga
	Número de flautas
	Corte al centro
	Fresa radial
in	Imperial
mm	Métrico
	Zanco rectificado (h6)
	Hélice de 30°
	Corte mano derecha

APLICACIONES

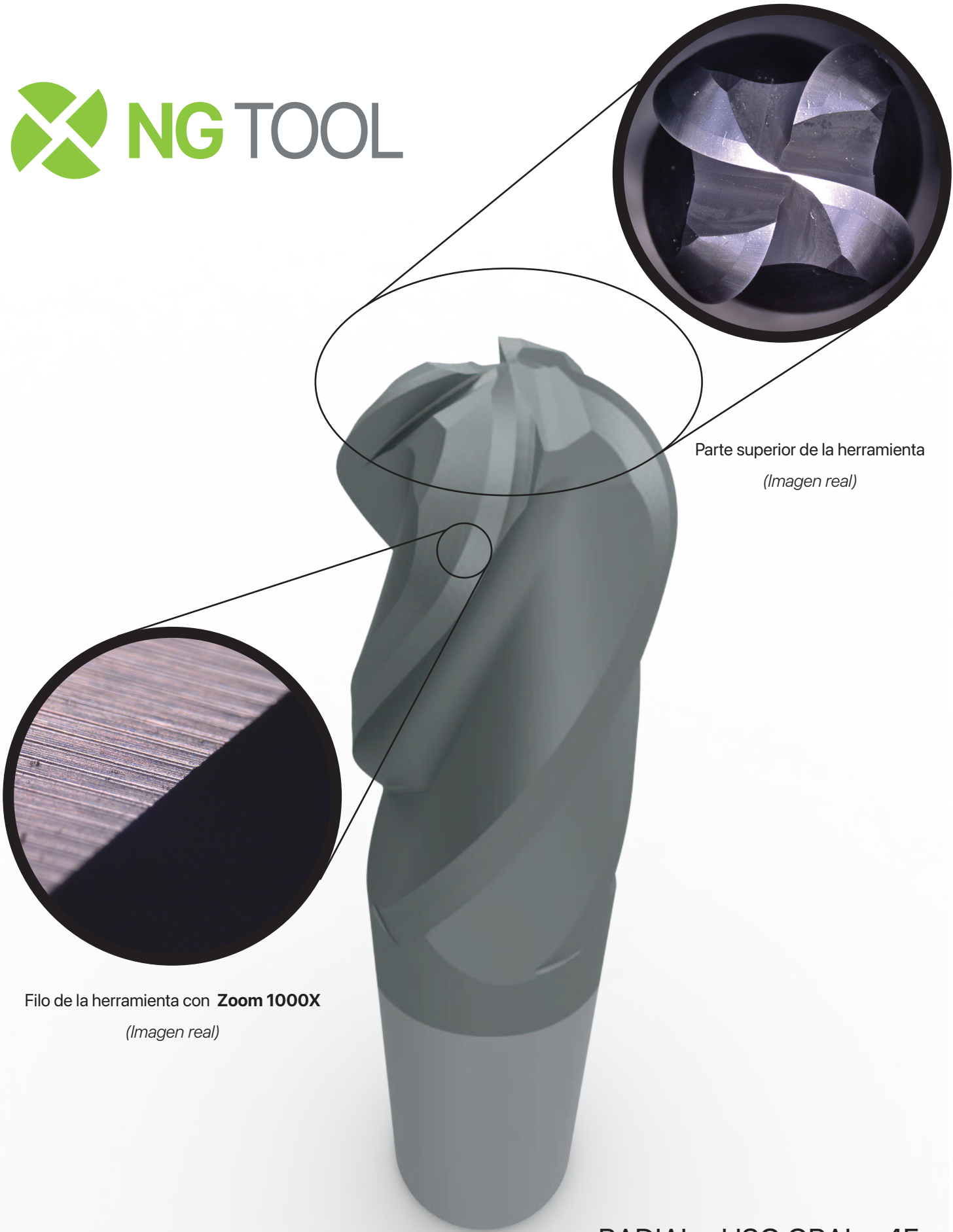
	Ranurado
	Corte en curvas
	Perfilado

GUÍA DE LA TABLA



IDENTIFICACIÓN DEL PRODUCTO

NGOXXXXXX
Clave de la empresa Clave de la familia Número de producto

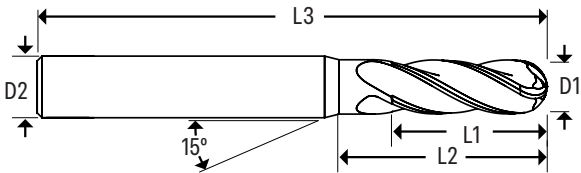


RADIAL - USO GRAL - 4F

NG-106



TOL +0.000
 -0.002

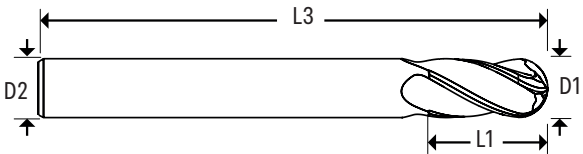


D1	L1	L2	D2	L3	Z	UC	CRONALUM
3/64	1/8	3/16	1/8	1 1/2	4	NG0106002	NG0106019
1/16	1/8	3/16	1/8	1 1/2	4	NG0106003	NG0106020
5/64	1/8	3/16	1/8	1 1/2	4	NG0106004	NG0106021
3/32	3/16	1/4	1/8	1 1/2	4	NG0106005	NG0106022
7/64	3/16	1/4	1/8	1 1/2	4	NG0106006	NG0106023
1/8	1/4	-	1/8	1 1/2	4	NG0106007	NG0106024
5/32	3/8	1/2	3/16	2	4	NG0106008	NG0106025
3/16	3/8	-	3/16	2	4	NG0106009	NG0106026
1/4	1/2	-	1/4	2	4	NG0106010	NG0106027
5/16	1/2	-	5/16	2 1/2	4	NG0106011	NG0106028
3/8	5/8	-	3/8	2 1/2	4	NG0106012	NG0106029
7/16	3/4	-	7/16	2 3/4	4	NG0106013	NG0106030
1/2	3/4	-	1/2	3	4	NG0106014	NG0106031
5/8	1	-	5/8	3 1/2	4	NG0106015	NG0106032
3/4	1	-	3/4	4	4	NG0106016	NG0106033
1	1	-	1	4	4	NG0106017	NG0106034

NG-120



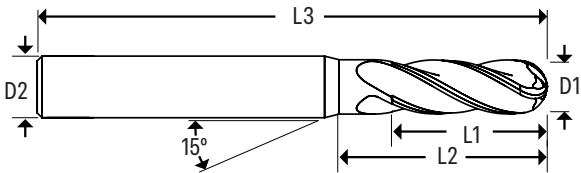
TOL +0.000
 -0.050



D1	L1	L2	D2	L3	Z	UC	CRONALUM
3	6	-	3	38	4	NG0120001	NG0120006
6	12	-	6	50	4	NG0120002	NG0120007
8	12	-	8	50	4	NG0120003	NG0120008
10	15	-	10	50	4	NG0120004	NG0120009
12	15	-	12	63	4	NG0120005	NG0120010



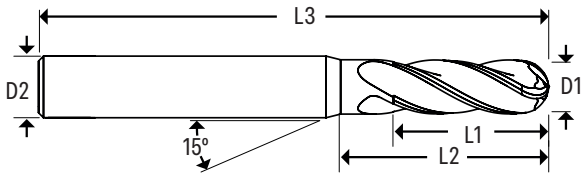
TOL +0.000
 -0.002



D1	L1	L2	D2	L3	Z	UC	CRONALUM
3/64	3/16	1/4	1/8	1 1/2	4	NG0107002	NG0107043
1/16	1/4	5/16	1/8	1 1/2	4	NG0107003	NG0107044
5/64	1/4	5/16	1/8	1 1/2	4	NG0107004	NG0107045
3/32	3/8	7/16	1/8	1 1/2	4	NG0107005	NG0107046
7/64	1/2	9/16	1/8	1 1/2	4	NG0107006	NG0107047
1/8	1/2	-	1/8	1 1/2	4	NG0107007	NG0107048
9/64	9/16	3/4	3/16	2	4	NG0107008	NG0107049
5/32	9/16	3/4	3/16	2	4	NG0107009	NG0107050
11/64	9/16	3/4	3/16	2	4	NG0107010	NG0107051
3/16	5/8	-	3/16	2	4	NG0107011	NG0107052
13/64	5/8	7/8	1/4	2 1/2	4	NG0107012	NG0107053
7/32	5/8	7/8	1/4	2 1/2	4	NG0107013	NG0107054
15/64	3/4	1	1/4	2 1/2	4	NG0107014	NG0107055
1/4	3/4	-	1/4	2 1/2	4	NG0107015	NG0107056
17/64	7/8	1 1/8	5/16	2 1/2	4	NG0107016	NG0107057
9/32	7/8	1 1/8	5/16	2 1/2	4	NG0107017	NG0107058
19/64	7/8	1 1/8	5/16	2 1/2	4	NG0107018	NG0107059
5/16	7/8	-	5/16	2 1/2	4	NG0107019	NG0107060
21/64	7/8	1 1/8	3/8	2 1/2	4	NG0107020	NG0107061
11/32	7/8	1 1/8	3/8	2 1/2	4	NG0107021	NG0107062



TOL +0.000
 -0.002



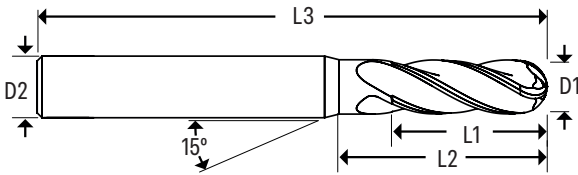
D1	L1	L2	D2	L3	Z	UC	CRONALUM
23/64	1	1 1/4	3/8	2 1/2	4	NG0107022	NG0107063
3/8	1	-	3/8	2 1/2	4	NG0107023	NG0107064
25/64	1	1 1/4	7/16	2 3/4	4	NG0107024	NG0107065
13/32	1	1 1/4	7/16	2 3/4	4	NG0107025	NG0107066
27/64	1	1 1/4	7/16	2 3/4	4	NG0107026	NG0107067
7/16	1	-	7/16	2 3/4	4	NG0107027	NG0107068
29/64	1	1 1/4	1/2	3	4	NG0107028	NG0107069
15/32	1	1 1/4	1/2	3	4	NG0107029	NG0107070
31/64	1	1 1/4	1/2	3	4	NG0107030	NG0107071
1/2	1	-	1/2	3	4	NG0107031	NG0107072
9/16	1 1/4	-	9/16	3 1/2	4	NG0107032	NG0107073
5/8	1 1/2	-	5/8	3 1/2	4	NG0107033	NG0107074
11/16	1 1/2	1 7/8	3/4	4	4	NG0107034	NG0107075
3/4	1 1/2	-	3/4	4	4	NG0107035	NG0107076
7/8	1 1/2	-	7/8	4	4	NG0107036	NG0107077
12/31	1 1/2	-	12/31	4	4	NG0107037	NG0107078
1 1/8	2	2 1/2	1 1/4	4 1/2	4	NG0107038	NG0107079
1 1/4	2	-	1 1/4	4 1/2	4	NG0107039	NG0107080
1 3/8	2	-	1 1/4	4 1/2	4	NG0107040*	NG0107081*
1 1/2	2	-	1 1/4	4 1/2	4	NG0107041*	NG0107082*

* Bajo pedido

NG-121



TOL +0.000
 -0.050

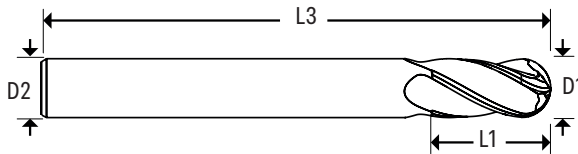


D1	L1	L2	D2	L3	Z	UC	CRONALUM
1	4	4.5	3	38	4	NG0121001	NG0121023
1.5	6	8	3	38	4	NG0121002	NG0121024
2	8	10	3	38	4	NG0121003	NG0121025
2.5	12	14.5	3	38	4	NG0121004	NG0121026
3	12	-	3	38	4	NG0121005	NG0121027
3.5	12	16	4	50	4	NG0121006	NG0121028
4	14	-	4	50	4	NG0121007	NG0121029
4.5	14	18.5	6	51	4	NG0121008	NG0121030
5	16	21	6	64	4	NG0121009	NG0121031
6	20	-	6	64	4	NG0121010	NG0121032
7	22	27.5	8	64	4	NG0121011	NG0121033
8	22	-	8	64	4	NG0121012	NG0121034
9	22	28	10	64	4	NG0121013	NG0121035
10	25	-	10	64	4	NG0121014	NG0121036
11	25	32	12	84	4	NG0121015	NG0121037
12	25	-	12	84	4	NG0121016	NG0121038
14	32	-	14	84	4	NG0121017	NG0121039
16	38	-	16	89	4	NG0121018	NG0121040
18	40	54	20	100	4	NG0121019	NG0121041
20	40	-	20	100	4	NG0121020	NG0121042

NG-108



TOL +0.000
 -0.002

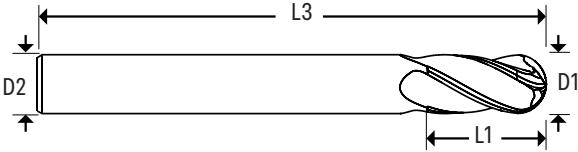


D1	L1	L2	D2	L3	Z	UC	CRONALUM
1/8	3/4	-	1/8	3	4	NG0108001	NG0108041
1/8	1	-	1/8	3	4	NG0108002	NG0108042
3/16	1 1/4	-	3/16	3	4	NG0108003	NG0108043
3/16	1	-	3/16	4	4	NG0108004	NG0108044
1/4	1 1/8	-	1/4	3	4	NG0108005	NG0108045
1/4	1	-	1/4	4	4	NG0108006	NG0108046
1/4	1 1/2	-	1/4	4	4	NG0108007	NG0108047
1/4	1 1/2	-	1/4	6	4	NG0108008	NG0108048
5/16	1 1/8	-	5/16	3	4	NG0108009	NG0108049
5/16	1	-	5/16	4	4	NG0108010	NG0108050
5/16	1 5/8	-	5/16	4	4	NG0108011	NG0108051
5/16	1 1/2	-	5/16	6	4	NG0108012	NG0108052
3/8	1 1/8	-	3/8	3	4	NG0108013	NG0108053
3/8	1	-	3/8	4	4	NG0108014	NG0108054
3/8	1 1/2	-	3/8	4	4	NG0108015	NG0108055
3/8	2	-	3/8	4	4	NG0108016	NG0108056
3/8	1 1/2	-	3/8	6	4	NG0108017	NG0108057
3/8	3	-	3/8	6	4	NG0108018	NG0108058
7/16	1	-	7/16	4	4	NG0108019	NG0108059
7/16	2	-	7/16	4	4	NG0108020	NG0108060

NG-108



TOL +0.000
 -0.002

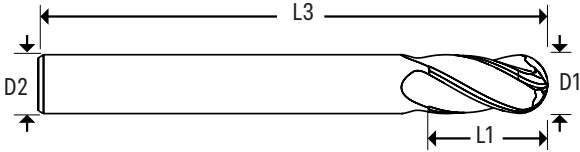


D1	L1	L2	D2	L3	Z	UC	CRONALUM
7/16	1 1/2	-	7/16	6	4	NG0108021	NG0108061
7/16	3	-	7/16	6	4	NG0108022	NG0108062
1/2	1 1/4	-	1/2	3	4	NG0108023	NG0108063
1/2	1	-	1/2	4	4	NG0108024	NG0108064
1/2	1 1/2	-	1/2	4	4	NG0108025	NG0108065
1/2	2	-	1/2	4	4	NG0108026	NG0108066
1/2	1 1/2	-	1/2	6	4	NG0108027	NG0108067
1/2	3	-	1/2	6	4	NG0108028	NG0108068
5/8	2 1/2	-	5/8	5	4	NG0108029	NG0108069
5/8	1 1/2	-	5/8	6	4	NG0108030	NG0108070
5/8	3	-	5/8	6	4	NG0108031	NG0108071
3/4	2 1/2	-	3/4	5	4	NG0108032	NG0108072
3/4	1 1/2	-	3/4	6	4	NG0108033	NG0108073
3/4	3	-	3/4	6	4	NG0108034	NG0108074
3/4	4	-	3/4	7	4	NG0108035	NG0108075
1	2	-	1	4 1/2	4	NG0108036	NG0108076
1	2 1/2	-	1	5	4	NG0108037	NG0108077
1	3	-	1	6	4	NG0108038	NG0108078
1	4	-	1	7	4	NG0108039	NG0108079
1 1/4	3	-	1 1/4	6	4	NG0108040	NG0108080

NG-122



TOL +0.000
 -0.050



D1	L1	L2	D2	L3	Z	UC	CRONALUM
3	25	-	3	76	4	NG0122001	NG0122008
6	29	-	6	76	4	NG0122002	NG0122009
8	29	-	8	76	4	NG0122003	NG0122010
10	45	-	10	100	4	NG0122004	NG0122011
12	50	-	12	100	4	NG0122005	NG0122012
16	63	-	16	125	4	NG0122006	NG0122013
20	63	-	20	125	4	NG0122007	NG0122014

FRESA RECTA Y RADIAL DE 4 FILOS PARA USO GENERAL- IMPERIAL

NGO: 100, 101, 102, 103, 104, 105, 106, 107, 108

No recomendado para aluminio alto en silicio >10% materiales compuestos plásticos, grafito.

Aluminio bajo en Silicio (<10%)
(1427-1948) SFM (ft/min)

Cobre y Latón
(515-774) SFM (ft/min)

	Ranurado	Perfilado	Desbaste	Ambos	Acabado	Ranurado	Perfilado	Desbaste	Ambos	Acabado
Axial	<(1xD)	<(1xD)	1.5xD	1xD	<(1xD)	<(1xD)	<(1xD)	1.5xD	1xD	<(1xD)
Radial	full	full	(.3-.5)xD	(.1-.15)xD	(.010-.015)	full	full	(.3-.5)xD	(.1-.15)xD	(.010-.015)
1/8"	0.0015	0.0015	0.0015	0.0016	0.0015	0.0012	0.0014	0.0009	0.0014	0.0009
1/4"	0.0040	0.0045	0.0040	0.0045	0.0040	0.0017	0.0018	0.0012	0.0020	0.0012
3/8"	0.0060	0.0065	0.0060	0.0065	0.0060	0.0027	0.0026	0.0016	0.0027	0.0016
1/2"	0.0080	0.0080	0.0080	0.0085	0.0080	0.0033	0.0036	0.0033	0.0036	0.0033
3/4"	0.0105	0.0100	0.0105	0.0100	0.0105	0.0039	0.0046	0.0036	0.0046	0.0036
1"	0.0130	0.0150	0.0130	0.0150	0.0130	0.0052	0.0059	0.0046	0.0052	0.0046

Aceros
(298-449) SFM (ft/min)

Hierro fundido
(322-515) SFM (ft/min)

	Ranurado	Perfilado	Desbaste	Ambos	Acabado	Ranurado	Perfilado	Desbaste	Ambos	Acabado
Axial	<(1xD)	<(1xD)	1.5xD	1xD	<(1xD)	<(1xD)	<(1xD)	1.5xD	1xD	<(1xD)
Radial	full	full	(.3-.5)xD	(.1-.15)xD	(.010-.015)	full	full	(.3-.5)xD	(.1-.15)xD	(.010-.015)
1/8"	0.0008	0.0012	0.0008	0.0012	0.0008	0.0013	0.0016	0.0010	0.0016	0.0010
1/4"	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0020	0.0013	0.0020	0.0013
3/8"	0.0030	0.0030	0.0030	0.0030	0.0030	0.0029	0.0029	0.0017	0.0029	0.0017
1/2"	0.0032	0.0032	0.0032	0.0032	0.0032	0.0033	0.0039	0.0033	0.0039	0.0033
3/4"	0.0035	0.0035	0.0035	0.0035	0.0035	0.0036	0.0046	0.0039	0.0046	0.0039
1"	0.0045	0.0045	0.0045	0.0045	0.0045	0.0046	0.0059	0.0052	0.0059	0.0052

Aceros inoxidables
(164-361) SFM (ft/min)

Super aleaciones (a base de níquel y cromo)
(102-151) SFM (ft/min)

	Ranurado	Perfilado	Desbaste	Ambos	Acabado	Ranurado	Perfilado	Desbaste	Ambos	Acabado
Axial	<(1xD)	<(1xD)	1.5xD	1xD	<(1xD)	<(1xD)	<(1xD)	1.5xD	1xD	<(1xD)
Radial	full	full	(.3-.5)xD	(.1-.15)xD	(.010-.015)	full	full	(.3-.5)xD	(.1-.15)xD	(.010-.015)
1/8"	0.0010	0.0008	0.0010	0.0008	0.0010	0.0004	0.0005	0.0004	0.0005	0.0004
1/4"	0.0020	0.0020	0.0020	0.0020	0.0020	0.0009	0.0013	0.0009	0.0013	0.0009
3/8"	0.0030	0.0030	0.0030	0.0030	0.0030	0.0015	0.0020	0.0015	0.0020	0.0015
1/2"	0.0030	0.0030	0.0030	0.0030	0.0030	0.0023	0.0025	0.0023	0.0025	0.0023
3/4"	0.0032	0.0032	0.0032	0.0032	0.0032	0.0030	0.0035	0.0030	0.0035	0.0030
1"	0.0035	0.0035	0.0035	0.0035	0.0035	0.0040	0.0045	0.0040	0.0045	0.0040

Acero endurecido > 48 RC
(102-164) SFM (ft/min)

Titanio
(151-256) SFM (ft/min)

	Ranurado	Perfilado	Desbaste	Ambos	Acabado	Ranurado	Perfilado	Desbaste	Ambos	Acabado
Axial	<(1xD)	<(1xD)	1.5xD	1xD	<(1xD)	<(1xD)	<(1xD)	1.5xD	1xD	<(1xD)
Radial	full	full	(.3-.5)xD	(.1-.15)xD	(.010-.015)	full	full	(.3-.5)xD	(.1-.15)xD	(.010-.015)
1/8"	0.0010	0.0012	0.0010	0.0012	0.0010	0.0004	0.0005	0.0004	0.0005	0.0004
1/4"	0.0020	0.0021	0.0020	0.0021	0.0020	0.0009	0.0009	0.0009	0.0009	0.0009
3/8"	0.0026	0.0029	0.0026	0.0029	0.0026	0.0014	0.0014	0.0014	0.0014	0.0014
1/2"	0.0033	0.0033	0.0033	0.0033	0.0033	0.0018	0.0018	0.0018	0.0018	0.0018
3/4"	0.0036	0.0039	0.0036	0.0039	0.0036	0.0025	0.0025	0.0025	0.0025	0.0025
1"	0.0039	0.0046	0.0039	0.0046	0.0039	0.0035	0.0035	0.0035	0.0035	0.0035

IPT (in/tooth)

FRESA RECTA YRADIAL DE 4 FILOS PARA USO GENERAL - MÉTRICO

NGO: 114, 115, 116, 117, 118, 119, 120, 121, 122

No recomendado para aluminio alto en silicio >10% materiales compuestos plásticos, grafito.

Aluminio bajo en Silicio (<10%)
(435-594) SMM (m/min)

Cobre y Latón
(157-236) SMM (m/min)

	Ranurado	Perfilado	Desbaste	Ambos	Acabado	Ranurado	Perfilado	Desbaste	Ambos	Acabado
Axial	<(1xD)	<(1xD)	1.5xD	1xD	<(1xD)	<(1xD)	<(1xD)	1.5xD	1xD	<(1xD)
Radial	full	full	(.3-.5)xD	(.1-.15)xD	(.010-.015)	full	full	(.3-.5)xD	(.1-.15)xD	(.010-.015)
3	0.0381	0.0381	0.0381	0.0406	0.0381	0.0297	0.0363	0.0231	0.0363	0.0231
6	0.1016	0.1143	0.1016	0.1143	0.1016	0.0429	0.0462	0.0297	0.0495	0.0297
10	0.1524	0.1651	0.1524	0.1651	0.1524	0.0693	0.0660	0.0396	0.0693	0.0396
12	0.2032	0.2032	0.2032	0.2159	0.2032	0.0826	0.0925	0.0826	0.0925	0.0826
20	0.2667	0.2540	0.2667	0.2540	0.2667	0.0991	0.1156	0.0925	0.1156	0.0925
25	0.3302	0.3810	0.3302	0.3810	0.3302	0.1321	0.1486	0.1156	0.1321	0.1156

Aceros
(91-137) SMM (m/min)

Hierro fundido
(98-157)SMM (m/min)

	Ranurado	Perfilado	Desbaste	Ambos	Acabado	Ranurado	Perfilado	Desbaste	Ambos	Acabado
Axial	<(1xD)	<(1xD)	1.5xD	1xD	<(1xD)	<(1xD)	<(1xD)	1.5xD	1xD	<(1xD)
Radial	full	full	(.3-.5)xD	(.1-.15)xD	(.010-.015)	full	full	(.3-.5)xD	(.1-.15)xD	(.010-.015)
3	0.0203	0.0305	0.0203	0.0305	0.0203	0.0330	0.0396	0.0264	0.0396	0.0264
6	0.0462	0.0457	0.0462	0.0457	0.0462	0.0462	0.0495	0.0330	0.0495	0.0330
10	0.0762	0.0762	0.0762	0.0762	0.0762	0.0726	0.0726	0.0429	0.0726	0.0429
12	0.0813	0.0813	0.0813	0.0813	0.0813	0.0826	0.0991	0.0826	0.0991	0.0826
20	0.0889	0.0889	0.0889	0.0889	0.0889	0.0925	0.1156	0.0991	0.1156	0.0991
25	0.1143	0.1143	0.1143	0.1143	0.1143	0.1156	0.1486	0.1321	0.1486	0.1321

Aceros inoxidables
(50-110) SMM (m/min)

Super aleaciones (a base de níquel y cromo)
(31-46) SMM (m/min)

	Ranurado	Perfilado	Desbaste	Ambos	Acabado	Ranurado	Perfilado	Desbaste	Ambos	Acabado
Axial	<(1xD)	<(1xD)	1.5xD	1xD	<(1xD)	<(1xD)	<(1xD)	1.5xD	1xD	<(1xD)
Radial	full	full	(.3-.5)xD	(.1-.15)xD	(.010-.015)	full	full	(.3-.5)xD	(.1-.15)xD	(.010-.015)
3	0.0254	0.0203	0.0254	0.0203	0.0254	0.0099	0.0132	0.0099	0.0132	0.0099
6	0.0508	0.0508	0.0508	0.0508	0.0508	0.0229	0.0330	0.0229	0.0330	0.0229
10	0.0762	0.0762	0.0762	0.0762	0.0762	0.0381	0.0495	0.0381	0.0495	0.0381
12	0.0762	0.0759	0.0762	0.0759	0.0762	0.0584	0.0635	0.0584	0.0635	0.0584
20	0.0813	0.0813	0.0813	0.0813	0.0813	0.0762	0.0889	0.0762	0.0889	0.0762
25	0.0889	0.0889	0.0889	0.0889	0.0889	0.1016	0.1143	0.1016	0.1143	0.1016

Acero endurecido > 48 RC
(31-50) SMM (m/min)

Titanio
(46-78) SMM (m/min)

	Ranurado	Perfilado	Desbaste	Ambos	Acabado	Ranurado	Perfilado	Desbaste	Ambos	Acabado
Axial	<(1xD)	<(1xD)	1.5xD	1xD	<(1xD)	<(1xD)	<(1xD)	1.5xD	1xD	<(1xD)
Radial	full	full	(.3-.5)xD	(.1-.15)xD	(.010-.015)	full	full	(.3-.5)xD	(.1-.15)xD	(.010-.015)
3	0.0264	0.0297	0.0264	0.0297	0.0264	0.0099	0.0132	0.0099	0.0132	0.0099
6	0.0495	0.0528	0.0495	0.0528	0.0495	0.0231	0.0231	0.0231	0.0231	0.0231
10	0.0660	0.0726	0.0660	0.0726	0.0660	0.0356	0.0356	0.0356	0.0356	0.0356
12	0.0826	0.0826	0.0826	0.0826	0.0826	0.0462	0.0462	0.0462	0.0462	0.0462
20	0.0925	0.0991	0.0925	0.0991	0.0925	0.0635	0.0635	0.0635	0.0635	0.0635
25	0.0991	0.1156	0.0991	0.1156	0.0991	0.0889	0.0889	0.0889	0.0889	0.0889

MMPT (mm/tooth)

TABLA DE CONVERSIONES					
PULGADAS	DECIMAL	MILIMETROS	PULGADAS	DECIMAL	MILIMETROS
1/64	0.0156	0.397	19/32	0.5938	15.081
1/32	0.0313	0.794	39/64	0.6094	15.478
1/16	0.0625	1.588	5/8	0.6250	15.875
5/64	0.0781	1.984	41/64	0.6406	16.272
3/32	0.0938	2.381	21/32	0.6563	16.669
7/64	0.1094	2.778	43/64	0.6719	17.066
1/8	0.1250	3.175	11/16	0.6875	17.463
9/64	0.1406	3.572	45/64	0.7031	17.859
5/32	0.1563	3.969	23/32	0.7188	18.256
11/64	0.1719	4.366	47/64	0.7344	18.653
3/16	0.1875	4.763	3/4	0.7500	19.050
13/64	0.2031	5.159	49/64	0.7656	19.447
7/32	0.2188	5.556	25/32	0.7813	19.844
15/64	0.2344	5.953	51/64	0.7969	20.241
1/4	0.2500	6.350	13/16	0.8125	20.638
17/64	0.2656	6.747	53/64	0.8281	21.034
19/64	0.2969	7.541	55/64	0.8594	21.828
5/16	0.3125	7.938	7/8	0.8750	22.225
21/64	0.3281	8.334	57/64	0.8906	22.622
11/32	0.3438	8.731	29/32	0.9063	23.019
23/64	0.3594	9.128	15/16	0.9375	23.813
3/8	0.3750	9.525	61/64	0.9531	24.209
25/64	0.3906	9.922	31/32	0.9688	24.606
13/32	0.4063	10.319	1	1.0000	25.400
27/64	0.4219	10.716	1 1/16	1.0625	26.988
7/16	0.4375	11.113	1 1/8	1.1250	28.575
29/64	0.4531	11.509	1 1/4	1.2500	31.750
15/32	0.4688	11.906	1 1/2	1.5000	38.100
31/64	0.4844	12.303	1 5/8	1.6250	41.275
1/2	0.5000	12.700	1 3/4	1.7500	44.450
33/64	0.5156	13.097	1 7/8	1.8750	47.625
17/32	0.5313	13.494	2	2.0000	50.800
35/64	0.5469	13.891	3	3.0000	76.200
37/64	0.5781	14.684	4	4.0000	101.600

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