

Hi-Tech Tools for Hi-Tech Applications in Your Industry

Millstar's Hi-Tech Cutting Tools are ideal choices for accurately and aggressively machining products in many industries. Here are some examples

- Mold and die making: injection molds, glass molds, forging dies, extrusion dies.
- Aerospace: engine, landing gear and tail hook components, structural components, blisks, airfoil machining and forging dies, helicopter rotor components.
- Power generating: turbine blades and other components.
- Medical: hip and knee replacement joints, surgical instruments, medical device molds.
- Automotive: stamping dies, wheel and tire molds, ball joints, cam shaft machining, racing engine details, bumper and other injection molds, die cast dies, forging dies for crank and cam shafts, connecting rods, steering knuckles and yokes, and many other forged components.
- Consumer products: molds for cake forms and baking dishes, cell phones, lawn chairs, trash cans, toys, bottles, recyclable cutlery and dishes, jewelry, golf clubs, safety helmets, computer and accessory housings and much more.

Call on Millstar application specialists or visit our web site www.millstar.com for more product information and expert application assistance.

Millstar's new High Performance and ultra-precise solid carbide end mills were specifically designed for High Speed, High Velocity and Hard Steel milling. Designed with specially selected premium sub-micron carbide substrate, special tool geometry and proprietary heat-defying EXALON tool coating, these tools are beating the best products the competition has to offer. They are made in the United States, and are competitively priced. Please note just some of the benefits to users:

- Square nose tools Series EMS / EIS with sharp corner or square nose tools Series EIB / EMB with corner radius, all with medium-high helix and strong cutting edges and tool body, work extremely well in materials up to 65HRC as well as in softer materials.
- Ball nose tools Series BI / BM are designed with two flutes and special nose geometry for true High Speed and Hard Material milling up to 68 HRC. Ball nose tools are the most aggressive tools for these applications. We will be glad to share our proven approach to improving your machining results.
- A new Toroid Series TOI / TOM with large corner radius and slight back taper is a Millstar innovative addition. It is very useful in I.D. and O.D. Z-level and spiral milling at constant tool pressure, pocket milling, and milling of pre-hard and hardened flat surfaces at higher speeds than tools with smaller or sharp corner radii.
- Extended Reach ball nose tools Series BMNL and extended reach square nose tools Series EMR are useful tools specifically designed for long reach milling of extrusion dies, deep cavities and cores, deep rib milling and similar applications. The reduced flute length and neck diameter assure constant cutting pressure and minimal tool deflection.



ULTRA PRECISION END MILLS



A *Cole* TOOLING SYSTEMS CO.

INCH

End Mills, Square End, Series EIS Exalon (AlTiN)-Coated



Tool Ordering No.	Cutter Diameter tol. +0 /- .0004	Corner Radius	Shank Diameter (h6)	No. of Flutes	Neck Diameter	Cutting Length	Nose Taper	Overall Length
EIS-.020-EX	0.020	–	.250 / (1/4)	3	0.020	0.060	7.5° / side	2.5
EIS-.031-EX	.031 / (1/32)	–	.250 / (1/4)	3	0.031	0.100	7.5° / side	2.5
EIS-.062-EX	.062 / (1/16)	–	.250 / (1/4)	4	0.062	0.200	7.5° / side	2.5
EIS-.093-EX	.093 / (3/32)	–	.250 / (1/4)	4	0.093	0.300	7.5° / side	2.5
EIS-.125-EX	.125 / (1/8)	–	.250 / (1/4)	5	0.125	0.375	7.5° / side	3
EIS-.187-EX	.187 / (3/16)	–	.250 / (1/4)	6	0.187	0.600	7.5° / side	3
EIS-.250-EX	.250 / (1/4)	–	.250 / (1/4)	6	0.250	0.750	–	3
EIS-.312-EX	.312 / (5/16)	–	.312 / (5/16)	6	0.312	1.000	–	3.5
EIS-.375-EX	.375 / (3/8)	–	.375 / (3/8)	6	0.375	1.125	–	3.5
EIS-.437-EX	.437 / (7/16)	–	.437 / (7/16)	6	0.437	1.315	–	4
EIS-.500-EX	.500 / (1/2)	–	.500 / (1/2)	6	0.500	1.500	–	4

End Mills, Square End Bull Nose, with Corner Radius, Series EIB Exalon (AlTiN)-Coated



Tool Ordering No.	Cutter Diameter tol. +0 /- .0004	Corner Radius	Shank Diameter (h6)	No. of Flutes	Neck Diameter	Cutting Length	Nose Taper	Overall Length
EIB-.062-015-EX	.062 / (1/16)	0.015	.250 / (1/4)	4	0.062	0.200	7.5° / side	2.5
EIB-.093-015-EX	.093 / (3/32)	0.015	.250 / (1/4)	4	0.093	0.300	7.5° / side	2.5
EIB-.125-015-EX	.125 / (1/8)	0.015	.250 / (1/4)	5	0.125	0.375	7.5° / side	3
EIB-.125-030-EX	.125 / (1/8)	0.030	.250 / (1/4)	5	0.125	0.375	7.5° / side	3
EIB-.187-030-EX	.187 / (3/16)	0.030	.250 / (1/4)	6	0.187	0.600	7.5° / side	3
EIB-.250-015-EX	.250 / (1/4)	0.015	.250 / (1/4)	6	0.250	0.750	–	3
EIB-.250-030-EX	.250 / (1/4)	0.030	.250 / (1/4)	6	0.250	0.750	–	3
EIB-.312-030-EX	.312 / (5/16)	0.030	.312 / (5/16)	6	0.312	1.000	–	3.5
EIB-.375-030-EX	.375 / (3/8)	0.030	.375 / (3/8)	6	0.375	1.125	–	3.5
EIB-.437-030-EX	.437 / (7/16)	0.030	.437 / (7/16)	6	0.437	1.315	–	4
EIB-.500-030-EX	.500 / (1/2)	0.030	.500 / (1/2)	6	0.500	1.500	–	4

End Mill, Ball Nose, Series BI Exalon (AlTiN)-Coated



Tool Ordering No.	Cutter Diameter tol. +0 /- .0004	Ball Radius	Shank Diameter (h6)	No. of Flutes	Neck Diameter	Cutting Length	Nose Taper	Overall Length
BI.020 EX	0.020	0.01	.250 / (1/4)	2	–	0.020	7.5° / side	2.5
BI.031 EX	.031 / (1/32)	0.015	.250 / (1/4)	2	–	0.031	7.5° / side	2.5
BI.062 EX	.062 / (1/16)	0.031	.250 / (1/4)	2	–	0.062	7.5° / side	2.5
BI.090 EX	.090	0.045	.250 / (1/4)	2	–	0.090	7.5° / side	2.5
BI.093 EX	.093 / (3/32)	0.046	.250 / (1/4)	2	–	0.093	7.5° / side	2.5
BI.125 EX	.125 / (1/8)	0.062	.250 / (1/4)	2	–	0.125	7.5° / side	3
BI.187 EX	.187 / (3/16)	0.093	.250 / (1/4)	2	–	0.187	7.5° / side	3
BI.250 EX	.250 / (1/4)	0.125	.250 / (1/4)	2	–	0.250	–	3
BI.312 EX	.312 / (5/16)	0.156	.312 / (5/16)	2	–	0.312	–	3.5
BI.375 EX	.375 / (3/8)	0.187	.375 / (3/8)	2	–	0.375	–	3.5
BI.375 EXLL	.375 / (3/8)	0.187	.375 / (3/8)	2	–	0.375	–	4
BI.437 EX	.437 / (7/16)	0.218	.437 / (7/16)	2	–	0.437	–	4
BI.500 EX	.500 / (1/2)	0.250	.500 / (1/2)	2	–	0.500	–	4

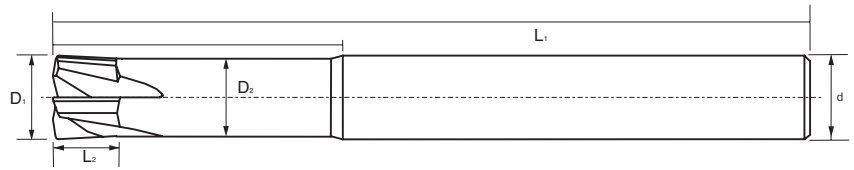
End Mill, Toroid, Series TOI Exalon (AlTiN)-Coated



Tool Ordering No.	Cutter Diameter tol. +0 /- .0004	Corner Radius	Shank Diameter (h6)	No. of Flutes	Neck Diameter	Cutting Length	Neck Length/ Nose Taper	Overall Length
TOI.125 EX	.125 / (1/8)	0.030	.250 / (1/4)	2	0.115	0.125	0.375 / 7.5°	2.5
TOI.250 EX	.250 / (1/4)	0.062	.250 / (1/4)	2	0.230	0.250	0.750 / -	2.5
TOI.375 EX	.375 / (3/8)	0.093	.375 / (3/8)	2	0.345	0.375	1.125 / -	3.0
TOI.500 EX	.500 / (1/2)	0.125	.500 / (1/2)	2	0.460	0.500	1.500 / -	3.5

All tools backdraft 3 deg.

All Tools Available Coated or Uncoated



NEW!

④ **New HFI4 (High Feed) Four Flute Solid Carbide**

Tool Ordering No.	Cutting Diameter D1	Radius A	Radius B	Shank Diameter d	Neck Diameter D2	Length of Cut L2	Neck Length L3	Overall Length L1	Step Over Ae	Depth of Cut Ap	Feed Per Tooth Fz
HFI4-0125...	0.125	0.0100	0.0390	0.250	0.115	0.0938	0.650	3	0.094	0.005	.003-.006
HFI4-0250...	0.250	0.0205	0.0780	0.250	0.235	0.1500	1.000	3	0.187	0.009	.006-.011
HFI4-0375...	0.375	0.0305	0.1170	0.375	0.360	0.1700	1.250	4	0.280	0.014	.009-.016
HFI4-0500...	0.500	0.0406	0.1562	0.500	0.485	0.1800	1.500	4	0.375	0.019	.012-.022

.. After the part number please indicate TLN, XRN or HSN when ordering.



3 Flute Endmill, 45° - Aluminum

Tool Ordering No.	Cutter Diameter tol. +0 /- .0006	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
EISA-0125-	1/8"	XX	0.125	0.500	1.5
EISA-0187-	3/16"	XX	0.187	0.625	2
EISA-0250-	1/4"	XX	0.250	0.750	2.5
EISA-0312-	5/16"	XX	0.312	0.750	2.5
EISA-0375-	3/8"	XX	0.375	0.875	2.5
EISA-0437-	7/16"	XX	0.437	0.875	2.5
EISA-0500-	1/2"	XX	0.500	1.250	3
EISA-0625-	5/8"	XX	0.625	1.250	3.5
EISA-0750-	3/4"	XX	0.750	1.500	4
EISA-1000-	1"	XX	1.000	1.500	4



3 Flute Ballnose, 45° - Aluminum

Tool Ordering No.	Cutter Diameter tol. +0 /- .0006	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
BIA-0125-	1/8"	.063"	0.125	0.500	1.5
BIA-0187-	3/16"	.094"	0.187	0.625	2
BIA-0250-	1/4"	.125"	0.250	0.750	2.5
BIA-0312-	5/16"	.156"	0.312	0.750	2.5
BIA-0375-	3/8"	.188"	0.375	0.875	2.5
BIA-0437-	7/16"	.219"	0.437	0.875	2.5
BIA-0500-	1/2"	.250"	0.500	1.250	3
BIA-0625-	5/8"	.313"	0.625	1.250	3.5
BIA-0750-	3/4"	.375"	0.750	1.500	4
BIA-1000-	1"	.500"	1.000	1.500	4



2 Flute Long Series Endmills, Ballnose

Tool Ordering No.	Cutter Diameter tol. +0 /- .0006	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
BI2-0125-LL-	1/8"	0.063"	0.125	0.625	2
BI2-0187-LL-	3/16"	.094"	0.187	1.000	3
BI2-0250-LL-	1/4"	.125"	0.250	1.000	3
BI2-0312-LL-	5/16"	.156"	0.312	1.000	3
BI2-0375-LL-	3/8"	.188"	0.375	1.000	4
BI2-0437-LL-	7/16"	.219"	0.437	1.000	4
BI2-0500-LL-	1/2"	.250"	0.500	1.000	4
BI2-0625-LL-	5/8"	.313"	0.625	2.000	6
BI2-0750-LL-	3/4"	.375"	0.750	2.000	6
BI2-1000-LL-	1"	.500"	1.000	2.000	6



4 Flute Long Series Endmills, Ballnose

Tool Ordering No.	Cutter Diameter tol. +0 /- .0006	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
BI4-0125-LL-	1/8"	0.063"	0.125	0.625	2
BI4-0187-LL-	3/16"	.094"	0.187	1.000	3
BI4-0250-LL-	1/4"	.125"	0.250	1.000	3
BI4-0312-LL-	5/16"	.156"	0.312	1.000	3
BI4-0375-LL-	3/8"	.188"	0.375	1.000	4
BI4-0437-LL-	7/16"	.219"	0.437	1.000	4
BI4-0500-LL-	1/2"	.250"	0.500	1.000	4
BI4-0625-LL-	5/8"	.313"	0.625	2.000	6
BI4-0750-LL-	3/4"	.375"	0.750	2.000	6
BI4-1000-LL-	1"	.500"	1.000	2.000	6

All Tools Available Coated or Uncoated



4 Flute Variable Fluted Endmills, Square End with 45° Chamfer

Tool Ordering No.	Cutter Diameter tol. +0 /- .0006	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
EIV4-0125-	1/8"	XX	0.125	0.500	1.5
EIV4-0187-	3/16"	XX	0.187	0.625	2
EIV4-0250-	1/4"	XX	0.250	0.750	2.5
EIV4-0312-	5/16"	XX	0.312	0.750	2.5
EIV4-0375-	3/8"	XX	0.375	0.875	2.5
EIV4-0437-	7/16"	XX	0.437	0.875	2.5
EIV4-0500-	1/2"	XX	0.500	1.250	3
EIV4-0625-	5/8"	XX	0.625	1.250	3.5
EIV4-0750-	3/4"	XX	0.750	1.500	4
EIV4-1000-	1"	XX	1.000	1.500	4



220° 2 Flute Endmills Ball End

Tool Ordering No.	Cutter Diameter tol. +0 /- .0006	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
BI220-0125-	1/8"	.125"	0.125	0.0938	1.5
BI220-0187-	3/16"	.093"	0.187	0.141	2
BI220-0250-	1/4"	.125"	0.250	0.188	2.5
BI220-0312-	5/16"	.156"	0.312	0.234	2.5
BI220-0375-	3/8"	.187"	0.375	0.281	2.5
BI220-0437-	7/16"	.218"	0.437	0.328	2.5
BI220-0500-	1/2"	.250"	0.500	0.375	3



2 Flute Endmills, Square End

Tool Ordering No.	Cutter Diameter tol. +0 /- .0006	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)	Nose Taper Per Side
EIS2-031-	1/32"	XX	0.125	0.094	1.5	7.5 Deg
EIS2-062-	1/16"	XX	0.125	0.250	1.5	7.5 Deg
EIS2-093-	3/32"	XX	0.125	0.375	1.5	7.5 Deg
EIS2-0125-	1/8"	XX	0.125	0.500	1.5	-
EIS2-0187-	3/16"	XX	0.187	0.625	2	-
EIS2-0250-	1/4"	XX	0.250	0.750	2.5	-
EIS2-0312-	5/16"	XX	0.312	0.750	2.5	-
EIS2-0375-	3/8"	XX	0.375	0.875	2.5	-
EIS2-0437-	7/16"	XX	0.437	0.875	2.5	-
EIS2-0500-	1/2"	XX	0.500	1.250	3	-
EIS2-0625-	5/8"	XX	0.625	1.250	3.5	-
EIS2-0750-	3/4"	XX	0.750	1.500	4	-
EIS2-0875-	7/8"	XX	0.875	1.500	4	-



4 Flute Endmills, Square End

Tool Ordering No.	Cutter Diameter tol. +0 /- .0006	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)	Nose Taper Per Side
EIS4-031-	1/32"	XX	0.125	0.094	1.5	7.5 Deg
EIS4-062-	1/16"	XX	0.125	0.250	1.5	7.5 Deg
EIS4-093-	3/32"	XX	0.125	0.375	1.5	7.5 Deg
EIS4-0125-	1/8"	XX	0.125	0.500	1.5	-
EIS4-0187-	3/16"	XX	0.187	0.625	2	-
EIS4-0250-	1/4"	XX	0.250	0.750	2.5	-
EIS4-0312-	5/16"	XX	0.312	0.750	2.5	-
EIS4-0375-	3/8"	XX	0.375	0.875	2.5	-
EIS4-0437-	7/16"	XX	0.437	0.875	2.5	-
EIS4-0500-	1/2"	XX	0.500	1.250	3	-
EIS4-0625-	5/8"	XX	0.625	1.250	3.5	-
EIS4-0750-	3/4"	XX	0.750	1.500	4	-
EIS4-0875-	7/8"	XX	0.875	1.500	4	-



2 Flute Long Series Endmills, Square End

Tool Ordering No.	Cutter Diameter tol. +0 /- .0006	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
EIS2-0125-LL-	1/8"	XX	0.125	0.625	2
EIS2-0187-LL-	3/16"	XX	0.187	1.000	3
EIS2-0250-LL-	1/4"	XX	0.250	1.000	3
EIS2-0312-LL-	5/16"	XX	0.312	1.000	3
EIS2-0375-LL-	3/8"	XX	0.375	1.000	4
EIS2-0437-LL-	7/16"	XX	0.437	1.000	4
EIS2-0500-LL-	1/2"	XX	0.500	1.000	4
EIS2-0625-LL-	5/8"	XX	0.625	2.000	6
EIS2-0750-LL-	3/4"	XX	0.750	2.000	6
EIS2-1000-LL-	1"	XX	1.000	2.000	6



4 Flute Long Series Endmills, Square End

Tool Ordering No.	Cutter Diameter tol. +0 /- .0006	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
EIS4-0125-LL-	1/8"	XX	0.125	0.625	2
EIS4-0187-LL-	3/16"	XX	0.187	1.000	3
EIS4-0250-LL-	1/4"	XX	0.250	1.000	3
EIS4-0312-LL-	5/16"	XX	0.312	1.000	3
EIS4-0375-LL-	3/8"	XX	0.375	1.000	4
EIS4-0437-LL-	7/16"	XX	0.437	1.000	4
EIS4-0500-LL-	1/2"	XX	0.500	1.000	4
EIS4-0625-LL-	5/8"	XX	0.625	2.000	6
EIS4-0750-LL-	3/4"	XX	0.750	2.000	6
EIS4-1000-LL-	1"	XX	1.000	2.000	6

- Square nose tools Series EMS / EIS with sharp corner or square nose tools Series EIB / EMB with corner radius, all with medium-high helix and strong cutting edges and tool body, work extremely well in materials up to 65HRC as well as in softer materials.
- Ball nose tools Series BI / BM are designed with two flutes and special nose geometry for true High Speed and Hard Material milling up to 68 HRC. Ball nose tools are the most aggressive tools for these applications. We will be glad to share our proven approach to improving your machining results.
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- Extended Reach ball nose tools Series BMNL and extended reach square nose tools Series EMR are useful tools specifically designed for long reach milling of extrusion dies, deep cavities and cores, deep rib milling and similar applications. The reduced flute length and neck diameter assure constant cutting pressure and minimal tool deflection.

End Mills, Square End, Series EMS

Exalon (AlTiN)-Coated



Tool Ordering No.	Cutter Diameter tol. +0 /-0.01	Corner Radius	Shank Diameter (h6)	No. of Flutes	Neck Diameter	Cutting Length	Nose Taper	Overall Length
EMS-0.5-EX	0,5	–	6	3	0,5	1,5	7.5° / side	63
EMS-1.0-EX	1	–	6	4	1	3	7.5° / side	63
EMS-1.5-EX	1,5	–	6	4	1,5	4,5	7.5° / side	63
EMS-2.0-EX	2	–	6	4	2,0	6	7.5° / side	63
EMS-3.0-EX	3	–	6	5	3,0	9	7.5° / side	75
EMS-4.0-EX	4	–	6	6	4,0	12	7.5° / side	75
EMS-5.0-EX	5	–	6	6	5	15	–	75
EMS-6.0-EX	6	–	6	6	6	18	–	75
EMS-8.0-EX	8	–	8	6	8	24	–	90
EMS-10.0-EX	10	–	10	6	10	30	–	100
EMS-12.0-EX	12	–	12	6	12	36	–	100

End Mills, Square End Bull Nose, with Corner Radius, Series EMB

Exalon (AlTiN)-Coated



Tool Ordering No.	Cutter Diameter tol. +0 /-0.01	Corner Radius	Shank Diameter (h6)	No. of Flutes	Neck Diameter	Cutting Length	Nose Taper	Overall Length
EMB-1.0-0.2-EX	1	0,2	6	4	1	3	7.5° / side	63
EMB-1.5-0.2-EX	1,5	0,2	6	4	1,5	4,5	7.5° / side	63
EMB-2.0-0.2-EX	2	0,2	6	4	2	6	7.5° / side	63
EMB-3.0-0.3-EX	3	0,3	6	5	3	9	7.5° / side	75
EMB-4.0-0.5-EX	4	0,5	6	6	4	12	7.5° / side	75
EMB-5.0-0.5-EX	5	0,5	6	6	5	15	7.5° / side	75
EMB-6.0-0.5-EX	6	0,5	6	6	6	18	–	75
EMB-6.0-1.0-EX	6	1	6	6	6	18	–	75
EMB-8.0-0.5-EX	8	0,5	8	6	8	24	–	90
EMB-10.0-1.0-EX	10	1	10	6	10	30	–	100
EMB-12.0-1.0-EX	12	1	12	6	12	36	–	100

End Mill, Ball Nose, Series BM

Exalon (AlTiN)-Coated



Tool Ordering No.	Cutter Diameter tol. +0 /-0.01	Ball Radius	Shank Diameter (h6)	No. of Flutes	Neck Diameter	Cutting Length	Nose Taper	Overall Length
BM 0.5 EX	0,5	0,25	6	2	–	0,5	7.5° / side	63
BM 1.0 EX	1	0,50	6	2	–	1,0	7.5° / side	63
BM 1.5 EX	1,5	0,75	6	2	–	1,5	7.5° / side	63
BM 2.0 EX	2	1,00	6	2	–	2,0	7.5° / side	63
BM 3.0 EX	3	1,50	6	2	–	3,0	7.5° / side	75
BM 4.0 EX	4	2,00	6	2	–	4,0	7.5° / side	75
BM 5.0 EX	5	2,50	6	2	–	5,0	7.5° / side	75
BM 6.0 EX	6	3,00	6	2	–	6,0	–	75
BM 8.0 EX	8	4,00	8	2	–	8,0	–	90
BM 10.0 EX	10	5,00	10	2	–	10,0	–	100
BM 12.0 EX	12	6,00	12	2	–	12,0	–	100
BM 16.0 EX	16	8,00	16	2	–	16,0	–	100
BM 16.0 EX-LL	16	8,00	16	2	–	16,0	–	150

ULTRA PRECISION END MILLS



A **Cole** TOOLING SYSTEMS CO.

METRIC

End Mill, Toroid, Series TOM Exalon (AlTiN)-Coated



Tool Ordering No.	Cutter Diameter tol. +0 /-0.01	Corner Radius	Shank Diameter (h6)	No. of Flutes	Neck Diameter	Cutting Length	Neck Length/ Nose Taper	Overall Length
All tools backdraft 3 deg.								
TOM 2.0 EX	2	0.5	6.0	2	1.84	2.0	6 / 7.5°	63
TOM 3.0 EX	3	0.5	6.0	2	2.76	3.0	9 / 7.5°	63
TOM 4.0 EX	4	1.0	6	2	3.68	4.0	12 / 7.5°	63
TOM 6.0 EX	6	1.5	6	2	5.52	6.0	18 / -	63
TOM 8.0 EX	8	2.0	8	2	7.37	8.0	24 / -	75
TOM 10.0 EX	10	2.5	10	2	9.21	10.0	30 / -	75
TOM 12.0 EX	12	3.0	12	2	11.05	12.0	36 / -	90

Ball End Mill, Extended Reach Tapered Nose, Series BMNL 1.3 degree neck taper per side Exalon (AlTiN)-Coated



Tool Ordering No.	Cutter Diameter tol. +0 /-0.01	Ball Radius	Shank Diameter (h6)	No. of Flutes	Neck Dia. / Taper	Cutting Length	Neck Length	Overall Length
BM-2.0-EX-1.25NL	2	1	6	2	1,9 / 1,3	2	31,75 / (1,25")	75
BM-2.0-EX-1.80NL	2	1	6	2	1,9 / 1,3	2	45,70 / (1,8")	75
BM-2.5-EX-1.25NL	2,5	1,25	6	2	2,4 / 1,3	2,5	31,75 / (1,25")	75
BM-2.5-EX-1.80NL	2,5	1,25	6	2	2,4 / 1,3	2,5	45,70 / (1,8")	75
BM-3.0-EX-1.25NL	3	1,5	6	2	2,9 / 1,3	3	31,75 / (1,25")	75
BM-3.0-EX-1.50NL	3	1,5	6	2	2,9 / 1,3	3	38,1 / (1,5")	75
BM-3.0-EX-1.80NL	3	1,5	6	2	2,9 / 1,3	3	45,70 / (1,8")	75
BM-3.0-EX-50NL	3	1,5	6	2	2,9 / 1,3	3	50 / (1,95")	75
BM-4.0-EX-1.25NL	4	2	6	2	3,9 / 1,3	4	31,75 / (1,25")	75
BM-4.0-EX-1.80NL	4	2	6	2	3,9 / 1,3	4	45,70 / (1,8")	75
BM-4.0-EX-50NL	4	2	6	2	3,9 / 1,3	4	50 / (1,95")	75
BM-5.0-EX-1.25NL	5	2,5	6	2	4,9 / 1,3	5	31,75 / (1,25")	75
BM-5.0-EX-1.80NL	5	2,5	6	2	4,9 / 1,3	5	45,70 / (1,8")	75
BM-6.0-EX-1.25NL	6	3	6	2	5,9 / -	6	31,75 / (1,25")	75
BM-6.0-EX-1.50NL	6	3	6	2	5,9 / -	6	38,1 / (1,5")	75
BM-6.0-EX-1.80NL	6	3	6	2	5,9 / -	6	45,70 / (1,8")	75
BM-8.0-EX-1.25NL	8	4	8	2	7,9 / -	8	31,75 / (1,25")	75

End Mill, Square End Bull Nose, with Corner Radius, Extended Reach Tapered Nose, Series EMR 1.3 degree neck taper per side Exalon (AlTiN)-Coated

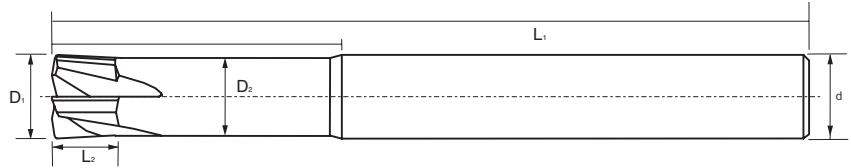


Tool Ordering No.	Cutter Diameter tol. +0 /-0.01	Corner Radius	Shank Diameter (h6)	No. of Flutes	Neck Dia. / Taper	Cutting Length	Neck Length	Overall Length
EMR-2.0-0.2-EX-1.25NL	2	0,2	6	4	1,9 / 1,3	2	31,75 / (1,25")	75
EMR-2.0-0.2-EX-1.80NL	2	0,2	6	4	1,9 / 1,3	2	45,70 / (1,8")	75
EMR-2.0-0.2-EX-50NL	2	0,2	6	4	1,9 / 1,3	2	50 / (1,95")	75
EMR-2.5-0.2-EX-1.25NL	2,5	0,2	6	4	2,4 / 1,3	2,5	31,75 / (1,25")	75
EMR-2.5-0.2-EX-1.80NL	2,5	0,2	6	4	2,4 / 1,3	2,5	45,70 / (1,8")	75
EMR-3.0-0.2-EX-1.25NL	3	0,2	6	5	2,9 / 1,3	3	31,75 / (1,25")	75
EMR-3.0-0.2-EX-1.80NL	3	0,2	6	5	2,9 / 1,3	3	45,70 / (1,8")	75
EMR-3.0-0.2-EX-50NL	3	0,2	6	5	2,9 / 1,3	3	50 / (1,95")	75
EMR-4.0-0.2-EX-1.25NL	4	0,2	6	6	3,9 / 1,3	4	31,75 / (1,25")	75
EMR-4.0-0.2-EX-1.80NL	4	0,2	6	6	3,9 / 1,3	4	45,70 / (1,8")	75
EMR-4.0-0.2-EX-50NL	4	0,2	6	6	3,9 / 1,3	4	50 / (1,95")	75
EMR-5.0-0.2-EX-1.25NL	5	0,2	6	6	4,9 / 1,3	5	31,75 / (1,25")	75
EMR-5.0-0.2-EX-1.80NL	5	0,2	6	6	4,9 / 1,3	5	45,70 / (1,8")	75
EMR-6.0-0.2-EX-1.25NL	6	0,2	6	6	5,9 / -	6	31,75 / (1,25")	75
EMR-6.0-0.2-EX-1.80NL	6	0,2	6	6	5,9 / -	6	45,70 / (1,8")	75
EMR-12.0-0.2-EX-1.25NL	12	0,2	12	6	11,9 / -	12	31,75 / (1,25")	75
EMR-12.0-0.2-EX-1.80NL	12	0,2	12	6	11,9 / -	12	45,70 / (1,8")	75

Safety Precautions Grinding or other use of this tool may produce hazardous dust and fumes which may endanger health. To avoid adverse health effects, read the material safety data sheet for this product, as well as for any cutting fluids or material coming into contact with this product – utilize adequate ventilation and appropriate protection. Cutting tools may shatter when broken, wearing of eye protection is strongly advised in the vicinity of their use.

All Tools Available Coated or Uncoated

NEW!



④ New HFM4 (High Feed) Four Flute Solid Carbide

Tool Ordering No.	Cutting Diameter D1	Radius A	Radius B	Shank Diameter d	Neck Diameter D2	Length of Cut L2	Neck Length L3	Overall Length L1	Step Over Ae	Depth of Cut Ap	Feed Per Tooth Fz
HFM4-03...	3	0,244	0,940	6	2,74	2,8	16	76	2,25	0.12	,07-,14
HFM4-06...	6	0,485	1,875	6	5,61	3,8	25	76	4,5	0.24	,14-,28
HFM4-08...	8	0,648	2,500	8	7,62	4,0	30	76	6	0.32	,18-,36
HFM4-10...	10	0,813	3,124	10	9,60	4,3	33	100	7,5	0.40	,22-,44
HFM4-12...	12	0,975	3,750	12	11,61	4,6	38	101	9	0.48	,27-,54

.. After the part number please indicate TLN, XRN or HSN when ordering.



3 Flute Endmill, 45° - Aluminum - METRIC

Tool Ordering No.	Cutter Diameter tol. +0 /- .015	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
EMSA-04-	4	XX	4,000	14	50
EMSA-06-	6	XX	6,000	19	63
EMSA-08-	8	XX	8,000	22	63
EMSA-10-	10	XX	10,000	25	63
EMSA-12-	12	XX	12,000	25	76
EMSA-16-	16	XX	16,000	38	88
EMSA-20-	20	XX	20,000	38	101



3 Flute Ballnose, 45° - Aluminum - METRIC

Tool Ordering No.	Cutter Diameter tol. +0 /- .015	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
BMA-03-	3	1,5	3,000	12	38
BMA-04-	4	2	4,000	14	50
BMA-06-	6	3	6,000	19	63
BMA-08-	8	4	8,000	22	63
BMA-10-	10	5	10,000	25	63
BMA-12-	12	6	12,000	25	76
BMA-16-	16	8	16,000	38	88
BMA-20-	20	10	20,000	38	101



2 Flute Endmills Long Series, Ball End - METRIC

Tool Ordering No.	Cutter Diameter tol. +0 /- .015	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
BM2-03-LL-	3	1,5	3	16	50
BM2-04-LL-	4	2	4	20	76
BM2-06-LL-	6	3	6	25	76
BM2-08-LL-	8	4	8	25	76
BM2-10-LL-	10	5	10	25	101
BM2-12-LL-	12	6	12	25	101
BM2-16-LL-	16	8	16	50	152
BM2-20-LL-	20	10	20	50	152



4 Flute Endmills Long Series, Ball End - METRIC

Tool Ordering No.	Cutter Diameter tol. +0 /- .015	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
BM4-03-LL-	3	1,5	3	16	50
BM4-04-LL-	4	2	4	20	76
BM4-06-LL-	6	3	6	25	76
BM4-08-LL-	8	4	8	25	76
BM4-10-LL-	10	5	10	25	101
BM4-12-LL-	12	6	12	25	101
BM4-16-LL-	16	8	16	50	152
BM4-20-LL-	20	10	20	50	152

All Tools Available Coated or Uncoated



4 Flute Variable Fluted Endmills, Square End with 45° Chamfer - METRIC

Tool Ordering No.	Cutter Diameter tol. +0 /-.015	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
EMV4-03-	3	XX	3	16	38
EMV4-04-	4	XX	4	20	50
EMV4-06-	6	XX	6	25	63
EMV4-08-	8	XX	8	25	63
EMV4-10-	10	XX	10	25	63
EMV4-12-	12	XX	12	25	76
EMV4-16-	16	XX	16	50	88
EMV4-20-	20	XX	20	50	101



220° - 2 Flute Endmills - Ball End - METRIC

Tool Ordering No.	Cutter Diameter tol. +0 /-.015	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
BM220-03-	3	1,5	3	2,25	38
BM220-04-	4	2	4	3,00	50
BM220-06-	6	3	6	4,50	63
BM220-08-	8	4	8	6,00	63
BM220-10-	10	5	10	7,50	63
BM220-12-	12	6	12	9,00	76



2 Flute Endmills, Square End - METRIC

Tool Ordering No.	Cutter Diameter tol. +0 /-.015	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
EMS2-01-	1*	XX	3,000	4	38
EMS2-02-	2*	XX	3,000	8	38
EMS2-03-	3	XX	3,000	12	38
EMS2-04-	4	XX	4,000	14	50
EMS2-06-	6	XX	6,000	19	63
EMS2-08-	8	XX	8,000	22	63
EMS2-10-	10	XX	10,000	25	63
EMS2-12-	12	XX	12,000	25	76
EMS2-16-	16	XX	16,000	38	88
EMS2-20-	20	XX	20,000	38	101



4 Flute Endmills, Square End - METRIC

Tool Ordering No.	Cutter Diameter tol. +0 /-.015	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
EMS4-03-	3	XX	3,000	12	38
EMS4-04-	4	XX	4,000	14	50
EMS4-06-	6	XX	6,000	19	63
EMS4-08-	8	XX	8,000	22	63
EMS4-10-	10	XX	10,000	25	63
EMS4-12-	12	XX	12,000	25	76
EMS4-16-	16	XX	16,000	38	88
EMS4-20-	20	XX	20,000	38	101



2 Flute Endmills Long Series, Square - METRIC

Tool Ordering No.	Cutter Diameter tol. +0 /-.015	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
EMS2-03-LL-	3	XX	3	16	50
EMS2-04-LL-	4	XX	4	20	76
EMS2-06-LL-	6	XX	6	25	76
EMS2-08-LL-	8	XX	8	25	76
EMS2-10-LL-	10	XX	10	25	101
EMS2-12-LL-	12	XX	12	25	101
EMS2-16-LL-	16	XX	16	50	152
EMS2-20-LL-	20	XX	20	50	152



4 Flute Endmills Long Series, Square - METRIC

Tool Ordering No.	Cutter Diameter tol. +0 /-.015	Corner Radius (R1)	Shank Diameter (D1)	Cutting Length (L1)	Total Length (L2)
EMS4-03-LL-	3	XX	3	16	50
EMS4-04-LL-	4	XX	4	20	76
EMS4-06-LL-	6	XX	6	25	76
EMS4-08-LL-	8	XX	8	25	76
EMS4-10-LL-	10	XX	10	25	101
EMS4-12-LL-	12	XX	12	25	101
EMS4-16-LL-	16	XX	16	50	152
EMS4-20-LL-	20	XX	20	50	152