



Power. Precision. Performance.



**DRIVING
PERFORMANCE
TO THE EDGE.**

**truCORE[®]
END MILLS
E SERIES**

FRACTIONAL AND METRIC CATALOG

**The front line for your
bottom line.**



Better precision, longer tool life by design.

Optimized flute designs and a super-thick core give IMCO truCORE E Series end mills cutting performance you don't see with conventional general-purpose tools. Choose an IMCO high-performance coating and the right end and shank design and the performance advantages really add up.



Power. Precision. Performance.

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Get higher productivity every day.

Improve your general machining productivity with IMCO's truCORE E Series end mills. With all these advantages – and IMCO's leadership in cutting tool technology – you get results that are anything but ordinary.

- Rugged ultra-fine grain carbide core for superior rigidity and longer life.
- 2, 3 or 4 helical flutes; tapered straight flutes for die and mold milling.
- 2 flute microtools for micromachining.
- All IMCO truCORE end mills over .031 in diameter are center cutting.
- Optimized geometries, designed and CNC precision-ground for stronger cutting edges, superior balance.
- Range of end styles for the right corner strength, part feature and surface finish.
- Available with advanced coatings or uncoated for exactly the performance you need.

truCORE E Series

IMCO E Series end mills give you better precision and better finishes in the materials you work with most.



Aluminum and non-ferrous alloys

Aluminum, copper, and magnesium alloys, brass, bronze, composites, and graphite



Cast iron

Malleable and gray cast irons



Carbon and tool steels

Carbon and tool steels < 50 HRC



Hardened materials

Carbon and tool steels and stainless steels > 50 HRC



Stainless steels

Austenitic, martensitic, and PH stainless steels



Heat-resistant super alloys

Inconel, Hastalloy, and titanium alloys



truCORE E Series Features

Multiple end type options: Wide variety of corner radii available, square end for general machining and finishing, and ball end style for contouring applications.

Use tapered endmills for milling or sinking die and mold cavities. **Constant helix design** and **unique flute form** assures fast and accurate cutting.

h6 tolerance shanks – fit all collets and conform to shrink-fit requirements. Many sizes offered with Weldon flat.

AlTiN coating gives the best performance in most materials. Its hot hardness allows tools to run at higher spindle speeds than uncoated tools or tools coated with TiN or TiCN.

Our **exclusive chipbreaker design** reduces cutting forces, creating smaller chips that can be removed faster and easier thus eliminating the cause of most tool chatter.

Ultra fine-grain carbide substrate starts tool design from a position of strength. Gives tool superior rigidity to prevent tool distortion and extend tool life.

E14 E53 M104

Options

End designs

Corner radii – A wide range available to help prevent cutting-end chipping when roughing or working in difficult-to-machine materials.

Square end – Better results with standard machining and finishing.

Ball end – For precision contouring

Center cutting – For plunge cutting and ramping.

Shank designs

H6 tolerance shanks – Fit all collets and conform to shrink-fit requirements.

Weldon Flats – Available on many sizes for end mill holders.

Choose the length for the job.

Extra rigidity – Choose stub length.

Deep cavity milling – Choose long or extra-long lengths.

Choose the right coating for the job.

E Series end mills make fast work of most machining work in these materials:

| | | AlTiN | TiCN | TiN | MG |
|----------|-------------------------------|-------|------|-----|-----|
| N | Aluminum & non-ferrous alloys | | | ● | ●●● |
| K | Cast irons | ●●● | ●● | ● | ● |
| P | Carbon & tool steels < 50 HRC | ●●● | ●● | ● | ● |
| H | Hardened materials > 50 HRC | ●●● | ● | | |
| M | Stainless steels | ●●● | ● | ● | |
| S | Heat-resistant super alloys | ●●● | ●● | ● | ● |

●●● Recommended ●● Good ● Suitable

E SERIES

Driving Performance to the Edge

What makes IMCO end mills the best choice for your everyday applications?

Strength: All IMCO truCORE end mills are made using submicron grain carbide with a 10% cobalt binder, increasing the transverse rupture strength for longer durability and even edge wear.

Consistency: IMCO end mills are manufactured on high-precision CNC grinders to exacting standards, ensuring repeatability from tool to tool.

Variety: Many length and dimension options are available in tools with 2, 3 or 4 flutes – many with AlTiN or TiCN coating. Weldon flats are available on many sizes.

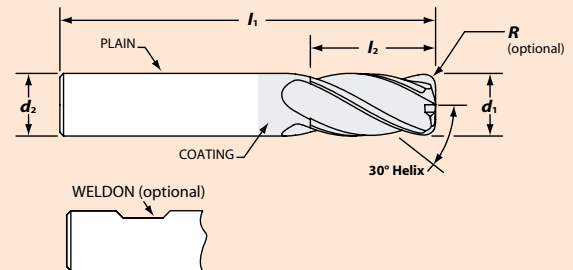
With all of this, it's easy to see how IMCO tooling can give you maximum performance when working in a wide range of materials.

E14

Square End and Corner Radius



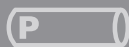
truCORE 4 flute mills are CNC ground from the highest quality carbide material, maximizing performance and repeatability. Available uncoated and with AlTiN, TiCN or TiN coating. Use tools with corner radius to extend tool life in roughing and semi-finishing operations.



in $d_1: +0.000 / -0.002$ $d_2: h_6$

mm $d_1: +0.000 / -0.050$ $d_2: h_6$

Model Code: E14
w/Square End and Plain Shank



| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AITIN Order Code | TiCN Order Code | MG Order Code | TiN Order Code | EZ-ID Number E14 - Cx - xxxx - xxxx - SQ - Lxx d1 l2 l1 |
|------------------|-----------------|---------------------|----------------------|---------------------|------------------------|------------------|---------------------|---|
| 1/32 | 1/8 | 1/16 | 1-1/2 | 30891 | | 34698 | | E14-Cx-0031-0062-SQ |
| | | 3/32 | 1-1/2 | 99345 | 34402 | 30701 | | E14-Cx-0031-0093-SQ |
| 3/64 | 1/8 | 3/32 | 1-1/2 | 30892 | | 34701 | | E14-Cx-0046-0093-SQ |
| | | 9/64 | 1-1/2 | 30537 | 34403 | 30703 | | E14-Cx-0046-0140-SQ |
| 1/16 | 1/8 | 1/8 | 1-1/2 | 30529 | 31530 | 31503 | 30706 | E14-Cx-0062-0125-SQ |
| | | 3/16 | 1-1/2 | 30800 | 34404 | 30705 | | E14-Cx-0062-0187-SQ |
| | | 1/4 | 1-1/2 | 90695 | | 90694 | | E14-Cx-0062-0250-SQ |
| 5/64 | 1/8 | 1/4 | 1-1/2 | 30506 | | 30707 | E14-Cx-0078-0250-SQ | |
| 3/32 | 1/8 | 3/16 | 1-1/2 | 31545 | 31531 | 31505 | 30710 | E14-Cx-0093-0187-SQ |
| | | 3/8 | 1-1/2 | 30531 | 34406 | 30709 | | E14-Cx-0093-0375-SQ |
| 7/64 | 1/8 | 3/8 | 1-1/2 | 30458 | | 30711 | 30714 | E14-Cx-0109-0375-SQ |
| | | 1/4 | 1-1/2 | 97871 | 31532 | 31507 | | E14-Cx-0125-0250-SQ |
| 1/8 | 1/8 | 1/2 | 1-1/2 | 30521 | 34408 | 30713 | | E14-Cx-0125-0500-SQ |
| | | 5/8 | 2 | 62107 | | | | E14-Cx-0125-0625-SQ |
| | | 3/4 | 2-1/4 | 30417 | 37710 | 37708 | | E14-Cx-0125-0750-SQ |
| | | 1 | 3 | 97847 | 34110 | 34108 | | E14-Cx-0125-1000-SQ |
| 9/64 | 3/16 | 9/16 | 2 | 30500 | | 30715 | E14-Cx-0140-0562-SQ | |
| 5/32 | 3/16 | 5/16 | 2 | 39757 | | 31509 | | E14-Cx-0156-0312-SQ |
| | | 9/16 | 2 | 30501 | 34410 | 30717 | | E14-Cx-0156-0562-SQ |
| 11/64 | 3/16 | 5/8 | 2 | 30507 | | 30719 | | E14-Cx-0171-0625-SQ |
| | | 3/8 | 2 | 31548 | 31534 | 31511 | 30722 | E14-Cx-0187-0375-SQ |
| 5/8 | 2 | 30520 | 34412 | 30721 | E14-Cx-0187-0625-SQ | | | |
| 3/4 | 2-1/2 | 37793 | | 37712 | E14-Cx-0187-0750-SQ | | | |
| 1 | 4 | 62110 | | | E14-Cx-0187-1000-SQ | | | |
| 13/64 | 1/4 | 5/8 | 2-1/2 | 30469 | 34114 | 34112 | | E14-Cx-0187-1125-SQ |
| 7/32 | 1/4 | 7/16 | 2 | 39759 | | | | E14-Cx-0203-0625-SQ-L25 |
| | | 5/8 | 2-1/2 | 30546 | 34414 | 30725 | | E14-Cx-0218-0437-SQ |
| 15/64 | 1/4 | 3/4 | 2-1/2 | 30972 | | | | E14-Cx-0218-0625-SQ-L25 |
| | | 1/2 | 2 | 31595 | 31536 | 31515 | 30730 | E14-Cx-0234-0750-SQ |
| 3/4 | 2-1/2 | 98955 | 34416 | 30729 | E14-Cx-0250-0500-SQ | | | |
| 1 | 4 | 62111 | | 62106 | E14-Cx-0250-0750-SQ | | | |
| 1-1/8 | 3 | 99336 | 37718 | 37716 | E14-Cx-0250-1000-SQ-L4 | | | |
| 1-1/2 | 4 | 98978 | 34118 | 34116 | E14-Cx-0250-1125-SQ | | | |
| 1-1/2 | 6 | 39772 | | 31163 | E14-Cx-0250-1500-SQ | | | |
| 17/64 | 5/16 | 3/4 | 2-1/2 | 30976 | | | | E14-Cx-0250-1500-SQ |
| 9/32 | 5/16 | 3/4 | 2-1/2 | 96156 | 34418 | 30733 | | E14-Cx-0265-0750-SQ |
| 19/64 | 5/16 | 13/16 | 2-1/2 | 30979 | | | | E14-Cx-0281-0750-SQ |
| | | 1/2 | 2 | 30534 | | 31517 | | E14-Cx-0296-0812-SQ |
| 5/16 | 5/16 | 13/16 | 2-1/2 | 30898 | 34420 | 30737 | 30738 | E14-Cx-0312-0500-SQ |
| | | 1 | 4 | 62114 | | | | E14-Cx-0312-0812-SQ |
| | | 1-1/8 | 3 | 30461 | 37722 | 37720 | | E14-Cx-0312-1000-SQ-L4 |
| | | 1-5/8 | 4 | 34123 | 34122 | 34120 | | E14-Cx-0312-1125-SQ |
| 21/64 | 3/8 | 1 | 2-1/2 | 31003 | | | E14-Cx-0312-1625-SQ | |
| 11/32 | 3/8 | 1 | 2-1/2 | 30463 | | 30741 | E14-Cx-0328-1000-SQ | |
| 23/64 | 3/8 | 1 | 2-1/2 | 31004 | | | E14-Cx-0343-1000-SQ | |
| 3/8 | 3/8 | 5/8 | 2 | 31549 | 31538 | 31519 | 30746 | E14-Cx-0359-1000-SQ |
| | | 1 | 2-1/2 | 98244 | 34424 | 30745 | | E14-Cx-0375-0625-SQ |
| | | 1 | 4 | 62115 | | | | E14-Cx-0375-1000-SQ |
| | | 1-1/8 | 3 | 37727 | 37726 | 37724 | | E14-Cx-0375-1000-SQ-L4 |
| | | 1-1/2 | 6 | 97850 | | 31135 | | E14-Cx-0375-1125-SQ |
| | | 1-3/4 | 4 | 34136 | 34126 | 34124 | | E14-Cx-0375-1500-SQ-L6 |
| 25/64 | 7/16 | 1 | 2-3/4 | 31024 | | | E14-Cx-0375-1750-SQ | |
| 13/32 | 7/16 | 1 | 2-3/4 | 31026 | | 30749 | E14-Cx-0390-1000-SQ | |
| 27/64 | 7/16 | 1 | 2-3/4 | 31028 | | | E14-Cx-0406-1000-SQ | |
| | | | | | | | | E14-Cx-0421-1000-SQ |

Model Code: E14
w/Square End and Plain Shank



| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | TiCN Order Code | MG Order Code | TiN Order Code | EZ-ID Number | | | |
|------------------|-----------------|---------------------|----------------------|---------------------|--------------------|------------------|-------------------|------------------------|---------------------|-------------------|-----------|
| | | | | | | | | E14 - Cx - | xxxx - d1 | xxxx - SQ - l2 | Lxx l1 |
| 7/16 | 7/16 | 1 | 2-3/4 | 31040 | 34430 | 30772 | 37754 | E14-Cx-0437-1000-SQ | | | |
| | | 2 | 4 | 37731 | 37730 | 37728 | | E14-Cx-0437-2000-SQ | | | |
| 29/64 | 1/2 | 1 | 3 | 30475 | | | | E14-Cx-0453-1000-SQ | | | |
| 15/32 | 1/2 | 1 | 3 | 31030 | | | | E14-Cx-0468-1000-SQ | | | |
| 31/64 | 1/2 | 1 | 3 | 99106 | | | | E14-Cx-0484-1000-SQ | | | |
| 1/2 | 1/2 | 5/8 | 2-1/2 | 31546 | 31540 | 31523 | 30762 | E14-Cx-0500-0625-SQ | | | |
| | | 1 | 3 | 98245 | 34432 | 30761 | | E14-Cx-0500-1000-SQ | | | |
| | | 1 | 4 | 62160 | | | | E14-Cx-0500-1000-SQ-L4 | | | |
| | | 1-1/2 | 6 | 31150 | | 31147 | | E14-Cx-0500-1500-SQ-L6 | | | |
| | | 2 | 4 | 37735 | 37734 | 37732 | | 37733 | E14-Cx-0500-2000-SQ | | |
| | | 3 | 6 | 34135 | 34134 | 34132 | | 34133 | E14-Cx-0500-3000-SQ | | |
| 9/16 | 9/16 | 1-1/4 | 3-1/2 | 30996 | 34436 | 30763 | 30764 | E14-Cx-0562-1250-SQ | | | |
| 5/8 | 5/8 | 3/4 | 3 | 39771 | | | | E14-Cx-0625-0750-SQ | | | |
| | | 1-1/4 | 3-1/2 | 30555 | 34440 | 30765 | 30766 | E14-Cx-0625-1250-SQ | | | |
| | | 2 | 6 | 31130 | | | | E14-Cx-0625-2000-SQ-L6 | | | |
| | | 2-1/4 | 5 | 30561 | 37742 | 37740 | 37741 | E14-Cx-0625-2250-SQ | | | |
| | | 3 | 6 | 34143 | 34142 | 34140 | 34141 | E14-Cx-0625-3000-SQ | | | |
| 11/16 | 3/4 | 1-1/2 | 4 | 31032 | | | | E14-Cx-0687-1500-SQ | | | |
| 3/4 | 3/4 | 1 | 3 | 30435 | | 31527 | | E14-Cx-0750-1000-SQ | | | |
| | | 1-1/2 | 4 | 98956 | 34448 | 30769 | 30770 | E14-Cx-0750-1500-SQ | | | |
| | | 2 | 6 | 31132 | | | | E14-Cx-0750-2000-SQ-L6 | | | |
| | | 2-1/4 | 5 | 37751 | 37750 | 37748 | 37749 | E14-Cx-0750-2250-SQ | | | |
| | | 3 | 6 | 34151 | 34150 | 34148 | 34149 | E14-Cx-0750-3000-SQ | | | |
| 13/16 | 7/8 | 1-1/2 | 4 | 31034 | | | | E14-Cx-0812-1500-SQ | | | |
| 7/8 | 7/8 | 1-1/2 | 4 | 30523 | 34456 | 30773 | | E14-Cx-0875-1500-SQ | | | |
| 15/16 | 1 | 1-1/2 | 4 | 31038 | | | | E14-Cx-0937-1500-SQ | | | |
| 1 | 1 | 1-1/2 | 4 | 98957 | 34464 | 30777 | 30778 | E14-Cx-1000-1500-SQ | | | |
| | | 2-1/4 | 5 | 37767 | 37766 | 37764 | | E14-Cx-1000-2250-SQ | | | |
| | | 3 | 6 | 34167 | 34166 | 34164 | | E14-Cx-1000-3000-SQ | | | |

Model Code: E14
w/Square End and Weldon Shank



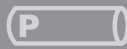
| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | TiCN Order Code | MG Order Code | EZ-ID Number | | |
|------------------|-----------------|---------------------|----------------------|---------------------|--------------------|------------------|-----------------------|--------------|-------------------|
| | | | | | | | E14 - Cx - | xxxx - d1 | xxxx - SQ - l2 |
| 1/4 | 1/4 | 3/4 | 2-1/2 | 39788 | 39779 | 39729 | E14-Cx-0250-0750-SQ-W | | |
| 5/16 | 5/16 | 13/16 | 2-1/2 | 39789 | | 39737 | E14-Cx-0312-0812-SQ-W | | |
| | | 1 | 2-1/2 | 39790 | 39781 | 39745 | E14-Cx-0375-1000-SQ-W | | |
| 3/8 | 3/8 | 1-1/8 | 3 | 39168 | | 39164 | E14-Cx-0375-1125-SQ-W | | |
| | | 1-3/4 | 4 | 39175 | | 39124 | E14-Cx-0375-1750-SQ-W | | |
| | | 1 | 3 | 39791 | 39782 | 39761 | E14-Cx-0500-1000-SQ-W | | |
| 1/2 | 1/2 | 2 | 4 | 39169 | | 96334 | E14-Cx-0500-2000-SQ-W | | |
| | | 3 | 6 | 39176 | | 39132 | E14-Cx-0500-3000-SQ-W | | |
| | | 1-1/4 | 3-1/2 | 39792 | | 39763 | E14-Cx-0562-1250-SQ-W | | |
| 5/8 | 5/8 | 1-1/4 | 3-1/2 | 39793 | 39784 | 39765 | E14-Cx-0625-1250-SQ-W | | |
| | | 2-1/4 | 5 | 39170 | | 39740 | E14-Cx-0625-2250-SQ-W | | |
| | | 3 | 6 | 39177 | | 39173 | E14-Cx-0625-3000-SQ-W | | |
| | | 1-1/2 | 4 | 39794 | 39785 | 39769 | E14-Cx-0750-1500-SQ-W | | |
| 3/4 | 3/4 | 2-1/4 | 5 | 39171 | | 39748 | E14-Cx-0750-2250-SQ-W | | |
| | | 3 | 6 | 39178 | | 39148 | E14-Cx-0750-3000-SQ-W | | |
| 7/8 | 7/8 | 1-1/2 | 4 | 39795 | | | E14-Cx-0875-1500-SQ-W | | |
| 1 | 1 | 1-1/2 | 4 | 39796 | | 39777 | E14-Cx-1000-1500-SQ-W | | |
| | | 2-1/4 | 5 | 39172 | | 39964 | E14-Cx-1000-2250-SQ-W | | |
| | | 3 | 6 | 39365 | | 96625 | E14-Cx-1000-3000-SQ-W | | |

**NEED
 LONGER
 LENGTHS?**

Check out our M9
 POW·R·FEED® catalog,
 available to download at
www.imcousa.com.



Model Code: E14
w/Corner Radius and Plain Shank



| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AITiN Order Code by Corner Radius (R) | | | | | | EZ-ID Number E14 - Cx - xxxx - xxxx - xxx d1 l2 R |
|------------------|-----------------|---------------------|----------------------|--|---------|---------|---------|---------|---------|---|
| | | | | .015 CR | .020 CR | .030 CR | .045 CR | .060 CR | .090 CR | |
| 1/8 | 1/8 | 1/2 | 1-1/2 | 97662 | 90523 | | | | | E14-C2-0125-0500-xxx |
| 3/16 | 3/16 | 5/8 | 2 | 39694 | 39695 | 39601 | | | | E14-C2-0187-0625-xxx |
| 1/4 | 1/4 | 3/4 | 2-1/2 | 30519 | 39513 | 39604 | 39696 | | | E14-C2-0250-0750-xxx |
| 5/16 | 5/16 | 13/16 | 2-1/2 | 39697 | 39698 | 39700 | 39701 | | | E14-C2-0312-0812-xxx |
| 3/8 | 3/8 | 1 | 2-1/2 | 37443 | 37444 | 37445 | 37446 | 37447 | 37448 | E14-C2-0375-1000-xxx |
| 1/2 | 1/2 | 1 | 3 | 37449 | 37450 | 37451 | 37452 | 37453 | 37454 | E14-C2-0500-1000-xxx |
| 5/8 | 5/8 | 1-1/4 | 3-1/2 | | | 37458 | | 37460 | | E14-C2-0625-1250-xxx |
| 3/4 | 3/4 | 1-1/2 | 4 | | | 37464 | | 37466 | 37467 | E14-C2-0750-1500-xxx |

Model Code: E14
w/Corner Radius and Weldon Shank



| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AITiN Order Code by Corner Radius (R) | | | | | | EZ-ID Number E14-Cx-xxxx-xxxx-xxx-W d1 l2 R |
|------------------|-----------------|---------------------|----------------------|--|---------|---------|---------|---------|---------|---|
| | | | | .015 CR | .020 CR | .030 CR | .045 CR | .060 CR | .090 CR | |
| 3/8 | 3/8 | 1 | 2-1/2 | 97665 | 39715 | 39605 | 39598 | 39702 | 39703 | E14-C2-0375-1000-xxx-W |
| 1/2 | 1/2 | 1 | 3 | 97710 | 30560 | 39704 | 39600 | 39597 | 39705 | E14-C2-0500-1000-xxx-W |
| 5/8 | 5/8 | 1-1/4 | 3-1/2 | | | 39709 | | 39544 | | E14-C2-0625-1250-xxx-W |
| 3/4 | 3/4 | 1-1/2 | 4 | | | 39603 | | 97575 | 39713 | E14-C2-0750-1500-xxx-W |

TOOL TIP

Which Coating to Use?

All of IMCO's tools are tested for the best combination of geometry, substrate and coating to achieve the desired performance for their targeted applications. But we also offer several coatings on our truCORE mills. Most coatings add hardness and lubricity to the cutting tool. So, which one is best for your application?

Overall, AlTiN coating gives the best performance in most materials. AlTiN's heat resistance (hot hardness rating) allows tools to run at higher spindle speeds than uncoated tools or tools coated with TiN or TiCN. AlTiN-style coatings are also the most effective coatings for running dry in many materials. Faster



speeds and improved cycle times can result from making the switch to AlTiN coating.

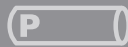
TiCN coating can be very beneficial in cutting aluminum, when you can't use an aluminum-based coating (like AlTiN). Choose TiCN coating to add lubricity to the cutting edge in gummy materials.

Model Code: E14
w/Square End and Plain Shank



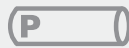
| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | TiCN Order Code | MG Order Code | EZ-ID Number E14 - Cx - xxx - xxx - SQ d1 l2 |
|------------------|-----------------|---------------------|----------------------|---------------------|--------------------|------------------|--|
| 1 | 3 | 2 | 38 | 39722 | 32175 | 38788 | E14-Cx-010-002-SQ |
| | | 3 | 38 | 32202 | 32141 | 31471 | E14-Cx-010-003-SQ |
| 1,5 | 3 | 3 | 38 | 39723 | 32142 | 38789 | E14-Cx-015-003-SQ |
| | | 4,5 | 38 | 32204 | | 31472 | E14-Cx-015-004-SQ |
| | | 6 | 38 | 30252 | | 38607 | E14-Cx-015-006-SQ |
| 2 | 3 | 4 | 38 | 39724 | 32101 | 38790 | E14-Cx-020-004-SQ |
| | | 6,3 | 38 | 32208 | | 31473 | E14-Cx-020-006-SQ |
| | | 9 | 38 | 30253 | | 38608 | E14-Cx-020-009-SQ |
| 2,5 | 3 | 5 | 38 | 39725 | 32145 | 38791 | E14-Cx-025-005-SQ |
| | | 9,5 | 38 | 32212 | | 31474 | E14-Cx-025-009-SQ |
| 3 | 3 | 6 | 38 | 39726 | 32145 | 38792 | E14-Cx-030-006-SQ |
| | | 9 | 38 | 99284 | | 36560 | E14-Cx-030-009-SQ |
| | | 12 | 38 | 32214 | | 31475 | E14-Cx-030-012-SQ |
| | | 19 | 57 | 39804 | | 30125 | E14-Cx-030-019-SQ |
| 3,5 | 4 | 25 | 75 | 32301 | 32147 | 30040 | E14-Cx-030-025-SQ |
| | | 7 | 50 | 39728 | | 38793 | E14-Cx-035-007-SQ |
| | | 14 | 50 | 32216 | | 31476 | E14-Cx-035-014-SQ |
| 4 | 4 | 8 | 50 | 39731 | 32147 | 38794 | E14-Cx-040-008-SQ |
| | | 11 | 50 | 36585 | | 36561 | E14-Cx-040-011-SQ |
| | | 14 | 50 | 32218 | | 31477 | E14-Cx-040-014-SQ |
| | | 19 | 63 | 39805 | | 30126 | E14-Cx-040-019-SQ |
| 4,5 | 5 | 31 | 75 | 32302 | 32149 | 30043 | E14-Cx-040-031-SQ |
| | | 16 | 50 | 32222 | | 31478 | E14-Cx-045-016-SQ |
| | | 10 | 50 | 39736 | | 38796 | E14-Cx-050-010-SQ |
| 5 | 5 | 13 | 50 | 36586 | 32149 | 36563 | E14-Cx-050-013-SQ |
| | | 16 | 50 | 32224 | | 31479 | E14-Cx-050-016-SQ |
| | | 19 | 63 | 39806 | | 30127 | E14-Cx-050-019-SQ |
| | | 31 | 100 | 32304 | | 30135 | E14-Cx-050-031-SQ |
| 6 | 6 | 12 | 54 | 36839 | 32150 | 38834 | E14-Cx-060-012-SQ |
| | | 13 | 57 | 36587 | | 36565 | E14-Cx-060-013-SQ |
| | | 19 | 63 | 32226 | | 31480 | E14-Cx-060-019-SQ |
| | | 29 | 75 | 39807 | | 30049 | E14-Cx-060-029-SQ |
| 7 | 7 | 38 | 100 | 32306 | 32152 | 30137 | E14-Cx-060-038-SQ |
| | | 16 | 60 | 36588 | | 36567 | E14-Cx-070-016-SQ |
| | | 19 | 63 | 32227 | | 31481 | E14-Cx-070-019-SQ |
| 8 | 8 | 14 | 58 | 36849 | 32152 | 38835 | E14-Cx-080-014-SQ |
| | | 19 | 63 | 36589 | | 36569 | E14-Cx-080-019-SQ |
| | | 20 | 63 | 32228 | | 31482 | E14-Cx-080-020-SQ |
| | | 29 | 75 | 39808 | | 30052 | E14-Cx-080-029-SQ |
| 9 | 9 | 41 | 100 | 32308 | 32154 | 30138 | E14-Cx-080-041-SQ |
| | | 19 | 67 | 36590 | | 36571 | E14-Cx-090-019-SQ |
| | | 22 | 72 | 32229 | | 31483 | E14-Cx-090-022-SQ |
| 10 | 10 | 16 | 66 | 36848 | 32154 | 38836 | E14-Cx-100-016-SQ |
| | | 22 | 72 | 36591 | | 36573 | E14-Cx-100-022-SQ |
| | | 25 | 72 | 32230 | | 31484 | E14-Cx-100-025-SQ |
| | | 40 | 88 | 36838 | | 30079 | E14-Cx-100-040-SQ |
| 11 | 11 | 45 | 100 | 32310 | 32155 | 30055 | E14-Cx-100-045-SQ |
| | | 26 | 83 | 36592 | | 36574 | E14-Cx-110-026-SQ |
| | | 19 | 73 | 36847 | | 38837 | E14-Cx-120-019-SQ |
| 12 | 12 | 25 | 76 | 32231 | 32155 | 31485 | E14-Cx-120-025-SQ |
| | | 26 | 83 | 36593 | | 36575 | E14-Cx-120-026-SQ |
| | | 50 | 100 | 39810 | | 30058 | E14-Cx-120-050-SQ |
| | | 75 | 150 | 32312 | | 30061 | E14-Cx-120-075-SQ |

Model Code: E14
w/Square End and Plain Shank



| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | TiCN Order Code | MG Order Code | EZ-ID Number | | |
|------------------|-----------------|---------------------|----------------------|---------------------|--------------------|------------------|---------------------------|----|----|
| | | | | | | | E14 - Cx - xxx - xxx - SQ | d1 | l2 |
| 14 | 14 | 26 | 83 | 36594 | | 36577 | E14-Cx-140-026-SQ | | |
| | | 32 | 83 | 32232 | | 34445 | E14-Cx-140-032-SQ | | |
| | | 57 | 125 | 39811 | | 30129 | E14-Cx-140-057-SQ | | |
| | | 75 | 150 | 32314 | | 30064 | E14-Cx-140-075-SQ | | |
| 16 | 16 | 25 | 82 | 39751 | | 38802 | E14-Cx-160-025-SQ | | |
| | | 32 | 89 | 32234 | | 31487 | E14-Cx-160-032-SQ | | |
| | | 32 | 92 | 36595 | | 36579 | E14-Cx-160-032-SQ | | |
| | | 57 | 125 | 39812 | | 30131 | E14-Cx-160-057-SQ | | |
| | | 75 | 150 | 32318 | | 30067 | E14-Cx-160-075-SQ | | |
| 18 | 18 | 32 | 92 | 36596 | | 36580 | E14-Cx-180-032-SQ | | |
| | | 38 | 100 | 32235 | | 31488 | E14-Cx-180-038-SQ | | |
| | | 57 | 125 | 39813 | | 30132 | E14-Cx-180-057-SQ | | |
| | | 75 | 150 | 32322 | | 30070 | E14-Cx-180-075-SQ | | |
| 20 | 20 | 38 | 100 | 32237 | | 31489 | E14-Cx-200-038-SQ | | |
| | | 38 | 104 | 36597 | | 36581 | E14-Cx-200-038-SQ | | |
| | | 57 | 125 | 39814 | | 30133 | E14-Cx-200-057-SQ | | |
| | | 75 | 150 | 32324 | | 30073 | E14-Cx-200-075-SQ | | |
| 22 | 22 | 38 | 100 | 30255 | | 31402 | E14-Cx-220-038-SQ | | |
| 25 | 25 | 38 | 100 | 32238 | | 31490 | E14-Cx-250-038-SQ | | |
| | | 45 | 120 | 36899 | | 36582 | E14-Cx-250-045-SQ | | |
| | | 57 | 125 | 39815 | | 30134 | E14-Cx-250-057-SQ | | |
| | | 75 | 150 | 32325 | | 30076 | E14-Cx-250-075-SQ | | |

Model Code: E14
w/Corner Radius and Plain Shank



| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | AlTiN Order Code by Corner Radius (R) | | | | | EZ-ID Number E14 - Cx - xxx - xxx - xxx d1 l2 R |
|------------------|-----------------|---------------------|----------------------|---------------------|--|--------|--------|--------|--------|---|
| | | | | | 0,3 CR | 0,4 CR | 0,5 CR | 1,0 CR | 1,5 CR | |
| 3 | 3 | 12 | 38 | 37478 | | | | | | E14-C2-030-012-xxx |
| 4 | 4 | 11 | 50 | | 37479 | | | | | E14-C2-040-011-xxx |
| 5 | 5 | 13 | 50 | | | 37480 | | | | E14-C2-050-013-xxx |
| 6 | 6 | 13 | 57 | 37481 | | 37482 | | | | E14-C2-060-013-xxx |
| 8 | 8 | 19 | 63 | | | 37483 | 37484 | 37485 | | E14-C2-080-019-xxx |
| 10 | 10 | 22 | 72 | | | 37486 | 37487 | 37488 | | E14-C2-100-022-xxx |
| 12 | 12 | 26 | 83 | | | 37489 | 37490 | 37491 | | E14-C2-120-026-xxx |
| 16 | 16 | 32 | 92 | | | 37492 | 37493 | 37494 | 37495 | E14-C2-160-032-xxx |
| 20 | 20 | 38 | 104 | | | 37496 | 37497 | 37498 | 37499 | E14-C2-200-038-xxx |

E14

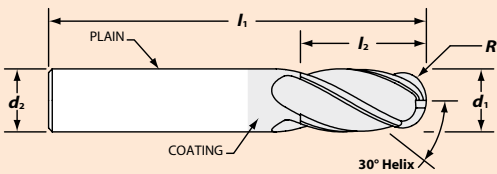
Model Code: E14 w/Ball End and Plain Shank



Ball End



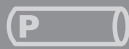
truCORE 4 flute mills are CNC ground from the highest quality carbide material, maximizing performance and repeatability. Available uncoated and with TiCN and AlTiN coating. Use ball end tools in contouring applications.



in $d_1: +0.000 / -0.002$ $d_2: h6$
mm $d_1: +0,000 / -0,050$ $d_2: h6$

| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | TiCN Order Code | MG Order Code | EZ-ID Number E14 - Cx - xxxx - xxxx - BN - Lxx d1 l2 l1 | | |
|------------------|-----------------|---------------------|----------------------|---------------------|---------------------|------------------|---|-------------------------|------------------------|
| 1/32 | 1/8 | 1/16 | 1-1/2 | 31774 | | 31699 | E14-Cx-0031-0062-BN | | |
| | | 3/32 | 1-1/2 | 30559 | | | E14-Cx-0031-0093-BN | | |
| 3/64 | 1/8 | 3/32 | 1-1/2 | 31775 | | 31701 | E14-Cx-0046-0093-BN | | |
| | | 9/64 | 1-1/2 | 30539 | | | E14-Cx-0046-0140-BN | | |
| 1/16 | 1/8 | 1/8 | 1-1/2 | 30530 | 34504 | 31703 | E14-Cx-0062-0125-BN | | |
| | | 3/16 | 1-1/2 | 97852 | | | E14-Cx-0062-0187-BN | | |
| 5/64 | 1/8 | 1/4 | 1-1/2 | 30482 | | 30905 | E14-Cx-0078-0250-BN | | |
| | | 3/16 | 1-1/2 | 31700 | | | E14-Cx-0093-0187-BN | | |
| 3/32 | 1/8 | 3/8 | 1-1/2 | 30992 | 34506 | 30907 | E14-Cx-0093-0375-BN | | |
| | | 7/64 | 1-1/2 | 30405 | | | E14-Cx-0109-0375-BN | | |
| 1/8 | 1/8 | 1/4 | 1-1/2 | 31747 | | 30911 | E14-Cx-0125-0250-BN | | |
| | | 1/2 | 1-1/2 | 30997 | | | 34508 | 30913 | E14-Cx-0125-0500-BN |
| | | 5/8 | 2 | 37897 | | | 37910 | 37908 | E14-Cx-0125-0625-BN |
| | | 3/4 | 2-1/4 | 37911 | | | | | E14-Cx-0125-0750-BN |
| 9/64 | 3/16 | 1 | 3 | 97842 | 34310 | 34308 | E14-Cx-0125-1000-BN | | |
| | | 9/16 | 2 | 31044 | | | E14-Cx-0140-0562-BN | | |
| 5/32 | 3/16 | 5/16 | 2 | 30465 | 34510 | 30917 | E14-Cx-0156-0312-BN | | |
| | | 9/16 | 2 | 30468 | | | E14-Cx-0156-0562-BN | | |
| 3/16 | 3/16 | 3/8 | 2 | 31746 | 34512 | 30921 | E14-Cx-0187-0375-BN | | |
| | | 5/8 | 2 | 30524 | | | 37912 | 37912 | E14-Cx-0187-0625-BN |
| | | 3/4 | 2-1/2 | 37915 | | | | | E14-Cx-0187-0750-BN |
| | | 1 | 4 | 37898 | | | E14-Cx-0187-1000-BN | | |
| 7/32 | 1/4 | 1-1/8 | 3 | 37938 | 34312 | 34312 | E14-Cx-0187-1125-BN | | |
| | | 5/8 | 2-1/2 | 31046 | | | 30925 | E14-Cx-0218-0625-BN-L25 | |
| | | 1/2 | 2 | 31745 | | | E14-Cx-0250-0500-BN | | |
| 1/4 | 1/4 | 3/4 | 2-1/2 | 30998 | 34516 | 30929 | E14-Cx-0250-0750-BN | | |
| | | 1 | 4 | 37899 | | | E14-Cx-0250-1000-BN-L4 | | |
| | | 1-1/8 | 3 | 37919 | | | 37918 | 37916 | E14-Cx-0250-1125-BN |
| | | 1-1/2 | 4 | 96411 | | | | | E14-Cx-0250-1500-BN |
| | | 1-1/2 | 6 | 97844 | | | 34318 | 34316 | E14-Cx-0250-1500-BN |
| 9/32 | 5/16 | 3/4 | 2-1/2 | 30464 | | 30933 | E14-Cx-0281-0750-BN | | |
| | | 1/2 | 2 | 31744 | | | E14-Cx-0312-0500-BN | | |
| 5/16 | 5/16 | 13/16 | 2-1/2 | 30525 | 34520 | 30937 | E14-Cx-0312-0812-BN | | |
| | | 1 | 4 | 37900 | | | E14-Cx-0312-1000-BN-L4 | | |
| | | 1-1/8 | 3 | 34323 | | | 37922 | 37920 | E14-Cx-0312-1125-BN |
| | | 1-5/8 | 4 | 34361 | | | | | E14-Cx-0312-1625-BN |
| 11/32 | 3/8 | 1 | 2-1/2 | 30408 | | 30945 | E14-Cx-0343-1000-BN | | |
| | | 5/8 | 2 | 31749 | | | E14-Cx-0375-0625-BN | | |
| 3/8 | 3/8 | 1 | 2-1/2 | 98262 | 34524 | 30945 | E14-Cx-0375-1000-BN | | |
| | | 1 | 4 | 37901 | | | E14-Cx-0375-1000-BN-L4 | | |
| | | 1-1/8 | 3 | 37927 | | | 37926 | 37924 | E14-Cx-0375-1125-BN |
| | | 1-1/2 | 6 | 97845 | | | | | E14-Cx-0375-1500-BN-L6 |
| | | 1-3/4 | 4 | 34335 | | | 34326 | 34324 | E14-Cx-0375-1750-BN |
| 7/16 | 7/16 | 1 | 2-3/4 | 31052 | 34530 | 30900 | E14-Cx-0437-1000-BN | | |
| | | 2 | 4 | 30485 | | | E14-Cx-0437-2000-BN | | |
| 1/2 | 1/2 | 5/8 | 2-1/2 | 31743 | | 30961 | E14-Cx-0500-0625-BN | | |
| | | 1 | 3 | 97922 | | | 34532 | 30961 | E14-Cx-0500-1000-BN |
| | | 1 | 4 | 37902 | | | 31347 | 37934 | E14-Cx-0500-1000-BN-L4 |
| | | 1-1/2 | 6 | 97846 | | | | | E14-Cx-0500-1500-BN-L6 |
| | | 2 | 4 | 37935 | | | 37934 | 37932 | E14-Cx-0500-2000-BN |
| 3 | 6 | 30473 | 34334 | 34332 | E14-Cx-0500-3000-BN | | | | |
| 9/16 | 9/16 | 1-1/4 | 3-1/2 | 30409 | | 30965 | E14-Cx-0562-1250-BN | | |
| | | 1-1/4 | 3-1/2 | 30991 | | | 34540 | 30965 | E14-Cx-0625-1250-BN |
| 5/8 | 5/8 | 2-1/4 | 5 | 30486 | | 37940 | E14-Cx-0625-2250-BN | | |
| | | 3 | 6 | 30488 | | | 34340 | 34340 | E14-Cx-0625-3000-BN |
| 11/16 | 3/4 | 1-1/2 | 4 | 31050 | | 30969 | E14-Cx-0687-1500-BN | | |
| | | 1-1/2 | 4 | 95757 | | | 34548 | 30969 | E14-Cx-0750-1500-BN |
| 3/4 | 3/4 | 2-1/4 | 5 | 37937 | | 37948 | E14-Cx-0750-2250-BN | | |
| | | 3 | 6 | 30474 | | | 34348 | 34348 | E14-Cx-0750-3000-BN |
| 7/8 | 7/8 | 1-1/2 | 4 | 30527 | | 30977 | E14-Cx-0875-1500-BN | | |
| | | 1-1/2 | 4 | 30528 | | | 30977 | 30977 | E14-Cx-1000-1500-BN |
| 1 | 1 | 2-1/4 | 5 | 37967 | | 37964 | E14-Cx-1000-2250-BN | | |
| | | 3 | 6 | 30476 | | | 34364 | 34364 | E14-Cx-1000-3000-BN |

Model Code: E14
w/Ball End and Plain Shank



| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | MG Order Code | EZ-ID Number E14 - Cx - xxx - xxx - BN d1 l2 |
|------------------|-----------------|---------------------|----------------------|---------------------|------------------|--|
| 1 | 3 | 2 | 38 | 39862 | 38881 | E14-Cx-010-002-BN |
| | | 3 | 38 | 39835 | 32641 | E14-Cx-010-003-BN |
| 1,5 | 3 | 3 | 38 | 39863 | 38882 | E14-Cx-015-003-BN |
| | | 4,5 | 38 | 39836 | 32642 | E14-Cx-015-004-BN |
| | | 6 | 38 | 62570 | 38617 | E14-Cx-015-006-BN |
| 2 | 3 | 4 | 38 | 39864 | 38883 | E14-Cx-020-004-BN |
| | | 6,3 | 38 | 39838 | 32643 | E14-Cx-020-006-BN |
| | | 9 | 38 | 62571 | 38618 | E14-Cx-020-009-BN |
| 2,5 | 3 | 5 | 38 | 39867 | 38884 | E14-Cx-025-005-BN |
| | | 9,5 | 38 | 39839 | 32644 | E14-Cx-025-009-BN |
| 3 | 3 | 6 | 38 | 39868 | 38885 | E14-Cx-030-006-BN |
| | | 12 | 38 | 39841 | 32645 | E14-Cx-030-012-BN |
| | | 19 | 57 | 39880 | 38894 | E14-Cx-030-019-BN |
| | | 25 | 75 | 39892 | 32326 | E14-Cx-030-025-BN |
| 3,5 | 4 | 14 | 50 | 39842 | 32646 | E14-Cx-035-014-BN |
| | | 8 | 50 | 39871 | 38887 | E14-Cx-040-008-BN |
| 4 | 4 | 14 | 50 | 39843 | 32647 | E14-Cx-040-014-BN |
| | | 19 | 63 | 39881 | 38895 | E14-Cx-040-019-BN |
| | | 31 | 75 | 39893 | 32329 | E14-Cx-040-031-BN |
| 4,5 | 5 | 16 | 50 | 39844 | 32648 | E14-Cx-045-016-BN |
| | | 10 | 50 | 39873 | 38889 | E14-Cx-050-010-BN |
| 5 | 5 | 16 | 50 | 39847 | 32649 | E14-Cx-050-016-BN |
| | | 19 | 63 | 39882 | 38896 | E14-Cx-050-019-BN |
| | | 31 | 100 | 39894 | 38897 | E14-Cx-050-031-BN |
| 6 | 6 | 12 | 54 | 37361 | 39441 | E14-Cx-060-012-BN |
| | | 19 | 63 | 39848 | 32650 | E14-Cx-060-019-BN |
| | | 29 | 75 | 39883 | 32335 | E14-Cx-060-029-BN |
| | | 38 | 100 | 39895 | 38898 | E14-Cx-060-038-BN |
| 7 | 8 | 19 | 63 | 39849 | 32651 | E14-Cx-070-019-BN |
| | | 14 | 58 | 37362 | 39442 | E14-Cx-080-014-BN |
| 8 | 8 | 20 | 63 | 39850 | 32652 | E14-Cx-080-020-BN |
| | | 29 | 75 | 39884 | 32338 | E14-Cx-080-029-BN |
| | | 41 | 100 | 39896 | 38899 | E14-Cx-080-041-BN |
| 9 | 10 | 22 | 72 | 39851 | 32653 | E14-Cx-090-022-BN |
| | | 16 | 66 | 37364 | 39443 | E14-Cx-100-016-BN |
| 10 | 10 | 25 | 72 | 39852 | 32654 | E14-Cx-100-025-BN |
| | | 40 | 88 | 37366 | 39444 | E14-Cx-100-040-BN |
| | | 45 | 100 | 39897 | 32341 | E14-Cx-100-045-BN |
| 12 | 12 | 25 | 76 | 39853 | 32655 | E14-Cx-120-025-BN |
| | | 26 | 83 | 37344 | 39446 | E14-Cx-120-026-BN |
| | | 50 | 100 | 39886 | 32344 | E14-Cx-120-050-BN |
| | | 75 | 150 | 39898 | 32347 | E14-Cx-120-075-BN |
| 14 | 14 | 32 | 83 | 39854 | | E14-Cx-140-032-BN |
| | | 32 | 89 | 39865 | | E14-Cx-160-032-BN |
| 16 | 16 | 57 | 125 | 39888 | | E14-Cx-160-057-BN |
| | | 38 | 100 | 39857 | | E14-Cx-180-038-BN |
| 20 | 20 | 38 | 104 | 32672 | | E14-Cx-200-038-BN |
| | | 57 | 125 | 39890 | | E14-Cx-200-057-BN |
| 25 | 25 | 45 | 120 | 37252 | | E14-Cx-250-045-BN |

E24

Square End



truCORE 4 flute mills are CNC ground from the highest quality carbide material, maximizing performance and repeatability. Available uncoated and with AlTiN, TiCN or TiN coating.

Model Code: E24 w/Square End and Plain Shank

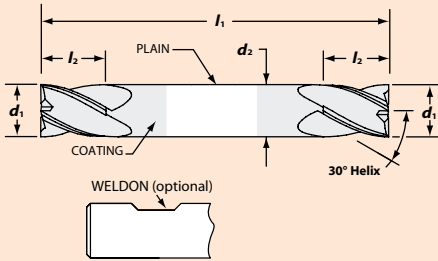


| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | TiCN Order Code | MG Order Code | TiN Order Code | EZ-ID Number E24 - Cx - xxxx - xxxx - SQ - Lxx d1 l2 l1 |
|------------------|-----------------|---------------------|----------------------|---------------------|--------------------|------------------|-------------------|---|
| 1/32 | 1/8 | 1/16 | 1-1/2 | 30410 | 31962 | 31930 | | E24-Cx-0031-0062-SQ |
| 3/64 | 1/8 | 3/32 | 1-1/2 | 31900 | 31963 | 31931 | | E24-Cx-0046-0093-SQ |
| 1/16 | 1/8 | 1/8 | 1-1/2 | 31985 | 31964 | 31903 | | E24-Cx-0062-0125-SQ |
| 5/64 | 1/8 | 1/8 | 1-1/2 | 31949 | 31965 | 31932 | | E24-Cx-0078-0125-SQ |
| 3/32 | 1/8 | 3/16 | 1-1/2 | 31927 | 31966 | 31905 | | E24-Cx-0093-0187-SQ |
| 7/64 | 1/8 | 3/16 | 1-1/2 | 31957 | 31967 | 31933 | | E24-Cx-0109-0187-SQ |
| 1/8 | 1/8 | 1/4 | 1-1/2 | 99125 | 31968 | 31907 | 31908 | E24-Cx-0125-0250-SQ |
| | | 3/8 | 2 | | | | | E24-Cx-0125-0375-SQ-L2 |
| 9/64 | 3/16 | 5/16 | 2 | 31926 | 31969 | 31934 | | E24-Cx-0140-0312-SQ |
| 5/32 | 3/16 | 5/16 | 2 | 31995 | 31970 | 31909 | | E24-Cx-0156-0312-SQ |
| 11/64 | 3/16 | 5/16 | 2 | 31958 | | 31935 | | E24-Cx-0171-0312-SQ |
| 3/16 | 3/16 | 3/8 | 2 | 99331 | 31972 | 31911 | 31912 | E24-Cx-0187-0375-SQ |
| | | 1/2 | 2-1/2 | | | | | E24-Cx-0187-0500-SQ |
| 7/32 | 1/4 | 1/2 | 2-1/2 | 31959 | 31974 | 31913 | | E24-Cx-0218-0500-SQ-L25 |
| 1/4 | 1/4 | 1/2 | 2-1/2 | 31990 | 31976 | 31915 | 31916 | E24-Cx-0250-0500-SQ-L25 |
| | | 5/8 | 3 | | | | | E24-Cx-0250-0625-SQ-L3 |
| 5/16 | 5/16 | 1/2 | 2-1/2 | 31991 | 31980 | 31917 | | E24-Cx-0312-0500-SQ-L25 |
| 3/8 | 3/8 | 9/16 | 2-1/2 | 31929 | 31984 | 31919 | 31920 | E24-Cx-0375-0562-SQ-L25 |
| | | 3/4 | 3-1/2 | | | | | E24-Cx-0375-0750-SQ-L35 |
| 1/2 | 1/2 | 5/8 | 3 | 31998 | 31992 | 31923 | 31924 | E24-Cx-0500-0625-SQ-L3 |
| | | 1 | 4 | | | | | E24-Cx-0500-1000-SQ-L4 |

Model Code: E24 w/Square End and Weldon Shank



| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | MG Order Code | EZ-ID Number E24 - xxxx - xxxx - SQ - Lxx - W - Sxxxx d1 l2 l1 |
|------------------|-----------------|---------------------|----------------------|------------------|--|
| 1/8 | 3/8 | 3/8 | 3-1/2 | 32705 | E24-0125-0375-SQ-L35-W-S0375 |
| 3/16 | 3/8 | 1/2 | 3-1/2 | 32709 | E24-0187-0500-SQ-L35-W-S0375 |
| 1/4 | 3/8 | 5/8 | 3-1/2 | 32713 | E24-0250-0625-SQ-L35-W-S0375 |
| 5/16 | 3/8 | 3/4 | 3-1/2 | 32717 | E24-0312-0750-SQ-L35-W-S0375 |
| 3/8 | 3/8 | 3/4 | 3-1/2 | 32721 | E24-0375-0750-SQ-L35-W-S0375 |
| 1/2 | 1/2 | 1 | 4 | 32725 | E24-0500-1000-SQ-L4-W-S0375 |



in d1: +0.000 / -0.002 d2: h6

E24

Model Code: E24 w/Ball End and Plain Shank

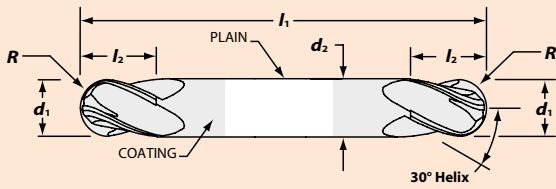


Ball End



truCORE 4 flute mills are CNC ground from the highest quality carbide material, maximizing performance and repeatability. Available with AlTiN coating. Use ball end tools in contouring applications.

| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | EZ-ID Number E24 - Cx - xxxx - xxxx - BN - Lxx d1 l2 l1 |
|------------------|-----------------|---------------------|----------------------|------------------|---|
| 1/32 | 1/8 | 1/16 | 1-1/2 | 32083 | E24-C2-0031-0062-BN |
| 3/64 | 1/8 | 3/32 | 1-1/2 | 32182 | E24-C2-0046-0093-BN |
| 1/16 | 1/8 | 1/8 | 1-1/2 | 32181 | E24-C2-0062-0125-BN |
| 5/64 | 1/8 | 1/8 | 1-1/2 | 32085 | E24-C2-0078-0125-BN |
| 3/32 | 1/8 | 3/16 | 1-1/2 | 32086 | E24-C2-0093-0187-BN |
| 1/8 | 1/8 | 1/4 | 1-1/2 | 32139 | E24-C2-0125-0250-BN |
| 5/32 | 3/16 | 5/16 | 2 | 32090 | E24-C2-0156-0312-BN |
| 3/16 | 3/16 | 3/8 | 2 | 32138 | E24-C2-0187-0375-BN |
| 1/4 | 1/4 | 1/2 | 2-1/2 | 32137 | E24-C2-0250-0500-BN-L25 |
| 5/16 | 5/16 | 1/2 | 2-1/2 | 32140 | E24-C2-0312-0500-BN-L25 |
| 3/8 | 3/8 | 9/16 | 2-1/2 | 32200 | E24-C2-0375-0562-BN-L25 |
| 1/2 | 1/2 | 5/8 | 3 | 32201 | E24-C2-0500-0625-BN-L3 |



in d1: +0.000 / -0.002 d2: h6

E13

Model Code: E13 w/Square End and Plain Shank

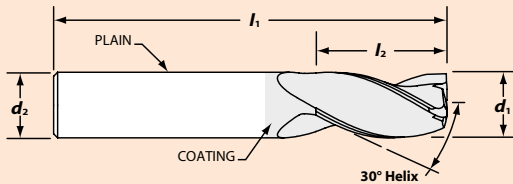


Square End



truCORE 3 flute mills are CNC ground from the highest quality carbide material, maximizing performance and repeatability. Available uncoated and with AlTiN coating.

| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | MG Order Code | EZ-ID Number E13 - Cx - xxxx - xxxx - SQ - Lxx d1 l2 l1 |
|------------------|-----------------|---------------------|----------------------|---------------------|------------------|---|
| 1/32 | 1/8 | 3/32 | 1-1/2 | 33801 | 33802 | E13-Cx-0031-0093-SQ |
| 3/64 | 1/8 | 9/64 | 1-1/2 | 33819 | 33803 | E13-Cx-0046-0140-SQ |
| 1/16 | 1/8 | 1/8 | 1-1/2 | 34057 | 33773 | E13-Cx-0062-0125-SQ |
| | | 3/16 | 1-1/2 | 33826 | 33804 | E13-Cx-0062-0187-SQ |
| 3/32 | 1/8 | 3/16 | 1-1/2 | 34011 | 33774 | E13-Cx-0093-0187-SQ |
| | | 3/8 | 1-1/2 | 33827 | 33806 | E13-Cx-0093-0375-SQ |
| | | 1/4 | 1-1/2 | 33800 | 33775 | E13-Cx-0125-0250-SQ |
| 1/8 | 1/8 | 1/2 | 1-1/2 | 33810 | 33808 | E13-Cx-0125-0500-SQ |
| | | 3/4 | 2-1/4 | 33911 | 33782 | E13-Cx-0125-0750-SQ |
| | | 1 | 3 | 34046 | 33791 | E13-Cx-0125-1000-SQ |
| | | 5/32 | 3/16 | 9/16 | 2 | 33814 |
| 3/16 | 3/16 | 3/8 | 2 | 34058 | 33776 | E13-Cx-0187-0375-SQ |
| | | 5/8 | 2 | 33850 | 33812 | E13-Cx-0187-0625-SQ |
| | | 3/4 | 2-1/2 | 33913 | 33783 | E13-Cx-0187-0750-SQ |
| | | 1-1/8 | 3 | 34047 | 33792 | E13-Cx-0187-1125-SQ |
| 7/32 | 1/4 | 5/8 | 2-1/2 | 33851 | 33818 | E13-Cx-0218-0625-SQ-L25 |
| 1/4 | 1/4 | 1/2 | 2 | 34059 | 33777 | E13-Cx-0250-0500-SQ |
| | | 3/4 | 2-1/2 | 33852 | 33816 | E13-Cx-0250-0750-SQ |
| | | 1-1/8 | 3 | 33929 | 33784 | E13-Cx-0250-1125-SQ |
| | | 1-1/2 | 4 | 34051 | 33793 | E13-Cx-0250-1500-SQ |
| 5/16 | 5/16 | 1/2 | 2 | 34060 | 33778 | E13-Cx-0312-0500-SQ |
| | | 13/16 | 2-1/2 | 33853 | 33820 | E13-Cx-0312-0812-SQ |
| | | 1-5/8 | 4 | 34097 | | E13-Cx-0312-1625-SQ |
| 3/8 | 3/8 | 5/8 | 2 | 34061 | | E13-Cx-0375-0625-SQ |
| | | 1 | 2-1/2 | 33854 | 33824 | E13-Cx-0375-1000-SQ |
| | | 1-1/8 | 3 | 33931 | 33786 | E13-Cx-0375-1125-SQ |
| | | 1-3/4 | 4 | 34052 | 33795 | E13-Cx-0375-1750-SQ |
| 7/16 | 7/16 | 1 | 2-3/4 | 30422 | 33863 | E13-Cx-0437-1000-SQ |
| 1/2 | 1/2 | 5/8 | 2-1/2 | 34063 | | E13-Cx-0500-0625-SQ |
| | | 1 | 3 | 90089 | 33832 | E13-Cx-0500-1000-SQ |
| | | 2 | 4 | 33955 | 33787 | E13-Cx-0500-2000-SQ |
| | | 3 | 6 | 34053 | 33796 | E13-Cx-0500-3000-SQ |
| | | 1-1/4 | 3-1/2 | 33855 | 33840 | E13-Cx-0625-1250-SQ |
| 5/8 | 5/8 | 2-1/4 | 5 | 34068 | 33788 | E13-Cx-0625-2250-SQ |
| | | 3 | 6 | 34054 | 33797 | E13-Cx-0625-3000-SQ |
| | | 1-1/2 | 4 | 33856 | 33848 | E13-Cx-0750-1500-SQ |
| 3/4 | 3/4 | 2-1/4 | 5 | 34069 | 33789 | E13-Cx-0750-2250-SQ |
| | | 3 | 6 | 34055 | 33798 | E13-Cx-0750-3000-SQ |



in d1: +0.000 / -0.002 d2: h6
mm d1: +0.000 / -0.050 d2: h6

Model Code: E13 w/Square End and Plain Shank



| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AITIN Order Code | MG Order Code | EZ-ID Number E13 - Cx - xxx - xxx - SQ d1 l2 | Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AITIN Order Code | MG Order Code | EZ-ID Number E13 - Cx - xxx - xxx - SQ d1 l2 | | |
|------------------|-----------------|---------------------|----------------------|---------------------|------------------|--|------------------|-----------------|---------------------|----------------------|---------------------|------------------|--|--|--|
| 1 | 3 | 2 | 38 | 30897 | 38849 | E13-Cx-010-002-SQ | | | 19 | 73 | 37164 | 38844 | E13-Cx-120-019-SQ | | |
| | | 3 | 38 | 62456 | 31451 | E13-Cx-010-003-SQ | | | 25 | 76 | 37034 | 31465 | E13-Cx-120-025-SQ | | |
| 1,5 | 3 | 3 | 38 | 62272 | 38850 | E13-Cx-015-003-SQ | 12 | 12 | 26 | 83 | 36779 | 36748 | E13-Cx-120-026-SQ | | |
| | | 4,5 | 38 | 62457 | 31452 | E13-Cx-015-004-SQ | | | 50 | 100 | 62266 | 31637 | E13-Cx-120-050-SQ | | |
| | | 6 | 38 | 37012 | 38605 | E13-Cx-015-006-SQ | | | 75 | 150 | 62176 | 31638 | E13-Cx-120-075-SQ | | |
| 2 | 3 | 4 | 38 | 62273 | 38851 | E13-Cx-020-004-SQ | 14 | 14 | 26 | 83 | 36780 | 36750 | E13-Cx-140-026-SQ | | |
| | | 6,3 | 38 | 62458 | 31453 | E13-Cx-020-006-SQ | | | 57 | 125 | 62267 | 30144 | E13-Cx-140-057-SQ | | |
| | | 9 | 38 | 37014 | 38606 | E13-Cx-020-009-SQ | | | 75 | 150 | 62177 | 31639 | E13-Cx-140-075-SQ | | |
| 2,5 | 3 | 5 | 38 | 62274 | 38852 | E13-Cx-025-005-SQ | 16 | 16 | 25 | 82 | 62287 | 38865 | E13-Cx-160-025-SQ | | |
| | | 9,5 | 38 | 37016 | 31454 | E13-Cx-025-009-SQ | | | 32 | 92 | 36781 | 36752 | E13-Cx-160-032-SQ | | |
| 3 | 3 | 6 | 38 | 62275 | 38853 | E13-Cx-030-006-SQ | 18 | 18 | 57 | 125 | 62268 | 30145 | E13-Cx-160-057-SQ | | |
| | | 9 | 38 | 99801 | 36732 | E13-Cx-030-009-SQ | | | 75 | 150 | 62178 | 31640 | E13-Cx-160-075-SQ | | |
| | | 12 | 38 | 30247 | 31455 | E13-Cx-030-012-SQ | | | 32 | 92 | 36782 | 36753 | E13-Cx-180-032-SQ | | |
| | | 19 | 57 | 62260 | 30139 | E13-Cx-030-019-SQ | | | 57 | 125 | 62269 | 30146 | E13-Cx-180-057-SQ | | |
| 3,5 | 4 | 25 | 75 | 62170 | 31631 | E13-Cx-030-025-SQ | 20 | 20 | 75 | 150 | 62179 | 31641 | E13-Cx-180-075-SQ | | |
| | | 14 | 50 | 37018 | 31456 | E13-Cx-035-014-SQ | | | 38 | 104 | 36783 | 36754 | E13-Cx-200-038-SQ | | |
| 4 | 4 | 8 | 50 | 62277 | 38855 | E13-Cx-040-008-SQ | 12 | 12 | 57 | 125 | 62270 | 30147 | E13-Cx-200-057-SQ | | |
| | | 11 | 50 | 36771 | 36734 | E13-Cx-040-011-SQ | | | 75 | 150 | 62180 | 31642 | E13-Cx-200-075-SQ | | |
| | | 14 | 50 | 37020 | 31457 | E13-Cx-040-014-SQ | | | | | | | | | |
| | | 19 | 63 | 62261 | 30140 | E13-Cx-040-019-SQ | | | | | | | | | |
| 4,5 | 5 | 31 | 75 | 62171 | 31632 | E13-Cx-040-031-SQ | | | | | | | | | |
| | | 16 | 50 | 37022 | 31458 | E13-Cx-045-016-SQ | | | | | | | | | |
| 5 | 5 | 10 | 50 | 62279 | 38858 | E13-Cx-050-010-SQ | | | | | | | | | |
| | | 13 | 50 | 36772 | 36736 | E13-Cx-050-013-SQ | | | | | | | | | |
| | | 16 | 50 | 37024 | 31459 | E13-Cx-050-016-SQ | | | | | | | | | |
| | | 19 | 63 | 62262 | 30141 | E13-Cx-050-019-SQ | | | | | | | | | |
| | | 31 | 100 | 62172 | 30150 | E13-Cx-050-031-SQ | | | | | | | | | |
| 6 | 6 | 12 | 54 | 36949 | 38841 | E13-Cx-060-012-SQ | | | | | | | | | |
| | | 13 | 57 | 36773 | 36738 | E13-Cx-060-013-SQ | | | | | | | | | |
| | | 19 | 63 | 37026 | 31460 | E13-Cx-060-019-SQ | | | | | | | | | |
| | | 29 | 75 | 62263 | 31634 | E13-Cx-060-029-SQ | | | | | | | | | |
| 7 | 7 | 38 | 100 | 62173 | 30151 | E13-Cx-060-038-SQ | | | | | | | | | |
| | | 16 | 60 | 36774 | 36740 | E13-Cx-070-016-SQ | | | | | | | | | |
| 8 | 8 | 14 | 58 | 37168 | 38842 | E13-Cx-080-014-SQ | | | | | | | | | |
| | | 19 | 63 | 36775 | 36742 | E13-Cx-080-019-SQ | | | | | | | | | |
| | | 20 | 63 | 37028 | 31462 | E13-Cx-080-020-SQ | | | | | | | | | |
| | | 29 | 75 | 62264 | 31635 | E13-Cx-080-029-SQ | | | | | | | | | |
| 9 | 9 | 41 | 100 | 62174 | 30152 | E13-Cx-080-041-SQ | | | | | | | | | |
| | | 19 | 67 | 36776 | 36744 | E13-Cx-090-019-SQ | | | | | | | | | |
| 10 | 10 | 22 | 72 | 37030 | 31463 | E13-Cx-090-022-SQ | | | | | | | | | |
| | | 16 | 66 | 37172 | 38843 | E13-Cx-100-016-SQ | | | | | | | | | |
| | | 22 | 72 | 36777 | 36746 | E13-Cx-100-022-SQ | | | | | | | | | |
| | | 25 | 72 | 37031 | 31464 | E13-Cx-100-025-SQ | | | | | | | | | |
| | | 40 | 88 | 37166 | 31644 | E13-Cx-100-040-SQ | | | | | | | | | |
| 11 | 11 | 45 | 100 | 62175 | 31636 | E13-Cx-100-045-SQ | | | | | | | | | |
| | | 26 | 83 | 36778 | 36747 | E13-Cx-110-026-SQ | | | | | | | | | |

E13

Model Code: E13 w/Ball End and Plain Shank

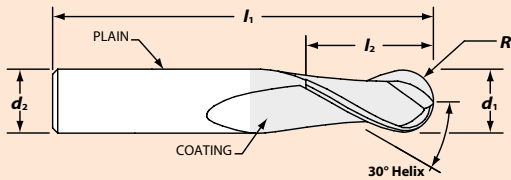


Ball End



truCORE 3 flute mills are CNC ground from the highest quality carbide material, maximizing performance and repeatability. Available uncoated and with AlTiN coating. Use ball end tools in contouring applications.

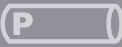
| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | MG Order Code | EZ-ID Number E13 - Cx - xxxx - xxxx - BN d1 l2 |
|------------------|-----------------|---------------------|----------------------|---------------------|------------------|--|
| 1/32 | 1/8 | 3/32 | 1-1/2 | 62053 | 33865 | E13-Cx-0031-0093-BN |
| 3/64 | 1/8 | 9/64 | 1-1/2 | 62054 | 33867 | E13-Cx-0046-0140-BN |
| 1/16 | 1/8 | 1/8 | 1-1/2 | 62063 | 33834 | E13-Cx-0062-0125-BN |
| | | 3/16 | 1-1/2 | 62055 | 33868 | E13-Cx-0062-0187-BN |
| 3/32 | 1/8 | 3/16 | 1-1/2 | 62064 | 33835 | E13-Cx-0093-0187-BN |
| | | 3/8 | 1-1/2 | 62056 | 33869 | E13-Cx-0093-0375-BN |
| 1/8 | 1/8 | 1/4 | 1-1/2 | 62065 | 33836 | E13-Cx-0125-0250-BN |
| | | 1/2 | 1-1/2 | 62057 | 33844 | E13-Cx-0125-0500-BN |
| | | 3/4 | 2-1/4 | 62070 | 33889 | E13-Cx-0125-0750-BN |
| | | 1 | 3 | 62079 | 33899 | E13-Cx-0125-1000-BN |
| 3/16 | 3/16 | 3/8 | 2 | 62066 | 33837 | E13-Cx-0187-0375-BN |
| | | 5/8 | 2 | 62058 | 33845 | E13-Cx-0187-0625-BN |
| | | 3/4 | 2-1/2 | 62071 | 33890 | E13-Cx-0187-0750-BN |
| | | 1-1/8 | 3 | 62080 | 33900 | E13-Cx-0187-1125-BN |
| 1/4 | 1/4 | 1/2 | 2 | 62067 | 33838 | E13-Cx-0250-0500-BN |
| | | 3/4 | 2-1/2 | 62059 | 33846 | E13-Cx-0250-0750-BN |
| | | 1-1/8 | 3 | 62072 | 33891 | E13-Cx-0250-1125-BN |
| | | 1-1/2 | 4 | 62081 | 33901 | E13-Cx-0250-1500-BN |
| 3/8 | 3/8 | 5/8 | 2 | 62068 | | E13-Cx-0375-0625-BN |
| | | 1 | 2-1/2 | 99776 | 33847 | E13-Cx-0375-1000-BN |
| | | 1-1/8 | 3 | 62074 | 33893 | E13-Cx-0375-1125-BN |
| | | 1-3/4 | 4 | 62083 | 33903 | E13-Cx-0375-1750-BN |
| 1/2 | 1/2 | 5/8 | 2-1/2 | 62069 | | E13-Cx-0500-0625-BN |
| | | 1 | 3 | 62060 | 33861 | E13-Cx-0500-1000-BN |
| | | 2 | 4 | 62075 | 33894 | E13-Cx-0500-2000-BN |
| | | 3 | 6 | 62084 | 33904 | E13-Cx-0500-3000-BN |



in $d1: +0.000 / -0.002$ $d2: h6$
 mm $d1: +0.000 / -0.050$ $d2: h6$



Model Code: E13
w/Ball End and Plain Shank



| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | MG Order Code | EZ-ID Number E13 - Cx - xxx - xxx - BN d1 l2 |
|------------------|-----------------|---------------------|----------------------|---------------------|------------------|--|
| 1 | 3 | 3 | 38 | 62460 | 32571 | E13-Cx-010-003-BN |
| 1,5 | 3 | 6 | 38 | 62601 | 38614 | E13-Cx-015-006-BN |
| 2 | 3 | 9 | 38 | 62602 | 38615 | E13-Cx-020-009-BN |
| 3 | 3 | 6 | 38 | 62692 | 39060 | E13-Cx-030-006-BN |
| | | 12 | 38 | 62604 | 32575 | E13-Cx-030-012-BN |
| | | 19 | 57 | 62637 | 39095 | E13-Cx-030-019-BN |
| | | 25 | 75 | 62661 | 32761 | E13-Cx-030-025-BN |
| 4 | 4 | 8 | 50 | 62694 | 39062 | E13-Cx-040-008-BN |
| | | 14 | 50 | 62606 | 32577 | E13-Cx-040-014-BN |
| | | 19 | 63 | 62638 | 39096 | E13-Cx-040-019-BN |
| | | 31 | 75 | 62662 | 32762 | E13-Cx-040-031-BN |
| 5 | 5 | 10 | 50 | 62696 | 39064 | E13-Cx-050-010-BN |
| | | 16 | 50 | 62608 | 32579 | E13-Cx-050-016-BN |
| | | 19 | 63 | 62639 | 39097 | E13-Cx-050-019-BN |
| 6 | 6 | 12 | 54 | 37500 | 39459 | E13-Cx-060-012-BN |
| | | 19 | 63 | 32591 | 32580 | E13-Cx-060-019-BN |
| | | 29 | 75 | 62640 | 32764 | E13-Cx-060-029-BN |
| | | 38 | 100 | 62664 | 39111 | E13-Cx-060-038-BN |
| 8 | 8 | 20 | 63 | 32592 | 32582 | E13-Cx-080-020-BN |
| | | 29 | 75 | 62641 | 32765 | E13-Cx-080-029-BN |
| | | 41 | 100 | 62665 | 39113 | E13-Cx-080-041-BN |
| 10 | 10 | 16 | 66 | 37376 | 39461 | E13-Cx-100-016-BN |
| | | 25 | 72 | 32593 | 32584 | E13-Cx-100-025-BN |
| | | 40 | 88 | 37374 | 39462 | E13-Cx-100-040-BN |
| | | 45 | 100 | 62666 | 32766 | E13-Cx-100-045-BN |
| 12 | 12 | 19 | 73 | 37378 | 39463 | E13-Cx-120-019-BN |
| | | 26 | 83 | 37380 | 39464 | E13-Cx-120-026-BN |
| | | 50 | 100 | 62643 | 32767 | E13-Cx-120-050-BN |
| | | 75 | 150 | 62667 | 32768 | E13-Cx-120-075-BN |

TOOL TIP

Ball End Milling: Cut Cycle Time

If your axial depth of cut (Z-axis depth) is less than the radius of your ball end mill, adjusting your spindle speed will help you cut cycle times, including finishing work.

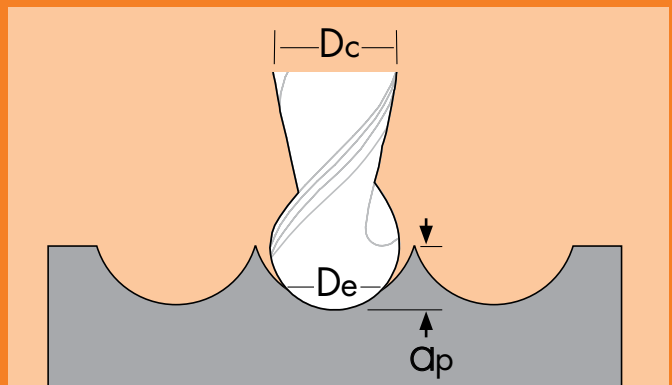
Calculate your optimal spindle speed using the effective cutting diameter (De) in two easy steps.

Step 1: Calculate the effective cutting diameter.

$$2 \times \sqrt{A_p \times (D_c - A_p)} = D_e \text{ (effective cutting diameter)}$$

Step 2: Calculate the optimum spindle speed.

$$(\text{SFM} \times 3.82) \div D_e = \text{Optimum spindle speed}$$



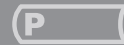
Dc = Actual cutting diameter

De = Effective cutting diameter

Ap = Axial depth of cut

E12

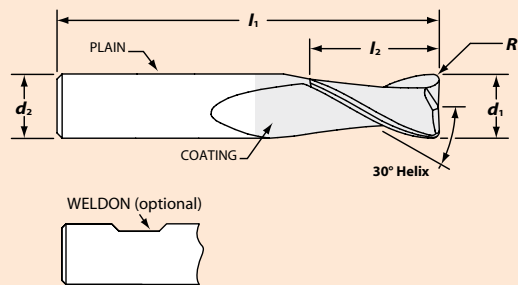
Model Code: E12 w/Square End and Plain Shank



Square End and Corner Radius



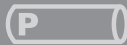
truCORE 2 flute mills are CNC ground from the highest quality carbide material, maximizing performance and repeatability. Available uncoated and with AlTiN or TiCN coating. Use tools with corner radius to extend tool life in roughing and semi-finishing operations.



in $d_1: +0.000 / -0.002$ $d_2: h_6$
mm $d_1: +0.000 / -0.050$ $d_2: h_6$

| Cutter Dia d_1 | Shank Dia d_2 | Length of Cut l_2 | Overall Length l_1 | AlTiN Order Code | TiCN Order Code | MG Order Code | EZ-ID Number E12 - Cx - xxxx - xxxx - SQ - Lxx d_1 l_2 l_1 |
|---------------------|--------------------|------------------------|-------------------------|------------------|-----------------|-------------------------|--|
| 1/64 | 1/8 | 1/32 | 1-1/2 | 90655 | | 90638 | E12-Cx-0015-0031-SQ |
| | | 3/64 | 1-1/2 | 90656 | | 90639 | E12-Cx-0015-0046-SQ |
| 1/32 | 1/8 | 1/16 | 1-1/2 | 38923 | 34602 | 34696 | E12-Cx-0031-0062-SQ |
| | | 3/32 | 1-1/2 | 30509 | | 30601 | E12-Cx-0031-0093-SQ |
| 3/64 | 1/8 | 3/32 | 1-1/2 | 39093 | 34603 | 34699 | E12-Cx-0046-0093-SQ |
| | | 9/64 | 1-1/2 | 35603 | | 30603 | E12-Cx-0046-0140-SQ |
| 1/16 | 1/8 | 1/8 | 1-1/2 | 39104 | 34604 | 31403 | E12-Cx-0062-0125-SQ |
| | | 3/16 | 1-1/2 | 30336 | | 30605 | E12-Cx-0062-0187-SQ |
| | | 1/4 | 1-1/2 | 90658 | | 90653 | E12-Cx-0062-0250-SQ |
| 5/64 | 1/8 | 1/4 | 1-1/2 | 30337 | | 30607 | E12-Cx-0078-0250-SQ |
| 3/32 | 1/8 | 3/16 | 1-1/2 | 39105 | 34606 | 31405 | E12-Cx-0093-0187-SQ |
| | | 3/8 | 1-1/2 | 30338 | | 30609 | E12-Cx-0093-0375-SQ |
| 7/64 | 1/8 | 3/8 | 1-1/2 | 30339 | | 30611 | E12-Cx-0109-0375-SQ |
| | | 1/4 | 1-1/2 | 90088 | | 31407 | E12-Cx-0125-0250-SQ |
| 1/8 | 1/8 | 1/2 | 1-1/2 | 96342 | 34608 | 30613 | E12-Cx-0125-0500-SQ |
| | | 5/8 | 2 | 62093 | | | E12-Cx-0125-0625-SQ |
| | | 3/4 | 2-1/4 | 36610 | | 37608 | E12-Cx-0125-0750-SQ |
| 9/64 | 3/16 | 1 | 3 | 34015 | | 34008 | E12-Cx-0125-1000-SQ |
| | | 9/16 | 2 | 30344 | | 30615 | E12-Cx-0140-0562-SQ |
| | | 5/16 | 2 | 39129 | | 31409 | E12-Cx-0156-0312-SQ |
| 5/32 | 3/16 | 9/16 | 2 | 30503 | | 30617 | E12-Cx-0156-0562-SQ |
| | | 11/64 | 2 | 30345 | | 30619 | E12-Cx-0171-0625-SQ |
| 3/16 | 3/16 | 3/8 | 2 | 39131 | 34612 | 31411 | E12-Cx-0187-0375-SQ |
| | | 5/8 | 2 | 30554 | | 30621 | E12-Cx-0187-0625-SQ |
| | | 3/4 | 2-1/2 | 36619 | | 37612 | E12-Cx-0187-0750-SQ |
| | | 1 | 4 | 62094 | | | E12-Cx-0187-1000-SQ |
| | | 1-1/8 | 3 | 34023 | | 34012 | E12-Cx-0187-1125-SQ |
| 13/64 | 1/4 | 5/8 | 2-1/2 | 97907 | | 30623 | E12-Cx-0203-0625-SQ-L25 |
| 7/32 | 1/4 | 7/16 | 2 | 39153 | | | E12-Cx-0218-0437-SQ |
| | | 5/8 | 2-1/2 | 30348 | 30625 | E12-Cx-0218-0625-SQ-L25 | |
| 15/64 | 1/4 | 3/4 | 2-1/2 | 30510 | 34616 | | E12-Cx-0234-0750-SQ |
| | | 1/2 | 2 | 39154 | | 31415 | E12-Cx-0250-0500-SQ |
| | | 3/4 | 2-1/2 | 30553 | | 30629 | E12-Cx-0250-0750-SQ |
| | | 1 | 4 | 62095 | | 62089 | E12-Cx-0250-1000-SQ-L4 |
| | | 1-1/8 | 3 | 36645 | | 37616 | E12-Cx-0250-1125-SQ |
| | | 1-1/2 | 4 | 34035 | | 34016 | E12-Cx-0250-1500-SQ |
| 17/64 | 5/16 | 1-1/2 | 6 | 39203 | | 31063 | E12-Cx-0250-1500-SQ |
| | | 3/4 | 2-1/2 | 30511 | | | E12-Cx-0265-0750-SQ |
| | | 3/4 | 2-1/2 | 30504 | 30633 | E12-Cx-0281-0750-SQ | |
| | | 13/16 | 2-1/2 | 30512 | | | E12-Cx-0296-0812-SQ |
| 5/16 | 5/16 | 1/2 | 2 | 39155 | 34620 | 31417 | E12-Cx-0312-0500-SQ |
| | | 13/16 | 2-1/2 | 30557 | | 30637 | E12-Cx-0312-0812-SQ |
| | | 1-1/8 | 3 | 36640 | | 37620 | E12-Cx-0312-1125-SQ |
| | | 1-5/8 | 4 | 34036 | | 34020 | E12-Cx-0312-1625-SQ |
| 11/32 | 3/8 | 1 | 2-1/2 | 30331 | | 30641 | E12-Cx-0343-1000-SQ |
| 3/8 | 3/8 | 5/8 | 2 | 39156 | 34624 | 31419 | E12-Cx-0375-0625-SQ |
| | | 1 | 2-1/2 | 30556 | | 30645 | E12-Cx-0375-1000-SQ |
| | | 1 | 4 | 62097 | | | E12-Cx-0375-1000-SQ-L4 |
| | | 1-1/8 | 3 | 36646 | | 37624 | E12-Cx-0375-1125-SQ |
| | | 1-1/2 | 6 | 30470 | | 31035 | E12-Cx-0375-1500-SQ-L6 |
| | | 1-3/4 | 4 | 34037 | | 34024 | E12-Cx-0375-1750-SQ |
| 13/32 | 7/16 | 1 | 2-3/4 | 30332 | | | E12-Cx-0406-1000-SQ |
| 7/16 | 7/16 | 1 | 2-3/4 | 99467 | | 30672 | E12-Cx-0437-1000-SQ |
| | | 2 | 4 | 99468 | | 37628 | E12-Cx-0437-2000-SQ |

Model Code: E12
w/Square End and Plain Shank



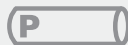
| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AITiN Order Code | TiCN Order Code | MG Order Code | EZ-ID Number | | |
|------------------|-----------------|---------------------|----------------------|---------------------|--------------------|------------------------|-----------------------------------|----|----|
| | | | | | | | E12 - Cx - xxxx - xxxx - SQ - Lxx | d1 | l2 |
| 15/32 | 1/2 | 1 | 3 | 30333 | | | E12-Cx-0468-1000-SQ | | |
| 1/2 | 1/2 | 5/8 | 2-1/2 | 39158 | 34632 | 31423 | E12-Cx-0500-0625-SQ | | |
| | | 1 | 3 | 30552 | | 30661 | E12-Cx-0500-1000-SQ | | |
| | | 1 | 4 | 62098 | | E12-Cx-0500-1000-SQ-L4 | | | |
| | | 1-1/2 | 6 | 39205 | | 31047 | E12-Cx-0500-1500-SQ-L6 | | |
| | | 2 | 4 | 36647 | | 37632 | E12-Cx-0500-2000-SQ | | |
| | | 3 | 6 | 34039 | | 34032 | E12-Cx-0500-3000-SQ | | |
| 9/16 | 9/16 | 1-1/4 | 3-1/2 | 30505 | | 30663 | E12-Cx-0562-1250-SQ | | |
| 5/8 | 5/8 | 1-1/4 | 3-1/2 | 30532 | | 30665 | E12-Cx-0625-1250-SQ | | |
| | | 2-1/4 | 5 | 36648 | 37640 | E12-Cx-0625-2250-SQ | | | |
| | | 3 | 6 | 34043 | 34040 | E12-Cx-0625-3000-SQ | | | |
| 3/4 | 3/4 | 1-1/2 | 4 | 30700 | | 30669 | E12-Cx-0750-1500-SQ | | |
| | | 2-1/4 | 5 | 36649 | 37648 | E12-Cx-0750-2250-SQ | | | |
| | | 3 | 6 | 34044 | 34048 | E12-Cx-0750-3000-SQ | | | |
| 1 | 1 | 1-1/2 | 4 | 30679 | | 30677 | E12-Cx-1000-1500-SQ | | |
| | | 2-1/4 | 5 | 36650 | 37664 | E12-Cx-1000-2250-SQ | | | |
| | | 3 | 6 | 34045 | 34064 | E12-Cx-1000-3000-SQ | | | |

Model Code: E12
w/Square End and Weldon Shank



| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AITiN Order Code | EZ-ID Number | |
|------------------|-----------------|---------------------|----------------------|---------------------|---------------------------------|-------|
| | | | | | E12 - Cx - xxxx - xxxx - SQ - W | d1 l2 |
| 3/8 | 3/8 | 1 | 2-1/2 | 39252 | E12-C2-0375-1000-SQ-W | |
| 1/2 | 1/2 | 1 | 3 | 39253 | E12-C2-0500-1000-SQ-W | |
| 5/8 | 5/8 | 1-1/4 | 3-1/2 | 39254 | E12-C2-0625-1250-SQ-W | |
| 3/4 | 3/4 | 1-1/2 | 4 | 39255 | E12-C2-0750-1500-SQ-W | |

Model Code: E12
w/Corner Radius and Plain Shank



| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AITiN Order Code | AITiN Order Code by Corner Radius (R) | | | | EZ-ID Number | | |
|------------------|-----------------|---------------------|----------------------|---------------------|--|---------|---------|---------|------------------------------|----|----|
| | | | | | .015 CR | .020 CR | .030 CR | .060 CR | E12 - Cx - xxxx - xxxx - xxx | d1 | l2 |
| 1/8 | 1/8 | 1/2 | 1-1/2 | 34071 | | | | | E12-C2-0125-0500-xxx | | |
| 3/16 | 3/16 | 5/8 | 2 | | 34072 | 34073 | | | E12-C2-0187-0625-xxx | | |
| 1/4 | 1/4 | 3/4 | 2-1/2 | | 34074 | 34075 | | | E12-C2-0250-0750-xxx | | |
| 5/16 | 5/16 | 13/16 | 2-1/2 | | 34076 | 34077 | | | E12-C2-0312-0812-xxx | | |
| 3/8 | 3/8 | 1 | 2-1/2 | | 34104 | 34105 | | | E12-C2-0375-1000-xxx | | |
| 1/2 | 1/2 | 1 | 3 | | | 34107 | 34190 | | E12-C2-0500-1000-xxx | | |

NEED MORE OPTIONS?

For more lengths and corner radii options, refer to our M2 STREAKERS® catalog, available to download at www.imcousa.com.

Model Code: E12 w/Square End and Plain Shank



| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | MG Order Code | EZ-ID Number E12- Cx - xxx - xxx - SQ d1 l2 | Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | MG Order Code | EZ-ID Number E12- Cx - xxx - xxx - SQ d1 l2 |
|------------------|-----------------|---------------------|----------------------|---------------------|------------------|---|------------------|-----------------|---------------------|----------------------|---------------------|------------------|---|
| 0,3 | 3 | 0,9 | 38 | | 31791 | E12-Cx-003-000-SQ | | | | | | | |
| 0,4 | 3 | 1,2 | 38 | | 31792 | E12-Cx-004-001-SQ | 7 | 7 | 16 | 60 | 36759 | 36717 | E12-Cx-070-016-SQ |
| 0,5 | 3 | 1,5 | 38 | | 31793 | E12-Cx-005-001-SQ | | 8 | 19 | 63 | 37985 | 31441 | E12-Cx-070-019-SQ |
| 0,6 | 3 | 1,8 | 38 | | 31794 | E12-Cx-006-001-SQ | | | 14 | 58 | 37183 | 39241 | E12-Cx-080-014-SQ |
| 0,7 | 3 | 2,1 | 38 | | 31795 | E12-Cx-007-002-SQ | | | 19 | 63 | 36760 | 36719 | E12-Cx-080-019-SQ |
| 0,8 | 3 | 2,4 | 38 | | 31796 | E12-Cx-008-002-SQ | 8 | 8 | 20 | 63 | 31492 | 31442 | E12-Cx-080-020-SQ |
| 0,9 | 3 | 2,7 | 38 | | 31797 | E12-Cx-009-002-SQ | | | 29 | 75 | 62198 | 30013 | E12-Cx-080-029-SQ |
| | | | | | | | | | 41 | 100 | 62186 | 30235 | E12-Cx-080-041-SQ |
| 1 | 3 | 2 | 38 | 62288 | 38866 | E12-Cx-010-002-SQ | | 9 | 19 | 67 | 36761 | 36721 | E12-Cx-090-019-SQ |
| | | 3 | 38 | 99079 | 31431 | E12-Cx-010-003-SQ | | | 22 | 72 | 37986 | 31443 | E12-Cx-090-022-SQ |
| | | 3 | 38 | 62289 | 38867 | E12-Cx-015-003-SQ | | | 16 | 66 | 37184 | 39242 | E12-Cx-100-016-SQ |
| 1,5 | 3 | 4,5 | 38 | 62455 | 31432 | E12-Cx-015-004-SQ | | | 22 | 72 | 36762 | 36723 | E12-Cx-100-022-SQ |
| | | 6 | 38 | 37980 | 38602 | E12-Cx-015-006-SQ | 10 | 10 | 25 | 72 | 99358 | 31444 | E12-Cx-100-025-SQ |
| | | 4 | 38 | 62290 | 38868 | E12-Cx-020-004-SQ | | | 40 | 88 | 37174 | 30223 | E12-Cx-100-040-SQ |
| 2 | 3 | 6,3 | 38 | 99081 | 31433 | E12-Cx-020-006-SQ | | | 45 | 100 | 62187 | 30016 | E12-Cx-100-045-SQ |
| | | 9 | 38 | 37981 | 38603 | E12-Cx-020-009-SQ | 11 | 11 | 26 | 83 | 36763 | 36724 | E12-Cx-110-026-SQ |
| 2,5 | 3 | 5 | 38 | 62291 | 38869 | E12-Cx-025-005-SQ | | | 19 | 73 | 37251 | 39243 | E12-Cx-120-019-SQ |
| | | 9,5 | 38 | 37982 | 31434 | E12-Cx-025-009-SQ | | | 25 | 76 | 99359 | 31445 | E12-Cx-120-025-SQ |
| | | 6 | 38 | 62292 | 38870 | E12-Cx-030-006-SQ | 12 | 12 | 26 | 83 | 36764 | 36725 | E12-Cx-120-026-SQ |
| | | 9 | 38 | 99093 | 36709 | E12-Cx-030-009-SQ | | | 50 | 100 | 62200 | 30019 | E12-Cx-120-050-SQ |
| 3 | 3 | 12 | 38 | 32601 | 31435 | E12-Cx-030-012-SQ | | | 75 | 150 | 62188 | 30022 | E12-Cx-120-075-SQ |
| | | 19 | 57 | 62194 | 30153 | E12-Cx-030-019-SQ | | | 26 | 83 | 36765 | 36727 | E12-Cx-140-026-SQ |
| | | 25 | 75 | 62182 | 30001 | E12-Cx-030-025-SQ | 14 | 14 | 57 | 125 | 62201 | 30158 | E12-Cx-140-057-SQ |
| 3,5 | 4 | 7 | 50 | 62293 | 38871 | E12-Cx-035-007-SQ | | | 75 | 150 | 62189 | 30025 | E12-Cx-140-075-SQ |
| | | 14 | 50 | 32603 | 31436 | E12-Cx-035-014-SQ | | | 25 | 82 | 62304 | 38880 | E12-Cx-160-025-SQ |
| | | 8 | 50 | 62294 | 38872 | E12-Cx-040-008-SQ | | | 32 | 89 | 37989 | 31447 | E12-Cx-160-032-SQ |
| 4 | 4 | 11 | 50 | 36756 | 36711 | E12-Cx-040-011-SQ | | 16 | 32 | 92 | 36766 | 36729 | E12-Cx-160-032-SQ |
| | | 14 | 50 | 99357 | 31437 | E12-Cx-040-014-SQ | | | 57 | 125 | 62202 | 30159 | E12-Cx-160-057-SQ |
| | | 19 | 63 | 62195 | 30155 | E12-Cx-040-019-SQ | | | 75 | 150 | 62190 | 30028 | E12-Cx-160-075-SQ |
| | | 31 | 75 | 62183 | 30004 | E12-Cx-040-031-SQ | | | 32 | 92 | 36767 | 36730 | E12-Cx-180-032-SQ |
| 4,5 | 5 | 16 | 50 | 37983 | 31438 | E12-Cx-045-016-SQ | 18 | 18 | 57 | 125 | 62203 | 30228 | E12-Cx-180-057-SQ |
| | | 10 | 50 | 62296 | 38874 | E12-Cx-050-010-SQ | | | 75 | 150 | 62191 | 30031 | E12-Cx-180-075-SQ |
| | | 13 | 50 | 36757 | 36713 | E12-Cx-050-013-SQ | | | 38 | 100 | 37991 | 31449 | E12-Cx-200-038-SQ |
| 5 | 5 | 16 | 50 | 32604 | 31439 | E12-Cx-050-016-SQ | | 20 | 38 | 104 | 36768 | 36731 | E12-Cx-200-038-SQ |
| | | 19 | 63 | 62196 | 30156 | E12-Cx-050-019-SQ | | | 57 | 125 | 62204 | 30229 | E12-Cx-200-057-SQ |
| | | 31 | 100 | 62184 | 30231 | E12-Cx-050-031-SQ | | | 75 | 150 | 62192 | 30034 | E12-Cx-200-075-SQ |
| | | 12 | 54 | 37176 | 39240 | E12-Cx-060-012-SQ | | | 45 | 120 | 37231 | 36769 | E12-Cx-250-045-SQ |
| | | 13 | 57 | 36758 | 36715 | E12-Cx-060-013-SQ | 25 | 25 | 75 | 150 | 62193 | 30037 | E12-Cx-250-075-SQ |
| | | 19 | 63 | 37984 | 31440 | E12-Cx-060-019-SQ | | | | | | | |
| | | 29 | 75 | 62197 | 30010 | E12-Cx-060-029-SQ | | | | | | | |
| | | 38 | 100 | 62185 | 30234 | E12-Cx-060-038-SQ | | | | | | | |

E12

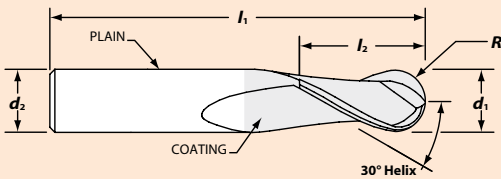
Model Code: E12 w/Ball End and Plain Shank



Ball End



truCORE 2 flute mills are CNC ground from the highest quality carbide material, maximizing performance and repeatability. Available uncoated and with AlTiN coating. Use ball end tools in contouring applications.



in $d_1: +0.000 / -0.002$ $d_2: h_6$
mm $d_1: +0,000 / -0,050$ $d_2: h_6$

| Cutter Dia d_1 | Shank Dia d_2 | Length of Cut l_2 | Overall Length l_1 | AlTiN Order Code | MG Order Code | EZ-ID Number E12 - Cx - xxxx - xxxx - BN - Lxx d_1 l_2 l_1 |
|---------------------|--------------------|------------------------|-------------------------|------------------|---------------|--|
| 1/32 | 1/8 | 1/16 | 1-1/2 | 30372 | 31601 | E12-Cx-0031-0062-BN |
| | | 3/32 | 1-1/2 | 30303 | 30801 | E12-Cx-0031-0093-BN |
| 3/64 | 1/8 | 3/32 | 1-1/2 | 30373 | 31602 | E12-Cx-0046-0093-BN |
| | | 9/64 | 1-1/2 | 30302 | 30803 | E12-Cx-0046-0140-BN |
| 1/16 | 1/8 | 1/8 | 1-1/2 | 30374 | 31603 | E12-Cx-0062-0125-BN |
| | | 3/16 | 1-1/2 | 30433 | 30805 | E12-Cx-0062-0187-BN |
| 5/64 | 1/8 | 1/4 | 1-1/2 | 30349 | 30807 | E12-Cx-0078-0250-BN |
| 3/32 | 1/8 | 3/16 | 1-1/2 | 30375 | 31605 | E12-Cx-0093-0187-BN |
| | | 3/8 | 1-1/2 | 30350 | 30809 | E12-Cx-0093-0375-BN |
| 7/64 | 1/8 | 3/8 | 1-1/2 | 30351 | 30811 | E12-Cx-0109-0375-BN |
| | | 1/4 | 1-1/2 | 31956 | 31607 | E12-Cx-0125-0250-BN |
| 1/8 | 1/8 | 1/2 | 1-1/2 | 30993 | 30813 | E12-Cx-0125-0500-BN |
| | | 5/8 | 2 | 37880 | | E12-Cx-0125-0625-BN |
| | | 3/4 | 2-1/4 | 30385 | 37808 | E12-Cx-0125-0750-BN |
| | | 1 | 3 | 31291 | 34208 | E12-Cx-0125-1000-BN |
| 9/64 | 3/16 | 9/16 | 2 | 90177 | 30815 | E12-Cx-0140-0562-BN |
| 5/32 | 3/16 | 5/16 | 2 | 30403 | | E12-Cx-0156-0312-BN |
| | | 9/16 | 2 | 30354 | 30817 | E12-Cx-0156-0562-BN |
| 3/16 | 3/16 | 3/8 | 2 | 30378 | | E12-Cx-0187-0375-BN |
| | | 5/8 | 2 | 90087 | 30821 | E12-Cx-0187-0625-BN |
| | | 3/4 | 2-1/2 | 30386 | 37812 | E12-Cx-0187-0750-BN |
| | | 1 | 4 | 37881 | | E12-Cx-0187-1000-BN |
| | | 1-1/8 | 3 | 90081 | 34212 | E12-Cx-0187-1125-BN |
| 7/32 | 1/4 | 5/8 | 2-1/2 | 30355 | 30825 | E12-Cx-0218-0625-BN-L25 |
| 1/4 | 1/4 | 1/2 | 2 | 30563 | | E12-Cx-0250-0500-BN |
| | | 3/4 | 2-1/2 | 30994 | 30829 | E12-Cx-0250-0750-BN |
| | | 1 | 4 | 37882 | | E12-Cx-0250-1000-BN-L4 |
| | | 1-1/8 | 3 | 30387 | 37816 | E12-Cx-0250-1125-BN |
| | | 1-1/2 | 4 | 90082 | 34216 | E12-Cx-0250-1500-BN |
| | | 1-1/2 | 6 | 34168 | 31263 | E12-Cx-0250-1500-BN |
| 9/32 | 5/16 | 3/4 | 2-1/2 | 30356 | | E12-Cx-0281-0750-BN |
| 5/16 | 5/16 | 1/2 | 2 | 30380 | | E12-Cx-0312-0500-BN |
| | | 13/16 | 2-1/2 | 30562 | 30837 | E12-Cx-0312-0812-BN |
| | | 1-1/8 | 3 | 20561 | 37820 | E12-Cx-0312-1125-BN |
| | | 1-5/8 | 4 | 31292 | 34220 | E12-Cx-0312-1625-BN |
| 11/32 | 3/8 | 1 | 2-1/2 | 30357 | | E12-Cx-0343-1000-BN |
| 3/8 | 3/8 | 5/8 | 2 | 30564 | | E12-Cx-0375-0625-BN |
| | | 1 | 2-1/2 | 30995 | 30845 | E12-Cx-0375-1000-BN |
| | | 1 | 4 | 37884 | | E12-Cx-0375-1000-BN-L4 |
| | | 1-1/8 | 3 | 30390 | 37824 | E12-Cx-0375-1125-BN |
| | | 1-1/2 | 6 | 34170 | 31235 | E12-Cx-0375-1500-BN-L6 |
| | | 1-3/4 | 4 | 31293 | 34224 | E12-Cx-0375-1750-BN |
| 7/16 | 7/16 | 1 | 2-3/4 | 30362 | 30879 | E12-Cx-0437-1000-BN |
| | | 2 | 4 | 30391 | | E12-Cx-0437-2000-BN |
| 1/2 | 1/2 | 5/8 | 2-1/2 | 31630 | | E12-Cx-0500-0625-BN |
| | | 1 | 3 | 97921 | 30861 | E12-Cx-0500-1000-BN |
| | | 1 | 4 | 37885 | 90503 | E12-Cx-0500-1000-BN-L4 |
| | | 1-1/2 | 6 | 34172 | 31247 | E12-Cx-0500-1500-BN-L6 |
| | | 2 | 4 | 30392 | 37832 | E12-Cx-0500-2000-BN |
| | | 3 | 6 | 31295 | 34232 | E12-Cx-0500-3000-BN |
| 9/16 | 9/16 | 1-1/4 | 3-1/2 | 30248 | 30863 | E12-Cx-0562-1250-BN |
| 5/8 | 5/8 | 1-1/4 | 3-1/2 | 30366 | 30865 | E12-Cx-0625-1250-BN |
| | | 2-1/4 | 5 | 30393 | 37840 | E12-Cx-0625-2250-BN |
| | | 3 | 6 | 31296 | 34240 | E12-Cx-0625-3000-BN |
| 3/4 | 3/4 | 1-1/2 | 4 | 30872 | 30869 | E12-Cx-0750-1500-BN |
| | | 2-1/4 | 5 | 30396 | 37848 | E12-Cx-0750-2250-BN |
| | | 3 | 6 | 31297 | 34248 | E12-Cx-0750-3000-BN |
| 1 | 1 | 1-1/2 | 4 | 30369 | 30877 | E12-Cx-1000-1500-BN |
| | | 2-1/4 | 5 | 30397 | 37864 | E12-Cx-1000-2250-BN |
| | | 3 | 6 | 31298 | 34264 | E12-Cx-1000-3000-BN |

Model Code: E12 w/Ball End and Plain Shank



| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | MG Order Code | EZ-ID Number E12 - Cx - xxx - xxx - BN d1 l2 |
|------------------|-----------------|---------------------|----------------------|---------------------|------------------|--|
| 1 | 3 | 2 | 38 | 62673 | 39071 | E12-Cx-010-002-BN |
| | | 3 | 38 | 99080 | 32551 | E12-Cx-010-003-BN |
| 1,5 | 3 | 3 | 38 | 62674 | 39072 | E12-Cx-015-003-BN |
| | | 4,5 | 38 | 62459 | 32552 | E12-Cx-015-004-BN |
| | | 6 | 38 | 62579 | 38611 | E12-Cx-015-006-BN |
| 2 | 3 | 4 | 38 | 62675 | 39073 | E12-Cx-020-004-BN |
| | | 6,3 | 38 | 99082 | 32553 | E12-Cx-020-006-BN |
| | | 9 | 38 | 62580 | 38612 | E12-Cx-020-009-BN |
| 2,5 | 3 | 9,5 | 38 | 62581 | 32554 | E12-Cx-025-009-BN |
| 3 | 3 | 6 | 38 | 62677 | 39075 | E12-Cx-030-006-BN |
| | | 12 | 38 | 32600 | 32555 | E12-Cx-030-012-BN |
| | | 19 | 57 | 62625 | 39114 | E12-Cx-030-019-BN |
| | | 25 | 75 | 62649 | 32365 | E12-Cx-030-025-BN |
| 3,5 | 4 | 14 | 50 | 62582 | 32556 | E12-Cx-035-014-BN |
| 4 | 4 | 8 | 50 | 62679 | 39077 | E12-Cx-040-008-BN |
| | | 14 | 50 | 32602 | 32557 | E12-Cx-040-014-BN |
| | | 19 | 63 | 62626 | 39115 | E12-Cx-040-019-BN |
| | | 31 | 75 | 62650 | 32368 | E12-Cx-040-031-BN |
| 4,5 | 5 | 16 | 50 | 62583 | 32558 | E12-Cx-045-016-BN |
| | | 10 | 50 | 62681 | 39079 | E12-Cx-050-010-BN |
| | | 16 | 50 | 99083 | 32559 | E12-Cx-050-016-BN |
| | | 19 | 63 | 62627 | 39116 | E12-Cx-050-019-BN |
| 5 | 5 | 31 | 100 | 62651 | 39123 | E12-Cx-050-031-BN |
| 6 | 6 | 12 | 54 | 37501 | 39466 | E12-Cx-060-012-BN |
| | | 19 | 63 | 62584 | 32560 | E12-Cx-060-019-BN |
| | | 29 | 75 | 62628 | 32374 | E12-Cx-060-029-BN |
| | | 38 | 100 | 62652 | 39125 | E12-Cx-060-038-BN |
| 7 | 8 | 19 | 63 | 62585 | 32561 | E12-Cx-070-019-BN |
| 8 | 8 | 14 | 58 | 37502 | 39467 | E12-Cx-080-014-BN |
| | | 20 | 63 | 99085 | 32562 | E12-Cx-080-020-BN |
| | | 29 | 75 | 62629 | 32377 | E12-Cx-080-029-BN |
| | | 41 | 100 | 62653 | 39126 | E12-Cx-080-041-BN |
| 9 | 10 | 22 | 72 | 62586 | 32563 | E12-Cx-090-022-BN |
| 10 | 10 | 16 | 66 | 37503 | 39468 | E12-Cx-100-016-BN |
| | | 25 | 72 | 62587 | 32564 | E12-Cx-100-025-BN |
| | | 40 | 88 | 37504 | 39469 | E12-Cx-100-040-BN |
| | | 45 | 100 | 62654 | 32380 | E12-Cx-100-045-BN |
| 12 | 12 | 25 | 76 | 99356 | 32565 | E12-Cx-120-025-BN |
| | | 26 | 83 | 37507 | 39471 | E12-Cx-120-026-BN |
| | | 50 | 100 | 62631 | 32383 | E12-Cx-120-050-BN |
| | | 75 | 150 | 62655 | 32386 | E12-Cx-120-075-BN |
| 14 | 14 | 32 | 83 | 62589 | 34565 | E12-Cx-140-032-BN |
| 16 | 16 | 32 | 89 | 62590 | 32567 | E12-Cx-160-032-BN |
| | | 57 | 125 | 62633 | 39119 | E12-Cx-160-057-BN |
| 20 | 20 | 38 | 104 | 36735 | 36733 | E12-Cx-200-038-BN |
| | | 57 | 125 | 62635 | 39121 | E12-Cx-200-057-BN |
| | | 75 | 150 | 62659 | 32398 | E12-Cx-200-075-BN |

E12M

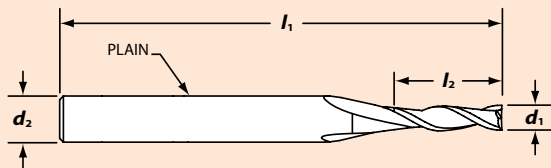
Model Code: E12M w/Square End and Plain Shank



Square End - Miniature



truCORE 2 flute mills are CNC ground from the highest quality carbide material, maximizing performance and repeatability. Available uncoated. Miniature sizes for precision machining.



in $d_1: +0.000 / -0.002$ $d_2: h6$

| Cutter Dia d_1 | Shank Dia d_2 | Length of Cut l_2 | Overall Length l_1 | MG Order Code | EZ-ID Number E12 - xxxx - xxxx - SQ d_1 l_2 |
|---------------------|--------------------|------------------------|-------------------------|---------------|---|
| .001 | 1/8 | .005 | 1-1/2 | 90625 | E12-0001-0005-SQ |
| .002 | 1/8 | .005 | 1-1/2 | 90626 | E12-0002-0005-SQ |
| .003 | 1/8 | .005 | 1-1/2 | 90627 | E12-0003-0005-SQ |
| .004 | 1/8 | .006 | 1-1/2 | 90628 | E12-0004-0006-SQ |
| .005 | 1/8 | .015 | 1-1/2 | 90629 | E12-0005-0015-SQ |
| .006 | 1/8 | .018 | 1-1/2 | 90630 | E12-0006-0018-SQ |
| .007 | 1/8 | .021 | 1-1/2 | 90631 | E12-0007-0021-SQ |
| .008 | 1/8 | .024 | 1-1/2 | 90632 | E12-0008-0024-SQ |
| .009 | 1/8 | .027 | 1-1/2 | 90633 | E12-0009-0027-SQ |
| .010 | 1/8 | .030 | 1-1/2 | 30101 | E12-0010-0030-SQ |
| .011 | 1/8 | .033 | 1-1/2 | 90634 | E12-0011-0033-SQ |
| .012 | 1/8 | .036 | 1-1/2 | 90635 | E12-0012-0036-SQ |
| .013 | 1/8 | .039 | 1-1/2 | 90636 | E12-0013-0039-SQ |
| .014 | 1/8 | .042 | 1-1/2 | 90637 | E12-0014-0042-SQ |
| .015 | 1/8 | .045 | 1-1/2 | 90600 | E12-0015-0045-SQ |
| .016 | 1/8 | .048 | 1-1/2 | 90640 | E12-0016-0048-SQ |
| .017 | 1/8 | .051 | 1-1/2 | 90641 | E12-0017-0051-SQ |
| .018 | 1/8 | .054 | 1-1/2 | 90642 | E12-0018-0054-SQ |
| .019 | 1/8 | .057 | 1-1/2 | 90643 | E12-0019-0057-SQ |
| .020 | 1/8 | .060 | 1-1/2 | 90601 | E12-0020-0060-SQ |
| .021 | 1/8 | .063 | 1-1/2 | 90644 | E12-0021-0063-SQ |
| .022 | 1/8 | .066 | 1-1/2 | 90645 | E12-0022-0066-SQ |
| .023 | 1/8 | .069 | 1-1/2 | 90646 | E12-0023-0069-SQ |
| .024 | 1/8 | .072 | 1-1/2 | 90647 | E12-0024-0072-SQ |
| .025 | 1/8 | .075 | 1-1/2 | 90602 | E12-0025-0075-SQ |
| .026 | 1/8 | .078 | 1-1/2 | 90648 | E12-0026-0078-SQ |
| .027 | 1/8 | .081 | 1-1/2 | 90649 | E12-0027-0081-SQ |
| .028 | 1/8 | .084 | 1-1/2 | 90650 | E12-0028-0084-SQ |
| .029 | 1/8 | .087 | 1-1/2 | 90651 | E12-0029-0087-SQ |
| .030 | 1/8 | .090 | 1-1/2 | 30102 | E12-0030-0090-SQ |
| .040 | 1/8 | .120 | 1-1/2 | 30104 | E12-0040-0120-SQ |
| .050 | 1/8 | .150 | 1-1/2 | 30107 | E12-0050-0150-SQ |
| .060 | 1/8 | .180 | 1-1/2 | 30109 | E12-0060-0180-SQ |

E22

Square End



truCORE 2 flute mills are CNC ground from the highest quality carbide material, maximizing performance and repeatability. Available uncoated and with AlTiN or TiN coating.

Model Code: E22 w/Square End and Plain Shank

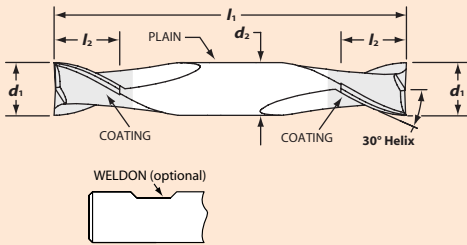


| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | MG Order Code | TiN Order Code | EZ-ID Number E22 - Cx - xxxx - xxxx - SQ - Lxx d1 l2 l1 |
|------------------|-----------------|---------------------|----------------------|---------------------|------------------|-------------------|---|
| 1/32 | 1/8 | 1/16 | 1-1/2 | 31802 | 31830 | | E22-Cx-0031-0062-SQ |
| 3/64 | 1/8 | 3/32 | 1-1/2 | 31826 | 31831 | | E22-Cx-0046-0093-SQ |
| 1/16 | 1/8 | 1/8 | 1-1/2 | 31827 | 31803 | | E22-Cx-0062-0125-SQ |
| 5/64 | 1/8 | 1/8 | 1-1/2 | 31828 | 31832 | | E22-Cx-0078-0125-SQ |
| 3/32 | 1/8 | 3/16 | 1-1/2 | 31829 | 31805 | | E22-Cx-0093-0187-SQ |
| 7/64 | 1/8 | 3/16 | 1-1/2 | 31849 | 31833 | | E22-Cx-0109-0187-SQ |
| 1/8 | 1/8 | 1/4 | 1-1/2 | 31857 | 31807 | 31808 | E22-Cx-0125-0250-SQ |
| 5/32 | 3/16 | 5/16 | 2 | 31858 | 31809 | | E22-Cx-0156-0312-SQ |
| 3/16 | 3/16 | 3/8 | 2 | 31860 | 31811 | 31812 | E22-Cx-0187-0375-SQ |
| 7/32 | 1/4 | 1/2 | 2-1/2 | 31861 | 31813 | | E22-Cx-0218-0500-SQ-L25 |
| 1/4 | 1/4 | 1/2 | 2-1/2 | 31873 | 31815 | 31816 | E22-Cx-0250-0500-SQ-L25 |
| 5/16 | 5/16 | 1/2 | 2-1/2 | 31882 | 31817 | | E22-Cx-0312-0500-SQ-L25 |
| 3/8 | 3/8 | 9/16 | 2-1/2 | 31881 | 31819 | 31820 | E22-Cx-0375-0562-SQ-L25 |
| 1/2 | 1/2 | 5/8 | 3 | 31885 | 31823 | 31824 | E22-Cx-0500-0625-SQ-L3 |

Model Code: E22 w/Square End and Weldon Shank



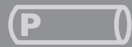
| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | MG Order Code | EZ-ID Number E22 - xxxx - xxxx - SQ - Lxx - W - Sxxxx d1 l2 l1 |
|------------------|-----------------|---------------------|----------------------|------------------|--|
| 1/8 | 3/8 | 3/8 | 3-1/2 | 32605 | E22-0125-0375-SQ-L35-W-S0375 |
| 3/16 | 3/8 | 1/2 | 3-1/2 | 32609 | E22-0187-0500-SQ-L35-W-S0375 |
| 1/4 | 3/8 | 5/8 | 3-1/2 | 32613 | E22-0250-0625-SQ-L35-W-S0375 |
| 5/16 | 3/8 | 3/4 | 3-1/2 | 32617 | E22-0312-0750-SQ-L35-W-S0375 |
| 3/8 | 3/8 | 3/4 | 3-1/2 | 32621 | E22-0375-0750-SQ-L35-W-S0375 |
| 1/2 | 1/2 | 1 | 4 | 32625 | E22-0500-1000-SQ-L4-W-S0375 |



in d1: +0.000 / -0.002 d2: h6

E22

Model Code: E22 w/Ball End and Plain Shank

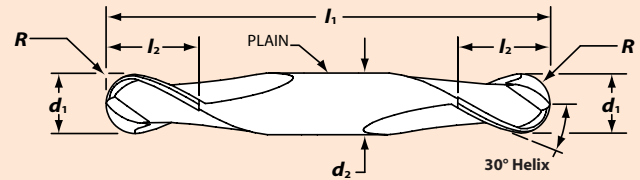


Ball End



truCORE 2 flute mills are CNC ground from the highest quality carbide material, maximizing performance and repeatability. Available uncoated. Use ball end tools in contouring applications.

| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | MG Order Code | EZ-ID Number E22-xxxx-xxxx-BN-Lxx d1 l2 l1 |
|------------------|-----------------|---------------------|----------------------|---------------|--|
| 1/32 | 1/8 | 1/16 | 1-1/2 | 32001 | E22-0031-0062-BN |
| 3/64 | 1/8 | 3/32 | 1-1/2 | 32002 | E22-0046-0093-BN |
| 1/16 | 1/8 | 1/8 | 1-1/2 | 32037 | E22-0062-0125-BN |
| 3/32 | 1/8 | 3/16 | 1-1/2 | 30480 | E22-0093-0187-BN |
| 1/8 | 1/8 | 1/4 | 1-1/2 | 30579 | E22-0125-0250-BN |
| 3/16 | 3/16 | 3/8 | 2 | 30577 | E22-0187-0375-BN |
| 1/4 | 1/4 | 1/2 | 2-1/2 | 32082 | E22-0250-0500-BN-L25 |
| 3/8 | 3/8 | 9/16 | 2-1/2 | 32095 | E22-0375-0562-BN-L25 |
| 1/2 | 1/2 | 5/8 | 3 | 32097 | E22-0500-0625-BN-L3 |

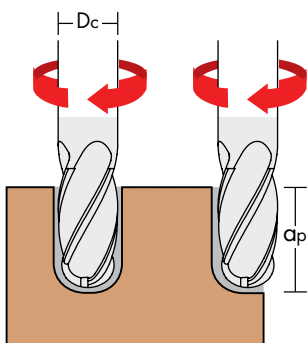


in d1: +0.000 / -0.002 d2: h6

TOOL TIP

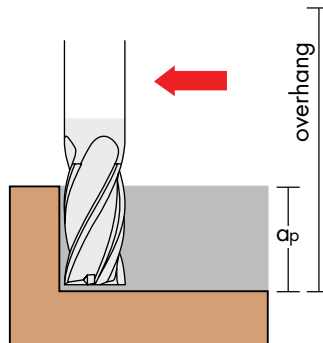
Making Adjustments

Apply the following adjustments when programming these applications. Refer to pages 28 and 29 for speed and feed information.



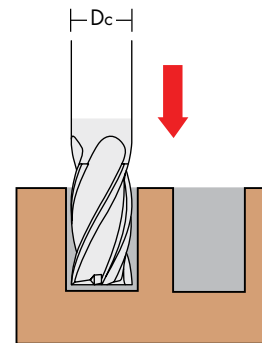
1. Ball nose end mills

- Reduce chip load by 25% from roughing/slotting recommendation when axial DOC (ap) exceeds 75% of Dc



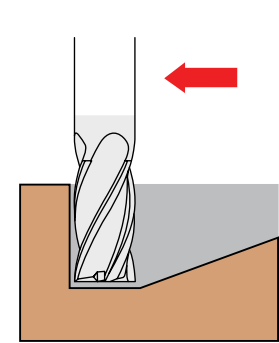
2. Long reach mills with large overhang

- Reduce speed rate and chip load by 20% each when total reach to tool diameter ratio is 5:1 or greater



3. Plunge entry into work piece







- Reduce chip load by 80% of recommended slotting rate
- Peck mill if axial DOC (ap) exceeds 50% of Dc



4. Ramp entry into work piece







- Ramp at 1.5°-2.5° angle
- Reduce chip load by 20% of recommended slotting rate

E Series Application Guide (Inch) • Speed & Feed

| ISO Classification | Work Material | Type of Cut | Axial DOC | Radial DOC | Number of Flutes | Speed (SFM) | | | Feed (Inches Per Tooth) | | | | | | |
|---|---|---------------------|-----------|------------|------------------|-------------|------|--------|-------------------------|--------|--------|--------|--------|--------|--------|
| | | | | | | MG | TiCN | AlTiN | 1/8 | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 1 |
|  | Aluminum Alloys 2024, 6061, 7075 | Slotting | .5 x D | 1 x D | 2 | 350 | 550 | — | 0.0008 | 0.0015 | 0.0023 | 0.0030 | 0.0038 | 0.0045 | 0.0060 |
| | | Peripheral - Rough | 1 x D | .5 x D | 2 | 450 | 650 | — | 0.0010 | 0.0020 | 0.0030 | 0.0040 | 0.0050 | 0.0060 | 0.0080 |
| | | Peripheral - Finish | 1.5 x D | .01 x D | 3 | 550 | — | — | 0.0010 | 0.0020 | 0.0030 | 0.0040 | 0.0050 | 0.0060 | 0.0080 |
| | Copper Alloys Brass & Bronze | Slotting | .5 x D | 1 x D | 2 | 275 | 350 | 350 | 0.0006 | 0.0013 | 0.0019 | 0.0025 | 0.0031 | 0.0038 | 0.0050 |
| | | Peripheral - Rough | 1 x D | .5 x D | 2 | 300 | 400 | 400 | 0.0008 | 0.0015 | 0.0023 | 0.0030 | 0.0038 | 0.0045 | 0.0060 |
| | | Peripheral - Rough | 1 x D | .5 x D | 3 | 300 | — | 400 | 0.0008 | 0.0015 | 0.0023 | 0.0030 | 0.0038 | 0.0045 | 0.0060 |
| | | Peripheral - Finish | 1.5 x D | .01 x D | 2 | 350 | 450 | 450 | 0.0009 | 0.0018 | 0.0026 | 0.0035 | 0.0044 | 0.0053 | 0.0070 |
| | | Peripheral - Finish | 1.5 x D | .01 x D | 3 | 350 | — | 450 | 0.0009 | 0.0018 | 0.0026 | 0.0035 | 0.0044 | 0.0053 | 0.0070 |
| | Composites, Plastics | Slotting | .5 x D | 1 x D | 4 | 300 | 350 | 350 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | | Peripheral - Rough | 1 x D | .5 x D | 4 | 375 | 450 | 450 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | | Peripheral - Finish | 1.5 x D | .01 x D | 4 | 450 | 650 | 650 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Magnesium Alloys | Slotting | .5 x D | 1 x D | 2 | 350 | 550 | 550 | 0.0008 | 0.0015 | 0.0023 | 0.0030 | 0.0038 | 0.0045 | 0.0060 |
| | | Peripheral - Rough | 1 x D | .5 x D | 2 | 450 | 650 | 650 | 0.0010 | 0.0020 | 0.0030 | 0.0040 | 0.0050 | 0.0060 | 0.0080 |
| | | Peripheral - Finish | 1.5 x D | .01 x D | 2 | 550 | 750 | 750 | 0.0010 | 0.0020 | 0.0030 | 0.0040 | 0.0050 | 0.0060 | 0.0080 |
| | Graphite | Slotting | .5 x D | 1 x D | 4 | 350 | 400 | 450 | 0.0008 | 0.0015 | 0.0023 | 0.0030 | 0.0038 | 0.0045 | 0.0060 |
| | | Peripheral - Rough | 1 x D | .5 x D | 4 | 425 | 475 | 525 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | | Peripheral - Finish | 1.5 x D | .01 x D | 4 | 500 | 550 | 600 | 0.0010 | 0.0019 | 0.0029 | 0.0038 | 0.0048 | 0.0057 | 0.0076 |
| |  | Cast Iron - Gray | Slotting | .5 x D | 1 x D | 4 | — | 350 | 350 | 0.0004 | 0.0008 | 0.0011 | 0.0015 | 0.0019 | 0.0023 |
| Peripheral - Rough | | | 1 x D | .4 x D | 4 | — | 400 | 400 | 0.0005 | 0.0010 | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0040 |
| Peripheral - Finish | | | 1.5 x D | .01 x D | 4 | — | 450 | 450 | 0.0008 | 0.0015 | 0.0023 | 0.0030 | 0.0038 | 0.0045 | 0.0060 |
| Cast Iron - Ductile | | Slotting | .5 x D | 1 x D | 4 | — | 250 | 250 | 0.0004 | 0.0008 | 0.0011 | 0.0015 | 0.0019 | 0.0023 | 0.0030 |
| | | Peripheral - Rough | 1 x D | .4 x D | 4 | — | 275 | 275 | 0.0005 | 0.0010 | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0040 |
| | | Peripheral - Finish | 1.5 x D | .01 x D | 4 | — | 325 | 325 | 0.0006 | 0.0012 | 0.0017 | 0.0023 | 0.0029 | 0.0035 | 0.0046 |
|  | Low Carbon Steel 1018, 12L14, 8620 | Slotting | .5 x D | 1 x D | 4 | 250 | 275 | 300 | 0.0005 | 0.0010 | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0040 |
| | | Slotting | .5 x D | 1 x D | 3 | 250 | — | 300 | 0.0005 | 0.0010 | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0040 |
| | | Peripheral - Rough | 1 x D | .5 x D | 4 | 275 | 300 | 325 | 0.0006 | 0.0013 | 0.0019 | 0.0025 | 0.0031 | 0.0038 | 0.0050 |
| | | Peripheral - Rough | 1 x D | .5 x D | 3 | 275 | — | 325 | 0.0006 | 0.0013 | 0.0019 | 0.0025 | 0.0031 | 0.0038 | 0.0050 |
| | | Finish | 1.5 x D | .01 x D | 4 | 300 | 325 | 350 | 0.0008 | 0.0015 | 0.0023 | 0.0030 | 0.0038 | 0.0045 | 0.0060 |
| | Medium Carbon Steels 4140, 4340 | Slotting | .5 x D | 1 x D | 4 | 225 | 250 | 275 | 0.0005 | 0.0010 | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0040 |
| | | Peripheral - Rough | 1 x D | .4 x D | 4 | 250 | 275 | 300 | 0.0006 | 0.0013 | 0.0019 | 0.0025 | 0.0031 | 0.0038 | 0.0050 |
| | Tool & Die Steels <= 38 HRC A2, D2, H13, P20 | Finish | 1.5 x D | .01 x D | 4 | 275 | 325 | 325 | 0.0008 | 0.0015 | 0.0023 | 0.0030 | 0.0038 | 0.0045 | 0.0060 |
| | | Slotting | .5 x D | 1 x D | 4 | 225 | 250 | 275 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | | Peripheral - Rough | 1 x D | .4 x D | 4 | 250 | 275 | 300 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
|  | Tool & Die Steels 39 - 48 HRC A2, D2, H13 | Finish | 1.5 x D | .01 x D | 4 | 275 | 300 | 325 | 0.0008 | 0.0015 | 0.0023 | 0.0030 | 0.0038 | 0.0045 | 0.0060 |
| | | Slotting | .25 x D | 1 x D | 4 | — | 175 | 200 | 0.0005 | 0.0009 | 0.0014 | 0.0018 | 0.0023 | 0.0027 | 0.0036 |
| | | Peripheral - Rough | 1 x D | .3 x D | 4 | — | 225 | 250 | 0.0005 | 0.0010 | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0040 |
|  | Martensitic Stainless Steel 416, 410, 440C | Finish | 1.5 x D | .01 x D | 4 | — | 275 | 300 | 0.0005 | 0.0010 | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0040 |
| | | Slotting | .5 x D | 1 x D | 4 | — | 250 | 250 | 0.0004 | 0.0008 | 0.0011 | 0.0015 | 0.0019 | 0.0023 | 0.0030 |
| | | Peripheral - Rough | 1 x D | .3 x D | 4 | — | 275 | 275 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Austenitic Stainless Steels 303, 304, 316 | Finish | 1.5 x D | .01 x D | 4 | — | 325 | 325 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | | Slotting | .5 x D | 1 x D | 4 | 200 | 225 | 250 | 0.0003 | 0.0005 | 0.0008 | 0.0010 | 0.0013 | 0.0015 | 0.0020 |
| | | Slotting | .5 x D | 1 x D | 3 | 200 | — | 250 | 0.0003 | 0.0005 | 0.0008 | 0.0010 | 0.0013 | 0.0015 | 0.0020 |
| | | Peripheral - Rough | 1 x D | .3 x D | 4 | 250 | 275 | 300 | 0.0004 | 0.0008 | 0.0011 | 0.0015 | 0.0019 | 0.0023 | 0.0030 |
| | Precipitation Hardening Stainless Steels 17-4 PH, 15-5 PH, 13-8 PH | Peripheral - Rough | 1 x D | .3 x D | 3 | 250 | — | 300 | 0.0004 | 0.0008 | 0.0011 | 0.0015 | 0.0019 | 0.0023 | 0.0030 |
| | | Finish | 1.5 x D | .01 x D | 4 | 300 | 325 | 350 | 0.0005 | 0.0009 | 0.0014 | 0.0018 | 0.0023 | 0.0027 | 0.0036 |
| Slotting | | .25 x D | 1 x D | 4 | — | 200 | 225 | 0.0004 | 0.0008 | 0.0011 | 0.0015 | 0.0019 | 0.0023 | 0.0030 | |
|  | Titanium Alloys | Peripheral - Rough | 1 x D | .3 x D | 4 | — | 225 | 250 | 0.0004 | 0.0009 | 0.0013 | 0.0017 | 0.0021 | 0.0026 | 0.0034 |
| | | Finish | 1.5 x D | .01 x D | 4 | — | 250 | 275 | 0.0004 | 0.0009 | 0.0013 | 0.0017 | 0.0021 | 0.0026 | 0.0034 |
| | | Slotting | .25 x D | 1 x D | 4 | — | 40 | 60 | 0.0003 | 0.0005 | 0.0008 | 0.0010 | 0.0013 | 0.0015 | 0.0020 |
| | High Temperature Alloys Inconel, Haynes, Stellite, Hastalloy | Peripheral - Rough | 1 x D | .25 x D | 4 | — | 50 | 70 | 0.0004 | 0.0008 | 0.0011 | 0.0015 | 0.0019 | 0.0023 | 0.0030 |
| | | Finish | 1.5 x D | .01 x D | 4 | — | 55 | 70 | 0.0004 | 0.0008 | 0.0011 | 0.0015 | 0.0019 | 0.0023 | 0.0030 |
| | | Slotting | .25 x D | 1 x D | 4 | — | 40 | 60 | 0.0003 | 0.0005 | 0.0008 | 0.0010 | 0.0013 | 0.0015 | 0.0020 |
| | | Peripheral - Rough | 1 x D | .25 x D | 4 | — | 50 | 70 | 0.0004 | 0.0008 | 0.0011 | 0.0015 | 0.0019 | 0.0023 | 0.0030 |

D = Tool diameter

E Series Application Guide (Metric) • Speed & Feed

| ISO Classification | Work Material | Type of Cut | Axial DOC | Radial DOC | Number of Flutes | Speed (M/min) | | | Feed (MM per Tooth) | | | | | | |
|---|---|--|-----------|------------|------------------|---------------|------|-------|---------------------|--------|--------|--------|--------|--------|--------|
| | | | | | | MG | TICN | AlTiN | 3,0 | 6,0 | 10,0 | 12,0 | 16,0 | 20,0 | 25,0 |
|  | Aluminum Alloys 2024, 6061, 7075 | Slotting | .5 x D | 1 x D | 2 | 107 | 168 | — | 0.0191 | 0.0381 | 0.0572 | 0.0762 | 0.0953 | 0.1273 | 0.1524 |
| | | Peripheral - Rough | 1 x D | .5 x D | 2 | 137 | 198 | — | 0.0254 | 0.0508 | 0.0762 | 0.1016 | 0.1270 | 0.1697 | 0.2032 |
| | | Peripheral - Finish | 1.5 x D | .01 x D | 3 | 168 | — | — | 0.0254 | 0.0508 | 0.0762 | 0.1016 | 0.1270 | 0.1697 | — |
| | Copper Alloys Brass & Bronze | Slotting | .5 x D | 1 x D | 2 | 84 | 107 | 107 | 0.0159 | 0.0318 | 0.0476 | 0.0635 | 0.0794 | 0.1060 | 0.1270 |
| | | Peripheral - Rough | 1 x D | .5 x D | 2 | 91 | 122 | 122 | 0.0191 | 0.0381 | 0.0572 | 0.0762 | 0.0953 | 0.1273 | 0.1524 |
| | | Peripheral - Rough | 1 x D | .5 x D | 3 | 91 | — | 122 | 0.0191 | 0.0381 | 0.0572 | 0.0762 | 0.0953 | 0.1273 | — |
| | | Peripheral - Finish | 1.5 x D | .01 x D | 2 | 107 | 137 | 137 | 0.0222 | 0.0445 | 0.0667 | 0.0889 | 0.1111 | 0.1485 | 0.1778 |
| | | Peripheral - Finish | 1.5 x D | .01 x D | 3 | 107 | — | 137 | 0.0222 | 0.0445 | 0.0667 | 0.0889 | 0.1111 | 0.1485 | — |
| | Composites, Plastics | Slotting | .5 x D | 1 x D | 4 | 91 | 107 | 107 | 0.0203 | 0.0406 | 0.0610 | 0.0813 | 0.1016 | 0.1357 | 0.1626 |
| | | Peripheral - Rough | 1 x D | .5 x D | 4 | 114 | 137 | 137 | 0.0254 | 0.0508 | 0.0762 | 0.1016 | 0.1270 | 0.1697 | 0.2032 |
| | | Peripheral - Finish | 1.5 x D | .01 x D | 4 | 137 | 198 | 198 | 0.0223 | 0.0447 | 0.0670 | 0.0893 | 0.1117 | 0.1492 | 0.1787 |
| | Magnesium Alloys | Slotting | .5 x D | 1 x D | 2 | 107 | 168 | 168 | 0.0191 | 0.0381 | 0.0572 | 0.0762 | 0.0953 | 0.1273 | 0.1524 |
| | | Peripheral - Rough | 1 x D | .5 x D | 2 | 137 | 198 | 198 | 0.0254 | 0.0508 | 0.0762 | 0.1016 | 0.1270 | 0.1697 | 0.2032 |
| | | Peripheral - Finish | 1.5 x D | .01 x D | 2 | 168 | 229 | 229 | 0.0254 | 0.0508 | 0.0762 | 0.1016 | 0.1270 | 0.1697 | 0.2032 |
| | Graphite | Slotting | .5 x D | 1 x D | 4 | 107 | 122 | 137 | 0.0191 | 0.0381 | 0.0572 | 0.0762 | 0.0953 | 0.1273 | 0.1524 |
| | | Peripheral - Rough | 1 x D | .5 x D | 4 | 130 | 145 | 160 | 0.0222 | 0.0445 | 0.0667 | 0.0889 | 0.1111 | 0.1485 | 0.1778 |
| | | Peripheral - Finish | 1.5 x D | .01 x D | 4 | 152 | 168 | 183 | 0.0241 | 0.0483 | 0.0724 | 0.0965 | 0.1207 | 0.1612 | 0.1930 |
| |  | Cast Iron - Gray | Slotting | .5 x D | 1 x D | 4 | — | 107 | 107 | 0.0095 | 0.0191 | 0.0286 | 0.0381 | 0.0476 | 0.0636 |
| Peripheral - Rough | | | 1 x D | .4 x D | 4 | — | 122 | 122 | 0.0127 | 0.0254 | 0.0381 | 0.0508 | 0.0635 | 0.0848 | 0.1016 |
| Peripheral - Finish | | | 1.5 x D | .01 x D | 4 | — | 137 | 137 | 0.0191 | 0.0381 | 0.0572 | 0.0762 | 0.0953 | 0.1273 | 0.1524 |
| Cast Iron - Ductile | | Slotting | .5 x D | 1 x D | 4 | — | 76 | 76 | 0.0095 | 0.0191 | 0.0286 | 0.0381 | 0.0476 | 0.0636 | 0.0762 |
| | | Peripheral - Rough | 1 x D | .4 x D | 4 | — | 84 | 84 | 0.0127 | 0.0254 | 0.0381 | 0.0508 | 0.0635 | 0.0848 | 0.1016 |
| | | Peripheral - Finish | 1.5 x D | .01 x D | 4 | — | 99 | 99 | 0.0146 | 0.0292 | 0.0438 | 0.0584 | 0.0730 | 0.0976 | 0.1168 |
|  | Low Carbon Steel 1018, 12L14, 8620 | Slotting | .5 x D | 1 x D | 4 | 76 | 84 | 91 | 0.0127 | 0.0254 | 0.0381 | 0.0508 | 0.0635 | 0.0848 | 0.1016 |
| | | Slotting | .5 x D | 1 x D | 3 | 76 | — | 91 | 0.0127 | 0.0254 | 0.0381 | 0.0508 | 0.0635 | 0.0848 | — |
| | | Peripheral - Rough | 1 x D | .5 x D | 4 | 84 | 91 | 99 | 0.0159 | 0.0318 | 0.0476 | 0.0635 | 0.0794 | 0.1060 | 0.1270 |
| | | Peripheral - Rough | 1 x D | .5 x D | 3 | 84 | — | 99 | 0.0159 | 0.0318 | 0.0476 | 0.0635 | 0.0794 | 0.1060 | — |
| | | Finish | 1.5 x D | .01 x D | 4 | 91 | 99 | 107 | 0.0191 | 0.0381 | 0.0572 | 0.0762 | 0.0953 | 0.1273 | 0.1524 |
| | Medium Carbon Steels 4140, 4340 | Slotting | .5 x D | 1 x D | 4 | 69 | 76 | 84 | 0.0127 | 0.0254 | 0.0381 | 0.0508 | 0.0635 | 0.0848 | 0.1016 |
| | | Peripheral - Rough | 1 x D | .4 x D | 4 | 76 | 84 | 91 | 0.0159 | 0.0318 | 0.0476 | 0.0635 | 0.0794 | 0.1060 | 0.1270 |
| | | Finish | 1.5 x D | .01 x D | 4 | 84 | 99 | 99 | 0.0191 | 0.0381 | 0.0572 | 0.0762 | 0.0953 | 0.1273 | 0.1524 |
| | Tool & Die Steels <= 38 HRC A2, D2, H13, P20 | Slotting | .5 x D | 1 x D | 4 | 69 | 76 | 84 | 0.0127 | 0.0254 | 0.0381 | 0.0508 | 0.0635 | 0.0848 | 0.1016 |
| | | Peripheral - Rough | 1 x D | .4 x D | 4 | 76 | 84 | 91 | 0.0159 | 0.0318 | 0.0476 | 0.0635 | 0.0794 | 0.1060 | 0.1270 |
| | | Finish | 1.5 x D | .01 x D | 4 | 84 | 91 | 99 | 0.0191 | 0.0381 | 0.0572 | 0.0762 | 0.0953 | 0.1273 | 0.1524 |
| |  | Tool & Die Steels 39 - 48 HRC A2, D2, H13 | Slotting | .25 x D | 1 x D | 4 | — | 53 | 61 | 0.0114 | 0.0229 | 0.0343 | 0.0457 | 0.0572 | 0.0764 |
| Peripheral - Rough | | | 1 x D | .3 x D | 4 | — | 69 | 76 | 0.0127 | 0.0254 | 0.0381 | 0.0508 | 0.0635 | 0.0848 | 0.1016 |
| Finish | | | 1.5 x D | .01 x D | 4 | — | 84 | 91 | 0.0127 | 0.0254 | 0.0381 | 0.0508 | 0.0635 | 0.0848 | 0.1016 |
|  | Martensitic Stainless Steel 416, 410, 440C | Slotting | .5 x D | 1 x D | 4 | — | 76 | 76 | 0.0095 | 0.0191 | 0.0286 | 0.0381 | 0.0476 | 0.0636 | 0.0762 |
| | | Peripheral - Rough | 1 x D | .3 x D | 4 | — | 84 | 84 | 0.0127 | 0.0254 | 0.0381 | 0.0508 | 0.0635 | 0.0848 | 0.1016 |
| | | Finish | 1.5 x D | .01 x D | 4 | — | 99 | 99 | 0.0160 | 0.0319 | 0.0479 | 0.0638 | 0.0798 | 0.1066 | 0.1276 |
| | Austenitic Stainless Steels 303, 304, 316 | Slotting | .5 x D | 1 x D | 4 | 61 | 69 | 76 | 0.0064 | 0.0127 | 0.0191 | 0.0254 | 0.0318 | 0.0424 | 0.0508 |
| | | Slotting | .5 x D | 1 x D | 3 | 61 | — | 76 | 0.0064 | 0.0127 | 0.0191 | 0.0254 | 0.0318 | 0.0424 | — |
| | | Peripheral - Rough | 1 x D | .3 x D | 4 | 76 | 84 | 91 | 0.0095 | 0.0191 | 0.0286 | 0.0381 | 0.0476 | 0.0636 | 0.0762 |
| | | Peripheral - Rough | 1 x D | .3 x D | 3 | 76 | — | 91 | 0.0095 | 0.0191 | 0.0286 | 0.0381 | 0.0476 | 0.0636 | — |
| | Precipitation Hardening Stainless Steels 17-4 PH, 15-5 PH, 13-8 PH | Finish | 1.5 x D | .01 x D | 4 | 91 | 99 | 107 | 0.0114 | 0.0229 | 0.0343 | 0.0457 | 0.0572 | 0.0764 | 0.0914 |
| | | Slotting | .25 x D | 1 x D | 4 | — | 61 | 69 | 0.0095 | 0.0191 | 0.0286 | 0.0381 | 0.0476 | 0.0636 | 0.0762 |
|  | Titanium Alloys | Peripheral - Rough | 1 x D | .3 x D | 4 | — | 69 | 76 | 0.0108 | 0.0216 | 0.0324 | 0.0432 | 0.0540 | 0.0721 | 0.0864 |
| | | Finish | 1.5 x D | .01 x D | 4 | — | 76 | 84 | 0.0108 | 0.0216 | 0.0324 | 0.0432 | 0.0540 | 0.0721 | 0.0864 |
| | | Slotting | .25 x D | 1 x D | 4 | — | 12 | 18 | 0.0064 | 0.0127 | 0.0191 | 0.0254 | 0.0318 | 0.0424 | 0.0508 |
| | High Temperature Alloys Inconel, Haynes, Stellite, Hastalloy | Peripheral - Rough | 1 x D | .25 x D | 4 | — | 15 | 21 | 0.0095 | 0.0191 | 0.0286 | 0.0381 | 0.0476 | 0.0636 | 0.0762 |
| | | Finish | 1.5 x D | .01 x D | 4 | — | 17 | 21 | 0.0095 | 0.0191 | 0.0286 | 0.0381 | 0.0476 | 0.0636 | 0.0762 |

D = Tool diameter

Sometimes you need a tool that is just “a little different” to get the job done, whether it’s milling draft angles, keyways or doing 3D contouring.

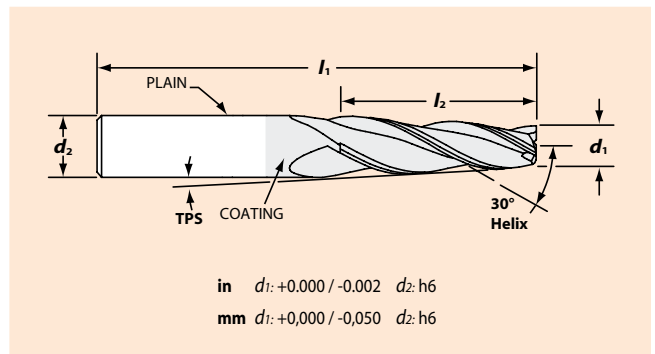
IMCO provides tools that are just right for the job. Made from the same high quality and durable micro-grain substrate as our truCORE tools, and the same attention to detail as our high performance tools, these products focus on specific applications:

- Tapered end mills for draft angles and die work
- Roughing end mills for chip control in pockets and slots
- Ball end mills for 3D contour milling and deep cavity work
- 6 flute mills for finishing and machining hardened steels

Square End



truCORE 3 flute mills are CNC ground from the highest quality carbide material, maximizing performance and repeatability. Tapered for die & mold machining.



Model Code: E53 w/Square End and Plain Shank P

| TPS | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | Tip Diameter d1 | AITIN Order Code |
|------|-----------------|---------------------|----------------------|--------------------|------------------|
| 1° | 1/4 | 1-1/2 | 3 | 1/8 | 39050 |
| | 3/8 | 1-3/4 | 3-1/2 | 3/16 | 39046 |
| 1.5° | 1/2 | 2 | 4 | 1/4 | 39047 |
| | 1/4 | 1-1/2 | 3 | 1/8 | 39049 |
| 2° | 3/8 | 1-3/4 | 3-1/2 | 3/16 | 39151 |
| | 1/4 | 1-1/4 | 3 | 1/8 | 39069 |
| 3° | 3/8 | 1-3/4 | 3-1/2 | 3/16 | 39160 |
| | 1/2 | 2 | 4 | 1/4 | 39161 |
| 5° | 1/4 | 1 | 3 | 1/8 | 39070 |
| | 3/8 | 1-3/4 | 3-1/2 | 5/32 | 39162 |
| 7° | 1/2 | 2 | 4 | 1/4 | 39163 |
| | 1/4 | 3/4 | 3 | 1/8 | 39127 |
| 10° | 3/8 | 1-1/2 | 3-1/2 | 1/8 | 39023 |
| | 1/2 | 1-1/4 | 4 | 1/4 | 39054 |
| 15° | 1/4 | 1/2 | 3 | 1/8 | 39179 |
| | 3/8 | 1 | 3-1/2 | 1/8 | 39180 |
| 20° | 1/2 | 1-1/4 | 4 | 3/16 | 39181 |
| | 1/4 | 1/2 | 3 | 3/32 | 39182 |
| 25° | 3/8 | 3/4 | 3-1/2 | 1/8 | 39183 |
| | 1/2 | 1 | 4 | 1/8 | 39184 |

TPS = Taper Per Side

| TPS | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | Tip Diameter d1 | AITIN Order Code |
|------|-----------------|---------------------|----------------------|--------------------|------------------|
| 0,5° | 4 | 20 | 63 | 3 | 37670 |
| | 5 | 20 | 63 | 4 | 37671 |
| | 6 | 30 | 75 | 5 | 37672 |
| | 8 | 30 | 75 | 6 | 37673 |
| 1° | 10 | 30 | 75 | 8 | 37674 |
| | 4 | 20 | 63 | 3 | 37675 |
| | 5 | 20 | 63 | 4 | 37676 |
| | 6 | 25 | 75 | 5 | 37677 |
| 2° | 8 | 30 | 75 | 6 | 37678 |
| | 10 | 30 | 75 | 8 | 37679 |
| | 5 | 20 | 63 | 3 | 37685 |
| | 6 | 20 | 63 | 4 | 37686 |
| 3° | 8 | 30 | 75 | 5 | 37687 |
| | 10 | 28 | 75 | 8 | 37689 |
| | 6 | 25 | 63 | 3 | 37690 |
| | 8 | 30 | 75 | 4 | 37692 |
| 5° | 8 | 30 | 75 | 3 | 37691 |
| | 10 | 30 | 75 | 6 | 37694 |
| | 10 | 40 | 75 | 5 | 37693 |
| | 8 | 30 | 75 | 3 | 37695 |
| 7° | 10 | 30 | 75 | 4 | 37698 |
| | 40 | 100 | 3 | 37697 | |

TPS = Taper Per Side

TOOL TIP

Which Holder to Use?

Picking the correct holder is as important as picking the right tool. Every holder style has its own advantages. The critical issue is runout: the more the runout, the worse the tool performance. Excessive runout greatly reduces tool life and performance, especially at high spindle speeds. Whatever your choice in holders, always take the time to indicate a new tool in the spindle. A few minutes of time during setup can yield great performance results.

It's common to use collets and collet holders when

milling. Make sure the collets are clean and not bell-mouthed from overuse or misuse. The collet holder with the shortest overhang allowable is always the best choice.

Using an end mill holder is great for heavy roughing applications. For best performance, make sure you use a mill with a factory ground flat on the shank.

Shrink-fit and press-fit systems work well at all speeds and feeds but are especially beneficial when running tooling over 8,000 rpm or in deep reaching applications. These systems balance the mill with low TIRs that are critical when running in aggressive applications or less-than-ideal setups.



E53

Model Code: E53 w/Ball End and Plain Shank



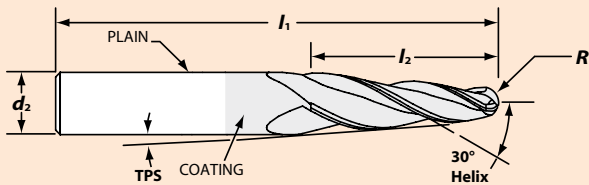
Ball End



truCORE 3 flute mills are CNC ground from the highest quality carbide material, maximizing performance and repeatability. Tapered for die & mold machining. Use ball end tools in contouring applications.

| TPS | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | Tip Radius R | AlTiN Order Code |
|------|-----------------|---------------------|----------------------|-----------------|---------------------|
| 1° | 1/4 | 1-1/2 | 3 | 1/16 R | 30428 |
| | 3/8 | 1-3/4 | 3-1/2 | 3/32 R | 39185 |
| | 1/2 | 2 | 4 | 1/8 R | 39186 |
| 1.5° | 1/4 | 1-1/2 | 3 | 1/16 R | 39187 |
| | 3/8 | 1-3/4 | 3-1/2 | 3/32 R | 39188 |
| 2° | 1/4 | 1-1/4 | 3 | 1/16 R | 39051 |
| | 3/8 | 1-3/4 | 3-1/2 | 3/32 R | 39189 |
| | 1/2 | 2 | 4 | 1/8 R | 39190 |
| 3° | 1/4 | 1 | 3 | 1/16 R | 39052 |
| | 3/8 | 1-3/4 | 3-1/2 | 5/64 R | 39191 |
| | 1/2 | 2 | 4 | 1/8 R | 39055 |
| 5° | 1/4 | 3/4 | 3 | 1/16 R | 39106 |
| | 3/8 | 1-1/2 | 3-1/2 | 1/16 R | 39081 |
| | 1/2 | 1-1/4 | 4 | 1/8 R | 30122 |
| 7° | 1/4 | 1/2 | 3 | 1/16 R | 39192 |
| | 3/8 | 1 | 3-1/2 | 1/16 R | 39193 |
| | 1/2 | 1-1/4 | 4 | 3/32 R | 30558 |
| 10° | 1/4 | 1/2 | 3 | 3/64 R | 39194 |
| | 3/8 | 3/4 | 3-1/2 | 1/16 R | 39195 |
| | 1/2 | 1 | 4 | 1/16 R | 39196 |

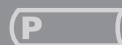
TPS = Taper Per Side



in $d_1: +0.000 / -0.002$ $d_2: h6$

E55

Model Code: E55 w/Ball End and Plain Shank



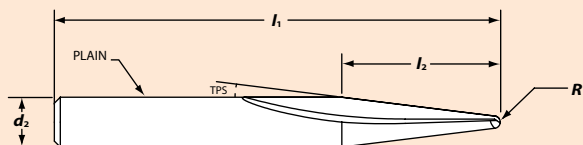
Ball End



truCORE 2 flute mills are CNC ground from the highest quality carbide material, maximizing performance and repeatability. Tapered straight flute for die & mold machining. Use ball end tools in contouring applications.

| TPS | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | Tip Radius R | MG Order Code |
|-----|-----------------|---------------------|----------------------|-----------------|---------------|
| 3° | 1/8 | 29/32 | 1-1/2 | 1/64 R | 30162 |
| | 1/8 | 19/32 | 1-1/2 | 1/32 R | 30163 |
| | 3/16 | 1 | 2 | 1/32 R | 30164 |
| | 1/4 | 1 | 2-1/2 | 1/32 R | 30167 |
| | 1/4 | 1 | 2-1/2 | 1/16 R | 97873 |
| 5° | 1/8 | 35/64 | 1-1/2 | 1/64 R | 30176 |
| | 1/8 | 23/64 | 1-1/2 | 1/32 R | 30177 |
| | 3/16 | 23/32 | 2 | 1/32 R | 30179 |
| | 1/4 | 1 | 2-1/2 | 1/32 R | 30181 |
| | 1/4 | 23/32 | 2-1/2 | 1/16 R | 30182 |
| 7° | 1/8 | 25/64 | 1-1/2 | 1/64 R | 30192 |
| | 1/8 | 1/4 | 1-1/2 | 1/32 R | 30160 |
| | 1/8 | 1/4 | 1-1/2 | 1/32 R | 30218 |
| | 3/16 | 1/2 | 2 | 1/32 R | 30193 |
| | 3/16 | 3/8 | 2 | 3/64 R | 30172 |
| | 1/4 | 49/64 | 2-1/2 | 1/32 R | 30195 |
| | 1/4 | 1/2 | 2-1/2 | 1/16 R | 30178 |
| | 1/4 | 1/2 | 2-1/2 | 1/16 R | 30219 |
| | 1/4 | 1/2 | 2-1/2 | 1/16 R | 30219 |
| 10° | 1/8 | 17/64 | 1-1/2 | 1/64 R | 30203 |
| | 1/8 | 11/64 | 1-1/2 | 1/32 R | 30204 |
| | 3/16 | 23/64 | 2 | 1/32 R | 30205 |
| | 1/4 | 17/32 | 2-1/2 | 1/32 R | 30207 |
| | 1/4 | 23/64 | 2-1/2 | 1/16 R | 30209 |

TPS = Taper Per Side



in $d_1: +0.000 / -0.002$ $d_2: h6$

M104

Square End



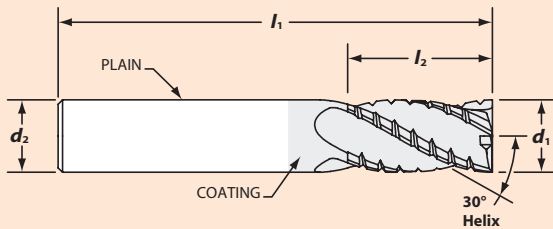
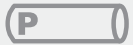
Rougher/Finisher with our unique chipbreaker geometry allows for high feed rates, excellent chip control, and finishes superior to most 4 flute roughing end mills.

Model Code: M104 w/Square End and Plain Shank



| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | EZ-ID Number | |
|------------------|-----------------|---------------------|----------------------|------------------|-----------------------|--------------|
| | | | | | M104 - Cx - xxxx - d1 | xxxx - SQ l2 |
| 1/8 | 1/8 | 1/4 | 1-1/2 | 33290 | M104-C2-0125-0250-SQ | |
| | | 1/2 | 1-1/2 | 30423 | M104-C2-0125-0500-SQ | |
| 3/16 | 3/16 | 3/8 | 2 | 33296 | M104-C2-0187-0375-SQ | |
| | | 5/8 | 2 | 30462 | M104-C2-0187-0625-SQ | |
| 1/4 | 1/4 | 1/2 | 2 | 91779 | M104-C2-0250-0500-SQ | |
| | | 3/4 | 2-1/2 | 98991 | M104-C2-0250-0750-SQ | |
| | | 1-1/8 | 3 | 33299 | M104-C2-0250-1125-SQ | |
| 5/16 | 5/16 | 1/2 | 2 | 33163 | M104-C2-0312-0500-SQ | |
| | | 13/16 | 2-1/2 | 30551 | M104-C2-0312-0812-SQ | |
| | | 1-1/8 | 3 | 33101 | M104-C2-0312-1125-SQ | |
| 3/8 | 3/8 | 5/8 | 2 | 33103 | M104-C2-0375-0625-SQ | |
| | | 1 | 2-1/2 | 33153 | M104-C2-0375-1000-SQ | |
| | | 1-1/8 | 3 | 33300 | M104-C2-0375-1125-SQ | |
| 1/2 | 1/2 | 5/8 | 2-1/2 | 33181 | M104-C2-0500-0625-SQ | |
| | | 1 | 3 | 98961 | M104-C2-0500-1000-SQ | |
| | | 2 | 4 | 30434 | M104-C2-0500-2000-SQ | |
| 5/8 | 5/8 | 1-1/4 | 3-1/2 | 33157 | M104-C2-0625-1250-SQ | |
| | | 2-1/4 | 5 | 97343 | M104-C2-0625-2250-SQ | |
| 3/4 | 3/4 | 1 | 3 | 33297 | M104-C2-0750-1000-SQ | |
| | | 1-1/2 | 4 | 33159 | M104-C2-0750-1500-SQ | |
| | | 2-1/4 | 5 | 33301 | M104-C2-0750-2250-SQ | |
| 1 | 1 | 1-1/2 | 4 | 33161 | M104-C2-1000-1500-SQ | |
| | | 2-1/4 | 5 | 33302 | M104-C2-1000-2250-SQ | |

Model Code: M104 w/Square End and Plain Shank



in $d_1: +0.000 / -0.002$ $d_2: h6$
 mm $d_1: +0.000 / -0.050$ $d_2: h6$

| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AlTiN Order Code | EZ-ID Number | |
|------------------|-----------------|---------------------|----------------------|------------------|-----------------------|-------------|
| | | | | | M104 - Cx - xxxx - d1 | xxx - SQ l2 |
| 6 | 6 | 13 | 57 | 62464 | M104-C2-060-013-SQ | |
| | | 29 | 75 | 34280 | M104-C2-060-029-SQ | |
| 8 | 8 | 19 | 63 | 62465 | M104-C2-080-019-SQ | |
| | | 29 | 75 | 34281 | M104-C2-080-029-SQ | |
| 10 | 10 | 22 | 72 | 62466 | M104-C2-100-022-SQ | |
| | | 40 | 88 | 37515 | M104-C2-100-040-SQ | |
| 12 | 12 | 26 | 83 | 62467 | M104-C2-120-026-SQ | |
| | | 50 | 100 | 34283 | M104-C2-120-050-SQ | |
| 16 | 16 | 32 | 92 | 62468 | M104-C2-160-032-SQ | |
| | | 57 | 125 | 34284 | M104-C2-160-057-SQ | |
| 20 | 20 | 38 | 104 | 62469 | M104-C2-200-038-SQ | |
| | | 57 | 125 | 34285 | M104-C2-200-057-SQ | |

M104 Application Guide (Inch) • Speed & Feed

| ISO Classification | Work Material | Type of Cut | Axial DOC | Radial DOC | Number of Flutes | Speed (SFM) | Feed (Inches Per Tooth) | | | | | | |
|--------------------|---|--------------------|-----------|------------|------------------|-------------|-------------------------|-------|-------|-------|-------|-------|-------|
| | | | | | | | 1/8 | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 1 |
| P | Low Carbon Steel 1018, 12L14, 8620 | Slotting | 1 x D | 1 x D | 4 | 350 | .0006 | .0012 | .0018 | .0024 | .0030 | .0036 | .0047 |
| | | Peripheral - Rough | 1.25 x D | .4 x D | 4 | 425 | .0007 | .0015 | .0022 | .0030 | .0037 | .0044 | .0059 |
| | Medium Carbon Steels < 38 HRC 4140, 4340 | Slotting | .75 x D | 1 x D | 4 | 275 | .0006 | .0011 | .0017 | .0023 | .0029 | .0034 | .0046 |
| | | Peripheral - Rough | 1.25 x D | .4 x D | 4 | 350 | .0007 | .0014 | .0021 | .0029 | .0036 | .0043 | .0057 |
| M | Martensitic Stainless Steel 416, 410, 440C | Slotting | .5 X D | 1 x D | 4 | 250 | .0005 | .0010 | .0016 | .0021 | .0026 | .0031 | .0042 |
| | | Peripheral - Rough | 1.25 x D | .3 x D | 4 | 300 | .0007 | .0013 | .0020 | .0026 | .0033 | .0039 | .0052 |

D = Tool diameter

M104 Application Guide (Metric) • Speed & Feed

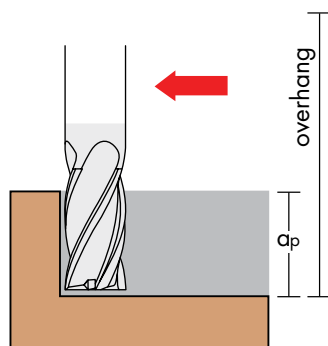
| ISO Classification | Work Material | Type of Cut | Axial DOC | Radial DOC | Number of Flutes | Speed (M/min) | Feed (MM per Tooth) | | | | | |
|--------------------|---|--------------------|-----------|------------|------------------|---------------|---------------------|--------|--------|--------|--------|--------|
| | | | | | | | 6,0 | 8,0 | 10,0 | 12,0 | 16,0 | 20,0 |
| P | Low Carbon Steel 1018, 12L14, 8620 | Slotting | 1 x D | 1 x D | 4 | 107 | 0.0301 | 0.0403 | 0.0499 | 0.0601 | 0.0800 | 0.1004 |
| | | Peripheral - Rough | 1.25 x D | .4 x D | 4 | 130 | 0.0376 | 0.0504 | 0.0624 | 0.0752 | 0.1000 | 0.1255 |
| | Medium Carbon Steels < 38 HRC 4140, 4340 | Slotting | .75 x D | 1 x D | 4 | 84 | 0.0290 | 0.0389 | 0.0482 | 0.0581 | 0.0772 | 0.0970 |
| | | Peripheral - Rough | 1.25 x D | .4 x D | 4 | 107 | 0.0363 | 0.0486 | 0.0602 | 0.0726 | 0.0965 | 0.1212 |
| M | Martensitic Stainless Steel 416, 410, 440C | Slotting | .5 X D | 1 x D | 4 | 84 | 0.0299 | 0.0401 | 0.0497 | 0.0599 | 0.0796 | 0.1000 |
| | | Peripheral - Rough | 1.25 x D | .3 x D | 4 | 107 | 0.0374 | 0.0501 | 0.0621 | 0.0748 | 0.0995 | 0.1250 |

D = Tool diameter

TOOL TIP

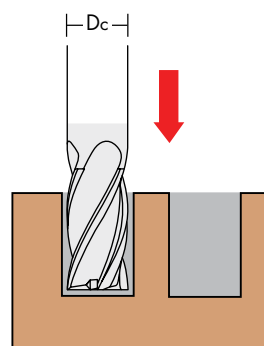
Making Adjustments

Apply the following adjustments when programming these applications.



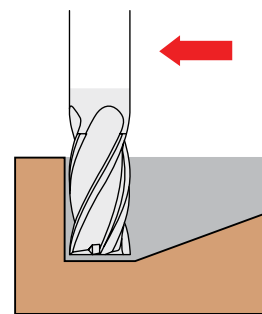
1. Long reach mills with large overhang

- Reduce speed rate and chip load by 20% each when total reach to tool diameter ratio is 5:1 or greater



2. Plunge entry into work piece

- Reduce chip load by 80% of recommended slotting rate
- Peck mill if axial DOC (ap) exceeds 50% of Dc



3. Ramp entry into work piece

- Ramp at 1.5°–2.5° angle
- Reduce chip load by 20% of recommended slotting rate

TOOL TIP

Working With a Ball End Mill

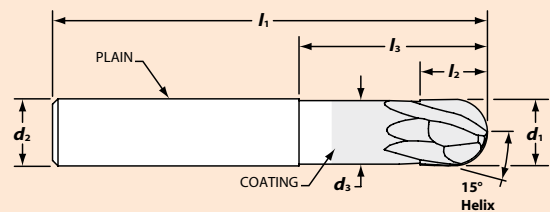
When working with a ball end mill, remember that adjusting your spindle speed will help you cut cycle times, including finishing work.

E520

Ball End

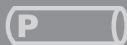


Designed for contouring applications in hardened materials. Added length and necked shank allow for stability when machining in deeper cavities.



in $d_1: +0.000 / -0.002$ $d_2: h6$

Model Code: E520 w/Ball End and Plain Shank



| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | LBS l3 | Neck Dia. d3 | AlTiN Order Code | EZ-ID Number E520 - Cx - xxxx - xxxx - Nxxxx - BN - Lxx d1 l2 d3 BN l1 |
|------------------|-----------------|---------------------|----------------------|-----------|-----------------|---------------------|--|
| 1/8 | 1/4 | 1/8 | 3 | 3/8 | .118 | 34288 | E520-C2-0125-0125-N0375-BN-L3 |
| 3/16 | 1/4 | 3/16 | 3 | 9/16 | .176 | 34289 | E520-C2-0187-0187-N0562-BN-L3 |
| 1/4 | 1/4 | 1/4 | 3 | 1-5/8 | .235 | 34290 | E520-C2-0250-0250-N1625-BN |
| 3/8 | 3/8 | 3/8 | 4 | 2-1/4 | .355 | 34292 | E520-C2-0375-0375-N2250-BN |
| 1/2 | 1/2 | 1/2 | 4 | 2-1/4 | .475 | 34293 | E520-C2-0500-0500-N2250-BN-L4 |

E520 Application Guide • Speed & Feed

| ISO Classification | Work Material | Type of Cut | Axial DOC | Radial DOC | Number of Flutes | Speed (SFM) | Feed (Inches Per Tooth) | | | |
|--------------------|------------------------------------|-------------|-----------|------------|------------------|-------------|-------------------------|-------|-------|-------|
| | | | | | | | 1/8 | 1/4 | 3/8 | 1/2 |
| P | Carbon and tool steels < 48 HRC | Rough | .2 x D | .2 x D | 2 | 400 | .0013 | .0025 | .0038 | .0050 |
| | | Finish | .02 x D | .02 x D | 2 | 275 | .0015 | .0030 | .0045 | .0060 |
| H | Hardened materials 49 to 57 HRC | Rough | .2 x D | .2 x D | 2 | 375 | .0008 | .0017 | .0025 | .0033 |
| | | Finish | .02 x D | .02 x D | 2 | 250 | .0010 | .0020 | .0030 | .0040 |
| | Hardened materials 58 to 62 HRC | Rough | .1 x D | .1 x D | 2 | 250 | .0007 | .0014 | .0021 | .0028 |
| | | Finish | .01 x D | .01 x D | 2 | 150 | .0005 | .0011 | .0016 | .0021 |

D = Tool diameter

TOOL TIP

Ball End Milling: Cut Cycle Time

If your axial depth of cut (Z-axis depth) is less than the radius of your ball end mill, adjusting your spindle speed will help you cut cycle times, including finishing work.

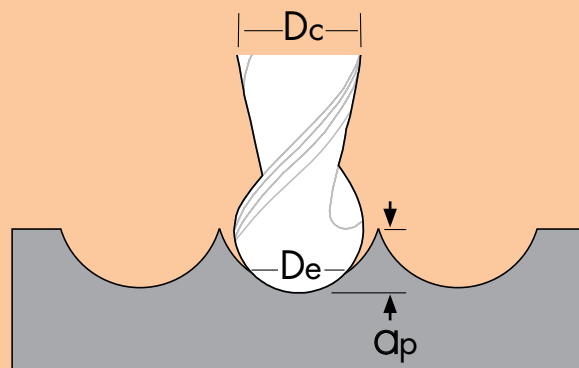
Calculate your optimal spindle speed using the effective cutting diameter (De) in two easy steps.

Step 1: Calculate the effective cutting diameter.

$$2 \times \sqrt{A_p} \times (D_c - A_p) = D_e \text{ (effective cutting diameter)}$$

Step 2: Calculate the optimum spindle speed.

$$(\text{SFM} \times 3.82) \div D_e = \text{Optimum spindle speed}$$



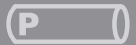
Dc = Actual cutting diameter

De = Effective cutting diameter

Ap = Axial depth of cut

E16

Model Code: E16 w/Square End and Plain Shank

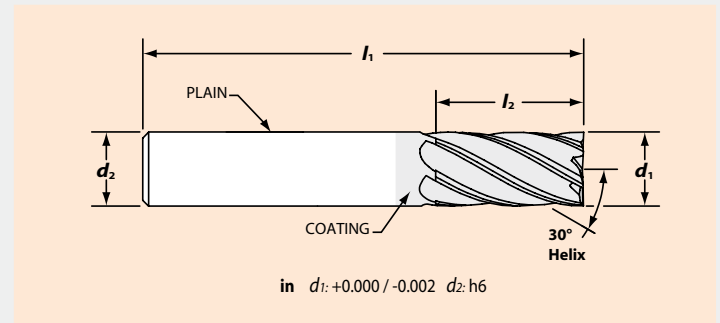


Square End



truCORE 6 flute mills are CNC ground from the highest quality carbide material, maximizing performance and repeatability. E16 mills are exceptional in finishing operations in a wide range of materials.

| Cutter Dia d1 | Shank Dia d2 | Length of Cut l2 | Overall Length l1 | AITIN Order Code | EZ-ID Number E16 - Cx - xxxx - xxxx - SQ d1 l2 |
|------------------|-----------------|---------------------|----------------------|------------------|--|
| 1/4 | 1/4 | 3/4 | 2-1/2 | 37602 | E16-C2-0250-0750-SQ |
| 3/8 | 3/8 | 1 | 2-1/2 | 37604 | E16-C2-0375-1000-SQ |
| 1/2 | 1/2 | 1 | 3 | 37605 | E16-C2-0500-1000-SQ |
| 3/4 | 3/4 | 1-1/2 | 4 | 37519 | E16-C2-0750-1500-SQ |
| 1 | 1 | 1-1/2 | 4 | 37523 | E16-C2-1000-1500-SQ |



E16 Application Guide • Speed & Feed

| ISO Classification | Work Material | Type of Cut | Axial DOC | Radial DOC | Number of Flutes | Speed (SFM) | Feed (Inches Per Tooth) | | | |
|--------------------|---|--------------------|-----------|------------|------------------|-------------|-------------------------|--------|--------|--------|
| | | | | | | | 1/4 | 3/8 | 1/2 | 3/4 |
| K | Cast Iron - Gray | Peripheral - Rough | 1.25 x D | .25 x D | 6 | 300 | 0.0014 | 0.0020 | 0.0027 | 0.0041 |
| | | Finish | 1.5 x D | .01 x D | 6 | 350 | 0.0014 | 0.0021 | 0.0028 | 0.0042 |
| | Cast Iron - Ductile | Peripheral - Rough | 1.25 x D | .25 X D | 6 | 325 | 0.0013 | 0.0019 | 0.0025 | 0.0038 |
| | | Finish | 1.5 x D | .01 x D | 6 | 350 | 0.0014 | 0.0020 | 0.0027 | 0.0041 |
| P | Low Carbon Steel 1018, 12L14, 8620 | Peripheral - Rough | 1.25 x D | .25 x D | 6 | 300 | 0.0015 | 0.0022 | 0.0029 | 0.0044 |
| | | Finish | 1.5 x D | .01 x D | 6 | 375 | 0.0016 | 0.0023 | 0.0031 | 0.0047 |
| | Medium Carbon Steels 4140, 4340 | Peripheral - Rough | 1.0 x D | .3 X D | 6 | 325 | 0.0011 | 0.0017 | 0.0022 | 0.0033 |
| | | Finish | 1.5 x D | .01 x D | 6 | 400 | 0.0014 | 0.0021 | 0.0028 | 0.0042 |
| | Tool & Die Steels < 48 Rc A2, D2, H13, P20 | Peripheral - Rough | 1.0 x D | .3 X D | 6 | 225 | 0.0008 | 0.0011 | 0.0015 | 0.0023 |
| | | Finish | 1.5 x D | .01 x D | 6 | 300 | 0.0007 | 0.0010 | 0.0013 | 0.0020 |
| H | Hardened Steels 49 Rc to 57 Rc | Peripheral - Rough | 1.0 x D | .25 x D | 6 | 175 | 0.0006 | 0.0009 | 0.0012 | 0.0018 |
| | | Finish | 1.25 x D | .01 x D | 6 | 250 | 0.0008 | 0.0011 | 0.0015 | 0.0023 |
| | Hardened Steels 58 Rc to 62 Rc | Peripheral - Rough | 1.0 x D | .20 x D | 6 | 65 | 0.0006 | 0.0009 | 0.0012 | 0.0018 |
| | | Finish | 1.25 x D | .01 x D | 6 | 90 | 0.0008 | 0.0011 | 0.0015 | 0.0023 |
| M | Austenitic Stainless Steels 303, 304, 316 | Peripheral - Rough | 1.25 x D | .25 x D | 6 | 275 | 0.0011 | 0.0016 | 0.0021 | 0.0032 |
| | | Finish | 1.5 x D | .01 x D | 6 | 300 | 0.0012 | 0.0017 | 0.0023 | 0.0035 |
| | Martensitic Stainless Steel 416, 410, 440C | Peripheral - Rough | 1.25 x D | .25 x D | 6 | 300 | 0.0012 | 0.0017 | 0.0023 | 0.0035 |
| | | Finish | 1.5 x D | .01 x D | 6 | 350 | 0.0013 | 0.0019 | 0.0025 | 0.0038 |
| | Precipitation Hardening Stainless Steels 17-4 PH, 15-5 PH, 13-8 PH | Peripheral - Rough | 1.25 x D | .25 x D | 6 | 250 | 0.0010 | 0.0015 | 0.0020 | 0.0030 |
| | | Finish | 1.5 x D | .01 x D | 6 | 300 | 0.0013 | 0.0019 | 0.0025 | 0.0038 |
| S | Titanium Alloys | Peripheral - Rough | 1.0 x D | .2 x D | 6 | 250 | 0.0006 | 0.0009 | 0.0012 | 0.0018 |
| | | Finish | 1.25 x D | .01 x D | 6 | 275 | 0.0009 | 0.0014 | 0.0018 | 0.0027 |
| | High Temperature Alloys Inconel, Haynes, Stellite | Peripheral - Rough | 1.0 x D | .2 x D | 6 | 80 | 0.0007 | 0.0010 | 0.0013 | 0.0020 |
| Finish | | 1.25 x D | .01 x D | 6 | 85 | 0.0008 | 0.0011 | 0.0015 | 0.0023 | |

D = Tool diameter

imcousa.com

**Point.
Click.
Game
changed.**



User-focused navigation – Start with machining type (milling, holemaking, deburring, etc.), then you choose how you want to look further – by tool family, by application or by end type, whatever works best for you.

Complete tool info – Dimensions and drawings, flutes, coatings, end cuts, sizes ... everything you need to know. Downloadable catalogs, too.

Real-time data for distributors – Password-protected access 24/7 for secure online ordering, real-time inventory checks, order tracking and more. With 24/7 access to real-time information, you can respond to customer needs on the spot, anytime. When priorities shift from minute to minute, speed and flexibility are game changers.

“Our information technology should be as advanced, intuitive and productivity-driven as our cutting tool technology. Now, it is.”

– IMCO President Perry Osburn

TOOL MODIFICATIONS

Special tooling requirements can often be met through one or more simple modifications of standard, off-the-shelf products. Modifications include coating, adding corner radius or chamfer, flats and more. You can order more than one modification for the same tool as long as they do not depend on or conflict with each other. For example, you cannot choose both a corner radius and a corner chamfer.

Delivery

Allow 3 working days to modify tools available from stock in quantities up to 25 pieces. If tool coating is required allow 7-10 additional working days for shipment.

Performance & Standards

Tolerances may vary when dimensions are altered. Dimensions that are not altered or are incidental to your order will conform to our original product specifications.

Important Note

Modified products are non-returnable. Modifications are not available for miniature tools (less than 1/16 in. or 1.5 mm).



Consider any of these 9 modifications when ordering specialty end mills. Call your service rep at 1-800-765-4626 for pricing.

1 Add Coating

AlTiN_X

For better heat resistance in high performance machining of ferrous materials

AlTiN

For improved performance machining ferrous materials

AlCrN_X

For high performance machining of Steels and Stainless Steels

TiCN

For added abrasion resistance in steels and non-ferrous materials

TiN

Low coefficient of friction for improved chip flow

ZrN

Used for machining Aluminum and Aluminum Alloys

TiB₂

For machining Aluminum, and Aluminum alloys. Cannot be applied over other coatings.

Thin Film Diamond Coating (DLC)

For machining Graphite, Aluminum, Composites and Plastics. Cannot be applied over other coatings.

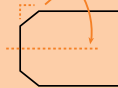
2 Add Corner Radius or Corner Chamfer

radius



Corner Radius
Specify radius

length | angle



Corner Chamfer
Specify angle and length

- Maximum radius or length is 25% of tool diameter.
- Radius Tolerance - in +/- .005 Tangency +/- .002
mm +/-0,127 Tangency +/-0,0500
- Chamfer Tolerance - in +/- .005 mm +/-0,127

3 Add Weldon Flat to Shank



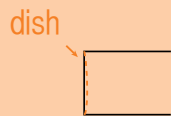
- Optional double flat available on 49/64 to 1-1/4 Diameter tools

4 Add Neck Relief

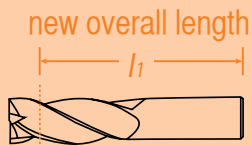


Specify length of relief

5 Remove End Dish and Resharpen



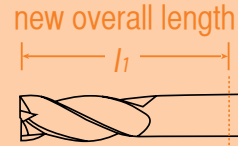
6 Shorten Flute Length Cut Off End and Resharpen



Specify either new flute or overall length

- $d1 < 1/4$: l1 tolerance - in +0.062/-0.0 mm +1,570/-0,0
- $d1 \geq 1/4$: l1 tolerance - in +0.125/-0.0 mm +3,175/-0,0

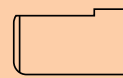
7 Shorten Flute Length Cut Off Shank and Add Chamfer



Specify new overall length

- $d1 < 1/4$: l1 tolerance - in +0.062/-0.0 mm +1,570/-0,0
- $d1 \geq 1/4$: l1 tolerance - in +0.125/-0.0 mm +3,175/-0,0

8 Add Set Screw Flat or Whistle Notch



Set Screw



Whistle Notch

9 Add Drill Point to End Mills



Point Angle

Specify point angle

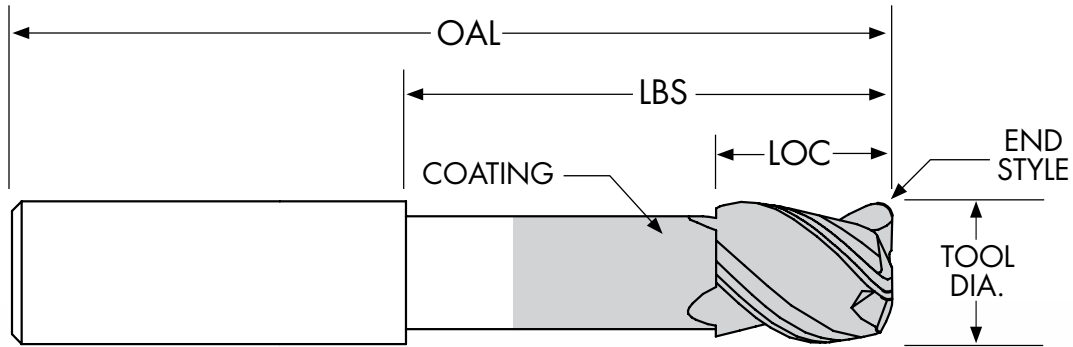
- A 90° drill point will be supplied unless otherwise specified.

EZ-ID

Understanding the new EZ-ID code.

IMCO's new "smart" coding system saves you time locating part numbers. Just use the specifics of the tool you need, "plug" them into the coding system, and you're there!

Each EZ-ID part number actually describes the tool itself. It starts with general information (type of tool and tool "family") and gets more specific as you go.



A step-by-step guide to building the EZ-ID code.

Insert the numbers in the segments as indicated here. If a certain segment doesn't apply (neck dimension, non-standard length or special shank), just skip it. Separate the segments with hyphens.



1 Enter the **model number**.

For example, the model number for a truCORE E Series 4 flute would be E14.

2 Enter the **coating code (C)**. Available coatings are:

AlTiN - **1** TiN - **5**
 AlTiN - **2** ZrN - **6**
 AlCrN - **3** TiB2 - **7**
 TiCN - **4** DLC - **8**

(NOTE: an uncoated tool will be provided if a coating is not listed in the EZ-ID and the tool does not come standard coated.)

3 Enter the **tool diameter** (always to three decimal places). Include the leading zero for diameters less than 1" or 10mm.

4 Enter the **length of cut (LOC)**. Include the leading zero for a LOC less than 1" or 10mm.

5 Enter the **length below shank (LBS) or reach**. Include the leading zero for a LBS less than 1" or 100 mm. Indicate that this is a neck dimension by placing an N before the number. (If the tool has no neck, you can skip this segment altogether.)

6 Enter the **end/corner** type or size. Include the leading zero for corner radii less than 1" or 1mm. For any other end/corner type, just indicate the type: SQ = square end, BN = ball nose, CC = corner chamfer.

7 If the **overall length** you need is not the standard length for the combination of tool diameter, LOC and LBS, then enter the overall length (**OAL**) here. Indicate that this is an overall length by placing an L before the number. If you do not specify an overall length, we will assume it is standard length.

8 Enter the code for the **type of shank** you need (W = Weldon flat, WN = whistle notch, P = plain). If you do not specify a shank style, we will assume it is a plain shank.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------|-------|---------|---------------|---------------------|--------------------------|-----|----------------|-------|
| | MODEL | COATING | TOOL DIAMETER | LENGTH OF CUT (LOC) | LENGTH BELOW SHANK (LBS) | END | OVERALL LENGTH | SHANK |
| INCH | E14 | C1 | 0750 | 1500 | N1750 | 060 | L6 | W |
| METRIC | E22 | C3 | 200 | 025 | N031 | SQ | L125 | W |

Segments highlighted in white may be omitted.

Put IMCO's front line to work on your bottom line.

See a video of truCORE E Series end mills in action at:

www.imcousa.com/content/videos

Test E Series tools for yourself. To order, or for more information:

In USA call **1-800-765-4626**

International **419-661-6313**

Fax **419-661-6314**



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