

DIE & MOLD END MILLS



CONICALTM

RUNNER CUTTERS

AMERICAN
MADE



GLOBALLY
RENOWNED

DIE & MOLD END MILLS

FOR SLOTTING MODIFIED TRAPEZOIDAL RUNNER CHANNELS



CONICALTM
CUTTING TOOLS



CONICALTM

RUNNER CUTTERS

FOR SLOTTING CHANNELS

IN FERROUS MATERIALS

FEATURES & BENEFITS

The Conical Runner Cutter is another premium micro-grain carbide tool that can easily handle tough slotting operations in tool steel and difficult to machine materials. Machining modified trapezoidal and full round runners with our Conical Runner Cutters saves massive time for the tool and die makers. Featuring AlTiN-X coating, a high strength two flute design and 12 degree helix, it is well suited for abrasion resistance and offers exceptional lubricity, wet or dry. Once again Conical Cutting Tools advances end mill technologies, one end mill at a time.

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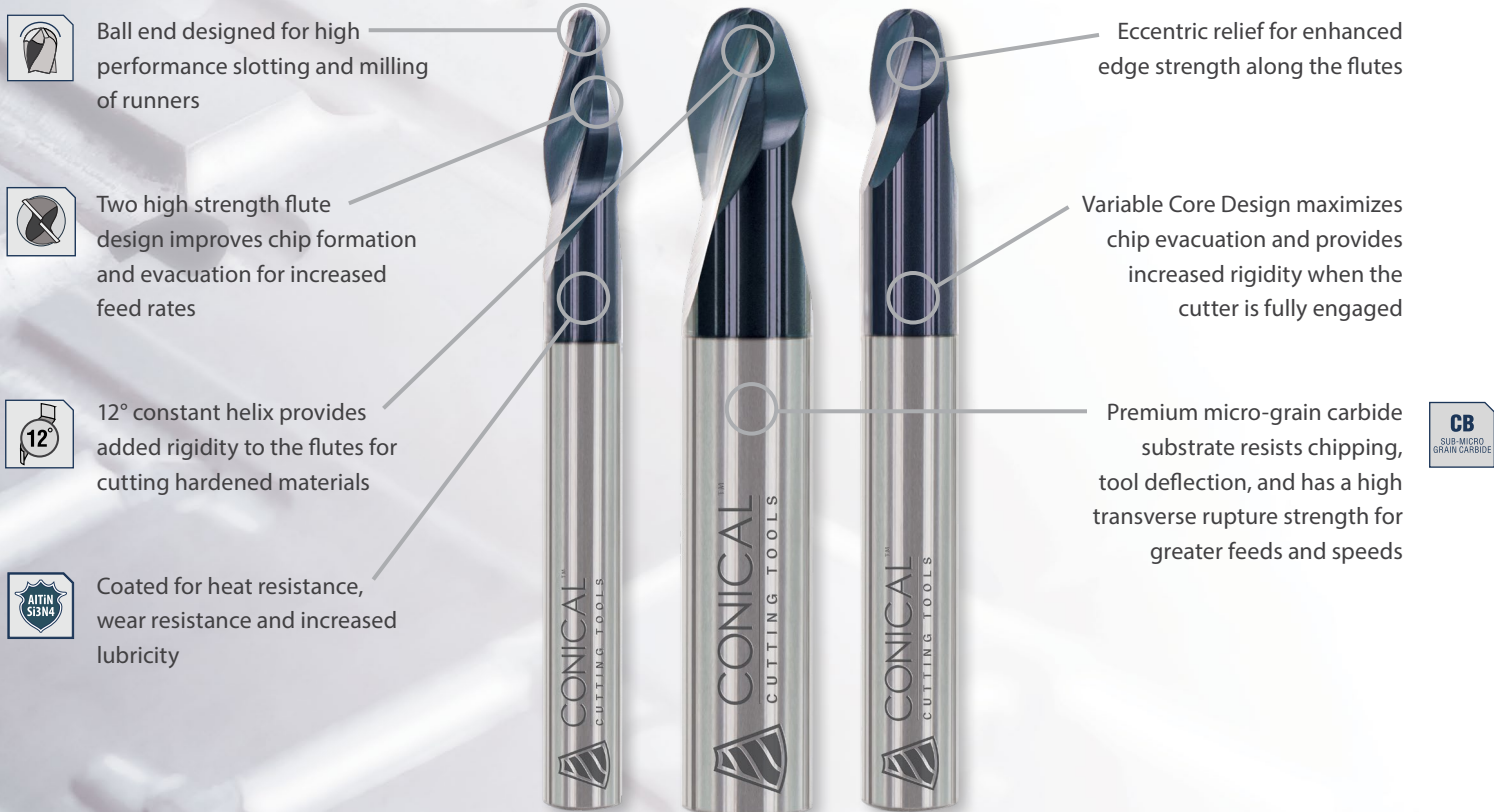


CONICALTM

CUTTING TOOLS

SERIES: RCX

For slotting of high hardness ferrous materials to create the most effective modified trapezoidal runner channels to minimize pressure and heat loss in molds and dies; wet or dry; mold & tools steels, alloy steels and high hardness materials.



Post polishing is performed after the tools are coated to remove surface inconsistencies and increase lubricity. This also increases feed rates and allows for smoother operations. The tool runs cooler and performs longer

TIP & END



SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL



COATING



RESULTS

Conical Runner Cutters mill channels in molds for use in various plastic injection and tool and die processes. They are specifically designed to mill modified trapezoidal runner channels, varying in degrees, as well as full round runners. Their versatile design is great for maximum tool

life and eliminating a second operation needed to create a full round runner. When you use only the best materials, rely on our accumulated 70 years' experience and trust in our end mills to do their assigned tasks, there is nothing that can stop you from succeeding.

Series RCX: Micro-Grain Carbide, 2 Flute; 12° Constant Helix

Subseries: RC10B, RC15B, RC20B

Configuration: Varying Angles; Varying Diameters;

Regular Length; 12° Constant Helix; Ball End

RUNNER CUTTERS

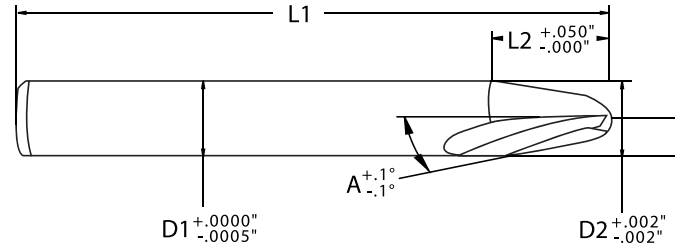
CONICAL™

SERIES RCX - CARBIDE, 2 FLUTE, VARYING ANGLES

MINIMUM WASTE, MAXIMUM PERFORMANCE

High performance slotting a perfect modified trapezoidal runner in record time, these tools let mold makers design for minimum waste and maximum mold performance.

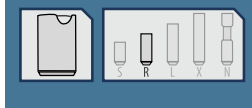
- Ball end designed for high performance slotting and milling of runners
- Two high strength flute design improves chip formation and evacuation for increased feed rates
- Creates modified round trapezoidal runner channels in molds and dies, the most efficient shape design after full round, while machining only one half of the mold



TIP & END



SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL



COATING



SERIES RC10B - 10 DEGREE, REGULAR LENGTH



ANGLE PER SIDE (A)	CUTTER DIAMETER (D2)		CORNER RADIUS (R)		SHANK DIAMETER (D1)		FLUTE LENGTH (L2)	OVERALL LENGTH (L1)		ALTiN COATED	
										PART #	EDP #
10°	1/16	0.0625	1/32	0.0313	3/16	0.188	0.385	2	2.000	RCJ-001	RJ01B
	3/32	0.0938	3/64	0.0469	3/16	0.188	0.308	2	2.000	RCJ-101	RJ02B
	1/8	0.1250	1/16	0.0625	1/4	0.250	0.413	2 1/2	2.500	RCJ-201	RJ03B
	5/32	0.1563	5/64	0.0781	1/4	0.250	0.338	2 1/2	2.500	RCJ-251	RJ04B
	3/16	0.1875	3/32	0.0938	5/16	0.313	0.442	2 1/2	2.500	RCJ-301	RJ05B
	7/32	0.2188	7/64	0.109	5/16	0.313	0.366	2 1/2	2.500	RCJ-351	RJ06B
	1/4	0.2500	1/8	0.1250	3/8	0.375	0.468	2 1/2	2.500	RCJ-401	RJ07B
	5/16	0.3125	5/32	0.1563	1/2	0.500	0.675	3	3.000	RCJ-501	RJ08B

SERIES RC15B - 15 DEGREE, REGULAR LENGTH



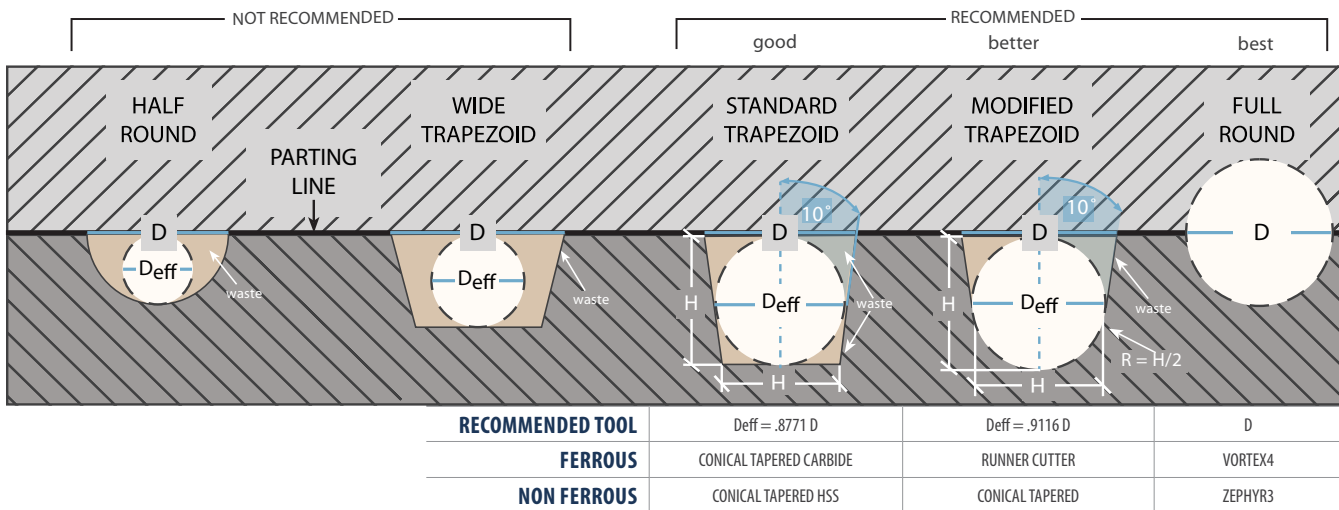
ANGLE PER SIDE (A)	CUTTER DIAMETER (D2)		CORNER RADIUS (R)		SHANK DIAMETER (D1)		FLUTE LENGTH (L2)	OVERALL LENGTH (L1)		ALTiN COATED	
										PART #	EDP #
15°	1/16	0.0625	1/32	0.0313	3/16	0.188	0.261	2	2.000	RCP-001	RP01B
	3/32	0.0938	3/64	0.0469	3/16	0.188	0.216	2	2.000	RCP-101	RP02B
	1/8	0.1250	1/16	0.0625	1/4	0.250	0.288	2 1/2	2.500	RCP-201	RP03B
	5/32	0.1563	5/64	0.0781	1/4	0.250	0.243	2 1/2	2.500	RCP-251	RP04B
	3/16	0.1875	3/32	0.0938	5/16	0.313	0.314	2 1/2	2.500	RCP-301	RP05B
	7/32	0.2188	7/64	0.109	5/16	0.313	0.271	2 1/2	2.500	RCP-351	RP06B
	1/4	0.2500	1/8	0.1250	3/8	0.375	0.342	2 1/2	2.500	RCP-401	RP07B
	5/16	0.3125	5/32	0.1563	1/2	0.500	0.490	3	3.000	RCP-501	RP08B

SERIES RC20B - 20 DEGREE, REGULAR LENGTH



ANGLE PER SIDE (A)	CUTTER DIAMETER (D2)		CORNER RADIUS (R)		SHANK DIAMETER (D1)		FLUTE LENGTH (L2)	OVERALL LENGTH (L1)		ALTiN COATED	
										PART #	EDP #
20°	1/16	0.0625	1/32	0.0313	3/16	0.188	0.197	2	2.000	RCT-001	RT01B
	3/32	0.0938	3/64	0.0469	3/16	0.188	0.167	2	2.000	RCT-101	RT02B
	1/8	0.1250	1/16	0.0625	1/4	0.250	0.225	2 1/2	2.500	RCT-201	RT03B
	5/32	0.1563	5/64	0.0781	1/4	0.250	0.194	2 1/2	2.500	RCT-251	RT04B
	1/4	0.2500	1/8	0.1250	3/8	0.375	0.275	2 1/2	2.500	RCT-401	RT05B
	5/16	0.3125	5/32	0.1563	1/2	0.500	0.387	3	3.000	RCT-501	RT06B

SERIES RCX - CARBIDE, 2 FLUTE, VARYING ANGLES



Above are common cross section designs for runners. The last three designs are generally recommended and each have unique properties which add pros and cons to their use.

The standard trapezoid is the last recommended design. With nearly twice the waste as the modified trapezoid, its primary attribute is the ability to machine its shape in a single half of the mold without losing considerable effective diameter.

The modified trapezoid is the next most efficient design as it can be machined in a single side of the mold. With minimum waste, resistance and heat loss, its shape has the closest effective hydraulic diameter to a full round runner.

The full-round runner is most ideal in terms of volume to surface ratio, which minimizes flow resistance, pressure drop and heat loss. Its design is the most complicated to employ and requires modifying both halves of the mold to align perfectly when the mold is closed.

RCX APPLICATION GUIDE • SPEED & FEED

WORK MATERIAL	TYPE OF CUT	AXIAL DOC	RADIAL DOC	NO. OF FLUTES	SPEED (SFM)	FEED (INCHES PER TOOTH)						
						< 3/32" (2 FL)	1/8" (2 FL)	5/32" (2 FL)	3/16" (2 FL)	7/32" (2 FL)	1/4" (2 FL)	5/16" (2 FL)
ALUMINUM	ALUMINUM ALLOYS Low Silicon Content	Slotting	1 x D	1 x D	2	765 - 990	0.0009 - 0.0011	0.0012 - 0.0015	0.0016 - 0.0019	0.0020 - 0.0023	0.0019 - 0.0023	0.0027 - 0.0031
	ALUMINUM DIE CAST ALLOY High Silicon Content	Slotting	1 x D	1 x D	2	635 - 825	0.0008 - 0.0010	0.0011 - 0.0014	0.0015 - 0.0018	0.0018 - 0.0022	0.0017 - 0.0021	0.0025 - 0.0029
NON FERROUS	MAGNESIUM ALLOYS ≤ 38 HRc	Slotting	1 x D	1 x D	2	1275 - 1650	0.0009 - 0.0011	0.0012 - 0.0015	0.0016 - 0.0019	0.0020 - 0.0023	0.0019 - 0.0023	0.0027 - 0.0031
	COPPER ALLOYS, BRASS & BRONZE 39 to 48 HRc	Slotting	1 x D	1 x D	2	255 - 330	0.0007 - 0.0009	0.0010 - 0.0013	0.0013 - 0.0016	0.0016 - 0.0020	0.0015 - 0.0019	0.0022 - 0.0027
CARBON STEEL	LOW CARBON STEELS ≤ 38 HRc	Slotting	1 x D	1 x D	2	510 - 660	0.0003 - 0.0005	0.0005 - 0.0007	0.0007 - 0.0010	0.0008 - 0.0012	0.0006 - 0.0010	0.0012 - 0.0016
	MEDIUM CARBON STEELS ≤ 38 HRc	Slotting	1 x D	1 x D	2	170 - 220	0.0003 - 0.0005	0.0004 - 0.0007	0.0006 - 0.0009	0.0008 - 0.0011	0.0005 - 0.0009	0.0011 - 0.0015
TOOL STEEL	TOOL & DIE STEELS ≤ 38 HRc	Slotting	1 x D	1 x D	2	170 - 220	0.0003 - 0.0005	0.0004 - 0.0007	0.0006 - 0.0009	0.0008 - 0.0011	0.0005 - 0.0009	0.0011 - 0.0015
	TOOL & DIE STEELS 39 to 48 HRc	Slotting	1 x D	1 x D	2	125 - 165	0.0002 - 0.0004	0.0003 - 0.0006	0.0004 - 0.0007	0.0006 - 0.0009	0.0002 - 0.0006	0.0008 - 0.0013
HARDENED STL	HARDENED STEELS 48 to 57 HRc	Slotting	1 x D	1 x D	2	85 - 110	0.0001 - 0.0003	0.0002 - 0.0004	0.0002 - 0.0005	0.0002 - 0.0006	-0.0002 - 0.0002	0.0002 - 0.0007
	HARDENED STEELS 58 to 65 HRc	Slotting	1 x D	1 x D	2	75 - 95	0.0001 - 0.0003	0.0001 - 0.0003	0.0001 - 0.0004	0.0001 - 0.0005	-0.0003 - 0.0001	0.0001 - 0.0006
STAINLESS STEEL	EASY TO MACHINE 72 - 85 HRb	Slotting	1 x D	1 x D	2	380 - 495	0.0003 - 0.0005	0.0004 - 0.0006	0.0005 - 0.0008	0.0005 - 0.0009	0.0002 - 0.0006	0.0007 - 0.0011
	MODERATELY DIFFICULT 79 - 85 HRb; 25 - 41 HRc	Slotting	1 x D	1 x D	2	170 - 220	0.0003 - 0.0005	0.0003 - 0.0006	0.0004 - 0.0007	0.0005 - 0.0008	0.0001 - 0.0005	0.0006 - 0.0010
	DIFFICULT TO MACHINE 31 - 50 HRc	Slotting	1 x D	1 x D	2	125 - 165	0.0002 - 0.0004	0.0002 - 0.0005	0.0002 - 0.0005	0.0003 - 0.0006	-0.0002 - 0.0002	0.0003 - 0.0008
CAST IRON	GRAY 100 - 200 HRb	Slotting	1 x D	1 x D	2	295 - 385	0.0004 - 0.0006	0.0006 - 0.0008	0.0008 - 0.0011	0.0010 - 0.0013	0.0007 - 0.0011	0.0014 - 0.0018
	DUCTILE 150 - 300 HRb	Slotting	1 x D	1 x D	2	210 - 275	0.0004 - 0.0006	0.0006 - 0.0008	0.0008 - 0.0011	0.0010 - 0.0013	0.0007 - 0.0011	0.0014 - 0.0018
	MALLEABLE 150 - 310 HRb	Slotting	1 x D	1 x D	2	170 - 220	0.0004 - 0.0006	0.0006 - 0.0008	0.0008 - 0.0011	0.0010 - 0.0013	0.0007 - 0.0011	0.0014 - 0.0018
ALLOYS	TITANIUM ALLOYS 70 - 100 HRb; 25 - 36 HRc	Slotting	1 x D	1 x D	2	125 - 165	0.0002 - 0.0004	0.0002 - 0.0005	0.0002 - 0.0005	0.0003 - 0.0006	-0.0002 - 0.0002	0.0003 - 0.0008
	HIGH TEMP ALLOYS 83 - 99 HRb; 30 - 52 HRc	Slotting	1 x D	1 x D	2	55 - 75	0.0002 - 0.0004	0.0002 - 0.0005	0.0002 - 0.0005	0.0003 - 0.0006	-0.0002 - 0.0002	0.0003 - 0.0008



70 YEARS OF INNOVATION



UNQUESTIONABLE RESOURCES

Our Conical Runner Cutters are an essential part of any mold maker's tool room. High performance slotting a perfect modified trapezoidal runner in record time, these tools let mold makers design for minimum waste and maximum mold performance.

With a huge tapered core, staged eccentric relief, slight positive rake, 12 degree helix and premium AlTiN/Si3N4 coating, they perform in all ferrous materials, whether the work piece is easily machinable, hardened or exotic.

Applications may include: mold and tool steels, alloy steels and high hardness materials, for use wet or dry. The true efficiencies of this tool may not even be possible to determine as they improve the performance of the mold and efficiencies of the supply chain. Its high strength flute design improves chip formation and evacuation, to such a high degree, our tools will become a standard practice in our customers' operations. We request customers let us know their results and always keep our experience in mind.

GROWING SPEED

We design our tools for exceptional machining characteristics, and design our operations for exceptional turnarounds. Whether our customers need a modification or custom tool, we can perform many in as little as 24 hours. The performance of a tool won't matter, if it doesn't arrive before the job is complete. You can rely on us for thousands of in-stock items, and thousands of available modifications.

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