



ORION 2 & 3 Flute

Issue 26

Solid Carbide End Mills for Aluminum

- Effective in a full range of machine speeds from 3,000 to 50,000 RPM's
- Use only one tool for roughing and finishing operations
- Slotting is effective up to full 1 x D axial depth, side milling (profiling) is effective up to 0.5 x D radial by 1.5 x D axial depth
- Multiple corner radii and extended neck configurations are available on request
- 3 Flute series uses unequal flute spacing for chatter free performance
- Especially useful in airframe construction and other aerospace applications
- Also used in General Engineering, Machine Tool, and Vehicle markets
- Designed for customers machining a large volume of aluminum products
- Effective in high-speed machining, conventional milling, and MQL applications
- The high shear flute design and high polished flutes allow for extremely high cutting rates, rapid chip removal, and long tool life



UK20 This uncoated carbide grade is made from high quality fine grade materials. Due to its exceptional balance of wear and toughness this grade enables sharp edges and consistent controlled wear rates. UK20 is used for general purpose machining of aluminum and non-ferrous materials.

CK20 A special fine grain carbide that has exceptional toughness and wear resistance. This ZrTiN (zirconium titanium nitride) coating is a hard thin coating with good lubricity compared to uncoated carbide. It is particularly suited for machining non-ferrous materials including aluminum, brass, copper alloys, graphite, and plastic. CK20 is also the first choice grade for machining aluminum with high silicon content.

DL15 This DLC diamond coating is one of the hardest available and has the lowest friction coefficient and is one of the best abrasive wear resistant coatings available. DL15 is used in graphite, aluminum and non-ferrous materials with little or no filler. Coolant must be used with DL15.

Speeds & Feeds are suggested starting points and may be increased or decreased depending on actual material & machining conditions. The speeds & feeds values listed are conservative in most cases.

Recommended Cutting Parameters		Application			Uncoated & Coated	Cutting Speed (Vc) Maximum Feed per Tooth for Side Milling Operations* Cutting Diameter							
		Side Milling		Slotting		SFM	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
		Axial Depth	Radial Depth	Max. Axial Depth									
Tool Series	Material	ap	ae	ap	SFM	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"	
ORION	Aluminum Alloys	1.5 x D	0.5 x D	1 x D	1000 - 2000 SFM	.0023 - .0043	.0028 - .0055	.0034 - .006	.0045 - .008	.0056 - .0095	.0068 - .011	.0090 - .013	
	Aluminum with High Silicon	1.5 x D	0.5 x D	1 x D	700 - 2000 SFM	.0018 - .0043	.0023 - .0050	.0027 - .0052	.0036 - .0061	.0045 - .0075	.0054 - .0081	.0072 - .0110	
	other Non-Ferrous materials	1.5 x D	0.5 x D	1 x D	750 - 1500 SFM	.0018 - .0043	.0023 - .0050	.0027 - .0052	.0036 - .0061	.0045 - .0075	.0054 - .0081	.0072 - .0110	

* Feed per tooth in slotting applications should not exceed 80% of feed per tooth for side milling

Use adequate coolant. We recommended using good quality balanced toolholders.



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Available From:

ORION 2 & 3 Flute Solid Carbide End Mills for Aluminum

- Two flute design for extremely high chip loads!
- Produces excellent surface finishes!



- Variable pitch three flute design for smooth cutting action and less harmonic stress!



End Mills	Cutter Dia.	Length of Cut	OAL	Rad.	Grades	
					UK20	CK20
OR2EC-SQ0125	1/8	1/2	1-1/2	-	■	■
OR2LC-SQ0125	1/8	3/4	2-1/2	-	■	■
OR2RC-SQ0125	1/8	3/8	1-1/2	-	■	■
OR2EC-SQ0187	3/16	9/16	2	-	■	■
OR2RC-SQ0187	3/16	5/16	2	-	■	■
OR2EC-SQ0250	1/4	3/4	2-1/2	-	■	■
OR2EC-SQ0250-015	1/4	3/4	2-1/2	0.015	■	■
OR2LC-SQ0250	1/4	1-1/8	2-1/2	-	■	■
OR2LC-SQ0250-015	1/4	1-1/8	2-1/2	0.015	■	■
OR2RC-SQ0250	1/4	1/2	2-1/2	-	■	■
OR2RC-SQ0250-015	1/4	1/2	2-1/2	0.015	■	■
OR2RC-SQ0250-030	1/4	1/2	2-1/2	0.030	■	■
OR2RC-SQ0250-060	1/4	1/2	2-1/2	0.060	■	■
OR2XC-SQ0250	1/4	2	4	-	■	■
OR2LC-SQ0312	5/16	1-1/8	3	-	■	■
OR2RC-SQ0312	5/16	5/8	2-1/2	-	■	■
OR2RC-SQ0312-030	5/16	5/8	2-1/2	0.030	■	■
OR2EC-SQ0375	3/8	1-1/8	3	-	■	■
OR2EC-SQ0375-030	3/8	1-1/8	3	0.030	■	■
OR2LC-SQ0375	3/8	2	4	-	■	■
OR2LC-SQ0375-030	3/8	2	4	0.030	■	■
OR2RC-SQ0375	3/8	3/4	2-1/2	-	■	■
OR2RC-SQ0375-030	3/8	3/4	2-1/2	0.030	■	■
OR2EC-SQ0500	1/2	1-1/4	3	-	■	■
OR2EC-SQ0500-030	1/2	1-1/4	3	0.030	■	■
OR2EC-SQ0500-060	1/2	1-1/4	3	0.060	■	■
OR2LC-SQ0500	1/2	2	4	-	■	■
OR2LC-SQ0500-030	1/2	2	4	0.030	■	■
OR2RC-SQ0500	1/2	1	3	-	■	■
OR2RC-SQ0500-030	1/2	1	3	0.030	■	■
OR2EC-SQ0625	5/8	1-5/8	3-1/2	-	■	■
OR2EC-SQ0625-030	5/8	1-5/8	3-1/2	0.030	■	■
OR2LC-SQ0625	5/8	2	4	-	■	■
OR2RC-SQ0625	5/8	1-1/4	3-1/2	-	■	■
OR2RC-SQ0625-030	5/8	1-1/4	3-1/2	0.030	■	■
OR2RC-SQ0625-060	5/8	1-1/4	3-1/2	0.060	■	■
OR2EC-SQ0750	3/4	1-3/4	4	-	■	■
OR2EC-SQ0750-030	3/4	1-3/4	4	0.030	■	■
OR2LC-SQ0750	3/4	3	6	-	■	■
OR2RC-SQ0750	3/4	1-1/2	4	-	■	■
OR2RC-SQ0750-030	3/4	1-1/2	4	0.030	■	■
OR2EC-SQ1000	1	2	4	-	■	■
OR2EC-SQ1000-030	1	2	4	0.030	■	■
OR2LC-SQ1000	1	3	6	-	■	■
OR2RC-SQ1000	1	1-1/2	4	-	■	■

End Mills	Cutter Dia.	Length of Cut	OAL	Rad.	Grades	
					UK20	CK20
OR3EC-SQ0125	1/8	1/2	1-1/2	-	■	■
OR3LC-SQ0125	1/8	3/4	2-1/2	-	■	■
OR3RC-SQ0125	1/8	3/8	1-1/2	-	■	■
OR3EC-SQ0187	3/16	9/16	2	-	■	■
OR3RC-SQ0187	3/16	5/16	2	-	■	■
OR3EC-SQ0250	1/4	3/4	2-1/2	-	■	■
OR3EC-SQ0250-015	1/4	3/4	2-1/2	0.015	■	■
OR3LC-SQ0250	1/4	1-1/8	2-1/2	-	■	■
OR3LC-SQ0250-015	1/4	1-1/8	2-1/2	0.015	■	■
OR3RC-SQ0250	1/4	1/2	2-1/2	-	■	■
OR3RC-SQ0250-015	1/4	1/2	2-1/2	0.015	■	■
OR3LC-SQ0312	5/16	1-1/8	3	-	■	■
OR3LC-SQ0312-030	5/16	1-1/8	3	0.030	■	■
OR3RC-SQ0312	5/16	5/8	2-1/2	-	■	■
OR3RC-SQ0312-030	5/16	5/8	2-1/2	0.030	■	■
OR3EC-SQ0375	3/8	1-1/8	3	-	■	■
OR3EC-SQ0375-030	3/8	1-1/8	3	0.030	■	■
OR3LC-SQ0375	3/8	2	4	-	■	■
OR3LC-SQ0375-030	3/8	2	4	0.030	■	■
OR3RC-SQ0375	3/8	3/4	2-1/2	-	■	■
OR3RC-SQ0375-030	3/8	3/4	2-1/2	0.030	■	■
OR3EC-SQ0500	1/2	1-1/4	3	-	■	■
OR3EC-SQ0500-030	1/2	1-1/4	3	0.030	■	■
OR3LC-SQ0500	1/2	2	4	-	■	■
OR3LC-SQ0500-030	1/2	2	4	0.030	■	■
OR3RC-SQ0500	1/2	1	3	-	■	■
OR3RC-SQ0500-030	1/2	1	3	0.030	■	■
OR3EC-SQ0625	5/8	1-5/8	3-1/2	-	■	■
OR3EC-SQ0625-030	5/8	1-5/8	3-1/2	0.030	■	■
OR3LC-SQ0625	5/8	2	4	-	■	■
OR3LC-SQ0625-030	5/8	2	4	0.030	■	■
OR3RC-SQ0625	5/8	1-1/4	3-1/2	-	■	■
OR3RC-SQ0625-030	5/8	1-1/4	3-1/2	0.030	■	■
OR3EC-SQ0750	3/4	1-3/4	4	-	■	■
OR3EC-SQ0750-030	3/4	1-3/4	4	0.030	■	■
OR3LC-SQ0750	3/4	3	6	-	■	■
OR3LC-SQ0750-030	3/4	3	6	0.030	■	■
OR3RC-SQ0750	3/4	1-1/2	4	-	■	■
OR3RC-SQ0750-030	3/4	1-1/2	4	0.030	■	■
OR3EC-SQ1000	1	2	4	-	■	■
OR3EC-SQ1000-030	1	2	4	0.030	■	■
OR3LC-SQ1000	1	3	6	-	■	■
OR3LC-SQ1000-030	1	3	6	0.030	■	■
OR3RC-SQ1000	1	1-1/2	4	-	■	■
OR3RC-SQ1000-030	1	1-1/2	4	0.030	■	■