



**Speeds & Feeds**

**Product Table:** End Mills for Composites - Chipbreaker Cutter

**Characteristics:** 3x Length of Cut, 4 Flutes

**Series:** 9692xx

Material	Type	Hardness	SFM	Chip Load (IPT) By Cutter Diameter																Depth of Cut	
				.015	.031	.047	.062	.078	.093	.125	.187	.250	.312	.375	.500	.625	.750	1.000	Radial	Axial	
FIBER REINFORCED PLASTICS FR4, G10, G11	Carbon/Glass Fiber 5% < 20%	100 > 150 Rr	500 - 700	Slot - Rough	.0002	.0005	.0007	.0009	.0012	.0014	.0019	.0028	.0038	.0047	.0056	.0075	.0094	.0113	.0150	1 x Dia	1 x Dia
				Profile	.0003	.0005	.0008	.0011	.0013	.0016	.0022	.0032	.0043	.0054	.0065	.0086	.0108	.0129	.0173	.35 x Dia	1 x Dia
G30	Carbon/Glass Fiber 21% < 40%	100 > 150 Rr	300 - 400	Slot - Rough	.0002	.0004	.0006	.0007	.0009	.0011	.0015	.0022	.0030	.0037	.0045	.0060	.0075	.0090	.0120	1 x Dia	1 x Dia
				Profile	.0002	.0004	.0006	.0009	.0011	.0013	.0017	.0026	.0035	.0043	.0052	.0069	.0086	.0104	.0138	.35 x Dia	1 x Dia

**Product Notes:**

Fiber Reinforced Plastics can be challenging as they encompass multiple variations. Please consider the following:

- An additional reduction in RPM may be necessary to avoid excessive fraying, splitting and tear out of fibers
- There may be high density areas or "hard spots" (especially in random/whisker reinforcement) in which speeds & feeds should be reduced
- Aramid fibers are more ductile and less abrasive than glass and carbon fibers allowing increased chip loads (IPT) in these materials
- When machining woven/cloth layered materials, use an oscillating program to help avoid heavy, localized wear on the cutter

Due to bur-style end geometry, axial machining should be done using a shallow ramp angle.

**General Notes:**

All posted speed and feed parameters are suggested starting values that may be increased given optimal setup conditions. Chip loads reflect uncoated cutters and may be increased, remain unchanged or even decreased if coated.

If you require additional information, Harvey Tool has a team of technical experts available to assist you through even the most challenging applications. Please contact us at **800-645-5609** or [Harveytech@harveyperformance.com](mailto:Harveytech@harveyperformance.com).

WARNING: Cutting tools may shatter under improper use. Government regulations require use of safety glasses and other appropriate safety equipment in the vicinity of use.