



Solid Carbide Tools

PCR SERIES

PLASTIC COMPOSITE ROUTER

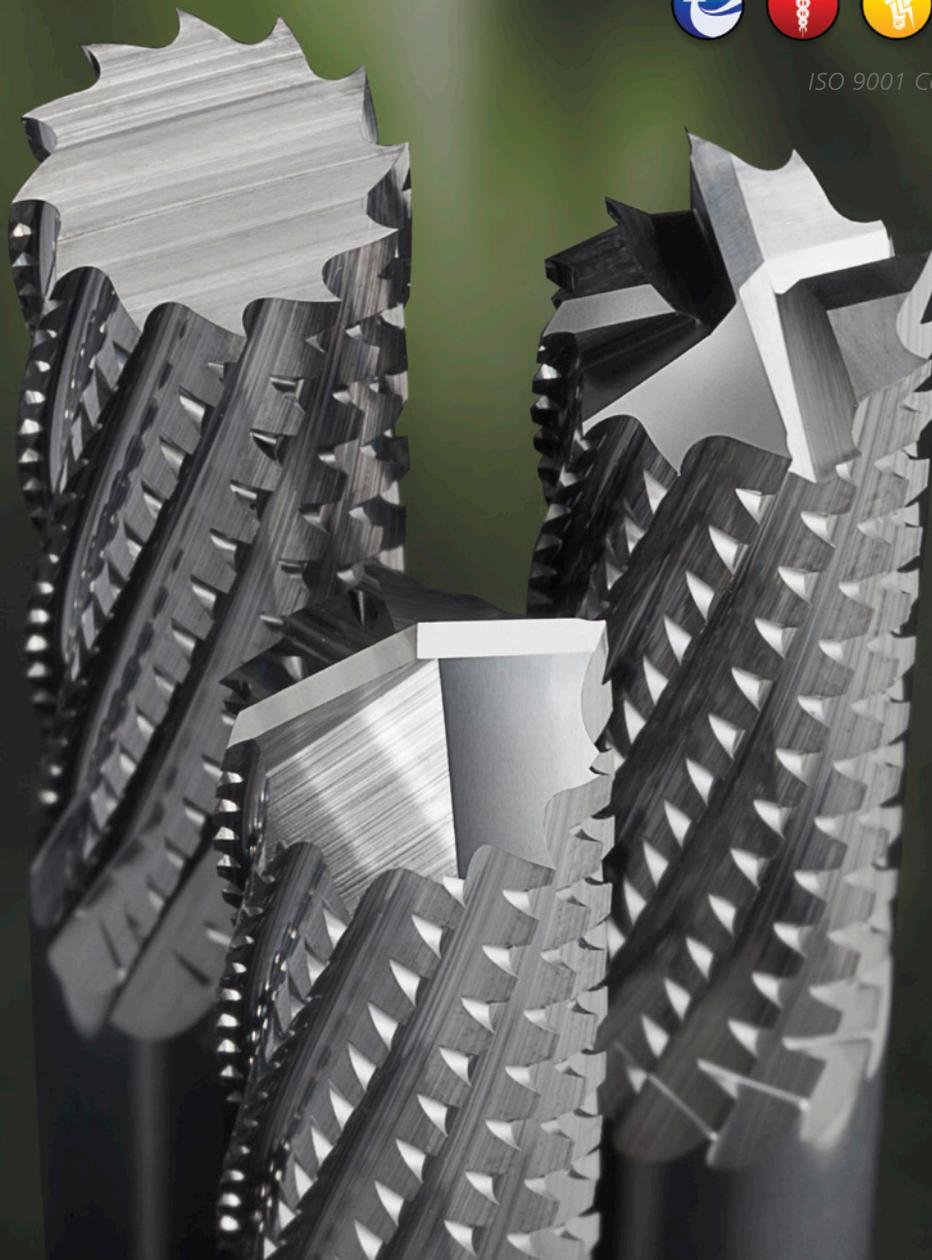
29

Plastic Composite

High Performance Routing | Series 29



ISO 9001 Certified Company





SERIES 29

PLASTIC COMPOSITE ROUTER

Using the latest in engineering design and grinding capabilities, the new Series 29 Plastic Composite Router (PCR) is specifically designed for machine routing glass reinforced composite materials, such as fiberglass and G10, as well as most other common plastic and non-metallic materials. This PCR is offered in a variety of length and diameter options as well as 3 different end styles; no end cut, end mill cut and drill point. All sizes and end configurations are available from stock uncoated or with optional DI-NAMITE for superior wear and increased tool life.

- Radial chisel edge design provides smoother cuts and longer tool life.
- Designed for enhanced wear resistance in abrasive non-metallic materials.
- Manufactured using high performance substrate specifically for machining abrasive materials.
- Maximum performance with optional Di-NAMITE coating.



Series 29 PCR is available with the hardest coating available with the best abrasion resistance. The engineered application process allows for maximum adhesion and smooth coating structure held to tight tolerances for consistent batch to batch results. Diamond is the longest wearing surface of any material allowing for improved cutting edge performance and improved surface finishes. The extremely high thermal properties protect the cutting edge from excessive heat to extend tool life.

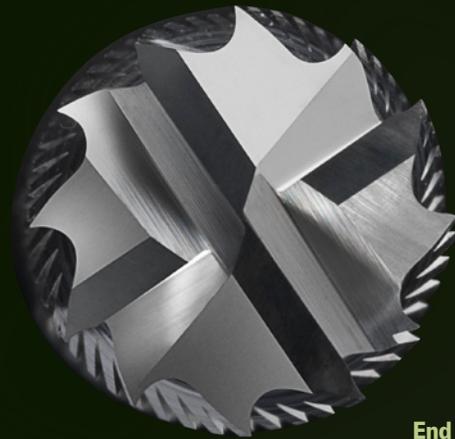
- Microhardness: > 8000HV**
- Oxidation Temperature: 800°C - 1470°F**
- Coefficient of Friction: 0.15 - 0.2**
- Thickness: 6 - 20 Microns (based on tool diameter)**

IDEAL INDUSTRIES:

- Aerospace
- Automotive
- Power Generation



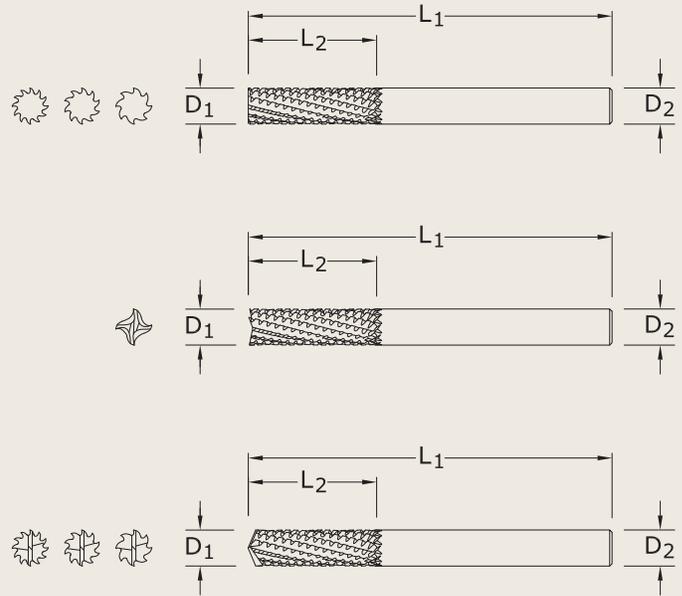
Drill End



End Mill Cut

TOLERANCES (inch)		
DIAMETER	D ₁	D ₂
All	+ .000 / - .005	h6

TOLERANCES (mm)		
DIAMETER	D ₁	D ₂
All	+0,000 / -0,130	h6

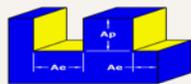


**SERIES 29
(FRACTIONAL)**

Cutting Diameter (D ₁)	Length of Cut (L ₂)	Overall Length (L ₁)	Shank Diameter (D ₂)	End Style	Number of Flutes	Uncoated EDP No.	Di-NAMITE (TD) EDP No.
1/8	1/2	1-1/2	1/8	No End Cut	8	74280	75080
1/8	1/2	1-1/2	1/8	End Mill	8	74281	75081
1/8	1/2	1-1/2	1/8	Drill	8	74282	75082
1/4	1	2-1/2	1/4	No End Cut	10	74283	75083
1/4	1	2-1/2	1/4	End Mill	10	74284	75084
1/4	1	2-1/2	1/4	Drill	10	74285	75085
5/16	1	2-1/2	5/16	No End Cut	12	74286	75086
5/16	1	2-1/2	5/16	End Mill	12	74287	75087
5/16	1	2-1/2	5/16	Drill	12	74288	75088
3/8	1-1/8	2-1/2	3/8	No End Cut	12	74289	75089
3/8	1-1/8	2-1/2	3/8	End Mill	12	74290	75090
3/8	1-1/8	2-1/2	3/8	Drill	12	74291	75091

**SERIES 29M
(METRIC)**

Cutting Diameter (D ₁)	Length of Cut (L ₂)	Overall Length (L ₁)	Shank Diameter (D ₂)	End Style	Number of Flutes	Uncoated EDP No.	Di-NAMITE (TD) EDP No.
3,0	12,0	38,0	3,0	No End Cut	8	84280	85080
3,0	12,0	38,0	3,0	End Mill	8	84281	85081
3,0	12,0	38,0	3,0	Drill	8	84282	85082
6,0	25,0	63,0	6,0	No End Cut	10	84283	85083
6,0	25,0	63,0	6,0	End Mill	10	84284	85084
6,0	25,0	63,0	6,0	Drill	10	84285	85085
8,0	25,0	63,0	8,0	No End Cut	12	84286	85086
8,0	25,0	63,0	8,0	End Mill	12	84287	85087
8,0	25,0	63,0	8,0	Drill	12	84288	85088
10,0	25,0	63,0	10,0	No End Cut	12	84289	85089
10,0	25,0	63,0	10,0	End Mill	12	84290	85090
10,0	25,0	63,0	10,0	Drill	12	84291	85091



Material Classification	Ae x D ₁	Ap x D ₁	Vc (sfm)	Diameter (D ₁) inch					
				1/8	1/4	5/16	3/8		
CFRP, AFRP (Carbon Fiber, Aramid Fiber)	Slot 	1	≤ 1	400 (320-480)	RPM	12224	6112	4890	4075
					Fr	0.0024	0.0048	0.0060	0.0072
					Feed (ipm)	29.4	29.4	29.4	29.4
	Profile 	≤ 0.5	≤ 1.5	500 (400-600)	RPM	15280	7640	6112	5093
					Fr	0.0024	0.0048	0.0060	0.0072
					Feed (ipm)	36.6	36.6	36.6	36.6
	HSM 	≤ 0.05	≤ 2	825 (660-990)	RPM	25212	12606	10085	8404
					Fr	0.0055	0.0110	0.0138	0.0165
					Feed (ipm)	139.0	139.0	139.0	139.0
GFRP (Fiberglass)	Slot 	1	≤ 1	320 (256-384)	RPM	9779	4890	3912	3260
					Fr	0.0024	0.0048	0.0060	0.0072
					Feed (ipm)	23.4	23.4	23.4	23.4
	Profile 	≤ 0.5	≤ 1.5	400 (320-480)	RPM	12224	6112	4890	4075
					Fr	0.0024	0.0048	0.0060	0.0072
					Feed (ipm)	29.4	29.4	29.4	29.4
	HSM 	≤ 0.05	≤ 2	660 (582-792)	RPM	20170	10085	8068	6723
					Fr	0.0055	0.0110	0.0138	0.0165
					Feed (ipm)	111.0	111.0	111.0	111.0
Carbon, Graphite	Slot 	1	≤ 1	480 (384-576)	RPM	14669	7334	5868	4890
					Fr	0.0037	0.0075	0.0094	0.0112
					Feed (ipm)	55.0	55.0	55.0	55.0
	Profile 	≤ 0.5	≤ 1.5	600 (480-720)	RPM	18336	9168	7334	6112
					Fr	0.0037	0.0075	0.0094	0.0112
					Feed (ipm)	68.7	68.7	68.7	68.7
	HSM 	≤ 0.05	≤ 2	990 (792-1188)	RPM	30254	15127	12102	10085
					Fr	0.0086	0.0172	0.0215	0.0258
					Feed (ipm)	260.0	260.0	260.0	260.0
Plastics	Slot 	1	≤ 1	800 (640-690)	RPM	24448	12224	9779	8149
					Fr	0.0038	0.0075	0.0094	0.0113
					Feed (ipm)	91.7	91.7	91.7	91.7
	Profile 	≤ 0.5	≤ 1.5	1000 (800-1200)	RPM	30560	15280	12224	10187
					Fr	0.0038	0.0075	0.0094	0.0113
					Feed (ipm)	114.6	114.6	114.6	114.6
	HSM 	≤ 0.05	≤ 2	1650 (1320-1980)	RPM	50424	25212	20170	16808
					Fr	0.0035	0.0069	0.0086	0.0104
					Feed (ipm)	174.0	174.0	174.0	174.0

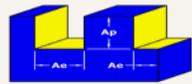
rpm = sfm x 3.82 / D₁
 ipm = (inch / revolution) x rpm
 HSM (high speed machining)
 Adjust parameters based on resin type and fiber structure

Reduce speed when overheating causes melting or damage to resin
 Reduce feed if delamination or fraying occur
 Finish cuts typically required reduced feed and cutting depths

Rates shown are for use without coolant; rates may be increased with coolant
 Dust collection is vital when machining dry
 Diamond coating will increase tool life in graphite and composite materials

Refer to the SGS Tool Wizard for complete technical information (www.sgstool.com)





Material Classification	Ae x D ₁	Ap x D ₁	V _c (m / min)	Diameter (D ₁) mm					
				3	6	8	10		
CFRP, AFRP (Carbon Fiber, Aramid Fiber)	Slot 	1	≤ 1	120 (96-164)	RPM	12722	6361	4771	3817
					Fr	0.061	0.122	0.163	0.203
					Feed (mm/min)	776	776	776	776
	Profile 	≤ 0.5	≤ 1.5	150 (120-180)	RPM	15903	7951	5963	4771
					Fr	0.061	0.122	0.163	0.203
					Feed (mm/min)	970	970	970	970
	HSM 	≤ 0.05	≤ 2	250 (200-300)	RPM	26504	13252	9939	7951
					Fr	0.140	0.280	0.373	0.467
					Feed (mm/min)	3710	3710	3710	3710
GFRP (Fiberglass)	Slot 	1	≤ 1	100 (80-120)	RPM	10602	5301	3976	3181
					Fr	0.061	0.122	0.162	0.203
					Feed (mm/min)	646	646	646	646
	Profile 	≤ 0.5	≤ 1.5	120 (96-164)	RPM	12722	6361	4771	3817
					Fr	0.061	0.122	0.163	0.203
					Feed (mm/min)	776	776	776	776
	HSM 	≤ 0.05	≤ 2	200 (160-240)	RPM	21203	10602	7951	6361
					Fr	0.140	0.280	0.374	0.467
					Feed (mm/min)	2970	2970	2970	2970
Carbon, Graphite	Slot 	1	≤ 1	145 (116-174)	RPM	15372	7686	5765	4612
					Fr	0.095	0.190	0.253	0.317
					Feed (mm/min)	1460	1460	1460	1460
	Profile 	≤ 0.5	≤ 1.5	185 (148-222)	RPM	19613	9807	7355	5884
					Fr	0.095	0.190	0.253	0.317
					Feed (mm/min)	1863	1863	1863	1863
	HSM 	≤ 0.05	≤ 2	300 (240-360)	RPM	31805	15903	11927	9542
					Fr	0.219	0.437	0.583	0.729
					Feed (mm/min)	6957	6957	6957	6957
Plastics	Slot 	1	≤ 1	245 (196-294)	RPM	25974	12987	9740	7792
					Fr	0.037	0.075	0.100	0.125
					Feed (mm/min)	974	974	974	974
	Profile 	≤ 0.5	≤ 1.5	305 (244-366)	RPM	32335	16168	12126	9701
					Fz	0.038	0.075	0.100	0.125
					Feed (mm/min)	1213	1213	1213	1213
	HSM 	≤ 0.05	≤ 2	505 (404-606)	RPM	53538	26769	20077	16062
					Fr	0.088	0.175	0.233	0.292
					Feed (mm/min)	4685	4685	4685	4685

rpm = (1000 x m / min) / (3.14 x D₁)
mm / min = (mm / revolution) x rpm

HSM (high speed machining)

Adjust parameters based on resin type and fiber structure

Reduce speed when overheating causes melting or damage to resin

Reduce feed if delamination or fraying occur

Finish cuts typically required reduced feed and cutting depths

Rates shown are for use without coolant; rates may be increased with coolant

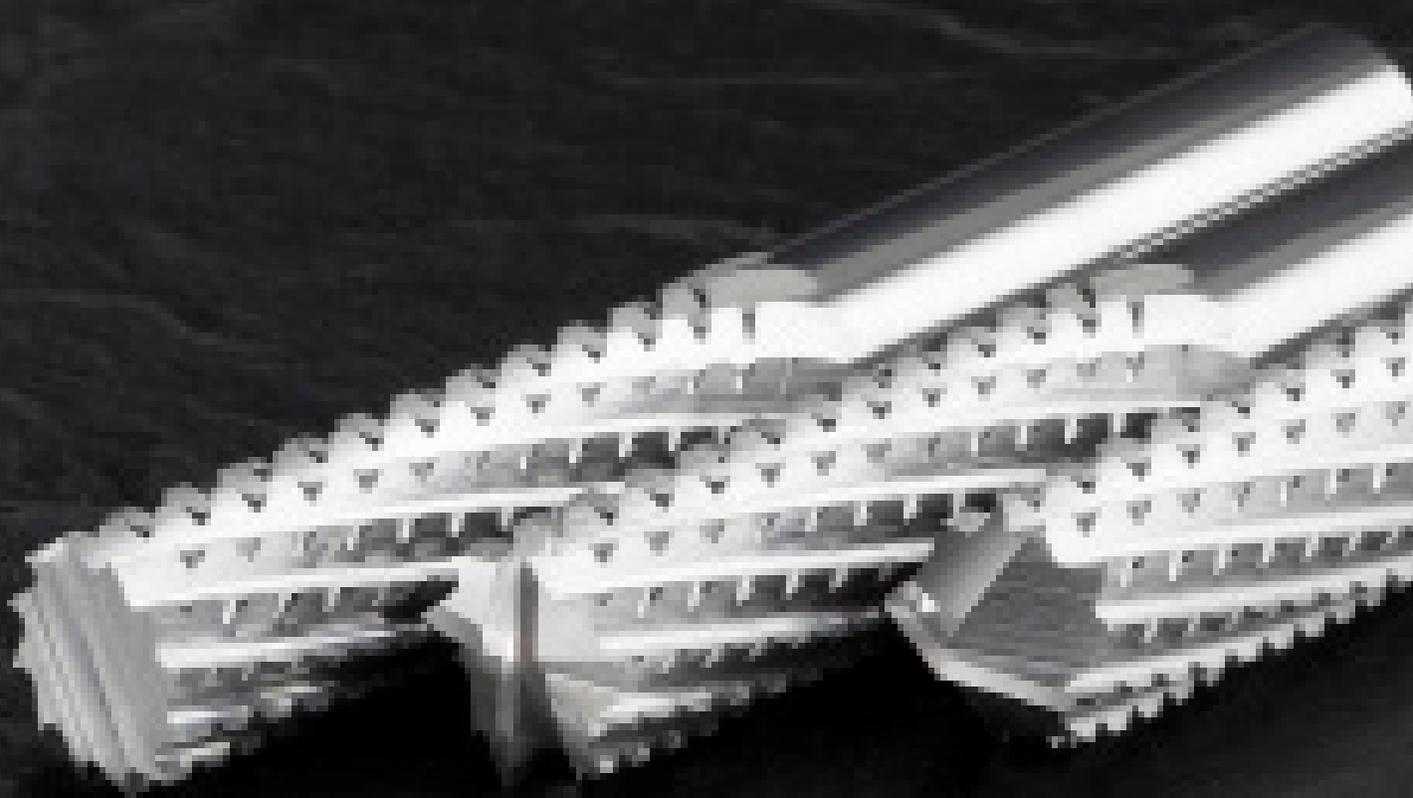
Dust collection is vital when machining dry

Diamond coating will increase tool life in graphite and composite materials

Refer to the SGS Tool Wizard for complete technical information (www.sgstool.com)

SERIES 29

PLASTIC COMPOSITE ROUTER





Solid Carbide Tools

Solutions Around The Globe

SGS Tool Company is a privately-held, ISO-certified leader of round solid carbide cutting tool technology for the aerospace, metalworking, and automotive industries with manufacturing sites in the United States and United Kingdom. Our global network of Sales Representatives, Industrial Distributors, and Agents blanket the world selling into more than 60 countries.

Leaders in Solid Carbide Tool Technology

Brand names such as Z-Carb, S-Carb, V-Carb, Hi-PerCarb, Multi-Carb have become synonymous with high performance tooling in the machining and metalworking industry.

We're proud to have pioneered some of the world's most advanced cutting technology right here in our Northeast Ohio manufacturing campus. SGS high performance end mills, drills and routers are increasing productivity and reducing cost around the world.

Exceeding Customer Expectations

In addition to our substantial R&D facilities, we offer a portfolio of products and services that have an unparalleled track record in manufacture, supply and value at the spindle.

- Incredible batch-to-batch consistency
- Metallurgical lab dedicated to testing and rigorous quality control
- ISO-certified quality procedures
- Patented geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality—even at extreme parameters
- Specialists in extreme and demanding product applications
- Experienced Field Sales Engineers who work to optimize a tool for your particular application
- Dedicated multi-lingual customer service representatives

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Performance by Design

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