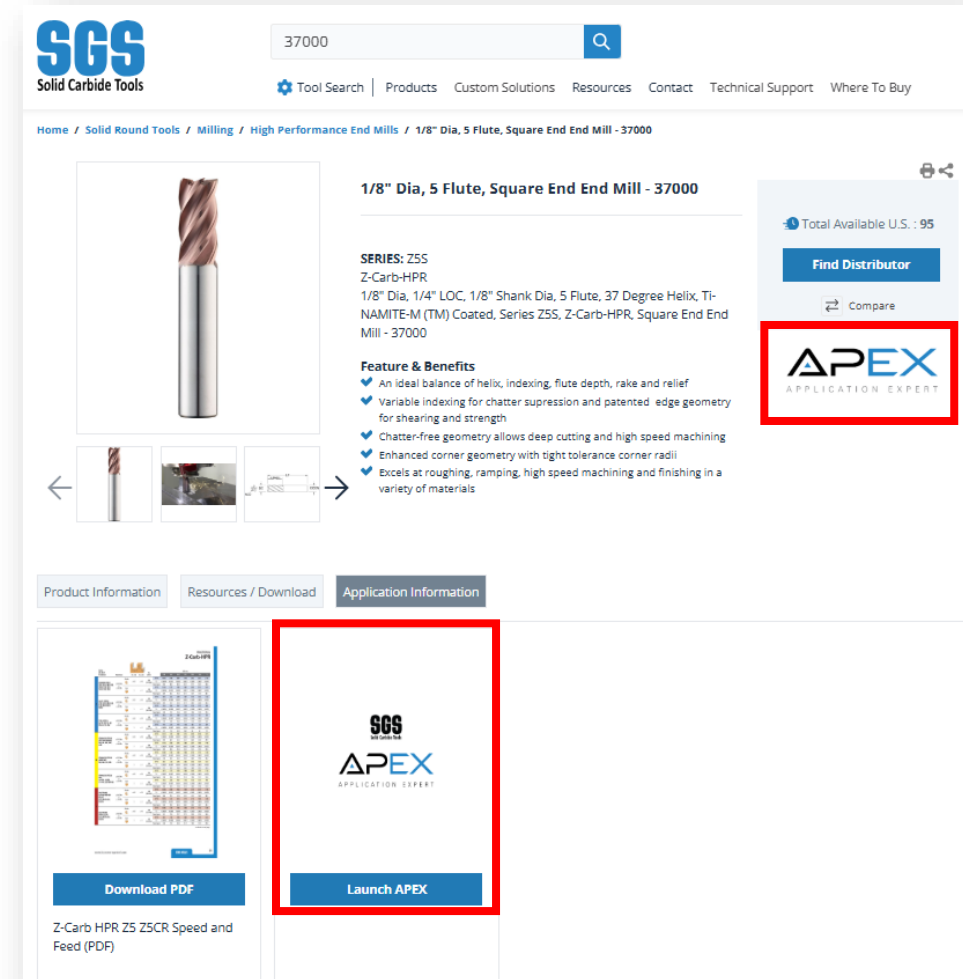
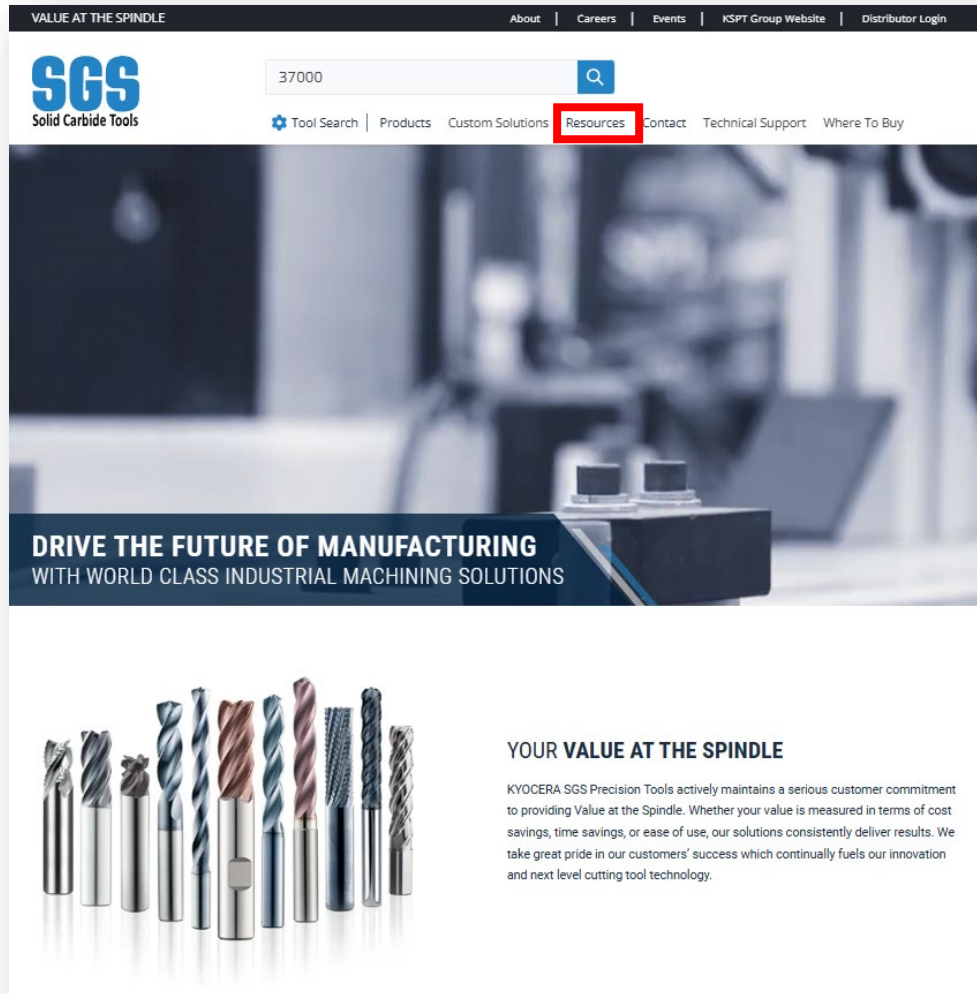


SGS
Solid Carbide Tools

APEX
APPLICATION EXPERT

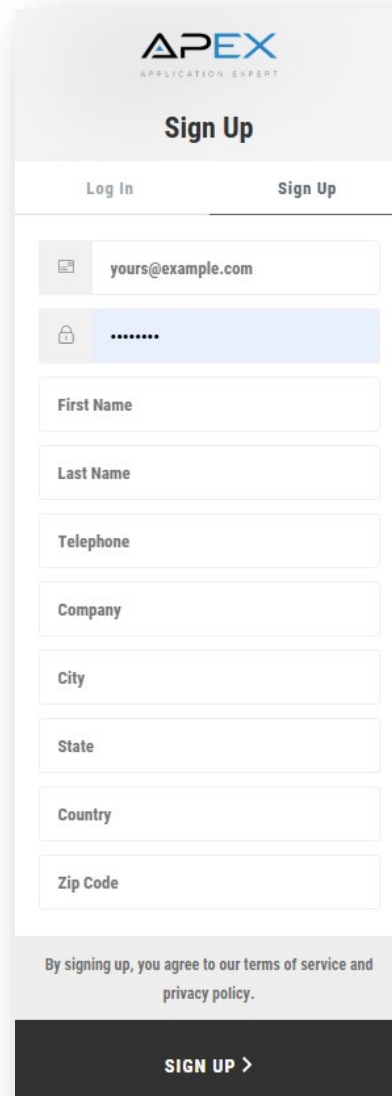
User Guide

Welcome to APEX, the SGS Application Expert, your go-to guide for optimizing tool performance. APEX provides specific application information, taking the guess work out of determining the ideal cutting parameters for your SGS endmills and drills.

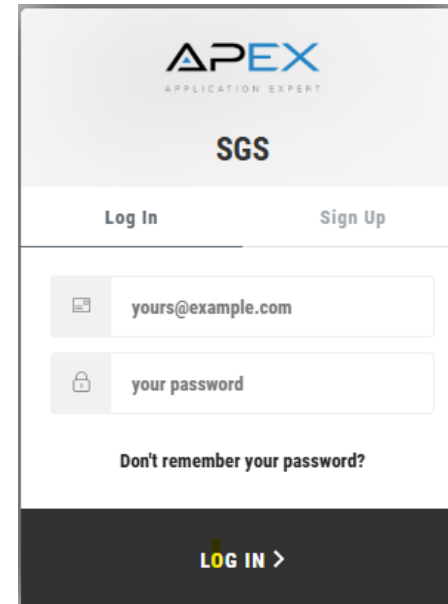


APEX can be accessed directly from the KYOCERA SGS website, either from the **Resources Menu** or from the **Product Detail Pages**.

A one-time registration is required to access APEX. After initial registration, you will enter a username and password to gain access.



The APEX sign-up form features the APEX logo at the top, followed by a navigation bar with 'Log In' and 'Sign Up' links. The form includes input fields for email (pre-filled with 'yours@example.com'), password (masked with dots), first name, last name, telephone, company, city, state, country, and zip code. A disclaimer at the bottom states, 'By signing up, you agree to our terms of service and privacy policy.' A dark 'SIGN UP >' button is at the bottom.



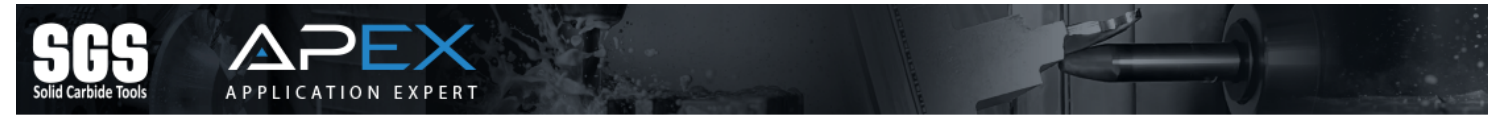
The SGS log-in form features the SGS logo at the top, followed by a navigation bar with 'Log In' and 'Sign Up' links. The form includes input fields for email (pre-filled with 'yours@example.com') and password (pre-filled with 'your password'). A checkbox labeled 'Don't remember your password?' is present. A dark 'LOG IN >' button is at the bottom.

After completing the registration process, you'll be asked to input some key metrics before proceeding.

- 1 The application type: Milling or Drilling
- 2 The Display Units: Fractional or Metric
- 3 The Workpiece Material, which can be selected from a comprehensive list of primary materials, subcategory materials, hardness ranges, and some common examples of that specific material.
- 4 The Product EDP. If you are unsure of the product EDP, click on the link to the **SGS product locator**. After selecting your tool, enter the six-digit number into the Product EDP field.

Each of these initial entries are required but can be changed on the fly once in the Application Expert.

When you click next, you'll enter the main screen of the app.



The screenshot shows the APEX APPLICATION EXPERT registration form. It is divided into four sections, each with a numbered callout:

- 1 APPLICATION**: Radio buttons for MILLING and DRILLING.
- 2 DISPLAY UNITS**: Radio buttons for FRACTIONAL and METRIC.
- 3 WORKPIECE MATERIAL***: A scrollable list of materials including STEEL | Low Carbon, STEEL | Medium Carbon, STEEL | High Carbon, STEEL | Medium Alloy, STEEL | High Strength Alloy, STEEL | Tool, Mold & Die, and CAST IRON | Low-Medium Alloy.
- 4 PRODUCT EDP***: A text input field containing the value "37100" and a "NEXT" button. A blue arrow points from the "SGS product locator" text in the list above to a URL: <https://www.kyocera-sgstool.com/products/categories/solid-round-tools/milling>.



On the top of the APEX Milling page, you'll see the parameters you entered on the previous screen along with the product image and drawing

Below the images you'll see attributes and suggestions for the selected tool:

- 1 Tool Attributes and Dimensions
- 2 The Preferred Cut Type
- 3 Suggested Cooling
- 4 Suggested Materials

Below these tables, you'll see blue boxes to enter optional overrides. These are the fields that allow you to further tailor your results and give you the ideal rates for your specific application.

After entering the optional overrides and clicking "Calculate Cutting Parameters", the application data is revealed.

Technical Support Log Out

Workpiece Material: STEEL | Tool, Mold & Die | ≤ 28 HRC | D2, H13, P20 Display Units: FRACTIONAL Product EDP: 37100

1 **Tool Attributes**

EDP	37100
TOOL UNITS	FRACTIONAL
CATEGORY	HIGH PERFORMANCE
CATALOG CODE	ZSCR
CUTTING EDGES	5
CUTTING EDGE STYLE	CONTINUOUS
END CONFIGURATION	CORNER RADIUS
HELIX	Ae ★
Ae ★	37°
CENTER CUTTING	NO
COATING	TI-NAMITE M
SHANK TYPE	WELDON FLAT
DC	0.7500
RE	0.1900
APMX	0.8750
LF	4.0000
DCON	0.7500
LU/DN	LU
LU	-
α/DC1	α ANGLE
α ANGLE	-

2 **Preferred Cut Type (Ae & Ap) for Series ***

Heavy 100%-40% Ae Ap ≤ 1 x DC	Moderate 40%-25% Ae Ap ≤ 1.5 x DC	Light 25%-10% Ae Ap ≤ 2.5 x DC	Fine 10%-2% Ae Ap ≤ 4.5 x DC	Wall Finish 2%-0% Ae Any Ap	Floor Finish Up to 100% Ae Ap ≤ .02 x DC
☆	★	★	☆	☆	☆

Best ★ Better ☆ Good ◦

3 **SUGGESTED COOLING**

FLOOD (EXTERNAL/INTERNAL)	YES
MIST/MQL	YES
DRY/AIR	YES

4 **SUGGESTED MATERIALS**

ISO Material Description	Hardness
P STEEL	<45 HRc
M STAINLESS STEEL	<45 HRc
K CAST IRON	<45 HRc
S1 HIGH TEMP ALLOYS	ALL
S2 TITANIUM ALLOYS	ALL

Cutting parameters automatically update with changes made to the Optional Overrides

OPTIONAL OVERRIDES

SPEED	FEED	MAX MACHINE RPM	PROGRAMMED Ap	TILT ANGLE	RADIUS CONTOUR	RAD PRIOR TO CUT	PART OF CS CUTTING
▼	▼				▼		▼

Calculate Cutting Parameters

OPTIONAL OVERRIDES							
SPEED	FEED	MAX MACHINE RPM	PROGRAMMED Ap	TILT ANGLE	RADIUS CONTOUR	RAD PRIOR TO CUT	PART OF CS CUTTING
▼	▼				▼		▼

Hide Cutting Parameters

MILLING DATA FOR SELECTED TOOL	RADIAL MILLING: CUTTER DIAMETER PERCENTAGE (% DC)													UNIQUE STEPOVER (Ae)	
	HEAVY			MODERATE			LIGHT			FINE			WALL FINISH		FLOOR FINISH
Radial Percentage (% DC)	100%	75%	50%	40%	33%	25%	20%	15%	10%	7%	5%	2%	≤ 2%	Up to 100%	0.00%
Radial Engagement Angle**	180°	120°	90°	78°	71°	60°	53°	46°	37°	31°	26°	16°	16°	Up to 180°	
Ae of Effective Diameter (inch)	0.7500	0.5625	0.3750	0.3000	0.2475	0.1875	0.1500	0.1125	0.0750	0.0525	0.0375	0.0150	0.0150	0.7500	
Ap Max or Programmed (inch)	0.7500	0.7500	0.9375	0.8750	0.8750	0.8750	0.8750	0.8750	0.8750	0.8750	0.8750	0.8750	0.8750	0.0150	
SFM	209	229	251	277	293	314	331	354	376	418	460	523	523	314	
RPM	1065	1169	1277	1410	1490	1597	1688	1802	1916	2129	2342	2661	2661	1597	
IPT	0.00258	0.00258	0.00258	0.00265	0.00275	0.00298	0.00323	0.00362	0.00431	0.00506	0.00593	0.00923	0.00207	0.00258	
IPM	13.8	15.1	16.5	18.7	20.5	23.8	27.3	32.6	41.3	53.9	69.4	122.8	27.5	20.6	
MRR*** (in ³ /min), Ae x Max Ap x IPM	7.74	6.37	5.80	4.90	4.43	3.91	3.58	3.21	2.71	2.48	2.28	1.61	0.36	0.23	
Power required at motor**** (HP)	16.07	13.34	12.20	10.41	9.47	8.42	7.76	7.02	6.02	5.55	5.16	3.82	1.32	1.06	
Power required at spindle**** (HP)	12.38	10.19	9.28	7.85	7.09	6.25	5.72	5.13	4.33	3.96	3.64	2.58	0.58	0.37	

**Radial Engagement Angle is based upon a straight toolpath unless an ID/OD Contour (Optional Overrides) is selected. This will adjust the engagement angle based on type of contour and the diameter entered.

Actual MRR will vary depending on the toolpath and how much "air cutting" is occurring due to the part geometry *Power ratings are based upon an 80% machine efficiency

Max Depth per Ramp Recommended (inch)	0.750	AXIAL ENTRY: PLUNGE, STRAIGHT RAMP ANGLE													
		90°	45°	25°	15°	10°	9°	8°	7°	6°	5°	4°	3°	2°	1°
Distance at Max Depth per Ramp (inch)	-	-	-	-	-	-	-	-	6.881	7.905	9.339	11.489	15.071	22.234	43.721
SFM	-	-	-	-	-	-	-	-	209	209	229	242	251	277	293
RPM	-	-	-	-	-	-	-	-	1065	1065	1169	1234	1277	1410	1490
IPT	-	-	-	-	-	-	-	-	0.0014	0.0016	0.0018	0.0021	0.0026	0.0028	0.0031
IPM	-	-	-	-	-	-	-	-	7.6	8.3	10.6	12.8	16.5	20.0	23.1

Part Geometry such as pocket size will determine actual depth per ramp and ramp distance - shown is the distance when max depth is achieved.

Diameter Range (inch)	Minimum Maximum	0.98 1.13	AXIAL ENTRY: HELICAL RAMP ANGLE													
			30°	25°	20°	15°	10°	9°	8°	7°	6°	5°	4°	3°	2°	1°
Drop Per Rev at Maximum Diameter (inch)	-	-	-	-	-	-	-	-	0.145	0.124	0.103	0.082	0.062	0.041	0.021	
SFM	-	-	-	-	-	-	-	-	229	242	251	277	293	314	331	
RPM	-	-	-	-	-	-	-	-	1169	1234	1277	1410	1490	1597	1688	
IPT	-	-	-	-	-	-	-	-	0.0018	0.0019	0.0021	0.0023	0.0026	0.0028	0.0031	
IPM	-	-	-	-	-	-	-	-	10.6	12.0	13.2	16.4	19.3	22.7	26.2	

Diameter range is a suggestion for normal entry situations - diameter can vary from this depending on part geometry such as ramping around a boss which will affect (increase) drop per rev. For non center-cutting tools, do not go below minimum diameter.

SPEED CALCULATOR STEPOVER FEED CALCULATOR

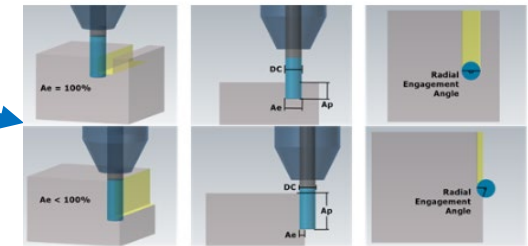
Here in the **Cutting Parameters Table**, you will find all the application data for the selected tool at a range of stepovers.

The two tables below that provide additional cutting data: **Ramping parameters** for straight ramping or plunging and **Helical Ramp** entry methods.

A custom radial percentage can be entered in the **Unique Stepoover** field.

Clicking the green plus symbols to the right will give you a few visuals for some of the labels on the corresponding tables.

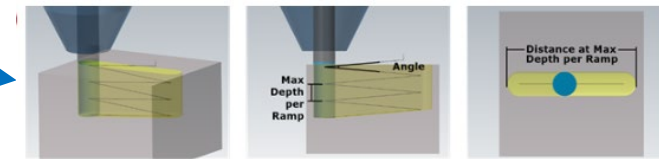
MILLING DATA FOR SELECTED TOOL	RADIAL MILLING: CUTTER DIAMETER PERCENTAGE (% DC)													UNIQUE STEPOVER (Ae)		
	HEAVY			MODERATE			LIGHT			FINE			WALL FINISH	FLOOR FINISH		
Radial Percentage (% DC)	100%	75%	50%	40%	33%	25%	20%	15%	10%	7%	5%	2%	≤ 2%	Up to 100%	0.00%	+
Radial Engagement Angle**	180°	120°	90°	78°	71°	60°	53°	46°	37°	31°	26°	16°	16°	Up to 180°		
Ae of Effective Diameter (inch)	0.7500	0.5625	0.3750	0.3000	0.2475	0.1875	0.1500	0.1125	0.0750	0.0525	0.0375	0.0150	0.0150	0.7500		
Ap Max or Programmed (inch)	0.7500	0.7500	0.9375	0.8750	0.8750	0.8750	0.8750	0.8750	0.8750	0.8750	0.8750	0.8750	0.8750	0.0150		
SFM	209	229	251	277	293	314	331	354	376	418	460	523	523	314		
RPM	1065	1169	1277	1410	1490	1597	1688	1802	1916	2129	2342	2661	2661	1597		
IPT	0.00258	0.00258	0.00258	0.00265	0.00275	0.00298	0.00323	0.00362	0.00431	0.00506	0.00593	0.00923	0.00207	0.00258		
IPM	13.8	15.1	16.5	18.7	20.5	23.8	27.3	32.6	41.3	53.9	69.4	122.8	27.5	20.6		
MRR*** (in ³ /min), Ae x Max Ap x IPM	7.74	6.37	5.80	4.90	4.43	3.91	3.58	3.21	2.71	2.48	2.28	1.61	0.36	0.23		
Power required at motor**** (HP)	16.07	13.34	12.20	10.41	9.47	8.42	7.76	7.02	6.02	5.55	5.16	3.82	1.32	1.06		
Power required at spindle**** (HP)	12.38	10.19	9.28	7.85	7.09	6.25	5.72	5.13	4.33	3.96	3.64	2.58	0.58	0.37		



**Radial Engagement Angle is based upon a straight toolpath unless an ID/OD Contour (Optional Overrides) is selected. This will adjust the engagement angle based on type of contour and the diameter entered.

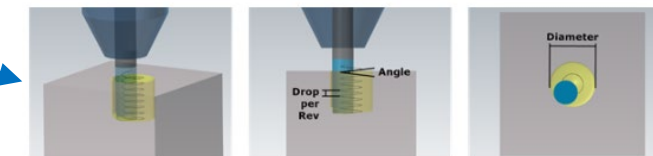
Actual MRR will vary depending on the toolpath and how much "air cutting" is occurring due to the part geometry *Power ratings are based upon an 80% machine efficiency

Max Depth per Ramp Recommended (inch)	AXIAL ENTRY: PLUNGE, STRAIGHT RAMP ANGLE														
	90°	45°	25°	15°	10°	9°	8°	7°	6°	5°	4°	3°	2°	1°	
Distance at Max Depth per Ramp (inch)	-	-	-	-	-	-	-	-	6.881	7.905	9.339	11.489	15.071	22.234	43.721
SFM	-	-	-	-	-	-	-	-	209	209	229	242	251	277	293
RPM	-	-	-	-	-	-	-	-	1065	1065	1169	1234	1277	1410	1490
IPT	-	-	-	-	-	-	-	-	0.0014	0.0016	0.0018	0.0021	0.0026	0.0028	0.0031
IPM	-	-	-	-	-	-	-	-	7.6	8.3	10.6	12.8	16.5	20.0	23.1



Part Geometry such as pocket size will determine actual depth per ramp and ramp distance - shown is the distance when max depth is achieved.

Diameter Range (inch)	AXIAL ENTRY: HELICAL RAMP ANGLE														
	Minimum	0.98	30°	25°	20°	15°	10°	9°	8°	7°	6°	5°	4°	3°	2°
Drop Per Rev at Maximum Diameter (inch)	1.13	-	-	-	-	-	-	-	0.145	0.124	0.103	0.082	0.062	0.041	0.021
SFM	-	-	-	-	-	-	-	-	229	242	251	277	293	314	331
RPM	-	-	-	-	-	-	-	-	1169	1234	1277	1410	1490	1597	1688
IPT	-	-	-	-	-	-	-	-	0.0018	0.0019	0.0021	0.0023	0.0026	0.0028	0.0031
IPM	-	-	-	-	-	-	-	-	10.6	12.0	13.2	16.4	19.3	22.7	26.2



Diameter range is a suggestion for normal entry situations - diameter can vary from this depending on part geometry such as ramping around a boss which will affect (increase) drop per rev. For non center-cutting tools, do not go below minimum diameter.

Max Depth per Ramp Recommended (inch)	0.750	AXIAL ENTRY: PLUNGE, STRAIGHT RAMP ANGLE														
		90°	45°	25°	15°	10°	9°	8°	7°	6°	5°	4°	3°	2°	1°	
Distance at Max Depth per Ramp (inch)		-	-	-	-	-	-	-	-	6.881	7.905	9.339	11.489	15.071	22.234	43.721
SFM		-	-	-	-	-	-	-	-	209	209	229	242	251	277	293
RPM		-	-	-	-	-	-	-	-	1085	1065	1169	1234	1277	1410	1490
IPT		-	-	-	-	-	-	-	-	0.0014	0.0018	0.0018	0.0021	0.0026	0.0028	0.0031
IPM		-	-	-	-	-	-	-	-	7.6	8.3	10.6	12.8	16.5	20.0	23.1

Part Geometry such as pocket size will determine actual depth per ramp and ramp distance - shown is the distance when max depth is achieved.

Diameter Range (inch)	Minimum	0.98	Maximum	1.13	AXIAL ENTRY: HELICAL RAMP ANGLE																				
					30°	25°	20°	15°	10°	9°	8°	7°	6°	5°	4°	3°	2°	1°							
Drop Per Rev at Maximum Diameter (inch)					-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.145	0.124	0.103	0.082	0.062	0.041	0.021
SFM					-	-	-	-	-	-	-	-	-	-	-	-	-	-	229	242	251	277	293	314	331
RPM					-	-	-	-	-	-	-	-	-	-	-	-	-	-	1169	1234	1277	1410	1490	1597	1688
IPT					-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0018	0.0019	0.0021	0.0023	0.0026	0.0028	0.0031
IPM					-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.6	12.0	13.2	16.4	19.3	22.7	26.2

Diameter range is a suggestion for normal entry situations - diameter can vary from this depending on part geometry such as ramping around a boss which will affect (increase) drop per rev. For non center-cutting tools, do not go below minimum diameter.

SPEED CALCULATOR STEPOVER FEED CALCULATOR

Comparison Tool
Summary Page
Drawing Page
START OVER

At the bottom of the page are additional features, including the **Comparison Tool, Summary Page, and Drawing Page**. Clicking Start Over will take you back to the opening screen but won't log you out of the application.

TOOL SPECIFICATIONS					
CATEGORY	HIGH PERFORMANCE	HIGH PERFORMANCE	HIGH PERFORMANCE	HIGH PERFORMANCE	HIGH PERFORMANCE
TOOL UNITS - CATALOG CODE	METRIC	METRIC	METRIC	METRIC	METRIC
CUTTING EDGES	4	4	5	5	5
CUTTING EDGE STYLE	CONTINUOUS	CONTINUOUS	CONTINUOUS	CHIP BREAKER	CONTINUOUS
END CONFIGURATION	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS
HELIX	34°-38°	34°-38°	37°	37°	37°
CENTER CUTTING	YES	YES	NO	NO	NO
COATING	MEGACOAT NANO	MEGACOAT NANO	TI-NAMITE M	TI-NAMITE M	TI-NAMITE A
SHANK TYPE	SOLID ROUND	SOLID ROUND	WELDON FLAT	SOLID ROUND	SOLID ROUND
DC	0.32	0.39	0.47	0.32	0.32
RE	0.08	0.02	0.03	0.08	0.04
APMX	0.75	0.87	1.02	0.94	0.71
LF	2.48	2.83	3.27	2.95	2.95
DCON	0.32	0.39	0.47	0.32	0.32
LU	-	-	-	-	1.2598
DN	-	-	-	-	0.2992
INCLUDED ANGLE	-	-	-	-	-
TIP DIAMETER	-	-	-	-	-
PRODUCT EDP	47812	47816	47026	47511	47656
COMPANY/SERIES	Z-Carb XPR	Z-Carb XPR	Z-Carb HPR	Z-Carb HPR	Z-Carb HPR
STEPOVER % OF DC (Ae)	25% Ae	25% Ae	25% Ae	25% Ae	25% Ae
SPEED OVERRIDE					
FEED OVERRIDE					
Radial Engagement Angle**	60°	60°	60°	60°	60°
Ae of Effective Diameter (inch)	0.0788	0.0984	0.1181	0.0788	0.0788
Ap Max or Programmed (inch)	0.7480	0.8661	1.0236	0.9449	0.7087
SFM	402.0	405.0	297.0	295.0	295.0
RPM	4875.0	3930.0	2402.0	3577.0	3577.0
IPT	0.001063	0.001448	0.002245	0.001181	0.001300
IPM	20.73	22.76	26.96	21.12	23.25
MRR*** (in3/min), Ae x Max Ap x IPM	1.22	1.94	3.26	1.57	1.30
Power required at motor**** (HP)	3.35	4.96	7.94	4.14	3.53
Power required at spindle**** (HP)	2.20	3.49	5.87	2.83	2.34

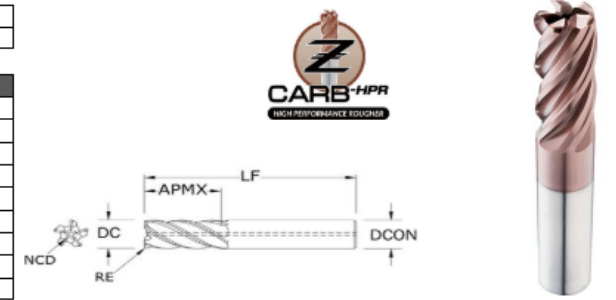
[Return to Calculation](#)

The **Comparison Tool** allows you to enter up to five EDPs and a stepover for each to compare MRR for each scenario. Remember that MRR is a theoretical number and can be used to compare tools in similar toolpaths.



		APPLICATION INFORMATION		DATE December 19, 2024
MATERIAL	STEEL Tool, Mold & Die 28 to 35 HRc D2, H13, P20			
DISPLAY UNITS	FRACTIONAL	SFM OVERRIDE	NO OVERRIDE	
COOLANT	FLOOD, MIST, DRY	FEED OVERRIDE	NO OVERRIDE	
ID/OD CONTOUR		MAX RPM OVERRIDE	NO OVERRIDE	
DIA PRIOR TO CUT		PART OF CS CUTTING		
V24-07	SERIES Z-Carb HPR	PROGRAMMED AP	NO OVERRIDE	
	PRODUCT EDP 37100	TILT ANGLE	NO OVERRIDE	

TOOL SPECIFICATIONS			
CATEGORY	HIGH PERFORMANCE	SHANK TYPE	WELDON FLAT
TOOL UNITS - CATALOG CODE	FRACTIONAL - Z5CR	DC	0.75
CUTTING EDGES	5	RE	0.19
CUTTING EDGE STYLE	CONTINUOUS	APMX	0.875
END CONFIGURATION	CORNER RADIUS	LF	4
HELIX	37°	DCON	0.75
CENTER CUTTING	NO	LU	-
COATING	TI-NAMITE M	DN	-
TAPER ANGLE	-	TIP DIAMETER	-



The summary page gives you all the selected application data and allows you to **Print Summary Page**, which will create a single page PDF, which can then be printed from your computer.

MILLING DATA FOR SELECTED TOOL				RADIAL MILLING													UNIQUE STEPOVER		
				Heavy			Moderate					Floor Finish							
Radial Percentage (% DC)				100%	75%	50%	40%	33%	25%	20%	15%	10%	7%	5%	2%	≤2%	Floor Finish	0%	
Rank:	Best ★	Better ☆	Good ○	★	★	★	★	★	★	★	★	★	★	★	★	★	★		
Radial Engagement Angle				180%	120%	90%	78%	71%	60%	53%	46%	37%	31%	26%	16%	16%	Up to 180°	0	
Ae of Effective Diameter (inch)				0.7500	0.5625	0.3750	0.3000	0.2475	0.1875	0.1500	0.1125	0.0750	0.0525	0.0375	0.0150	0.0150	0.7500	0.0000	
Ap Max. or Programmed (inch)				0.7500	0.7500	0.9375	0.8750	0.8750	0.8750	0.8750	0.8750	0.8750	0.8750	0.8750	0.8750	0.8750	0.8750	0.0150	0.8750
SFM				198	217	238	262	277	297	314	335	356	396	436	495	495	297	495	
RPM				1008	1107	1210	1336	1412	1513	1999	1707	1815	2017	2219	2521	2521	1513	2521	
IPT				0.00258	0.00258	0.00258	0.00265	0.00275	0.00298	0.00323	0.00362	0.00431	0.00506	0.00593	0.00923	0.00207	0.00258	0.01298	
IPM				13.03	14.31	15.63	17.70	19.40	22.57	25.83	30.89	39.09	51.06	65.76	116.33	26.06	19.54	163.68	
MRR (in3/min), Ae x Max Ap x IPM				7.33	6.04	5.50	4.65	4.20	3.70	3.39	3.04	2.57	2.35	2.16	1.53	0.34	0.22	0.00	
Power required at motor (HP)				17.09	14.18	12.97	11.05	10.05	8.93	8.23	7.44	6.37	5.88	5.45	4.04	1.37	1.09	0.60	
Power required at spindle (HP)				13.19	10.86	9.89	8.36	7.56	6.66	6.10	5.47	4.62	4.22	3.88	2.75	0.62	0.40	0.00	
Max. Depth per Ramp Recommended (inch)				AXIAL ENTRY: PLUNGE, STRAIGHT RAMP ANGLE															
				90°	45°	25°	15°	10°	9°	8°	7°	6°	5°	4°	3°	2°	1°		
Distance at Max Depth per Ramp (inch)				-	-	-	-	-	-	-	6.881	7.905	9.339	11.489	15.071	22.234	43.721		
SFM				-	-	-	-	-	-	198	198	217	230	238	262	277			
RPM				-	-	-	-	-	-	1008	1008	1107	1169	1210	1336	1412			
IPT				-	-	-	-	-	-	0.00142	0.00155	0.00161	0.00207	0.00258	0.00284	0.00310			
IPM				-	-	-	-	-	-	7.17	7.82	10.01	12.08	15.63	18.99	21.89			
Diameter Range (inch)				AXIAL ENTRY: HELICAL RAMP ANGLE															
Minimum				0.975	30°	25°	20°	15°	10°	9°	8°	7°	6°	5°	4°	3°	2°	1°	
Maximum				1.125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Drop Per Rev at Maximum Diameter (inch)				-	-	-	-	-	-	-	0.145	0.124	0.103	0.082	0.062	0.041	0.021		
SFM				-	-	-	-	-	-	-	217	230	238	262	277	297	314		
RPM				-	-	-	-	-	-	-	1107	1169	1210	1336	1412	1513	1599		
IPT				-	-	-	-	-	-	-	0.00181	0.00194	0.00207	0.00233	0.00258	0.00284	0.00310		
IPM				-	-	-	-	-	-	-	10.01	11.33	12.51	15.54	18.24	21.50	24.79		

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SERIES	Z-Carb HPR	PROGRAMMED AP	NO OVERRIDE
PRODUCT EDP	37100	TILT ANGLE	NO OVERRIDE

MATERIAL	STEEL Tool, Mold & Die 28 to 35 HRC D2, H13, P20		
DISPLAY UNITS	FRACTIONAL	SFM OVERRIDE	NO OVERRIDE
COOLANT	FLOOD, MIST, DRY	FEED OVERRIDE	NO OVERRIDE
IDIOD CONTOUR		MAX RPM OVERRIDE	NO OVERRIDE
DIA PRIOR TO CUT		PART OF CS CUTTING	

TOOL SPECIFICATIONS			
CATEGORY	HIGH PERFORMANCE	SHANK TYPE	WELDON FLAT
TOOL UNITS - CATALOG CODE	FRACTIONAL - ZSCR	DC	0.75
CUTTING EDGES	5	RE	0.19
CUTTING EDGE STYLE	CONTINUOUS	APMX	0.875
END CONFIGURATION	CORNER RADIUS	LF	4
HELIX	37°	DCON	0.75
CENTER CUTTING	NO	LU	-
COATING	TI-NAMITE M	DN	-
TAPER ANGLE	-	TIP DIAMETER	-

MILLING DATA FOR SELECTED TOOL						
		Heavy			Moderate	
Radial Percentage (% DC)	100%	75%	50%	40%	33%	25%
Rank: Best ☆ Better ☆ Good ○	☆	☆	☆	☆	☆	☆
Radial Engagement Angle	180%	120%	90%	78%	71%	60%
Ae of Effective Diameter (inch)	0.7500	0.5625	0.3750	0.3000	0.2475	0.1875
Ap Max or Programmed (inch)	0.7500	0.7500	0.9375	0.8750	0.8750	0.8750
SFM	198	217	238	262	277	297
RPM	1008	1107	1210	1338	1412	1513
IPT	0.00258	0.00258	0.00258	0.00265	0.00275	0.00298
IPM	13.03	14.31	15.83	17.70	19.40	22.57
MRR (in3/min), Ae x Max Ap x IPM	7.33	6.04	5.50	4.65	4.20	3.70
Power required at motor (HP)	17.09	14.18	12.97	11.05	10.05	8.93
Power required at spindle (HP)	13.19	10.86	9.89	8.36	7.56	6.66

Max Depth per Ramp Recommended (inch)	0.75	AXIAL ENTRY: FLANGE, STRAIGHT RAMP ANGLE													
		90°	45°	25°	15°	10°	9°	8°	7°	6°	5°	4°	3°	2°	1°
Distance at Max Depth per Ramp (inch)	-	-	-	-	-	-	-	-	6.881	7.905	9.339	11.489	15.07	22.234	43.721
SFM	-	-	-	-	-	-	-	-	198	198	217	230	238	262	277
RPM	-	-	-	-	-	-	-	-	1008	1008	1107	1160	1210	1338	1412
IPT	-	-	-	-	-	-	-	-	0.00142	0.00155	0.00181	0.00207	0.00258	0.00284	0.00310
IPM	-	-	-	-	-	-	-	-	7.17	7.82	10.01	12.08	15.83	18.99	21.89

Diameter Range (inch)	Minimum 0.975 Maximum 1.125	AXIAL ENTRY: HELICAL RAMP ANGLE													
		30°	25°	20°	15°	10°	9°	8°	7°	6°	5°	4°	3°	2°	1°
Drop Per Rev at Maximum Diameter (inch)	-	-	-	-	-	-	-	-	0.145	0.124	0.108	0.082	0.062	0.041	0.021
SFM	-	-	-	-	-	-	-	-	217	230	238	262	277	297	314
RPM	-	-	-	-	-	-	-	-	1107	1160	1210	1338	1412	1513	1599
IPT	-	-	-	-	-	-	-	-	0.00181	0.00194	0.00207	0.00233	0.00258	0.00284	0.00310
IPM	-	-	-	-	-	-	-	-	10.01	11.33	12.51	15.54	18.24	21.50	24.79

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