

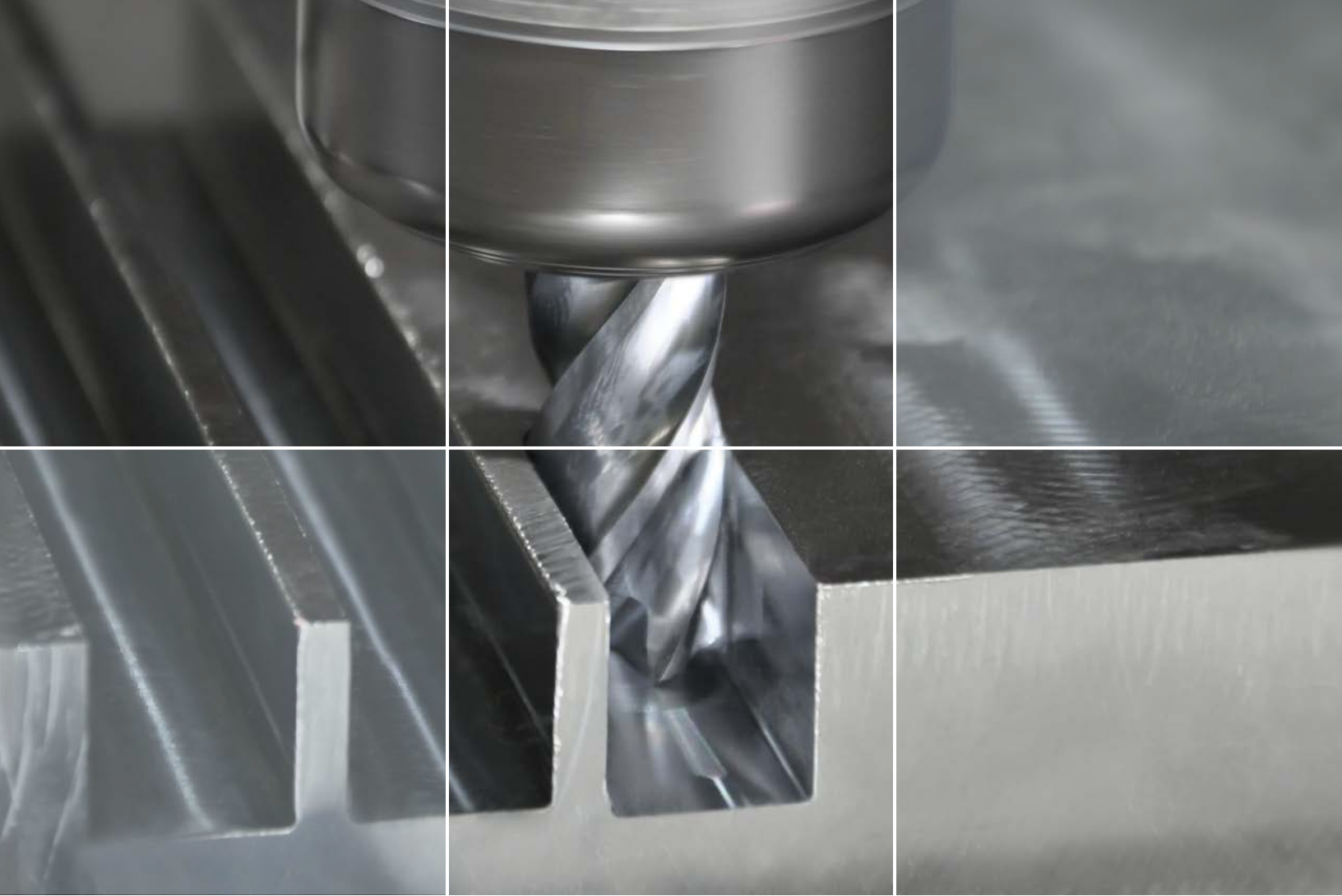
**NIAGARA  
CUTTER™  
STABILIZER™  
2.0**



**DOUBLE YOUR METAL  
REMOVAL RATE**



**Niagara Cutter**  
A SECO TOOLS COMPANY



## DOUBLE YOUR PRODUCTIVITY

The Stabilizer 2.0 family of end mills raises the bar in high performance milling by incorporating a patented continuously varying asymmetrical geometry which helps create a smooth chatter free milling condition. This configuration, along with a specially engineered flute shape, allow for feed rates twice that of the previous Stabilizer.

The ST430.2 series of end mills are specifically designed for machining steels, alloy steels, copper alloys and cast iron. The ST440.2 series of end mills are specifically designed for machining ISO-S materials such as stainless steel, steels over 42 Rc, titanium and Inconel. These end mills also feature an AlTiN coating that offers high heat resistance and superior abrasion resistance to maximize tool life.

# STABILIZER™ 2.0

## PRODUCT OVERVIEW

- Solid carbide high performance tools excel in slot and side milling.
- 2x the feed rate of the previous Stabilizer yields significant productivity gains.
- Longer tool life than previous tool types even when applied double feed rates.
- Continuously varying asymmetrical geometry provides smooth, chatter free cutting.
- Wide application area covered from steel to exotic materials.
- ST430.2 (4-flutes) high performance series, 1, 2 and 3 x diameter flute length, diameters range from 0.125" - 1.00" (3 - 25 mm), cylindrical and weldon shank, sharp, standard aerospace radii 0.010", 0.020", 0.030", 0.060", 0.090", 0.120", 0.250" and ball nose.
- ST440.2 (4-flutes) high performance series, 1, 2 and 3 x diameter flute length, diameters range from 0.125" - 1.00" (3 - 25 mm), cylindrical shanks and weldon for 3/8" shank diameter and larger, standard aerospace radii 0.010", 0.020", 0.030", 0.060", 0.120" and ball nose.

## RANGE OVERVIEW

- 4-flute, patented continuously varying asymmetrical flute geometry with end mill diameters from 1/8"- 1" (3 - 25 mm)
- 1 x D, 2 x D and 3 x D length versions available
- Corner radius and ball nose necked versions with 2 x D flute length and 3 x D of reach

## KEY BENEFITS

- Double your feed rates
- Reduced cycle times with higher MRR
- Minimized harmonics
- High heat and abrasion resistance
- Smooth chatter free cutting
- Long and predictable tool life
- Consistent performance in all applications



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US Patent number 6,991,409



# 6 TIPS

## HIGH PERFORMANCE MACHINING

High performance machining (HPM) with the new Stabilizer 2.0 can be highly effective in many 2D applications including slot milling, pocket milling and side milling. Higher metal removal rates can be achieved by increased feed rates and step overs pushing 50%+ of the cutter diameter compared to conventional machining strategies. Achieving the best possible results requires using these few common practices.

### 1. UNDERSTANDING THE NEED FOR INCREASED CUTTING PRESSURE

Due to the advanced flute geometry of the new Stabilizer 2.0, large step-overs need to be incorporated into the milling strategy in order to stabilize the tool while in cut. As a rule of thumb, a minimum of 20% of the diameter of the tool should be utilized. If the part and/or machine configuration does not allow for this large of a step-over, then the recommended catalog feed rate should be doubled to increase cutting pressure. Failure to “load” the tool may cause premature wear and a loss in productivity.

### 2. USE STRONG, SECURE TOOLHOLDERS & FIXTURING

The heaving cutting pressure of the Stabilizer 2.0 demands secure tool holders and fixturing. Utilizing an anti-pull-out system is the first choice when high performance milling is applied. Side lock holders, milling chucks and shrinkfit holders with anti-pull-out systems will help ensure that the tools are secure and provide optimal run-out of less than 0.0004”. Some high precision collet systems and heavy-duty reinforced hydraulic chucks are a second option. However, the pull-out cannot be forgotten. Rigid fixturing and clamping will help ensure that the work piece stays fastened to the machining table.

### 3. LIMITING FACTORS OF MACHINE TOOLS

Knowing machine tool limitations and horse power consumption rates prior to implementing HPM strategies is crucial for success. These methods consume higher levels of horsepower and torque compared to standard milling strategies, this can push machine tools past their limits causing catastrophic failures. Using greater than a ½” diameter end mill in a CAT40 or similar size taper machine tool while utilizing HPM strategies could be problematic. Knowing your machine’s limit is always the best option.

### 4. NOT ALL STAINLESS STEELS ARE CREATED EQUAL

To ensure optimal success, careful consideration must be taken when machining common pH hardened stainless steels such as 13-8, 15-5 and 17-4. When heat treated to a range of 32-42 Hrc, these materials have a machining characteristic like common tool steel. The ST430.2 is designed for steel machining applications and may be a better option than the ST440.2 which is the first choice tool for stainless steel applications. Utilizing the recommended cutting parameters for the ST440.2 while using the ST430.2, is a safe common practice.

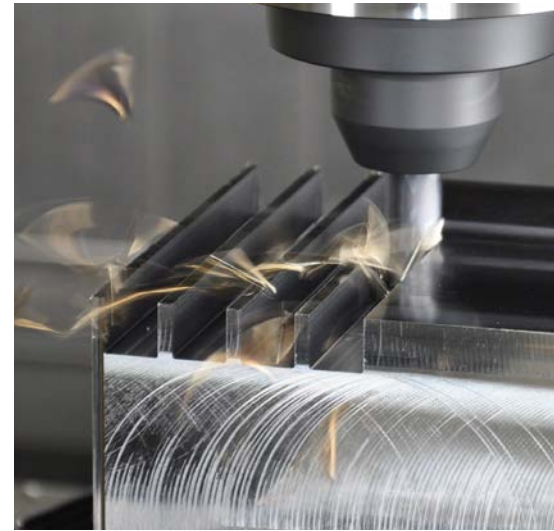
### 5. VERSATILE STABILIZER 2.0

If you wanted to choose one Stabilizer 2.0 series as an all-around tool for machining both steel and stainless steels, the ST440.2 series is the answer. Feed rates in steel are lower than the ST430.2 series due to reduced chip spacing (higher helix angle = less chip spacing). On average, the fpt of the ST440.2 series is 25% of the max feed rate in steel compared to the ST430.2 series.

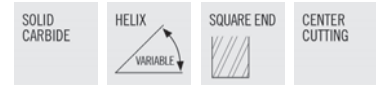
**Example:** fpt in 4140 for a 1.00” OD ST430.2 is 0.005”, fpt for a 1.00” OD ST440.2 will only be 0.00375”

### 6. RECOMMENDED CUTTING PARAMETERS

Through meticulous research and years of first-hand experience, we have developed specific recommended cutting parameters. Cutting data is optimized for each tool’s design, specifications and material groups. These configurations should always be used as a starting point and then modified from there depending on the application.



# SOLID END MILLING - STABILIZER™ 2.0



## STS430.2

PRODUCT NUMBER	DESCRIPTION	DIMENSIONS IN INCH				NO. OF FLUTES	COATING	RADIUS	CYLINDRICAL	WELDON
		FLUTE DIA (DC)	SHANK DIA (DMM)	LOC (APMX)	OVERALL LENGTH (OAL)					



STS430.2										
Inch										
N09696	STS430.2-0.125-D1-S.0-Z4	1/8	1/8	1/8	1 1/2	4	AITIN	-	■	
N09697	STS430.2-0.125-D2-S.0-Z4	1/8	1/8	1/4	1 1/2	4	AITIN	-	■	
N09698	STS430.2-0.125-D3-S.0-Z4	1/8	1/8	3/8	1 1/2	4	AITIN	-	■	
N09699	STS430.2-0.156-F1-S.0-Z4	5/32	3/16	5/32	2	4	AITIN	-	■	
N09702	STS430.2-0.156-F2-S.0-Z4	5/32	3/16	5/16	2	4	AITIN	-	■	
N09703	STS430.2-0.156-F3-S.0-Z4	5/32	3/16	15/32	2	4	AITIN	-	■	
N09704	STS430.2-0.188-D1-S.0-Z4	3/16	3/16	3/16	2	4	AITIN	-	■	
N09705	STS430.2-0.188-D2-S.0-Z4	3/16	3/16	3/8	2	4	AITIN	-	■	
N09706	STS430.2-0.188-D3-S.0-Z4	3/16	3/16	9/16	2	4	AITIN	-	■	
N09707	STS430.2-0.219-F1-S.0-Z4	7/32	1/4	7/32	2	4	AITIN	-	■	
N09708	STS430.2-0.219-F2-S.0-Z4	7/32	1/4	7/16	2 1/2	4	AITIN	-	■	
N09709	STS430.2-0.219-F3-S.0-Z4	7/32	1/4	21/32	2 1/2	4	AITIN	-	■	
N09712	STS430.2-0.250-D1-S.0-Z4	1/4	1/4	1/4	2	4	AITIN	-	■	
N09713	STS430.2-0.250-D2-S.0-Z4	1/4	1/4	1/2	2 1/2	4	AITIN	-	■	
N09714	STS430.2-0.250-D3-S.0-Z4	1/4	1/4	3/4	2 1/2	4	AITIN	-	■	
N09715	STS430.2-0.281-F1-S.0-Z4	9/32	5/16	9/32	2	4	AITIN	-	■	
N09716	STS430.2-0.281-F2-S.0-Z4	9/32	5/16	9/16	2 1/2	4	AITIN	-	■	
N09717	STS430.2-0.281-F3-S.0-Z4	9/32	5/16	27/32	2 1/2	4	AITIN	-	■	
N09718	STS430.2-0.313-D1-S.0-Z4	5/16	5/16	5/16	2	4	AITIN	-	■	
N09719	STS430.2-0.313-D2-S.0-Z4	5/16	5/16	5/8	2 1/2	4	AITIN	-	■	
N09722	STS430.2-0.313-D3-S.0-Z4	5/16	5/16	15/16	2 1/2	4	AITIN	-	■	
N09723	STS430.2-0.375-D1-S.0-Z4	3/8	3/8	3/8	2	4	AITIN	-	■	
N09724	STS430.2-0.375-D1-S.3-Z4	3/8	3/8	3/8	2	4	AITIN	-	■	■
N09725	STS430.2-0.375-D2-S.0-Z4	3/8	3/8	3/4	2 1/2	4	AITIN	-	■	
N09726	STS430.2-0.375-D2-S.3-Z4	3/8	3/8	3/4	2 1/2	4	AITIN	-	■	■
N09727	STS430.2-0.375-D3-S.0-Z4	3/8	3/8	1 1/8	3	4	AITIN	-	■	
N09728	STS430.2-0.375-D3-S.3-Z4	3/8	3/8	1 1/8	3	4	AITIN	-	■	■
N09729	STS430.2-0.438-D1-S.0-Z4	7/16	7/16	7/16	2 3/4	4	AITIN	-	■	
N09732	STS430.2-0.438-D1-S.3-Z4	7/16	7/16	7/16	2 3/4	4	AITIN	-	■	□
N09733	STS430.2-0.438-D2-S.0-Z4	7/16	7/16	7/8	2 3/4	4	AITIN	-	■	
N09734	STS430.2-0.438-D2-S.3-Z4	7/16	7/16	7/8	2 3/4	4	AITIN	-	■	□
N09735	STS430.2-0.438-D3-S.0-Z4	7/16	7/16	1 5/16	4	4	AITIN	-	■	
N09736	STS430.2-0.438-D3-S.3-Z4	7/16	7/16	1 5/16	4	4	AITIN	-	■	□
N09737	STS430.2-0.500-D1-S.0-Z4	1/2	1/2	1/2	2 1/2	4	AITIN	-	■	
N09738	STS430.2-0.500-D1-S.3-Z4	1/2	1/2	1/2	2 1/2	4	AITIN	-	■	■
N09739	STS430.2-0.500-D2-S.0-Z4	1/2	1/2	1	3	4	AITIN	-	■	
N09742	STS430.2-0.500-D2-S.3-Z4	1/2	1/2	1	3	4	AITIN	-	■	■
N09743	STS430.2-0.500-D3-S.0-Z4	1/2	1/2	1 1/4	3	4	AITIN	-	■	
N09744	STS430.2-0.500-D3-S.3-Z4	1/2	1/2	1 1/4	3	4	AITIN	-	■	■
N09745	STS430.2-0.500-D4-S.0-Z4	1/2	1/2	1 1/2	4	4	AITIN	-	■	
N09746	STS430.2-0.500-D4-S.3-Z4	1/2	1/2	1 1/2	4	4	AITIN	-	■	■
N09747	STS430.2-0.625-D1-S.0-Z4	5/8	5/8	5/8	3	4	AITIN	-	■	
N09748	STS430.2-0.625-D1-S.3-Z4	5/8	5/8	5/8	3	4	AITIN	-	■	■
N09749	STS430.2-0.625-D2-S.0-Z4	5/8	5/8	1 1/4	3 1/2	4	AITIN	-	■	
N09752	STS430.2-0.625-D2-S.3-Z4	5/8	5/8	1 1/4	3 1/2	4	AITIN	-	■	■
N09753	STS430.2-0.625-D3-S.0-Z4	5/8	5/8	1 7/8	4	4	AITIN	-	■	
N09754	STS430.2-0.625-D3-S.3-Z4	5/8	5/8	1 7/8	4	4	AITIN	-	■	□
N09755	STS430.2-0.750-D1-S.0-Z4	3/4	3/4	3/4	3	4	AITIN	-	■	
N09756	STS430.2-0.750-D1-S.3-Z4	3/4	3/4	3/4	3	4	AITIN	-	■	■
N09757	STS430.2-0.750-D2-S.0-Z4	3/4	3/4	1 1/2	4	4	AITIN	-	■	
N09758	STS430.2-0.750-D2-S.3-Z4	3/4	3/4	1 1/2	4	4	AITIN	-	■	■
N09759	STS430.2-0.750-D3-S.0-Z4	3/4	3/4	2 1/4	5	4	AITIN	-	■	
N09762	STS430.2-0.750-D3-S.3-Z4	3/4	3/4	2 1/4	5	4	AITIN	-	■	■
N09763	STS430.2-0.875-D1-S.0-Z4	7/8	7/8	7/8	4	4	AITIN	-	■	
N09764	STS430.2-0.875-D1-S.3-Z4	7/8	7/8	7/8	4	4	AITIN	-	■	□
N09765	STS430.2-0.875-D2-S.0-Z4	7/8	7/8	1 3/4	4	4	AITIN	-	■	
N09766	STS430.2-0.875-D2-S.3-Z4	7/8	7/8	1 3/4	4	4	AITIN	-	■	□
N09767	STS430.2-0.875-D3-S.0-Z4	7/8	7/8	2 5/8	5	4	AITIN	-	■	
N09768	STS430.2-0.875-D3-S.3-Z4	7/8	7/8	2 5/8	5	4	AITIN	-	■	□
N09769	STS430.2-1.000-D1-S.0-Z4	1	1	1	4	4	AITIN	-	■	
N09772	STS430.2-1.000-D1-S.3-Z4	1	1	1	4	4	AITIN	-	■	□
N09773	STS430.2-1.000-D2-S.0-Z4	1	1	2	5	4	AITIN	-	■	
N09774	STS430.2-1.000-D2-S.3-Z4	1	1	2	5	4	AITIN	-	■	■
N09775	STS430.2-1.000-D3-S.0-Z4	1	1	3	6	4	AITIN	-	■	
N09776	STS430.2-1.000-D3-S.3-Z4	1	1	3	6	4	AITIN	-	■	□

DISCOUNT CODE D43

□ Quick Response Item. Delivery within 7 days.

# SOLID END MILLING - STABILIZER™ 2.0



## STS430.2 & STR430.2

PRODUCT NUMBER	DESCRIPTION	DIMENSIONS IN INCH/METRIC				NO. OF FLUTES	COATING	RADIUS	CYLINDRICAL	WELDON
		FLUTE DIA (DC)	SHANK DIA (DMM)	LOC (APMX)	OVERALL LENGTH (OAL)					



STS430.2										
Metric										
N09538	STS430M.2-030-F2-S.0-Z4	3	6	6	58	4	AITIN	-	■	
N09539	STS430M.2-030-F3-S.0-Z4	3	6	9	58	4	AITIN	-	■	
N09542	STS430M.2-040-F2-S.0-Z4	4	6	8	58	4	AITIN	-	■	
N09543	STS430M.2-040-F3-S.0-Z4	4	6	12	58	4	AITIN	-	■	
N09544	STS430M.2-050-F2-S.0-Z4	5	6	10	58	4	AITIN	-	■	
N09545	STS430M.2-050-F3-S.0-Z4	5	6	15	58	4	AITIN	-	■	
N09546	STS430M.2-060-D2-S.0-Z4	6	6	12	58	4	AITIN	-	■	
N09547	STS430M.2-060-D3-S.0-Z4	6	6	18	58	4	AITIN	-	■	
N09548	STS430M.2-080-D2-S.0-Z4	8	8	16	64	4	AITIN	-	■	
N09549	STS430M.2-080-D3-S.0-Z4	8	8	24	64	4	AITIN	-	■	
N09552	STS430M.2-100-D2-S.0-Z4	10	10	20	73	4	AITIN	-	■	
N09553	STS430M.2-100-D3-S.0-Z4	10	10	30	73	4	AITIN	-	■	
N09554	STS430M.2-120-D2-S.0-Z4	12	12	24	84	4	AITIN	-	■	
N09555	STS430M.2-120-D3-S.0-Z4	12	12	36	84	4	AITIN	-	■	
N09556	STS430M.2-160-D2-S.0-Z4	16	16	32	93	4	AITIN	-	■	
N09557	STS430M.2-160-D3-S.0-Z4	16	16	48	93	4	AITIN	-	■	
N09558	STS430M.2-200-D2-S.0-Z4	20	20	40	105	4	AITIN	-	■	
N09559	STS430M.2-200-D3-S.0-Z4	20	20	60	125	4	AITIN	-	■	
N09562	STS430M.2-250-D2-S.0-Z4	25	25	50	115	4	AITIN	-	■	
N09563	STS430M.2-250-D3-S.0-Z4	25	25	75	147	4	AITIN	-	■	



STR430.2										
Inch										
N09777	STR430.2-0.125-D1-R010.0-Z4	1/8	1/8	1/8	1 1/2	4	AITIN	0.010	■	
N09778	STR430.2-0.125-D2-R010.0-Z4	1/8	1/8	1/4	1 1/2	4	AITIN	0.010	■	
N09779	STR430.2-0.125-D3-R010.0-Z4	1/8	1/8	3/8	1 1/2	4	AITIN	0.010	■	
N09782	STR430.2-0.156-F1-R010.0-Z4	5/32	3/16	5/32	2	4	AITIN	0.010	■	
N09783	STR430.2-0.156-F2-R010.0-Z4	5/32	3/16	5/16	2	4	AITIN	0.010	■	
N09784	STR430.2-0.156-F3-R010.0-Z4	5/32	3/16	15/32	2	4	AITIN	0.010	■	
N09785	STR430.2-0.188-D1-R010.0-Z4	3/16	3/16	3/16	2	4	AITIN	0.010	■	
N09786	STR430.2-0.188-D2-R010.0-Z4	3/16	3/16	3/8	2	4	AITIN	0.010	■	
N09787	STR430.2-0.188-D3-R010.0-Z4	3/16	3/16	9/16	2	4	AITIN	0.010	■	
N09788	STR430.2-0.219-F1-R020.0-Z4	7/32	1/4	7/32	2	4	AITIN	0.020	■	
N09789	STR430.2-0.219-F2-R020.0-Z4	7/32	1/4	7/16	2 1/2	4	AITIN	0.020	■	
N09792	STR430.2-0.219-F3-R020.0-Z4	7/32	1/4	21/32	2 1/2	4	AITIN	0.020	■	
N09793	STR430.2-0.250-D1-R020.0-Z4	1/4	1/4	1/4	2	4	AITIN	0.020	■	
N09794	STR430.2-0.250-D2-R020.0-Z4	1/4	1/4	1/2	2 1/2	4	AITIN	0.020	■	
N09795	STR430.2-0.250-D3-R020.0-Z4	1/4	1/4	3/4	2 1/2	4	AITIN	0.020	■	
N09796	STR430.2-0.281-F1-R020.0-Z4	9/32	5/16	9/32	2	4	AITIN	0.020	■	
N09797	STR430.2-0.281-F2-R020.0-Z4	9/32	5/16	9/16	2 1/2	4	AITIN	0.020	■	
N09798	STR430.2-0.281-F3-R020.0-Z4	9/32	5/16	27/32	2 1/2	4	AITIN	0.020	■	
N09799	STR430.2-0.313-D1-R020.0-Z4	5/16	5/16	5/16	2	4	AITIN	0.020	■	
N09802	STR430.2-0.313-D2-R020.0-Z4	5/16	5/16	5/8	2 1/2	4	AITIN	0.020	■	
N09803	STR430.2-0.313-D3-R020.0-Z4	5/16	5/16	15/16	2 1/2	4	AITIN	0.020	■	
N09804	STR430.2-0.375-D1-R020.0-Z4	3/8	3/8	3/8	2	4	AITIN	0.020	■	
N09805	STR430.2-0.375-D1-R020.3-Z4	3/8	3/8	3/8	2	4	AITIN	0.020	■	■
N09806	STR430.2-0.375-D2-R020.0-Z4	3/8	3/8	3/4	2 1/2	4	AITIN	0.020	■	
N09807	STR430.2-0.375-D2-R020.3-Z4	3/8	3/8	3/4	2 1/2	4	AITIN	0.020	■	■
N09808	STR430.2-0.375-D3-R020.0-Z4	3/8	3/8	1 1/8	3	4	AITIN	0.020	■	
N09809	STR430.2-0.375-D3-R020.3-Z4	3/8	3/8	1 1/8	3	4	AITIN	0.020	■	■
N09812	STR430.2-0.438-F1-R020.0-Z4	7/16	7/16	7/16	2 3/4	4	AITIN	0.020	■	
N09813	STR430.2-0.438-F1-R020.3-Z4	7/16	7/16	7/16	2 3/4	4	AITIN	0.020	■	□
N09814	STR430.2-0.438-F2-R020.0-Z4	7/16	7/16	7/8	2 3/4	4	AITIN	0.020	■	
N09815	STR430.2-0.438-F2-R020.3-Z4	7/16	7/16	7/8	2 3/4	4	AITIN	0.020	■	□
N09816	STR430.2-0.438-F3-R020.0-Z4	7/16	7/16	1 5/16	4	4	AITIN	0.020	■	
N09817	STR430.2-0.438-F3-R020.3-Z4	7/16	7/16	1 5/16	4	4	AITIN	0.020	■	□
N09818	STR430.2-0.500-D1-R030.0-Z4	1/2	1/2	1/2	2 1/2	4	AITIN	0.030	■	
N09819	STR430.2-0.500-D1-R030.3-Z4	1/2	1/2	1/2	2 1/2	4	AITIN	0.030	■	■
N09844	STR430.2-0.500-D2-R030.0-Z4	1/2	1/2	1	3	4	AITIN	0.030	■	
N09845	STR430.2-0.500-D2-R030.3-Z4	1/2	1/2	1	3	4	AITIN	0.030	■	■
03212567	STR430.2-0.500-D2-R060.0-Z4	1/2	1/2	1	3	4	AITIN	0.060	■	
03212568	STR430.2-0.500-D2-R060.3-Z4	1/2	1/2	1	3	4	AITIN	0.060	■	■

DISCOUNT CODE D43

□ Quick Response Item. Delivery within 7 days.

## STR430.2 (CONT)

PRODUCT NUMBER	DESCRIPTION	DIMENSIONS IN INCH				NO. OF FLUTES	COATING	RADIUS	CYLINDRICAL	WELDON
		FLUTE DIA (DC)	SHANK DIA (DMM)	LOC (APMX)	OVERALL LENGTH (OAL)					
<b>STR430.2 (CONT)</b>										
<b>Inch</b>										
03212569	STR430.2-0.500-D2-R120.0-Z4	1/2	1/2	1	3	4	AlTiN	0.120	■	
03212570	STR430.2-0.500-D2-R120.3-Z4	1/2	1/2	1	3	4	AlTiN	0.120		■
N09846	STR430.2-0.500-D3-R030.0-Z4	1/2	1/2	1 1/4	3	4	AlTiN	0.030	■	
N09847	STR430.2-0.500-D3-R030.3-Z4	1/2	1/2	1 1/4	3	4	AlTiN	0.030		■
03212571	STR430.2-0.500-D3-R060.0-Z4	1/2	1/2	1 1/4	4	4	AlTiN	0.060	■	
03212572	STR430.2-0.500-D3-R060.3-Z4	1/2	1/2	1 1/4	4	4	AlTiN	0.060		■
03212573	STR430.2-0.500-D3-R120.0-Z4	1/2	1/2	1 1/4	4	4	AlTiN	0.120	■	
03212574	STR430.2-0.500-D3-R120.3-Z4	1/2	1/2	1 1/4	4	4	AlTiN	0.120		■
N09848	STR430.2-0.500-D4-R030.0-Z4	1/2	1/2	1 1/2	4	4	AlTiN	0.030	■	
N09849	STR430.2-0.500-D4-R030.3-Z4	1/2	1/2	1 1/2	4	4	AlTiN	0.030		■
03212575	STR430.2-0.500-D4-R060.0-Z4	1/2	1/2	1 1/4	4	4	AlTiN	0.060	■	
03212576	STR430.2-0.500-D4-R060.3-Z4	1/2	1/2	1 1/4	4	4	AlTiN	0.060		■
03212577	STR430.2-0.500-D4-R120.0-Z4	1/2	1/2	1 1/4	4	4	AlTiN	0.120	■	
03212578	STR430.2-0.500-D4-R120.3-Z4	1/2	1/2	1 1/4	4	4	AlTiN	0.120		■
N09852	STR430.2-0.625-D1-R030.0-Z4	5/8	5/8	5/8	3	4	AlTiN	0.030	■	
N09853	STR430.2-0.625-D1-R030.3-Z4	5/8	5/8	5/8	3	4	AlTiN	0.030		□
N09854	STR430.2-0.625-D2-R030.0-Z4	5/8	5/8	1 1/4	3 1/2	4	AlTiN	0.030	■	
N09855	STR430.2-0.625-D2-R030.3-Z4	5/8	5/8	1 1/4	3 1/2	4	AlTiN	0.030		■
03212579	STR430.2-0.625-D2-R060.0-Z4	5/8	5/8	1 1/4	3 1/2	4	AlTiN	0.060	■	
03212580	STR430.2-0.625-D2-R060.3-Z4	5/8	5/8	1 1/4	3 1/2	4	AlTiN	0.060		■
03212581	STR430.2-0.625-D2-R090.0-Z4	5/8	5/8	1 1/4	3 1/2	4	AlTiN	0.090	■	
03212582	STR430.2-0.625-D2-R090.3-Z4	5/8	5/8	1 1/4	3 1/2	4	AlTiN	0.090		■
03212583	STR430.2-0.625-D2-R120.0-Z4	5/8	5/8	1 1/4	3 1/2	4	AlTiN	0.120	■	
03212584	STR430.2-0.625-D2-R120.3-Z4	5/8	5/8	1 1/4	3 1/2	4	AlTiN	0.120		■
N09856	STR430.2-0.625-D3-R030.0-Z4	5/8	5/8	1 7/8	4	4	AlTiN	0.030	■	
N09857	STR430.2-0.625-D3-R030.3-Z4	5/8	5/8	1 7/8	4	4	AlTiN	0.030		□
03212585	STR430.2-0.625-D3-R060.0-Z4	5/8	5/8	1 7/8	4	4	AlTiN	0.060	■	
03212586	STR430.2-0.625-D3-R060.3-Z4	5/8	5/8	1 7/8	4	4	AlTiN	0.060		□
03212587	STR430.2-0.625-D3-R090.0-Z4	5/8	5/8	1 7/8	4	4	AlTiN	0.090	■	
03212588	STR430.2-0.625-D3-R090.3-Z4	5/8	5/8	1 7/8	4	4	AlTiN	0.090		□
03212589	STR430.2-0.625-D3-R120.0-Z4	5/8	5/8	1 7/8	4	4	AlTiN	0.120	■	
03212590	STR430.2-0.625-D3-R120.3-Z4	5/8	5/8	1 7/8	4	4	AlTiN	0.120		□
N09858	STR430.2-0.750-D1-R030.0-Z4	3/4	3/4	3/4	3	4	AlTiN	0.030	■	
N09859	STR430.2-0.750-D1-R030.3-Z4	3/4	3/4	3/4	3	4	AlTiN	0.030		■
N09862	STR430.2-0.750-D2-R030.0-Z4	3/4	3/4	1 1/2	4	4	AlTiN	0.030	■	
N09863	STR430.2-0.750-D2-R030.3-Z4	3/4	3/4	1 1/2	4	4	AlTiN	0.030		■
03212591	STR430.2-0.750-D2-R060.0-Z4	3/4	3/4	1 1/2	4	4	AlTiN	0.060	■	
03212592	STR430.2-0.750-D2-R060.3-Z4	3/4	3/4	1 1/2	4	4	AlTiN	0.060		■
03212593	STR430.2-0.750-D2-R090.0-Z4	3/4	3/4	1 1/2	4	4	AlTiN	0.090	■	
03212594	STR430.2-0.750-D2-R090.3-Z4	3/4	3/4	1 1/2	4	4	AlTiN	0.090		■
03212595	STR430.2-0.750-D2-R120.0-Z4	3/4	3/4	1 1/2	4	4	AlTiN	0.120	■	
03212596	STR430.2-0.750-D2-R120.3-Z4	3/4	3/4	1 1/2	4	4	AlTiN	0.120		■
03212597	STR430.2-0.750-D2-R250.0-Z4	3/4	3/4	1 1/2	4	4	AlTiN	0.250	■	
03212598	STR430.2-0.750-D2-R250.3-Z4	3/4	3/4	1 1/2	4	4	AlTiN	0.250		■
N09864	STR430.2-0.750-D3-R030.0-Z4	3/4	3/4	2 1/4	5	4	AlTiN	0.030	■	
N09865	STR430.2-0.750-D3-R030.3-Z4	3/4	3/4	2 1/4	5	4	AlTiN	0.030		■
03212599	STR430.2-0.750-D3-R060.0-Z4	3/4	3/4	2 1/4	5	4	AlTiN	0.060	■	
03212600	STR430.2-0.750-D3-R060.3-Z4	3/4	3/4	2 1/4	5	4	AlTiN	0.060		■
03212601	STR430.2-0.750-D3-R090.0-Z4	3/4	3/4	2 1/4	5	4	AlTiN	0.090	■	
03212602	STR430.2-0.750-D3-R090.3-Z4	3/4	3/4	2 1/4	5	4	AlTiN	0.090		■
03212603	STR430.2-0.750-D3-R120.0-Z4	3/4	3/4	2 1/4	5	4	AlTiN	0.120	■	
03212604	STR430.2-0.750-D3-R120.3-Z4	3/4	3/4	2 1/4	5	4	AlTiN	0.120		■
03212606	STR430.2-0.750-D3-R250.0-Z4	3/4	3/4	2 1/4	5	4	AlTiN	0.250	■	
03212607	STR430.2-0.750-D3-R250.3-Z4	3/4	3/4	2 1/4	5	4	AlTiN	0.250		■
N09866	STR430.2-0.875-D1-R030.0-Z4	7/8	7/8	7/8	4	4	AlTiN	0.030	■	
N09867	STR430.2-0.875-D1-R030.3-Z4	7/8	7/8	7/8	4	4	AlTiN	0.030		□
N09868	STR430.2-0.875-D2-R030.0-Z4	7/8	7/8	1 3/4	4	4	AlTiN	0.030	■	
N09869	STR430.2-0.875-D2-R030.3-Z4	7/8	7/8	1 3/4	4	4	AlTiN	0.030		□
N09872	STR430.2-0.875-D3-R030.0-Z4	7/8	7/8	2 5/8	5	4	AlTiN	0.030	■	
N09873	STR430.2-0.875-D3-R030.3-Z4	7/8	7/8	2 5/8	5	4	AlTiN	0.030		□
N09874	STR430.2-1.000-D1-R030.0-Z4	1	1	1	4	4	AlTiN	0.030	■	
N09875	STR430.2-1.000-D1-R030.3-Z4	1	1	1	4	4	AlTiN	0.030		□
N09876	STR430.2-1.000-D2-R030.0-Z4	1	1	2	5	4	AlTiN	0.030	■	
N09877	STR430.2-1.000-D2-R030.3-Z4	1	1	2	5	4	AlTiN	0.030		■
N09878	STR430.2-1.000-D3-R030.0-Z4	1	1	3	6	4	AlTiN	0.030	■	
N09879	STR430.2-1.000-D3-R030.3-Z4	1	1	3	6	4	AlTiN	0.030		□

DISCOUNT CODE D43

□ Quick Response Item. Delivery within 7 days.

## STR430.2 (CONT) & STRN430.2 (NECKED)

PRODUCT NUMBER	DESCRIPTION	DIMENSIONS IN INCH/METRIC						NO. OF FLUTES	COATING	RADIUS	CYLINDRICAL	WELDON
		FLUTE DIA (DC)	SHANK DIA (DMM)	LOC (APMX)	OVERALL LENGTH (OAL)	NECK DIA (DN)	REACH (LN)					
<b>STR430.2 (CONT)</b>												
<b>Metric</b>												
<a href="#">N09564</a>	STR430M.2-030-F2-R250.0-Z4	3	6	6	58	-	-	4	AITiN	0.250	■	
<a href="#">N09565</a>	STR430M.2-030-F3-R250.0-Z4	3	6	9	58	-	-	4	AITiN	0.250	■	
<a href="#">N09566</a>	STR430M.2-040-F2-R250.0-Z4	4	6	8	58	-	-	4	AITiN	0.250	■	
<a href="#">N09567</a>	STR430M.2-040-F3-R250.0-Z4	4	6	12	58	-	-	4	AITiN	0.250	■	
<a href="#">N09568</a>	STR430M.2-050-F2-R250.0-Z4	5	6	10	58	-	-	4	AITiN	0.250	■	
<a href="#">N09569</a>	STR430M.2-050-F3-R250.0-Z4	5	6	15	58	-	-	4	AITiN	0.250	■	
<a href="#">N09582</a>	STR430M.2-060-D2-R500.0-Z4	6	6	12	58	-	-	4	AITiN	0.500	■	
<a href="#">N09583</a>	STR430M.2-060-D3-R500.0-Z4	6	6	18	58	-	-	4	AITiN	0.500	■	
<a href="#">N09584</a>	STR430M.2-080-D2-R500.0-Z4	8	8	16	64	-	-	4	AITiN	0.500	■	
<a href="#">N09585</a>	STR430M.2-080-D3-R500.0-Z4	8	8	24	64	-	-	4	AITiN	0.500	■	
<a href="#">N09586</a>	STR430M.2-100-D2-R500.0-Z4	10	10	20	73	-	-	4	AITiN	0.500	■	
<a href="#">N09587</a>	STR430M.2-100-D3-R500.0-Z4	10	10	30	73	-	-	4	AITiN	0.500	■	
<a href="#">N09588</a>	STR430M.2-120-D2-R750.0-Z4	12	12	24	84	-	-	4	AITiN	0.750	■	
<a href="#">N09589</a>	STR430M.2-120-D3-R750.0-Z4	12	12	36	84	-	-	4	AITiN	0.750	■	
<a href="#">N09602</a>	STR430M.2-160-D2-R750.0-Z4	16	16	32	93	-	-	4	AITiN	0.750	■	
<a href="#">N09603</a>	STR430M.2-160-D3-R750.0-Z4	16	16	48	93	-	-	4	AITiN	0.750	■	
<a href="#">N09604</a>	STR430M.2-200-D2-R750.0-Z4	20	20	40	105	-	-	4	AITiN	0.750	■	
<a href="#">N09605</a>	STR430M.2-200-D3-R750.0-Z4	20	20	60	125	-	-	4	AITiN	0.750	■	
<a href="#">N09606</a>	STR430M.2-250-D2-R750.0-Z4	25	25	50	115	-	-	4	AITiN	0.750	■	
<a href="#">N09607</a>	STR430M.2-250-D3-R750.0-Z4	25	25	75	147	-	-	4	AITiN	0.750	■	



## STRN430.2 (NECKED)

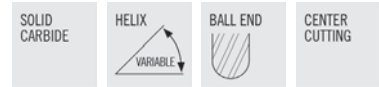
<b>Inch</b>												
<a href="#">N09447</a>	STRN430.2-0.250-E2-R020.0-Z4	1/4	1/4	1/2	2 1/2	0.240	0.750	4	AITiN	0.020	■	
<a href="#">N09448</a>	STRN430.2-0.313-E2-R020.0-Z4	5/16	5/16	5/8	3	0.300	0.938	4	AITiN	0.020	■	
<a href="#">N09449</a>	STRN430.2-0.375-E2-R020.0-Z4	3/8	3/8	3/4	3	0.360	1.125	4	AITiN	0.020	■	
<a href="#">N09456</a>	STRN430.2-0.375-E2-R020.3-Z4	3/8	3/8	3/4	3	0.360	1.125	4	AITiN	0.020		□
<a href="#">N09457</a>	STRN430.2-0.438-E2-R020.0-Z4	7/16	7/16	7/8	4	0.420	1.313	4	AITiN	0.020	■	
<a href="#">N09462</a>	STRN430.2-0.438-E2-R020.3-Z4	7/16	7/16	7/8	4	0.420	1.313	4	AITiN	0.020		□
<a href="#">N09463</a>	STRN430.2-0.500-E2-R030.0-Z4	1/2	1/2	1	3	0.480	1.500	4	AITiN	0.030	■	
<a href="#">N09464</a>	STRN430.2-0.500-E2-R030.3-Z4	1/2	1/2	1	3	0.480	1.500	4	AITiN	0.030		■
<a href="#">N09465</a>	STRN430.2-0.625-E2-R030.0-Z4	5/8	5/8	1 1/4	3 1/2	0.600	1.875	4	AITiN	0.030	■	
<a href="#">N09466</a>	STRN430.2-0.625-E2-R030.3-Z4	5/8	5/8	1 1/4	3 1/2	0.600	1.875	4	AITiN	0.030		□
<a href="#">N09467</a>	STRN430.2-0.750-E2-R030.0-Z4	3/4	3/4	1 1/2	4	0.720	2.250	4	AITiN	0.030	■	
<a href="#">N09468</a>	STRN430.2-0.750-E2-R030.3-Z4	3/4	3/4	1 1/2	4	0.720	2.250	4	AITiN	0.030		■
<a href="#">N09469</a>	STRN430.2-1.000-E2-R030.0-Z4	1	1	2	5	0.960	3.000	4	AITiN	0.030	■	
<a href="#">N09472</a>	STRN430.2-1.000-E2-R030.3-Z4	1	1	2	5	0.960	3.000	4	AITiN	0.030		□

## DISCOUNT CODE D43

□ Quick Response Item. Delivery within 7 days.



# SOLID END MILLING - STABILIZER™ 2.0



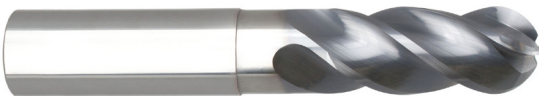
## STB430.2 & STBN430.2 (NECKED)

PRODUCT NUMBER	DESCRIPTION	DIMENSIONS IN INCH/METRIC						NO. OF FLUTES	COATING	CYLINDRICAL	WELDON
		FLUTE DIA (DC)	SHANK DIA (DMM)	LOC (APMX)	OVERALL LENGTH (OAL)	NECK DIA (DN)	REACH (LN)				



### STB430.2

Inch											
N09369	STB430.2-0.125-D2-B.0-Z4	1/8	1/8	1/4	1 1/2	-	-	4	AITIN	■	
N09373	STB430.2-0.188-D2-B.0-Z4	3/16	3/16	3/8	2	-	-	4	AITIN	■	
N09383	STB430.2-0.250-D2-B.0-Z4	1/4	1/4	1/2	2 1/2	-	-	4	AITIN	■	
N09386	STB430.2-0.313-D2-B.0-Z4	5/16	5/16	5/8	2 1/2	-	-	4	AITIN	■	
N09387	STB430.2-0.375-D2-B.0-Z4	3/8	3/8	3/4	2 1/2	-	-	4	AITIN	■	
N09389	STB430.2-0.375-D2-B.3-Z4	3/8	3/8	3/4	2 1/2	-	-	4	AITIN	■	■
N09393	STB430.2-0.438-D2-B.0-Z4	7/16	7/16	7/8	2 3/4	-	-	4	AITIN	■	
N09396	STB430.2-0.438-D2-B.3-Z4	7/16	7/16	7/8	2 3/4	-	-	4	AITIN	■	□
N09397	STB430.2-0.500-D2-B.0-Z4	1/2	1/2	1	3	-	-	4	AITIN	■	
N09398	STB430.2-0.500-D2-B.3-Z4	1/2	1/2	1	3	-	-	4	AITIN	■	■
N09399	STB430.2-0.625-D2-B.0-Z4	5/8	5/8	1 1/4	3 1/2	-	-	4	AITIN	■	
N09402	STB430.2-0.625-D2-B.3-Z4	5/8	5/8	1 1/4	3 1/2	-	-	4	AITIN	■	□
N09403	STB430.2-0.750-D2-B.0-Z4	3/4	3/4	1 1/2	4	-	-	4	AITIN	■	
N09404	STB430.2-0.750-D2-B.3-Z4	3/4	3/4	1 1/2	4	-	-	4	AITIN	■	■
N09405	STB430.2-1.000-D2-B.0-Z4	1	1	2	5	-	-	4	AITIN	■	
N09406	STB430.2-1.000-D2-B.3-Z4	1	1	2	5	-	-	4	AITIN	■	□
Metric											
N09608	STB430M.2-030-F2-B.0-Z4	3	6	6	58	-	-	4	AITIN	■	
N09609	STB430M.2-030-F3-B.0-Z4	3	6	9	58	-	-	4	AITIN	■	
N09612	STB430M.2-040-F2-B.0-Z4	4	6	8	58	-	-	4	AITIN	■	
N09613	STB430M.2-040-F3-B.0-Z4	4	6	12	58	-	-	4	AITIN	■	
N09614	STB430M.2-050-F2-B.0-Z4	5	6	10	58	-	-	4	AITIN	■	
N09615	STB430M.2-050-F3-B.0-Z4	5	6	15	58	-	-	4	AITIN	■	
N09616	STB430M.2-060-D2-B.0-Z4	6	6	12	58	-	-	4	AITIN	■	
N09617	STB430M.2-060-D3-B.0-Z4	6	6	18	58	-	-	4	AITIN	■	
N09618	STB430M.2-080-D2-B.0-Z4	8	8	16	64	-	-	4	AITIN	■	
N09622	STB430M.2-080-D3-B.0-Z4	8	8	24	64	-	-	4	AITIN	■	
N09623	STB430M.2-100-D2-B.0-Z4	10	10	20	73	-	-	4	AITIN	■	
N09624	STB430M.2-100-D3-B.0-Z4	10	10	30	73	-	-	4	AITIN	■	
N09626	STB430M.2-120-D2-B.0-Z4	12	12	24	84	-	-	4	AITIN	■	
N09627	STB430M.2-120-D3-B.0-Z4	12	12	36	84	-	-	4	AITIN	■	
N09628	STB430M.2-160-D2-B.0-Z4	16	16	32	93	-	-	4	AITIN	■	
N09631	STB430M.2-160-D3-B.0-Z4	16	16	48	93	-	-	4	AITIN	■	
N09632	STB430M.2-200-D2-B.0-Z4	20	20	40	105	-	-	4	AITIN	■	
N09633	STB430M.2-200-D3-B.0-Z4	20	20	60	125	-	-	4	AITIN	■	
N09634	STB430M.2-250-D2-B.0-Z4	25	25	50	115	-	-	4	AITIN	■	
N09635	STB430M.2-250-D3-B.0-Z4	25	25	75	147	-	-	4	AITIN	■	



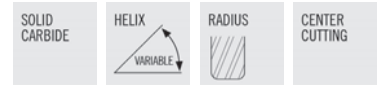
### STBN430.2 (NECKED)

Inch											
N09473	STBN430.2-0.250-E2-B.0-Z4	1/4	1/4	1/2	2 1/2	0.240	0.750	4	AITIN	■	
N09474	STBN430.2-0.313-E2-B.0-Z4	5/16	5/16	5/8	3	0.300	0.938	4	AITIN	■	
N09475	STBN430.2-0.375-E2-B.0-Z4	3/8	3/8	3/4	3	0.360	1.125	4	AITIN	■	
N09476	STBN430.2-0.375-E2-B.3-Z4	3/8	3/8	3/4	3	0.360	1.125	4	AITIN	■	□
N09477	STBN430.2-0.438-E2-B.0-Z4	7/16	7/16	7/8	4	0.420	1.313	4	AITIN	■	
N09478	STBN430.2-0.438-E2-B.3-Z4	7/16	7/16	7/8	4	0.420	1.313	4	AITIN	■	□
N09479	STBN430.2-0.500-E2-B.0-Z4	1/2	1/2	1	3	0.480	1.500	4	AITIN	■	
N09493	STBN430.2-0.500-E2-B.3-Z4	1/2	1/2	1	3	0.480	1.500	4	AITIN	■	■
N09494	STBN430.2-0.625-E2-B.0-Z4	5/8	5/8	1 1/4	3 1/2	0.600	1.875	4	AITIN	■	
N09495	STBN430.2-0.625-E2-B.3-Z4	5/8	5/8	1 1/4	3 1/2	0.600	1.875	4	AITIN	■	□
N09496	STBN430.2-0.750-E2-B.0-Z4	3/4	3/4	1 1/2	4	0.720	2.250	4	AITIN	■	
N09497	STBN430.2-0.750-E2-B.3-Z4	3/4	3/4	1 1/2	4	0.720	2.250	4	AITIN	■	□
N09499	STBN430.2-1.000-E2-B.0-Z4	1	1	2	5	0.960	3.000	4	AITIN	■	
N09502	STBN430.2-1.000-E2-B.3-Z4	1	1	2	5	0.960	3.000	4	AITIN	■	□

DISCOUNT CODE D43

□ Quick Response Item. Delivery within 7 days.

# SOLID END MILLING - STABILIZER™ 2.0



## STR440.2

PRODUCT NUMBER	DESCRIPTION	DIMENSIONS IN INCH/METRIC				NO. OF FLUTES	COATING	RADIUS	CYLINDRICAL	WELDON
		FLUTE DIA (DC)	SHANK DIA (DMM)	LOC (APMX)	OVERALL LENGTH (OAL)					
<b>STR440.2</b>										
Inch										
N09882	STR440.2-0.125-D1-R010.0-Z4	1/8	1/8	1/8	1 1/2	4	AlTiN	0.010	■	
N09883	STR440.2-0.125-D2-R010.0-Z4	1/8	1/8	1/4	1 1/2	4	AlTiN	0.010	■	
N09884	STR440.2-0.125-D3-R010.0-Z4	1/8	1/8	3/8	1 1/2	4	AlTiN	0.010	■	
N09885	STR440.2-0.156-D1-R010.0-Z4	5/32	3/16	5/32	2	4	AlTiN	0.010	■	
N09886	STR440.2-0.156-F2-R010.0-Z4	5/32	3/16	5/16	2	4	AlTiN	0.010	■	
N09887	STR440.2-0.156-F3-R010.0-Z4	5/32	3/16	15/32	2	4	AlTiN	0.010	■	
N09888	STR440.2-0.188-D1-R010.0-Z4	3/16	3/16	3/16	2	4	AlTiN	0.010	■	
N09889	STR440.2-0.188-D2-R010.0-Z4	3/16	3/16	3/8	2	4	AlTiN	0.010	■	
N09892	STR440.2-0.188-D3-R010.0-Z4	3/16	3/16	9/16	2	4	AlTiN	0.010	■	
N09893	STR440.2-0.219-F1-R020.0-Z4	7/32	1/4	7/32	2	4	AlTiN	0.020	■	
N09894	STR440.2-0.219-F2-R020.0-Z4	7/32	1/4	7/16	2 1/2	4	AlTiN	0.020	■	
N09895	STR440.2-0.219-F3-R020.0-Z4	7/32	1/4	21/32	2 1/2	4	AlTiN	0.020	■	
N09896	STR440.2-0.250-D1-R020.0-Z4	1/4	1/4	1/4	2	4	AlTiN	0.020	■	
N09897	STR440.2-0.250-D2-R020.0-Z4	1/4	1/4	1/2	2 1/2	4	AlTiN	0.020	■	
N09898	STR440.2-0.250-D3-R020.0-Z4	1/4	1/4	3/4	2 1/2	4	AlTiN	0.020	■	
N09899	STR440.2-0.281-F1-R020.0-Z4	9/32	5/16	9/32	2	4	AlTiN	0.020	■	
N09902	STR440.2-0.281-F3-R020.0-Z4	9/32	5/16	9/16	2 1/2	4	AlTiN	0.020	■	
N09903	STR440.2-0.281-F4-R020.0-Z4	9/32	5/16	27/32	2 1/2	4	AlTiN	0.020	■	
N09904	STR440.2-0.313-D1-R020.0-Z4	5/16	5/16	5/16	2	4	AlTiN	0.020	■	
N09905	STR440.2-0.313-D2-R020.0-Z4	5/16	5/16	5/8	2 1/2	4	AlTiN	0.020	■	
N09906	STR440.2-0.313-D3-R020.0-Z4	5/16	5/16	15/16	2 1/2	4	AlTiN	0.020	■	
N09907	STR440.2-0.375-D1-R020.0-Z4	3/8	3/8	3/8	2	4	AlTiN	0.020	■	
N09908	STR440.2-0.375-D1-R020.3-Z4	3/8	3/8	3/8	2	4	AlTiN	0.020	■	■
N09909	STR440.2-0.375-D2-R020.0-Z4	3/8	3/8	3/4	2 1/2	4	AlTiN	0.020	■	
N09912	STR440.2-0.375-D2-R020.3-Z4	3/8	3/8	3/4	2 1/2	4	AlTiN	0.020	■	■
N09913	STR440.2-0.375-D3-R020.0-Z4	3/8	3/8	1 1/8	3	4	AlTiN	0.020	■	
N09914	STR440.2-0.375-D3-R020.3-Z4	3/8	3/8	1 1/8	3	4	AlTiN	0.020	■	■
N09915	STR440.2-0.438-D1-R020.0-Z4	7/16	7/16	7/16	2 3/4	4	AlTiN	0.020	■	
N09916	STR440.2-0.438-D1-R020.3-Z4	7/16	7/16	7/16	2 3/4	4	AlTiN	0.020	■	□
N09917	STR440.2-0.438-D2-R020.0-Z4	7/16	7/16	7/8	2 3/4	4	AlTiN	0.020	■	
N09919	STR440.2-0.438-D2-R020.3-Z4	7/16	7/16	7/8	2 3/4	4	AlTiN	0.020	■	□
N09934	STR440.2-0.438-D3-R020.0-Z4	7/16	7/16	1 5/16	4	4	AlTiN	0.020	■	
N09935	STR440.2-0.438-D3-R020.3-Z4	7/16	7/16	1 5/16	4	4	AlTiN	0.020	■	■
N09939	STR440.2-0.500-D1-R030.0-Z4	1/2	1/2	1/2	2 1/2	4	AlTiN	0.030	■	
N09942	STR440.2-0.500-D1-R030.3-Z4	1/2	1/2	1/2	2 1/2	4	AlTiN	0.030	■	■
N09943	STR440.2-0.500-D1-R060.0-Z4	1/2	1/2	1/2	2 1/2	4	AlTiN	0.060	■	
N09944	STR440.2-0.500-D1-R060.3-Z4	1/2	1/2	1/2	2 1/2	4	AlTiN	0.060	■	■
N09945	STR440.2-0.500-D1-R120.0-Z4	1/2	1/2	1/2	2 1/2	4	AlTiN	0.120	■	
N09946	STR440.2-0.500-D1-R120.3-Z4	1/2	1/2	1/2	2 1/2	4	AlTiN	0.120	■	■
N09947	STR440.2-0.500-D2-R030.0-Z4	1/2	1/2	1	3	4	AlTiN	0.030	■	
N09948	STR440.2-0.500-D2-R030.3-Z4	1/2	1/2	1	3	4	AlTiN	0.030	■	■
N09949	STR440.2-0.500-D3-R030.0-Z4	1/2	1/2	1 1/4	3	4	AlTiN	0.030	■	
N09952	STR440.2-0.500-D3-R030.3-Z4	1/2	1/2	1 1/4	3	4	AlTiN	0.030	■	■
N09953	STR440.2-0.500-D2-R060.0-Z4	1/2	1/2	1	3	4	AlTiN	0.060	■	
N09954	STR440.2-0.500-D2-R060.3-Z4	1/2	1/2	1	3	4	AlTiN	0.060	■	■
N09955	STR440.2-0.500-D2-R120.0-Z4	1/2	1/2	1	3	4	AlTiN	0.120	■	
N09956	STR440.2-0.500-D2-R120.3-Z4	1/2	1/2	1	3	4	AlTiN	0.120	■	■
N09957	STR440.2-0.500-D4-R030.0-Z4	1/2	1/2	1 1/2	4	4	AlTiN	0.030	■	
N09958	STR440.2-0.500-D4-R030.3-Z4	1/2	1/2	1 1/2	4	4	AlTiN	0.030	■	■
N09959	STR440.2-0.500-D3-R060.0-Z4	1/2	1/2	1 1/2	4	4	AlTiN	0.060	■	
N09962	STR440.2-0.500-D3-R060.3-Z4	1/2	1/2	1 1/2	4	4	AlTiN	0.060	■	■
N09963	STR440.2-0.500-D3-R120.0-Z4	1/2	1/2	1 1/2	4	4	AlTiN	0.120	■	
N09964	STR440.2-0.500-D3-R120.3-Z4	1/2	1/2	1 1/2	4	4	AlTiN	0.120	■	■
N09965	STR440.2-0.625-D1-R030.0-Z4	5/8	5/8	5/8	3	4	AlTiN	0.030	■	
N09966	STR440.2-0.625-D1-R030.3-Z4	5/8	5/8	5/8	3	4	AlTiN	0.030	■	□
N09967	STR440.2-0.625-D1-R060.0-Z4	5/8	5/8	5/8	3	4	AlTiN	0.060	■	
N09968	STR440.2-0.625-D1-R060.3-Z4	5/8	5/8	5/8	3	4	AlTiN	0.060	■	□
N09969	STR440.2-0.625-D1-R120.0-Z4	5/8	5/8	5/8	3	4	AlTiN	0.120	■	
N09972	STR440.2-0.625-D1-R120.3-Z4	5/8	5/8	5/8	3	4	AlTiN	0.120	■	□
N09973	STR440.2-0.625-D2-R030.0-Z4	5/8	5/8	1 1/4	3 1/2	4	AlTiN	0.030	■	
N09974	STR440.2-0.625-D2-R030.3-Z4	5/8	5/8	1 1/4	3 1/2	4	AlTiN	0.030	■	■
N09975	STR440.2-0.625-D2-R060.0-Z4	5/8	5/8	1 1/4	3 1/2	4	AlTiN	0.060	■	
N09976	STR440.2-0.625-D2-R060.3-Z4	5/8	5/8	1 1/4	3 1/2	4	AlTiN	0.060	■	□
N09977	STR440.2-0.625-D2-R120.0-Z4	5/8	5/8	1 1/4	3 1/2	4	AlTiN	0.120	■	
N09978	STR440.2-0.625-D2-R120.3-Z4	5/8	5/8	1 1/4	3 1/2	4	AlTiN	0.120	■	□
N09979	STR440.2-0.625-D3-R030.0-Z4	5/8	5/8	1 7/8	4	4	AlTiN	0.030	■	
N09982	STR440.2-0.625-D3-R030.3-Z4	5/8	5/8	1 7/8	4	4	AlTiN	0.030	■	□
N09983	STR440.2-0.625-D3-R060.0-Z4	5/8	5/8	1 7/8	4	4	AlTiN	0.060	■	

DISCOUNT CODE D43

□ Quick Response Item. Delivery within 7 days.

## STR440.2 (CONT) & STRN440.2 (NECKED)

PRODUCT NUMBER	DESCRIPTION	DIMENSIONS IN INCH/METRIC							NO. OF FLUTES	COATING	RADIUS	CYLINDRICAL	WELDON
		FLUTE DIA (DC)	SHANK DIA (DMM)	LOC (APMX)	OVERALL LENGTH (OAL)	NECK DIA (DN)	REACH (LN)						
<b>STB430.2</b>													
Inch													
N09984	STR440.2-0.625-D3-R060.3-Z4	5/8	5/8	1 7/8	4	-	-	4	AlTiN	0.060		<input type="checkbox"/>	
N00328	STR440.2-0.625-D3-R120.0-Z4	5/8	5/8	1 7/8	4	-	-	4	AlTiN	0.120	■	<input type="checkbox"/>	
N00329	STR440.2-0.625-D3-R120.3-Z4	5/8	5/8	1 7/8	4	-	-	4	AlTiN	0.120		<input type="checkbox"/>	
N00332	STR440.2-0.750-D1-R030.0-Z4	3/4	3/4	3/4	3	-	-	4	AlTiN	0.030	■	<input type="checkbox"/>	
N00333	STR440.2-0.750-D1-R030.3-Z4	3/4	3/4	3/4	3	-	-	4	AlTiN	0.030		■	
N00334	STR440.2-0.750-D1-R060.0-Z4	3/4	3/4	3/4	3	-	-	4	AlTiN	0.060	■	<input type="checkbox"/>	
N00335	STR440.2-0.750-D1-R060.3-Z4	3/4	3/4	3/4	3	-	-	4	AlTiN	0.060		<input type="checkbox"/>	
N00336	STR440.2-0.750-D1-R120.0-Z4	3/4	3/4	3/4	3	-	-	4	AlTiN	0.120	■	<input type="checkbox"/>	
N00337	STR440.2-0.750-D1-R120.3-Z4	3/4	3/4	3/4	3	-	-	4	AlTiN	0.120		<input type="checkbox"/>	
N00338	STR440.2-0.750-D2-R030.0-Z4	3/4	3/4	1 1/2	4	-	-	4	AlTiN	0.030	■	<input type="checkbox"/>	
N00339	STR440.2-0.750-D2-R030.3-Z4	3/4	3/4	1 1/2	4	-	-	4	AlTiN	0.030		■	
N00342	STR440.2-0.750-D2-R060.0-Z4	3/4	3/4	1 1/2	4	-	-	4	AlTiN	0.060	■	<input type="checkbox"/>	
N00343	STR440.2-0.750-D2-R060.3-Z4	3/4	3/4	1 1/2	4	-	-	4	AlTiN	0.060		<input type="checkbox"/>	
N00344	STR440.2-0.750-D2-R120.0-Z4	3/4	3/4	1 1/2	4	-	-	4	AlTiN	0.120	■	<input type="checkbox"/>	
N00345	STR440.2-0.750-D2-R120.3-Z4	3/4	3/4	1 1/2	4	-	-	4	AlTiN	0.120		<input type="checkbox"/>	
N00346	STR440.2-0.750-D3-R030.0-Z4	3/4	3/4	2 1/4	5	-	-	4	AlTiN	0.030	■	<input type="checkbox"/>	
N00347	STR440.2-0.750-D3-R030.3-Z4	3/4	3/4	2 1/4	5	-	-	4	AlTiN	0.030		<input type="checkbox"/>	
N00348	STR440.2-0.750-D3-R060.0-Z4	3/4	3/4	2 1/4	5	-	-	4	AlTiN	0.060	■	<input type="checkbox"/>	
N00349	STR440.2-0.750-D3-R060.3-Z4	3/4	3/4	2 1/4	5	-	-	4	AlTiN	0.060		<input type="checkbox"/>	
N00352	STR440.2-0.750-D3-R120.0-Z4	3/4	3/4	2 1/4	5	-	-	4	AlTiN	0.120	■	<input type="checkbox"/>	
N00353	STR440.2-0.750-D3-R120.3-Z4	3/4	3/4	2 1/4	5	-	-	4	AlTiN	0.120		<input type="checkbox"/>	
N00354	STR440.2-1.000-D1-R030.0-Z4	1	1	1	4	-	-	4	AlTiN	0.030	■	<input type="checkbox"/>	
N00355	STR440.2-1.000-D1-R030.3-Z4	1	1	1	4	-	-	4	AlTiN	0.030		<input type="checkbox"/>	
N09327	STR440.2-1.000-D1-R060.0-Z4	1	1	1	4	-	-	4	AlTiN	0.060	■	<input type="checkbox"/>	
N09329	STR440.2-1.000-D1-R060.3-Z4	1	1	1	4	-	-	4	AlTiN	0.060		<input type="checkbox"/>	
N09333	STR440.2-1.000-D1-R120.0-Z4	1	1	1	4	-	-	4	AlTiN	0.120	■	<input type="checkbox"/>	
N09336	STR440.2-1.000-D1-R120.3-Z4	1	1	1	4	-	-	4	AlTiN	0.120		<input type="checkbox"/>	
N09337	STR440.2-1.000-D2-R030.0-Z4	1	1	2	5	-	-	4	AlTiN	0.030	■	<input type="checkbox"/>	
N09339	STR440.2-1.000-D2-R030.3-Z4	1	1	2	5	-	-	4	AlTiN	0.030		■	
N09343	STR440.2-1.000-D2-R060.0-Z4	1	1	2	5	-	-	4	AlTiN	0.060	■	<input type="checkbox"/>	
N09346	STR440.2-1.000-D2-R060.3-Z4	1	1	2	5	-	-	4	AlTiN	0.060		<input type="checkbox"/>	
N09347	STR440.2-1.000-D2-R120.0-Z4	1	1	2	5	-	-	4	AlTiN	0.120	■	<input type="checkbox"/>	
N09349	STR440.2-1.000-D2-R120.3-Z4	1	1	2	5	-	-	4	AlTiN	0.120		<input type="checkbox"/>	
N09356	STR440.2-1.000-D3-R030.0-Z4	1	1	3	6	-	-	4	AlTiN	0.030	■	<input type="checkbox"/>	
N09357	STR440.2-1.000-D3-R030.3-Z4	1	1	3	6	-	-	4	AlTiN	0.030		<input type="checkbox"/>	
N09359	STR440.2-1.000-D3-R060.0-Z4	1	1	3	6	-	-	4	AlTiN	0.060	■	<input type="checkbox"/>	
N09363	STR440.2-1.000-D3-R060.3-Z4	1	1	3	6	-	-	4	AlTiN	0.060		<input type="checkbox"/>	
N09366	STR440.2-1.000-D3-R120.0-Z4	1	1	3	6	-	-	4	AlTiN	0.120	■	<input type="checkbox"/>	
N09367	STR440.2-1.000-D3-R120.3-Z4	1	1	3	6	-	-	4	AlTiN	0.120		<input type="checkbox"/>	
Metric													
N09636	STR440M.2-030-F2-R250.0-Z4	3	6	6	58	-	-	4	AlTiN	0.250	■	<input type="checkbox"/>	
N09637	STR440M.2-030-F3-R250.0-Z4	3	6	9	58	-	-	4	AlTiN	0.250	■	<input type="checkbox"/>	
N09645	STR440M.2-040-F2-R250.0-Z4	4	6	8	58	-	-	4	AlTiN	0.250	■	<input type="checkbox"/>	
N09646	STR440M.2-040-F3-R250.0-Z4	4	6	12	58	-	-	4	AlTiN	0.250	■	<input type="checkbox"/>	
N09647	STR440M.2-050-F2-R250.0-Z4	5	6	10	58	-	-	4	AlTiN	0.250	■	<input type="checkbox"/>	
N09648	STR440M.2-050-F3-R250.0-Z4	5	6	15	58	-	-	4	AlTiN	0.250	■	<input type="checkbox"/>	
N09649	STR440M.2-060-D2-R500.0-Z4	6	6	12	58	-	-	4	AlTiN	0.500	■	<input type="checkbox"/>	
N09650	STR440M.2-060-D3-R500.0-Z4	6	6	18	58	-	-	4	AlTiN	0.500	■	<input type="checkbox"/>	
N09651	STR440M.2-080-D2-R500.0-Z4	8	8	16	64	-	-	4	AlTiN	0.500	■	<input type="checkbox"/>	
N09652	STR440M.2-080-D3-R500.0-Z4	8	8	24	64	-	-	4	AlTiN	0.500	■	<input type="checkbox"/>	
N09653	STR440M.2-100-D2-R500.0-Z4	10	10	20	73	-	-	4	AlTiN	0.500	■	<input type="checkbox"/>	
N09654	STR440M.2-100-D3-R500.0-Z4	10	10	30	73	-	-	4	AlTiN	0.500	■	<input type="checkbox"/>	
N09655	STR440M.2-120-D2-R750.0-Z4	12	12	24	84	-	-	4	AlTiN	0.750	■	<input type="checkbox"/>	
N09665	STR440M.2-120-D3-R750.0-Z4	12	12	36	84	-	-	4	AlTiN	0.750	■	<input type="checkbox"/>	
N09667	STR440M.2-160-D2-R750.0-Z4	16	16	32	93	-	-	4	AlTiN	0.750	■	<input type="checkbox"/>	
N09668	STR440M.2-160-D3-R750.0-Z4	16	16	48	93	-	-	4	AlTiN	0.750	■	<input type="checkbox"/>	
N09670	STR440M.2-200-D2-R750.0-Z4	20	20	40	105	-	-	4	AlTiN	0.750	■	<input type="checkbox"/>	
N09671	STR440M.2-200-D3-R750.0-Z4	20	20	60	125	-	-	4	AlTiN	0.750	■	<input type="checkbox"/>	
N09672	STR440M.2-250-D2-R750.0-Z4	25	25	50	115	-	-	4	AlTiN	0.750	■	<input type="checkbox"/>	
N09673	STR440M.2-250-D3-R750.0-Z4	25	25	75	147	-	-	4	AlTiN	0.750	■	<input type="checkbox"/>	
<b>STRN440.2 (NECKED)</b>													
Inch													
N09503	STRN440.2-0.250-E2-R020.0-Z4	1/4	1/4	1/2	2 1/2	0.240	0.750	4	AlTiN	0.020	■	<input type="checkbox"/>	
N09504	STRN440.2-0.313-E2-R020.0-Z4	5/16	5/16	5/8	3	0.300	0.938	4	AlTiN	0.020	■	<input type="checkbox"/>	
N09505	STRN440.2-0.375-E2-R020.0-Z4	3/8	3/8	3/4	3	0.360	1.125	4	AlTiN	0.020	■	<input type="checkbox"/>	
N09506	STRN440.2-0.375-E2-R020.3-Z4	3/8	3/8	3/4	3	0.360	1.125	4	AlTiN	0.020		<input type="checkbox"/>	
N09507	STRN440.2-0.438-E2-R020.0-Z4	7/16	7/16	7/8	4	0.420	1.313	4	AlTiN	0.020	■	<input type="checkbox"/>	
N09508	STRN440.2-0.438-E2-R020.3-Z4	7/16	7/16	7/8	4	0.420	1.313	4	AlTiN	0.020		<input type="checkbox"/>	
N09509	STRN440.2-0.500-E2-R030.0-Z4	1/2	1/2	1	3	0.480	1.500	4	AlTiN	0.030	■	<input type="checkbox"/>	
N09512	STRN440.2-0.500-E2-R030.3-Z4	1/2	1/2	1	3	0.480	1.500	4	AlTiN	0.030		■	

DISCOUNT CODE D43

Quick Response Item. Delivery within 7 days.



## STRN440.2 (NECKED CONT), STB440.2 & STBN440.2 (NECKED)

PRODUCT NUMBER	DESCRIPTION	DIMENSIONS IN INCH/METRIC						NO. OF FLUTES	COATING	RADIUS	CYLINDRICAL	WELDON
		FLUTE DIA (DC)	SHANK DIA (DMM)	LOC (APMX)	OVERALL LENGTH (OAL)	NECK DIA (DN)	REACH (LN)					
<b>STRN440.2 (NECKED)</b>												
Inch												
<a href="#">N09513</a>	STRN440.2-0.625-E2-R030.0-Z4	5/8	5/8	1 1/4	3 1/2	0.600	1.875	4	AlTiN	0.030	■	
<a href="#">N09515</a>	STRN440.2-0.625-E2-R030.3-Z4	5/8	5/8	1 1/4	3 1/2	0.600	1.875	4	AlTiN	0.030		□
<a href="#">N09516</a>	STRN440.2-0.750-E2-R030.0-Z4	3/4	3/4	1 1/2	4	0.720	2.250	4	AlTiN	0.030	■	
<a href="#">N09517</a>	STRN440.2-0.750-E2-R030.3-Z4	3/4	3/4	1 1/2	4	0.720	2.250	4	AlTiN	0.030		■
<a href="#">N09518</a>	STRN440.2-1.000-E2-R030.0-Z4	1	1	2	5	0.960	3.000	4	AlTiN	0.030	■	
<a href="#">N09519</a>	STRN440.2-1.000-E2-R030.3-Z4	1	1	2	5	0.960	3.000	4	AlTiN	0.030		□



<b>STB440.2</b>												
Inch												
<a href="#">N09407</a>	STB440.2-0.125-D2-B.0-Z4	1/8	1/8	1/4	1 1/2	-	-	4	AlTiN	-	■	
<a href="#">N09408</a>	STB440.2-0.188-D2-B.0-Z4	3/16	3/16	3/8	2	-	-	4	AlTiN	-	■	
<a href="#">N09409</a>	STB440.2-0.250-D2-B.0-Z4	1/4	1/4	1/2	2 1/2	-	-	4	AlTiN	-	■	
<a href="#">N09422</a>	STB440.2-0.313-D2-B.0-Z4	5/16	5/16	5/8	2 1/2	-	-	4	AlTiN	-	■	
<a href="#">N09423</a>	STB440.2-0.375-D2-B.0-Z4	3/8	3/8	3/4	2 1/2	-	-	4	AlTiN	-	■	
<a href="#">N09426</a>	STB440.2-0.375-D2-B.3-Z4	3/8	3/8	3/4	2 1/2	-	-	4	AlTiN	-		■
<a href="#">N09427</a>	STB440.2-0.438-D2-B.0-Z4	7/16	7/16	7/8	2 3/4	-	-	4	AlTiN	-	■	
<a href="#">N09428</a>	STB440.2-0.438-D2-B.3-Z4	7/16	7/16	7/8	2 3/4	-	-	4	AlTiN	-		□
<a href="#">N09429</a>	STB440.2-0.500-D2-B.0-Z4	1/2	1/2	1	3	-	-	4	AlTiN	-	■	
<a href="#">N09432</a>	STB440.2-0.500-D2-B.3-Z4	1/2	1/2	1	3	-	-	4	AlTiN	-		■
<a href="#">N09433</a>	STB440.2-0.625-D2-B.0-Z4	5/8	5/8	1 1/4	3 1/2	-	-	4	AlTiN	-	■	
<a href="#">N09442</a>	STB440.2-0.625-D2-B.3-Z4	5/8	5/8	1 1/4	3 1/2	-	-	4	AlTiN	-		□
<a href="#">N09443</a>	STB440.2-0.750-D2-B.0-Z4	3/4	3/4	1 1/2	4	-	-	4	AlTiN	-	■	
<a href="#">N09444</a>	STB440.2-0.750-D2-B.3-Z4	3/4	3/4	1 1/2	4	-	-	4	AlTiN	-		■
<a href="#">N09445</a>	STB440.2-1.000-D2-B.0-Z4	1	1	2	5	-	-	4	AlTiN	-	■	
<a href="#">N09446</a>	STB440.2-1.000-D2-B.3-Z4	1	1	2	5	-	-	4	AlTiN	-		□
Metric												
<a href="#">N09674</a>	STB440M.2-030-F2-B.0-Z4	3	6	6	58	-	-	4	AlTiN	-	■	
<a href="#">N09675</a>	STB440M.2-030-F3-B.0-Z4	3	6	9	58	-	-	4	AlTiN	-	■	
<a href="#">N09676</a>	STB440M.2-040-F2-B.0-Z4	4	6	8	58	-	-	4	AlTiN	-	■	
<a href="#">N09677</a>	STB440M.2-040-F3-B.0-Z4	4	6	12	58	-	-	4	AlTiN	-	■	
<a href="#">N09679</a>	STB440M.2-050-F2-B.0-Z4	5	6	10	58	-	-	4	AlTiN	-	■	
<a href="#">N09680</a>	STB440M.2-050-F3-B.0-Z4	5	6	15	58	-	-	4	AlTiN	-	■	
<a href="#">N09682</a>	STB440M.2-060-D2-B.0-Z4	6	6	12	58	-	-	4	AlTiN	-	■	
<a href="#">N09683</a>	STB440M.2-060-D3-B.0-Z4	6	6	18	58	-	-	4	AlTiN	-	■	
<a href="#">N09684</a>	STB440M.2-080-D2-B.0-Z4	8	8	16	64	-	-	4	AlTiN	-	■	
<a href="#">N09685</a>	STB440M.2-080-D3-B.0-Z4	8	8	24	64	-	-	4	AlTiN	-	■	
<a href="#">N09686</a>	STB440M.2-100-D2-B.0-Z4	10	10	20	73	-	-	4	AlTiN	-	■	
<a href="#">N09687</a>	STB440M.2-100-D3-B.0-Z4	10	10	30	73	-	-	4	AlTiN	-	■	
<a href="#">N09688</a>	STB440M.2-120-D2-B.0-Z4	12	12	24	84	-	-	4	AlTiN	-	■	
<a href="#">N09689</a>	STB440M.2-120-D3-B.0-Z4	12	12	36	84	-	-	4	AlTiN	-	■	
<a href="#">N09690</a>	STB440M.2-160-D2-B.0-Z4	16	16	32	93	-	-	4	AlTiN	-	■	
<a href="#">N09691</a>	STB440M.2-160-D3-B.0-Z4	16	16	48	93	-	-	4	AlTiN	-	■	
<a href="#">N09692</a>	STB440M.2-200-D2-B.0-Z4	20	20	40	105	-	-	4	AlTiN	-	■	
<a href="#">N09693</a>	STB440M.2-200-D3-B.0-Z4	20	20	60	125	-	-	4	AlTiN	-	■	
<a href="#">N09694</a>	STB440M.2-250-D2-B.0-Z4	25	25	50	115	-	-	4	AlTiN	-	■	
<a href="#">N09695</a>	STB440M.2-250-D3-B.0-Z4	25	25	75	147	-	-	4	AlTiN	-	■	

<b>STBN440.2 (NECKED)</b>												
Inch												
<a href="#">N09522</a>	STBN440.2-0.250-E2-B.0-Z4	1/4	1/4	1/2	2 1/2	0.240	0.750	4	AlTiN	-	■	
<a href="#">N09523</a>	STBN440.2-0.313-E2-B.0-Z4	5/16	5/16	5/8	3	0.300	0.938	4	AlTiN	-	■	
<a href="#">N09524</a>	STBN440.2-0.375-E2-B.0-Z4	3/8	3/8	3/4	3	0.360	1.125	4	AlTiN	-	■	
<a href="#">N09525</a>	STBN440.2-0.375-E2-B.3-Z4	3/8	3/8	3/4	3	0.360	1.125	4	AlTiN	-		□
<a href="#">N09526</a>	STBN440.2-0.438-E2-B.0-Z4	7/16	7/16	7/8	4	0.420	1.313	4	AlTiN	-	■	
<a href="#">N09527</a>	STBN440.2-0.438-E2-B.3-Z4	7/16	7/16	7/8	4	0.420	1.313	4	AlTiN	-		□
<a href="#">N09528</a>	STBN440.2-0.500-E2-B.0-Z4	1/2	1/2	1	3	0.480	1.500	4	AlTiN	-	■	
<a href="#">N09529</a>	STBN440.2-0.500-E2-B.3-Z4	1/2	1/2	1	3	0.480	1.500	4	AlTiN	-		■
<a href="#">N09532</a>	STBN440.2-0.625-E2-B.0-Z4	5/8	5/8	1 1/4	3 1/2	0.600	1.875	4	AlTiN	-	■	
<a href="#">N09533</a>	STBN440.2-0.625-E2-B.3-Z4	5/8	5/8	1 1/4	3 1/2	0.600	1.875	4	AlTiN	-		□
<a href="#">N09534</a>	STBN440.2-0.750-E2-B.0-Z4	3/4	3/4	1 1/2	4	0.720	2.250	4	AlTiN	-	■	
<a href="#">N09535</a>	STBN440.2-0.750-E2-B.3-Z4	3/4	3/4	1 1/2	4	0.720	2.250	4	AlTiN	-		■
<a href="#">N09536</a>	STBN440.2-1.000-E2-B.0-Z4	1	1	2	5	0.960	3.000	4	AlTiN	-	■	
<a href="#">N09537</a>	STBN440.2-1.000-E2-B.3-Z4	1	1	2	5	0.960	3.000	4	AlTiN	-		□

DISCOUNT CODE D43

□ Quick Response Item. Delivery within 7 days.

## SECO MATERIAL GROUP (SMG)

### STEEL, FERRITIC AND MARTENSITIC STAINLESS STEEL

ISO	SMG	REPRESENTATIVE MATERIAL	DESCRIPTION	BHN	kc <sub>c</sub> 1.1 x 1000 lbf/in <sup>2</sup>	m <sub>c</sub>
P	1	1010	Very soft carbon steels Purely ferritic steels	< 135	196	0.21
	2	1140	Free-cutting steels	120 < 210	218	0.22
	3	1045	Structural steels. Ordinary carbon steels with low to medium carbon content (<0,5%C)	135 < 165	218	0.25
	4	4140	Carbon steels with high carbon content (>0,5%C) Medium hard steels for toughening. Ordinary low-alloy steels Ferritic and martensitic stainless steels	165 < 210	247	0.24
	5	4340	Normal tool steels Harder steels for toughening Martensitic stainless steels	210 < 270	276	0.24
	6	D2	Difficult tool steels High-alloy steels with high hardness Martensitic stainless steels	270 < 360	290	0.24
H	7	A128 Grade A	Difficult high-strength steels with 42 to 56 HRC hardness Hardened steels from material group 3-6 Martensitic stainless steels	> 360	421	0.22

### FREE-CUTTING, AUSTENITIC AND DUPLEX STAINLESS STEEL

M	8	304	Easy-cutting stainless steels Free-cutting stainless steels Calcium-treated stainless steels		254	0.22
	9	316	Moderately difficult stainless steels Austenitic and duplex stainless steels		276	0.2
	10	310	Difficult stainless steels Austenitic and duplex stainless steels		297	0.2
	11	330	Very difficult stainless steels Austenitic and duplex stainless steels		312	0.2

### CAST IRON

K	12	60-40-18	Medium hard cast iron Grey cast iron		167	0.22
	13	A536 80-55-06	Low-alloy cast iron Malleable cast iron Nodular cast iron		178	0.25
	14	A536 100-70-03	Moderately difficult alloy cast iron Moderately difficult malleable cast iron Nodular cast iron		196	0.28
	15	A536 120-90-02	Difficult high-alloy cast iron Difficult malleable cast iron Nodular cast iron		213	0.3

### OTHER MATERIALS

N	16	A380	Aluminum alloys: Low Si		101	0.25
	17	B390.0	Aluminum alloys: High Si		101	0.27
	18	CA937	Copper alloys			
S	19	Discalloy	Fe-based superalloys			
	20	Stellite 21	Co-based superalloys		377	0.24
	21	Inconel 718 (bar, forge, ring)	Ni-based superalloys		479	0.24
	22	Ti 6Al-4V (annealed)	Titanium alloys		210	0.23

kc<sub>c</sub>1.1-values with 0 degree effective cutting rake angle. For other rake angles, reduce the kc<sub>c</sub>1.1-value by 1% for every degree increase in the cutting rake angle and vice versa. Keep in mind that the BHN-value is only an aid in the selection of the material group when the material has been worked by rolling, drawing, heat treatment or other methods that increase the strength of the material.

## STS430.2, STR430.2, STB430.2 - SLOTTING - INCH

ISO GROUP	SMG	a <sub>p</sub> x D <sub>c</sub>	a <sub>e</sub> x D <sub>c</sub>	v <sub>c</sub> (sf / min)		SLOTTING														
						Zn = 4														
						1/8	5/32	3/16	7/32	1/4	9/32	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	
P	E 1-2	1.00	1.00	425	n (min-1)	12988	10390	8659	7422	6494	5772	5195	4329	3711	3247	2598	2165	1855	1624	
		x	x		fz (in)	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0024	0.0028	0.0032	0.0039	0.0047	0.0055	0.0063	
	Dc	Dc	325 - 525	vf (in/min)	40.9	40.9	40.9	40.9	40.9	40.9	40.9	40.9	40.9	40.9	40.9	40.9	40.9	40.9	40.9	40.9
	E 3-4	1.00	1.00	400	n (min-1)	12224	9779	8149	6985	6112	5433	4890	4075	3493	3056	2445	2037	1746	1528	
		x	x		fz (in)	0.0007	0.0009	0.0011	0.0012	0.0014	0.0016	0.0018	0.0021	0.0025	0.0029	0.0036	0.0043	0.0050	0.0057	
	Dc	Dc	350 - 450	vf (in/min)	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8
E 5-6	1.00	1.00	350	n (min-1)	10696	8557	7131	6112	5348	4754	4278	3565	3056	2674	2139	1783	1528	1337		
	x	x		fz (in)	0.0006	0.0008	0.0009	0.0011	0.0013	0.0014	0.0016	0.0019	0.0022	0.0025	0.0031	0.0038	0.0044	0.0050		
Dc	Dc	330 - 370	vf (in/min)	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	
K	E 12-13	1.00	1.00	350	n (min-1)	10696	8557	7131	6112	5348	4754	4278	3565	3056	2674	2139	1783	1528	1337	
		x	x		fz (in)	0.0007	0.0009	0.0010	0.0012	0.0014	0.0015	0.0017	0.0021	0.0024	0.0028	0.0034	0.0041	0.0048	0.0055	
	Dc	Dc	280 - 420	vf (in/min)	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	
	E 14-15	1.00	1.00	325	n (min-1)	9932	7946	6621	5675	4966	4414	3973	3311	2838	2483	1986	1655	1419	1242	
x		x	fz (in)		0.0006	0.0007	0.0008	0.0010	0.0011	0.0013	0.0014	0.0017	0.0020	0.0023	0.0028	0.0034	0.0039	0.0045		
Dc	Dc	275 - 375	vf (in/min)	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	
E 18	1.00	1.00	500	n (min-1)	15280	12224	10187	8731	7640	6791	6112	5093	4366	3820	3056	2547	2183	1910		
	x	x		fz (in)	0.0005	0.0006	0.0008	0.0009	0.0010	0.0011	0.0013	0.0015	0.0018	0.0020	0.0025	0.0030	0.0035	0.0040		
Dc	Dc	400 - 600	vf (in/min)	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	

## STS430.2, STR430.2, STB430.2 - SIDE MILLING/ROUGHING - INCH

ISO GROUP	SMG	a <sub>p</sub> x D <sub>c</sub>	a <sub>e</sub> x D <sub>c</sub>	v <sub>c</sub> (sf / min)		SIDE MILLING ROUGHING														
						Zn = 4														
						1/8	5/32	3/16	7/32	1/4	9/32	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	
P	E 1-2	1.50	0.25	425	n (min-1)	12988	10390	8659	7422	6494	5772	5195	4329	3711	3247	2598	2165	1855	1624	
		x	x		fz (in)	0.0009	0.0011	0.0013	0.0015	0.0018	0.0020	0.0022	0.0026	0.0031	0.0035	0.0044	0.0053	0.0061	0.0070	
	Dc	Dc	325 - 525	vf (in/min)	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	
	E 3-4	1.50	0.25	400	n (min-1)	12224	9779	8149	6985	6112	5433	4890	4075	3493	3056	2445	2037	1746	1528	
		x	x		fz (in)	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0024	0.0028	0.0032	0.0040	0.0048	0.0056	0.0064	
	Dc	Dc	350 - 450	vf (in/min)	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1
E 5-6	1.00	0.25	350	n (min-1)	10696	8557	7131	6112	5348	4754	4278	3565	3056	2674	2139	1783	1528	1337		
	x	x		fz (in)	0.0008	0.0009	0.0011	0.0013	0.0015	0.0017	0.0019	0.0023	0.0026	0.0030	0.0038	0.0045	0.0053	0.0060		
Dc	Dc	330 - 370	vf (in/min)	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	
K	E 12-13	1.50	0.25	350	n (min-1)	10696	8557	7131	6112	5348	4754	4278	3565	3056	2674	2139	1783	1528	1337	
		x	x		fz (in)	0.0008	0.0009	0.0011	0.0013	0.0015	0.0017	0.0019	0.0023	0.0026	0.0030	0.0038	0.0045	0.0053	0.0060	
	Dc	Dc	280 - 420	vf (in/min)	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	
	E 14-15	1.00	0.25	325	n (min-1)	9932	7946	6621	5675	4966	4414	3973	3311	2838	2483	1986	1655	1419	1242	
x		x	fz (in)		0.0006	0.0008	0.0009	0.0011	0.0013	0.0014	0.0016	0.0019	0.0022	0.0025	0.0031	0.0038	0.0044	0.0050		
Dc	Dc	275 - 375	vf (in/min)	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	
E 18	1.50	0.25	500	n (min-1)	15280	12224	10187	8731	7640	6791	6112	5093	4366	3820	3056	2547	2183	1910		
	x	x		fz (in)	0.0006	0.0007	0.0008	0.0010	0.0011	0.0012	0.0014	0.0017	0.0019	0.0022	0.0028	0.0033	0.0039	0.0044		
Dc	Dc	400 - 600	vf (in/min)	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	

SMG = Seco Material Group  
n (min-1) = RPM  
fz (in) = Feed/tooth  
vf (in/min) = Feed rate  
v<sub>c</sub> (sf/min) = Surface feet/min  
a<sub>p</sub> x D<sub>c</sub> = % of diameter  
a<sub>e</sub> x D<sub>c</sub> = % of diameter  
All cutting data are start values  
All cutting data is in inch values

**NOTE: HPM is an excellent strategy for achieving high metal removal rates and increased productivity, but requires use of the right equipment and cutting parameters. If you are having problems implementing the approach or want to learn more about how to use the strategy to process a part, contact the Technical Support Team at 1-800-TEC-TEAM.**

## STS430.2, STR430.2, STB430.2 - SLOTTING - METRIC

ISO GROUP	SMG	a <sub>p</sub> x D <sub>c</sub>	a <sub>e</sub> x D <sub>c</sub>	v <sub>c</sub> (sf / min)	SLOTTING											
					Zn = 4											
					3	4	5	6	8	10	12	14	16	20	25	
P	E 1 - 2	1.00 x D <sub>c</sub>	1.00 x D <sub>c</sub>	425	n (min-1)	13790	10350	8280	6900	5170	4140	3450	2960	2590	2070	1660
					fz (in)	0.0007	0.0010	0.0012	0.0015	0.0020	0.0025	0.0030	0.0035	0.0040	0.0050	0.0062
					vf (in/min)	41.0	41.1	41.1	41.1	41.0	41.1	41.1	41.1	41.1	41.1	41.1
	E 3 - 4	1.00 x D <sub>c</sub>	1.00 x D <sub>c</sub>	400	n (min-1)	12940	9710	7770	6470	4850	3880	3240	2770	2430	1940	1550
					fz (in)	0.0007	0.0009	0.0011	0.0013	0.0018	0.0022	0.0027	0.0031	0.0036	0.0045	0.0056
					vf (in/min)	34.8	34.9	34.9	34.8	34.8	34.8	34.9	34.8	34.9	34.8	34.9
	E 5 - 6	1.00 x D <sub>c</sub>	1.00 x D <sub>c</sub>	350	n (min-1)	11350	8510	6810	5680	4260	3410	2840	2430	2130	1700	1360
					fz (in)	0.0006	0.0008	0.0010	0.0012	0.0016	0.0020	0.0024	0.0028	0.0031	0.0039	0.0049
					vf (in/min)	26.8	26.8	26.8	26.8	26.8	26.9	26.8	26.8	26.8	26.8	26.8
K	E 12 - 13	1.00 x D <sub>c</sub>	1.00 x D <sub>c</sub>	350	n (min-1)	11350	8510	6810	5680	4260	3410	2840	2430	2130	1700	1360
					fz (in)	0.0006	0.0009	0.0011	0.0013	0.0017	0.0022	0.0026	0.0030	0.0035	0.0043	0.0054
					vf (in/min)	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5
	E 14 - 15	1.00 x D <sub>c</sub>	1.00 x D <sub>c</sub>	325	n (min-1)	10500	7880	6300	5250	3940	3150	2630	2250	1970	1580	1260
					fz (in)	0.0005	0.0007	0.0009	0.0011	0.0014	0.0018	0.0021	0.0025	0.0028	0.0035	0.0044
					vf (in/min)	22.3	22.3	22.3	22.3	22.3	22.3	22.4	22.3	22.3	22.4	22.3
E	18	1.00 x D <sub>c</sub>	1.00 x D <sub>c</sub>	500	n (min-1)	16130	12100	9680	8060	6050	4840	4030	3460	3020	2420	1940
					fz (in)	0.0005	0.0006	0.0008	0.0009	0.0013	0.0016	0.0019	0.0022	0.0025	0.0031	0.0039
					vf (in/min)	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.4	30.5

## STS430.2, STR430.2, STB430.2 - SIDE MILLING/ROUGHING - METRIC

ISO GROUP	SMG	a <sub>p</sub> x D <sub>c</sub>	a <sub>e</sub> x D <sub>c</sub>	v <sub>c</sub> (sf / min)	SIDE MILLING ROUGHING											
					Zn = 4											
					3	4	5	6	8	10	12	14	16	20	25	
P	E 1 - 2	1.50 x D <sub>c</sub>	0.25 x D <sub>c</sub>	425	n (min-1)	13790	10350	8280	6900	5170	4140	3450	2960	2590	2070	1660
					fz (in)	0.0008	0.0011	0.0014	0.0017	0.0022	0.0028	0.0033	0.0039	0.0044	0.0055	0.0069
					vf (in/min)	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.7	45.7	45.6
	E 3 - 4	1.50 x D <sub>c</sub>	0.25 x D <sub>c</sub>	400	n (min-1)	12940	9710	7770	6470	4850	3880	3240	2770	2430	1940	1550
					fz (in)	0.0008	0.0010	0.0013	0.0015	0.0020	0.0025	0.0030	0.0035	0.0040	0.0050	0.0063
					vf (in/min)	39.1	39.1	39.2	39.1	39.1	39.1	39.2	39.1	39.2	39.1	39.2
	E 5 - 6	1.50 x D <sub>c</sub>	0.25 x D <sub>c</sub>	350	n (min-1)	11350	8510	6810	5680	4260	3410	2840	2430	2130	1700	1360
					fz (in)	0.0007	0.0009	0.0012	0.0014	0.0019	0.0024	0.0028	0.0033	0.0038	0.0047	0.0059
					vf (in/min)	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.1	32.2	32.1
K	E 12 - 13	1.50 x D <sub>c</sub>	0.25 x D <sub>c</sub>	350	n (min-1)	11350	8510	6810	5680	4260	3410	2840	2430	2130	1700	1360
					fz (in)	0.0007	0.0009	0.0012	0.0014	0.0019	0.0024	0.0028	0.0033	0.0038	0.0047	0.0059
					vf (in/min)	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.1	32.2	32.1	32.1
	E 14 - 15	1.50 x D <sub>c</sub>	0.25 x D <sub>c</sub>	325	n (min-1)	10500	7880	6300	5250	3940	3150	2630	2250	1970	1580	1260
					fz (in)	0.0006	0.0008	0.0010	0.0012	0.0016	0.0020	0.0024	0.0028	0.0031	0.0039	0.0049
					vf (in/min)	24.8	24.8	24.8	24.8	24.8	24.8	24.9	24.8	24.8	24.9	24.8
E	18	1.50 x D <sub>c</sub>	0.25 x D <sub>c</sub>	500	n (min-1)	16130	12100	9680	8060	6050	4840	4030	3460	3020	2420	1940
					fz (in)	0.0005	0.0007	0.0009	0.0010	0.0014	0.0017	0.0021	0.0024	0.0028	0.0035	0.0043
					vf (in/min)	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.6	33.5	33.5

SMG = Seco Material Group

n (min-1) = RPM

fz (in) = Feed/tooth

vf (in/min) = Feed rate

v<sub>c</sub> (sf/min) = Surface feet/min

a<sub>p</sub> x D<sub>c</sub> = % of diameter

a<sub>e</sub> x D<sub>c</sub> = % of diameter

All cutting data are start values

All cutting data is in inch values



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## STRN430.2, STBN430.2 - SLOTTING - INCH

ISO GROUP	SMG	a <sub>p</sub> x D <sub>c</sub>	a <sub>e</sub> x D <sub>c</sub>	v <sub>c</sub> (sf / min)	SLOTTING								
					Zn = 4								
					1/4	5/16	3/8	7/16	1/2	5/8	3/4	1	
P	E 1 - 2	0.50	1.00	425	n (min-1)	6494	5195	4329	3711	3247	2598	2165	1624
		x	x		fz (in)	0.0008	0.0009	0.0011	0.0013	0.0015	0.0019	0.0023	0.0030
		Dc	Dc	325 - 525	vf (in/min)	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5
	E 3 - 4	0.50	1.00	400	n (min-1)	6112	4890	4075	3493	3056	2445	2037	1528
		x	x		fz (in)	0.0006	0.0008	0.0009	0.0011	0.0013	0.0016	0.0019	0.0025
		Dc	Dc	350 - 450	vf (in/min)	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3
	E 5 - 6	0.50	1.00	350	n (min-1)	5348	4278	3565	3056	2674	2139	1783	1337
		x	x		fz (in)	0.0006	0.0007	0.0009	0.0010	0.0012	0.0014	0.0017	0.0023
		Dc	Dc	330 - 370	vf (in/min)	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3
K	E 12 - 13	0.50	1.00	350	n (min-1)	5348	4278	3565	3056	2674	2139	1783	1337
		x	x		fz (in)	0.0010	0.0013	0.0015	0.0018	0.0020	0.0025	0.0030	0.0040
		Dc	Dc	280 - 420	vf (in/min)	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4
	E 14 - 15	0.50	1.00	325	n (min-1)	4966	3973	3311	2838	2483	1986	1655	1242
		x	x		fz (in)	0.0008	0.0009	0.0011	0.0013	0.0015	0.0019	0.0023	0.0030
		Dc	Dc	285 - 365	vf (in/min)	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9
E	18	0.50	1.00	500	n (min-1)	7640	6112	5093	4366	3820	3056	2547	1910
		x	x		fz (in)	0.0006	0.0008	0.0009	0.0011	0.0013	0.0016	0.0019	0.0025
		Dc	Dc	400 - 600	vf (in/min)	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1

## STRN430.2, STBN430.2 - SIDE MILLING ROUGHING - INCH

ISO GROUP	SMG	a <sub>p</sub> x D <sub>c</sub>	a <sub>e</sub> x D <sub>c</sub>	v <sub>c</sub> (sf / min)	SIDE MILLING ROUGHING								
					Zn = 4								
					1/4	5/16	3/8	7/16	1/2	5/8	3/4	1	
P	E 1 - 2	1.00	0.25	425	n (min-1)	6494	5195	4329	3711	3247	2598	2165	1624
		x	x		fz (in)	0.0009	0.0011	0.0013	0.0015	0.0018	0.0022	0.0026	0.0035
		Dc	Dc	325 - 525	vf (in/min)	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7
	E 3 - 4	1.00	0.25	400	n (min-1)	6112	4890	4075	3493	3056	2445	2037	1528
		x	x		fz (in)	0.0008	0.0009	0.0011	0.0013	0.0015	0.0019	0.0023	0.0030
		Dc	Dc	350 - 450	vf (in/min)	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3
	E 5 - 6	1.00	0.25	350	n (min-1)	5348	4278	3565	3056	2674	2139	1783	1337
		x	x		fz (in)	0.0007	0.0009	0.0011	0.0012	0.0014	0.0018	0.0021	0.0028
		Dc	Dc	330 - 370	vf (in/min)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
K	E 12 - 13	1.00	0.25	350	n (min-1)	5348	4278	3565	3056	2674	2139	1783	1337
		x	x		fz (in)	0.0011	0.0014	0.0017	0.0020	0.0023	0.0028	0.0034	0.0045
		Dc	Dc	280 - 420	vf (in/min)	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1
	E 14 - 15	1.00	0.25	325	n (min-1)	4966	3973	3311	2838	2483	1986	1655	1242
		x	x		fz (in)	0.0009	0.0011	0.0013	0.0015	0.0018	0.0022	0.0026	0.0035
		Dc	Dc	285 - 365	vf (in/min)	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4
E	18	1.00	0.25	500	n (min-1)	7640	6112	5093	4366	3820	3056	2547	1910
		x	x		fz (in)	0.0008	0.0009	0.0011	0.0013	0.0015	0.0019	0.0023	0.0030
		Dc	Dc	400 - 600	vf (in/min)	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9

SMG = Seco Material Group

n (min-1) = RPM

fz (in) = Feed/tooth

vf (in/min) = Feed rate

v<sub>c</sub> (sf/min) = Surface feet/min

a<sub>p</sub> x D<sub>c</sub> = % of diameter

a<sub>e</sub> x D<sub>c</sub> = % of diameter

All cutting data are start values

All cutting data is in inch values



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## STR440.2 - STB440.2 - SLOTING - INCH

ISO GROUP	SMG	a <sub>p</sub> x D <sub>c</sub>	a <sub>e</sub> x D <sub>c</sub>	v <sub>c</sub> (sf / min)	SLOTING													
					Zn = 4													
					1/8	5/32	3/16	7/32	1/4	9/32	5/16	3/8	7/16	1/2	5/8	3/4	1	
M	E 8 - 9	1.00	1.00	370	n (min-1)	11307	9046	7538	6461	5654	5025	4523	3769	3231	2827	2261	1885	1413
		x	x		fz (in)	0.0008	0.0009	0.0011	0.0013	0.0015	0.0017	0.0019	0.0023	0.0026	0.0030	0.0038	0.0045	0.0060
	Dc	Dc	270 - 470	vf (in/min)	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9
	E 10 - 11	1.00	1.00	300	n (min-1)	9168	7334	6112	5239	4584	4075	3667	3056	2619	2292	1834	1528	1146
x		x	fz (in)		0.0008	0.0009	0.0011	0.0013	0.0015	0.0017	0.0019	0.0023	0.0026	0.0030	0.0038	0.0045	0.0060	
S	E 19	1.00	1.00	90	n (min-1)	2750	2200	1834	1572	1375	1222	1100	917	786	688	550	458	344
		x	x		fz (in)	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009	0.0010	0.0012	0.0014	0.0016	0.0020	0.0024	0.0032
	Dc	Dc	70 - 110	vf (in/min)	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
	E 20	1.00	1.00	90	n (min-1)	2750	2200	1834	1572	1375	1222	1100	917	786	688	550	458	344
		x	x		fz (in)	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009	0.0010	0.0012	0.0014	0.0016	0.0020	0.0024	0.0032
	Dc	Dc	70 - 110	vf (in/min)	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
	E 21	1.00	1.00	90	n (min-1)	2750	2200	1834	1572	1375	1222	1100	917	786	688	550	458	344
		x	x		fz (in)	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009	0.0010	0.0012	0.0014	0.0016	0.0020	0.0024	0.0032
	Dc	Dc	70 - 110	vf (in/min)	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
	E 22	1.00	1.00	185	n (min-1)	5654	4523	3769	3231	2827	2513	2261	1885	1615	1413	1131	942	707
		x	x		fz (in)	0.0006	0.0008	0.0009	0.0011	0.0013	0.0014	0.0016	0.0019	0.0022	0.0025	0.0031	0.0038	0.0050
	Dc	Dc	165 - 205	vf (in/min)	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1

## STR440.2 - STB440.2 - SIDE MILLING/ROUGHING - INCH

ISO GROUP	SMG	a <sub>p</sub> x D <sub>c</sub>	a <sub>e</sub> x D <sub>c</sub>	v <sub>c</sub> (sf / min)	SIDE MILLING ROUGHING													
					Zn = 4													
					1/8	5/32	3/16	7/32	1/4	9/32	5/16	3/8	7/16	1/2	5/8	3/4	1	
H	E 7	1.00	0.15	150	n (min-1)	4584	3667	3056	2619	2292	2037	1834	1528	1310	1146	917	764	573
		x	x		fz (in)	0.0003	0.0004	0.0004	0.0005	0.0006	0.0006	0.0007	0.0009	0.0010	0.0012	0.0014	0.0017	0.0023
		Dc	Dc		120 - 180	vf (in/min)	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
M	E 8 - 9	1.00	0.25	370	n (min-1)	11307	9046	7538	6461	5654	5025	4523	3769	3231	2827	2261	1885	1413
		x	x		fz (in)	0.0008	0.0009	0.0011	0.0013	0.0015	0.0017	0.0019	0.0023	0.0026	0.0030	0.0038	0.0045	0.0060
	Dc	Dc	270 - 470	vf (in/min)	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9
	E 10 - 11	1.00	0.25	300	n (min-1)	9168	7334	6112	5239	4584	4075	3667	3056	2619	2292	1834	1528	1146
x		x	fz (in)		0.0008	0.0009	0.0011	0.0013	0.0015	0.0017	0.0019	0.0023	0.0026	0.0030	0.0038	0.0045	0.0060	
Dc	Dc	250 - 350	vf (in/min)	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	
S	E 19	1.00	0.15	90	n (min-1)	2750	2200	1834	1572	1375	1222	1100	917	786	688	550	458	344
		x	x		fz (in)	0.0005	0.0006	0.0008	0.0009	0.0010	0.0011	0.0013	0.0015	0.0018	0.0020	0.0025	0.0030	0.0040
	Dc	Dc	70 - 110	vf (in/min)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
	E 20	1.00	0.15	90	n (min-1)	2750	2200	1834	1572	1375	1222	1100	917	786	688	550	458	344
		x	x		fz (in)	0.0005	0.0006	0.0008	0.0009	0.0010	0.0011	0.0013	0.0015	0.0018	0.0020	0.0025	0.0030	0.0040
	Dc	Dc	70 - 110	vf (in/min)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
	E 21	1.00	0.15	90	n (min-1)	2750	2200	1834	1572	1375	1222	1100	917	786	688	550	458	344
		x	x		fz (in)	0.0005	0.0006	0.0008	0.0009	0.0010	0.0011	0.0013	0.0015	0.0018	0.0020	0.0025	0.0030	0.0040
Dc	Dc	70 - 110	vf (in/min)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5		
E 22	1.00	0.25	185	n (min-1)	5654	4523	3769	3231	2827	2513	2261	1885	1615	1413	1131	942	707	
	x	x		fz (in)	0.0008	0.0009	0.0011	0.0013	0.0015	0.0017	0.0019	0.0023	0.0026	0.0030	0.0038	0.0045	0.0060	
Dc	Dc	165 - 205	vf (in/min)	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0		

SMG = Seco Material Group

n (min-1) = RPM

fz (in) = Feed/tooth

vf (in/min) = Feed rate

v<sub>c</sub> (sf/min) = Surface feet/min

a<sub>p</sub> x D<sub>c</sub> = % of diameter

a<sub>e</sub> x D<sub>c</sub> = % of diameter

All cutting data are start values

All cutting data is in inch values

**NOTE: HPM is an excellent strategy for achieving high metal removal rates and increased productivity, but requires use of the right equipment and cutting parameters. If you are having problems implementing the approach or want to learn more about how to use the strategy to process a part, contact the Technical Support Team at 1-800-TEC-TEAM.**

## STR440.2 - STB440.2 - SLOTTING - METRIC

ISO GROUP	SMG	a <sub>p</sub> x D <sub>c</sub>	a <sub>g</sub> x D <sub>c</sub>	v <sub>c</sub> (sf / min)		SLOTTING										
						Zn = 4										
						3	4	5	6	8	10	12	14	16	20	25
M	E 8 - 9	1.00 x D <sub>c</sub>	1.00 x D <sub>c</sub>	370	n (min-1)	11990	8990	7190	5990	4500	3600	3000	2570	2250	1800	1440
					fz (in)	0.0007	0.0009	0.0012	0.0014	0.0019	0.0024	0.0028	0.0033	0.0038	0.0047	0.0059
	E 10 - 11	1.00 x D <sub>c</sub>	1.00 x D <sub>c</sub>	300	n (min-1)	9660	7240	5790	4830	3620	2900	2410	2070	1810	1450	1160
					fz (in)	0.0007	0.0009	0.0012	0.0014	0.0019	0.0024	0.0028	0.0033	0.0038	0.0047	0.0059
S	E 19	1.00 x D <sub>c</sub>	1.00 x D <sub>c</sub>	90	n (min-1)	2860	2150	1720	1430	1070	860	720	610	540	430	340
					fz (in)	0.0004	0.0005	0.0006	0.0008	0.0010	0.0013	0.0015	0.0018	0.0020	0.0025	0.0031
	E 20	1.00 x D <sub>c</sub>	1.00 x D <sub>c</sub>	90	n (min-1)	2860	2150	1720	1430	1070	860	720	610	540	430	340
					fz (in)	0.0004	0.0005	0.0006	0.0008	0.0010	0.0013	0.0015	0.0018	0.0020	0.0025	0.0031
	E 21	1.00 x D <sub>c</sub>	1.00 x D <sub>c</sub>	90	n (min-1)	2860	2150	1720	1430	1070	860	720	610	540	430	340
					fz (in)	0.0004	0.0005	0.0006	0.0008	0.0010	0.0013	0.0015	0.0018	0.0020	0.0025	0.0031
	E 22	1.00 x D <sub>c</sub>	1.00 x D <sub>c</sub>	185	n (min-1)	5940	4460	3570	2970	2230	1780	1490	1270	1110	890	710
					fz (in)	0.0006	0.0008	0.0010	0.0012	0.0016	0.0020	0.0024	0.0028	0.0031	0.0039	0.0049
					v <sub>f</sub> (in/min)	14.0	14.0	14.1	14.0	14.0	14.0	14.1	14.0	14.0	14.0	14.0

## STR440.2 - STB440.2 - SIDE MILLING/ROUGHING - METRIC

ISO GROUP	SMG	a <sub>p</sub> x D <sub>c</sub>	a <sub>g</sub> x D <sub>c</sub>	v <sub>c</sub> (sf / min)		SIDE MILLING ROUGHING										
						Zn = 4										
						3	4	5	6	8	10	12	14	16	20	25
H	E 7	1.00 x D <sub>c</sub>	0.15 x D <sub>c</sub>	150	n (min-1)	4880	3660	2930	2440	1830	1460	1220	1050	920	730	590
					fz (in)	0.0003	0.0004	0.0005	0.0005	0.0007	0.0009	0.0011	0.0013	0.0014	0.0018	0.0023
M	E 8 - 9	1.00 x D <sub>c</sub>	0.25 x D <sub>c</sub>	370	n (min-1)	11990	8990	7190	5990	4500	3600	3000	2570	2250	1800	1440
					fz (in)	0.0007	0.0009	0.0012	0.0014	0.0019	0.0024	0.0028	0.0033	0.0038	0.0047	0.0059
	E 10 - 11	1.00 x D <sub>c</sub>	0.25 x D <sub>c</sub>	300	n (min-1)	9660	7240	5790	4830	3620	2900	2410	2070	1810	1450	1160
					fz (in)	0.0007	0.0009	0.0012	0.0014	0.0019	0.0024	0.0028	0.0033	0.0038	0.0047	0.0059
S	E 19	1.00 x D <sub>c</sub>	0.15 x D <sub>c</sub>	90	n (min-1)	2860	2150	1720	1430	1070	860	720	610	540	430	340
					fz (in)	0.0005	0.0006	0.0008	0.0009	0.0013	0.0016	0.0019	0.0022	0.0025	0.0031	0.0039
	E 20	1.00 x D <sub>c</sub>	0.15 x D <sub>c</sub>	90	n (min-1)	2860	2150	1720	1430	1070	860	720	610	540	430	340
					fz (in)	0.0005	0.0006	0.0008	0.0009	0.0013	0.0016	0.0019	0.0022	0.0025	0.0031	0.0039
	E 21	1.00 x D <sub>c</sub>	0.15 x D <sub>c</sub>	90	n (min-1)	2860	2150	1720	1430	1070	860	720	610	540	430	340
					fz (in)	0.0005	0.0006	0.0008	0.0009	0.0013	0.0016	0.0019	0.0022	0.0025	0.0031	0.0039
	E 22	1.00 x D <sub>c</sub>	0.25 x D <sub>c</sub>	185	n (min-1)	5940	4460	3570	2970	2230	1780	1490	1270	1110	890	710
					fz (in)	0.0007	0.0009	0.0012	0.0014	0.0019	0.0024	0.0028	0.0033	0.0038	0.0047	0.0059
					v <sub>f</sub> (in/min)	16.8	16.9	16.9	16.8	16.9	16.8	16.9	16.8	16.8	16.8	16.8

SMG = Seco Material Group  
 n (min-1) = RPM  
 fz (in) = Feed/tooth  
 v<sub>f</sub> (in/min) = Feed rate  
 v<sub>c</sub> (sf/min) = Surface feet/min  
 a<sub>p</sub> x D<sub>c</sub> = % of diameter  
 a<sub>g</sub> x D<sub>c</sub> = % of diameter  
 All cutting data are start values  
 All cutting data is in inch values

**NOTE: HPM is an excellent strategy for achieving high metal removal rates and increased productivity, but requires use of the right equipment and cutting parameters. If you are having problems implementing the approach or want to learn more about how to use the strategy to process a part, contact the Technical Support Team at 1-800-TEC-TEAM.**

## STRN440.2 - STBN440.2 - SLOTING - INCH

ISO GROUP	SMG	a <sub>p</sub> x D <sub>c</sub>	a <sub>e</sub> x D <sub>c</sub>	v <sub>c</sub> (sf / min)		Zn = 4							
						1/4	5/16	3/8	7/16	1/2	5/8	3/4	1
M	E 8 - 9	0.50	1.00	370	n (min-1)	5654	4523	3769	3231	2827	2261	1885	1413
		x	x		fz (in)	0.0008	0.0009	0.0011	0.0013	0.0015	0.0019	0.0023	0.0030
		Dc	Dc	340 - 400	vf (in/min)	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
	E 10 - 11	0.50	1.00	300	n (min-1)	4584	3667	3056	2619	2292	1834	1528	1146
		x	x		fz (in)	0.0008	0.0009	0.0011	0.0013	0.0015	0.0019	0.0023	0.0030
		Dc	Dc	270 - 330	vf (in/min)	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8
S	E 19	0.50	1.00	90	n (min-1)	1375	1100	917	786	688	550	458	344
		x	x		fz (in)	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009	0.0011	0.0015
		Dc	Dc	70 - 110	vf (in/min)	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	E 20	0.50	1.00	90	n (min-1)	1375	1100	917	786	688	550	458	344
		x	x		fz (in)	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009	0.0011	0.0015
		Dc	Dc	70 - 110	vf (in/min)	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	E 21	0.50	1.00	90	n (min-1)	1375	1100	917	786	688	550	458	344
		x	x		fz (in)	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009	0.0011	0.0015
		Dc	Dc	70 - 110	vf (in/min)	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	E 22	0.50	1.00	185	n (min-1)	2827	2261	1885	1615	1413	1131	942	707
		x	x		fz (in)	0.0006	0.0008	0.0009	0.0011	0.0012	0.0015	0.0018	0.0024
		Dc	Dc	165 - 205	vf (in/min)	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8

## STRN440.2 - STBN440.2 - SIDE MILLING/ROUGHING - INCH

ISO GROUP	SMG	a <sub>p</sub> x D <sub>c</sub>	a <sub>e</sub> x D <sub>c</sub>	v <sub>c</sub> (sf / min)		Zn = 4							
						1/4	5/16	3/8	7/16	1/2	5/8	3/4	1
H	E 7	1.00	0.15	150	n (min-1)	2292	1834	1528	1310	1146	917	764	573
		x	x		fz (in)	0.0003	0.0004	0.0005	0.0006	0.0006	0.0008	0.0010	0.0013
		Dc	Dc	120 - 180	vf (in/min)	2.93	2.9	2.9	2.9	2.9	2.9	2.9	2.9
M	E 8 - 9	1.00	0.25	370	n (min-1)	5654	4523	3769	3231	2827	2261	1885	1413
		x	x		fz (in)	0.0008	0.0010	0.0012	0.0014	0.0016	0.0020	0.0024	0.0032
		Dc	Dc	340 - 400	vf (in/min)	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
	E 10 - 11	1.00	0.25	300	n (min-1)	4584	3667	3056	2619	2292	1834	1528	1146
		x	x		fz (in)	0.0008	0.0010	0.0012	0.0014	0.0016	0.0020	0.0024	0.0032
		Dc	Dc	270 - 330	vf (in/min)	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
S	E 19	1.00	0.15	90	n (min-1)	1375	1100	917	786	688	550	458	344
		x	x		fz (in)	0.0005	0.0006	0.0008	0.0009	0.0010	0.0013	0.0015	0.0020
		Dc	Dc	70 - 110	vf (in/min)	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	E 20	1.00	0.15	90	n (min-1)	1375	1100	917	786	688	550	458	344
		x	x		fz (in)	0.0005	0.0006	0.0008	0.0009	0.0010	0.0013	0.0015	0.0020
		Dc	Dc	70 - 110	vf (in/min)	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	E 21	1.00	0.15	90	n (min-1)	1375	1100	917	786	688	550	458	344
		x	x		fz (in)	0.0005	0.0006	0.0008	0.0009	0.0010	0.0013	0.0015	0.0020
		Dc	Dc	70 - 110	vf (in/min)	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	E 22	1.00	0.25	185	n (min-1)	2827	2261	1885	1615	1413	1131	942	707
		x	x		fz (in)	0.0007	0.0008	0.0010	0.0011	0.0013	0.0016	0.0020	0.0026
		Dc	Dc	165 - 205	vf (in/min)	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3

SMG = Seco Material Group

n (min-1) = RPM

fz (in) = Feed/tooth

vf (in/min) = Feed rate

v<sub>c</sub> (sf/min) = Surface feet/min

a<sub>p</sub> x D<sub>c</sub> = % of diameter

a<sub>e</sub> x D<sub>c</sub> = % of diameter

All cutting data are start values

All cutting data is in inch values



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technical videos, search product numbers and more!

Surface speed, surface footage and surface area are directly related. Cutting speed is the peripheral speed (velocity) at the outside edge of an endmill (surface speed). The faster the spindle speed the higher the SFM. SFM is the distance in feet that the cutting edge travels in one minute. IPM and IPT is the rate at which the cutting tool is advanced into the workpiece. Feed per tooth is the thickness of chip that each cutting edge removes in one pass.

**RPM**

$$n = \frac{v_c \cdot 12}{\pi \cdot D_c} \quad \text{or} \quad \frac{v_c \cdot 3.82}{D_c} \quad (\text{rev/min})$$

**CUTTING SPEED**

$$v_c = \frac{n \cdot \pi \cdot D_c}{12} \quad \text{or} \quad \frac{n \cdot D_c}{3.82} \quad (\text{sf/min})$$

**FEED SPEED**

$$v_f = n \cdot z_n \cdot f_z$$

$$v_f = n \cdot z_c \cdot f_z \quad (\text{inch/min})$$

**FEED PER REVOLUTION**

$$f = z_n \cdot f_z$$

$$f = z_c \cdot f_z \quad (\text{inch/rev})$$

**METAL REMOVAL RATE (MRR)**

$$Q = a_e \cdot a_p \cdot v_f \quad (\text{inch}^3/\text{min})$$

**CUTTING SPEED AND RPM FOR COPYING**

$$v_c = \frac{n \cdot \pi \cdot D_w}{12} \quad \text{or} \quad \frac{n \cdot D_w}{3.82} \quad (\text{sf/min})$$

$$n = \frac{v_c \cdot 12}{\pi \cdot D_w} \quad \text{or} \quad \frac{v_c \cdot 3.82}{D_w} \quad (\text{RPM})$$

$$D_w = 2 \cdot \sqrt{a_p (D_c - a_p)} \quad (\text{inch})$$

**CALCULATION OF  $a_p$  VS. OVERHANG LENGTH:**

If the overhang length (XS) is longer than  $4 \times D_c$  and cylindrical shanks are used, it is important to adopt another depth of cut ( $a_p$ ) value than that indicated in the table. Use the following formula to calculate the new  $a_p$  value

$$a_p = a_p \cdot (4 \cdot D_c / xs)^2$$

**PROFILE HEIGHT**

$$H = \frac{D_c}{2} - \sqrt{\frac{D_c^2 - a_p^2}{2}}$$

$$D_w = 2 \cdot \sqrt{a_p (D_c - a_p)}$$

**PROFILE HEIGHT H (UM)**

$D_c$	Pitch $a_e$ (mm)						
	0.06	0.08	0.11	0.15	0.20	0.30	0.45
1	0.90	1.60	3.00	5.70	10.00	23.00	53.00
2	0.45	0.80	1.50	2.80	5.00	11.00	26.00
4	0.23	0.40	0.76	1.40	2.50	5.60	13.00
6	0.15	0.27	0.50	0.94	1.70	3.80	8.40
8	0.11	0.20	0.38	0.70	1.30	2.80	6.30
10	0.09	0.16	0.30	0.56	1.00	2.30	5.10
12	0.08	0.13	0.25	0.47	0.83	1.90	4.20

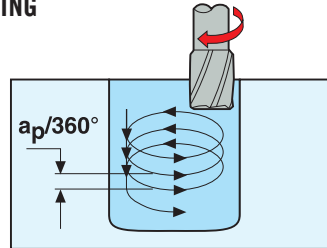
- $a_p$  = Depth of cut (mm) / axial depth of cut (in)
- $a_e$  = Width of cut (mm) / radial depth of cut (in)
- $D_c$  = Cutter diameter
- $f$  = Feed per revolution (in/rev)
- $f_z$  = Feed per tooth (in/tooth)
- $z_n$  = No. of teeth
- $n$  = RPM (rev/min)
- $Q$  = Material removal rate ( $\text{in}^3/\text{min}$ )
- $v_c$  = Cutting speed (sf/min)
- $v_f$  = Feed speed (in/min)
- $D_w$  = Working diameter

## HELICAL INTERPOLATION

The table below shows the minimum hole diameter that should be made per the diameter of the end mill being used.

### RECOMMENDED DIAMETER OF HOLE FOR HELICAL INTERPOLATION RAMPING

DIAMETER OF END MILL $D_c$	DIAMETER OF HOLE
1/32 - 3/32	$1.4 \times D_c$
1/8 - 1/4	$1.3 \times D_c$
3/8 - 1/2	$1.2 \times D_c$
5/8 - 1 1/4	$1.15 \times D_c$

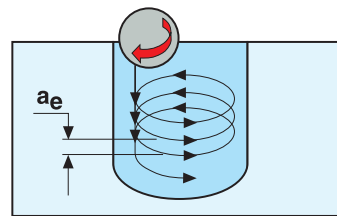


## TROCHOIDAL METHOD

The figure below shows a method often called the trochoidal method for milling slots.

### RECOMMENDED WIDTH OF SLOT

DIAMETER OF END MILL $D_c$	SLOT WIDTH
1/32 - 3/32	$1.8 \times D_c$
1/8 - 1/4	$1.6 \times D_c$
3/8 - 1/2	$1.4 \times D_c$
5/8 - 1 1/4	$1.2 \times D_c$



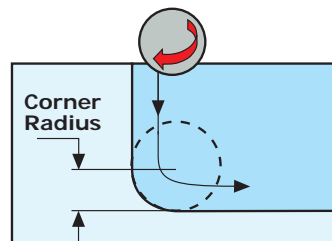
## CORNER CONTACT

### GENERATE COMPONENT CORNERS TO OPTIMIZE TOOL LIFE:

- Use maximum diameter of cutting tool, but have maximum difference between the radius of the tool and the radius in the corner of the component.
- In a corner, the contact arc of the tool increases rapidly according to the difference in radius between the tool and the component. This causes more force on the tool, resulting in deflection and increased temperature in the corner, reducing tool life.

### RECOMMENDATIONS

END MILL DIAMETER	MINIMUM CORNER RADIUS
1/64 - 3/32	$D_c / 2 \times 1.4$
1/8 - 1/4	$D_c / 2 \times 1.3$
3/8 - 1/2	$D_c / 2 \times 1.2$
5/8 - 1 1/4	$D_c / 2 \times 1.15$



Example: 1/4 tool, minimum corner radius to be generated is 0.1625".

PROBLEM / CAUSE	SOLUTION
<b>TOOL BREAKAGE</b>	
Feed rate excessive	Reduce feed rate
Depth of cut excessive	Decrease width and depth of cut
Overhang of tool is too much	Hold shank deeper, use shorter end mill
Wear is too much	Regrind at earlier stage
<b>EXCESSIVE WEAR</b>	
Speed is too fast	Decrease spindle speed, use better coolant
Hard work material	Use the right coating
Improper speed and feed (usually too slow)	Increase feed and speed
Improper helix angle	Change tool to correct helix angle
Primary relief angle is too large	Change to smaller relief angle
Recutting chips	Change feed and speed / Use more coolant or high pressure coolant/air
<b>REDUCED TOOL LIFE</b>	
Cutting friction is excessive	Regrind at earlier stage
Hard work material	Use an appropriate coolant
Improper helix and relief angle	Change to correct helix angle and primary relief
<b>CHIPPED CUTTING EDGES</b>	
Feed rate excessive	Reduce feed rate
Feed too heavy on first cut	Reduce feed rate on first cut
Lack of rigidity (machine & holder)	Use better machine or tool holder or change parameters
Lack of rigidity (tool)	Use shorter tool, hold shank deeper, try climb milling
Tool cutting corner too sharp	Decrease primary relief and cutting angle, reduce radial width-of-cut
Single chipped cutting edge	Reduce run-out to less than .0004"
<b>CHIP PACKING</b>	
Cut too heavy	Decrease width and depth of cut
Not enough chip clearance	Use end mill with fewer flutes
Not enough coolant	Use higher coolant pressure and reposition nozzle to point of cut or use air pressure

PROBLEM / CAUSE	SOLUTION
<b>WORK PIECE BURRS</b>	
Wear on primary relief is too much	Regrind at earlier stage
Incorrect feed and speed rates	Correct cutting parameters
Improper helix angle	Change to correct cutting angle
<b>ROUGH SURFACE FINISH</b>	
Feed rate too high	Reduce feed rate
Cutting speed too slow	Increase RPM
Wear is excessive	Regrind at earlier stage
Recutting chips	Change feed and speed. Use more coolant or high pressure coolant/air
<b>SQUEAL AND CHATTERING</b>	
Feed and speed too fast	Correct cutting parameters
Lack of rigidity (machine & holder)	Use better machine or tool holder or change parameters
Poor set up	Improve clamping rigidity
Cut is too heavy	Decrease width and depth of cut
Overhang of tool excessive	Hold shank deeper, use shorter end mill
Lack of relief	Decrease relief angle
<b>SIDE WALL TAPER IN WORKPIECE</b>	
Feed rate too heavy	Reduce feed rate
Overhang of tool excessive	Hold shank deeper, use shorter end mill
Too few flutes	Use multiflute end mill, use end mill with higher rigidity
<b>NO DIMENSIONAL ACCURACY</b>	
Cut is too heavy	Decrease width and depth of cut
Lack of accuracy (machine & holder)	Repair machine or holder
Rigidity is insufficient (machine & holder)	Change machine or tool holder or change parameters
Too few flutes	Use multiflute end mill, use end mill with higher rigidity

## WHEN IS IT TIME TO CHANGE A TOOL?

- When the part's surface finish is no longer acceptable
- When accuracy is no longer achievable and constant offset adjustment is required
- When burrs start to appear on the work piece that were not there before
- When chips change to a blue, purple, black color
- When unusual noises start (increased vibration)
- When the spindle load reaches an unacceptable level (power consumption)
- When a pre-determined number of parts has been reached
- When the wear land reaches a certain level for the diameter and type of end mill (reference only, see right)

CUTTING DIAMETER	FINISHING END MILL	ROUGHING END MILL
1/8" - 3/8"	up to 0.004"	0.004" - 0.006"
3/8" - 3/4"	up to 0.006"	0.006" - 0.010"
3/4" - 1"	up to 0.008"	0.010" - 0.012"
1" - 1 1/4"	up to 0.010"	0.012" - 0.016"

To find an Authorized SECO/Niagara  
Cutter Distributor near you, please refer  
to our Distributor Locator:

**SECOLOCATOR.COM**

For technical assistance, call:  
**1-800-TEC-TEAM**

For customer service, call:  
**1-248-528-5220**

**SECO TOOLS, LLC**  
North American Headquarters  
2805 Bellingham Drive  
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248-528-5200

**SECOTOOLS.COM**

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