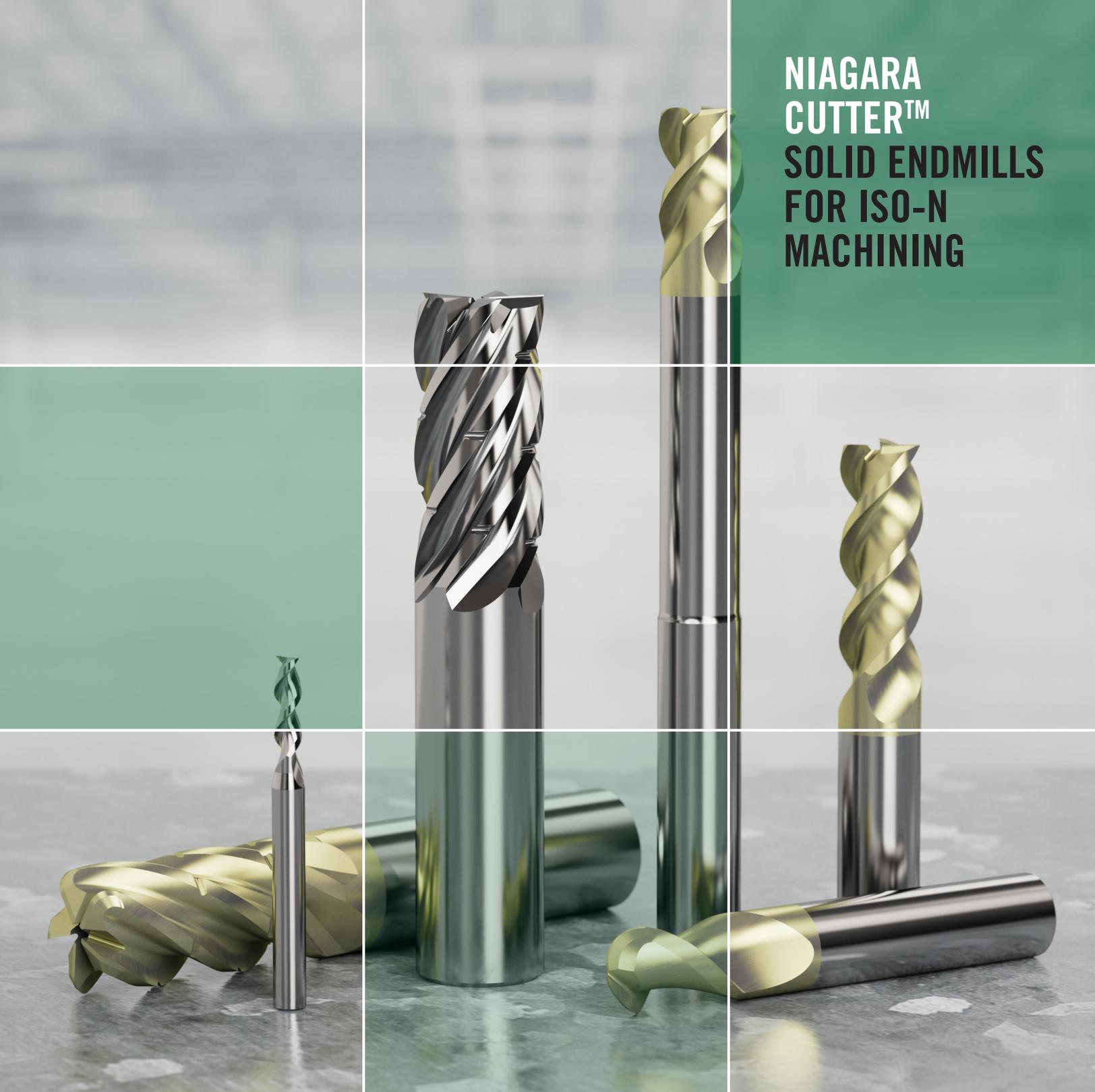


**NIAGARA
CUTTER™
SOLID ENDMILLS
FOR ISO-N
MACHINING**



**MAXIMIZE YOUR PRODUCTIVITY
IN ALUMINUM APPLICATIONS**



Niagara Cutter
A SECO TOOLS COMPANY

ACHIEVE OPTIMAL METAL REMOVAL RATES AND TOOL LIFE IN ISO-N MACHINING

YOUR CHALLENGE

Machine horsepower and torque limitations cause poor metal removal rates in ISO-N materials.

OUR SOLUTION

Reduce cutting forces and power consumption with the A245/A345 product families' newly developed ANF PVD coating and improved geometry.

YOUR CHALLENGE:

Gummy ISO-N materials create built-up edge, resulting in reduced tool life and workpiece surface quality.

OUR SOLUTION

Maximize tool life and improve workpiece surface finish with the proprietary ANF PVD coating developed in-house by Niagara Cutter® to reduce built-up edge.

YOUR CHALLENGE

An endmill that can be used in ISO-N materials in many applications. These applications range from slotting, roughing, semi-roughing, advanced roughing, and finishing.

OUR SOLUTION

A 5 flute endmill specifically engineered for ISO-N materials that has a unique flute shape combined with advanced chip splitters, internal central coolant hole, and proprietary ANF PVD coating yield a new level of application versatility and productivity in ISO-N (Aluminum) milling applications.



MAXIMIZE YOUR ISO-N MILLING PRODUCTIVITY

Machining non-ferrous materials like aluminum, brass, copper, and other ISO-N materials allows manufacturers to push their machines to the limit and achieve the highest metal removal rates (MRR). Push past those limits and achieve higher MRR in ISO-N materials – even with older and less rigid machines – with the upgraded family of A245/A345 solid carbide end mills from Niagara Cutter™. Re-engineered tool geometry coupled with a new proprietary PVD coating developed by Niagara Cutter result in a minimum of 20% less power consumption, yielding improved cutting efficiency for superior surface finishes and exceptional tool life.

Machining aluminum and other gummy ISO-N materials efficiently requires tools that can handle aggressive speeds and feeds and minimize built-up edge, even in less stable machining environments. The existing A245/A345 product line helps to address these issues with a cylindrical margin that minimizes chatter and vibration for superior surface finishes. Now, these products feature a polished K-land and optimized flute shape to control chip formation and reduce friction. Paired with a new proprietary Niagara Cutter ANF (aluminum non-ferrous) PVD coating with the smoothness needed to minimize built-up edge. As a result, manufacturers can reduce cutting forces and power consumption for truly exceptional MRR in ISO-N materials.

KEY BENEFITS

- Reduced power consumption
- Increased cutting efficiency
- Improved chip evacuation
- Superior workpiece surface finish
- Increased tool life
- Boosted process stability

RANGE OVERVIEW

Inch & metric range expansion encompassing select existing Niagara Cutter geometries with and without ANF PVD coating:

2-flute configurations

- A245 square corner end mill
- AB245 ball end mill

3-flute configurations

- A345 square corner end mill
- A345R corner radius end mill
- A345M metric square corner end mill (ANF coated only)
- AN345 reduced neck square corner end mill
- AN345R reduced neck corner radius end mill (ANF coated only)

5-flute configurations

- ACS540 square corner end mill
- ACS540R corner radius end mill

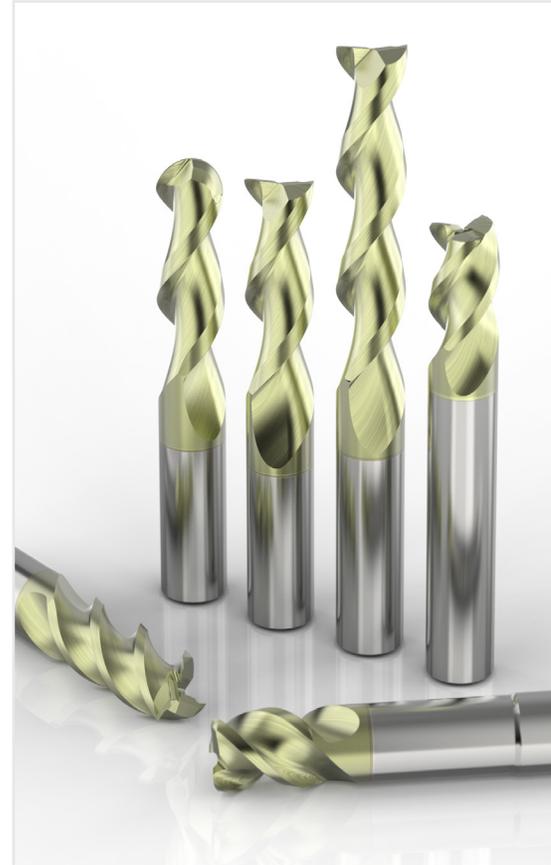
INDUSTRY TARGETS

- Aerospace
- Medical
- General Machining

SECO MATERIAL GROUPS

Non-Ferrous N16-N17

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EVERYTHING SECO AT YOUR FINGERTIPS

Simplification can become a strong competitive advantage, so we developed **My Pages** to streamline every interaction you have with us, no matter where you are. This simple, user friendly interface was designed to empower you with instantaneous, comprehensive metal cutting information whenever and wherever you need it.

VISIT SECOTOOLS.COM TO LEARN MORE

A245



- Cylindrical land to eliminate chatter
- Form ground flute shape
- Polished K-Land
- Wiper flat on end teeth
- ANF coating reduces friction and built up material

ITEM NUMBER	DESCRIPTION	DIMENSIONS IN INCH				FLUTES	COATING	SHANK TYPE
		FLUTE DIA.	SHANK DIA.	LOC	OAL			
17002948	A245-0.125-D2-S.0-Z2	1/8	1/8	1/4	1-1/2	2	-	CYLINDRICAL
10022702	A245-0.125-D2-S.0-Z2	1/8	1/8	1/4	1-1/2	2	ANF	CYLINDRICAL
17002949	A245-0.125-D3-S.0-Z2	1/8	1/8	3/8	1-1/2	2	-	CYLINDRICAL
10022703	A245-0.125-D3-S.0-Z2	1/8	1/8	3/8	1-1/2	2	ANF	CYLINDRICAL
17002950	A245-0.156-F2-S.0-Z2	5/32	3/16	5/16	2	2	-	CYLINDRICAL
10022704	A245-0.156-F2-S.0-Z2	5/32	3/16	5/16	2	2	ANF	CYLINDRICAL
17002951	A245-0.156-F3-S.0-Z2	5/32	3/16	1/2	2	2	-	CYLINDRICAL
10022705	A245-0.156-F3-S.0-Z2	5/32	3/16	1/2	2	2	ANF	CYLINDRICAL
17002952	A245-0.188-D2-S.0-Z2	3/16	3/16	5/16	2	2	-	CYLINDRICAL
10022706	A245-0.188-D2-S.0-Z2	3/16	3/16	5/16	2	2	ANF	CYLINDRICAL
17002953	A245-0.188-D3-S.0-Z2	3/16	3/16	9/16	2	2	-	CYLINDRICAL
10022707	A245-0.188-D3-S.0-Z2	3/16	3/16	9/16	2	2	ANF	CYLINDRICAL
17002955	A245-0.219-F3-S.0-Z2	7/32	1/4	3/4	2-1/2	2	-	CYLINDRICAL
10022708	A245-0.219-F3-S.0-Z2	7/32	1/4	3/4	2-1/2	2	ANF	CYLINDRICAL
17002956	A245-0.250-D2-S.0-Z2	1/4	1/4	3/8	2-1/2	2	-	CYLINDRICAL
10022709	A245-0.250-D2-S.0-Z2	1/4	1/4	3/8	2-1/2	2	ANF	CYLINDRICAL
17002957	A245-0.250-D3-S.0-Z2	1/4	1/4	3/4	2-1/2	2	-	CYLINDRICAL
10022710	A245-0.250-D3-S.0-Z2	1/4	1/4	3/4	2-1/2	2	ANF	CYLINDRICAL
17002958	A245-0.250-D5-S.0-Z2	1/4	1/4	1-1/4	4	2	-	CYLINDRICAL
10022711	A245-0.250-D5-S.0-Z2	1/4	1/4	1-1/4	4	2	ANF	CYLINDRICAL
17002961	A245-0.313-D1-S.0-Z2	5/16	5/16	7/16	2-1/2	2	-	CYLINDRICAL
10022712	A245-0.313-D1-S.0-Z2	5/16	5/16	7/16	2-1/2	2	ANF	CYLINDRICAL
17002962	A245-0.313-D3-S.0-Z2	5/16	5/16	13/16	2-1/2	2	-	CYLINDRICAL
10022713	A245-0.313-D3-S.0-Z2	5/16	5/16	13/16	2-1/2	2	ANF	CYLINDRICAL
17002963	A245-0.313-D4-S.0-Z2	5/16	5/16	1-1/4	3-1/2	2	-	CYLINDRICAL
10022714	A245-0.313-D4-S.0-Z2	5/16	5/16	1-1/4	3-1/2	2	ANF	CYLINDRICAL
17002967	A245-0.375-D1-S.0-Z2	3/8	3/8	1/2	2-1/2	2	-	CYLINDRICAL
10022715	A245-0.375-D1-S.0-Z2	3/8	3/8	1/2	2-1/2	2	ANF	CYLINDRICAL
17002968	A245-0.375-D3-S.0-Z2	3/8	3/8	1	2-1/2	2	-	CYLINDRICAL
10022716	A245-0.375-D3-S.0-Z2	3/8	3/8	1	2-1/2	2	ANF	CYLINDRICAL
17002969	A245-0.375-D4-S.0-Z2	3/8	3/8	1-1/2	4	2	-	CYLINDRICAL
10022717	A245-0.375-D4-S.0-Z2	3/8	3/8	1-1/2	4	2	ANF	CYLINDRICAL
17002976	A245-0.500-D1-S.0-Z2	1/2	1/2	5/8	3	2	-	CYLINDRICAL
10022718	A245-0.500-D1-S.0-Z2	1/2	1/2	5/8	3	2	ANF	CYLINDRICAL
17002977	A245-0.500-D3-S.0-Z2	1/2	1/2	1-1/4	3	2	-	CYLINDRICAL
10022719	A245-0.500-D3-S.0-Z2	1/2	1/2	1-1/4	3	2	ANF	CYLINDRICAL
17002978	A245-0.500-D4-S.0-Z2	1/2	1/2	2	4	2	-	CYLINDRICAL
10022720	A245-0.500-D4-S.0-Z2	1/2	1/2	2	4	2	ANF	CYLINDRICAL
17002979	A245-0.500-D6-S.0-Z2	1/2	1/2	3-1/8	6	2	-	CYLINDRICAL
10022721	A245-0.500-D6-S.0-Z2	1/2	1/2	3-1/8	6	2	ANF	CYLINDRICAL
17002981	A245-0.625-D3-S.0-Z2	5/8	5/8	1-5/8	3-1/2	2	-	CYLINDRICAL
10022722	A245-0.625-D3-S.0-Z2	5/8	5/8	1-5/8	3-1/2	2	ANF	CYLINDRICAL
17002982	A245-0.625-D4-S.0-Z2	5/8	5/8	2-1/2	5	2	-	CYLINDRICAL
10022723	A245-0.625-D4-S.0-Z2	5/8	5/8	2-1/2	5	2	ANF	CYLINDRICAL
17002983	A245-0.625-D6-S.0-Z2	5/8	5/8	3-3/4	6	2	-	CYLINDRICAL
10022724	A245-0.625-D6-S.0-Z2	5/8	5/8	3-3/4	6	2	ANF	CYLINDRICAL
17002984	A245-0.750-D1-S.0-Z2	3/4	3/4	1	3	2	-	CYLINDRICAL

A245 (CONT.)



ITEM NUMBER	DESCRIPTION	DIMENSIONS IN INCH				FLUTES	COATING	SHANK TYPE
		FLUTE DIA.	SHANK DIA.	LOC	OAL			
10022725	A245-0.750-D1-S.0-Z2	3/4	3/4	1	3	2	ANF	CYLINDRICAL
17002985	A245-0.750-D2-S.0-Z2	3/4	3/4	1-5/8	4	2	-	CYLINDRICAL
10022726	A245-0.750-D2-S.0-Z2	3/4	3/4	1-5/8	4	2	ANF	CYLINDRICAL
17002986	A245-0.750-D3-S.0-Z2	3/4	3/4	2-1/4	5	2	-	CYLINDRICAL
10022727	A245-0.750-D3-S.0-Z2	3/4	3/4	2-1/4	5	2	ANF	CYLINDRICAL
17002987	A245-0.750-D4-S.0-Z2	3/4	3/4	3-1/4	6	2	-	CYLINDRICAL
10022728	A245-0.750-D4-S.0-Z2	3/4	3/4	3-1/4	6	2	ANF	CYLINDRICAL
17002988	A245-0.750-D5-S.0-Z2	3/4	3/4	4	6-1/2	2	-	CYLINDRICAL
10022729	A245-0.750-D5-S.0-Z2	3/4	3/4	4	6-1/2	2	ANF	CYLINDRICAL
17002990	A245-1.000-D2-S.0-Z2	1	1	2	5	2	-	CYLINDRICAL
10022730	A245-1.000-D2-S.0-Z2	1	1	2	5	2	ANF	CYLINDRICAL
17002992	A245-1.000-D4-S.0-Z2	1	1	3-1/4	6	2	-	CYLINDRICAL
10022731	A245-1.000-D4-S.0-Z2	1	1	3-1/4	6	2	ANF	CYLINDRICAL

AB245



- Cylindrical land to eliminate chatter
- Form ground flute shape
- Polished K-Land
- ANF coating reduces friction and built up material

ITEM NUMBER	DESCRIPTION	DIMENSIONS IN INCH				FLUTES	COATING	SHANK TYPE
		FLUTE DIA.	SHANK DIA.	LOC	OAL			
17003632	AB245-0.250-D2-B.0-Z2	1/4	1/4	3/8	2-1/2	2	-	CYLINDRICAL
10022732	AB245-0.250-D2-B.0-Z2	1/4	1/4	3/8	2-1/2	2	ANF	CYLINDRICAL
17003633	AB245-0.250-D3-B.0-Z2	1/4	1/4	3/4	2-1/2	2	-	CYLINDRICAL
10022733	AB245-0.250-D3-B.0-Z2	1/4	1/4	3/4	2-1/2	2	ANF	CYLINDRICAL
17003635	AB245-0.313-D3-B.0-Z2	5/16	5/16	13/16	2-1/2	2	-	CYLINDRICAL
10022734	AB245-0.313-D3-B.0-Z2	5/16	5/16	13/16	2-1/2	2	ANF	CYLINDRICAL
17003636	AB245-0.375-D1-B.0-Z2	3/8	3/8	1/2	2-1/2	2	-	CYLINDRICAL
10022735	AB245-0.375-D1-B.0-Z2	3/8	3/8	1/2	2-1/2	2	ANF	CYLINDRICAL
17003637	AB245-0.375-D3-B.0-Z2	3/8	3/8	1	2-1/2	2	-	CYLINDRICAL
10022736	AB245-0.375-D3-B.0-Z2	3/8	3/8	1	2-1/2	2	ANF	CYLINDRICAL
17003640	AB245-0.500-D1-B.0-Z2	1/2	1/2	5/8	3	2	-	CYLINDRICAL
10022737	AB245-0.500-D1-B.0-Z2	1/2	1/2	5/8	3	2	ANF	CYLINDRICAL
17003641	AB245-0.500-D3-B.0-Z2	1/2	1/2	1-1/4	3	2	-	CYLINDRICAL
10022738	AB245-0.500-D3-B.0-Z2	1/2	1/2	1-1/4	3	2	ANF	CYLINDRICAL
17003645	AB245-0.750-D2-B.0-Z2	3/4	3/4	1-5/8	4	2	-	CYLINDRICAL
10022739	AB245-0.750-D2-B.0-Z2	3/4	3/4	1-5/8	4	2	ANF	CYLINDRICAL

ELITE A SERIES HIGH PERFORMANCE

A345



- Cylindrical land to eliminate chatter
- Form ground flute shape
- Polished K-Land
- Wiper flat on end teeth
- ANF coating reduces friction and built up material

ITEM NUMBER	DESCRIPTION	DIMENSIONS IN INCH				FLUTES	COATING	SHANK TYPE
		FLUTE DIA.	SHANK DIA.	LOC	OAL			
17003132	A345-0.125-D2-S.0-Z3	1/8	1/8	1/4	1-1/2	3	-	CYLINDRICAL
10023001	A345-0.125-D2-S.0-Z3	1/8	1/8	1/4	1-1/2	3	ANF	CYLINDRICAL
17003133	A345-0.125-D3-S.0-Z3	1/8	1/8	3/8	1-1/2	3	-	CYLINDRICAL
10023002	A345-0.125-D3-S.0-Z3	1/8	1/8	3/8	1-1/2	3	ANF	CYLINDRICAL
17003134	A345-0.156-F2-S.0-Z3	5/32	3/16	5/16	2	3	-	CYLINDRICAL
10023003	A345-0.156-F2-S.0-Z3	5/32	3/16	5/16	2	3	ANF	CYLINDRICAL
17003135	A345-0.156-F3-S.0-Z3	5/32	3/16	1/2	2	3	-	CYLINDRICAL
10023004	A345-0.156-F3-S.0-Z3	5/32	3/16	1/2	2	3	ANF	CYLINDRICAL
17003136	A345-0.188-D2-S.0-Z3	3/16	3/16	5/16	2	3	-	CYLINDRICAL
10023005	A345-0.188-D2-S.0-Z3	3/16	3/16	5/16	2	3	ANF	CYLINDRICAL
17003137	A345-0.188-D3-S.0-Z3	3/16	3/16	9/16	2	3	-	CYLINDRICAL
10023006	A345-0.188-D3-S.0-Z3	3/16	3/16	9/16	2	3	ANF	CYLINDRICAL
17003139	A345-0.219-F3-S.0-Z3	7/32	1/4	3/4	2-1/2	3	-	CYLINDRICAL
10023007	A345-0.219-F3-S.0-Z3	7/32	1/4	3/4	2-1/2	3	ANF	CYLINDRICAL
17003140	A345-0.250-D2-S.0-Z3	1/4	1/4	3/8	2-1/2	3	-	CYLINDRICAL
10023008	A345-0.250-D2-S.0-Z3	1/4	1/4	3/8	2-1/2	3	ANF	CYLINDRICAL
17003141	A345-0.250-D3-S.0-Z3	1/4	1/4	3/4	2-1/2	3	-	CYLINDRICAL
10023009	A345-0.250-D3-S.0-Z3	1/4	1/4	3/4	2-1/2	3	ANF	CYLINDRICAL
17003142	A345-0.250-D5-S.0-Z3	1/4	1/4	1-1/4	4	3	-	CYLINDRICAL
10023010	A345-0.250-D5-S.0-Z3	1/4	1/4	1-1/4	4	3	ANF	CYLINDRICAL
17003145	A345-0.313-D1-S.0-Z3	5/16	5/16	7/16	2-1/2	3	-	CYLINDRICAL
10023011	A345-0.313-D1-S.0-Z3	5/16	5/16	7/16	2-1/2	3	ANF	CYLINDRICAL
17003146	A345-0.313-D3-S.0-Z3	5/16	5/16	13/16	2-1/2	3	-	CYLINDRICAL
10023012	A345-0.313-D3-S.0-Z3	5/16	5/16	13/16	2-1/2	3	ANF	CYLINDRICAL
17003147	A345-0.313-D4-S.0-Z3	5/16	5/16	1-1/4	3-1/2	3	-	CYLINDRICAL
10023013	A345-0.313-D4-S.0-Z3	5/16	5/16	1-1/4	3-1/2	3	ANF	CYLINDRICAL
17003148	A345-0.313-D7-S.0-Z3	5/16	5/16	2-1/4	4	3	-	CYLINDRICAL
10023014	A345-0.313-D7-S.0-Z3	5/16	5/16	2-1/4	4	3	ANF	CYLINDRICAL
17003151	A345-0.375-D1-S.0-Z3	3/8	3/8	1/2	2-1/2	3	-	CYLINDRICAL
10023015	A345-0.375-D1-S.0-Z3	3/8	3/8	1/2	2-1/2	3	ANF	CYLINDRICAL
17003152	A345-0.375-D3-S.0-Z3	3/8	3/8	1	2-1/2	3	-	CYLINDRICAL
10023016	A345-0.375-D3-S.0-Z3	3/8	3/8	1	2-1/2	3	ANF	CYLINDRICAL
17003153	A345-0.375-D4-S.0-Z3	3/8	3/8	1-1/2	4	3	-	CYLINDRICAL
10023017	A345-0.375-D4-S.0-Z3	3/8	3/8	1-1/2	4	3	ANF	CYLINDRICAL
17003157	A345-0.438-D2-S.0-Z3	7/16	7/16	1	2-3/4	3	-	CYLINDRICAL
10023018	A345-0.438-D2-S.0-Z3	7/16	7/16	1	2-3/4	3	ANF	CYLINDRICAL
17003160	A345-0.500-D1-S.0-Z3	1/2	1/2	5/8	3	3	-	CYLINDRICAL
10023019	A345-0.500-D1-S.0-Z3	1/2	1/2	5/8	3	3	ANF	CYLINDRICAL
17003161	A345-0.500-D3-S.0-Z3	1/2	1/2	1-1/4	3	3	-	CYLINDRICAL
10023020	A345-0.500-D3-S.0-Z3	1/2	1/2	1-1/4	3	3	ANF	CYLINDRICAL
17003162	A345-0.500-D4-S.0-Z3	1/2	1/2	2	4	3	-	CYLINDRICAL
10023021	A345-0.500-D4-S.0-Z3	1/2	1/2	2	4	3	ANF	CYLINDRICAL
17003163	A345-0.500-D6-S.0-Z3	1/2	1/2	3-1/8	6	3	-	CYLINDRICAL
10023022	A345-0.500-D6-S.0-Z3	1/2	1/2	3-1/8	6	3	ANF	CYLINDRICAL
17003164	A345-0.625-D1-S.0-Z3	5/8	5/8	3/4	3	3	-	CYLINDRICAL
10023023	A345-0.625-D1-S.0-Z3	5/8	5/8	3/4	3	3	ANF	CYLINDRICAL
17003165	A345-0.625-D3-S.0-Z3	5/8	5/8	1-5/8	3-1/2	3	-	CYLINDRICAL

A345 (CONT.)



ITEM NUMBER	DESCRIPTION	DIMENSIONS IN INCH				FLUTES	COATING	SHANK TYPE
		FLUTE DIA.	SHANK DIA.	LOC	OAL			
10023024	A345-0.625-D3-S.0-Z3	5/8	5/8	1-5/8	3-1/2	3	ANF	CYLINDRICAL
17003166	A345-0.625-D4-S.0-Z3	5/8	5/8	2-1/2	5	3	-	CYLINDRICAL
10023025	A345-0.625-D4-S.0-Z3	5/8	5/8	2-1/2	5	3	ANF	CYLINDRICAL
17003168	A345-0.750-D1-S.0-Z3	3/4	3/4	1	3	3	-	CYLINDRICAL
10023026	A345-0.750-D1-S.0-Z3	3/4	3/4	1	3	3	ANF	CYLINDRICAL
17003169	A345-0.750-D2-S.0-Z3	3/4	3/4	1-5/8	4	3	-	CYLINDRICAL
10023027	A345-0.750-D2-S.0-Z3	3/4	3/4	1-5/8	4	3	ANF	CYLINDRICAL
17003170	A345-0.750-D3-S.0-Z3	3/4	3/4	2-1/4	5	3	-	CYLINDRICAL
10023028	A345-0.750-D3-S.0-Z3	3/4	3/4	2-1/4	5	3	ANF	CYLINDRICAL
17003171	A345-0.750-D4-S.0-Z3	3/4	3/4	3-1/4	6	3	-	CYLINDRICAL
10023029	A345-0.750-D4-S.0-Z3	3/4	3/4	3-1/4	6	3	ANF	CYLINDRICAL
17003172	A345-0.750-D5-S.0-Z3	3/4	3/4	4	6-1/2	3	-	CYLINDRICAL
10023030	A345-0.750-D5-S.0-Z3	3/4	3/4	4	6-1/2	3	ANF	CYLINDRICAL
17003173	A345-1.000-D1-S.0-Z3	1	1	1-1/4	4	3	-	CYLINDRICAL
10023031	A345-1.000-D1-S.0-Z3	1	1	1-1/4	4	3	ANF	CYLINDRICAL
17003174	A345-1.000-D2-S.0-Z3	1	1	2	5	3	-	CYLINDRICAL
10023032	A345-1.000-D2-S.0-Z3	1	1	2	5	3	ANF	CYLINDRICAL
17003175	A345-1.000-D3-S.0-Z3	1	1	2-5/8	6	3	-	CYLINDRICAL
10023033	A345-1.000-D3-S.0-Z3	1	1	2-5/8	6	3	ANF	CYLINDRICAL
17003176	A345-1.000-D4-S.0-Z3	1	1	3-1/4	6	3	-	CYLINDRICAL
10023034	A345-1.000-D4-S.0-Z3	1	1	3-1/4	6	3	ANF	CYLINDRICAL
17003177	A345-1.000-D5-S.0-Z3	1	1	4-1/8	7	3	-	CYLINDRICAL
10023035	A345-1.000-D5-S.0-Z3	1	1	4-1/8	7	3	ANF	CYLINDRICAL



A345M



- Cylindrical land to eliminate chatter
- Form ground flute shape
- Polished K-Land
- Wiper flat on end teeth
- ANF coating reduces friction and built up material

ITEM NUMBER	DESCRIPTION	DIMENSIONS IN METRIC				FLUTES	COATING	SHANK TYPE
		FLUTE DIA.	SHANK DIA.	LOC	OAL			
10023168	A345M-030-D4-S-0-Z3	3	3	12	39	3	ANF	CYLINDRICAL
10023169	A345M-040-D3-S-0-Z3	4	4	12	51	3	ANF	CYLINDRICAL
10023170	A345M-050-D3-S-0-Z3	5	5	14	51	3	ANF	CYLINDRICAL
10023171	A345M-060-D3-S-0-Z3	6	6	16	58	3	ANF	CYLINDRICAL
10023172	A345M-080-D2-S-0-Z3	8	8	20	64	3	ANF	CYLINDRICAL
10023173	A345M-100-D2-S-0-Z3	10	10	22	73	3	ANF	CYLINDRICAL
10023174	A345M-120-D3-S-0-Z3	12	12	32	84	3	ANF	CYLINDRICAL
10023175	A345M-160-D2-S-0-Z3	16	16	36	93	3	ANF	CYLINDRICAL
10023176	A345M-200-D3-S-0-Z3	20	20	50	105	3	ANF	CYLINDRICAL

A345R



- Cylindrical land to eliminate chatter
- Form ground flute shape
- Polished K-Land
- Wiper flat on end teeth
- ANF coating reduces friction and built up material

ITEM NUMBER	DESCRIPTION	DIMENSIONS IN INCH				FLUTES	COATING	RADIUS	SHANK TYPE
		FLUTE DIA.	SHANK DIA.	LOC	OAL				
10023036	A345R-0.125-D3-R010.0-Z3	1/8	1/8	3/8	1-1/2	3	ANF	0.010	CYLINDRICAL
10023037	A345R-0.125-D3-R020.0-Z3	1/8	1/8	3/8	1-1/2	3	ANF	0.020	CYLINDRICAL
10023038	A345R-0.125-D3-R030.0-Z3	1/8	1/8	3/8	1-1/2	3	ANF	0.030	CYLINDRICAL
10023039	A345R-0.156-F3-R010.0-Z3	5/32	3/16	1/2	2	3	ANF	0.010	CYLINDRICAL
10023040	A345R-0.156-F3-R020.0-Z3	5/32	3/16	1/2	2	3	ANF	0.020	CYLINDRICAL
10023041	A345R-0.156-F3-R030.0-Z3	5/32	3/16	1/2	2	3	ANF	0.030	CYLINDRICAL
10023042	A345R-0.188-D3-R010.0-Z3	3/16	3/16	9/16	2	3	ANF	0.010	CYLINDRICAL
10023043	A345R-0.188-D3-R020.0-Z3	3/16	3/16	9/16	2	3	ANF	0.020	CYLINDRICAL
10023044	A345R-0.188-D3-R030.0-Z3	3/16	3/16	9/16	2	3	ANF	0.030	CYLINDRICAL
10023045	A345R-0.219-F3-R010.0-Z3	7/32	1/4	3/4	2-1/2	3	ANF	0.010	CYLINDRICAL
10023046	A345R-0.219-F3-R020.0-Z3	7/32	1/4	3/4	2-1/2	3	ANF	0.020	CYLINDRICAL
10023047	A345R-0.219-F3-R030.0-Z3	7/32	1/4	3/4	2-1/2	3	ANF	0.030	CYLINDRICAL
10023048	A345R-0.250-D3-R010.0-Z3	1/4	1/4	3/4	2-1/2	3	ANF	0.010	CYLINDRICAL
10023049	A345R-0.250-D3-R020.0-Z3	1/4	1/4	3/4	2-1/2	3	ANF	0.020	CYLINDRICAL
10023050	A345R-0.250-D3-R030.0-Z3	1/4	1/4	3/4	2-1/2	3	ANF	0.030	CYLINDRICAL
10023051	A345R-0.250-D3-R045.0-Z3	1/4	1/4	3/4	2-1/2	3	ANF	0.045	CYLINDRICAL
10023052	A345R-0.250-D3-R060.0-Z3	1/4	1/4	3/4	2-1/2	3	ANF	0.060	CYLINDRICAL
10023053	A345R-0.375-D3-R010.0-Z3	3/8	3/8	1	2-1/2	3	ANF	0.010	CYLINDRICAL
10023054	A345R-0.375-D3-R020.0-Z3	3/8	3/8	1	2-1/2	3	ANF	0.020	CYLINDRICAL
10023055	A345R-0.375-D3-R030.0-Z3	3/8	3/8	1	2-1/2	3	ANF	0.030	CYLINDRICAL
10023056	A345R-0.375-D3-R045.0-Z3	3/8	3/8	1	2-1/2	3	ANF	0.045	CYLINDRICAL
10023057	A345R-0.375-D3-R060.0-Z3	3/8	3/8	1	2-1/2	3	ANF	0.060	CYLINDRICAL
10023058	A345R-0.500-D1-R010.0-Z3	1/2	1/2	5/8	3	3	ANF	0.010	CYLINDRICAL
10023059	A345R-0.500-D1-R020.0-Z3	1/2	1/2	5/8	3	3	ANF	0.020	CYLINDRICAL
10023060	A345R-0.500-D1-R030.0-Z3	1/2	1/2	5/8	3	3	ANF	0.030	CYLINDRICAL

ELITE A SERIES HIGH PERFORMANCE

A345R (CONT.)



ITEM NUMBER	DESCRIPTION	DIMENSIONS IN INCH				FLUTES	COATING	RADIUS	SHANK TYPE
		FLUTE DIA.	SHANK DIA.	LOC	OAL				
10023061	A345R-0.500-D1-R045.0-Z3	1/2	1/2	5/8	3	3	ANF	0.045	CYLINDRICAL
10023062	A345R-0.500-D1-R060.0-Z3	1/2	1/2	5/8	3	3	ANF	0.060	CYLINDRICAL
10023063	A345R-0.500-D1-R090.0-Z3	1/2	1/2	5/8	3	3	ANF	0.090	CYLINDRICAL
10023064	A345R-0.500-D1-R125.0-Z3	1/2	1/2	5/8	3	3	ANF	0.125	CYLINDRICAL
10023065	A345R-0.500-D3-R010.0-Z3	1/2	1/2	1-1/4	3	3	ANF	0.010	CYLINDRICAL
10023066	A345R-0.500-D3-R020.0-Z3	1/2	1/2	1-1/4	3	3	ANF	0.020	CYLINDRICAL
10023067	A345R-0.500-D3-R030.0-Z3	1/2	1/2	1-1/4	3	3	ANF	0.030	CYLINDRICAL
10023068	A345R-0.500-D3-R045.0-Z3	1/2	1/2	1-1/4	3	3	ANF	0.045	CYLINDRICAL
10023069	A345R-0.500-D3-R060.0-Z3	1/2	1/2	1-1/4	3	3	ANF	0.060	CYLINDRICAL
10023070	A345R-0.500-D3-R090.0-Z3	1/2	1/2	1-1/4	3	3	ANF	0.090	CYLINDRICAL
10023071	A345R-0.500-D3-R125.0-Z3	1/2	1/2	1-1/4	3	3	ANF	0.125	CYLINDRICAL
10023072	A345R-0.500-D4-R010.0-Z3	1/2	1/2	2	4	3	ANF	0.010	CYLINDRICAL
10023073	A345R-0.500-D4-R020.0-Z3	1/2	1/2	2	4	3	ANF	0.020	CYLINDRICAL
10023074	A345R-0.500-D4-R030.0-Z3	1/2	1/2	2	4	3	ANF	0.030	CYLINDRICAL
10023075	A345R-0.500-D4-R045.0-Z3	1/2	1/2	2	4	3	ANF	0.045	CYLINDRICAL
10023076	A345R-0.500-D4-R060.0-Z3	1/2	1/2	2	4	3	ANF	0.060	CYLINDRICAL
10023077	A345R-0.500-D4-R090.0-Z3	1/2	1/2	2	4	3	ANF	0.090	CYLINDRICAL
10023078	A345R-0.500-D4-R125.0-Z3	1/2	1/2	2	4	3	ANF	0.125	CYLINDRICAL
10023079	A345R-0.625-D3-R010.0-Z3	5/8	5/8	1-5/8	3-1/2	3	ANF	0.010	CYLINDRICAL
10023080	A345R-0.625-D3-R020.0-Z3	5/8	5/8	1-5/8	3-1/2	3	ANF	0.020	CYLINDRICAL
10023081	A345R-0.625-D3-R030.0-Z3	5/8	5/8	1-5/8	3-1/2	3	ANF	0.030	CYLINDRICAL
10023082	A345R-0.625-D3-R045.0-Z3	5/8	5/8	1-5/8	3-1/2	3	ANF	0.045	CYLINDRICAL
10023083	A345R-0.625-D3-R060.0-Z3	5/8	5/8	1-5/8	3-1/2	3	ANF	0.060	CYLINDRICAL
10023084	A345R-0.625-D3-R090.0-Z3	5/8	5/8	1-5/8	3-1/2	3	ANF	0.090	CYLINDRICAL
10023085	A345R-0.625-D3-R125.0-Z3	5/8	5/8	1-5/8	3-1/2	3	ANF	0.125	CYLINDRICAL
10023086	A345R-0.750-D1-R010.0-Z3	3/4	3/4	1	3	3	ANF	0.010	CYLINDRICAL
10023087	A345R-0.750-D1-R020.0-Z3	3/4	3/4	1	3	3	ANF	0.020	CYLINDRICAL
10023088	A345R-0.750-D1-R030.0-Z3	3/4	3/4	1	3	3	ANF	0.030	CYLINDRICAL
10023089	A345R-0.750-D1-R045.0-Z3	3/4	3/4	1	3	3	ANF	0.045	CYLINDRICAL
10023090	A345R-0.750-D1-R060.0-Z3	3/4	3/4	1	3	3	ANF	0.060	CYLINDRICAL
10023091	A345R-0.750-D1-R090.0-Z3	3/4	3/4	1	3	3	ANF	0.090	CYLINDRICAL
10023092	A345R-0.750-D1-R125.0-Z3	3/4	3/4	1	3	3	ANF	0.125	CYLINDRICAL
10023093	A345R-0.750-D1-R190.0-Z3	3/4	3/4	1	3	3	ANF	0.190	CYLINDRICAL
10023094	A345R-0.750-D3-R010.0-Z3	3/4	3/4	2-1/4	5	3	ANF	0.010	CYLINDRICAL
10023095	A345R-0.750-D3-R020.0-Z3	3/4	3/4	2-1/4	5	3	ANF	0.020	CYLINDRICAL
10023096	A345R-0.750-D3-R030.0-Z3	3/4	3/4	2-1/4	5	3	ANF	0.030	CYLINDRICAL
10023097	A345R-0.750-D3-R045.0-Z3	3/4	3/4	2-1/4	5	3	ANF	0.045	CYLINDRICAL
10023098	A345R-0.750-D3-R060.0-Z3	3/4	3/4	2-1/4	5	3	ANF	0.060	CYLINDRICAL
10023099	A345R-0.750-D3-R090.0-Z3	3/4	3/4	2-1/4	5	3	ANF	0.090	CYLINDRICAL
10023100	A345R-0.750-D3-R125.0-Z3	3/4	3/4	2-1/4	5	3	ANF	0.125	CYLINDRICAL
10023101	A345R-0.750-D3-R190.0-Z3	3/4	3/4	2-1/4	5	3	ANF	0.190	CYLINDRICAL
10023102	A345R-1.000-D3-R010.0-Z3	1	1	2-5/8	6	3	ANF	0.010	CYLINDRICAL
10023103	A345R-1.000-D3-R020.0-Z3	1	1	2-5/8	6	3	ANF	0.020	CYLINDRICAL
10023104	A345R-1.000-D3-R030.0-Z3	1	1	2-5/8	6	3	ANF	0.030	CYLINDRICAL
10023105	A345R-1.000-D3-R045.0-Z3	1	1	2-5/8	6	3	ANF	0.045	CYLINDRICAL
10023106	A345R-1.000-D3-R060.0-Z3	1	1	2-5/8	6	3	ANF	0.060	CYLINDRICAL
10023107	A345R-1.000-D3-R090.0-Z3	1	1	2-5/8	6	3	ANF	0.090	CYLINDRICAL
10023108	A345R-1.000-D3-R125.0-Z3	1	1	2-5/8	6	3	ANF	0.125	CYLINDRICAL
10023109	A345R-1.000-D3-R190.0-Z3	1	1	2-5/8	6	3	ANF	0.190	CYLINDRICAL

AN345



- Cylindrical land to eliminate chatter
- Form ground flute shape
- Polished K-Land
- Wiper flat on end teeth
- ANF coating reduces friction and built up material

ITEM NUMBER	DESCRIPTION	DIMENSIONS IN INCH						FLUTES	COATING	SHANK TYPE
		FLUTE DIA.	SHANK DIA.	LOC	OAL	DN	LN			
17000012	AN345-0.250-E2-S-0-Z3	1/4	1/4	3/8	4	0.240	2-1/8	3	-	CYLINDRICAL
10023110	AN345-0.250-E2-S-0-Z3	1/4	1/4	3/8	4	0.240	2-1/8	3	ANF	CYLINDRICAL
17002222	AN345-0.250-E3-S-0-Z3	1/4	1/4	1/2	3	0.240	1	3	-	CYLINDRICAL
10023111	AN345-0.250-E3-S-0-Z3	1/4	1/4	1/2	3	0.240	1	3	ANF	CYLINDRICAL
17002223	AN345-0.250-E4-S-0-Z3	1/4	1/4	1/2	4	0.240	1-1/2	3	-	CYLINDRICAL
10023112	AN345-0.250-E4-S-0-Z3	1/4	1/4	1/2	4	0.240	1-1/2	3	ANF	CYLINDRICAL
17000013	AN345-0.313-E1-S-0-Z3	5/16	5/16	7/16	4	0.300	2-1/8	3	-	CYLINDRICAL
10023113	AN345-0.313-E1-S-0-Z3	5/16	5/16	7/16	4	0.300	2-1/8	3	ANF	CYLINDRICAL
17000014	AN345-0.375-E1-S-0-Z3	3/8	3/8	3/8	2-1/2	0.360	1-1/8	3	-	CYLINDRICAL
10023114	AN345-0.375-E1-S-0-Z3	3/8	3/8	3/8	2-1/2	0.360	1-1/8	3	ANF	CYLINDRICAL
17000015	AN345-0.375-E2-S-0-Z3	3/8	3/8	1/2	4	0.360	2-1/8	3	-	CYLINDRICAL
10023115	AN345-0.375-E2-S-0-Z3	3/8	3/8	1/2	4	0.360	2-1/8	3	ANF	CYLINDRICAL
17000016	AN345-0.375-E3-S-0-Z3	3/8	3/8	1/2	6	0.360	4-1/8	3	-	CYLINDRICAL
10023116	AN345-0.375-E3-S-0-Z3	3/8	3/8	1/2	6	0.360	4-1/8	3	ANF	CYLINDRICAL
17002224	AN345-0.375-E4-S-0-Z3	3/8	3/8	3/4	4	0.360	2	3	-	CYLINDRICAL
10023118	AN345-0.375-E4-S-0-Z3	3/8	3/8	3/4	4	0.360	2	3	ANF	CYLINDRICAL
17002225	AN345-0.375-E5-S-0-Z3	3/8	3/8	3/4	5	0.360	3	3	-	CYLINDRICAL
10023119	AN345-0.375-E5-S-0-Z3	3/8	3/8	3/4	5	0.360	3	3	ANF	CYLINDRICAL
17000018	AN345-0.500-E2-S-0-Z3	1/2	1/2	5/8	4	0.480	2-1/8	3	-	CYLINDRICAL
10023120	AN345-0.500-E2-S-0-Z3	1/2	1/2	5/8	4	0.480	2-1/8	3	ANF	CYLINDRICAL
17002226	AN345-0.500-E4-S-0-Z3	1/2	1/2	5/8	5	0.480	3	3	-	CYLINDRICAL
10023121	AN345-0.500-E4-S-0-Z3	1/2	1/2	5/8	5	0.480	3	3	ANF	CYLINDRICAL
17000019	AN345-0.500-E3-S-0-Z3	1/2	1/2	5/8	6	0.480	4-1/8	3	-	CYLINDRICAL
10023122	AN345-0.500-E3-S-0-Z3	1/2	1/2	5/8	6	0.480	4-1/8	3	ANF	CYLINDRICAL
17000021	AN345-0.625-E2-S-0-Z3	5/8	5/8	3/4	6	0.600	4	3	-	CYLINDRICAL
10023123	AN345-0.625-E2-S-0-Z3	5/8	5/8	3/4	6	0.600	4	3	ANF	CYLINDRICAL
17000024	AN345-0.750-E3-S-0-Z3	3/4	3/4	1	6	0.720	3-1/2	3	-	CYLINDRICAL
10023124	AN345-0.750-E3-S-0-Z3	3/4	3/4	1	6	0.720	3-1/2	3	ANF	CYLINDRICAL
17000025	AN345-0.750-E4-S-0-Z3	3/4	3/4	1	7	0.720	4-1/8	3	-	CYLINDRICAL
10023125	AN345-0.750-E4-S-0-Z3	3/4	3/4	1	7	0.720	4-1/8	3	ANF	CYLINDRICAL
17000027	AN345-1.000-E2-S-0-Z3	1	1	1-1/4	6	0.960	3-1/2	3	-	CYLINDRICAL
10023126	AN345-1.000-E2-S-0-Z3	1	1	1-1/4	6	0.960	3-1/2	3	ANF	CYLINDRICAL

ELITE A SERIES HIGH PERFORMANCE

AN345R



- Cylindrical land to eliminate chatter
- Form ground flute shape
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ITEM NUMBER	DESCRIPTION	DIMENSIONS IN INCH						FLUTES	COATING	RADIUS	SHANK TYPE
		FLUTE DIA.	SHANK DIA.	LOC	OAL	DN	LN				
10023127	AN345R-0.250-E2-R010.0-Z3	1/4	1/4	3/8	4	0.240	2-1/8	3	ANF	0.010	CYLINDRICAL
10023128	AN345R-0.250-E2-R020.0-Z3	1/4	1/4	3/8	4	0.240	2-1/8	3	ANF	0.020	CYLINDRICAL
10023129	AN345R-0.250-E2-R030.0-Z3	1/4	1/4	3/8	4	0.240	2-1/8	3	ANF	0.030	CYLINDRICAL
10023130	AN345R-0.250-E2-R060.0-Z3	1/4	1/4	3/8	4	0.240	2-1/8	3	ANF	0.060	CYLINDRICAL
10023131	AN345R-0.250-E4-R010.0-Z3	1/4	1/4	1/2	4	0.240	1-1/2	3	ANF	0.010	CYLINDRICAL
10023132	AN345R-0.250-E4-R020.0-Z3	1/4	1/4	1/2	4	0.240	1-1/2	3	ANF	0.020	CYLINDRICAL
10023133	AN345R-0.250-E4-R030.0-Z3	1/4	1/4	1/2	4	0.240	1-1/2	3	ANF	0.030	CYLINDRICAL
10023134	AN345R-0.250-E4-R060.0-Z3	1/4	1/4	1/2	4	0.240	1-1/2	3	ANF	0.060	CYLINDRICAL
10023135	AN345R-0.375-E2-R010.0-Z3	3/8	3/8	1/2	4	0.360	2-1/8	3	ANF	0.010	CYLINDRICAL
10023136	AN345R-0.375-E2-R030.0-Z3	3/8	3/8	1/2	4	0.360	2-1/8	3	ANF	0.030	CYLINDRICAL
10023137	AN345R-0.375-E2-R060.0-Z3	3/8	3/8	1/2	4	0.360	2-1/8	3	ANF	0.060	CYLINDRICAL
10023138	AN345R-0.375-E3-R010.0-Z3	3/8	3/8	1/2	6	0.360	4-1/8	3	ANF	0.010	CYLINDRICAL
10023139	AN345R-0.375-E3-R030.0-Z3	3/8	3/8	1/2	6	0.360	4-1/8	3	ANF	0.030	CYLINDRICAL
10023140	AN345R-0.375-E3-R060.0-Z3	3/8	3/8	1/2	6	0.360	4-1/8	3	ANF	0.060	CYLINDRICAL
10023141	AN345R-0.375-E4-R010.0-Z3	3/8	3/8	3/4	4	0.360	2	3	ANF	0.010	CYLINDRICAL
10023142	AN345R-0.375-E4-R030.0-Z3	3/8	3/8	3/4	4	0.360	2	3	ANF	0.030	CYLINDRICAL
10023143	AN345R-0.375-E4-R060.0-Z3	3/8	3/8	3/4	4	0.360	2	3	ANF	0.060	CYLINDRICAL
10023144	AN345R-0.375-E5-R010.0-Z3	3/8	3/8	3/4	5	0.360	3	3	ANF	0.010	CYLINDRICAL
10023145	AN345R-0.375-E5-R030.0-Z3	3/8	3/8	3/4	5	0.360	3	3	ANF	0.030	CYLINDRICAL
10023146	AN345R-0.375-E5-R060.0-Z3	3/8	3/8	3/4	5	0.360	3	3	ANF	0.060	CYLINDRICAL
10023147	AN345R-0.500-E2-R010.0-Z3	1/2	1/2	5/8	4	0.480	2-1/8	3	ANF	0.010	CYLINDRICAL
10023148	AN345R-0.500-E2-R030.0-Z3	1/2	1/2	5/8	4	0.480	2-1/8	3	ANF	0.030	CYLINDRICAL
10023149	AN345R-0.500-E2-R060.0-Z3	1/2	1/2	5/8	4	0.480	2-1/8	3	ANF	0.060	CYLINDRICAL
10023150	AN345R-0.500-E2-R090.0-Z3	1/2	1/2	5/8	4	0.480	2-1/8	3	ANF	0.090	CYLINDRICAL
10023151	AN345R-0.500-E2-R125.0-Z3	1/2	1/2	5/8	4	0.480	2-1/8	3	ANF	0.125	CYLINDRICAL
10023152	AN345R-0.500-E3-R010.0-Z3	1/2	1/2	5/8	5	0.480	3	3	ANF	0.010	CYLINDRICAL
10023153	AN345R-0.500-E3-R030.0-Z3	1/2	1/2	5/8	5	0.480	3	3	ANF	0.030	CYLINDRICAL
10023154	AN345R-0.500-E3-R060.0-Z3	1/2	1/2	5/8	5	0.480	3	3	ANF	0.060	CYLINDRICAL
10023155	AN345R-0.500-E3-R090.0-Z3	1/2	1/2	5/8	5	0.480	3	3	ANF	0.090	CYLINDRICAL
10023156	AN345R-0.500-E3-R125.0-Z3	1/2	1/2	5/8	5	0.480	3	3	ANF	0.125	CYLINDRICAL
10023157	AN345R-0.500-E4-R010.0-Z3	1/2	1/2	5/8	6	0.480	4-1/8	3	ANF	0.010	CYLINDRICAL
10023158	AN345R-0.500-E4-R030.0-Z3	1/2	1/2	5/8	6	0.480	4-1/8	3	ANF	0.030	CYLINDRICAL
10023159	AN345R-0.500-E4-R060.0-Z3	1/2	1/2	5/8	6	0.480	4-1/8	3	ANF	0.060	CYLINDRICAL
10023160	AN345R-0.500-E4-R090.0-Z3	1/2	1/2	5/8	6	0.480	4-1/8	3	ANF	0.090	CYLINDRICAL
10023161	AN345R-0.500-E4-R125.0-Z3	1/2	1/2	5/8	6	0.480	4-1/8	3	ANF	0.125	CYLINDRICAL
10023162	AN345R-0.750-E3-R010.0-Z3	3/4	3/4	1	6	0.720	3-1/2	3	ANF	0.010	CYLINDRICAL
10023163	AN345R-0.750-E3-R020.0-Z3	3/4	3/4	1	6	0.720	3-1/2	3	ANF	0.020	CYLINDRICAL
10023164	AN345R-0.750-E3-R030.0-Z3	3/4	3/4	1	6	0.720	3-1/2	3	ANF	0.030	CYLINDRICAL
10023165	AN345R-0.750-E3-R060.0-Z3	3/4	3/4	1	6	0.720	3-1/2	3	ANF	0.060	CYLINDRICAL
10023166	AN345R-0.750-E3-R090.0-Z3	3/4	3/4	1	6	0.720	3-1/2	3	ANF	0.090	CYLINDRICAL
10023167	AN345R-0.750-E3-R125.0-Z3	3/4	3/4	1	6	0.720	3-1/2	3	ANF	0.125	CYLINDRICAL

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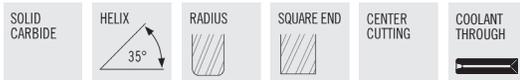
AN230 & AN230R



ITEM NUMBER	DESCRIPTION	DIMENSIONS IN INCH						FLUTES	COATING	RADIUS	SHANK TYPE
		FLUTE DIA.	SHANK DIA.	LOC	OAL	NECK DIA.	REACH				
03302585	AN230-0.500-E2-S-0-Z2	1/2	1/2	3/4	3	0.470	1-1/4	2	-	-	CYLINDRICAL
03302588	AN230-0.500-E3-S-0-Z2	1/2	1/2	3/4	3-1/2	0.470	1-3/4	2	-	-	CYLINDRICAL
03302591	AN230-0.500-E4-S-0-Z2	1/2	1/2	3/4	4	0.470	2-1/4	2	-	-	CYLINDRICAL
03302594	AN230-0.500-E5-S-0-Z2	1/2	1/2	3/4	4-1/2	0.470	2-3/4	2	-	-	CYLINDRICAL
03302597	AN230-0.750-E2-S-0-Z2	3/4	3/4	1	4	0.720	2-1/8	2	-	-	CYLINDRICAL
03302602	AN230-0.750-E3-S-0-Z2	3/4	3/4	1	4-1/2	0.720	2-5/8	2	-	-	CYLINDRICAL
03302607	AN230-0.750-E4-S-0-Z2	3/4	3/4	1	5	0.720	3-1/8	2	-	-	CYLINDRICAL
03302612	AN230-0.750-E5-S-0-Z2	3/4	3/4	1	5-1/2	0.720	3-5/8	2	-	-	CYLINDRICAL
03302617	AN230-1.000-E2-S-0-Z2	1	1	1-1/4	4	0.960	2-1/8	2	-	-	CYLINDRICAL
03302622	AN230-1.000-E3-S-0-Z2	1	1	1-1/4	4-1/2	0.960	2-5/8	2	-	-	CYLINDRICAL
03302627	AN230-1.000-E4-S-0-Z2	1	1	1-1/4	5	0.960	3-1/8	2	-	-	CYLINDRICAL
03302586	AN230R-0.500-E2-R030.0-Z2	1/2	1/2	3/4	3	0.470	1-1/4	2	-	0.030	CYLINDRICAL
03302587	AN230R-0.500-E2-R060.0-Z2	1/2	1/2	3/4	3	0.470	1-1/4	2	-	0.060	CYLINDRICAL
03302589	AN230R-0.500-E3-R030.0-Z2	1/2	1/2	3/4	3-1/2	0.470	1-3/4	2	-	0.030	CYLINDRICAL
03302590	AN230R-0.500-E3-R060.0-Z2	1/2	1/2	3/4	3-1/2	0.470	1-3/4	2	-	0.060	CYLINDRICAL
03302592	AN230R-0.500-E4-R030.0-Z2	1/2	1/2	3/4	4	0.470	2-1/4	2	-	0.030	CYLINDRICAL
03302593	AN230R-0.500-E4-R060.0-Z2	1/2	1/2	3/4	4	0.470	2-1/4	2	-	0.060	CYLINDRICAL
03302595	AN230R-0.500-E5-R030.0-Z2	1/2	1/2	3/4	4-1/2	0.470	2-3/4	2	-	0.030	CYLINDRICAL
03302596	AN230R-0.500-E5-R060.0-Z2	1/2	1/2	3/4	4-1/2	0.470	2-3/4	2	-	0.060	CYLINDRICAL
03302598	AN230R-0.750-E2-R030.0-Z2	3/4	3/4	1	4	0.720	2-1/8	2	-	0.030	CYLINDRICAL
03302599	AN230R-0.750-E2-R060.0-Z2	3/4	3/4	1	4	0.720	2-1/8	2	-	0.060	CYLINDRICAL
03302600	AN230R-0.750-E2-R090.0-Z2	3/4	3/4	1	4	0.720	2-1/8	2	-	0.090	CYLINDRICAL
03302601	AN230R-0.750-E2-R120.0-Z2	3/4	3/4	1	4	0.720	2-1/8	2	-	0.120	CYLINDRICAL
03302603	AN230R-0.750-E3-R030.0-Z2	3/4	3/4	1	4-1/2	0.720	2-5/8	2	-	0.030	CYLINDRICAL
03302604	AN230R-0.750-E3-R060.0-Z2	3/4	3/4	1	4-1/2	0.720	2-5/8	2	-	0.060	CYLINDRICAL
03302605	AN230R-0.750-E3-R090.0-Z2	3/4	3/4	1	4-1/2	0.720	2-5/8	2	-	0.090	CYLINDRICAL
03302606	AN230R-0.750-E3-R120.0-Z2	3/4	3/4	1	4-1/2	0.720	2-5/8	2	-	0.120	CYLINDRICAL
03302608	AN230R-0.750-E4-R030.0-Z2	3/4	3/4	1	5	0.720	3-1/8	2	-	0.030	CYLINDRICAL
03302609	AN230R-0.750-E4-R060.0-Z2	3/4	3/4	1	5	0.720	3-1/8	2	-	0.060	CYLINDRICAL
03302610	AN230R-0.750-E4-R090.0-Z2	3/4	3/4	1	5	0.720	3-1/8	2	-	0.090	CYLINDRICAL
03302611	AN230R-0.750-E4-R120.0-Z2	3/4	3/4	1	5	0.720	3-1/8	2	-	0.120	CYLINDRICAL
03302613	AN230R-0.750-E5-R030.0-Z2	3/4	3/4	1	5-1/2	0.720	3-5/8	2	-	0.030	CYLINDRICAL
03302614	AN230R-0.750-E5-R060.0-Z2	3/4	3/4	1	5-1/2	0.720	3-5/8	2	-	0.060	CYLINDRICAL
03302615	AN230R-0.750-E5-R090.0-Z2	3/4	3/4	1	5-1/2	0.720	3-5/8	2	-	0.090	CYLINDRICAL
03302616	AN230R-0.750-E5-R120.0-Z2	3/4	3/4	1	5-1/2	0.720	3-5/8	2	-	0.120	CYLINDRICAL
03302618	AN230R-1.000-E2-R030.0-Z2	1	1	1-1/4	4	0.960	2-1/8	2	-	0.030	CYLINDRICAL
03302619	AN230R-1.000-E2-R060.0-Z2	1	1	1-1/4	4	0.960	2-1/8	2	-	0.060	CYLINDRICAL
03302620	AN230R-1.000-E2-R090.0-Z2	1	1	1-1/4	4	0.960	2-1/8	2	-	0.090	CYLINDRICAL
03302621	AN230R-1.000-E2-R120.0-Z2	1	1	1-1/4	4	0.960	2-1/8	2	-	0.120	CYLINDRICAL
03302623	AN230R-1.000-E3-R030.0-Z2	1	1	1-1/4	4-1/2	0.960	2-5/8	2	-	0.030	CYLINDRICAL
03302624	AN230R-1.000-E3-R060.0-Z2	1	1	1-1/4	4-1/2	0.960	2-5/8	2	-	0.060	CYLINDRICAL
03302625	AN230R-1.000-E3-R090.0-Z2	1	1	1-1/4	4-1/2	0.960	2-5/8	2	-	0.090	CYLINDRICAL
03302626	AN230R-1.000-E3-R120.0-Z2	1	1	1-1/4	4-1/2	0.960	2-5/8	2	-	0.120	CYLINDRICAL
03302628	AN230R-1.000-E4-R030.0-Z2	1	1	1-1/4	5	0.960	3-1/8	2	-	0.030	CYLINDRICAL
03302629	AN230R-1.000-E4-R060.0-Z2	1	1	1-1/4	5	0.960	3-1/8	2	-	0.060	CYLINDRICAL
03302630	AN230R-1.000-E4-R090.0-Z2	1	1	1-1/4	5	0.960	3-1/8	2	-	0.090	CYLINDRICAL
03302631	AN230R-1.000-E4-R120.0-Z2	1	1	1-1/4	5	0.960	3-1/8	2	-	0.120	CYLINDRICAL

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AN335 & AN335R



ITEM NUMBER	DESCRIPTION	DIMENSIONS IN INCH							FLUTES	COATING	RADIUS	SHANK TYPE
		FLUTE DIA.	SHANK DIA.	LOC	OAL	NECK DIA.	REACH					
03302634	AN335-0.500-E2-S-0-Z3A	1/2	1/2	3/4	3	0.470	1-1/4	3	-	-	CYLINDRICAL	
03302637	AN335-0.500-E3-S-0-Z3A	1/2	1/2	3/4	3-1/2	0.470	1-3/4	3	-	-	CYLINDRICAL	
03302640	AN335-0.500-E4-S-0-Z3A	1/2	1/2	3/4	4	0.470	2-1/4	3	-	-	CYLINDRICAL	
03302643	AN335-0.500-E5-S-0-Z3A	1/2	1/2	3/4	4-1/2	0.470	2-3/4	3	-	-	CYLINDRICAL	
03302646	AN335-0.750-E2-S-0-Z3A	3/4	3/4	1	4	0.720	2-1/8	3	-	-	CYLINDRICAL	
03302651	AN335-0.750-E3-S-0-Z3A	3/4	3/4	1	4-1/2	0.720	2-5/8	3	-	-	CYLINDRICAL	
03302656	AN335-0.750-E4-S-0-Z3A	3/4	3/4	1	5	0.720	3-1/8	3	-	-	CYLINDRICAL	
03302662	AN335-0.750-E5-S-0-Z3A	3/4	3/4	1	5-1/2	0.720	3-5/8	3	-	-	CYLINDRICAL	
03302667	AN335-1.000-E2-S-0-Z3A	1	1	1-1/4	4	0.960	2-1/8	3	-	-	CYLINDRICAL	
03302672	AN335-1.000-E3-S-0-Z3A	1	1	1-1/4	4-1/2	0.960	2-5/8	3	-	-	CYLINDRICAL	
03302677	AN335-1.000-E4-S-0-Z3A	1	1	1-1/4	5	0.960	3-1/8	3	-	-	CYLINDRICAL	
03302635	AN335R-0.500-E2-R030.0-Z3A	1/2	1/2	3/4	3	0.470	1-1/4	3	-	0.030	CYLINDRICAL	
03302636	AN335R-0.500-E2-R060.0-Z3A	1/2	1/2	3/4	3	0.470	1-1/4	3	-	0.060	CYLINDRICAL	
03302638	AN335R-0.500-E3-R030.0-Z3A	1/2	1/2	3/4	3-1/2	0.470	1-3/4	3	-	0.030	CYLINDRICAL	
03302639	AN335R-0.500-E3-R060.0-Z3A	1/2	1/2	3/4	3-1/2	0.470	1-3/4	3	-	0.060	CYLINDRICAL	
03302641	AN335R-0.500-E4-R030.0-Z3A	1/2	1/2	3/4	4	0.470	2-1/4	3	-	0.030	CYLINDRICAL	
03302642	AN335R-0.500-E4-R060.0-Z3A	1/2	1/2	3/4	4	0.470	2-1/4	3	-	0.060	CYLINDRICAL	
03302644	AN335R-0.500-E5-R030.0-Z3A	1/2	1/2	3/4	4-1/2	0.470	2-3/4	3	-	0.030	CYLINDRICAL	
03302645	AN335R-0.500-E5-R060.0-Z3A	1/2	1/2	3/4	4-1/2	0.470	2-3/4	3	-	0.060	CYLINDRICAL	
03302647	AN335R-0.750-E2-R030.0-Z3A	3/4	3/4	1	4	0.720	2-1/8	3	-	0.030	CYLINDRICAL	
03302648	AN335R-0.750-E2-R060.0-Z3A	3/4	3/4	1	4	0.720	2-1/8	3	-	0.060	CYLINDRICAL	
03302649	AN335R-0.750-E2-R090.0-Z3A	3/4	3/4	1	4	0.720	2-1/8	3	-	0.090	CYLINDRICAL	
03302650	AN335R-0.750-E2-R120.0-Z3A	3/4	3/4	1	4	0.720	2-1/8	3	-	0.120	CYLINDRICAL	
03302652	AN335R-0.750-E3-R030.0-Z3A	3/4	3/4	1	4-1/2	0.720	2-5/8	3	-	0.030	CYLINDRICAL	
03302653	AN335R-0.750-E3-R060.0-Z3A	3/4	3/4	1	4-1/2	0.720	2-5/8	3	-	0.060	CYLINDRICAL	
03302654	AN335R-0.750-E3-R090.0-Z3A	3/4	3/4	1	4-1/2	0.720	2-5/8	3	-	0.090	CYLINDRICAL	
03302655	AN335R-0.750-E3-R120.0-Z3A	3/4	3/4	1	4-1/2	0.720	2-5/8	3	-	0.120	CYLINDRICAL	
03302657	AN335R-0.750-E4-R030.0-Z3A	3/4	3/4	1	5	0.720	3-1/8	3	-	0.030	CYLINDRICAL	
03302658	AN335R-0.750-E4-R060.0-Z3A	3/4	3/4	1	5	0.720	3-1/8	3	-	0.060	CYLINDRICAL	
03302659	AN335R-0.750-E4-R090.0-Z3A	3/4	3/4	1	5	0.720	3-1/8	3	-	0.090	CYLINDRICAL	
03302660	AN335R-0.750-E4-R120.0-Z3A	3/4	3/4	1	5	0.720	3-1/8	3	-	0.120	CYLINDRICAL	
03302663	AN335R-0.750-E5-R030.0-Z3A	3/4	3/4	1	5-1/2	0.720	3-5/8	3	-	0.030	CYLINDRICAL	
03302664	AN335R-0.750-E5-R060.0-Z3A	3/4	3/4	1	5-1/2	0.720	3-5/8	3	-	0.060	CYLINDRICAL	
03302665	AN335R-0.750-E5-R090.0-Z3A	3/4	3/4	1	5-1/2	0.720	3-5/8	3	-	0.090	CYLINDRICAL	
03302666	AN335R-0.750-E5-R120.0-Z3A	3/4	3/4	1	5-1/2	0.720	3-5/8	3	-	0.120	CYLINDRICAL	
03302668	AN335R-1.000-E2-R030.0-Z3A	1	1	1-1/4	4	0.960	2-1/8	3	-	0.030	CYLINDRICAL	
03302669	AN335R-1.000-E2-R060.0-Z3A	1	1	1-1/4	4	0.960	2-1/8	3	-	0.060	CYLINDRICAL	
03302670	AN335R-1.000-E2-R090.0-Z3A	1	1	1-1/4	4	0.960	2-1/8	3	-	0.090	CYLINDRICAL	
03302671	AN335R-1.000-E2-R120.0-Z3A	1	1	1-1/4	4	0.960	2-1/8	3	-	0.120	CYLINDRICAL	
03302673	AN335R-1.000-E3-R030.0-Z3A	1	1	1-1/4	4-1/2	0.960	2-5/8	3	-	0.030	CYLINDRICAL	
03302674	AN335R-1.000-E3-R060.0-Z3A	1	1	1-1/4	4-1/2	0.960	2-5/8	3	-	0.060	CYLINDRICAL	
03302675	AN335R-1.000-E3-R090.0-Z3A	1	1	1-1/4	4-1/2	0.960	2-5/8	3	-	0.090	CYLINDRICAL	
03302676	AN335R-1.000-E3-R120.0-Z3A	1	1	1-1/4	4-1/2	0.960	2-5/8	3	-	0.120	CYLINDRICAL	
03302678	AN335R-1.000-E4-R030.0-Z3A	1	1	1-1/4	5	0.960	3-1/8	3	-	0.030	CYLINDRICAL	
03302679	AN335R-1.000-E4-R060.0-Z3A	1	1	1-1/4	5	0.960	3-1/8	3	-	0.060	CYLINDRICAL	
03302680	AN335R-1.000-E4-R090.0-Z3A	1	1	1-1/4	5	0.960	3-1/8	3	-	0.090	CYLINDRICAL	
03302681	AN335R-1.000-E4-R120.0-Z3A	1	1	1-1/4	5	0.960	3-1/8	3	-	0.120	CYLINDRICAL	

ACS540 / ACS540R



- Engineered for ISO-N aerospace aluminum alloys and non-ferrous materials
- 5 flutes for increased feedrates in optimized roughing and finishing toolpaths
- Asymmetrical geometry minimizes chatter and harmonics yielding increased metal removal rates
- Form ground proprietary flute shape maximizes chip load per tooth and evacuation
- Internal coolant hole for increased chip flushing and chip management
- Advanced staggered chip splitter design for increased chip control and reduced cutting forces
- ANF PVD coating reduces friction and built-up edge improving workpiece surface finish and increased tool life

ITEM NUMBER	DESCRIPTION	DIMENSIONS IN INCH				FLUTES	COATING	RADIUS	SHANK TYPE
		FLUTE DIA.	SHANK DIA.	LOC	OAL				
10134849	ACS540-0.375-D2-S.0-Z5	3/8	3/8	3/4	2 1/2	5	UNCOATED	-	CYLINDRICAL
10135014	ACS540R-0.375-D2-R015.0-Z5	3/8	3/8	3/4	2 1/2	5	ANF	0.015	CYLINDRICAL
10135015	ACS540R-0.375-D2-R030.0-Z5	3/8	3/8	3/4	2 1/2	5	ANF	0.030	CYLINDRICAL
10135016	ACS540R-0.375-D2-R060.0-Z5	3/8	3/8	3/4	2 1/2	5	ANF	0.060	CYLINDRICAL
10134850	ACS540-0.375-D3-S.0-Z5	3/8	3/8	1 1/8	3	5	UNCOATED	-	CYLINDRICAL
10135017	ACS540R-0.375-D3-R015.0-Z5	3/8	3/8	1 1/8	3	5	ANF	0.015	CYLINDRICAL
10135018	ACS540R-0.375-D3-R030.0-Z5	3/8	3/8	1 1/8	3	5	ANF	0.030	CYLINDRICAL
10135019	ACS540R-0.375-D3-R060.0-Z5	3/8	3/8	1 1/8	3	5	ANF	0.060	CYLINDRICAL
10134851	ACS540-0.500-D2-S.0-Z5	1/2	1/2	1	3	5	UNCOATED	-	CYLINDRICAL
10135020	ACS540R-0.500-D2-R015.0-Z5	1/2	1/2	1	3	5	ANF	0.015	CYLINDRICAL
10135021	ACS540R-0.500-D2-R030.0-Z5	1/2	1/2	1	3	5	ANF	0.030	CYLINDRICAL
10135022	ACS540R-0.500-D2-R060.0-Z5	1/2	1/2	1	3	5	ANF	0.060	CYLINDRICAL
10134852	ACS540-0.500-D3-S.0-Z5	1/2	1/2	1 1/2	3 1/2	5	UNCOATED	-	CYLINDRICAL
10135023	ACS540R-0.500-D3-R015.0-Z5	1/2	1/2	1 1/2	3 1/2	5	ANF	0.015	CYLINDRICAL
10135024	ACS540R-0.500-D3-R030.0-Z5	1/2	1/2	1 1/2	3 1/2	5	ANF	0.030	CYLINDRICAL
10135025	ACS540R-0.500-D3-R060.0-Z5	1/2	1/2	1 1/2	3 1/2	5	ANF	0.060	CYLINDRICAL
10134853	ACS540-0.750-D2-S.0-Z5	3/4	3/4	1 1/2	4	5	UNCOATED	-	CYLINDRICAL
10135026	ACS540R-0.750-D2-R030.0-Z5	3/4	3/4	1 1/2	4	5	ANF	0.030	CYLINDRICAL
10135028	ACS540R-0.750-D2-R060.0-Z5	3/4	3/4	1 1/2	4	5	ANF	0.060	CYLINDRICAL
10135029	ACS540R-0.750-D2-R090.0-Z5	3/4	3/4	1 1/2	4	5	ANF	0.090	CYLINDRICAL
10135030	ACS540R-0.750-D2-R120.0-Z5	3/4	3/4	1 1/2	4	5	ANF	0.120	CYLINDRICAL
10134854	ACS540-0.750-D3-S.0-Z5	3/4	3/4	2 1/4	5	5	UNCOATED	-	CYLINDRICAL
10135031	ACS540R-0.750-D3-R030.0-Z5	3/4	3/4	2 1/4	5	5	ANF	0.030	CYLINDRICAL
10135032	ACS540R-0.750-D3-R060.0-Z5	3/4	3/4	2 1/4	5	5	ANF	0.060	CYLINDRICAL
10135033	ACS540R-0.750-D3-R090.0-Z5	3/4	3/4	2 1/4	5	5	ANF	0.090	CYLINDRICAL
10135034	ACS540R-0.750-D3-R120.0-Z5	3/4	3/4	2 1/4	5	5	ANF	0.120	CYLINDRICAL

SECO MATERIAL GROUP (SMG)

STEEL, FERRITIC AND MARTENSITIC STAINLESS STEEL

ISO	SMG	REPRESENTATIVE MATERIAL	DESCRIPTION	BHN	KC1.1 X 1000 LBF/IN ²	MC
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

$k_{c,1}$ -values with 0 degree effective cutting rake angle. For other rake angles, reduce the $k_{c,1}$ -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.

A245 / AB245

SLOTTING																
ISO GROUP	SMG	a _p x Dc (max)	a _e x Dc (max)	v _c (sf / min)		Z _n = 2										
						1/8	5/32	3/16	7/32	1/4	5/16	3/8	1/2	5/8	3/4	1
N	E 16	1.00	1300	1300	n [min-1]	39728	31833	26485	22702	19864	15891	13243	9932	7933	6621	4966
					fz [in]	0.0020	0.0025	0.0030	0.0035	0.0040	0.0050	0.0060	0.0080	0.0100	0.0120	0.0160
					vf [in/min]	159	159	159	159	159	159	159	159	159	159	159
	E 17	1.00	900	900	n [min-1]	27504	22038	18336	15717	13752	11002	9168	6876	5492	4584	3438
					fz [in]	0.0016	0.0020	0.0024	0.0028	0.0033	0.0041	0.0049	0.0065	0.0081	0.0098	0.0130
					vf [in/min]	89	89	89	89	89	89	89	89	89	89	89
				675	-	1125										

A245 / AB245

SIDE MILLING - ROUGHING																
ISO GROUP	SMG	a _p x Dc (max)	a _e x Dc (max)	v _c (sf / min)		Z _n = 2										
						1/8	5/32	3/16	7/32	1/4	5/16	3/8	1/2	5/8	3/4	1
N	E 16	2.00	0.50	1300	n [min-1]	39728	31782	26485	22702	19864	15891	13243	9932	7933	6621	4966
					fz [in]	0.0025	0.0031	0.0038	0.0044	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200
					vf [in/min]	199	199	199	199	199	199	199	199	199	199	199
	E 17	1.50	0.50	900	n [min-1]	27504	22003	18336	15717	13752	11002	9168	6876	5492	4584	3438
					fz [in]	0.0020	0.0025	0.0030	0.0035	0.0040	0.0050	0.0060	0.0080	0.0100	0.0120	0.0160
					vf [in/min]	110	110	110	110	110	110	110	110	110	110	110
				675	-	1125										

A245 / AB245

SIDE MILLING - FINISHING																
ISO GROUP	SMG	a _p x Dc (max)	a _e x Dc (max)	v _c (sf / min)		Z _n = 2										
						1/8	5/32	3/16	7/32	1/4	5/16	3/8	1/2	5/8	3/4	1
N	E 16	MAX	0.02	1600	n [min-1]	48896	39117	32597	27941	24448	19558	16299	12224	9764	8149	6112
					fz [in]	0.0009	0.0011	0.0013	0.0015	0.0018	0.0022	0.0026	0.0035	0.0044	0.0053	0.0070
					vf [in/min]	86	86	86	86	86	86	86	86	86	86	86
	E 17	MAX	0.02	1100	n [min-1]	33616	26893	22411	19209	16808	13446	11205	8404	6712	5603	4202
					fz [in]	0.0009	0.0011	0.0013	0.0015	0.0018	0.0022	0.0026	0.0035	0.0044	0.0053	0.0070
					vf [in/min]	59	59	59	59	59	59	59	59	59	59	59
				825	-	1375										

A345 / A345R

SLOTTING																	
ISO GROUP	SMG	a _p x Dc (max)	a _e x Dc (max)	v _c (sf / min)		Z _n = 3											
						1/8	5/32	3/16	7/32	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1
N	E 16	1.00	1.00	1300	n [min-1]	39728	31782	26485	22702	19864	15891	13243	11351	9932	7933	6621	4966
					fz [in]	0.0018	0.0022	0.0026	0.0031	0.0035	0.0044	0.0053	0.0061	0.0070	0.0088	0.0105	0.0140
					vf [in/min]	209	209	209	209	209	209	209	209	209	209	209	209
	E 17	1.00	1.00	900	n [min-1]	27504	22003	18336	15717	13752	11002	9168	7858	6876	5492	4584	3438
					fz [in]	0.0015	0.0019	0.0023	0.0026	0.0030	0.0038	0.0045	0.0053	0.0060	0.0075	0.0090	0.0120
					vf [in/min]	124	124	124	124	124	124	124	124	124	124	124	124
				675	-	1125											

A345 / A345R

SIDE MILLING - ROUGHING																	
ISO GROUP	SMG	$a_p \times D_c$ (max)	$a_e \times D_c$ (max)	v_c (sf / min)		$Z_n = 3$											
						1/8	5/32	3/16	7/32	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1
N	E 16	2.00	0.40	1300	n [min-1]	39728	31782	26485	22702	19864	15891	13243	11351	9932	7933	6621	4966
					fz [in]	0.0023	0.0028	0.0034	0.0039	0.0045	0.0056	0.0068	0.0079	0.0090	0.0113	0.0135	0.0180
					vf [in/min]	268	268	268	268	268	268	268	268	268	268	268	268
	E 17	1.50	0.40	900	n [min-1]	27504	22003	18336	15717	13752	11002	9168	7858	6876	5492	4584	3438
					fz [in]	0.0020	0.0025	0.0030	0.0035	0.0040	0.0050	0.0060	0.0070	0.0080	0.0100	0.0120	0.0160
					vf [in/min]	165	165	165	165	165	165	165	165	165	165	165	165

A345 / A345R

SIDE MILLING - FINISHING																	
ISO GROUP	SMG	$a_p \times D_c$ (max)	$a_e \times D_c$ (max)	v_c (sf / min)		$Z_n = 3$											
						1/8	5/32	3/16	7/32	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1
N	E 16	MAX	0.02	1600	n [min-1]	48896	39117	32597	27941	24448	19558	16299	13970	12224	9764	8149	6112
					fz [in]	0.0009	0.0011	0.0013	0.0015	0.0018	0.0022	0.0026	0.0031	0.0035	0.0044	0.0053	0.0070
					vf [in/min]	128	128	128	128	128	128	128	128	128	128	128	128
	E 17	MAX	0.02	1100	n [min-1]	33616	26893	22411	19209	16808	13446	11205	9605	8404	6712	5603	4202
					fz [in]	0.0009	0.0011	0.0013	0.0015	0.0018	0.0022	0.0026	0.0031	0.0035	0.0044	0.0053	0.0070
					vf [in/min]	88	88	88	88	88	88	88	88	88	88	88	88

A345M

SLOTING																	
ISO GROUP	SMG	$a_p \times D_c$ (max)	$a_e \times D_c$ (max)	v_c (sf / min)		$Z_n = 3$											
						3	4	5	6	8	10	12	16	20			
N	E 16	1.00	1.00	1300	n [min-1]	42045	31534	25227	21023	15767	12614	10511	7884	6307			
					fz [in]	0.0017	0.0022	0.0028	0.0033	0.0044	0.0055	0.0066	0.0088	0.0110			
					vf [in/min]	209	209	209	209	209	209	209	209	209	209		
	E 17	1.00	1.00	900	n [min-1]	29108	21831	17465	14554	10916	8733	7277	5458	4366			
					fz [in]	0.0014	0.0019	0.0024	0.0028	0.0038	0.0047	0.0057	0.0076	0.0094			
					vf [in/min]	124	124	124	124	124	124	124	124	124	124		

A345M

SIDE MILLING - ROUGHING																	
ISO GROUP	SMG	$a_p \times D_c$ (max)	$a_e \times D_c$ (max)	v_c (sf / min)		$Z_n = 3$											
						3	4	5	6	8	10	12	16	20			
N	E 16	2.00	0.40	1300	n [min-1]	42045	31534	25227	21023	15767	12614	10511	7884	6307			
					fz [in]	0.0021	0.0028	0.0035	0.0043	0.0057	0.0071	0.0085	0.0113	0.0142			
					vf [in/min]	268	268	268	268	268	268	268	268	268	268	268	
	E 17	1.50	0.40	900	n [min-1]	29108	21831	17465	14554	10916	8733	7277	5458	4366			
					fz [in]	0.0019	0.0025	0.0031	0.0038	0.0050	0.0063	0.0076	0.0101	0.0126			
					vf [in/min]	165	165	165	165	165	165	165	165	165	165		

A345M

SIDE MILLING - FINISHING														
ISO GROUP	SMG	a _p x Dc (max)	a _e x Dc (max)	v _c (sf / min)		Z _n = 3								
						3	4	5	6	8	10	12	16	20
N	E 16	MAX	0.02	1600	n [min-1]	51748	38811	31049	25874	19406	15524	12937	9703	7762
					fz [in]	0.0008	0.0011	0.0014	0.0017	0.0022	0.0028	0.0033	0.0044	0.0055
					vf [in/min]	128	128	128	128	128	128	128	128	128
	E 17	MAX	0.02	1100	n [min-1]	35577	26683	21346	17788	13341	10673	8894	6671	5337
					fz [in]	0.0008	0.0011	0.0014	0.0017	0.0022	0.0028	0.0033	0.0044	0.0055
					vf [in/min]	88	88	88	88	88	88	88	88	88
				825 - 1375										

AN345 / AN345R

SLOTING													
ISO GROUP	SMG	a _p x Dc (max)	a _e x Dc (max)	v _c (sf / min)		Z _n = 3							
						1/4	5/16	3/8	1/2	5/8	3/4	1	
N	E 16	0.50	1.00	800	n [min-1]	12224	9779	8149	6112	4882	4075	3056	
					fz [in]	0.0019	0.0024	0.0029	0.0039	0.0048	0.0058	0.0077	
					vf [in/min]	71	71	71	71	71	71	71	
	E 17	0.50	1.00	640	n [min-1]	9779	7823	6519	4890	3905	3260	2445	
					fz [in]	0.0015	0.0019	0.0023	0.0031	0.0038	0.0046	0.0061	
					vf [in/min]	45	45	45	45	45	45	45	
				480 - 800									

AN345 / AN345R

SIDE MILLING - ROUGHING													
ISO GROUP	SMG	a _p x Dc (max)	a _e x Dc (max)	v _c (sf / min)		Z _n = 3							
						1/4	5/16	3/8	1/2	5/8	3/4	1	
N	E 16	2.00	0.40	800	n [min-1]	12224	9779	8149	6112	4882	4075	3056	
					fz [in]	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	
					vf [in/min]	110	110	110	110	110	110	110	
	E 17	1.50	0.40	640	n [min-1]	9779	7823	6519	4890	3905	3260	2445	
					fz [in]	0.0025	0.0031	0.0038	0.0050	0.0063	0.0075	0.0100	
					vf [in/min]	73	73	73	73	73	73	73	
				480 - 800									

AN345 / AN345R

SIDE MILLING - FINISHING													
ISO GROUP	SMG	a _p x Dc (max)	a _e x Dc (max)	v _c (sf / min)		Z _n = 3							
						1/4	5/16	3/8	1/2	5/8	3/4	1	
N	E 16	MAX	0.02	1000	n [min-1]	15280	12224	10187	7640	6102	5093	3820	
					fz [in]	0.0018	0.0022	0.0026	0.0035	0.0044	0.0053	0.0070	
					vf [in/min]	80	80	80	80	80	80	80	
	E 17	MAX	0.02	800	n [min-1]	12224	9779	8149	6112	4882	4075	3056	
					fz [in]	0.0018	0.0022	0.0026	0.0035	0.0044	0.0053	0.0070	
					vf [in/min]	64	64	64	64	64	64	64	
				600 - 1000									

AN230 / AN230R

SLOT MILLING

ISO GROUP	SMG	$a_p \times D_c$ (max)	$a_e \times D_c$ (max)	v_c (sf / min)		$Z_n = 2$		
						1/2	3/4	1
N	E 16 Alum (Si<9%)	1.00	1.00	3300	n (min-1)	25212	16808	12606
					fz (in)	0.0041	0.0061	0.0081
					vf (in/min)	205	205	205
	E 17 Alum (9%<Si<16%)	0.80	1.00	2700	n (min-1)	20628	13752	10314
					fz (in)	0.0032	0.0047	0.0063
					vf (in/min)	130	130	130
			1350	-	4050			

AN230 / AN230R

SIDE MILLING - ROUGHING

ISO GROUP	SMG	$a_p \times D_c$ (max)	$a_e \times D_c$ (max)	v_c (sf / min)		$Z_n = 2$		
						1/2	3/4	1
N	E 16 Alum (Si<9%)	1.30	0.25	4000	n (min-1)	30560	20373	15280
					fz (in)	0.0059	0.0088	0.0118
					vf (in/min)	360	360	360
	E 17 Alum (9%<Si<16%)	1.30	0.25	3300	n (min-1)	25212	16808	12606
					fz (in)	0.0044	0.0065	0.0087
					vf (in/min)	220	220	220
			1650	-	4950			

AN230 / AN230R

SIDE MILLING - FINISHING

ISO GROUP	SMG	$a_p \times D_c$ (max)	$a_e \times D_c$ (max)	v_c (sf / min)		$Z_n = 2$		
						1/2	3/4	1
N	E 16 Alum (Si<9%)	1.00	0.02	5000	n (min-1)	38200	25467	19100
					fz (in)	0.0025	0.0037	0.0050
					vf (in/min)	190	190	190
	E 17 Alum (9%<Si<16%)	1.00	0.02	4100	n (min-1)	31324	20883	15662
					fz (in)	0.0025	0.0037	0.0050
					vf (in/min)	155	155	155
			2050	-	6150			

AN335 / AN335R

SLOT MILLING									
ISO GROUP	SMG	$a_p \times D_c$ (max)	$a_g \times D_c$ (max)	v_c (sf / min)			$Z_n = 3$		
							1/2	3/4	1
N	E 16 Alum (Si<9%)	0.50	1.00	3300		n (min-1)	25212	16808	12606
						fz (in)	0.0032	0.0049	0.0065
				1650	-	4950	vf (in/min)	245	245
	E 17 Alum (9%<Si<16%)	0.40	1.00	2700		n (min-1)	20628	13752	10314
						fz (in)	0.0024	0.0036	0.0049
				1350	-	4050	vf (in/min)	150	150

AN335 / AN335R

SIDE MILLING - ROUGHING									
ISO GROUP	SMG	$a_p \times D_c$ (max)	$a_g \times D_c$ (max)	v_c (sf / min)			$Z_n = 3$		
							1/2	3/4	1
N	E 16 Alum (Si<9%)	1.30	0.25	4000		n (min-1)	30560	20373	15280
						fz (in)	0.0044	0.0065	0.0087
				2000	-	6000	vf (in/min)	400	400
	E 17 Alum (9%<Si<16%)	1.20	0.25	3300		n (min-1)	25212	16808	12606
						fz (in)	0.0033	0.0050	0.0066
				1650	-	4950	vf (in/min)	250	250

AN335 / AN335R

SIDE MILLING - FINISHING									
ISO GROUP	SMG	$a_p \times D_c$ (max)	$a_g \times D_c$ (max)	v_c (sf / min)			$Z_n = 3$		
							1/2	3/4	1
N	E 16 Alum (Si<9%)	1.00	0.02	5000		n (min-1)	38200	25467	19100
						fz (in)	0.0025	0.0037	0.0050
				2500	-	7500	vf (in/min)	190	190
	E 17 Alum (9%<Si<16%)	1.00	0.02	4100		(min-1)	31324	20883	15662
						fz (in)	0.0025	0.0037	0.0050
				2050	-	6150	vf (in/min)	155	155

ACS540 / ACS540R

SIDE MILLING - FINISHING									
ISO GROUP	SMG	$a_p \times D_c$ (max)	$a_e \times D_c$ (max)	V_C (sf / min)			$Z_n = 5$		
							3/8	1/2	3/4
N	E 16	MAX	0.02	1450		n (min-1)	14771	11078	7385
				1088 - 1813		fz (in)	0.0019	0.0025	0.0038
						vf (in/min)	138	138	138
	E 17	MAX	0.02	1100		n (min-1)	11205	8404	5603
				825 - 1375		fz (in)	0.0017	0.0023	0.0034
						vf (in/min)	95	95	95

ACS540 / ACS540R

SIDE MILLING - ROUGHING									
ISO GROUP	SMG	$a_p \times D_c$ (max)	$a_e \times D_c$ (max)	V_C (sf / min)			$Z_n = 5$		
							3/8	1/2	3/4
N	E 16	2.00	0.30	1300		n (min-1)	13243	9932	6621
				975 - 1625		fz (in)	0.0034	0.0045	0.0068
						vf (in/min)	223	223	223
	E 17	2.00	0.30	900		n (min-1)	9168	6876	4584
				675 - 1125		fz (in)	0.0023	0.0030	0.0045
						vf (in/min)	103	103	103

ACS540 / ACS540R

SIDE MILLING - ROUGHING									
ISO GROUP	SMG	$a_p \times D_c$ (max)	$a_e \times D_c$ (max)	V_C (sf / min)			$Z_n = 5$		
							3/8	1/2	3/4
N	E 16	3.00	0.30	840		n (min-1)	8556	6417	4278
				630 - 1050		fz (in)	0.0026	0.0035	0.0053
						vf (in/min)	111	112	113
	E 17	3.00	0.30	581		n (min-1)	5923	4443	2962
				436 - 727		fz (in)	0.0023	0.0030	0.0045
						vf (in/min)	68	67	67

ACS540 / ACS540R

SLOTTING										
ISO GROUP	SMG	$a_p \times D_c$ (max)	$a_e \times D_c$ (max)	v_c (sf / min)			$Z_n = 5$			
							3/8	1/2	3/4	
N	E 16	2.00	1.00	975	-	1625	n (min-1)	13243	9932	6621
							fz (in)	0.0030	0.0040	0.0060
				975	-	1625	vf (in/min)	199	199	199
	E 17	2.00	1.00	675	-	1125	n (min-1)	9168	6876	4584
							fz (in)	0.0023	0.0030	0.0045
				675	-	1125	vf (in/min)	103	103	103

ACS540 / ACS540R

SLOTTING										
ISO GROUP	SMG	$a_p \times D_c$ (max)	$a_e \times D_c$ (max)	v_c (sf / min)			$Z_n = 5$			
							3/8	1/2	3/4	
N	E 16	3.00	1.00	504	-	840	n (min-1)	6845	5134	3422
							fz (in)	0.0019	0.0025	0.0038
				504	-	840	vf (in/min)	65	64	65
	E 17	3.00	1.00	349	-	581	n (min-1)	4739	3554	2369
							fz (in)	0.0015	0.0020	0.0030
				349	-	581	vf (in/min)	36	36	36

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