HY-PRO® and HY-PRO® DIN
Cutting Conditions for Machining Centers

Work Material	Examples	HY-PRO® SFM*	HY-PRO® Coolant-Through** SFM
Low Carbon Steel	A36, 1018, 12L14	50 - 90	150 - 250
Medium Carbon Steel	1025, 1035, 1144	40 - 80	100 - 200
High Carbon Steel	1065	40 - 60	100 - 120
Alloy Steels	4140, 4340, 8620	40 - 80	50 - 150
Hardened Steels	Up to 35 HRC	20 - 60	40 - 120
Stainless Steels	303, 304, 316, 400	40 - 80	50 - 120
Copper and Alloys	Cu, Brass, Bronze (Including castings)	30 - 80	150 - 250
Aluminum Alloys	2024, 6061, 7075	30 - 80	150 - 300
Aluminum Casting	326, 390, < 16% Si	30 - 80	150 - 250
Zinc Alloy Casting	ZDC	30 - 80	150 - 200

*** Rigid Setup Required to run these speeds.** **** 250psi minimum recommended for these speeds.**

EXOTAP® NRT® and HY-PRO® NRT®
Cutting Conditions for OSG Forming Taps

Work Material	Examples	HY-PRO® NRT SFM	EXOTAP® NRT SFM
Low Carbon Steel	A36, 1018, 12L14	35 - 100	35 - 130
Medium Carbon Steel	1025, 1035, 1144	20 - 50	20 - 50
High Carbon Steel	1080, 1095	15 - 25	15 - 30
Alloy Steels	4140, 4340, 8620	15 - 25	15 - 30
Hardened Steels	(HYPRO up to 30 HRC) (EXO up to 35 HRC)	10 - 15	10 - 15
Stainless Steels	303, 304, 316, 400	15 - 40	15 - 50
Copper and Alloys	Cu, Brass, Bronze (Including castings)	30 - 90	30 - 100
Aluminum Alloys	2024, 6061, 6063, 7075	50 - 90	65 - 150
Aluminum Casting	326, 390, < 16% Si	45 - 100	65 - 130
Zinc Alloy Casting	ZDC	30 - 80	30 - 100

EXOPRO® S-XPF and OIL-S-XPF
Cutting Conditions for OSG XPF Forming Taps

Work Material	Examples	XPF SFM
Low Carbon Steel	A36, 1018, 12L14	50-130
Medium Carbon Steel	1025, 1035, 1144	50-130
High Carbon Steel	1065	50-100
Alloy Steels	4140, 4340, 8620	50-100
Die Steels	20 HRC	50-100
Titanium	6Al4V (30 HRC)	15-40
Hardened Steels	Up to 35 HRC	15-65
Hardened Steels	Up to 40 HRC	15-35
Stainless Steels	300 & 400 Series	15-50
Stainless Steels	17-4PH	15-40
Copper and Alloys	Cu, Brass, Bronze (including castings)	30-100
Aluminum Alloys	2024, 6061, 7075	65-130
Aluminum Casting	326, 390, <16% Si	65-110
Zinc Alloy Casting	ZDC	30-100

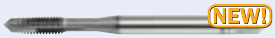
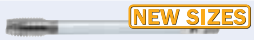
List	Item	Series	Page	Tech Page	Inch/ Metric	Material	Feature
EXOCARB® Taps							
10059		EXOCARB®	276	412-413	Inch	Carbide	Straight Flute
10061		EXOCARB®	277	412-413	Metric	Carbide	Straight Flute
349		EXOCARB®	278	412-413	Metric	Carbide	Straight Flute, JIS
356		EXOCARB®	279	412-413	Metric	Carbide	Straight Flute, Long Shank, JIS

List	Item	Series	Page	Tech Page	Inch/ Metric	Material	Feature
Forming Taps							
14050		EXOTAP® -NRT®	288-289	415	Inch	VC-10	For Difficult to Machine Materials
14150		EXOTAP® -NRT®	290-291	415	Metric	VC-10	For Difficult to Machine Materials
14001		HY-PRO® -NRT®	292-295	415	Inch	HSS-CO	For Wide Range of Materials
14101		HY-PRO® -NRT®	296-297	415	Metric	HSS-CO	For Wide Range of Materials
286		HY-PRO® -SEVEN	298	415	Inch/ Metric	HSS	

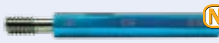
List	Item	Series	Page	Tech Page	Inch/ Metric	Material	Feature
Spiral Fluted Taps							
313TI	 NEW SIZES	EXOTAP® VC-10 TI	299	412-413	Inch	VC-10	For Titanium Alloys
345TI	 NEW SIZES	EXOTAP® VC-10 TI	300	412-413	Metric	VC-10	For Titanium Alloys
313NI	 NEW SIZES	EXOTAP® VC-10 NI	301	412-413	Inch	VC-10	For Nickel Based Alloys
345NI	 NEW SIZES	EXOTAP® VC-10 NI	302	412-413	Metric	VC-10	For Nickel Based Alloys
313		EXOTAP® VC-10	303-304	412-413	Inch	VC-10	For Difficult to Machine Materials
345		EXOTAP® VC-10	304	412-413	Metric	VC-10	For Difficult to Machine Materials
303	 NEW SIZES	EXOTAP VA-3®	305-307	412-413	Inch	HSSE	For Stainless Steel
343	 NEW SIZES	EXOTAP VA-3®	308	412-413	Metric	HSSE	For Stainless Steel
398		EXOTAP VA-3®	309	412-413	Inch	HSSE	Long Shank, For Stainless Steel
220		HY-PRO® DIN	310	412-413	Inch	HSSE	DIN OAL For Wide Range of Materials
229		HY-PRO® DIN	311	412-413	Metric	HSSE	DIN OAL For Wide Range of Materials
230		HY-PRO® DIN	312	412-413	Inch	HSSE	Coolant-Through, DIN OAL For Wide Range of Materials
239		HY-PRO® DIN	312	412-413	Metric	HSSE	Coolant-Through, DIN OAL For Wide Range of Materials
13013		HY-PRO® ALLOY	313	415	Inch	HSSE	Coolant-Through, DIN OAL For Alloy Steels
13113		HY-PRO® ALLOY	313	415	Metric	HSSE	Coolant-Through, DIN OAL For Alloy Steels
13014		HY-PRO® -HXL	314	415	Inch	HSSE	For Horizontal Applications, DIN OAL
13024	 NEW!	HY-PRO® -HXL-OIL	315	415	Inch	HSSE	Coolant-Through, For Horizontal Applications, DIN OAL
13015		HY-PRO® -VXL	316	415	Inch	HSSE	For Vertical Applications, DIN OAL
13025	 NEW!	HY-PRO® -VXL-OIL	317	415	Inch	HSSE	Coolant-Through, For Vertical Applications, DIN OAL
13116		HY-PRO® -HXL-W	318	415	Metric	HSSE	For Horizontal Applications, DIN OAL
13126	 NEW!	HY-PRO® -HXL-W-OIL	319	415	Metric	HSSE	Coolant-Through, For Horizontal Applications, DIN OAL
13117		HY-PRO® -VXL-W	320	415	Metric	HSSE	For Vertical Applications, DIN OAL
13127	 NEW!	HY-PRO® -VXL-W-OIL	321	415	Metric	HSSE	Coolant-Through, For Vertical Applications, DIN OAL
13058		HY-PRO® SYNCHRO AL	322	415	Inch	HSSE	For Aluminum and Aluminum Alloy, Synchro Tapping
13158		HY-PRO® SYNCHRO AL	322	415	Metric	HSSE	For Aluminum and Aluminum Alloy, Synchro Tapping

List	Item	Series	Page	Tech Page	Inch/ Metric	Material	Feature
Spiral Fluted Taps							
295		HY-PRO® AL	323	415	Inch	HSSE	For Aluminum
296		HY-PRO® AL	323	415	Metric	HSSE	For Aluminum
13019	 NEW!	HY-PRO® AL DIN	324	415	Inch	HSSE	DIN OAL, For Aluminum
13119	 NEW!	HY-PRO® AL DIN	324	415	Metric	HSSE	DIN OAL, For Aluminum
290		HY-PRO®	325	415	Inch	HSSE	For Wide Range of Materials
299		HY-PRO®	326	412-413	Metric	HSSE	For Wide Range of Materials
298		HY-PRO® SEVEN	327	415	Inch/ Metric	HSS	
107	 NEW SIZES	GENERAL PURPOSE	328	412-413	Inch	HSS	
143	 NEW SIZES	GENERAL PURPOSE	329	412-413	Metric	HSS	
13020	 NEW!	GENERAL PURPOSE	330	412-413	Inch	HSSE	
123		GENERAL PURPOSE	331	412-413	Metric	HSSE	JIS
918		GENERAL PURPOSE	332	412-413	Inch	HSS	Long Shank

List	Item	Series	Page	Tech Page	Inch/ Metric	Material	Feature
Spiral Pointed Taps							
312TI		EXOTAP® VC-10 TI	333	412-413	Inch	VC-10	For Titanium Alloys
344TI		EXOTAP® VC-10 TI	333	412-413	Metric	VC-10	For Titanium Alloys
312NI	 NEW SIZES	EXOTAP® VC-10 NI	334	412-413	Inch	VC-10	For Nickel Based Alloys
344NI	 NEW SIZES	EXOTAP® VC-10 NI	335	412-413	Metric	VC-10	For Nickel Based Alloys
312		EXOTAP® VC-10	336	412-413	Inch	VC-10	For Difficult to Machine Materials
344		EXOTAP® VC-10	336	412-413	Metric	VC-10	For Difficult to Machine Materials
300	 NEW SIZES	EXOTAP VA-3®	337	412-413	Inch	HSSE	For Stainless Steel
342	 NEW SIZES	EXOTAP VA-3®	338	412-413	Metric	HSSE	For Stainless Steel
397	 NEW SIZES	EXOTAP VA-3®	339	412-413	Inch	HSSE	Long Shank, For Stainless Steel
320		EXO TIN	340	412-413	Inch	HSSE	For Difficult to Machine Materials
250		HY-PRO® DIN	341	412-413	Inch	HSSE	DIN OAL For Wide Range of Materials

List	Item	Series	Page	Tech Page	Inch/ Metric	Material	Feature
Spiral Pointed Taps							
259		HY-PRO® DIN	341	415	Metric	HSSE	DIN OAL For Wide Range of Materials
260		HY-PRO® DIN	342	415	Inch	HSSE	Coolant-Through, DIN OAL For Wide Range of Materials
269		HY-PRO® DIN	342	415	Metric	HSSE	Coolant-Through, DIN OAL For Wide Range of Materials
11015		HY-PRO® AERO-F	343	415	Inch	HSSE	For Aerospace Fastener Applications
11115		HY-PRO® AERO-F	344	415	Metric	HSSE	For Aerospace Fastener Applications
13118		HY-PRO® -RXL-W	345	415	Metric	HSSE	DIN OAL & Extended OAL, For Through Holes
13059		HY-PRO® SYNCHRO AL	346	415	Inch	HSSE	Synchronized, Left Hand Spiral For Aluminum
13159		HY-PRO® SYNCHRO AL	346	415	Metric	HSSE	Synchronized, Left Hand Spiral For Aluminum
11016	 NEW!	HY-PRO® AL DIN	347	415	Inch	HSSE	DIN OAL, For Aluminum
11116	 NEW!	HY-PRO® AL DIN	348	415	Metric	HSSE	DIN OAL, For Aluminum
11017	 NEW!	HY-PRO® V DIN	349	415	Inch	HSSE	For Wide Range of Materials
11117	 NEW!	HY-PRO® V DIN	350	415	Metric	HSSE	For Wide Range of Materials
280		HY-PRO®	351	415	Inch	HSSE	For Wide Range of Materials
289		HY-PRO®	352	415	Metric	HSSE	For Wide Range of Materials
288		HY-PRO® SEVEN	353	415	Inch/ Metric	HSS	
105	 NEW SIZES	GENERAL PURPOSE	354-355	412-413	Inch	HSS	
105B		GENERAL PURPOSE	356	412-413	Inch	HSS	
105A		GENERAL PURPOSE	357	412-413	Inch	HSS	Assembly Type Taps
105+	 NEW SIZES	GENERAL PURPOSE	357	412-413	Inch	HSS	H7 Taps
105H		GENERAL PURPOSE	358	412-413	Inch	HSS	+.005" Oversize
142H		GENERAL PURPOSE	358	412-413	Metric	HSS	+.005" Oversize
142	 NEW SIZES	GENERAL PURPOSE	359	412-413	Metric	HSS	
122		GENERAL PURPOSE	359-360	412-413	Metric	HSSE	JIS
917	 NEW SIZES	GENERAL PURPOSE	361	412-413	Inch	HSS	Long Shank
11118	 NEW!	GENERAL PURPOSE	362	412-413	Metric	HSS	Extended Length
S110		MINIATURE	363	412-413	Inch	HSS	

List	Item	Series	Page	Tech Page	Inch/ Metric	Material	Feature
Pipe Taps							
308	 NEW SIZES	EXOPIPE®	397	417	Inch	HSSE	NPT, For Stainless Steel
318	 NEW SIZES	EXOPIPE®	397	417	Inch	HSSE	NPTF, For Stainless Steel
12053		HY-PRO® PIPE	398	412-413	Inch	HSSE	NPT, Interrupted, For Wide Range of Materials
12054		HY-PRO® PIPE	398	412-413	Inch	HSSE	NPTF, Interrupted, For Wide Range of Materials
328		EXOTAP-MOLD®	399	415	Inch	HSS-CO	NPT, ANPT
108	 NEW SIZES	TAPER PIPE	400	412-413	Inch	HSS	NPT, ANPT
108AL	 NEW!	GENERAL PURPOSE	400	412-413	Inch	HSS	NPT, For Aluminum
118	 NEW SIZES	GENERAL PURPOSE	401	412-413	Inch	HSS	NPTF
108G		GENERAL PURPOSE	402	412-413	Inch	HSS	Interrupted Thread NPT, NPTF, ANPT
S125		GENERAL PURPOSE	402	412-413	Inch	HSS	Short Projection, NPT, NPTF
12006	 NEW!	GENERAL PURPOSE	403	412-413	Inch	HSS	Special Short Projection, NPTF
12007	 NEW!	GENERAL PURPOSE	403	412-413	Inch	HSS	NPT
109		GENERAL PURPOSE	404	412-413	Inch	HSS	NPS, NPSF

List	Item	Series	Page	Tech Page	Inch/ Metric	Material	Feature
Round Dies							
134		GENERAL	405-407	–	Inch	HSS	Solid & Adjustable Round Split Dies
134P		GENERAL	407	–	Inch	HSS	Adjustable Round Split Dies, Taper Pipe
135	 NEW SIZES	GENERAL	408	–	Metric	HSS	Adjustable Round Split Dies
Thread Gages							
15001	 NEW!	GENERAL	409	–	Inch	HSS	Go/NoGo, Class 2B
15002	 NEW!	GENERAL	410	–	Metric	HSS	Go/NoGo, Class 6H