

Determining Correct Speed Within Specified Range

Compilation of Guidelines From Tap Manufacturers And Other Sources For Cutting or Cold-Forming of Threads In Relation To Work Piece Material

Cutting Speed For Tapping: Several factors, singly or in combination can cause very great differences in the permissible tapping speed. The principal factors affecting the tapping speed are the pitch of the thread, the chamfer length on the tap, the percentage of full thread to be cut, the length of the hole to be tapped, the cutting fluid used, whether the threads are straight or tapered, the machine tool used to perform the operation, and the material to be tapped. *From Machinery's Handbook 23rd edition.*

If your coolant does not contain EP additives or its lubrication quality is low, start from the lower speeds in the range. Roll form taps in particular require good lubrication because of the high friction forces involved. As the lubrication quality of a coolant is often unknown, we recommend you start from the lower speeds in the range.

These Factors Apply to <i>Everyone's</i> Tapping Speed Charts				
Ten Factors Requiring Lower Speeds		Ten Factors Permitting Higher Speeds		
-%				+%
-20	Poor Lubrication	1	Good Lubrication	+20
-15	High Tensile Strength Of Material	2	Low Tensile Strength Of Material	+15
-15	Large Thread Diameter	4	Small Thread Diameter	+15
-10	High Alloy Materials	3	Low Alloy Materials	+10
-10	Thread Depth More Than 1.5 x Dia.	5	Thread Depth 1.5 x Dia. Or Less	+10
-10	Thread Pitch Coarse	6	Thread Pitch Fine	+10
-5	Drill Size More than 65% of Thread	7	Drill Size 65% or Less Thread	+5
-5	Tap Lead Less Than 3.5 Thread	8	Tap Lead More Than 3.5 Threads	+5
-5	Blind Holes	9	Through Holes	+5
-5	Free Running Spindle Inaccurate Pitch Control Hydraulic/Air Feed	10	Synchronous Spindle Lead Screw CNC Control	+5

Example: Tap Size: 1/4"-28 Coated, Material: Aluminum Die Cast, From Chart 688-1375 RPM, RPM Spread = 687

Minus Factors:	High Tensile Strength	-15	Plus Factors:	Coolant With Good EP	+20
	Thread Depth 3 x Dia.	-10		Small Thread Diameter	+15
	Drill Size = 75% Thd.	-5		Pitch Fine	+10
	Blind Hole	-5		Lead 3.5 Threads	+5
	TOTAL	-35		CNC Machine	+5
				TOTAL	+55

Apply The Factors Against The RPM Spread of 687
 +.55 X 687 = 378 Added to minimum RPM 688 = 1066 New Minimum RPM
 -.35 X 687 = 240 Subtracted from maximum RPM 1375 = 1135 New Maximum RPM
Common Sense Rule: Begin with min RPM and work up to optimum efficiency and tap life.

TAPMATIC SFT, SynchroFlex, Rigid Tap Drivers		
Model	RPM	Capacity
SFT10	Limited	#2 - #10-32
SFT50	Only By	#10 - 1/2"
SFT75	Rigid	1/2"-13 - 3/4"-10
SFT100	Tapping Program	3/4"-10 - 1"

TAPMATIC CST, Constant Speed, Self-Reversing Tapping Heads					
Model	Spindle	RPM	Spindle	RPM	Capacity
RDT15 HD and HS	Heavy Duty	5000 RPM	High Speed	6000 RPM	(#0-#6, M1-M3)
RDT25 HD and HS	Heavy Duty	3500 RPM	High Speed	4000 RPM	(#4-1/4", M2.5-M6)
RDT50 HD and HS	Heavy Duty	2000 RPM	High Speed	2500 RPM	(#10-1/2", M4.5-M12)
RDT75		1500 RPM			(#3/8"-3/4", M10-M20)
RDT85		1200 RPM			(#1/2"-1", M12-M25)

Tools come with Popular Inch & Metric Size Straight Shanks adaptable to CAT, BT and HSK. All sizes available. See Price List.

Comparison Test Between Fastest Rigid Tapping Method And Constant Speed Tapping

Which Is Faster At The Same RPM?



1999 Hi-Speed Tapping Center Tapmatic & 1996 Machining Center
 TEST: (10) 6mm Roll Form Holes, 9mm Deep, 2500 RPM, 7075 Aluminum
 Even when the tapping center's RPM was increased to 4000, it didn't produce more *Holes Per Minute (HPM) than Tapmatic at 2500. SEND FOR COPY OF THIS VIDEO.

Seven Essential Steps For Trouble Free Performance With Self-Reversing Tapping Heads

- Choose the proper tap:** Follow your tap manufacturers recommendations for your specific application.
- Calculate the correct tapping speed** from the adjacent charts and the rules on this page.
- Common sense rule:** Begin conservatively and increase speed until optimum results are obtained.
- Select the best tool** for your application or applications. High production with one tap size (*Don't compromise*), low production with a variety of taps, (*Choose the tool that best covers range.*)
- Follow our programming instructions exactly, and absolutely make sure ramp or exact stop has been eliminated from tapping cycle.** Leaving it in will increase tapping time 30% increase thread depth variations substantially, and wear out the tapping head prematurely.
- Follow our installation instructions exactly** and lock orientation collar in place once stop arm is in proper position. Then fix it positively with the locking screw provided.
- Schedule preventative maintenance.** Disassembly, cleaning, re-lubricating, and reassembly takes no more than half an hour. Just consider what the head does for the machine by eliminating its reversal related wear and tear. Simple maintenance will keep the head working efficiently, and pay big dividends in trouble free production.

Speed Recommendations & Tool Selection

Standard Taps

Tap Size	Low Carbon Steel, Medium Carbon Steel	High Carbon Steel, High Strength Steel Tool Steel	High Strength Steel, Tool Steel Hardened	Stainless 303, 304, 316	Stainless 410, 430, 17-4 Hardened	Stainless 17-4 Annealed	Titanium Alloys	Nickel Base Alloys	Aluminum Alloys	Aluminum Die Cast	Magnesium	Brass, Bronze	Copper	Cast Iron	
	Surface Feet Per Minute											Uncoated Tap			
	Coated Tap											Coated Tap			
	25-50 50-80	6-30 10-35	6-12	12-35 20-50	12-15	12-15 12-25	3-15	10-15	50-65	40-65 45-90	45-100	30-65	50-60 65-100	35-50 50-65	
RPM Range Uncoated RPM Range Coated Recommended Tapmatic Attachment															
0	1592-3183 3183-5093 RDT15HS	382-1910 637-2228 RDT15HD	382-764 RDT15HD	764-2228 1273-3183 RDT15HD	764-955 RDT15HD	764-955 764-1592 RDT15HD	191-955 RDT15HD	637-955 RDT15HD	3183-4138 RDT15HS	2546-4138 2865-5730 RDT15HS	2865-6000 RDT15HS	1910-4138 RDT15HS	3183-3820 4138-6000 RDT15HS	2228-3183 3183-4138 RDT15HS	
	1	1308-2617 2617-4186 RDT15HS	314-1570 523-1831 RDT15HD	314-628 382-764 RDT15HD	628-1831 1047-2617 RDT15HD	628-785 RDT15HD	628-785 628-1308 RDT15HD	157-785 RDT15HD	523-785 RDT15HD	2617-3401 RDT15HD	2093-3401 2355-4710 RDT15HS	2355-5233 RDT15HS	1570-3401 RDT15HD	2617-3140 3401-5233 RDT15HS	1831-2617 2617-3401 RDT15HD
		2	1110-2221 2221-3554 RDT15HD	267-1333 444-1555 RDT15HD	314-628 RDT15HD	533-1555 888-2221 RDT15HD	533-666 RDT15HD	533-666 533-1110 RDT15HD	133-666 RDT15HD	444-666 RDT15HD	2221-2887 RDT15HD	1777-2887 1999-3999 RDT15HD	1999-4442 RDT15HD	1333-2887 RDT15HD	2221-2665 2887-4442 RDT15HD
3	964-1929 1929-3086 RDT15HD	231-1157 386-1351 RDT15HD	231-463 RDT15HD	463-1351 772-1929 RDT15HD	463-579 RDT15HD	463-579 463-964 RDT15HD	116-579 RDT15HD	386-579 RDT15HD	1929-2508 RDT15HD	1543-2508 1736-3472 RDT15HD	1736-3858 RDT15HD	1157-2508 RDT15HD	1929-2315 2508-3858 RDT15HD	1351-1929 1929-2508 RDT15HD	
	4	853-1705 1705-2728 RDT25HD	205-1023 341-1194 RDT25HD	205-409 RDT25HD	409-1194 682-1705 RDT25HD	409-512 RDT25HD	409-512 409-853 RDT25HD	102-512 RDT25HD	341-512 RDT25HD	1705-2217 RDT25HD	1364-2217 1535-3069 RDT25HD	1535-3411 RDT25HD	1023-2217 RDT25HD	1705-2046 2107-3411 RDT25HD	1194-1705 1705-2217 RDT25HD
5	764-1528 1528-2445 RDT25HD	183-917 306-1070 RDT25HD	183-367 RDT25HD	367-1070 611-1528 RDT25HD	367-458 RDT25HD	367-458 367-764 RDT25HD	92-458 RDT25HD	306-458 RDT25HD	1528-1986 RDT25HD	1222-1986 1375-2750 RDT25HD	1375-3056 RDT25HD	917-1986 RDT25HD	1528-1833 1986-3056 RDT25HD	1070-1528 1528-1986 RDT25HD	
	6	691-1382 1382-2211 RDT25HD	166-829 277-969 RDT25HD	166-332 RDT25HD	332-969 553-1382 RDT25HD	332-415 RDT25HD	332-415 332-691 RDT25HD	83-415 RDT25HD	277-415 RDT25HD	1382-1799 RDT25HD	1106-1799 1246-2487 RDT25HD	1246-2764 RDT25HD	829-1799 RDT25HD	1382-1658 1799-2764 RDT25HD	969-1382 1382-1799 RDT25HD
8	583-1165 1165-1864 RDT25HD	140-699 233-815 RDT25HD	140-280 RDT25HD	280-815 466-1165 RDT25HD	280-349 RDT25HD	280-349 280-583 RDT25HD	70-349 RDT25HD	233-349 RDT25HD	1165-1514 RDT25HD	932-1514 1048-2097 RDT25HD	1048-2330 RDT25HD	699-1514 RDT25HD	1165-1398 1514-2330 RDT25HD	815-1165 1165-1514 RDT25HD	
	10	502-1005 1005-1607 RDT25HD	121-603 201-704 RDT25HD	121-241 RDT25HD	241-704 402-1005 RDT25HD	241-302 RDT25HD	241-302 241-502 RDT25HD	60-302 RDT25HD	201-302 RDT25HD	1005-1307 RDT25HD	804-1307 905-1808 RDT25HD	905-2009 RDT25HD	603-1307 RDT25HD	1005-1205 1307-2009 RDT25HD	704-1005 1005-1307 RDT25HD
12	442-884 884-1415 RDT25HD	106-531 177-619 RDT25HD	106-212 RDT25HD	212-619 354-884 RDT25HD	212-265 RDT25HD	212-265 212-442 RDT25HD	53-265 RDT25HD	177-265 RDT25HD	884-1150 RDT25HD	707-1150 796-1592 RDT25HD	796-1769 RDT25HD	531-1150 RDT25HD	884-1061 1150-1769 RDT25HD	619-884 884-1150 RDT25HD	
	1/4	382-764 764-1222 RDT50HD	92-458 153-535 RDT50HD	92-183 RDT50HD	183-535 306-764 RDT50HD	183-229 RDT50HD	183-229 183-382 RDT50HD	46-229 RDT50HD	153-229 RDT50HD	764-993 RDT50HD	611-993 688-1375 RDT25HD	688-1528 RDT25HD	458-993 RDT50HD	764-917 993-1528 RDT25HD	535-764 764-993 RDT50HD
5/16	306-611 611-978 RDT50HD	73-367 122-429 RDT50HD	73-147 RDT50HD	147-429 245-611 RDT50HD	147-184 RDT50HD	147-184 147-306 RDT50HD	37-184 RDT50HD	122-184 RDT50HD	611-796 RDT50HD	489-796 551-1100 RDT50HD	551-1222 RDT50HD	367-796 RDT50HD	611-733 796-1222 RDT50HD	429-611 611-796 RDT50HD	
	3/8	255-509 509-815 RDT50HD	61-306 102-357 RDT50HD	61-122 RDT50HD	122-357 204-509 RDT50HD	122-153 RDT50HD	122-153 122-255 RDT50HD	31-153 RDT50HD	102-153 RDT50HD	509-662 RDT50HD	407-662 458-917 RDT50HD	458-1019 RDT50HD	306-662 RDT50HD	509-611 662-1019 RDT50HD	357-509 509-662 RDT50HD
7/16	219-437 437-698 RDT50	52-262 87-306 RDT85HS	52-105 RDT85HS	105-306 175-437 RDT85HS	105-131 RDT85HS	105-131 105-219 RDT85HS	26-131 RDT85HS	87-131 RDT85HS	437-568 RDT85HS	349-568 393-786 RDT50HD	393-873 RDT50HD	262-568 RDT85HS	437-524 568-873 RDT50HD	306-437 437-568 RDT85HS	
	1/2	191-382 382-611 RDT85HS	46-229 76-267 RDT85HS	46-92 RDT85HS	92-267 153-382 RDT85HS	92-115 RDT85HS	92-115 92-191 RDT85HS	23-115 RDT85HS	76-115 RDT85HS	382-497 RDT85HS	306-497 344-688 RDT85HS	344-764 RDT85HS	229-497 RDT85HS	382-458 497-764 RDT85HS	267-382 382-497 RDT85HS
9/16	172-344 344-550 RDT85HS	41-206 68-238 RDT85HS	41-82 RDT85HS	82-238 137-344 RDT85HS	82-102 RDT85HS	82-102 82-172 RDT85HS	20-102 RDT85HS	68-102 RDT85HS	344-442 RDT85HS	275-442 306-619 RDT85HS	306-687 RDT85HS	206-442 RDT85HS	344-412 442-687 RDT85HS	238-344 344-442 RDT85HS	
	5/8	153-306 306-489 RDT85	37-183 61-214 RDT85	37-73 RDT85	73-214 122-306 RDT85	73-92 RDT85	73-92 73-153 RDT85	18-92 RDT85	61-92 RDT85	306-397 RDT85	244-397 275-550 RDT85	275-611 RDT85	183-397 RDT85	306-367 397-611 RDT85	214-306 306-397 RDT85
3/4	128-255 255-407 RDT85	31-153 51-178 RDT85	31-61 RDT85	61-178 102-255 RDT85	61-76 RDT85	61-76 61-128 RDT85	15-76 RDT85	51-76 RDT85	255-331 RDT85	203-331 229-458 RDT85	229-509 RDT85	153-331 RDT85	255-306 331-509 RDT85	178-255 255-331 RDT85	
	7/8	109-218 218-350 RDT85	26-131 44-153 RDT85	26-52 RDT85	52-153 87-218 RDT85	52-65 RDT85	52-65 52-109 RDT85	13-65 RDT85	44-65 RDT85	218-284 RDT85	175-284 196-392 RDT85	196-437 RDT85	131-284 RDT85	218-262 284-437 RDT85	153-218 218-284 RDT85
1	96-191 191-306 RDT85	23-115 38-134 RDT85	23-46 RDT85	46-134 76-191 RDT85	46-57 RDT85	46-57 46-96 RDT85	11-57 RDT85	38-57 RDT85	191-248 RDT85	153-248 172-344 RDT85	172-382 RDT85	115-248 RDT85	191-230 248-382 RDT85	134-191 191-248 RDT85	

Speed Recommendations & Tool Selection

Roll Form Taps

Tap Size	Low Carbon Steel, Medium Carbon Steel	High Carbon Steel, High Strength Steel, Tool Steel	Stainless 303, 304, 316	Titanium Alloys	Aluminum Alloys	Aluminum Die Cast
	Surface Feet Per Minute			Uncoated Tap Coated Tap		
	30-50 65-100	25-65	20-25 25-35	25-40	35-50 50-65	35-65
	RPM Range Uncoated RPM Range Coated Recommended Tapmatic Attachment					
M2 0	1910-3183 4138-6000 RDT15HS	1592-4138 RDT15HD	1273-1592 1592-2228 RDT15HD	1592-2546 RDT15HD	2228-3183 3183-4138 RDT15HD	2228-4138 RDT15HD
M2 1	1570-2617 3401-5233 RDT15HS	1308-3401 RDT15HD	1047-1308 1308-1831 RDT15HD	1308-2093 RDT15HD	1831-2617 2617-3401 RDT15HD	1831-3401 RDT15HD
M2 2	1333-2221 2887-4442 RDT15HD	1110-2887 RDT15HD	888-1110 1110-1555 RDT15HD	1110-1777 RDT15HD	1555-2221 2221-2887 RDT15HD	1555-2887 RDT15HD
M2 3	1157-1929 2508-3858 RDT15HD	964-2508 RDT15HD	772-964 964-1351 RDT15HD	964-1543 RDT15HD	1351-1929 1929-2508 RDT15HD	1351-2508 RDT15HD
M3 4	1023-1705 2217-3411 RDT25HD	853-2217 RDT25HD	682-853 853-1194 RDT25HD	853-1364 RDT25HD	1194-1705 1705-2217 RDT25HD	1194-2217 RDT25HD
M3 5	917-1528 1986-3056 RDT25HD	764-1986 RDT25HD	611-764 764-1070 RDT25HD	764-1222 RDT25HD	1070-1528 1528-1986 RDT25HD	1070-1986 RDT25HD
M4 6	829-1382 1799-2764 RDT25HD	691-1799 RDT25HD	553-691 691-969 RDT25HD	691-1106 RDT25HD	969-1382 1382-1799 RDT25HD	969-1799 RDT25HD
M4 8	699-1165 1514-2330 RDT25HD	583-1514 RDT25HD	466-583 583-815 RDT25HD	583-932 RDT25HD	815-1165 1165-1514 RDT25HD	815-1514 RDT25HD
M5 10	603-1005 1307-2009 RDT25HD	502-1307 RDT25HD	402-502 502-704 RDT25HD	502-804 RDT25HD	704-1005 1005-1307 RDT25HD	704-1307 RDT25HD
M5 12	531-884 1150-1769 RDT50HD	442-1150 RDT50HD	354-442 442-619 RDT50HD	442-707 RDT50HD	619-884 884-1150 RDT50HD	619-1150 RDT50HD
M6 1/4	458-764 993-1528 RDT50HD	382-993 RDT50HD	306-382 382-535 RDT50HD	382-611 RDT50HD	535-764 764-993 RDT50HD	535-993 RDT50HD
M7 5/16	367-611 796-1222 RDT50HD	306-796 RDT50HD	245-306 306-429 RDT50HD	306-489 RDT50HD	429-611 611-796 RDT50HD	429-796 RDT50HD
M9 3/8	306-509 662-1019 RDT50HD	255-662 RDT50HD	204-255 255-357 RDT50HD	255-407 RDT50HD	357-509 509-662 RDT50HD	357-662 RDT50HD
M10 7/16	262-437 568-873 RDT85HS	219-568 RDT85HS	175-219 219-306 RDT85HS	219-349 RDT85HS	306-437 437-568 RDT85HS	306-568 RDT85HS
M12 1/2	229-382 497-764 RDT85	191-497 RDT85	153-191 191-267 RDT85	191-306 RDT85	267-382 382-497 RDT85	267-497 RDT85
M14 9/16	206-344 442-687 RDT85	172-442 RDT85	137-172 172-238 RDT85	172-275 RDT85	238-344 344-442 RDT85	238-442 RDT85
M16 5/8	183-306 397-611 RDT85	153-397 RDT85	122-153 153-214 RDT85	153-244 RDT85	214-306 306-397 RDT85	214-397 RDT85
M18 3/4	153-255 331-509 RDT85	128-331 RDT85	102-128 128-178 RDT85	128-203 RDT85	178-255 255-331 RDT85	178-331 RDT85
M20						

High Speed / Top Speed Taps

Tap Size	Low Carbon Steel, Medium Carbon Steel	High Carbon Steel, High Strength Steel, Tool Steel	Stainless 303, 304, 316	Stainless 17-4 Annealed	Aluminum Alloys	Aluminum Die Cast	Magnesium	Copper	Cast Iron
	Surface Feet Per Minute								
	165-200	25-100	30-80	20-40	65-200	65-100	100-130	100-130	130-165
	RPM Range Based on SFM RPM Range For Tapping Head if Different Recommended Tapmatic Attachment								
M2 0	10505-12733 6000 RDT15HS	1592-6366 1592-6000 RDT15HS	1910-5093 RDT15HS	1273-2546 RDT15HD	4138-12733 4138-6000 RDT15HS	4138-6366 4138-6000 RDT15HS	6366-8276 6000 RDT15HS	6366-8276 6000 RDT15HS	8276-10505 6000 RDT15HS
M2 1	8634-10465 6000 RDT15HS	1308-5233 RDT15HS	1570-4186 RDT15HS	1047-2093 RDT15HD	3401-10465 3401-6000 RDT15HS	3401-5233 RDT15HS	5233-6808 5233-6000 RDT15HS	5233-6808 5233-6000 RDT15HS	6808-8634 6000 RDT15HS
M2 2	7329-8884 5000 RDT15HD	1110-4442 RDT15HD	1333-3554 RDT15HD	888-1777 RDT15HD	2887-8884 2887-5000 RDT15HD	2887-4442 RDT15HD	4442-5774 4442-5000 RDT15HD	4442-5774 4442-5000 RDT15HD	5774-7329 5000 RDT15HD
M2 3	6367-7717 5000 RDT15HD	964-3858 RDT25HS	1157-3086 RDT25HD	772-1543 RDT25HD	2508-7717 2508-5000 RDT15HD	2508-3858 RDT25HS	3858-5015 3858-5000 RDT15HD	3858-5015 3858-5000 RDT15HD	5015-6367 5000 RDT15HD
M3 4	5628-6821 5000 RDT15HD	853-3411 RDT25HD	1023-2728 RDT25HD	682-1364 RDT25HD	2217-6821 2217-5000 RDT15HD	2217-3411 RDT25HD	3411-4434 RDT15HD	3411-4434 RDT15HD	4434-5628 4434-5000 RDT15HD
M3 5	5042-6122 4000 RDT25HS	764-3056 RDT25HD	917-2445 RDT25HD	611-1222 RDT25HD	1986-6122 1986-4000 RDT25HS	1986-3056 RDT25HD	3056-3973 RDT25HS	3056-3973 RDT25HS	3973-5042 3973-4000 RDT25HS
M4 6	4567-5536 4000 RDT25HS	691-2764 RDT25HD	829-2211 RDT25HD	553-1106 RDT25HD	1799-5536 1799-4000 RDT25HS	1799-2764 RDT25HD	2764-3592 RDT25HS	2764-3592 RDT25HS	3592-4567 3592-4000 RDT25HS
M4 8	3843-4659 3843-4000 RDT25HS	583-2330 RDT25HD	699-1864 RDT25HD	466-932 RDT25HD	1514-4659 1514-4000 RDT25HS	1514-2330 RDT25HD	2330-3029 RDT25HD	2330-3029 RDT25HD	3029-3843 RDT25HS
M5 10	3317-4021 3317-4000 RDT25HS	502-2009 RDT25HD	603-1607 RDT25HD	402-804 RDT25HD	1307-4021 1307-4000 RDT25HS	1307-2009 RDT25HD	2009-2612 RDT25HD	2009-2612 RDT25HD	2612-3317 RDT25HD
M5 12	2918-3537 RDT25HS	442-1769 RDT25HD	531-1415 RDT25HD	354-707 RDT25HD	1150-3537 RDT25HS	1150-1769 RDT25HD	1769-2300 RDT25HD	1769-2300 RDT25HD	2300-2918 RDT25HD
M6 1/4	2521-3056 RDT25HD	382-1528 RDT50HD	458-1222 RDT50HD	306-611 RDT50HD	993-3056 RDT25HD	993-1528 RDT25HD	1528-1986 RDT25HD	1528-1986 RDT25HD	1986-2521 RDT25HD
M8 5/16	2017-2449 RDT50HS	306-1222 RDT50HD	367-978 RDT50HD	245-489 RDT50HD	796-2449 RDT50HS	796-1222 RDT50HD	1222-1589 RDT50HD	1222-1589 RDT50HD	1589-2017 RDT50HS
M9 3/8	1681-2037 RDT50HS	255-1019 RDT50HD	306-815 RDT50HD	204-407 RDT50HD	662-2037 RDT50HS	662-1019 RDT50HD	1019-1324 RDT50HD	1019-1324 RDT50HD	1324-1681 RDT50HD
M10 7/16	1441-1748 RDT50HD	219-873 RDT50HD	262-698 RDT50HD	175-349 RDT50HD	568-1748 RDT50HD	568-873 RDT50HD	873-1135 RDT50HD	873-1135 RDT50HD	1135-1441 RDT50HD
M12 1/2	1261-1528 RDT50HD	191-764 RDT85HS	229-611 RDT85HS	153-306 RDT85HS	497-1528 RDT50HD	497-764 RDT85HS	764-993 RDT85HS	764-993 RDT85HS	993-1261 RDT50HD
M14 9/16	1121-1359 RDT85HS	172-687 RDT85HS	206-550 RDT85HS	137-275 RDT85HS	442-1359 RDT85HS	442-687 RDT85HS	687-893 RDT85HS	687-893 RDT85HS	893-1121 RDT85HS
M16 5/8	1008-1222 RDT85HS	153-611 RDT85	183-489 RDT85	122-244 RDT85	397-1222 RDT85HS	397-611 RDT85	611-794 RDT85	611-794 RDT85	794-1008 RDT85HS
M18 3/4	840-1019 RDT85	128-509 RDT85	153-407 RDT85	102-203 RDT85	331-1019 RDT85	331-509 RDT85	509-662 RDT85	509-662 RDT85	662-840 RDT85
M22 7/8	720-873 RDT85	109-437 RDT85	131-350 RDT85	87-175 RDT85	284-873 RDT85	284-437 RDT85	437-568 RDT85	437-568 RDT85	568-720 RDT85
M24									
M25 1	630-764 RDT85	96-382 RDT85	115-306 RDT85	76-153 RDT85	248-764 RDT85	248-382 RDT85	382-497 RDT85	382-497 RDT85	497-630 RDT85