

## Tools & Installation

**MAXPRO** offers a complete line of manual tools for the proper preparation of medium, high and ultra-high pressure connections to 9/16" OD tubing. For complete coning and threading instructions, visit our website at [www.maxprotech.com](http://www.maxprotech.com).

### Tools & Installation feature:

- ▶ Manual Coning and Threading Coning tools are designed to thread up to 9/16" OD tubing.
- ▶ One size Coning and Threading tool with interchangeable bushings and thread dies eliminates multiple tool inventories.
- ▶ Internal needle bearings and high strength materials offers ease of operation and extended tool life.
- ▶ Coning blades are designed to cut both the angle and straight areas to insure good concentricity between the sealing surfaces.
- ▶ Precision Reseating Tools to repair damaged female high pressure connections without full disassembly of components.

**Note:** When selecting multiple items, the pressure rating would be that of the lowest rated component.

See page 8 for our Coning and Threading Machines where single ended operation is only one of many state of the art features.

See our Coning and Threading machine video at [www.maxprotech.com](http://www.maxprotech.com).

### Tools & Installation Index

Coning and Threading Tools . . . . .	2
Reseating and Deburr Tools . . . . .	3
Tube Connection Details . . . . .	4
Assembly Instructions . . . . .	5
Tubing Minimum Bend Radius & Valve Torque Values . . . . .	6
Coning and Threading Tool Kits . . . . .	7
Coning and Threading Machine . . . . .	8
Tooling . . . . .	9

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**MAXIMATOR** offers tools for coning and threading tubing up to 9/16" O.D. These are precise tools that allow manual coning and threading of medium, high, and ultra high pressure tubing. Please refer to the Maxpro Technologies website, [www.maxprotech.com](http://www.maxprotech.com), and click on the VFT button to find detailed instructions for the coning and threading process.

### Coning Tools

The coning tool comes complete with blades, collet and tools. The blades and tool feed nut allow the user to control the cutting feed rate and face the end of the tube when complete. The blades and collet can be changed for other sizes, while using the same base tool.

Tubing Size O.D. x I.D. (in.)	Tubing Pressure (psi @ R.T.)	Connection Type	Coning Tool Complete Catalog Number	Replacement Part Information	
				Collet Part Number	Coning Blades Set (Qty. 2) Part Number
1/4 x .109	22,500	4MM	<b>CT4M</b>	3781.1009	3781.1014
3/8 x .203	22,500	6MM	<b>CT6M</b>	3781.1010	3781.1013
9/16 x .312	22,500	9MM	<b>CT9M</b>	3781.1011	3781.1012
9/16 x .359	15,200	9MM	<b>CT9M.359</b>	3781.1011	3781.1179
1/4 x .083	65,000/101,000	4HM/4UM	<b>CT4H</b>	3781.1009	3781.0843
3/8 x .125	65,000/101,000	6HM/6UM	<b>CT6H</b>	3781.1010	3781.1017
9/16 x .188	65,000	9HM	<b>CT9H</b>	3781.1011	3781.1016
5/16 x .062	152,000	5UM	<b>CT5U</b>	3781.0846	3781.0843



### Threading Tools

The threading tool comes complete with the threading die and bushing. The thread is a left hand type. The thread die and bushing can be changed for other sizes, while using the same base tool.

Tubing Size O.D. x I.D. (in.)	Tubing Pressure (psi @ R.T.)	Connection Type	Left Hand Thread Size (UNF class 2)	Threading Tool Complete Catalog Number	Replacement Part Information	
					Die Part Number	Bushing Part Number
1/4 x .109	22,500	4MM	1/4-28	<b>TT4</b>	3781.0584	3781.1055
3/8 x .203	22,500	6MM	3/8-24	<b>TT6</b>	3781.0582	3781.1053
9/16 x .312	22,500	9MM	9/16-18	<b>TT9</b>	3781.0583	3781.1054
9/16 x .359	15,200	9MM	9/16-18	<b>TT9</b>	3781.0583	3781.1054
1/4 x .083	65,000/101,000	4HM/4UM	1/4-28	<b>TT4</b>	3781.0584	3781.1055
3/8 x .125	65,000/101,000	6HM/6UM	3/8-24	<b>TT6</b>	3781.0582	3781.1053
9/16 x .188	65,000	9HM	9/16-18	<b>TT9</b>	3781.0583	3781.1054
5/16 x .062	152,000	5UM	5/16-24	<b>TT5</b>	3781.0581	3781.1052

**Note: For complete coning and threading tool kits, see page 7.**

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MT R22 10/2024



### Reseating Tools

The reseating tool is designed to rework an existing damaged coned and threaded connection without full disassembly of the component. The reseating tool will resurface the sealing surfaces of the medium, high, and ultra high pressure connections up to 9/16" tubing.

Tubing Size O.D. x I.D. (in.)	Tubing Pressure (psi @ R.T.)	Connection Type	Reseating Tool Complete Catalog Number	Replacement Part Information		
				Cutter Part Number	Bushing Part Number	Gland Part Number
1/4 x .109	22,500	4MF	<b>RT4M</b>	3781.0647	n/a	3781.0649
3/8 x .203	22,500	6MF	<b>RT6M</b>	3781.0650	n/a	3781.0651
9/16 x .312	22,500	9MF	<b>RT9M</b>	3781.0656	n/a	3781.0655
9/16 x .359	15,200	9MF	<b>RT9M</b>	3781.0656	n/a	3781.0655
1/4 x .083	65,000/101,000	4HM/4UM	<b>RT4H</b>	3781.0647	1700.0719	3781.0648
3/8 x .125	65,000/101,000	6HM/6UM	<b>RT6H</b>	3781.0645	1700.0718	3781.0646
9/16 x .188	65,000/101,000	9HF/9UF	<b>RT9H</b>	3781.0532	1700.0613	3781.0533
5/16 x .062	152,000	5UF	<b>RT5U</b>	3781.0532	n/a	3781.0652



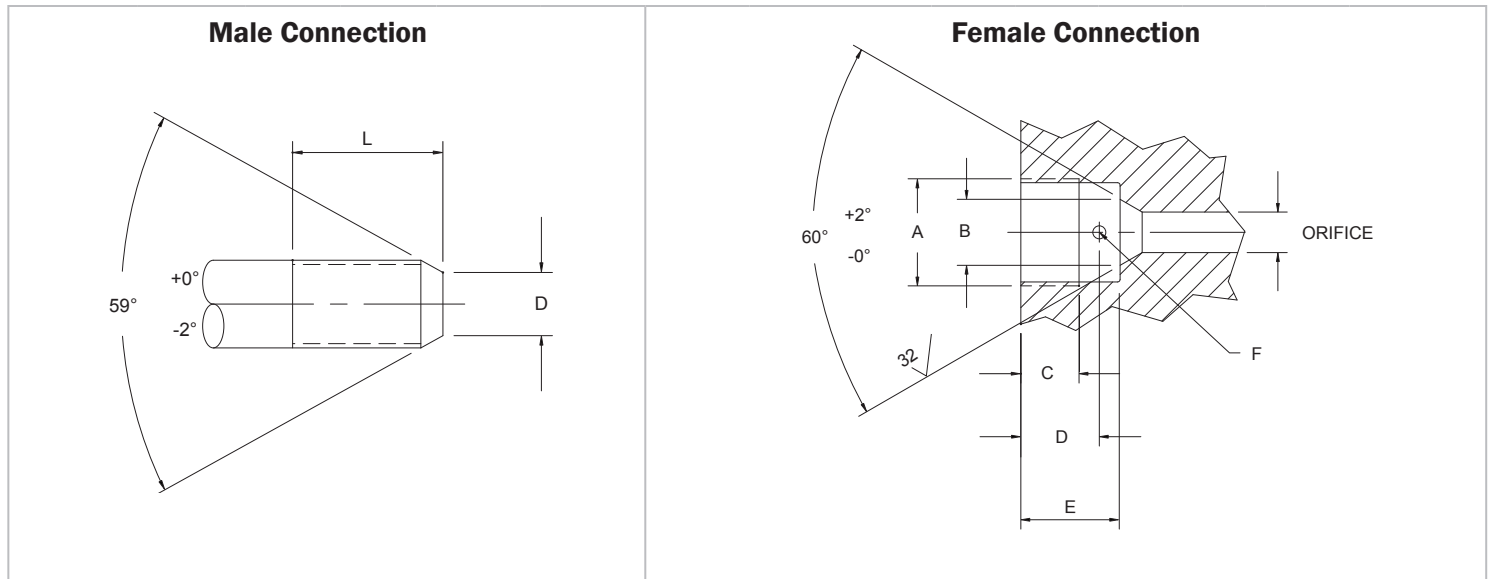
### Deburring Tools

The deburring tool is designed to remove the metal burr on the inside diameter of the tubing after the cutting process. The deburring tool will work on all medium, high, and ultra high pressure connections up to 9/16" tubing.

Tubing Size O.D. x I.D. (in.)	Tubing Pressure (psi @ R.T.)	Connection Type	Deburring Tool Complete Catalog Number	Replacement Part Information
				Bushing Part Number
1/4 x .109	22,500	4MM	<b>DT4</b>	3781.1381
3/8 x .203	22,500	6MM	<b>DT4</b>	3781.1381
9/16 x .312	22,500	9MM	<b>DT4</b>	3781.1381
9/16 x .359	15,200	9MM	<b>DT4</b>	3781.1381
1/4 x .083	65,000/101,000	4HM/4UM	<b>DT4</b>	3781.1381
3/8 x .125	65,000/101,000	6HM/6UM	<b>DT4</b>	3781.1381
9/16 x .188	65,000/101,000	9HF/9UF	<b>DT4</b>	3781.1381
5/16 x .062	152,000	5UM	<b>DT4</b>	3781.1381

# Tools & Installation

## Tube Connection Details



Tubing Size O.D. x I.D. (in.)	Tubing Pressure (psi @ R.T)	Dimension (in.)				Male Conn. Type	Female Conn. Type	Dimension (in.)						
		D	L	Left Hand Thread **	A**			B	C	D	E	F*	Orifice*	Tubing Engagement Allowance
<b>Medium Pressure</b>														
1/4 x .109	22,500	0.141	0.344	1/4-28	4MM	4MF	7/16-20	0.19	0.280	0.375	0.50	.093	0.125	0.55
3/8 x .203	22,500	0.250	0.438	3/8-24	6MM	6MF	9/16-18	0.31	0.380	0.500	0.62	.093	0.219	0.69
9/16 x .312	22,500	0.406	0.500	9/16-18	9MM-22	9MF	13/16-16	0.50	0.440	0.594	0.750	.093	0.312	0.83
9/16 x .359	15,200	0.438	0.500	9/16-18	9MM-15									
3/4 x .438	22,500	0.562	0.625	3/4-16	12MM-22	12MF	3/4-14 NPS***	0.625	0.500	0.719	0.938	.156	0.438	0.99
3/4 x .516	15,200	0.578	0.625	3/4-16	12MM-15									
1 x .562	22,500	0.719	0.781	1-14	16MM-22	16MF	1-3/8-12	0.875	0.813	1.063	1.313	.188	0.562	1.38
1 x .688	15,200	0.812	0.781	1-14	16MM-15									
1 1/2 X .937	15,200	1.062	1.000	1 1/2-12	24MM	24MF	1-7/8-12	1.375	1.000	1.295	1.590	.188	0.937	1.88
<b>High Pressure</b>														
1/4 x .083	65,000	0.125	0.562	1/4-28	4HM	4HF	9/16-18	0.172	0.380	0.375	0.438	.093	.093	0.50
3/8 x .125	65,000	0.219	0.750	3/8-24	6HM	6HF	3/4-16	0.266	0.531	0.563	0.625	.093	.125	0.69
9/16 x .188	65,000	0.281	0.938	9/16-18	9HM	9HF	1-1/8-12	0.375	0.625	0.656	0.750	.093	0.188	0.84
9/16 X .250	40,000	0.312	0.938	9/16-18	9HM-40									
1 X .438	43,000	0.562	0.910	1-14	16MM	16MF	1-3/8-12	0.875	0.813	1.062	1.313	.188	0.438	1.62
<b>Ultra High Pressure</b>														
1/4 x .083	101,000	0.125	0.562	1/4-28	4UM	4UF	9/16-18	0.172	0.380	0.375	0.438	.093	.093	0.50
3/8 x .125	101,000	0.219	0.750	3/8-24	6UM	6UF	3/4-16	0.266	0.531	0.563	0.625	.093	.125	0.69
9/16 x .188	101,000	0.281	0.938	9/16-18	9UM	9UF	1-1/8-12	0.375	0.625	0.656	0.750	.093	.188	0.84
5/16 x .062	152,000	0.125	0.687	5/16-24	5UM	5UF	5/8-18	0.250	0.625	0.938	1.062	.093	.093	1.25

\* Port diameters may vary depending on specific valve or fitting component type.  
See actual component catalog page for orifice sizes and pressure ratings.

\*\* Unified National Fine thread, Class 2A & 2B.

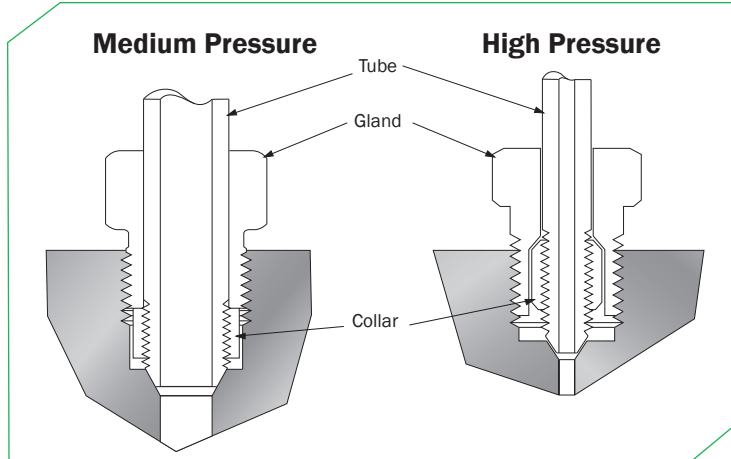
\*\*\* National Pipe Straight thread

.000 Dimensions = ± .005 Tolerance

All 59° & 60° surfaces require a 32 rms Finish

All dimensions are for references only and are subject to change.

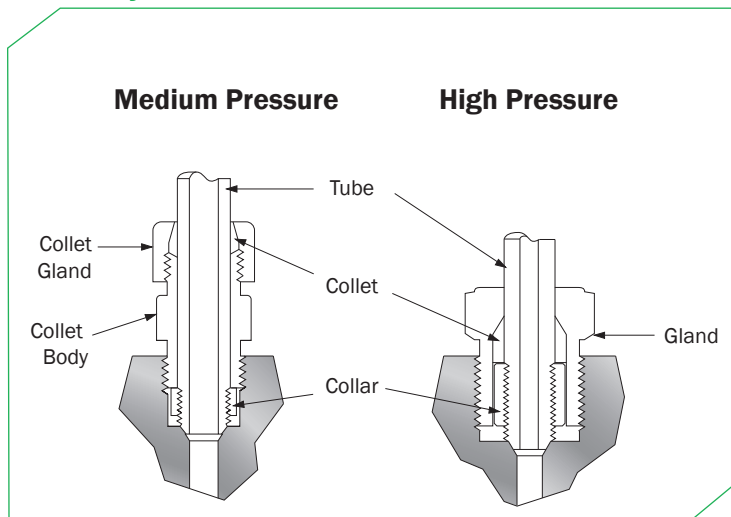
### Assembly of Standard Coned & Threaded Connections



#### Assembly Instructions:

1. Insert the gland onto the tubing. Thread the left handed collar onto the tube until one or two threads are exposed from the tapered coned end.
2. Apply a compatible lubricant to the gland threads and the back side of the collar where it comes in contact with the gland. Also lubricate the tapered cone portion of the tube with a system compatible lubricant. This will help protect the sealing surfaces from galling during the assembly process.
3. Insert the tubing into the connection and tighten the assembly hand tight. Then use a torque wrench to tighten the connection to the appropriate value in the table below. It is good practice to use an additional wrench to prevent the opposite connection from turning.

### Assembly of Anti-Vibration Collet Gland Connections



#### Assembly Instructions

1. The High Pressure Anti-Vibration Collet Gland Assembly can be installed using the same procedure as the standard coned and threaded connection. (see above steps 1 through 3) The high pressure collet grips the tube when the connection gland is tightened.
2. When using the Medium Pressure Anti-Vibration Collet Assembly, the procedure is the same as that of the standard coned and threaded connection (see above steps 1 through 3) with the additional step below.
3. Once the Collet Body has been tightened to the appropriate torque value in the table below, the Collet Gland can be turned 1 - 1/4 turns past hand tight. This will compress the collet against the tube. After the initial compression of the collet, any additional retightening would only require 3/4 of a turn past hand tight.

### Torque Values

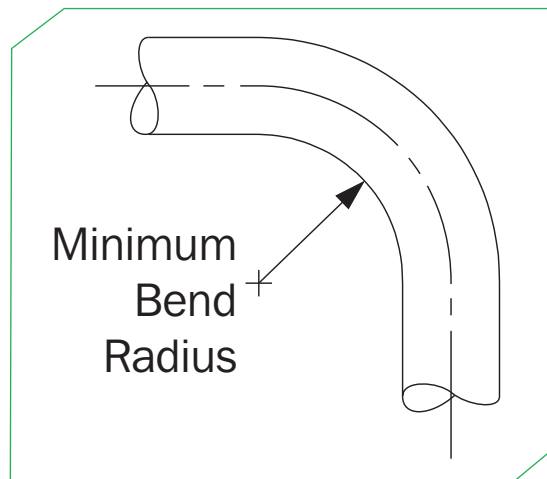
Tubing Size O.D. x I.D. (in.)	Tubing Pressure (psi @ R.T.)	Connection Type	Tube Gland Hex Size (in.)	Required Torque (ft-lbs.)
1/4 x .109	22,500	4M	1/2	20
3/8 x .203	22,500	6M	5/8	30
9/16 x .312	22,500	9M	15/16	55
9/16 x .359	15,200	9M	15/16	55
3/4 x .438	22,500	12M	1-3/16	90
3/4 x .516	15,200	12M	1-3/16	90
1 x .562	22,500	16M	1-3/8	150
1 x .688	15,200	16M	1-3/8	150
1-1/2 x .937	15,200	24M	1-7/8	200
1/4 x .083	65,000	4H	5/8	25
3/8 x .125	65,000	6H	13/16	50
9/16 x .188	65,000	9H	1-3/16	110
9/16 X 250	40,000	9H	1-3/16	60
1 X .438	43,000	16M	1-3/8	150
1/4 x .083	101,000	4U	5/8	35
3/8 x .125	101,000	6U	13/16	65
9/16 x .188	101,000	9U	1-3/16	145
5/16 x .062	152,000	5U	3/4	70

# Tools & Installation

## Tubing Minimum Bend Radius & Valve Torque Values

### Minimum Bend Radius for 316SS, 304SS & HP160SS Tubing

Tubing Size O.D. x I.D. (in.)	Tubing Pressure (psi @ R.T.)	Minimum Bend Radius (in.)
1/4 x .109	22,500	<b>1.25</b>
3/8 x .203	22,500	<b>1.75</b>
9/16 x .312	22,500	<b>2.63</b>
9/16 x .359	15,200	<b>2.63</b>
3/4 x .438	22,500	<b>3.50</b>
3/4 x .516	15,200	<b>3.50</b>
1 x .562	22,500	<b>4.63</b>
1 x .688	15,200	<b>4.63</b>
1-1/2 x .937	15,200	<b>10.00</b>
1/4 x .083	65,000/ 101,000	<b>1.25</b>
3/8 x .125	65,000/ 101,000	<b>1.75</b>
9/16 x .188	65,000/ 101,000	<b>2.63</b>
9/16 x .250	40,000	<b>2.63</b>
1 x .438	43,000	<b>4.63</b>
5/16 x .062	152,000	<b>6.00</b>



All dimensions are for references only and are subject to change.

### Needle Valve Torque Values

Valve Series	Tubing Size (in.)	Packing Gland Hex (in.) Size	Packing Gland Torque (ft.-lbs.)	Running Torque (in.-lbs.)	Seating Torque (in.-lbs.)
Pipe Valves 15,000 psig @ RT 15V	1/4 NPT	5/8	<b>30</b>	40	55
	3/8 NPT	13/16	<b>60</b>	46	90
	1/2 NPT	13/16	<b>60</b>	46	90
Medium Pressure 22,500 psig @ RT 21V	1/4	5/8	<b>30</b>	40	55
	3/8	5/8	<b>30</b>	40	55
	9/16	13/16	<b>60</b>	60	90
	3/4	15/16	<b>¾ turn</b>	300	360
	1	1 3/8	<b>¾ turn</b>	360	600
High Pressure 36,000 psig @ RT 36V	1/4	13/16	<b>45</b>	50	60
	3/8				
	9/16				
High Pressure 43,000 psig @ RT 43V	1	1-3/8	<b>¾ turn</b>	360	600
High Pressure 65,000 psig @ RT 65V	1/4	13/16	<b>40</b>	65	75
	3/8				
	9/16				
Ultra High Pressure 101,000 psig @ RT 101V	1/4	13/16	<b>50</b>	65	75
	3/8				
	9/16				
	5/16	15/16	<b>60</b>	100	120

All dimensions are for references only and are subject to change.

### The Coning and Threading Tool Kits:

Maxpro offers a complete line of coning and threading tool kits for manually coning and threading 1/4" O.D. to 9/16" O.D. tubing.

There are three different tool kit versions, "Medium" pressure, "High" pressure, and the "Complete Kit" that contains both the Medium and the High Pressure tools. All items are conveniently packaged in a sturdy hand carry tool case with removable top tray. The unique coning and threading tool design allows for interchangeability between components, eliminating multiple tool inventories.



### The Coning and Threading Tool Kit contains:

- Coning Tool Assembly
- 1/4, 3/8, 9/16 Collets
- Collet Wrench
- 1/4, 3/8, 9/16 Cutting Blades
- Threading Tool Assembly
- 1/4, 3/8, 9/16 Guide Bushing
- 1/4, 3/8, 9/16 Threading Dies
- Allen Wrenches
- Complete Deburring Tool
- Suflo Cutting Oil
- Laminated Instruction Manual

Tubing Size O.D. x I.D. (inches.)	Tubing Pressure (psi @ R.T.)	Connection Type	Coning & Threading Tool Kits Catalog Number	Coning & Threading Tool Kit Complete Catalog Number
1/4 x .109	22,500	4MM	<b>CTK-M</b> (Medium Pressure Kit)	<b>CTK-C</b> (Both Medium & High Pressure Kits)
3/8 X .203	22,500	6MM		
9/16 X .312	22,500	9MM		
9/16 X .359	15,200	9MM	<b>CTK-H</b> (High Pressure Kit)	
1/4 X .083	65,000/101,000	4HM/4UM		
3/8 X .125	65,000/101,000	6HM/6UM		
9/16 X .188	65,000	9HM		
5/16 X .062	152,000	5UM	<b>CTK-5U (5/16 Ultra High Pressure Kit)</b>	

Note: For additional coning and threading components see pages 2 and 3.

For Coning & Threading 9/16 Ultra High Pressure tubing (101,000 psi)  
Maxpro recommends using the "Coning & Threading Machine" on page 8.



### MAXPRO CONING & THREADING MACHINES



**MODEL #MTCAT** - Quickly cones and threads 1/4", 3/8", 9/16", 3/4" and 1" Medium Pressure and 1/4", 3/8" and 9/16" High Pressure Tubing. US Patent #9,015,915, CE Mark

**MODEL MTCAT-1.5** - The only Coning & Threading Machine on the market that quickly cones and threads all MTCAT tubing sizes plus 1-1/2" Medium Pressure Tubing. CE Mark & Patent Pending

#### COMMON QUALITY FEATURES

- \* Quick start intuitive operation
- \* Cones and threads tubing in minutes
- \* Thread length selection is made by simply dialing in the tubing size
  - \* Both machines use the same coning blades.
  - Simple installation, calibration not required
  - \* Install the tube ONCE, then cone and thread, and DONE.
- \* Tube remains stationary, accommodating formed tubes, ready for installation
- \* Capable of 4" straight length nipples through 1" OD, 6" nipples in 1-1/2" OD.
  - \* Die head resets automatically after threading during the retract stroke
    - \* Safe operation!
- \* Recirculating cutting oil system
  - \* Available to rent or buy
  - \* Tooling sold separately



### MTCAT TOOLING PART NUMBERS:

Tube Size and Pressure (kpsi)	Tube Size (Inches)	LH Coning Blade Holder*	Collet Only (only one req'd for tube holder)	LH Coning Blade Set	LH Threading Chaser (Set Only)	Complete LH Tool Set** (Coning Blade, Chaser Set, Collet)
1/4 MP 22.5	1/4 x .109	301-0226	601-0038	302-0225	601-0043	601-0048
1/4 HP 65	1/4 x .083	301-0226	601-0038	301-0225	601-0043	601-0049
5/16 UHP 152	5/16 X .062	301-0226	601-0151	301-0225	601-0152	601-0149
3/8 MP 22.5	3/8 x .203	301-0226	601-0039	304-0225	601-0044	601-0050
3/8 HP 65	3/8 x .125	301-0226	601-0039	303-0225	601-0044	601-0051
9/16 MP 22.5	9/16 x .312	301-0226	601-0040	306-0225	601-0045	601-0052
9/16 MP 15	9/16 x .359	301-0226	601-0040	307-0225	601-0045	601-0053
9/16 HP 65	9/16 x .188	301-0226	601-0040	305-0225	601-0045	601-0054
9/16 HP 40	9/16 x .250	301-0226	601-0040	313-0225	601-0045	601-0148
3/4 MP 22.5	3/4 x .438	301-0226	601-0041	308-0225	601-0046	601-0055
3/4 MP 15	3/4 x .516	301-0226	601-0041	309-0225	601-0046	601-0056
1" MP 22.5	1 x .562	301-0226	601-0042	310-0225	601-0047	601-0057
1" MP 15	1 x .688	301-0226	601-0042	311-0225	601-0047	601-0058
1" HP 43	1 x .438	301-0226	601-0042	315-0225	601-0047	601-0146

\* One LH coning blade TOOL HOLDER (covers 1/4" - 1") comes with the MTCAT Coning and Threading Machine.

\*\*Machine does not come with tooling (COLLET, CONING BLADES, THREAD CHASERS).

### MTCAT-1.5 TOOLING PART NUMBERS:

Tube Size and Pressure (kpsi)	Tube Size (Inches)	LH Coning Blade Holder*	Collet Only (only one req'd for tube holder)	LH Coning Blade Set	LH Threading Chaser (Set Only)	Complete LH Tool Set** (Coning Blade, Chaser Set, Collet)
1/4 MP 22.5	1/4 x .109	301-0226	P-0018	302-0225	601-0043	K-0015
1/4 HP 65	1/4 x .083	301-0226	P-0018	301-0225	601-0043	K-0016
5/16 UHP 152	5/16 X .062	301-0226	P-0019	301-0225	601-0152	K-0017
3/8 MP 22.5	3/8 x .203	301-0226	P-0020	304-0225	601-0044	K-0018
3/8 HP 65	3/8 x .125	301-0226	P-0020	303-0225	601-0044	K-0019
9/16 MP 22.5	9/16 x .312	301-0226	P-0021	306-0225	601-0045	K-0020
9/16 MP 15	9/16 x .359	301-0226	P-0021	307-0225	601-0045	K-0021
9/16 HP 65	9/16 x .188	301-0226	P-0021	305-0225	601-0045	K-0022
9/16 HP 40	9/16 x .250	301-0226	P-0021	313-0225	601-0045	K-0023
3/4 MP 22.5	3/4 x .438	301-0226	P-0022	308-0225	601-0046	K-0024
3/4 MP 15	3/4 x .516	301-0226	P-0022	309-0225	601-0046	K-0025
1" MP 22.5	1 x .562	301-0226	P-0023	310-0225	601-0047	K-0026
1" MP 15	1 x .688	301-0226	P-0023	311-0225	601-0047	K-0027
1" HP 43	1 x .438	301-0226	P-0023	315-0225	601-0047	K-0028
1-1/2" MP 15	1-1/2 x .937	M1-0054	P-0024	315-0225	P-0002	K-0014

\* One LH coning blade TOOL HOLDER (covers 1/4" - 1") comes with the MTCAT-1.5 Coning and Threading Machine.

\* ONE LH coning blade TOOL HOLDER (FOR 1-1/2") comes with MTCAT-1.5

\*\*Machine does not come with tooling (COLLET, CONING BLADES, THREAD CHASERS).