AXIAL Thread Rolling

For producing long threads, or threads without run-out restriction, then RSVP axial rolling heads are the ideal selection. Axial heads feed on from the end of the part and require one revolution of the spindle for each pitch of thread to be produced. Controlled forward axial motion, either by cam or CNC feed, are recommended although manually operated lathes can also give excellent results. RSVP axial heads are self opening and normally require an external closing action to reset them for the next pass. Right hand rolling heads are required for rolling right hand threads and the spindle direction must also be right hand. Left hand threads require corresponding heads and spindle rotation.

How To Order

Selecting The Correct Thread Rolling Head
There are two main factors that govern the choice of thread rolling head:

1. The thread size has to be within the standard capacity of the thread rolling head.

2. There must be sufficient clearance within the machine for the head to operate.

On pages 34 to 47 the range of axial thread rolling heads is illustrated, showing the outline dimensions and standard thread sizes for each head. Left hand and rotating versions of these heads are available in all the standard sizes. Special high-helix heads can also be supplied to accommodate Acme and multi-start threads.

Example:
In order to produce a 7/16 - 14 UNC stud, there is a choice between the A1, A2 and A3 heads. This choice may be limited by the clearance on the machine so it is most important to know the maximum diameter and projection available. If the maximum diameter that will clear when the machine turret indexes is 3.75", then the A3 head, at 4.60" diameter, is no longer a viable option. The choice between the A1 or the A2 should then be made with consideration given to any other threads that may need to be produced on the chosen head. If 7/16 UNC is the maximum thread size required then the A1, with a range of 1/4 UNC up to 7/16 UNC would be the recommended choice. However, if thread sizes above 7/16 UNC are required then the A2, with a range of 5/16 UNC up to 5/8 UNC, should be selected. Having selected the appropriate thread rolling head, please specify the required shank diameter from the options available.

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Selecting Thread Rolls
When ordering thread rolls it is important to specify as much information as possible about the rolls and the application so that the correct rolls may be promptly supplied. The minimum details required are as follows:

The full thread specification (e.g. 3/8 - 16 UNC, 7/16 - 20 UNF, 1/2 - 14 NPSM, 1/4 - 19 BSP)

The thread rolling head for which the rolls are required (A1, A23, A01 Etc.)

The lead required on the rolls (1K standard short lead, 2K standard long lead, or other special lead)

Using the 7/16 - 14 UNC stud example, to be produced using the A2 head, the final order would read as follows:

Quantity	Description
1	A2 THREAD ROLLING HEAD, 1" DIAMETER SHANK
2 SETS	7/16 - 14 UNC ROLLS WITH 2K LEAD, TO SUIT A2 HEAD

Should there be any doubt about the type of lead required on the rolls, or the size of head to be used, please provide our technical department with a component drawing so that we may make our own recommendations. Test samples may be produced with customer's material on special request.

THREAD ROLLING Advantages

Advantages To Using An RSVP Thread Rolling System

Thread rolling is now recognized as the fastest and most reliable method of producing quality threads, with RSVP axial and tangential heads and rolls at the forefront of this technology.

The introduction of radial thread rolling offers a new dimension to users of this process, and means thread production can be measured in fractions of a second!

The applications for RSVP thread rolling heads are almost limitless, with models available to suit virtually every type of lathe in the industry.

Technical support

It should be noted that many of the features of thread rolling are shared by axial, tangential and radial rolling heads. Customers are advised to contact our technical department for assistance in selecting the appropriate equipment.

RSVP enjoy the advantage of a dedicated manufacturing facility that offers the customer unrivaled technical support and know-how across a full range of thread rolling and thread cutting products. This expertise applies throughout our thread rolling program and is available to all our customers in North America.

The Benefits Of Thread Rolling

In order to select the appropriate rolling head, it is important to understand the principles of thread rolling.

The cold forming rolling process produces threads by plastic deformation of the material. This in turn imparts high strength plus excellent surface finish, combined with improved wear and corrosion resistance.

As a result, rolled threads are indispensable to safety critical applications in the aerospace, nuclear and automotive industries.

The high rates of material deformation required to roll threads have a most beneficial consequence; very short cycle times. Compare thread rolling with other widely used methods and the potential savings in time and cost are self evident. Figure 1 illustrates the time saving over single point as 7.2 seconds per thread. Multiply this by over 200,000 parts per annum to give a total time saving of 400 hours. This equates to 10 extra weeks of valuable machine time!

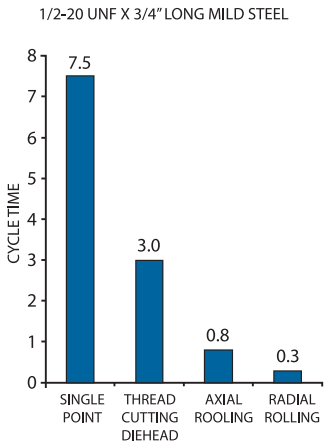

Figure: 1

Axial, Tangential Or Radial?

Before choosing the optimum rolling system, there are certain criteria that must be met:

a. Material - for axial rolling should have minimum elongation of 5% and the tensile strength should not exceed 1700 N/mm². However, 8% elongation and 1000 N/mm² are preferred for radial rolling.

b. Spindle - should be fast enough to permit rolling speeds of 60-180 sfm when axial thread rolling and 60-90 sfm when radial rolling. The work piece must always be on the same center line as the rolling head.

c. Power - available power for rolling at high speeds is essential. Radial rolling requires additional torque to axial and tangential rolling as the process is completed in just one revolution of the rolls.

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INTRODUCTION to Axial Thread Rolling

Description

The thread rolling process is now widely acknowledged as the fastest and most efficient method of producing accurate external threads, with surface finish and mechanical properties unobtainable by any other method.

This simple cold forming operation enables engineers to produce threaded fasteners and components to the most exacting standards with ease and repeatability on a wide range of materials. In fact, many high tensile and safety critical components, such as used in the aerospace industries, demand a rolled thread for its high strength properties and no other threading method will be accepted in these cases.

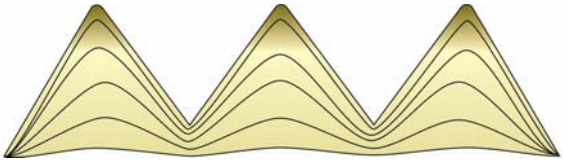

Figure 1: Grain structure of rolled thread

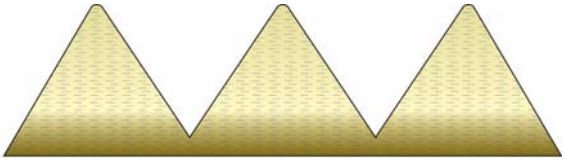

Figure 2: Grain structure of cut thread

The properties of a rolled thread are best illustrated by examining the cross section of a thread that has been produced by thread rolling and comparing it to a thread that has been produced by conventional cutting.

The rolled thread form does not break through the grain of the material as occurs with a cut thread and is subsequently more resistant to fracture during tensile loading. The compressive action that takes place during thread rolling serves to increase the hardness of the material, improve its tensile and yield strengths due to the burnishing action of rolling. As a result, thread rolling gives a highly polished finish that resists surface corrosion.

Axial Thread Rolling

The thread rolling heads detailed on pages 34 - 47 of this catalog all function by means of axial or end feeding. This process requires the head to be applied to the end of a prepared blank at a controlled feed rate so that the lead on the thread rolls engage with the lead chamfer on the blank. Once the rolls have engaged with the blank the head will feed itself axially along the part until it reaches the end of its stroke. At this point the forward motion of the head is arrested and the pull off mechanism operates to open the head so that the rolls clear the thread and the head can then be retracted from the part. Due to the self feeding action of the head, it is equally suited to machines without a feed control mechanism as well as machines with lead screws or CNC controlled slides.

On manual type machines the head is reset by the operator before each threading pass using the standard handle equipped with the head. The same method is used when the head is mounted into the turret of a CNC chucking lathe. When operated under automatic cycle on either cam or CNC bar autos, the manual ball type handle is replaced by a closing pin which has to be actuated by an external closing lever or strike plate mounted at the indexing position of the machine turret (the same principle as a conventional diehead). Some machine tool manufacturers offer separate pneumatic actuating units which are ideally suited to closing thread rolling heads.

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AXIAL Application

Applications
Axial thread rolling heads have an established reputation for reducing thread cycle times and increasing productivity on a wide range of conventional and CNC controlled machines. The nature of thread-rolling, being up to four times faster than traditional cutting methods, requires the machine tool to be able to run at much higher speeds which can place limitations on older lathes and cam autos that were designed for cutting at lower speeds and feeds. The widespread use of CNC lathes with their elevated spindle speeds and accurate programmable feed rates has helped to increase the potential applications for axial thread rolling heads, especially on smaller diameter threading where single point methods are slower and less accurate. High resolution programming to .0001" (.001mm) enables pre-rolling blank diameters to be maintained more accurately on CNC lathes which is advantages when producing threads to tight tolerances.

The basic criteria for selecting a machine for thread rolling are as follows:

Spindle Speed: The machine spindle must be capable of rotating at the speed required for the thread to be rolled.

Feed Control: Automatic machines should be equipped with a controllable feed mechanism that allows a smooth start to the rolling process and a positive, accurate stop mechanism for reliable opening of the head. On both manual and automatic machines, a heavy or sticking slide will not allow the self-feeding of the head to function correctly and premature opening of the head will result. Over feeding of the head will cause damage both to the start threads on the piece part as well as the rolls and must be avoided.

Alignment: As with all on center end working tools, it is essential that the machine spindle and the head are not misaligned, as this can result in malformed threads, shortened roll life and in severe cases breakage to the thread rolling head.

Coolant: An adequate supply of good quality, particle-free coolant should be obtainable from the machine coolant system.

If the basic criteria outlined above are met, then successful thread rolling can be achieved on most types of turning machines, including CNC lathes, multi-spindle screw machines, single-spindle screw machines, turret lathes, centre lathes and special purpose threading machines.

Material Properties
Axial thread rolling proves most successful on materials that have an elongation of 10% or more and a tensile strength of below 1500N/mm² (140,000 psi). It is often possible to roll materials outside these parameters, but the life of the thread rolls can be so reduced as to make the process uneconomic. Certain free cutting grades of steel and brass may have low tensile strengths and good elongation factors but are often susceptible to flaking at the root and flanks of the thread, especially on Acme, trapezoidal and coarse v-form threads. For these applications, it is advisable to obtain material grades that offer good machinability combined with a low lead content.

The following chart gives an indication of the types of materials that can be thread rolled using an axial head, combined with the recommended rolling speeds for standard v-form threads:

	feet/min	meters/min
Low - medium carbon steels	100 - 200	30 - 60
Medium case hardening steels	100 - 200	30 - 60
High alloy steels	120 - 250	35 - 75
Stainless steels	120 - 225	35 - 70
Copper alloys	200 - 300	60 - 90

As a guide, coarse pitches and high tensile materials are rolled at the lower end of the above speed ranges. Fine pitches and light alloys may be rolled at the top end of the above speed ranges.

Standard HSS Thread Rolls

Nitrided HSS Thread Rolls

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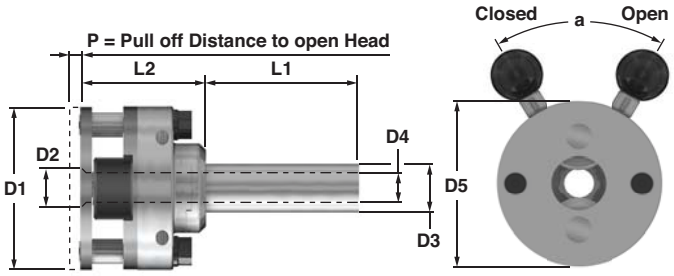
A0 Axial Head

EDP	Shank
7101	3/4
7101-20	20mm

Approximate Weight: 1.2 lbs



Axial Thread Rolling Heads
For Right Hand Threads
For Stationary Applications

A0 Axial Head Dimensions

Dimensions

Helix Angle in Head = 4°		D1	D2	D3	D4	D5 max
Allowable Component Lead	inches	1.970	0.453	3/4	0.260	2.146
Angle = 2° 25' - 5° 12'	mm	50	11.5	20	6.5	54.5

Dimensions Continued

Helix Angle in Head = 4°		L1	L2	P	a
Allowable Component Lead	inches	1.970	1.520	0.080	50°
Angle = 2° 25' - 5° 12'	mm	50	39	2	

Left hand heads are dimensionally the same as right hand heads but open and close on the opposite direction. Thread rolls can be used in both right hand and left hand heads.

The Following Thread Rolls May Be Ordered As Standard On The A0 Axial Head

ISO Metric

1K EDP	2K EDP	Description
8101	8102	M1.4 x 0.3
8103	8104	M1.6 - 1.8 x .035
8105	8106	M2.0 - 2.3 x 0.4
8107	8108	M2.2 - 2.6 x 045
8109	8110	M2.5 - 3.0 x 0.5
8111	8112	M3.0 - 3.5 x 0.6
8113	8114	M4 x .07
8115	8116	M4.0 - 4.5 x 0.75
8117	8118	M5 x 0.8
8119	8120	M5.0 - 5.5 x 0.9

Unified Coarse UNC

1K EDP	2K EDP	Description
8121	8122	No. 1 x 64
8123	8124	No. 2 x 56
8125	8126	No. 3 x 48
8127	8128	No. 4 - 5 x 40
8129	8130	No. 6 - 8 x 32
8131	8132	No. 10 - 12 x 24

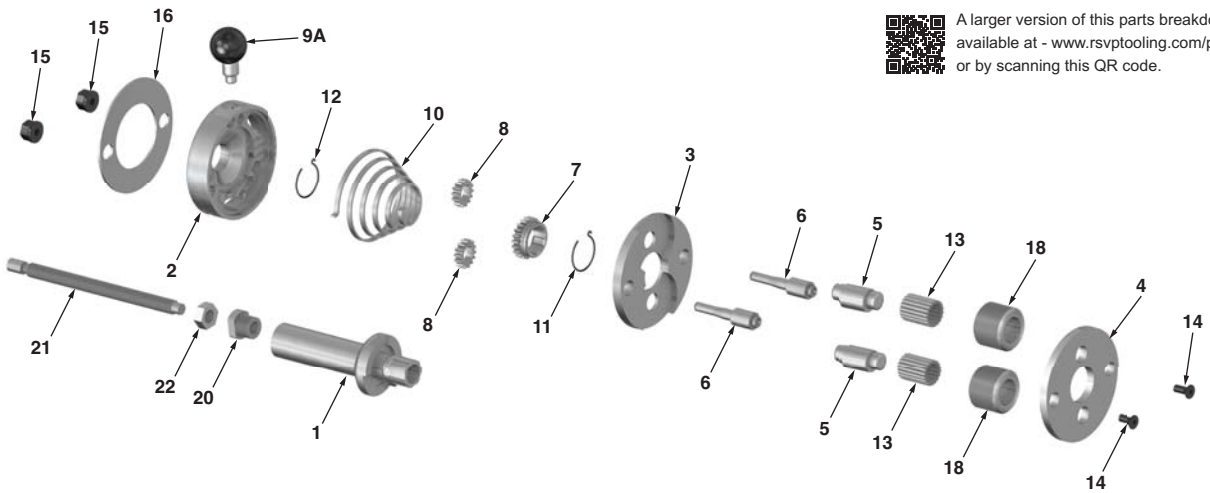
Unified Fine UNF

1K EDP	2K EDP	Description
8133	8134	No. 0 x 80
8135	8136	No. 1 x 72
8137	8138	No. 2 x 64
8139	8140	No. 3 x 56
8141	8142	No. 4 x 48
8143	8144	No. 5 x 44
8145	8146	No. 6 x 40
8147	8148	No. 8 x 36
8149	8150	No. 10 x 32
8151	8152	No. 12 x 28

Threads outside of the above standard series may also be rolled on this head provided that their helix does not fall outside the permissible range.

Nitrided Rolls are available for use in rolling special alloys such as Stainless Steel.

Component Parts Breakdown



A larger version of this parts breakdown is available at - www.rsvptooling.com/prints.html or by scanning this QR code.

Ref	Qty	Description	EDP
1	1	Shank	7500
2	1	Spring Housing	7501
3	1	Center Plate	7502
4	1	Front Plate	7503
5	2	Eccentric Spindle	7504
6	2	Spacer Stud	7505
7	1	Center Gear	7506
8	2	Outer Gear	7507

Ref	Qty	Description	EDP
9A	1	Handle Assy.	7508A
10	1	Coil Spring	7509
11	1	Circlip	7510
12	1	Circlip	7511
13	36	Needle Bearings	7512
13*	2	Carbide Bushing	1466
14	2	Front Plate Screw	7514
15	2	Hexagon Nut	7515

Ref	Qty	Description	EDP
16	1	Ring Washer	7516
18	3	Thread Roll (See Chart for Size & EDP)	
20	1	Stop Screw Body	7517
21	1	Stop Screw	7518
22	1	Hexagon Nut	7519

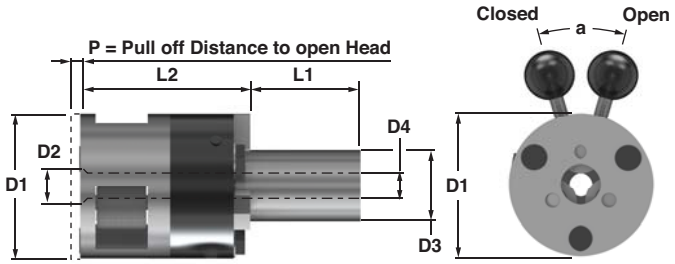
(*) #13 Needle Bearings are provided as standard. Optional Carbide Bushings provided at additional cost upon request.

A001 Axial Head

EDP	Shank	EDP	Shank
7102	3/4	7102-20	20mm
7102-5/8	5/8	7102-16	16mm

Approximate Weight: 0.1 lbs

Axial Thread Rolling Heads
For Right Hand Threads
For Stationary Applications



A001 Axial Head Dimensions

Dimensions

Helix Angle in Head = 4°		D1	D2	D3	D4
Allowable Component Lead	inches	1.575	0.275	3/4 / 5/8	0.295
Angle = 2° 25' - 5° 12'	mm	40	7	20 / 16	7.5

Dimensions Continued

Helix Angle in Head = 4°		L1	L2	P	a
Allowable Component Lead	inches	0.985	1.575	0.060	32°
Angle = 2° 25' - 5° 12'	mm	25	40	1.5	

Left hand heads are dimensionally the same as right hand heads but open and close on the opposite direction. Thread rolls can be used in both right hand and left hand heads.

The Following Thread Rolls May Be Ordered As Standard On The A001 Axial Head

ISO Metric

1K EDP	2K EDP	Description
8167	8168	M2.6 x 0.45
8169	8170	M3.0 x 0.5
8171	8172	M3.0 - 3.5 x 0.6
8173	8174	M4.0 x 0.7
8165	8166	M4.0 x 0.75

Unified Coarse UNC

1K EDP	2K EDP	Description
8175	8176	No. 4 - 5 x 40
8177	8178	No. 6 - 8 x 32

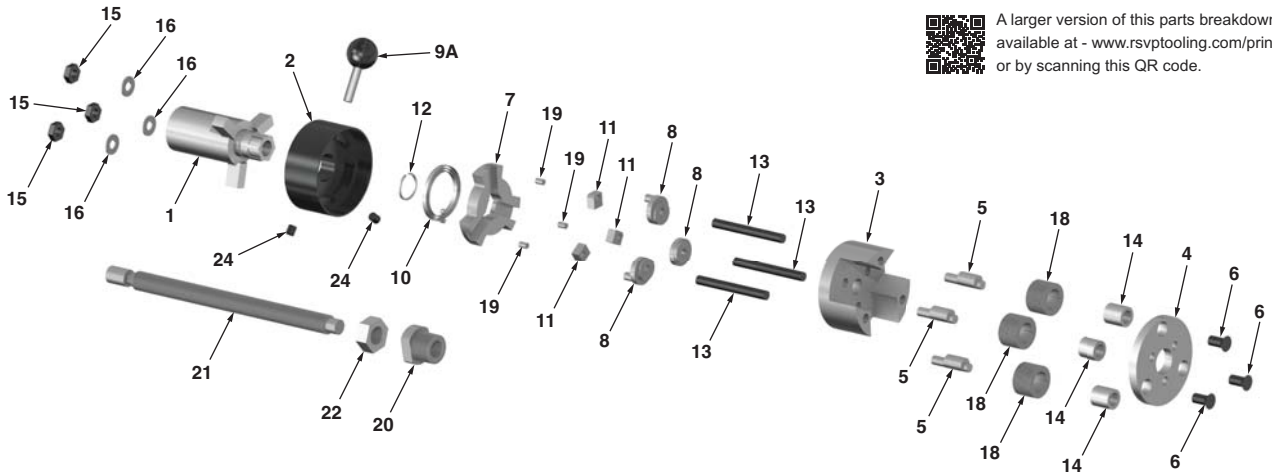
Unified Fine UNF

1K EDP	2K EDP	Description
8179	8180	No. 4 x 48
8181	8182	No. 5 x 44
8183	8184	No. 6 x 40

Threads outside of the above standard series may also be rolled on this head provided that their helix does not fall outside the permissible range.

Nitrided Rolls are available for use in rolling special alloys such as Stainless Steel.

Component Parts Breakdown



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Ref	Qty	Description	EDP
1	1	Shank	7544
2	1	Spring Housing	7513
3	1	Center Plate	7520
4	1	Front Plate	7521
5	3	Eccentric Spindle	7522
6	3	Front Plate Screw	7523
7	1	Clutch Plate	7524
8	3	Cam	7525
9A	1	Handle Assy.	7546A

Ref	Qty	Description	EDP
10	1	Coil Spring	7545
11	3	Hardened Slide	7528
12	1	Circlip	7529
13	3	Studs	7542
14	3	Carbide Bushing	1453
15	3	Hexagon Nut	7543
16	3	Washer	7537
17	1	Hexagon Nut	7549

Ref	Qty	Description	EDP
18	3	Thread Roll (See Chart for Size & EDP)	
19	3	Shear Pin	7533
20	1	Stop Screw Body	7535
21	1	Stop Screw	7536
22	1	Hexagon Nut	7519
24	2	Set Screw	7547
25	1	Washer	7548

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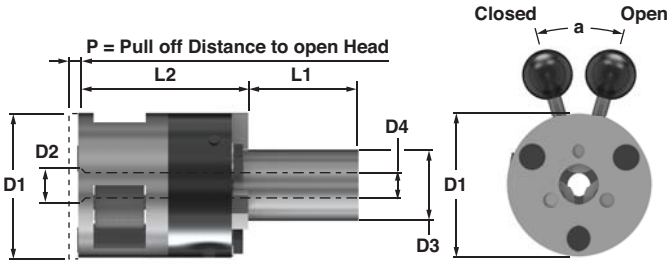
A01 Axial Head

Axial Thread Rolling Heads
For Right Hand Threads
For Stationary Applications

EDP	Shank	EDP	Shank
7103	3/4	7103-20	20mm
7103-5/8	5/8	7103-16	16mm

Approximate Weight: 0.8 lbs



A01 Axial Head Dimensions

Dimensions					
Helix Angle in Head = 3° 30'		D1	D2	D3	D4
Allowable Component Lead	inches	1.575	0.470	3/4 / 5/8	0.295
Angle = 2° 5' - 4° 33'	mm	40	12	20 / 16	7.5

Dimensions Continued					
Helix Angle in Head = 3° 30'		L1	L2	P	a
Allowable Component Lead	inches	0.950	1.710	0.060	32°
Angle = 2° 5' - 4° 33'	mm	24	43.5	1.5	

Left hand heads are dimensionally the same as right hand heads but open and close on the opposite direction. Thread rolls can be used in both right hand and left hand heads.

The Following Thread Rolls May Be Ordered As Standard On The A01 Axial Head

ISO Metric

1K EDP	2K EDP	Description
8189	8190	M3.5 x 0.6
8191	8192	M4.0 x 0.7
8193	8194	M4.0 - 4.5 x 0.75
8195	8196	M5.0 x 0.8
8197	8198	M5.0 - 5.5 x 0.9
8199	8200	M6.0 x 1.0

ISO Metric Fine

1K EDP	2K EDP	Description
8201	8202	M4.0 - 5.0 x 0.5

Unified Coarse UNC

1K EDP	2K EDP	Description
8203	8204	No. 8 x 32
8205	8206	No. 10 - 12 x 24
8217	8218	1/4 x 20

Unified Fine UNF

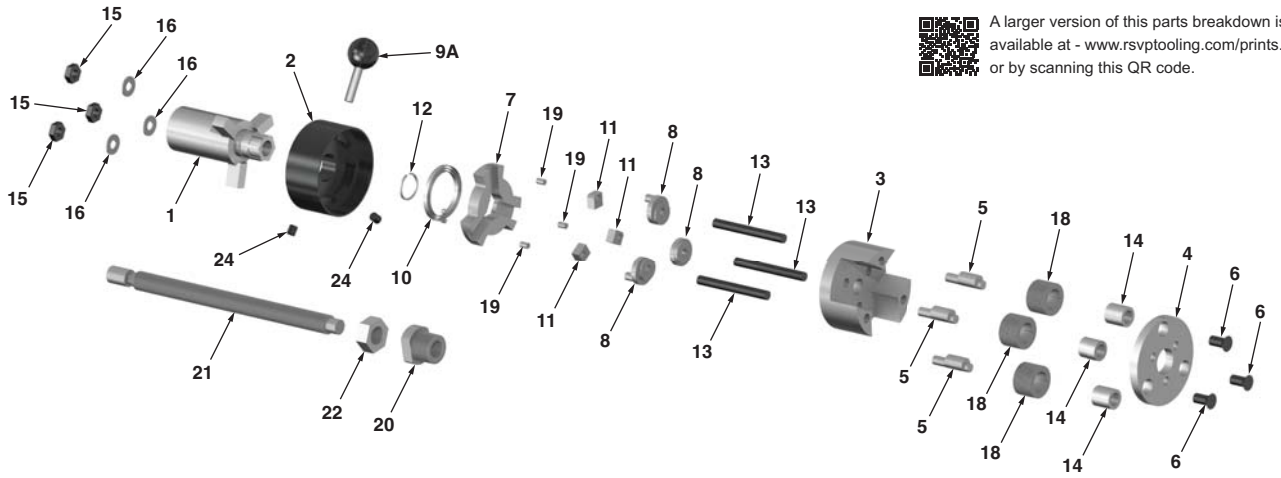
1K EDP	2K EDP	Description
8207	8208	No. 6 x 40
8209	8210	No. 8 x 36
8211	8212	No. 10 x 32
8213	8214	No. 12 x 28
8215	8216	1/4 x 28

Threads outside of the above standard series may also be rolled on this head provided that their helix does not fall outside the permissible range.

Nitrided Rolls are available for use in rolling special alloys such as Stainless Steel.

Component Parts Breakdown

A larger version of this parts breakdown is available at - www.rsvptooling.com/prints.html or by scanning this QR code.



Ref	Qty	Description	EDP
1	1	Shank	7544
2	1	Spring Housing	7686
3	1	Center Plate	7526
4	1	Front Plate	7539
5	3	Eccentric Spindle	7531
6	3	Front Plate Screw	7523
7	1	Clutch Plate	7527
8	3	Cam	7525
9A	1	Handle Assy.	7546A

Ref	Qty	Description	EDP
10	1	Coil Spring	7545
11	3	Hardened Slide	7528
12	1	Circlip	7529
13	3	Studs	7532
14	3	Carbide Bushing	1454
15	3	Hexagon Nut	7543
16	3	Washer	7537
17	1	Hexagon Nut	7549

Ref	Qty	Description	EDP
18	3	Thread Roll (See Chart for Size & EDP)	
19	3	Shear Pin	7533
20	1	Stop Screw Body	7535
21	1	Stop Screw	7536
22	1	Hexagon Nut	7519
24	2	Set Screw	7547
25	1	Washer	7548

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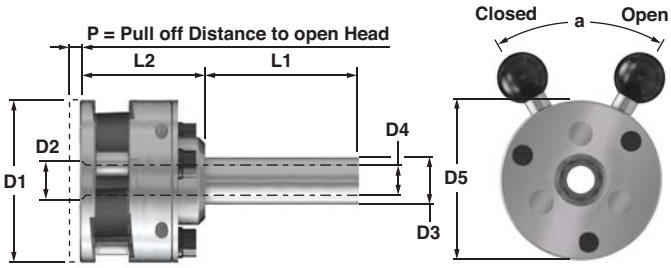
A1 Axial Head

EDP	Shank
7104	3/4
7104-20	20mm

Approximate Weight: 2.0 lbs

Axial Thread Rolling Heads
For Right Hand Threads
For Stationary Applications



A1 Axial Head Dimensions

Dimensions

Helix Angle in Head = 3º 30'		D1	D2	D3	D4	D5 max
Allowable Component Lead	inches	2.520	0.670	3/4	0.440	2.756
Angle = 2º 5' - 4º 33'	mm	64	17	20	11	70

Dimensions Continued

Helix Angle in Head = 3º 30'		L1	L2	P	a
Allowable Component Lead	inches	2.360	1.970	0.080	60º
Angle = 2º 5' - 4º 33'	mm	60	50	2	

Left hand heads are dimensionally the same as right hand heads but open and close on the opposite direction. Thread rolls can be used in both right hand and left hand heads.

The Following Thread Rolls May Be Ordered As Standard On The A1 Axial Head

ISO Metric

1K EDP	2K EDP	Description
8001	8002	M6.0 - 8.0 x 1.0
8003	8004	M8.0- 9.0 x 1.25
8005	8006	M10.0 x 1.5

ISO Metric Fine

1K EDP	2K EDP	Description
8047	8046	M6.0 - 8.0 x 0.75
8055	8056	M8.0 - 10.0 x 1.0
9945	9953	M10.0 - 11.0 x 1.25

Unified Coarse UNC

1K EDP	2K EDP	Description
8007	8008	1/4 x 20
8009	8010	5/16 x 18
8011	8012	3/8 x 16
8013	8014	7/16 x 14

Unified Fine UNF

1K EDP	2K EDP	Description
8015	8016	1/4 x 28
8017	8018	5/16 - 3/8 x 24
8068	8070	7/16 x 20

National Pipe Thread NPT

1K EDP	2K EDP	Description
8058	8059	1/16 x 27 NPT
8060	8061	1/8 x 27 NPT

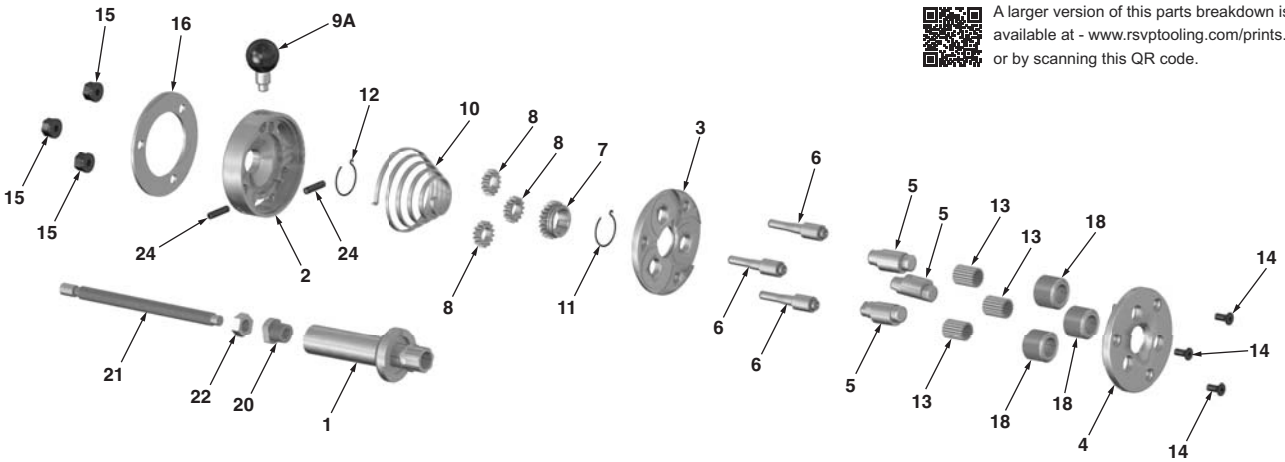
National Pipe Thread Dryseal NPTF

1K EDP	2K EDP	Description
8062	8063	1/16 x 27 NPTF
8064	8065	1/8 x 27 NPTF

Threads outside of the above standard series may also be rolled on this head provided that their helix does not fall outside the permissible range.

Nitrided Rolls are available for use in rolling special alloys such as Stainless Steel.

Component Parts Breakdown



A larger version of this parts breakdown is available at - www.rsvptooling.com/prints.html or by scanning this QR code.

Ref	Qty	Description	EDP
1	1	Shank 3/4"	7554
1A	1	Shank 20mm	7554-20
2	1	Spring Housing	7571
3	1	Center Plate	7556
4	1	Front Plate	7557
5	3	Eccentric Spindle	7558
6	3	Spacer Stud	7559
7	1	Center Gear	7560

Ref	Qty	Description	EDP
8	3	Outer Gear	7561
9A	1	Handle Assy.	7576A
10	1	Coil Spring	7563
11	1	Circlip	7564
12	1	Circlip	7565
13	57	Needle Roller Bearings	7566
13*	3	Carbide Bushing	1455
14	3	Front Plate Screw	7568

Ref	Qty	Description	EDP
15	3	Hexagon Nut	7578
16	1	Ring Washer	7570
18	3	Thread Roll (See Chart for Size & EDP)	
20	1	Stop Screw Body	2185
21	1	Stop Screw	2187
22	1	Hexagon Nut	2186
24	2	Set Screw (2/set)	2190

(*) #13 Needle Bearings are provided as standard. Optional Carbide Bushings provided at additional cost upon request.

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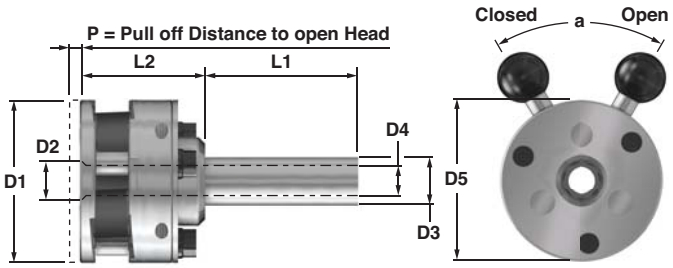
A12 Axial Head

EDP	Shank
7105	3/4
7105-20	20mm

Approximate Weight: 2.0 lbs

Axial Thread Rolling Heads
For Right Hand Threads
For Stationary Applications



A12 Axial Head Dimensions

Dimensions						
Helix Angle in Head = 1° 50'		D1	D2	D3	D4	D5 max
Allowable Component Lead	inches	2.520	0.790	3/4	0.430	2.756
Angle = 1° 5' - 2° 23'	mm	64	20	20	11	70

Dimensions Continued					
Helix Angle in Head = 1° 50'		L1	L2	P	a
Allowable Component Lead	inches	2.360	1.970	0.080	60°
Angle = 1° 5' - 2° 23'	mm	60	50	2	

Left hand heads are dimensionally the same as right hand heads but open and close on the opposite direction. Thread rolls can be used in both right hand and left hand heads.

The Following Thread Rolls May Be Ordered As Standard On The A12 Axial Head

ISO Metric Fine

1K EDP	2K EDP	Description
8229	8230	M6.0 - 7.0 x 0.5
8231	8232	M7.0 - 8.0 x 0.5
8233	8234	M6.0 x 7.0 x 0.75
8235	8236	M8.0 - 9.0 x 0.75
8237	8238	M9.0 - 10.0 x 0.75
8239	8240	M10.0 - 11.0 x 0.75*
8241	8242	M11.0 - 12.0 x 0.75*
8243	8244	M8.0 - 9.0 x 1.0
8245	8246	M9.0 - 10.0 x 1.0
8247	8248	M10.0 - 11.0 x 1.0
8249	8250	M11.0 - 12.0 x 1.0

ISO Metric Fine (Continued)

1K EDP	2K EDP	Description
8251	8252	M10 - 11.0 x 1.25
8253	8254	M11.0 - 12.0 x 1.25
8255	8256	M12.0 x 1.5

Unified Fine UNF

1K EDP	2K EDP	Description
8257	8258	1/4 - 5/16 x 40
8259	8260	5/16 - 3/8 x 36
8261	8262	7/16 x 36*
8263	8264	5/16 - 3/8 x 32
8265	8266	7/16 - 1/2 x 32*

Unified Fine UNF (Continued)

1K EDP	2K EDP	Description
8267	8268	3/8 - 7/16 x 28*
8269	8270	1/2 x 28*
8271	8272	7/16 - 1/2 x 26*
8273	8274	3/8 - 7/16 x 24*
8275	8276	7/16 - 1/2 x 24*
8277	8278	7/16 - 1/2 x 22*
8279	8280	7/16 - 1/2 x 20*

National Pipe Thread NPT

1K EDP	2K EDP	Description
8281	8282	1/8 x 27 NPT
8283	8284	1/4 x 18 NPT

National Pipe Thread Dryseal NPTF

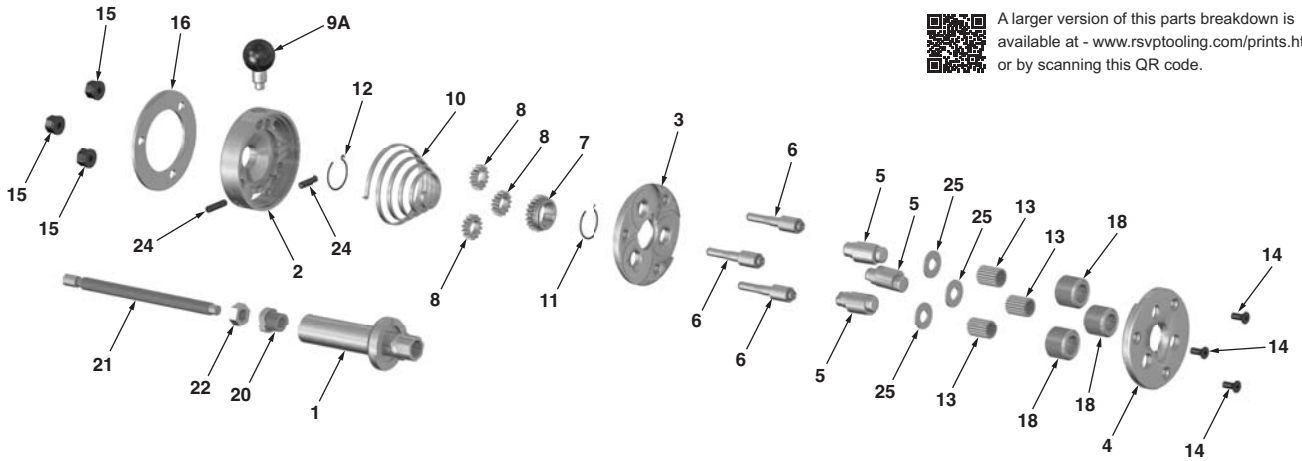
1K EDP	2K EDP	Description
8285	8286	1/8 x 27 NPTF
8287	8288	1/4 x 18 NPTF

(*) Limited to short threads up to 14mm (0.551") including thread runout

Threads outside of the above standard series may also be rolled on this head provided that their helix does not fall outside the permissible range.

Nitrided Rolls are available for use in rolling special alloys such as Stainless Steel.

Component Parts Breakdown



A larger version of this parts breakdown is available at - www.rsvptooling.com/prints.html or by scanning this QR code.

Ref	Qty	Description	EDP
1	1	Shank 3/4"	7554
1A	1	Shank 20mm	7554-20
2	1	Spring Housing	7571
3	1	Center Plate	7610
4	1	Front Plate	7581
5	3	Eccentric Spindle	7580
6	3	Spacer Stud	7654
7	1	Center Gear	2177
8	3	Outer Gear	7579

Ref	Qty	Description	EDP
9A	1	Handle Assy.	7576A
10	1	Coil Spring	7563
11	1	Circlip	7564
12	1	Circlip	7565
13	57	Needle Roller Bearings	7584
13*	3	Carbide Bushing	1467
14	3	Front Plate Screw	7568
15	3	Hexagon Nut	7578

Ref	Qty	Description	EDP
16	1	Ring Washer	7570
18	3	Thread Roll (See Chart for Size & EDP)	
20	1	Stop Screw Body	2185
21	1	Stop Screw	2187
22	1	Hexagon Nut	2186
24	2	Set Screw (2/set)	2190
25	3	Washer	7585

(*) #13 Needle Bearings are provided as standard. Optional Carbide Bushings provided at additional cost upon request.

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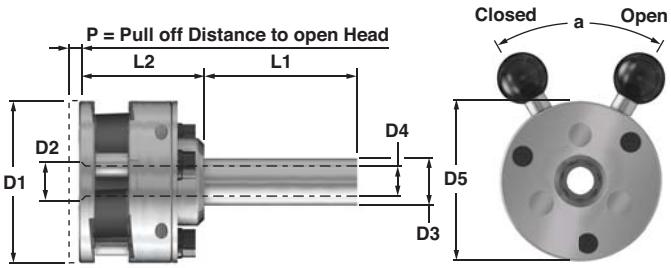
A2 Axial Head

EDP	Shank
7106	1”
7106-25	25mm

Approximate Weight: 4.2 lbs

Axial Thread Rolling Heads
For Right Hand Threads
For Stationary Applications



A2 Axial Head Dimensions

Dimensions

Helix Angle in Head = 3º		D1	D2	D3	D4	D5 max
Allowable Component Lead	inches	3.460	0.940	1	0.670	3.681
Angle = 1º 50' - 4º 15'	mm	88	24	25	17	93.5

Dimensions Continued

Helix Angle in Head = 3º		L1	L2	P	a
Allowable Component Lead	inches	2.990	2.720	0.120	60º
Angle = 1º 50' - 4º 15'	mm	76	69	3	

Left hand heads are dimensionally the same as right hand heads but open and close on the opposite direction. Thread rolls can be used in both right hand and left hand heads.

The Following Thread Rolls May Be Ordered As Standard On The A2 Axial Head

ISO Metric

1K EDP	2K EDP	Description
8019	8020	M8.0 - 10.0 x 1.25
8021	8022	M10.0 - 12.0 x 1.5
8023	8024	M12.0 - 14.0 x 1.75
8025	8026	M14.0 - 16.0 x 2.0

ISO Metric Fine

1K EDP	2K EDP	Description
8073	8074	M8.0 - 10.0 x 1.0
8075	8076	M10.0 - 12.0 x 1.25
8077	8078	M12.0 - 14.0 x 1.5

Unified Coarse UNC

1K EDP	2K EDP	Description
8027	8028	5/16 x 18
8029	8030	3/8 x 16
8031	8032	7/16 x 14
8033	8034	1/2 x 13
8035	8036	9/16 x 12
8037	8038	5/8 x 11

Unified Fine UNF

1K EDP	2K EDP	Description
8039	8040	5/16 - 3/8 x 24
8041	8042	7/16 - 1/2 x 20
8043	8044	9/16 - 5/8 x 18

National Pipe Thread NPT

1K EDP	2K EDP	Description
8084	8085	1/4 x 18 NPT

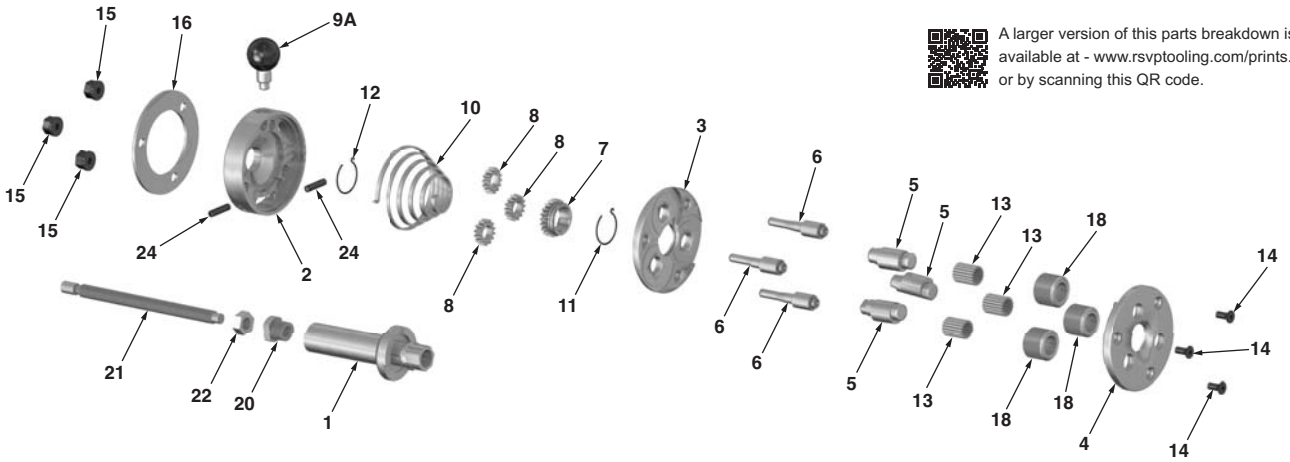
National Pipe Thread Dryseal NPTF

1K EDP	2K EDP	Description
8086	8087	1/4 x 18 NPTF

Threads outside of the above standard series may also be rolled on this head provided that their helix does not fall outside the permissible range.

Nitrided Rolls are available for use in rolling special alloys such as Stainless Steel.

Component Parts Breakdown



A larger version of this parts breakdown is available at - www.rsvptooling.com/prints.html or by scanning this QR code.

Ref	Qty	Description	EDP
1	1	Shank 1”	7590
1A	1	Shank 25mm	7590-25
2	1	Spring Housing	7310
3	1	Center Plate	7593
4	1	Front Plate	7594
5	3	Eccentric Spindle	7595
6	3	Spacer Stud	7609
7	1	Center Gear	7597

Ref	Qty	Description	EDP
8	3	Outer Gear	7598
9A	1	Handle Assy.	7604A
10	1	Coil Spring	7600
11	1	Circlip	7601
12	1	Circlip	7683
13	57	Needle Roller Bearings	7603
13*	3	Carbide Bushing	1461
14	3	Front Plate Screw	7605

(*) #13 Needle Bearings are provided as standard. Optional Carbide Bushings provided at additional cost upon request.

Ref	Qty	Description	EDP
15	3	Hexagon Nut	7606
16	1	Ring Washer	7596
18	3	Thread Roll (See Chart for Size & EDP)	
20	1	Stop Screw Body	7592
21	1	Stop Screw	7599
22	1	Hexagon Nut	7602
24	2	Set Screw (2/set)	7311

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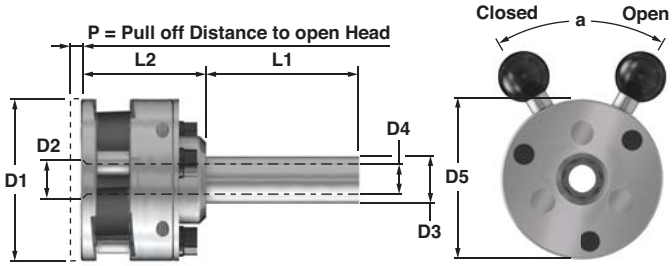
A23 Axial Head

Axial Thread Rolling Heads
For Right Hand Threads
For Stationary Applications

EDP	Shank
7107	1"
7107-25	25mm

Approximate Weight: 4.2 lbs



A23 Axial Head Dimensions

Dimensions

Helix Angle in Head = 1º 25'		D1	D2	D3	D4	D5 max
Allowable Component Lead	inches	3.470	1.100	1	0.670	3.681
Angle = 0º 50' - 2º 0'	mm	88	28	25	17	93.5

Dimensions Continued

Helix Angle in Head = 1º 25'		L1	L2	P	a
Allowable Component Lead	inches	2.990	2.720	0.120	60º
Angle = 0º 50' - 2º 0'	mm	76	69	3	

Left hand heads are dimensionally the same as right hand heads but open and close on the opposite direction. Thread rolls can be used in both right hand and left hand heads.

The Following Thread Rolls May Be Ordered As Standard On The A23 Axial Head

ISO Metric Fine

1K EDP	2K EDP	Description
8323	8324	M8.0 - 10.0 x 0.5
8325	8326	M8.0 - 10.0 x 0.75
8289	8290	M10.0 - 12.0 x 0.75
8291	8292	M10.0 - 12.0 x 1.0
8293	8294	M12.0 - 14.0 x 1.0
8341	8342	M14.0 - 16.0 x 1.0
8297	8298	M16.0 - 18.0 x 1.0
8299	8300	M18.0 - 20.0 x 1.0
8301	8302	M14.0 - 16.0 x 1.25
8303	8304*	M16.0 - 18.0 x 1.5
8305	8306*	M18.0 - 20.0 x 1.5
8307	8308*	M20.0 - 22.0 x 1.5

Unified Fine UNF

1K EDP	2K EDP	Description
8327	8328	5/16 - 3/8 x 32
8329	8330	3/8 - 7/16 x 32
8331	8332	7/16 - 1/2 x 28
8333	8334	7/16 - 1/2 x 32
8353	8354	1/2 - 9/16 x 20
8337	8338	1/2 - 9/16 x 28
8339	8340	1/2 - 9/16 x 32
8365	8366	9/16 - 5/8 x 18
8343	8344	9/16 - 5/8 x 20
8345	8346	9/16 - 5/8 x 24
8347	8348	9/16 - 5/8 x 28
8335	8336	9/16 - 5/8 x 32

Unified Fine UNF (Continued)

1K EDP	2K EDP	Description
8351	8352	5/8 - 11/16 x 16*
8349	8350	5/8 - 11/16 x 20*
8367	8368	5/8 - 11/16 x 24*
8369	8370	5/8 - 11/16 x 28*
8359	8360	11/16 - 3/4 x 16*
8361	8362	11/16 - 3/4 x 20*
8363	8364	3/4 - 13/16 x 16*
8365	8366	3/4 - 13/16 x 20*
8355	8356	13/16 - 7/8 x 20*

National Pipe Thread NPT

1K EDP	2K EDP	Description
8309	8310	1/8 x 27 NPT
8313	8314	1/4 x 18 NPT
8315	8316	3/8 x 18 NPT

National Pipe Thread Dryseal NPTF

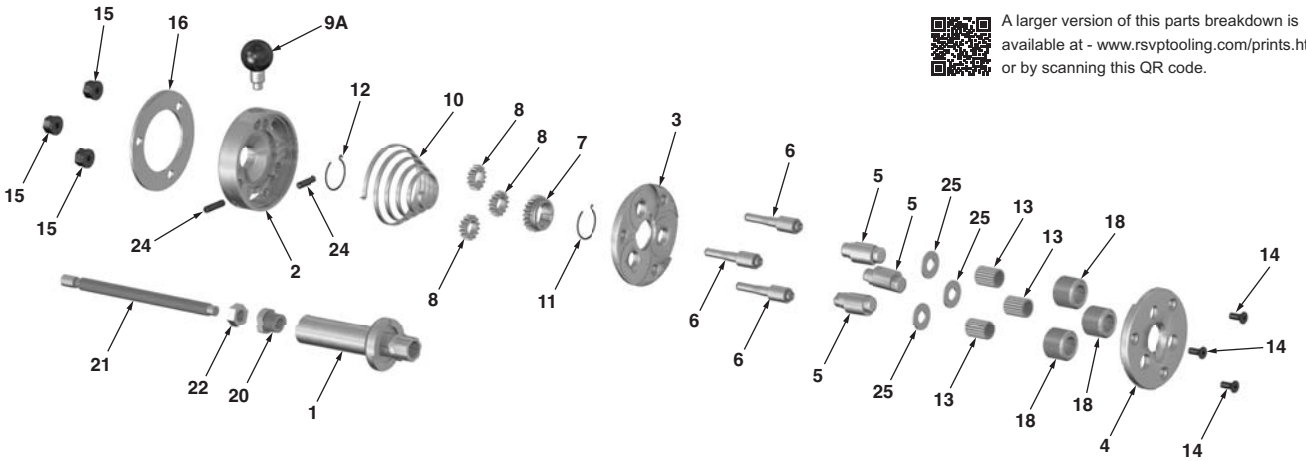
1K EDP	2K EDP	Description
8317	8318	1/8 x 27 NPTF
8319	8320	1/4 x 18 NPTF
8321	8322	3/8 x 18 NPTF

(*) Limited to short threads up to 19mm (0.748") including thread runout

Threads outside of the above standard series may also be rolled on this head provided that their helix does not fall outside the permissible range.

Nitrided Rolls are available for use in rolling special alloys such as Stainless Steel.

Component Parts Breakdown



A larger version of this parts breakdown is available at - www.rsvptooling.com/prints.html or by scanning this QR code.

Ref	Qty	Description	EDP
1	1	Shank 1"	7590
1A	1	Shank 25mm	7590-25
2	1	Spring Housing	7310
3	1	Center Plate	7491
4	1	Front Plate	7492
5	3	Eccentric Spindle	7589
6	3	Spacer Stud	7493
7	1	Center Gear	7494

Ref	Qty	Description	EDP
8	3	Outer Gear	7495
9A	1	Handle Assy.	7604A
10	1	Coil Spring	7600
11	1	Circlip	7601
12	1	Circlip	7683
13	57	Needle Roller Bearings	7566
13*	3	Carbide Bushing	1455
14	3	Front Plate Screw	7605

(*) #13 Needle Bearings are provided as standard. Optional Carbide Bushings provided at additional cost upon request.

Ref	Qty	Description	EDP
15	3	Hexagon Nut	7606
16	1	Ring Washer	7596
18	3	Thread Roll (See Chart for Size & EDP)	
20	1	Stop Screw Body	7592
21	1	Stop Screw	7599
22	1	Hexagon Nut	7602
24	2	Set Screw (2/set)	7311
25	3	Washer	7673

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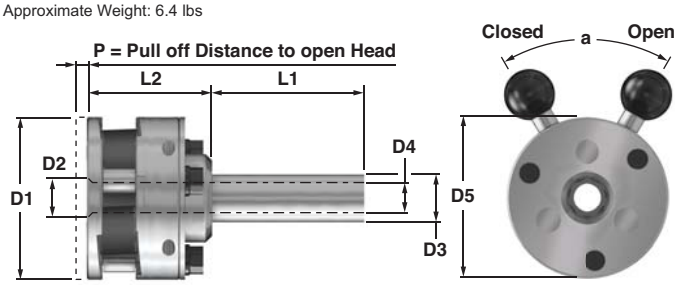
A233400 Axial Head

Axial Thread Rolling Heads
For Right Hand Threads
For Stationary Applications

EDP	Shank	EDP	Shank
7108	1"	7108-30	30mm
7108-1.25	1-1/4	7108-25	25mm

Approximate Weight: 6.4 lbs



A233400 Axial Head Dimensions

Dimensions

Helix Angle in Head = 1º 15'		D1	D2	D3	D4	D5 max
Allowable Component Lead	inches	3.780	1.540	1 / 1.1/4	0.550	4.528
Angle = 0º 45' - 1º 40'	mm	96	39	25 / 30	14	115

Dimensions Continued

Helix Angle in Head = 1º 15'		L1	L2	P	a
Allowable Component Lead	inches	2.360	3.250	0.120	30º
Angle = 0º 45' - 1º 40'	mm	115	60	82.5	3

Left hand heads are dimensionally the same as right hand heads but open and close on the opposite direction. Thread rolls can be used in both right hand and left hand heads.

The Following Thread Rolls May Be Ordered As Standard On The A233400 Axial Head

ISO Metric Fine

1K EDP	2K EDP	Description
8373	8374	M16.0 - 18.0 x 1.5
8375	8376	M18.0 - 20.0 x 1.5
8377	8378	M20.0 - 22.0 x 1.5
8379	8380	M22.0 - 24.0 x 1.5
8381	8382	M24.0 - 26.0 x 1.5
8383	8384	M26.0 - 28.0 x 1.5
8385	8386	M28.0 - 30.0 x 1.5
8387	8388	M30.0 - 32.0 x 1.5
8389	8390	M32.0 - 34.0 x 1.5
8391	8392	M34.0 - 36.0 x 1.5
8393	8394	M22.0 - 24.0 x 2.0
8395	8396	M24.0 - 26.0 x 2.0
8397	8398	M26.0 - 28.0 x 2.0
8399	8400	M28.0 - 30.0 x 2.0
8401	8402	M30.0 - 32.0 x 2.0
8403	8404	M32.0 - 34.0 x 2.0
8405	8406	M34.0 - 36.0 x 2.0

(*) Limited to short threads up to 67mm (2.638") including thread runout
(**) Limited to short threads up to 24mm (1.063") including thread runout

Unified Fine UNF

1K EDP	2K EDP	Description
8419	8420	3/4 x 26*
8421	8422	5/8 x 24*
8423	8424	11/16 x 24*
8425	8426	3/4 x 24*
8427	8428	7/8 x 24*
8429	8430	3/4 x 22*
8431	8432	7/8 x 22*
8433	8434	5/8 - 11/16 x 20*
8435	8436	11/16 - 3/4 x 20*
8437	8438	3/4 - 13/16 x 20*
8439	8440	13/16 - 7/8 x 20*
8441	8442	7/8 - 15/16 x 20*
8443	8444	15/16 - 1 x 20*
8445	8446	1 - 1-1/16 x 20*
8447	8448	1-1/16* - 1-1/8** x 20
8449	8450	1-1/8** - 1-3/16** x 20
8451	8452	5/8 x 18*
8453	8454	3/4 x 18*
8455	8456	7/8 x 18*
8457	8458	1" - 1-1/16 x 18*
8459	8460	1-1/16* - 1-1/8** x 18

Unified Fine UNF (Continued)

1K EDP	2K EDP	Description
8461	8462	1-1/8 - 1-3/16 x 18**
8463	8464	11/16 -3/4 x 16*
8465	8466	13/16 - 7/8 x 16*
8467	8468	7/8 - 15/16 x 16*
8469	8470	15/16 - 1 x 16*
8471	8472	1" - 1-1/16 x 16*"
8473	8474	1-1/16* - 1-1/8** x 16
8475	8476	1-1/8 - 1-3/16 x 16**
8477	8478	1-3/16 - 1-1/4 x 16**
8479	8480	1-1/4 - 1-5/16 x 16**
8481	8482	1-5/16 - 1-3/8 16**
8483	8484	1-3/8 - 1-7/16 x 16**
8485	8486	13/16 - 7/8 x 14*
8487	8488	7/8 - 15/16 x 14*
8489	8490	15/16 - 1 x 14*
8491	8492	1" - 1-1/16 x 14*"
8493	8494	1-1/16* - 1-1/8** x 14
8495	8496	1-1/8 - 1-3/16 x 14**
8497	8498	1-3/16 - 1-1/4 x 14**
8499	8500	1-1/4 - 1-5/16 x 14**
8501	8502	1-5/16 - 1-3/8 14**

Unified Fine UNF (Continued)

1K EDP	2K EDP	Description
8503	8504	1-3/8 - 1-7/16 x 14**
8505	8506	7/8 - 15/16 x 12*
8507	8508	15/16 -1 x 12*
8509	8510	1" -1-1/16 x 12*"
8511	8512	1-1/16* - 1-1/8** x 12
8513	8514	1-1/8 - 1-3/16 x 12**
8515	8516	1-3/16 - 1-1/4 x 12**
8517	8518	1-1/4 - 1-5/16 x 12**
8519	8520	1-5/16 - 1-3/8 x 12**
8521	8522	1-3/8 - 1-7/16 x 12**

National Pipe Thread NPT

1K EDP	2K EDP	Description
8407	8408	3/8 x 18 NPT

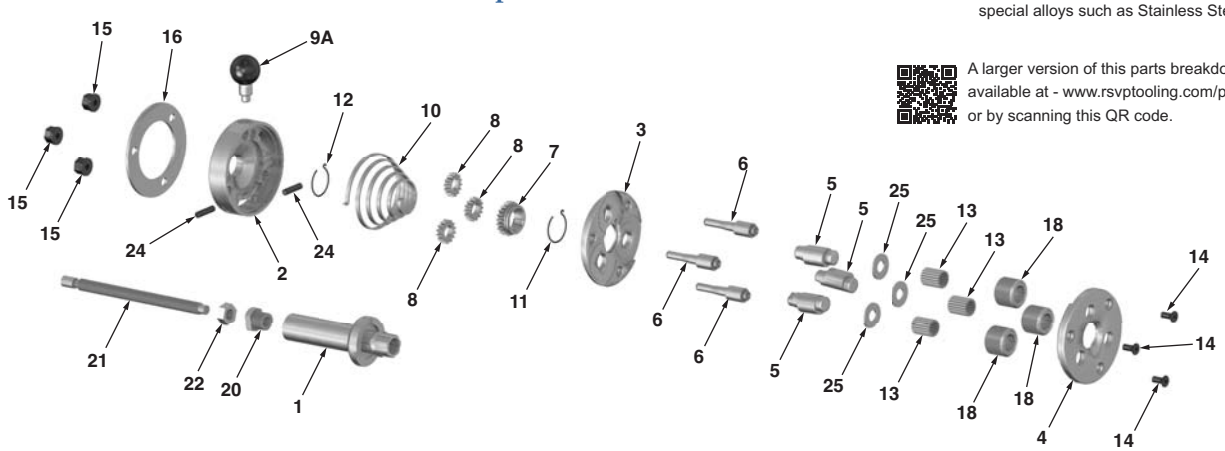
National Pipe Thread Dryseal NPTF

1K EDP	2K EDP	Description
8409	8410	3/8 x 18 NPTF

Threads outside of the above standard series may also be rolled on this head provided that their helix does not fall outside the permissible range.

Nitrided Rolls are available for use in rolling special alloys such as Stainless Steel.

Component Parts Breakdown



A larger version of this parts breakdown is available at - www.rsvptooling.com/prints.html or by scanning this QR code.

Ref	Qty	Description	EDP
1	1	Shank 1-1/4	7389
1A	1	Shank 1"	7389-1
1B	1	Shank 30mm	7389-30
1C	1	Shank 25mm	7389-25
2	1	Spring Housing	7339
3	1	Center Plate	7340
4	1	Front Plate	7341
5	3	Eccentric Spindle	7388
6	3	Spacer Stud	7342

Ref	Qty	Description	EDP
7	1	Center Gear	7344
8	3	Outer Gear	7345
9A	1	Handle Assy.	7346A
10	1	Coil Spring	7347
11	1	Circlip	7348
12	1	Circlip	7349
13	57	Needle Roller Bearings	7350
13*	3	Carbide Bushing	1458
14	3	Front Plate Screw	7351

Ref	Qty	Description	EDP
15	3	Hexagon Nut	7352
16	1	Ring Washer	7353
18	3	Thread Roll (See Chart for Size & EDP)	
20	1	Stop Screw Body	7592
21	1	Stop Screw	7599
22	1	Hexagon Nut	7602
24	2	Set Screw (2/set)	7354
25	3	Washer	7355

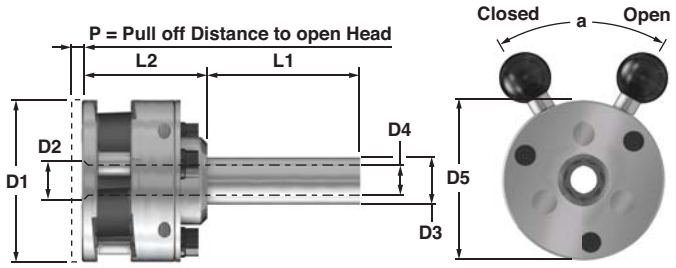
(*) #13 Needle Bearings are provided as standard. Optional Carbide Bushings provided at additional cost upon request.

A3 Axial Head

Axial Thread Rolling Heads
For Right Hand Threads
For Stationary Applications

EDP	Shank	EDP	Shank
7109	1-1/2	7109-30	30mm
7109-1.25	1-1/4	7109-32	32mm

Approximate Weight: 8.3 lbs



A3 Axial Head Dimensions

Dimensions

Helix Angle in Head = 2° 40'		D1	D2	D3	D4	D5 max
Allowable Component Lead	inches	4.600	1.500	1.25/1.5	0.870	5.157
Angle = 1° 35' - 3° 30'	mm	117	38	30 / 40	22	131

Dimensions Continued

Helix Angle in Head = 2° 40'		L1	L2	P	a
Allowable Component Lead	inches	3.540	3.270	0.160	60°
Angle = 1° 35' - 3° 30'	mm	89	83	4	

Left hand heads are dimensionally the same as right hand heads but open and close on the opposite direction. Thread rolls can be used in both right hand and left hand heads.

The Following Thread Rolls May Be Ordered As Standard On The A3 Axial Head

ISO Metric

1K EDP	2K EDP	Description
8523	8562	M12.0 - 14.0 x 1.75
8525	8526	M14.0 - 16.0 x 2.0
8527	8528	M18.0 - 20.0 x 2.5
8529	8530	M20.0 - 22.0 x 2.5

ISO Metric Fine

1K EDP	2K EDP	Description
8531	8532	M12.0 - 14.0 x 1.5
8533	8534	M14.0 - 16.0 x 1.5
8535	8536	M18.0 - 20.0 x 2.0
8537	8538	M20.0 - 22.0 x 2.0

Unified Coarse UNC

1K EDP	2K EDP	Description
8539	8540	7/16 x 14
8541	8542	1/2 x 13
8543	8563	9/16 x 12
8545	8546	5/8 x 11
8547	8548	3/4 x 10
8549	8550	7/8 x 9

Unified Fine UNF

1K EDP	2K EDP	Description
8551	8552	7/16 - 1/2 x 20
8553	8554	9/16 - 5/8 x 18
1514	1492	3/4 x 16
8561	8560	7/8 x 14

National Pipe Thread NPT

1K EDP	2K EDP	Description
8569	8570	1/4 x 18 NPT

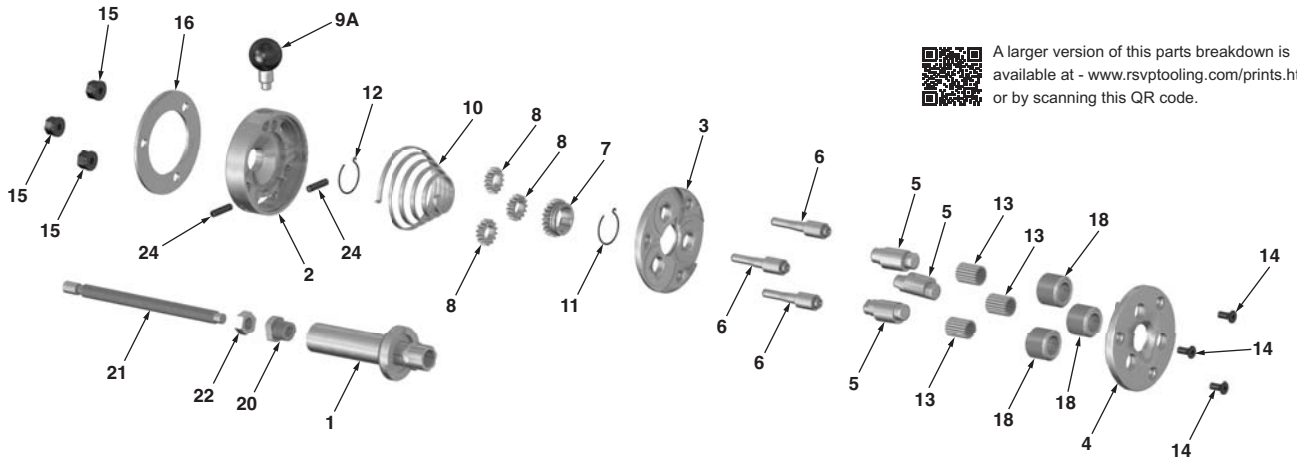
National Pipe Thread Dryseal NPTF

1K EDP	2K EDP	Description
8567	8568	1/4 x 18 NPTF

Threads outside of the above standard series may also be rolled on this head provided that their helix does not fall outside the permissible range.

Nitrided Rolls are available for use in rolling special alloys such as Stainless Steel.

Component Parts Breakdown



A larger version of this parts breakdown is available at - www.rsvptooling.com/prints.html or by scanning this QR code.

Ref	Qty	Description	EDP
1	1	Shank 1-1/2	7364
1A	1	Shank 1-1/4	7361
1B	1	Shank 30mm	7364-30
1C	1	Shank 32mm	7364-32
2	1	Spring Housing	7375
3	1	Center Plate	7358
4	1	Front Plate	7359
5	3	Eccentric Spindle	7360
6	3	Spacer Stud	7357

Ref	Qty	Description	EDP
7	1	Center Gear	7362
8	3	Outer Gear	7363
9A	1	Handle Assy.	7369A
10	1	Coil Spring	7365
11	1	Circlip	7366
12	1	Circlip	7367
13	57	Needle Roller Bearings	7368
13*	3	Carbide Bushing	1460
14	3	Front Plate Screw	7370

Ref	Qty	Description	EDP
15	3	Hexagon Nut	7371
16	1	Ring Washer	7387
18	3	Thread Roll (See Chart for Size & EDP)	
20	1	Stop Screw Body	7372
21	1	Stop Screw	7373
22	1	Hexagon Nut	7374
24	2	Set Screw (2/set)	7312

(*) #13 Needle Bearings are provided as standard. Optional Carbide Bushings provided at additional cost upon request.

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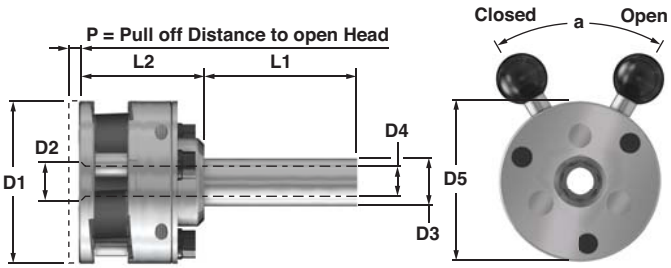
A34 Axial Head

EDP	Shank	EDP	Shank
7110	1-1/2	7110-30	30mm
7110-1-1/4	1-1/4	7110-32	32mm

Approximate Weight: 8.3 lbs

Axial Thread Rolling Heads
For Right Hand Threads
For Stationary Applications



A34 Axial Head Dimensions

Dimensions						
Helix Angle in Head = 1º 15'		D1	D2	D3	D4	D5 max
Allowable Component Lead	inches	4.610	1.730	1.25/1.5	0.870	5.039
Angle = 0º 45' - 1º 40'	mm	117	44	30 / 40	22	128

Dimensions Continued					
Helix Angle in Head = 1º 15'		L1	L2	P	a
Allowable Component Lead	inches	3.540	3.290	0.160	60º
Angle = 0º 45' - 1º 40'	mm	89	83.5	4	

Left hand heads are dimensionally the same as right hand heads but open and close on the opposite direction. Thread rolls can be used in both right hand and left hand heads.

The Following Thread Rolls May Be Ordered As Standard On The A34 Axial Head

ISO Metric Fine

1K EDP	2K EDP	Description
8579	8580	M12.0 - 14.0 x 1.0
8581	8582	M14.0 - 16.0 x 1.0
8583	8584	M16.0 - 18.0 x 1.0
8596	8586	M18.0 - 20.0 x 1.0
8587	8588	M16.0 - 18.0 x 1.5
8589	8590	M18.0 - 20.0 x 1.5
8591	8600	M20.0 - 22.0 x 1.5
8601	8602	M22.0 - 24.0 x 1.5*
8603	8604	M24.0 - 27.0 x 1.5*
8605	8606	M27.0 - 30.0 x 1.5*

Unified Fine UNF

1K EDP	2K EDP	Description
8607	8608	1/2 x 28
8609	8610	5/8 - 11/16 x 28
8611	8612	11/16 - 3/4 x 28
8613	8614	3/4 - 13/16 x 28
8615	8616	13/16 - 7/8* x 28
8617	8618	9/16 - 5/8 x 24
8619	8620	5/8 - 11/16 x 24
8623	8624	5/8 - 11/16 x 20
8625	8626	3/4 - 13/16 x 20
8631	8632	13/16 - 7/8* x 20

Unified Fine UNF (Continued)

1K EDP	2K EDP	Description
8633	8634	7/8 - 15/16 x 20*
8635	8636	15/16 - 1" x 20*
8627	8628	5/8 x 18
8637	8638	1-1/16 - 1-1/8 x 18*
8639	8640	3/4 - 13/16 x 16
8641	8642	7/8 - 15/16 x 16*
8645	8648	7/8 x14
8643	8644	7/8 - 15/16 x 12*
8651	8652	1" x 12*
8647	8649	1" x 14*"

National Pipe Thread NPT

1K EDP	2K EDP	Description
8571	8572	3/8 x 18 NPT
8573	8574	1/2 x 14 NPT
8575	8576	3/4 x 14 NPT

National Pipe Thread Dryseal NPTF

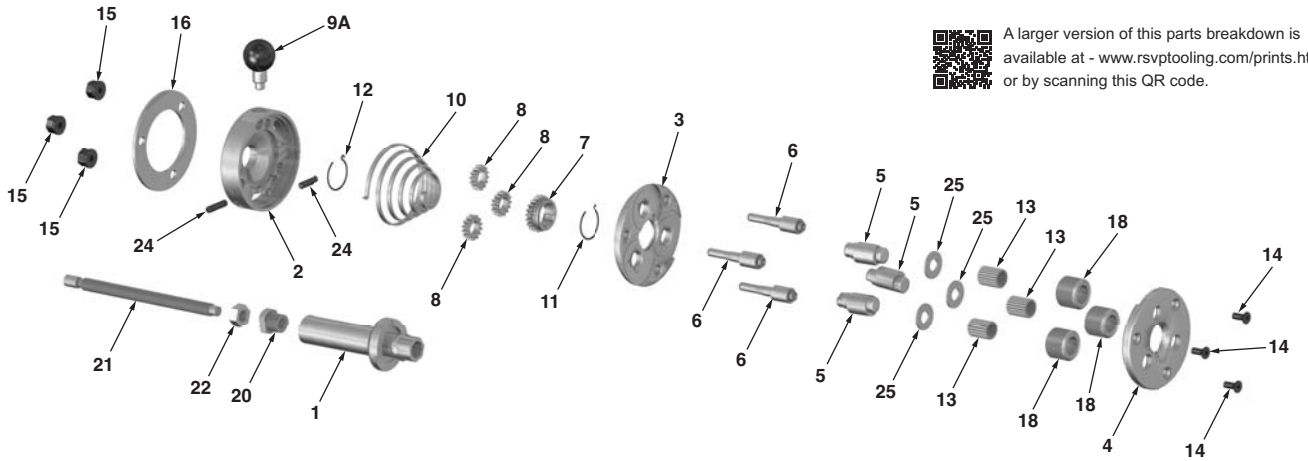
1K EDP	2K EDP	Description
8577	8578	3/8 x 18 NPTF
8653	8654	1/2 x 14 NPTF
8655	8656	3/4 x 14 NPTF

(*) Limited to short threads up to 24mm (0.945") including thread runout

Threads outside of the above standard series may also be rolled on this head provided that their helix does not fall outside the permissible range.

Nitrided Rolls are available for use in rolling special alloys such as Stainless Steel.

Component Parts Breakdown



A larger version of this parts breakdown is available at - www.rsvptooling.com/prints.html or by scanning this QR code.

Ref	Qty	Description	EDP
1	1	Shank 1-1/2	7364
1A	1	Shank 1-1/4	7361
1B	1	Shank 30mm	7364-30
1C	1	Shank 32mm	7364-32
2	1	Spring Housing	7375
3	1	Center Plate	7396
4	1	Front Plate	7397
5	3	Eccentric Spindle	7394
6	3	Spacer Stud	7680

Ref	Qty	Description	EDP
7	1	Center Gear	7393
8	3	Outer Gear	7395
9A	1	Handle Assy.	7369A
10	1	Coil Spring	7365
11	1	Circlip	7398
12	1	Circlip	7367
13	57	Needle Roller Bearings	7603
13*	3	Carbide Bushing	1461
14	3	Front Plate Screw	7370

Ref	Qty	Description	EDP
15	3	Hexagon Nut	7371
16	1	Ring Washer	7387
18	3	Thread Roll (See Chart for Size & EDP)	
20	1	Stop Screw Body	7372
21	1	Stop Screw	7373
22	1	Hexagon Nut	7374
24	2	Set Screw (2/set)	7312
25	3	Washer	7395

(*) #13 Needle Bearings are provided as standard. Optional Carbide Bushings provided at additional cost upon request.

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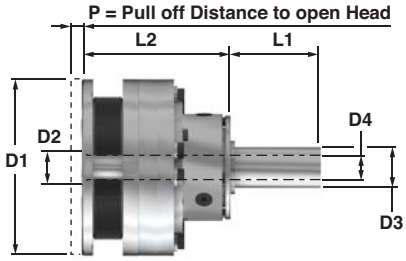
A4 Axial Head

EDP	Shank	EDP	Shank
7121	1/1/02	7121-40	40mm
7124	2"	7124-50	50mm

Approximate Weight: 30 lbs

Axial Thread Rolling Heads
For Right Hand Threads
For Stationary Applications



A4 Axial Head Dimensions

Dimensions

Helix Angle in Head = 2º 30'		D1	D2	D3	D4
Allowable Component Lead	inches	6.339	1.811	1.5 / 2	1.100 / 1.260
Angle = 1º 30' - 3º 10'	mm	161	46	40 / 50	28 / 32

Dimensions Continued

Helix Angle in Head = 2º 30'		L1	L2	P	a
Allowable Component Lead	inches	2.953	6.142	0.157	30º
Angle = 1º 30' - 3º 10'	mm	75	156	4	

Left hand heads are dimensionally the same as right hand heads but open and close on the opposite direction. Thread rolls can be used in both right hand and left hand heads.

The Following Thread Rolls May Be Ordered As Standard On The A4 Axial Head

ISO Metric

1K EDP	2K EDP	Description
8745	8746	M14.0 - 16.0 x 2.0
8747	8748	M18.0 - 20.0 x 2.5
8592	8750	M20.0 - 22.0 x 2.5
8749	8690	M24.0 - 27.0 x 3.0
2826	2827	M27.0 - 30.0 x 3.5

ISO Metric Fine

1K EDP	2K EDP	Description
8751	8752	M14.0 - 16.0 x 1.5
8753	8754	M16.0 - 18.0 x 1.5
8755	8756	M18.0 - 20.0 x 2.0
8757	8758	M22.0 - 24.0 x 2.0

Unified Coarse UNC

1K EDP	2K EDP	Description
8759	8760	9/16 x 12
8696	8697	5/8 x 11
2514	2523	3/4 x 10
8699	2850	7/8 x 9
1742	1638	1" x 8
8761	8762	1-1/8 x 7

Unified Fine UNF

1K EDP	2K EDP	Description
2181	8763	9/16 - 5/8 x 18
8693	8764	3/4 x 16
2496	8765	7/8 x 14
2547	2548	1 x 12
8597	8599	1 x 14

National Pipe Thread NPT

1K EDP	2K EDP	Description
8766	8767	1/2 x 14 NPT

National Pipe Thread Dryseal NPTF

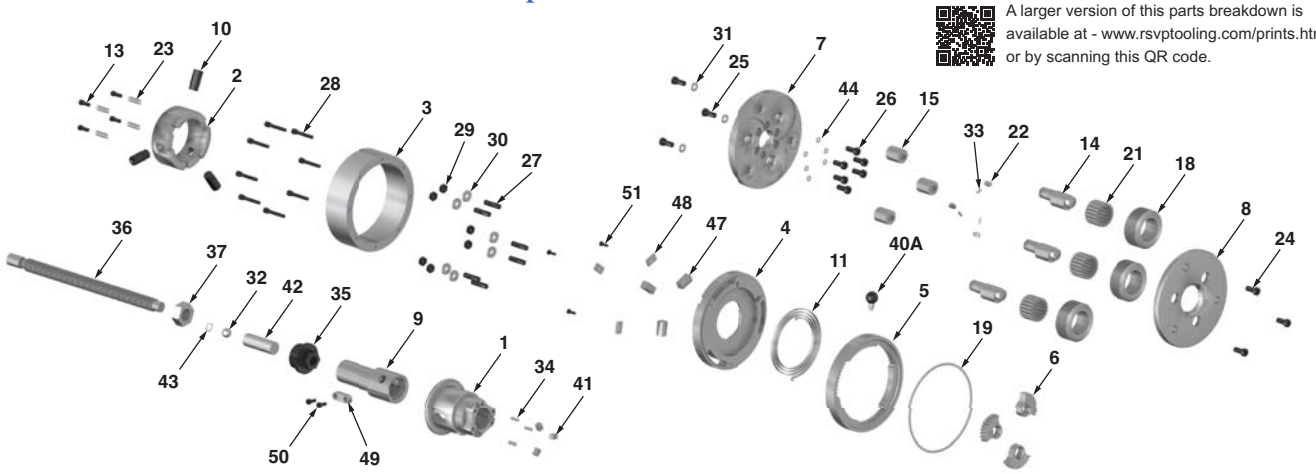
1K EDP	2K EDP	Description
8768	8769	1/2 x 14 NPTF

Threads outside of the above standard series may also be rolled on this head provided that their helix does not fall outside the permissible range.

Nitrided Rolls are available for use in rolling special alloys such as Stainless Steel.

Component Parts Breakdown

A larger version of this parts breakdown is available at - www.rsvptooling.com/prints.html or by scanning this QR code.



Ref	Qty	Description	EDP
1	1	Flange	4-001
2	1	Clutch	4-002
3	1	Operating Ring	4-003
4	1	Spring Housing	4-004
5	1	Gear Ring	4-005
6	3	Gear Sectors	4-006
7	1	Center Plate	4-007
8	1	Front Plate	4-008
9	1	Shank 1-1/2	4-009
9A	1	Shank 2"	4-009A
9B	1	Shank 40mm	4-009B
9C	1	Shank 50mm	4-009C
10	1	Pin	4-010
11	1	Coil Spring	4-011
13	4	Spring Pin	4-013
14	3	Eccentric Spindles	4-014
15	3	Spacer Studs	4-015

Ref	Qty	Description	EDP
18	3	Thread Roll (See Chart for Size & EDP)	
19	116	Steel Ball	4-019
21	57	Needle Roller Bearings	4-021
21*	3	Carbide Bushing	1462
22	3	Fitting Key	4-022
23	4	Pressure Ring	4-023
24	3	Cap Screw	4-024
25	3	Cap Screw	4-025
26	6	Cap Screw	4-026
27	6	Stud	4-027
28	8	Cap Screw	4-028
29	6	Hex Nut	4-029
30	6	Washer	4-030
31	3	Lock Washer	4-031
32	1	Steel Ball	4-032
33	3	Shear Pins	4-033

Ref	Qty	Description	EDP
34	3	Roll Pins	4-034
35	1	Stop Screw Body	4-035
36	1	Stop Screw Body	4-036
37	1	Hex Nut	4-037
39	1	Hex Nut	4-039
40A	1	Handle Assy.	4-040A
41	3	Fitting Key	4-041
42	1	Rotating End Stop	4-042
43	1	Circlip	4-043
44	6	Circlip	4-044
47	3	Clutch Wedge	4-047
48	3	Cover Plate	4-048
49	1	Fitting Key	4-049
50	2	Cap Screw	4-050
51	3	Cap Screw	4-051

(*) #21 Needle Bearings are provided as standard. Optional Carbide Bushings provided at additional cost upon request.

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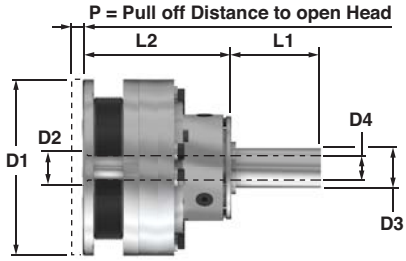
A45 Axial Head

EDP	Shank	EDP	Shank
7113	1/1/02	7113-40	40mm
7113-2	2”	7121-50	50mm

Approximate Weight: 30 lbs



Axial Thread Rolling Heads

For Right Hand Threads
For Stationary Applications

A45 Axial Head Dimensions

Dimensions

Helix Angle in Head = 1° 10'		D1	D2	D3	D4
Allowable Component Lead	inches	6.339	1.890	1.5 / 2	1.100 / 1.260
Angle = 0° 40' - 1° 40'	mm	161	48	40 / 50	28 / 32

Dimensions Continued

Helix Angle in Head = 1° 10'		L1	L2	P	a
Allowable Component Lead	inches	2.953	6.220	0.157	30°
Angle = 0° 40' - 1° 40'	mm	75	158	4	

Left hand heads are dimensionally the same as right hand heads but open and close on the opposite direction. Thread rolls can be used in both right hand and left hand heads.

The Following Thread Rolls May Be Ordered As Standard On The A45 Axial Head

ISO Metric Fine

1K EDP	2K EDP	Description
8771	8772	M16.0 - 18.0 x 1.0
8773	8774	M18.0 - 20.0 x 1.0
8775	8776	M20.0 - 22.0 x 1.0
8777	8778	M22.0 - 24.0 x 1.0
8779	8780	M18.0 - 20.0 x 1.5
8781	8782	M20.0 - 22.0 x 1.5
8783	8784	M22.0 - 24.0 x 1.5
8785	8786	M24.0 - 27.0 x 1.5
8787	8788	M27.0 - 30.0 x 1.5
8789	8790	M30.0 - 33.0 x 1.5
8791	8792	M33.0 - 36.0 x 1.5
8793	8794	M36.0 - 39.0 x 1.5*
8795	8796	M38.0 - 40.0 x 1.5*
8797	8798	M24.0 - 27.0 x 2.0
8799	8800	M27.0 - 30.0 x 2.0
8801	8804	M30.0 - 33.0 x 2.0
8803	8660	M33.0 - 36.0 x 2.0
8805	8806	M36.0 - 39.0 x 2.0*
8807	8808	M39.0 - 42.0 x 2.0

Unified Fine UNF

1K EDP	2K EDP	Description
8809	8810	3/4 - 13/16 x 32
8811	8812	13/16 - 7/8 x 32
8813	8814	3/4 - 13/16 x 28
8815	8816	13/16 - 7/8 x 28
8817	8818	3/4 - 13/16 x 20
8819	8820	13/16 - 7/8 x 20
8821	8822	7/8 - 15/16 x 20
8823	8824	15/16 - 1 x 20
8825	8826	1 - 1-1/16 x 20
8827	8828	1-1/16 - 1-1/8 x 20
8829	8830	1-1/8 - 1-3/16 x 20
8831	8832	1-3/16 - 1-1/4 x 20
8664	8802	1-1/4 - 1-5/16 x 20
8833	8834	1-1/16 - 1-1/8 x 18
8835	8836	1-1/8 - 1-3/16 x 18
8837	8838	1-3/16 - 1-1/4 x 18
8839	8840	1-1/4 - 1-5/16 x 18
8841	8842	1-5/16 - 1-3/8 x 18
8843	8844	13/16 - 7/8 x 16
8845	8846	7/8 - 15/16 x 16

Unified Fine UNF (Continued)

1K EDP	2K EDP	Description
8849	8850	15/16 - 1 x 16
8851	8852	1 - 1-1/16 x 16
8665	8848	1-1/16 - 1-1/8 x 16
2271	2272	1-1/8 - 1-3/16 x 16
8847	0934	1-3/16 - 1-1/4 x 16
8853	8854	1-1/4 - 1-5/16 x 16
8855	8856	1-5/16 - 1-3/8 x 16
8857	8858	1-3/8 - 1-7/16 x 16
8859	8860	1-7/16 - 1-1/2 x 16*
8861	8862	1-1/2 - 1-9/16 x 16*
2902	0954	7/8 x 14
2892	2890	1 - 1-1/16 x 12
8863	8864	1-1/16 - 1-1/8 x 12
0948	0927	1-1/8 - 1-3/16 x 12
1824	1825	1-3/16 - 1-1/4 x 12
8865	8866	1-1/4 - 1-5/16 x 12
8867	8868	1-5/16 - 1-3/8 x 12
8869	8870	1-3/8 - 1-7/16 x 12
8871	8872	1-7/16 - 1-1/2 x 12*
8873	8874	1-1/2 - 1-9/16 x 12*

National Pipe Thread NPT

1K EDP	2K EDP	Description
8875	8876	3/4 x 14 NPT
8877	8878	1 x 11.5 NPT

National Pipe Thread Dryseal NPTF

1K EDP	2K EDP	Description
8879	8880	3/4 x 14 NPTF
8881	8882	1 x 11.5 NPTF

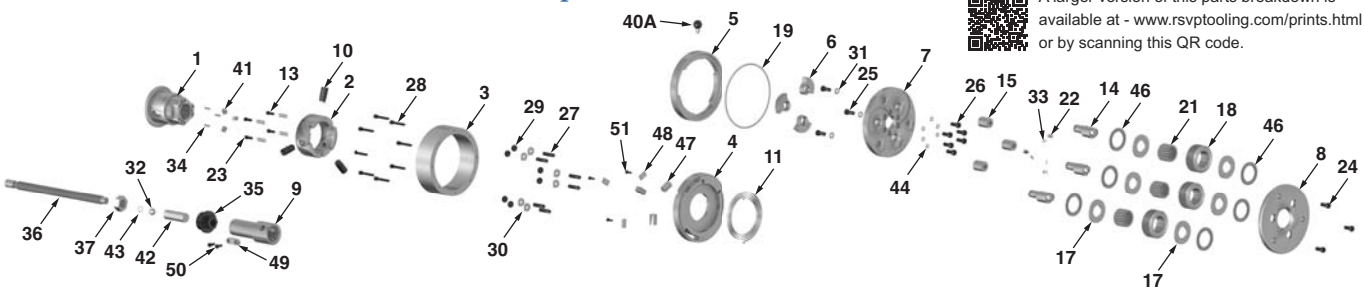
(*) Limited to short threads up to 28mm (1.102”) including thread runout

Threads outside of the above standard series may also be rolled on this head provided that their helix does not fall outside the permissible range.

Nitrided Rolls are available for use in rolling special alloys such as Stainless Steel.

Component Parts Breakdown

A larger version of this parts breakdown is available at - www.rsvptooling.com/prints.html or by scanning this QR code.



Ref	Qty	Description	EDP
1	1	Flange	4-001
2	1	Clutch	4-002
3	1	Operating Ring	4-003
4	1	Spring Housing	4-004
5	1	Gear Ring	4-005
6	3	Gear Sectors	45-006
7	1	Center Plate	45-007
8	1	Front Plate	45-008
9	1	Shank 1-1/2	4-009
9A	1	Shank 2”	4-009A
9B	1	Shank 40mm	4-009B
9C	1	Shank 50mm	4-009C
10	1	Pin	4-010
11	1	Coil Spring	4-011
13	4	Spring Pin	4-013
14	3	Eccentric Spindles	45-014
15	3	Spacer Studs	45-015
17	6	Axial Washer	45-017

Ref	Qty	Description	EDP
18	3	Thread Roll (See Chart for Size & EDP)	
19	116	Steel Ball	4-019
21	54	Needle Roller Bearings	7368
21*	3	Carbide Bushing	1460
22	3	Fitting Key	4-022
23	4	Pressure Ring	4-023
24	3	Cap Screw	4-024
25	3	Cap Screw	4-025
26	6	Cap Screw	4-026
27	6	Stud	4-027
28	8	Cap Screw	4-028
29	6	Hex Nut	4-029
30	6	Washer	4-030
31	3	Lock Washer	4-031
32	1	Steel Ball	4-032
33	3	Shear Pins	4-033
34	3	Roll Pins	4-034

Ref	Qty	Description	EDP
35	1	Stop Screw Body	4-035
36	1	Stop Screw Body	4-036
37	1	Hex Nut	4-037
39	1	Hex Nut	4-039
40A	1	Handle Assy.	4-040A
41	3	Fitting Key	4-041
42	1	Rotating End Stop	4-042
43	1	Circlip	4-043
44	6	Circlip	4-044
46	6	Axial Bearing Cage	45-046
47	3	Clutch Wedge	4-047
48	3	Cover Plate	4-048
49	1	Fitting Key	4-049
50	2	Cap Screw	4-050
51	3	Cap Screw	4-051

(*) #21 Needle Bearings are provided as standard. Optional Carbide Bushings provided at additional cost upon request.

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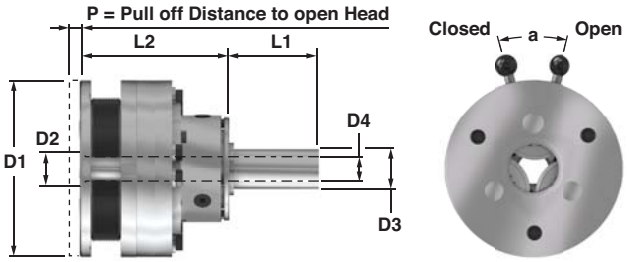
A5 Axial Head

EDP	Shank	EDP	Shank	EDP	Shank
7127	2"	7127-2.5	2/1/02	7127-60	60mm
7127-2.25	2/1/04	7127-50	50mm		

Approximate Weight: 58 lbs



Axial Thread Rolling Heads

For Right Hand Threads
For Stationary Applications

A5 Axial Head Dimensions

Dimensions

Helix Angle in Head = 2° 30'		D1	D2	D3	D4
Allowable Component Lead	inches	8.031	2.165	2 / 2.5	1.260 / 1.575
Angle = 1° 30' - 3°	mm	204	55	50 / 70	32 / 40

Dimensions Continued

Helix Angle in Head = 2° 30'		L1	L2	P	a
Allowable Component Lead	inches	3.740	6.850	0.197	30°
Angle = 1° 30' - 3°	mm	95	174	5	

Left hand heads are dimensionally the same as right hand heads but open and close on the opposite direction. Thread rolls can be used in both right hand and left hand heads.

The Following Thread Rolls May Be Ordered As Standard On The A5 Axial Head

ISO Metric

1K EDP	2K EDP	Description
8714	8715	M18.0 - 20.0 x 2.5
8716	8717	M20.0 - 22.0 x 2.5
8718	8719	M24.0 - 27.0 x 3.0
8720	8721	M30.0 - 33.0 x 3.5
8722	8723	M36.0 - 39.0 x 4.0

ISO Metric Fine

1K EDP	2K EDP	Description
8724	8725	M18.0 x 1.5
8726	8727	M18.0 - 20.0 x 2.0
8728	8729	M22.0 - 24.0 x 2.0
8730	8731	M30.0 - 33.0 x 3.0
8732	8733	M33.0 - 36.0 x 3.0

Unified Coarse UNC

1K EDP	2K EDP	Description
8700	8701	3/4 x 10
8734	8735	7/8 x 9
8702	8703	1" x 8
8704	1938	1-1/8 - 1-1/4 x 7
8706	8707	1-3/8 - 1-1/2 x 6

Unified Fine UNF

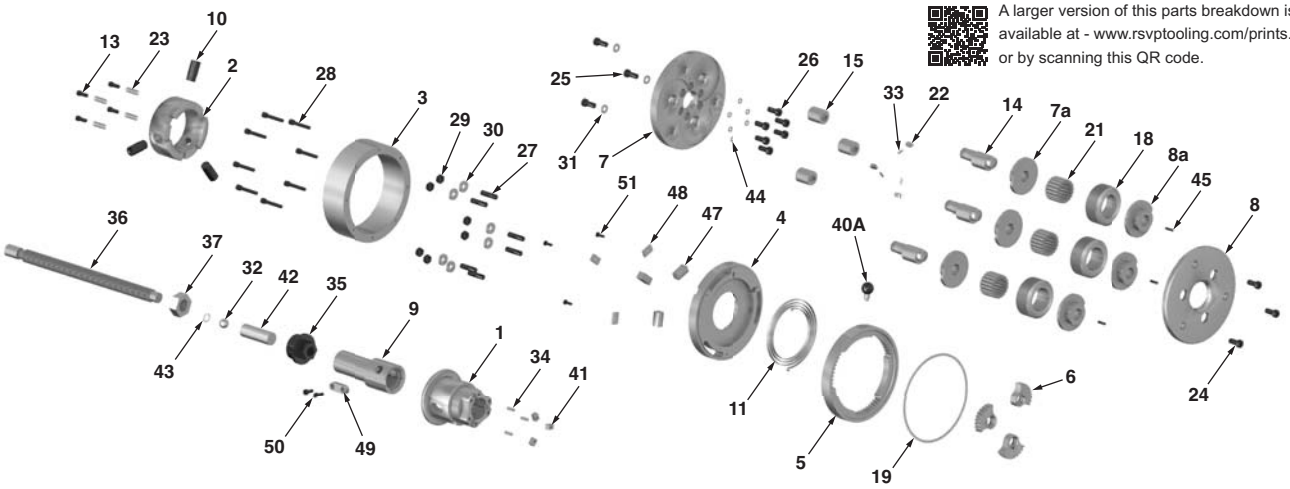
1K EDP	2K EDP	Description
8708	8709	3/4 x 16
8710	8711	7/8 x 14
8712	8713	1 x 12

Threads outside of the above standard series may also be rolled on this head provided that their helix does not fall outside the permissible range.

Nitrided Rolls are available for use in rolling special alloys such as Stainless Steel.

Component Parts Breakdown

A larger version of this parts breakdown is available at - www.rsvptooling.com/prints.html or by scanning this QR code.



Ref	Qty	Description	EDP
1	1	Flange	5-001
2	1	Clutch	5-002
3	1	Operating Ring	5-003
4	1	Spring Housing	5-004
5	1	Gear Ring	5-005
6	3	Gear Sectors	5-006
7	1	Center Plate	5-007
7a	3	Center Plate Bushing	5-007a
8	1	Front Plate	5-008
8a	3	Front Plate Bushing	5-008a
9	1	Shank 2"	5-009
9A		Shank 2-1/4	5-009A
9B	1	Shank 2-1/2	5-009B
9C	1	Shank 50mm	5-009C
9D	1	Shank 60mm	5-009D
10	1	Pin	5-010
11	1	Coil Spring	5-011
13	3	Spring Pin	5-013

Ref	Qty	Description	EDP
14	3	Eccentric Spindles	5-014
15	3	Spacer Studs	5-015
18	3	Thread Roll (See Chart for Size & EDP)	
19	145	Steel Ball	5-019
21	78	Needle Roller Bearings	5-021
21*	3	Carbide Bushing	1457
22	3	Fitting Key	5-022
23	3	Pressure Ring	5-023
24	3	Cap Screw	5-024
25	3	Cap Screw	5-025
26	6	Cap Screw	5-026
27	6	Stud	5-027
28	8	Cap Screw	5-028
29	6	Hex Nut	5-029
30	6	Washer	5-030
31	3	Lock Washer	5-031
32	1	Steel Ball	5-032

Ref	Qty	Description	EDP
33	3	Shear Pins	5-033
34	3	Roll Pins	5-034
35	1	Stop Screw Body	5-035
36	1	Stop Screw Body	5-036
37	1	Hex Nut	5-037
39	3	Clutch Wedge	5-039
40A	1	Handle Assy.	5-040A
41	3	Fitting Key	5-041
42	1	Rotating End Stop	5-042
43	1	Circlip	5-043
44	6	Circlip	5-044
45	3	Roll Pins	5-045
48	3	Cover Plate	5-048
49	1	Fitting Key	5-049
50	2	Cap Screw	5-050
54	3	Cap Screw	5-054

(*) #21 Needle Bearings are provided as standard. Optional Carbide Bushings provided at additional cost upon request.

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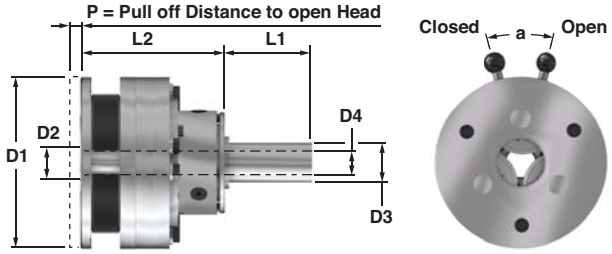
A56 Axial Head

EDP	Shank	EDP	Shank	EDP	Shank
7120	2"	7120-2.5	2/1/02	7120-60	60mm
7120-2.25	2/1/04	7120-50	50mm		

Approximate Weight: 58 lbs



Axial Thread Rolling Heads

For Right Hand Threads
For Stationary Applications

A56 Axial Head Dimensions

Dimensions					
Helix Angle in Head = 1°		D1	D2	D3	D4
Allowable Component Lead	inches	8.031	2.283	2 / 2.5	1.260 / 1.575
Angle = 0° 35' - 3° 30'	mm	204	58	50 / 70	32 / 40

Dimensions Continued					
Helix Angle in Head = 1°		L1	L2	P	a
Allowable Component Lead	inches	3.740	6.614	0.197	30°
Angle = 0° 35' - 3° 30'	mm	95	168	5	

Left hand heads are dimensionally the same as right hand heads but open and close on the opposite direction. Thread rolls can be used in both right hand and left hand heads.

The Following Thread Rolls May Be Ordered As Standard On The A56 Axial Head

ISO Metric Fine

1K EDP	2K EDP	Description
8889	8890	M22.0 - 24.0 x 1.5
8891	8892	M24.0 - 27.0 x 1.5
8893	8894	M27.0 - 30.0 x 1.5
8895	8896	M30.0 - 33.0 x 1.5
8897	8898	M33.0 - 36.0 x 1.5
8899	8900	M36.0 - 39.0 x 1.5
8901	8902	M39.0 - 42.0 x 1.5
8903	8904	M42.0 - 45.0 x 1.5
8905	8906	M45.0 - 48.0 x 1.5*
8907	8908	M27.0 - 30.0 x 2.0
8909	8910	M30.0 - 33.0 x 2.0
8911	8912	M33.0 - 36.0 x 2.0
8913	8914	M36.0 - 39.0 x 2.0
8915	8916	M39.0 - 42.0 x 2.0
8917	8918	M42.0 - 45.0 x 2.0
8919	8920	M45.0 - 48.0 x 2.0*
8921	8689	M48.0 - 50.0 x 2.0*
8923	8924	M50.0 - 52.0 x 2.0*
8925	8926	M42.0 - 45.0 x 3.0

(*) Limited to short threads up to 95mm (3.74") including thread runout

ISO Metric Fine (Continued)

1K EDP	2K EDP	Description
8927	8928	M45.0 - 48.0 x 3.0*
8929	8930	M48.0 - 50.0 x 3.0*
8931	8932	M50.0 - 52.0 x 3.0*

Unified Fine UNF

1K EDP	2K EDP	Description
8933	8934	7/8 - 1 x 32
8935	8936	7/8 - 1 x 28
8937	8938	1 - 1-1/8 x 28
8939	8940	1-1/8 - 1-1/4 x 28
8941	8942	1-1/4 - 1-5/16 x 28
8943	8944	7/8 - 1 x 20
8945	8946	1 - 1-1/8 x 20
8947	8948	1-1/8 - 1-1/4 x 20
8949	8950	1-1/4 - 1-3/8 x 20
8951	8952	1-3/8 - 1-1/2 x 20
8953	8954	1-1/16 - 1-3/16 x 18
8955	8956	1-3/16 - 1-5/16 x 18
8957	8958	1-5/16 - 1-7/16 x 18

(** Limited to short threads up to 38mm (1.496") including thread runout

Unified Fine UNF (Continued)

1K EDP	2K EDP	Description
8959	8960	1-7/16 - 1-9/16 x 18
8961	8962	1-9/16 - 1-11/16 x 18
8963	8964	7/8 - 1 x 16
8965	8966	1 - 1-1/8 x 16
8967	8968	1-1/8 - 1-1/4 x 16
8969	8970	1-1/4 - 1-3/8 x 16
8971	8972	1-3/8 - 1-1/2 x 16
8973	8663	1-1/2 - 1-5/8 x 16
8975	8976	1-5/8 - 1-3/4 x 16
8977	8978	1-3/4 - 1-7/8 x 16*
8979	8980	1-7/8 - 2 x 16*
8981	8692	1-1/8 - 1-1/4 x 12
8983	8984	1-1/4 - 1-3/8 x 12
8985	8986	1-3/8 - 1-1/2 x 12
8987	8691	1-1/2 - 1-5/8 x 12
8989	8666	1-5/8 - 1-3/4 x 12
8991	8992	1-3/4 - 1-7/8 x 12*
8993	8994	1-7/8 - 2 x 12*
8995	8996	2* - 2-1/8** x 12

Nitrided Rolls are available for use in rolling special alloys such as Stainless Steel.

Unified Fine UNF (Continued)

1K EDP	2K EDP	Description
8997	8998	1-3/4 - 1-7/8 x 8*
8999	8988	1-7/8 - 2 x 8*
8667	8668	2* - 2-1/8** x 12

National Pipe Thread NPT

1K EDP	2K EDP	Description
8669	8670	3/4 x 14 NPT
8671	8672	1 x 11.5 NPT
8673	8674	1-1/4 x 11.5 NPT
8675	8676	1-1/2 x 11.5 NPT

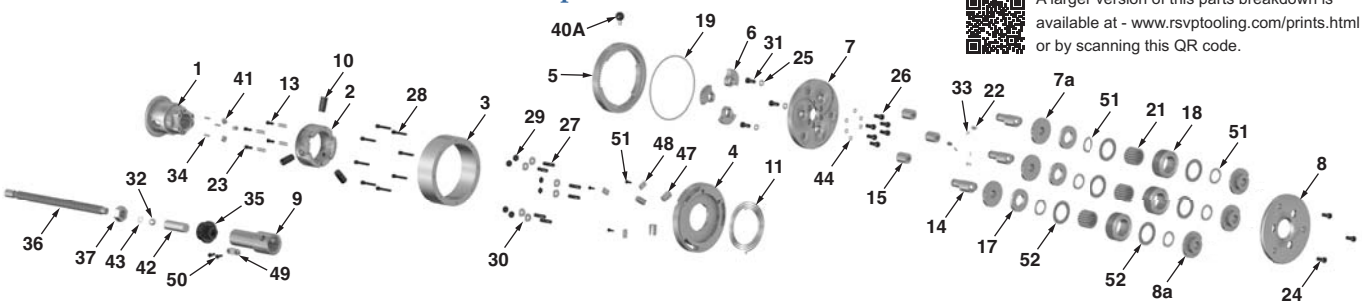
National Pipe Thread Dryseal NPTF

1K EDP	2K EDP	Description
8677	8678	3/4 x 14 NPTF
8679	8680	1 x 11.5 NPTF
8681	8682	1-1/4 x 11.5 NPTF
8683	8684	1-1/2 x 11.5 NPTF

Threads outside of the above standard series may also be rolled on this head provided that their helix does not fall outside the permissible range.

Component Parts Breakdown

A larger version of this parts breakdown is available at - www.rsvptooling.com/prints.html or by scanning this QR code.



Ref	Qty	Description	EDP
1	1	Flange	5-001
2	1	Clutch	5-002
3	1	Operating Ring	5-003
4	1	Spring Housing	5-004
5	1	Gear Ring	5-005
6	3	Gear Sectors	56-006
7	1	Center Plate	56-007
7a	3	Center Plate Bushing	56-007a
8	1	Front Plate	56-008
8a	3	Front Plate Bushing	56-008a
9	1	Shank 2"	5-009
9A	1	Shank 2-1/4	5-009A
9B	1	Shank 2-1/2	5-009B
9C	1	Shank 50mm	5-009C
9D	1	Shank 60mm	5-009D
10	1	Pin	5-010
11	1	Coil Spring	5-011
13	3	Spring Pin	5-013

Ref	Qty	Description	EDP
14	3	Eccentric Spindles	56-014
15	3	Spacer Studs	56-015
17	3	Washer	56-017
18	3	Thread Roll (See Chart for Size & EDP)	
19	145	Steel Ball	5-019
21	57	Needle Roller Bearings	4-021
21*	3	Carbide Bushing	1462
22	3	Fitting Key	5-022
23	3	Pressure Ring	5-023
24	3	Cap Screw	5-024
25	3	Cap Screw	5-025
26	6	Cap Screw	5-026
27	6	Stud	5-027
28	8	Cap Screw	5-028
29	6	Hex Nut	5-029
30	6	Washer	5-030
31	3	Lock Washer	5-031

Ref	Qty	Description	EDP
32	1	Steel Ball	5-032
33	3	Shear Pins	5-033
34	3	Roll Pins	5-034
35	1	Stop Screw Body	5-035
36	1	Stop Screw Body	5-036
37	1	Hex Nut	5-037
39	3	Clutch Wedge	5-039
40A	1	Handle Assy.	5-040A
41	3	Fitting Key	5-041
42	1	Rotating End Stop	5-042
43	1	Circlip	5-043
44	6	Circlip	5-044
48	3	Cover Plate	5-048
49	1	Fitting Key	5-049
50	2	Cap Screw	5-050
51	6	Centering Ring	56-051
52	6	Axial Bearing Cage	56-052
54	3	Cap Screw	5-054

(*) #21 Needle Bearings are provided as standard. Optional Carbide Bushings provided at additional cost upon request.

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AXIAL Operation

Operation
Thread rolling remains a simple and efficient process, provided the three main conditions listed below are met and adhered to at all times:

The material to be rolled must be suitable for thread rolling. Attempting to roll unsuitable material may at best give poor thread quality, and at worst cause severe damage to both the rolls and the thread rolling head.

The correct rolling speed should be selected according to the material being rolled and the profile of the thread form required. Reference to material properties, and the rolling speeds chart will enable the correct spindle speed to be calculated. For most standard V-form threads such as unified, metric & Whitworth, 100 ft/min (30m/min) should be considered as the absolute minimum speed, with only Acme, trapezoidal and similar thread forms being attempted at speeds as low as 65 ft/min (20m/min). Attempting to roll at too low a speed will most likely result in premature thread roll failure. Conversely, a higher rolling speed will often improve a material's rolling characteristics, thus improving thread roll life.

An adequate supply of good quality coolant is essential for successful thread rolling, as it is for most machining processes. The choice between neat cutting oils and water soluble is often governed by the type of machine being used or, where applicable, the user's environmental/health and safety policy. While neat cutting oils normally possess superior lubricating and extreme pressure properties, they do not dissipate heat away from the rolls as efficiently as water soluble solutions, unless some type of refrigeration unit is incorporated into the coolant system. When mixing soluble oils it is advisable to maximize the ratio of oil to water, as this gives the best combination of lubrication and cooling properties needed for thread rolling. Finally, once the choice of coolant has been made, ensure the supply is both copious and free of metallic particles. An insufficient supply will soon result in the rolls overheating, while particulate contamination can cause damage to the thread rolls, their bearings and the head mechanism.

Having satisfied the principal machining conditions outlined above, the following steps should be followed when setting up for each thread size:

Blank Preparation
Such is the variety of components that can be rolled it is impossible to illustrate the pre-rolling blank for every application. However, with few exceptions, component blanks fall in to one of three following categories:

A. Rod/tube drawn or ground to pre-rolling size.

When producing studs, linkages, U-bolts, conduit and similar parts, pre-machining can be eliminated by careful selection of material stock that has been drawn or ground to the correct pre-rolling diameter. The increasing popularity of thread rolling has resulted in rod and tube mills offering many standard materials in a range of pre-rolling diameters for most commercial thread sizes. It is often found the blank diameter will be at or within .002"/.05mm of the threads effective diameter, but before committing production to any given supply of bar stock, it is advisable to run sample batches in order to determine that both the basic stock size and tolerance will suit the application. Consideration should be given to the fact that a variation in blank diameter will affect the resultant major diameter by a ratio of approximately three to one when rolling directly on to bar stock. For example, if a drawn rod is supplied with a tolerance of nominal size 0.0/-0.002" (0.0/-0.05mm), then the rolled major diameter will have a tolerance band of 0.006" (0.15mm) which is allowable for most threads of class 2A and 6G fit. If a tighter tolerance on major diameter is required, then ground stock should be considered ahead of drawn stock.

Once the correct diameter of bar or tube has been selected, it only remains for the blank to be pre-chamfered to facilitate the initial engagement of the rolls and leave the finished piece part with a clean lead in thread (See figures 3 & 4).

Figure: 3 Pre-rolled rod

Figure: 4 Rod after rolling

B. Blank pre-turned up to a shoulder.

Most thread rolling applications involve the piece part being turned in the spindle prior to the actual rolling process. This has the distinct advantage the blank and the rolling head will be in line which eliminates the problems involved with misalignment. The required blank diameter will need to be determined by machining several trial parts to the following procedure:

1. The rolling head has to be adjusted as close as possible to its final running position. With the head in its closed position, a plain plug, turned to the minor diameter of the thread, is placed between the thread rolls in the head. The three nuts (part number 15) are slackened off and the head is adjusted down so that the rolls grip the plug. The plug is then removed and the head adjusted down 1/2 a division on the graduated scale to remove any play in the bearings.

2. The piece part is turned down to the pitch diameter, minus .002"/.05mm, with a chamfer machined to .010"-.020" (.25mm-.5mm) below the root diameter. The angle of the chamfer should be no more than 30 degrees to the axis, with 20-25 degrees being ideal (See figure 5). After rolling, the resultant chamfer should be approximately 45 degrees, due to the flow of material at this point (figure 6).

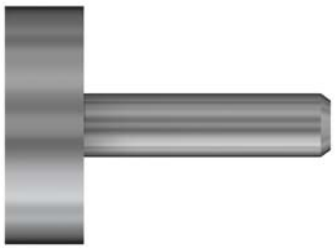

Figure: 5 Before rolling

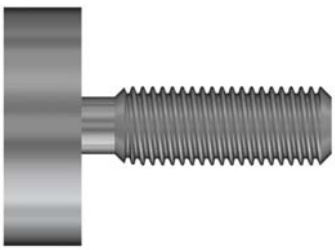

Figure: 6 After rolling

3. The opening position of the rolling head is then determined by advancing it forward, in the open condition, until the front faces of the rolls are just short of the shoulder. On a conventional machine, the mechanical stops would be set at this point, whereas on a CNC machine the Z-axis position should be noted and used as the end point in the program. This procedure should be undertaken with the spindle stationary and as previously stated, with the head in the open condition.

4. With the head set to the approximate size, and the blank turned to the lowest estimate of the required pre-rolling diameter, the first attempt at rolling is then made, using the appropriate spindle speed for the thread being rolled and advancing the head at, or just below, the required feed rate (1 X pitch/rev). At the opening position the head stops advancing, allowing it to pull off and trip open as the drive coupling disengages between the shank and spring housing. (A short, half a second dwell on the machine cam or in the CNC program is required to allow the head to open before it is retracted).

It is most likely that the first component rolled following the above procedure will be oversize on the pitch diameter and undersize on the major diameter. If this is the case, then the next step is to adjust the head down another 1/2 division on the graduated scale and then roll another test piece. By adjusting the head down, the pitch diameter will decrease, while the major diameter will increase. After just one or two further test pieces, the pitch diameter should be established to suit the gauges, but the major diameter may still be undersized. If this is the case, calculate the amount by which the major diameter needs to increase and adjust the blank diameter up by a third of this amount. Ideally, when both the pitch and the major diameters are at the middle limit of their tolerances, the crest of the thread should have a slight truncation and not quite be fully formed. A fully formed thread, while giving a smooth and polished appearance, is a sign of over rolling which causes over stressing of the rolls and reduces their working life.

C. Thread rolling into an undercut

The same principles for thread rolling up to a shoulder apply when thread rolling into an undercut, except for the blank profile at the undercut itself. Here, the chamfer is machined on the front of the blank must also be machined at the undercut, as illustrated in figure 7.

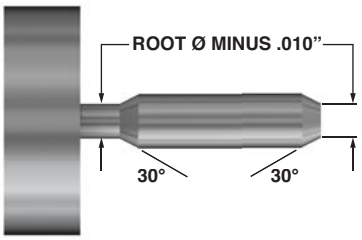

Figure: 7 Blank with undercut

In selecting the width of undercut, consideration should be given for the length of run out required when the thread rolling head opens. Axial thread rolls are available with two standard styles of lead: 1K and 2K.

Rolls designated 1K have one modified lead thread that enables the rolls to engage on the end of the blank and allows for the material to be progressively formed up to the full thread depth. Chosen as the standard short lead, these rolls generate a runout length of 2.3 X P, where P is the pitch of the thread being rolled. This formula allows for the length of the lead on the rolls and for the opening action of the thread rolling head and is therefore only a close approximation. In practice, it may be found that a shorter runout is obtained when a sample component is rolled.

Note: If the standard 1K lead is too long for the desired undercut, rolls can be supplied with special extra short leads of 0.6K or even 0.3K. However, by concentrating the rolling process into a shorter lead, roll life can be significantly

reduced. Subsequently, 0.6 and 0.3K leads are only recommended on low tensile, ductile materials.

The preferred standard lead for most thread rolling applications is 2K, as this spreads the working load over two start threads on each roll, giving a general increase in roll life over 1K lead rolls. Due to the extra lead thread on each roll, the runout length on the component will increase by one extra pitch. The following examples show the runout for each type of lead on some typical threads:

Length	Runout Lead	Thread formula	Runout size
0.3 K	1.6 x Pitch	M6 x 1	1.6mm
0.6 K	2 x Pitch	7/16 x 20 UNF	0.10"
1 K	2.3 x Pitch	M14 x 2	4.6mm
2 K	3.3 x Pitch	3/4 x 10 UNC	0.33"

Assembling Rolls Into Head

Remove the front plate screws to release the front plate, revealing the eccentric spindles on which the thread rolls are to be mounted. For the A0 head, which has 2 rolls, the rolls are assembled 1-2 or A-B while for all right hand 3 roll heads, the rolls are assembled 1,2,3 or A,B,C in a clockwise direction as viewed by the operator (for left hand thread rolling heads, rolls are assembled counter clockwise). Before assembly, it is recommended to smear all contact surfaces with a good quality lubricating grease or paste to minimize friction and wear. This will help protect the rolls, needle bearings and eccentric spindles which perform at high speeds under severe loads.

With the rolls in the correct sequence, insert the needle bearings or carbide bushes, replace the front plate and secure tightly with the front plate screws. Always ensure that the full amount of needle bearings are loaded between the rolls and the eccentric spindles (refer to head breakdown). For example, the A2 head requires 57 needle bearings, which is 19 per roll. Insufficient needle bearings in just one roll will reduce accuracy, promote roll failure and cause excessive wear to the eccentric spindle. This potential problem is eliminated by the use of carbide bushings, which are also quicker and easier to replace and allow roll changeovers to be accomplished with the head still mounted in the machine turret.

With the rolls assembled and the front plate tightened down, it should be possible to rotate the rolls freely by hand. The head can now be adjusted to suit the thread to be rolled by following this simple procedure:

a. Ensure the head is in the closed condition.

b. Loosen the 3 nuts (part number 15) which will allow the front cage of the head to be rotated relative to the spring housing. Note the setting line and graduated scale. As the head is adjusted in the minus direction (-), the rolls close down, opening outwards when the head is adjusted in the plus (+) direction.

c. The head can now be adjusted down on to a setting piece, which can be a screwed sample or a plain plug machined to the minor diameter of the thread. If the head is adjusted to either the + or - limit, and is still not to size, remove the 3 nuts and ring washer (part number 16). The front cage assembly is then removed, rotated about 120 degrees in the desired direction of adjustment, and then reassembled on the spring housing. Another indicator will then line up at one end of the graduated scale, permitting further adjustment in the desired direction.

d. When the head has been successfully adjusted down on to the setting piece, the 3 nuts can then be re-tightened. The first component to be rolled at this setting is invariably oversize, and the head will then need to be adjusted down in 1/2 division increments until the desired pitch diameter is achieved. Any necessary alterations to the blank diameter can now be made to produce the correct major diameter on the thread.

Axial Rolling head with
standard needle bearings installed

Axial Rolling head with
optional Carbide Bushings installed

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AXIAL Problem Solving

Fault / Condition	Probable Cause	Remedy
Major diameter is under size with truncated form, but the pitch diameter is correct	The pre-rolling blank diameter is undersize	Increase the pre-rolling blank diameter in small increments until correct major is obtained
Major diameter is undersize with truncated form and the pitch diameter is oversize	Thread rolling head is not adjusted correctly to size	Adjust thread rolling head down This will decrease the pitch but increase the major diameter
Both major diameter and pitch diameter are oversize	Blank diameter is oversize Head is adjusted oversize	Reduce blank diameter and readjust head, then follow setup procedure
The first 2 or 3 threads are rough or malformed	The approach rate of the thread rolling head is too fast or too slow	Check feed cam, programmed feed rate or hydraulic system according to type used
	Chamfer angle is too high or not uniform	Check that chamfer is not more than 30 degrees to the axis and is smooth/uniform
	The thread rolling head and component are misaligned	Check that the thread rolling head is on center with spindle
Thread slivers/flakes	Insufficient ductility	Change material/grade
	Material is leaded for free cutting	If other machining parameters permit, change to a low or non leaded grade of material
	Swarf/metal particles present in the coolant	Flush out and change coolant Improve filtration system
	Over rolling Thread form is full	Reduce blank diameter until thread form starts to truncate
Poor finish on thread	Thread rolls worn or chipped on the leads	Reverse rolls in the head before the leads chip. Replace badly damaged rolls
Component is bent or out of round	Blank is bent prior to rolling or bends during rolling	Material has inherent stress Anneal material
	Blank is not perfectly round	Check pre-turning operation particularly on long threads
	Thread rolling head and component are misaligned	Check that the thread rolling head is on center with spindle

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AXIAL Lead Angles Based On Basic Pitch Diameter

For UN Threads

Diameter			Threads per inch													
	Inches	mm	80	72	64	56	50	48	44	40	36	32	30	28	26	24
No. 0	0.060	1.52	4°23'	4°57'	5°42'	6°42'	7°43'	8° 8'	9° 6'	10°21'	11°55'	14° 6'				
No. 1	0.073	1.85	3°30'	3°57'	4°31'	5°17'	6° 3'	6°16'	7° 5'	8° 2'	9° 9'	10°43'				
No. 2	0.086	2.18	2°56'	3°17'	3°46'	4°22'	4°59'	5°14'	5°48'	6°31'	7°25'	8°37'	9°23'			
No. 3	0.099	2.51	2°30'	2°49'	3°12'	3°43'	4°14'	4°26'	4°55'	5°30'	6°14'	7°13'	7°44'	8°32'	9°25'	9°16'
No. 4	0.112	2.84	2°12'	2°27'	2°48'	3°14'	3°41'	3°51'	4°15'	4°45'	5°23'	6°12'	6°43'	7°18'	8° 2'	8°53'
No. 5	0.125	3.18	1°57'	2°11'	2°29'	2°52'	3°16'	3°24'	3°45'	4°11'	4°46'	5°26'	5°52'	6°22'	7° 0'	7°43'
No. 6	0.138	3.51	1°45'	1°58'	2°14'	2°34'	2°55'	3° 3'	3°21'	3°44'	4°13'	4°50'	5°13'	5°39'	6°12'	6°50'
No. 8	0.164	4.17	1°28'	1°38'	1°51'	2° 5'	2°25'	2°27'	2°43'	3° 5'	3°28'	3°58'	4°32'	4°37'	5° 2'	5°32'
No. 10	0.190	4.83	1°15'	1°24'	1°35'	1°49'	2° 5'	2° 9'	2°22'	2°37'	2°56'	3°21'	3°40'	3°54'	4°25'	4°39'
No. 12	0.216	5.49	1° 6'	1°13'	1°23'	1°36'	1°46'	1°53'	2° 3'	2°17'	2°33'	2°55'	3° 6'	3°22'	3°37'	4° 1'
1/4"	0.250	6.35	0°57'	1° 3'	1°12'	1°22'	1°33'	1°37'	1°46'	1°57'	2°11'	2°24'	2°40'	2°53'	3° 7'	3°24'
9/32"	0.281	7.14	0°50'	0°56'	1° 3'	1°12'	1°22'	1°25'	1°34'	1°43'	1°56'	2°11'	2°21'	2°31'	2°44'	3° 0'
5/16"	0.313	7.95	0°45'	0°50'	0°57'	1° 5'	1°13'	1°16'	1°24'	1°33'	1°43'	1°57'	2° 5'	2°15'	2°27'	2°40'
11/32"	0.344	8.74	0°40'	0°45'	0°51'	0°59'	1° 6'	1° 9'	1°15'	1°24'	1°34'	1°46'	1°54'	2° 2'	2°12'	2°24'
3/8"	0.375	9.53	0°37'	0°41'	0°47'	0°54'	1° 1'	1° 3'	1° 9'	1°16'	1°25'	1°37'	1°43'	1°51'	2° 0'	2°11'
13/32"	0.406	10.31	0°34'	0°38'	0°43'	0°50'	0°56'	0°58'	1° 4'	1°10'	1°18'	1°29'	1°35'	1°42'	1°50'	2° 0'
7/16"	0.438	11.13	0°32'	0°36'	0°40'	0°46'	0°52'	0°54'	0°59'	1° 5'	1°12'	1°22'	1°27'	1°34'	1°42'	1°51'
15/32"	0.469	11.91	0°30'	0°33'	0°37'	0°43'	0°48'	0°50'	0°55'	1° 1'	1° 8'	1°17'	1°22'	1°27'	1°35'	1°43'
1/2"	0.500	12.70	0°28'	0°31'	0°35'	0°40'	0°45'	0°47'	0°52'	0°57'	1° 3'	1°12'	1°16'	1°22'	1°29'	1°37'
17/32"	0.531	13.49			0°33'	0°38'	0°42'	0°44'	0°48'	0°53'	0°59'	1° 7'	1°11'	1°17'	1°24'	1°30'
9/16"	0.563	14.30			0°31'	0°36'	0°40'	0°42'	0°45'	0°50'	0°56'	1° 3'	1° 8'	1°12'	1°18'	1°25'
19/32"	0.594	15.09			0°29'	0°34'	0°38'	0°39'	0°43'	0°47'	0°53'	1° 0'	1° 4'	1° 9'	1°14'	1°20'
5/8"	0.625	15.88			0°28'	0°32'	0°36'	0°37'	0°41'	0°45'	0°50'	0°57'	1° 0'	1° 5'	1°10'	1°17'
11/16"	0.688	17.48			0°25'	0°29'	0°33'	0°34'	0°37'	0°41'	0°46'	0°51'	0°55'	0°59'	1° 4'	1° 9'
3/4"	0.750	19.05			0°23'	0°27'	0°30'	0°31'	0°34'	0°37'	0°42'	0°47'	0°50'	0°54'	0°58'	1° 3'
13/16"	0.813	20.65				0°25'	0°27'	0°29'	0°31'	0°35'	0°38'	0°43'	0°46'	0°50'	0°53'	0°58'
7/8"	0.875	22.23				0°23'	0°25'	0°27'	0°29'	0°32'	0°36'	0°40'	0°43'	0°46'	0°50'	0°54'
15/16"	0.938	23.83				0°21'	0°24'	0°25'	0°27'	0°30'	0°33'	0°37'	0°40'	0°43'	0°46'	0°50'
1"	1.000	25.40				0°20'	0°22'	0°23'	0°25'	0°28'	0°31'	0°35'	0°37'	0°40'	0°43'	0°47'
1.1/16"	1.063	27.00				0°19'	0°21'	0°22'	0°24'	0°26'	0°29'	0°33'	0°35'	0°38'	0°41'	0°44'
1.1/8"	1.125	28.58				0°18'	0°20'	0°21'	0°23'	0°25'	0°28'	0°31'	0°33'	0°36'	0°38'	0°42'
1.3/16"	1.188	30.18				0°17'	0°19'	0°20'	0°21'	0°24'	0°26'	0°29'	0°31'	0°34'	0°36'	0°39'
1.1/4"	1.250	31.75				0°16'	0°18'	0°19'	0°20'	0°22'	0°25'	0°28'	0°30'	0°32'	0°35'	0°37'
1.5/16"	1.313	33.35				0°15'	0°17'	0°18'	0°19'	0°21'	0°24'	0°26'	0°28'	0°30'	0°33'	0°36'
1.3/8"	1.375	34.93				0°14'	0°17'	0°17'	0°18'	0°20'	0°23'	0°25'	0°27'	0°29'	0°31'	0°34'
1.7/16"	1.438	36.53								0°19'	0°22'	0°24'	0°26'	0°28'	0°30'	0°32'
1.1/2"	1.500	38.10								0°18'	0°21'	0°23'	0°25'	0°27'	0°29'	0°31'
1.5/8"	1.625	41.28										0°21'	0°23'	0°24'	0°26'	0°29'
1.3/4"	1.750	44.45										0°20'	0°21'	0°22'	0°24'	0°27'
1.7/8"	1.875	47.63										0°18'	0°20'	0°21'	0°23'	0°25'
2"	2.000	50.80										0°17'	0°18'	0°20'	0°21'	0°23'

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AXIAL Lead Angles Based On Basic Pitch Diameter

For UN Threads

Diameter			Threads per inch													
	Inches	mm	20	18	16	14	13	12	11	10	9	8	7	6	5	4.5
No. 0	0.060	1.52														
No. 1	0.073	1.85														
No. 2	0.086	2.18														
No. 3	0.099	2.51														
No. 4	0.112	2.84														
No. 5	0.125	3.18	9°46'	11°16'	13°18'											
No. 6	0.138	3.51	8°35'	9°51'	11°30'											
No. 8	0.164	4.17	6°55'	7°50'	9°10'	10°57'	12° 9'	13°36'								
No. 10	0.190	4.83	5°47'	6°34'	7°36'	9° 1'	9°56'	11° 4'								
No. 12	0.216	5.49	4°58'	5°37'	6°28'	7°39'	8°24'	9°19'	10°29'							
1/4"	0.250	6.35	4°12'	4°43'	5°26'	6°23'	6°59'	7°43'	8°38'	9°47'						
9/32"	0.281	7.14	3°40'	4° 9'	4°43'	5°32'	6° 3'	6°40'	7°26'	8°23'						
5/16"	0.313	7.95	3°15'	3°40'	4°12'	4°53'	5°20'	5°52'	6°32'	7°20'	8°23'	9°46'				
11/32"	0.344	8.74	2°51'	3°17'	3°46'	4°26'	4°46'	5°15'	5°49'	6°31'	7°26'	8°38'				
3/8"	0.375	9.53	2°47'	3° 0'	3°24'	3°58'	4°20'	4°43'	5°15'	5°52'	6°40'	7°44'				
13/32"	0.406	10.31	2°27'	2°44'	3° 7'	3°37'	3°47'	4°26'	4°46'	5°20'	6° 3'	6°59'	8°16'	10° 7'		
7/16"	0.438	11.13	2°15'	2°31'	2°53'	3°20'	3°37'	3°58'	4°24'	4°53'	5°32'	6°23'	7°32'	9°10'	11°43'	
15/32"	0.469	11.91	2° 5'	2°20'	2°40'	3°60'	3°21'	3°40'	4° 3'	4°30'	5° 6'	5°52'	6°55'	8°26'	10°40'	
1/2"	0.500	12.70	1°57'	2°11'	2°29'	2°53'	3° 7'	3°24'	3°46'	4°12'	4°43'	5°26'	6°23'	7°44'	9°46'	11°16'
17/32"	0.531	13.49	1°50'	2° 3'	2°20'	2°41'	2°55'	3°12'	3°31'	3°57'	4°24'	5° 3'	5°56'	7°10'	9° 2'	10° 3'
9/16"	0.563	14.30	1°43'	1°55'	2°11'	2°31'	2°44'	3° 0'	3°17'	3°40'	4° 9'	4°44'	5°32'	6°40'	8°23'	9°37'
19/32"	0.594	15.09	1°38'	1°49'	2° 4'	2°23'	2°35'	2°49'	3° 6'	3°27'	3°59'	4°27'	5°12'	6°15'	7°50'	8°57'
5/8"	0.625	15.88	1°33'	1°43'	1°57'	2°15'	2°27'	2°40'	2°56'	3°15'	3°40'	4°11'	4°53'	5°52'	7°20'	8°23'
11/16"	0.688	17.48	1°24'	1°34'	1°46'	2° 2'	2°12'	2°24'	2°38'	2°56'	3°17'	3°46'	4°24'	5°14'	6°31'	7°26'
3/4"	0.750	19.05	1°16'	1°25'	1°37'	1°51'	2° 0'	2°11'	2°24'	2°40'	3° 0'	3°24'	3°58'	4°43'	5°52'	6°40'
13/16"	0.813	20.65	1°10'	1°18'	1°29'	1°42'	1°50'	2° 0'	2°12'	2°27'	2°44'	3° 7'	3°37'	4°20'	5°20'	6° 3'
7/8"	0.875	22.23	1° 5'	1°12'	1°22'	1°34'	1°42'	1°51'	2° 2'	2°15'	2°32'	2°53'	3°20'	3°28'	4°53'	5°32'
15/16"	0.938	23.83	1° 1'	1° 8'	1°16'	1°27'	1°35'	1°43'	1°54'	2° 5'	2°20'	2°40'	3° 6'	3°40'	4°30'	5° 6'
1"	1.000	25.40	0°57'	1° 3'	1°12'	1°22'	1°29'	1°37'	1°46'	1°57'	2°11'	2°29'	2°53'	3°24'	4°12'	4°44
1.1/16"	1.063	27.00	0°53'	0°59'	1° 7'	1°17'	1°24'	1°31'	1°39'	1°56'	2° 3'	2°20'	2°41'	3°12'	3°55'	4°24'
1.1/8"	1.125	28.58	0°50'	0°56'	1° 3'	1°13'	1°18'	1°25'	1°34'	1°43'	1°56'	2°11'	2°32'	3° 0'	3°40'	4° 8'
1.3/16"	1.188	30.18	0°47'	0°53'	1° 0'	1° 9'	1°14'	1°21'	1°28'	1°38'	1°49'	2° 4'	2°23'	2°49'	3°27'	3°53'
1.1/4"	1.250	31.75	0°45'	0°50'	0°57'	1° 5'	1°10'	1°16'	1°24'	1°33'	1°43'	1°57'	2°15'	2°40'	3°15'	3°40'
1.5/16"	1.313	33.35	0°43'	0°48'	0°54'	1° 2'	1° 7'	1°12'	1°19'	1°27'	1°38'	1°51'	2° 8'	2°31'	3° 6'	3°29'
1.3/8"	1.375	34.93	0°41'	0°45'	0°51'	0°59'	1° 4'	1° 9'	1°15'	1°24'	1°34'	1°46'	2° 2'	2°24'	2°56'	3°17'
1.7/16"	1.438	36.53	0°39'	0°43'	0°49'	0°56'	1° 1'	1° 6'	1°12'	1°20'	1°29'	1°41'	1°56'	2°17'	2°47'	3° 8'
1.1/2"	1.500	38.10	0°37'	0°42'	0°47'	0°54'	0°58'	1° 3'	1° 9'	1°16'	1°25'	1°36'	1°51'	2°11'	2°40'	3° 0'
1.5/8"	1.625	41.28	0°34'	0°38'	0°43'	0°50'	0°53'	0°58'	1° 4'	1°10'	1°18'	1°29'	1°42'	2° 0'	2°26'	2°44'
1.3/4"	1.750	44.45	0°32'	0°36'	0°40'	0°46'	0°50'	0°54'	0°59'	1° 5'	1°12'	1°22'	1°34'	1°52'	2°15'	2°31'
1.7/8"	1.875	47.63	0°30'	0°33'	0°37'	0°43'	0°46'	0°50'	0°55'	1° 1'	1° 8'	1°17'	1°28'	1°43'	2° 5'	2°20'
2"	2.000	50.80	0°28'	0°31'	0°35'	0°40'	0°43'	0°47'	0°51'	0°57'	1° 3'	1°11'	1°22'	1°37'	1°57'	2°11'

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AXIAL Lead Angles Based On Basic Pitch Diameter

For Metric Screw Threads M Profile

Diameter		Pitch										
mm	inches	0.30	0.35	0.40	0.45	0.50	0.60	0.70	0.75	0.80	1.00	1.25
1.4	0.055	4° 32'	5° 26'	6° 22'	7° 22'							
1.6	0.063	3° 53'	4° 38'	5° 26'	6° 15'	7° 7'						
1.8	0.071	3° 24'	4° 3'	4° 44'	5° 26'	6° 9'						
2.0	0.079	3° 2'	3° 36'	4° 11'	4° 48'	5° 26'	6° 46'					
2.2	0.087	2° 44'	3° 14'	3° 45'	4° 18'	4° 51'	6° 1'	7° 17'				
2.5	0.098	2° 22'	2° 48'	3° 15'	3° 43'	4° 11'	5° 10'	6° 13'	6° 46'	7° 20'		
3.0	0.118	1° 57'	2° 18'	2° 40'	3° 2'	3° 24'	4° 11'	5° 0'	5° 26'	5° 52'		
3.5	0.138	1° 39'	1° 57'	2° 15'	2° 33'	2° 52'	3° 31'	4° 11'	4° 32'	4° 53'	6° 22'	
4.0	0.157	1° 26'	1° 41'	1° 57'	2° 13'	2° 29'	3° 2'	3° 36'	3° 53'	4° 11'	5° 26'	7° 7'
4.5	0.177	1° 16'	1° 30'	1° 43'	1° 57'	2° 11'	2° 40'	3° 9'	3° 24'	3° 40'	4° 44'	6° 9'
5.0	0.197	1° 8'	1° 20'	1° 32'	1° 45'	1° 57'	2° 22'	2° 48'	3° 2'	3° 15'	4° 11'	5° 26'
6.0	0.236	0° 57'	1° 6'	1° 16'	1° 26'	1° 36'	1° 57'	2° 18'	2° 29'	2° 40'	3° 24'	4° 23'
6.3	0.248	0° 54'	1° 3'	1° 12'	1° 22'	1° 32'	1° 51'	2° 11'	2° 21'	2° 31'	3° 13'	4° 9'
8.0	0.315	0° 42'	0° 49'	0° 57'	1° 4'	1° 11'	1° 26'	1° 41'	1° 49'	1° 57'	2° 29'	3°10'
10.0	0.394	0° 33'	0° 39'	0° 45'	1° 51'	0° 57'	1° 8'	1° 20'	1° 26'	1° 32'	1° 57'	2° 29'
12.0	0.472	0° 28'	0° 33'	0° 37'	0° 42'	0° 47'	0° 57'	1° 6'	1° 11'	1° 16'	1° 36'	2° 2'
14.0	0.551	0° 24'	0° 28'	0° 32'	0° 36'	0° 40'	0° 48'	0° 57'	1° 1'	1° 5'	1° 22'	1° 44'
16.0	0.630	0° 21'	0° 24'	0° 28'	0° 31'	0° 35'	0° 42'	0° 49'	0° 53'	0° 57'	1° 11'	1° 30'
18.0	0.709		0° 22'	0° 25'	0° 28'	0° 31'	0° 37'	0° 44'	0° 47'	0° 50'	1° 3'	1° 20'
20.0	0.787			0° 22'	0° 25'	0° 28'	0° 33'	0° 39'	0° 42'	0° 45'	0° 57'	1° 11'
22.0	0.866			0° 20'	0° 23'	0° 25'	0° 30'	0° 36'	0° 38'	0° 41'	0° 51'	1° 5'
24.0	0.945				0° 21'	0° 23'	0° 28'	0° 33'	0° 35'	0° 37'	0° 47'	0° 59'
27.0	1.063					0° 21'	0° 25'	0° 29'	0° 31'	0° 33'	0° 42'	0° 52'
30.0	1.181						0° 22'	0° 26'	0° 28'	0° 30'	0° 37'	0° 47'
33.0	1.299						0° 20'	0° 24'	0° 25'	0° 27'	0° 34'	0° 42'
36.0	1.417							0° 22'	0° 23'	0° 25'	0° 31'	0° 39'
39.0	1.535							0° 20'	0° 21'	0° 23'	0° 29'	0° 36'
42.0	1.654								0° 20'	0° 21'	0° 26'	0° 33'
45.0	1.772									0° 20'	0° 25'	0° 31'
48.0	1.890										0° 23'	0° 29'
52.0	2.047										0° 21'	0° 27'

Diameter		Pitch										
mm	inches	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00
1.4	0.055											
1.6	0.063											
1.8	0.071											
2.0	0.079											
2.2	0.087											
2.5	0.098											
3.0	0.118											
3.5	0.138											
4.0	0.157											
4.5	0.177											
5.0	0.197	6° 46'										
6.0	0.236	5° 26'	6° 32'									
6.3	0.248	5° 7'	6° 9'	7° 15'								
8.0	0.315	3° 53'	4° 38'	5° 26'	7° 7'							
10.0	0.394	3° 2'	3° 36'	4° 11'	5° 26'	6° 46'						
12.0	0.472	2° 29'	2° 56'	3° 24'	4° 23'	5° 26'	6° 32'					
14.0	0.551	2° 6'	2° 29'	2° 52'	3° 41'	4° 32'	5° 26'	6° 22'	7° 22'			
16.0	0.630	1° 49'	2° 9'	2° 29'	3° 10'	3° 53'	4° 38'	5° 26'	6° 15'	7° 7'		
18.0	0.709	1° 36'	1° 54'	2° 11'	2° 47'	3° 24'	4° 3'	4° 44'	5° 26'	6° 9'	6° 55'	
22.0	0.866	1° 18'	1° 32'	1° 46'	2° 14'	2° 44'	3° 14'	3° 45'	4° 18'	4° 51'	5° 26'	6° 1'
24.0	0.945	1° 11'	1° 24'	1° 36'	2° 2'	2° 29'	2° 56'	3° 24'	3° 53'	4° 23'	4° 54'	5° 26'
27.0	1.063	1° 3'	1° 14'	1° 25'	1° 48'	2° 11'	2° 35'	2° 59'	3° 24'	3° 50'	4° 16'	4° 44'
30.0	1.181	0° 57'	1° 6'	1° 16'	1° 36'	1° 57'	2° 18'	2° 40'	3° 2'	3° 24'	3° 47'	4° 11'
33.0	1.299	0° 51'	1° 0'	1° 9'	1° 27'	1° 46'	2° 5'	2° 24'	2° 44'	3° 4'	3° 24'	3° 45'
36.0	1.417	0° 47'	0° 55'	1° 3'	1° 20'	1° 36'	1° 54'	2° 11'	2° 29'	2° 47'	3° 5'	3° 24'
39.0	1.535	0° 43'	0° 51'	0° 58'	1° 13'	1° 29'	1° 44'	2° 0'	2° 16'	2° 33'	2° 50'	3° 7'
42.0	1.654	0° 40'	0° 47'	0° 54'	1° 8'	1° 22'	1° 36'	1° 51'	2° 6'	2° 21'	2° 37'	2° 52'
45.0	1.772	0° 37'	0° 44'	0° 50'	1° 3'	1° 16'	1° 30'	1° 43'	1° 57'	2° 11'	2° 25'	2° 40'
48.0	1.890	0° 35'	0° 41'	0° 47'	0° 59'	1° 11'	1° 24'	1° 36'	1° 49'	2° 2'	2° 15'	2° 29'
52.0	2.047	0° 32'	0° 38'	0°43'	0° 54'	1° 6'	1° 17'	1° 29'	1° 40'	1° 52'		

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AXIAL Recommended Blank Diameters

Blank Diameters For Parallel Rolled Threads UNF & UNC - Class 2

		Steel														Aluminum Alloy			
Size		10-50 C Soft		30-50 C Soft		30-50 C or Alloy 15-25 RC		30-50 C Chrome Nickel 26-32 RC		Stainless Chrome 300 Series*		Stainless Chrome 400 Series*		Brass and Bronze		Soft		Hard	
O.D.	Pitch	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
#0	80	.0504	.0498	.0507	.0501	.0509	.0503	.0511	.0505	.0513	.0507	.0515	.0509	.0507	.0501	.0509	.0503	.0507	.0501
#1	72	.0623	.0617	.0627	.0621	.0629	.0622	.0631	.0625	.0633	.0626	.0635	.0628	.0627	.06321	.0629	.0622	.0627	0621
#1	64	.0612	.0605	.0616	.0609	.0618	.0611	.0620	.0613	.0622	.0615	.0624	.0617	.0616	.0609	.0618	.0611	.0616	.0609
#2	64	.0742	.0735	.0746	.0739	.0748	.0741	.0750	.0743	.0752	.0745	.0754	.0747	.0746	.0739	.0748	.0741	.0746	0739
#2	56	.0726	.0719	.0730	.0723	.0732	.0725	.0734	.0728	.0737	.0730	.0739	.0732	.0730	.0723	.0732	.0725	.0730	.0723
#3	56	.0855	.0847	.0859	.0852	.0861	.0854	.0863	.0856	.0866	.0858	.0868	.0860	.0859	.0852	.0861	.0854	.0859.	.0852
#3	48	.0835	.0827	.0840	.0832	.0842	.0834	.0844	.0837	.0846	.0839	.0849	.0841	.0840	.0832	.0842	.0834	.0840	.0832
#4	48	.0964	.0956	.0969	.0961	.0971	.0964	.0974	.0966	.0976	.0968	.0979	.0971	.0969	.0961	.0971	.0964	.0969	.0961
#4	40	.0936	.0928	.0941	.0933	.0943	.09335	.0946	.0938	.0948	.0940	.0951	.0943	.0941	.0938	.0943	.0935	.0941	.0933
#5	44	.1081	.1073	.1086	.1078	.1088	.1080	.1091	.1082	.1093	.1085	.1096	.1088	.1086	.1078	.1088	.1080	.1086	.1078
#5	40	.1065	.1057	.1070	.1062	.1073	.1064	.1075	.1067	.1078	.1070	.1081	.1072	.1070	.1062	.1073	.1064	.1070	.1062
#6	40	.1195	.1187	.1200	.1192	.1203	.1194	.1205	.1197	.1208	.1200	.1211	.1202	.1200	.1192	.1203	.1194	.1200	.1192
#6	32	.1153	.1144	.1159	.1149	.1161	.1152'	.1164	.1155	.1167	.1158	.1170	.1161	.1159	.1149	.1161	.1152	.1159	.1149
#8	36	.1436	.1427	.1442	.1432	.1444	.1435	.1447	.1438	.1450	.1441	.1453	.1444	.1442	.1432	.1444	.1435	.1442	.1432
#8	32	.1412	.1402	.1417	.1408	.1420	.1411	.1423	.1414	.1426	.1416	.1429	.1419	.1417	.1408	.1420	.1411	.1417	.1408
#10	32	.1671	.1661	.1677	.1667	.1680	.1670	.1683	.1673	.1686	.1676	.1689	.1679	.1677	.1667	.1680	.1670	.1677	.1667
#10	24	.1591	.1589	.1608	.1596	.1611	.1599	.1614	.1602	.1618	.1606	.1621	.1609	.1608	.1596	.1611	.1599	.1608	.1596
#12	28	.1900	.1889	.1907	.1896	.1910	.1899	.1913	.1902	.1916	.1905	.1920	.1908	.1907	.1896	.1910	.1899	.1907	.1896
#12	24	.1861	.1848	.1868	.1855	.1871	.1859	.1874	.1862	.1878	.1865	.1881	.1869	.1868	.1855	.1871	.1859	.1868	.1855
1/4	20	.2144	.2131	.2151	.2138	.2155	.2142	.2159	.2146	.2166	.2153	.2159	.2146	.2151	.2138	.2155	.2142	.2151	.2138
1/4	28	.2241	.2228	.2248	.2235	.2251	.2238	.2255	.2242	.2261	.2248	.2255	.2242	.2248	.2235	.2251	.2238	.2248	.2235
5/16	18	.2729	.2716	.2737	.2724	.2741	.2728	.2745	.2732	.2753	.2740	.2745	.2732	.2737	.2724	.2741	.2728	.737	.2724
5/16	24	.2823	.2810	.2830	.2817	.2834	.2821	.2837	.2824	.2845	.2832	.2837	.2824	.2830	.2817	.2834	.2821	.2830	.2817
3/8	16	.3306	.3291	.3315	.3300	.3320	.3305	.3324	.3309	.3333	.3318	.3324	.3309	.3315	.3300	.3320	.3305	.3315	.3300
3/8	24	.3448	.3434	.3455	.3441	.3459	.3445	.3463	.3449	.3471	.3457	.3463	.3449	.3455	.3441	.3459	.3445	.3455	.3441
7/16	14	.3871	.3855	.3880	.3864	.3885	.3869	.3890	.3874	.3899	.3883	.3890	.3874	.3880	.3864	.3885	.3869	.3880	.3864
7/16	20	.4012	.3999	.4021	.4008	.4025	.4012	.4029	.4016	.4037	.4024	.4029	.4016	.4021	.4008	.4025	.4012	.4021	.4008
1/2	13	.4458	.4440	.4468	.4450	.4473	.4455	.4478	.4460	.4488	.4470	.4478	.4460	.4468	.4450	.4473	.4455	.4468	.4450
1/2	20	.4637	.4623	.4646	.4632	.4650	.4636	.4655	.4641	.4663	.4649	.4655	.4641	.4646	.4632	.4650	.4636	.4646	.4632
9/16	12	.5039	.5021	.5050	.5032	.5055	.5037	.5060	.5042	.5070	.5052	.5060	.5042	.5050	.5032	.5055	.5037	.5050	.5032
9/16	18	.5225	.5210	.5234	.5219	.5238	.5223	.5243	.5228	.5252	.5237	.5243	.5228	.5234	.5219	.5238	.5223	.5234	.5219
5/8	11	.5614	.5595	.5625	.5606	.5630	.5611	.5636	.5617	.5647	.5628	.5636	.5617	.5625	.5606	.5630	5611	.5625	.5606
5/8	18	.5850	.5833	.5859	.5842	.5864	.5847	.5869	.5852	.5878	.5861	.5869	.5852	.5859	.5842	.5864	.5847	.5859	.5842
3/4	10	.6799	.6779	.6811	.6791	.6817	.6797	.6823	.6803	.6834	.6814	.6823	.6803	.6811	.6791	.6817	.6797	.6811	.6791
3/4	16	.7052	.7034	.7062	.7044	.7067	.7049	.7072	.7054	.7082	.7064	.7072	.7054	.7062	.7044	.7067	.7049	.7062	.7044
7/8	9	.7972	.7952	.7985	.7965	.7991	.7971	.7998	.7978	.8010	.7990	.7998	.7978	.7985	.7965	.7991	.7971	.7985	.7965
7/8	14	.8240	.8221	.8251	.8232	.8257	.8238	.8262	.8243	.8273	.8259	.8262	.8243	.8251	.8232	.8257	.8238	.8251	.8232
1	8	.9131	.9107	.9144	.9120	.9151	.9127	.9158	.9134	.9172	.9148	.9158	.9134	.9144	.9120	.9151	.9127	.9144	.9120
1	12	.9408	.9388	.9420	.9400	.9426	.9406	.9432	.9412	.9443	.9423	.9432	.9412	.9420	.9400	.9426	.9406	.9420	.9400
1-1/8	7	1.0262	1.0235	1.0276	1.0250	1.0283	1.0257	1.0290	1.0264	1.0304	1.0278	1.0290	1.0264	1.0276	1.0250	1.0283	1.0257	1.0276	1.0250
1-1/8	12	1.0657	1.0637	1.0669	1.0649	1.0675	1.0655	1.0681	1.0661	1.0693	1.0673	1.0681	1.0661	1.0669	1.0649	1.0675	1.0655	1.0669	1.0649
1-1/4	7	1.1510	1.1483	1.1525	1.1498	1.1533	1.1506	1.1540	1.1513	1.1555	1.1528	1.1540	1.1513	1.1525	1.1498	1.1533	1.1506	1.1525	1.1498
1-1/4	12	1.1906	1.1885	1.1919	1.1898	1.1925,	1.1904	1.1931	1.1910	1.1943	1.1922	1.1931	1.1910	1.1919	1.1898	1.1925	1.1904	1.1919	1.1898
1-3/8	6	1.2601	1.2571	1.2617	1.2587	1.2625	1.2595	1.2633	1.2603	1.2649	1.2619	1.2633	1.2603	1.2617	1.2587	1.2625	1.2595	1.2617	1.2587
1-3/8	12	1.3153	1.3133	1.3166	1.3146	1.3171	1.3152	1.3178	1.3158	1.3191	1.3171	1.13178	1.3158	1.3166	1.3146	1.3172	1.3152	1.3166	1.3146
1-1/2	6	1.3850	1.3820	1.3866	1.3836	1.3874	1.3844	1.3882	1.3852	1.3898	1.3868	1.3882	1.3851	1.3866	1.3836	1.3874	1.3844	1.3866	1.3836
1-1/2	12	1.4402	1.4382	1.4415	1.4395	1.4422	1.4402	1.4428	1.4408	1.4441	1.4421	1.4428	1.4408	1.4415	1.4395	1.4422	1.4402	1.4415	1.4395
1-3/4	5	1.6124	1.6094	1.6142	1.6112	1.6150	1.6120	1.6159	1.6129	1.6177	1.6147	1.6159	1.6129	1.6142	1.6112	1.6150	1.6120	1.6142	1.6112
2	4-1/2	1.8474	1.8442	1.8493	1.8461	1.8503	1.8471	1.8512	1.8480	1.8531	1.8499	1.8512	1.8480	1.8442	1.8461	1.8503	1.8471	1.8442	1.8461

Note: These dimensions are for set-up reference. Diameters must be finally established by actual rolling.

• Only Certain Grades Rollable

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AXIAL Recommended Blank Diameters

Blank Diameters For Parallel Rolled Threads UNF & UNC - Class 3

		Steel														Aluminum Alloy			
Size		10-50 C Soft		30-50 C Soft		30-50 C or Alloy 15-25 RC		30-50 C Chrome Nickel 26-32 RC		Stainless Chrome 300 Series*		Stainless Chrome 400 Series*		Brass and Bronze		Soft		Hard	
O.D.	Pitch	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
#0	80	.0512	.0507	.0514	.0510	.0515	.0511	.0517	.0513	.0519	.0515	.0517	.0513	.0514	.0510	.0515	.0511	.0514	.0510
#1	72	.0632	.0627	.0635	.0630	.0637	.0632	.0638	.0633	.0641	.0636	.0638	.0633	.0635	.0630	.0637	.0632	.0635	.0630
#1	64	.0621	.0616	.0624	.0619	.0625	.0620	.0627	.0622	.0630	.0625	.0627	.0622	.0624	.0619	.0625	.0620	.0624	.0619
#2	64	.0751	.0746	.0754	.0749	.0755	.0750	.0757	.0752	.0760	.0755	.0757	.0752	.0754	.0749	.0755	.0750	.0754	.0749
#2	56	.0735	.0730	.0738	.0733	.0739	.0734	.0741	.0736	.0744	.0739	.0741	.0736	.0738	.0733	.0739	.0734	.0738	.0733
#3	56	.0865	.0860	.0868	.0863	.0869	.0864	.0871	.0866	.0874	.0869	.0871	.0866	.0868	.0863	.0869	.0864	.0868	.0863
#3	48	.0845	.0840	.0848	.0843	.0850	.0845	.0852	.0847	.0855	.0850	.0852	.0847	.0848	.0843	.0850	.0845	.0848	.0843
#4	48	.0975	.0969	.0978	.0972	.0980	.0974	.0982	.0976	.0986	.0980	.0982	.0976	.0978	.0972	.0980	.0974	.0978	.0972
#4	40	.0947	.0941	.0950	.0945	.0953	.0947	.0955	.0949	.0958	.0952	.0955	.0949	.0950	.0945	.0953	.0947	.0950	.0945
#5	44	.1091	.1085	.1095	.1088	.1097	.1091	.1099	.1093	.1102	.1096	.1099	.1093	.1095	.1088	.1097	.1091	.1095	.1088
#5	40	.1077	.1071	.1081	.1075	.1083	.1077	.1085	.1079	.1088	.1082	.1085	.1079	.1081	.1075	.1083	.1077	.1081	.1075
#6	40	.1207	.1200	.1211	.1204	.1213	.1206	.1215	.1208	.1219	.1212	.1215	.1208	.1211	.1204	.1213	.1206	.1211	.1204
#6	32	.1164	.1157	.1169	.1162	.1171	.1164	.1174	.1167	.1178	.1171	.1174	.1167	.1169	.1162	.1171	.1164	.1169	.1162
#8	36	.1448	.1441	.1452	.1445	.1454	.1447	.1457	.1450	.1461	.1454	.1457	.1450	.1452	.1445	.1454	.1447	.1452	.1445
#8	32	.1424	.1417	.1429	.1422	.1431	.1424	.1433	.1426	.1437	.1430	.1433	.1426	.1429	.1422	.1431	.1424	.1429	.1422
#10	32	.1683	.1676	.1688	.1681	.1690	.1683	.1693	.1686	.1697	.1690	.1693	.1686	.1688	.1681	.1690	.1683	.1688	.1681
#10	24	.1615	.1607	.1620	.1612	.1622	.1614	.1625	.1617	.1630	.1622	.1625	.1617	.1620	.1612	.1622	.1614	.1620	.1612
#12	28	.1913	.1906	.1918	.1911	.1921	.1914	.1923	.1916	.1928	.1921	.1923	.1916	.1918	.1911	.1921	.1914	.1918	.1911
#12	24	.1874	.1866	.1879	.1871	.1881	.1873	.1884	.1876	.1889	.1881	.1884	.1876	.1879	.1871	.1881	.1873	.1879	.1871
1/4	20	.2159	.2150	.2164	.2155	.2167	.2158	.2170	.2161	.2176	.2167	.2170	.2161	.2164	.2155	.2167	.2158	.2164	.2155
1/4	28	.2254	.2246	.2259	.2251	.2261	.2253	.2264	.2256	.2269	.2261	.2264	.2256	.2259	.2251	.2261	.2253	.2259	.2251
5/16	18	.2724	.2737	.2753	.2743	.2756	.2746	.2759	.2749	.2765	.2755	.2759	.2749	.2753	.2743	.2756	.2746	.2753	.2743
5/16	24	.2839	.2830	.2845	.2836	.2847	.2838	.2850	.2841	.2855	.2846	.2850	.2841	.2845	.2836	.2847	.2838	.2845	.2836
3/8	16	.3326	.3314	.3333	.3321	.3336	.3324	.3340	.3328	.3346	.3334	.3340	.3328	.3346	.3334	.3340	.3328	.3333	.3321
3/8	24	.3463	.3453	.3469	.3459	.3472	.3462	.3475	.3465	.3480	.3470	.3475	.3465	.3469	.3459	.3472	.3462	.3469	.3459
7/16	14	.3893	.3880	.3900	.3887	.3903	.3890	.3907	.3894	.3914	.3901	.3907	.3894	.3900	.3887	.3903	.3890	.3900	.3887
7/16	20	.4032	.4022	.4038	.4028	.4041	.4031	.4044	.4034	.4051	.4041	.4044	.4034	.4038	.4028	.4041	.4031	.4038	.4028
1/2	13	.4480	.4467	.4487	.4474	.4491	.4478	.4495	.4482	.4502	.4489	.4495	.4482	.4487	.4474	.4491	.4478	.4487	.4474
1/2	20	.4657	.4646	.4664	.4653	.4654	.4643	.4670	.4659	.4676	.4665	.4670	.4659	.4664	.4653	.4654	.4643	.4664	.4653
9/16	12	.5062	.5049	.5070	.5057	.5070	.5057	.5078	.5065	.5085	.5072	.5078	.5065	.5070	.5057	.5070	.5057	.5070	.5057
9/16	18	.5246	.5233	.5253	.5240	.5253	.5240	.5260	.5247	.5267	.5254	.5260	.5247	.5253	.5240	.5253	.5240	.5253	.5240
5/8	11	.5636	.5623	.5644	.5631	.5644	.5631	.5653	.5640	.5661	.5648	.5653	.5640	.5644	.5631	.5644	.5631	.5644	.5631
5/8	18	.5871	.5858	.5878	.5865	.5878	.5865	.5885	.5872	.5892	.5879	.5885	.5872	.5878	.5865	.5878	.5865	.5878	.5865
3/4	10	.6825	.6810	.6834	.6819	.6834	.6819	.6843	.6828	.6852	.6837	.6843	.6828	.6834	.6819	.6834	.6819	.6834	.6819
3/4	16	.7073	.7060	.7080	.7067	.7080	.7067	.7088	.7075	.7096	.7083	.7088	.7075	.7080	.7067	.7080	.7067	.7087	.7067
7/8	9	.8002	.7986	.8010	.7994	.8011	.7995	.8021	.8005	.8030	.8014	.8021	.8005	.8010	.7994	.8011	.7995	.8010	.7994
7/8	14	.8262	.8249	.8270	.8257	.8270	.8257	.8279	.8266	.8287	.8274	.8279	.8266	.8270	.8257	.8270	.8257	.8270	.8257
1	8	.9160	.9142	.9170	.9151	.9170	.9152	.9180	.9162	.9191	.9173	.9180	.9162	.9170	.9152	.9170	.9152	.9170	.9152
1	12	.9434	.9419	.9443	.9428	.9428	.9415	.9452	.9437	.9461	.9446	.9452	.9437	.9443	.9428	.9428	.9415	.9443	.9428
1-1/8	7	1.0292	1.0273	1.0303	1.0284	1.0303	1.0284	1.0314	1.0295	1.0325	1.0306	1.0314	1.0295	1.0303	1.0284	1.0303	1.0284	1.0303	1.0284
1-1/8	12	1.0684	1.0669	1.0693	1.0678	1.0693	1.0678	1.0693	1.0678	1.0711	1.0696	1.0693	1.0678	1.0693	1.0678	1.0693	1.0678	1.0693	1.0678
1-1/4	7	1.1542	1.1523	1.1553	1.1534	1.1553	1.1534	1.1553	1.1534	1.1575	1.1556	1.1553	1.1534	1.1553	1.1539	1.1553	1.1534	1.1553	1.1534
1-1/4	12	1.1933	1.1918	1.1942	1.1927	1.1942	1.1927	1.1951	1.1936	1.1960	1.1945	1.1951	1.1936	1.1942	1.1927	1.1942	1.1927	1.1942	1.1927
1-3/8	6	1.2633	1.2613	1.2645	1.2625	1.2651	1.2631	1.2657	1.2637	1.2665	1.2649	1.2657	1.2637	1.2645	1.2625	1.2651	1.2631	1.2645	1.2625
1-3/8	12	1.3182	1.3167	1.3191	1.3176	1.3196	1.3181	1.3200	1.3185	1.3210	1.3195	1.3200	1.3185	1.3191	1.3176	1.3196	1.3161	1.3191	1.3176
1-1/2	6	1.3883	1.3862	1.3894	1.3874	1.3900	1.3880	1.3906	1.3886	1.3918	1.3898	1.3906	1.3886	1.3894	1.3874	1.3900	1.3880	1.3894	1.3874
1-1/2	12	1.4433	1.4416	1.4442	1.4425	1.4447	1.4430	1.4451	1.4434	1.4461	1.4444	1.4451	1.4434	1.4442	1.4425	1.4447	1.4430	1.4442	1.4435
1-3/4	5	1.6165	1.6141	1.6178	1.6154	1.6185	1.6161	1.6191	1.6167	1.6205	1.6181	1.6191	1.6167	1.6178	1.6154	1.6185	1.6161	1.6178	1.6159
2	4-1/2	1.8518	1.8493	1.8532	1.8507	1.8539	1.8514	1.8546	1.8521	1.8561	1.8536	1.8546	1.8521	1.8532	1.8507	1.8539	1.8514	1.8532	1.8507

Note: These dimensions are for set-up reference. Diameters must be finally established by actual rolling.

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AXIAL Recommended Blank Diameters

Blank Diameters In Inches For Straight, Metric Threads

			Steel														Aluminum Alloy			
Size in MM			10-50 C Soft		30-50 C Soft		30-50 C or Alloy 15-25 RC		30-50 C Chrome Nickel 26-32 RC		Stainless Chrome 300 Series*		Stainless Chrome 400 Series*		Brass and Bronze		Soft		Hard	
O.D.	Pitch		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
3	35	In.	.1085	.1080	.1088	.1083	.1090	.1085	.1091	.1086	.1094	.1089	.1091	.1086	.1088	.1083	.1090	.1085	.1088	.1083
3	.5	In.	.1044	.1039	.1047	.1042	.1049	.1044	.1050	.1045	.1053	.1048	.1050	.1045	.1047	.1042	.1049	.1044	.1047	.1042
3.5	.35	In.	.1282	.1277	1284	.1279	.1286	.1281	.1287	.1282	.1290	.1285	.1287	.1282	.1284	.1279	.1286	.1281	.1284	.1279
3.5	6	In.	.1214	.1209	.1218	.1213	.1219	.1214	.1221	.1216	.1224	.1219	.1221	.1216	.1218	.1213	.1219	.1214	.1218	.1213
4	.5	In.	.1438	.1433	.1441	.1436	.1442	.1437	.1444	.1439	.1447	.1442	.1444	.1439	.1441	.1436	.1442	.1437	.1441	.1436
4	.7	In.	.1386	.1380	.1389	.1383	.1391	.1385	.1393	.1387	.1397	.1391	.1393	.1387	.1389	.1383	.1391	.1385	.1389	.1383
4.5	.5	In.	.1635	.1630	.1638	.1633	.1639	.1634	.1641	.1636	.1644,	.1639	.1641	.1636	.1638	.1633	.1639	.1634	.1638	.1633
5	.5	In.	.1831	.1826	.1835	.1830	.1836	.1831	.1837	.1832	.1841	.1836	.1837	.1832	.1835	.1830	.1836	.1831	.1835	.1830
5	.8	In.	.1754	.1747	.1757	.1751	.1759	.1753	.1761	.1755	.1765	.1758	.1761	.1755	.1757	.1751	.1759	.1753	.1757	.1751
6	.75	In.	.2159	.2153	.2163	.2157	.2165	.2159	.2167	.2161	.2170	.2164	.2167	.2161	.2163	.2157	.2165	.2159	.2163	.2157
6	1.0	In.	.2092	.2084	.2097	.2089	.2100	.2092	.2102	.2094	.2107	.2099	.2102	.2094	.2097	.2089	.2100	.2092	.2097	.2089
7	.75	In.	.2553	.2547	.2557	.2551	.2559	.2553	.2561	.2555	.2564	.2558	.1561	.2561	.2557	.2551	.2559	.2553	.2557	.2551
7	1.0	In.	.2486	.2478	.2491	.2483	.2494	.2486	.2496	.2488	.2501	.2493	.2496	.2488	.2491	.2483	.2494	.2486	.2491	.2483
8	1.0	In.	.2880	.2872	.2885	.2877	.2888	.2880	.2890	.2882	.2895	2.887	2.890	.2882	.2885	.2877.	.2888	.2880	.2885	.2877
8	1.25	In.	.2815	.2807	.2820	.2812	.2822	.2814	.2825	.2817	.2830	.2822	.2825	.2817	.2820	.2812	.2822	.2814	.2820	.2812
9	1.0	In.	.3273	.3265	.3278	.3270	.3281	.3273	.3283	.3275	.3288	.3280	.3283	.3275	.3278	.3270	.3281	.3273	.3278	.3270
9	1.25	In.	.3209	.3201	.3214	.3206	.3216	.3208	.3219	.3211	.3224.	.3216	.3219	.3211	.3214	.3206	.3216	.3208	.3214	.3206
10	1.0	In.	.3667	.3659	.3672	.3664	.3675	.3667	.3677	.3669	.3682	.3674	.3677	.3669	.3672	.3664	.3675	.3667	.3672	.3664
10	1.5	In.	.3537	.3526	.3543	.3532	.3546	.3535	.3549	.3539	.3555	.3545	.3549	.3539	.3543	.3532	.3546	.3535	.3543	.3532
11	1.5	In.	.3930	.3919	.3936	.3925	.3939	.3928	.3942	.3932	.3948	.3938	.3942	.3932	.3936	.3925	.3939	.3928	.3936	.3925
12	1.5	In.	.4324,	.4313	.4330	.4319	.4333	.4322	.4336	.4326	.4342	.4332	.4336	.4326	.4330	.4319	.4333	.4322	.4330	.4319
12	1.75	In.	.4259	.4246	.4266	.4253	.4269	.4256	.4273	.4260	.4280	.4267	.4273	.4260	.4266	.4253	.4269	.4256	.4266	.4253
14	1.5	In.	.5111	.5100	.5117	.5106	.5120	.5109	.5123	.5113	.5129	.5119	.5123	.5113	.5117	.5106.	.5120	.5109	.5117	.5106
14	2	In.	.4979	.4966	.4986	.4973	.4990	.4977	.4994	.4981	.5002	.4989	.4994	.4981	.4986	.4973	.4990	.4977	.4986	.4973
16	1.5	In.	.5899	.5888	.5905	.5894	.5908'	.5897	.5911	.5901	.5917	.5907	.5911	.5901	.5905	.5894	.5908	.5897	.5905	.5894
16	2	In.	.5767	.5754	.5774	.5761	.5778	.5765	.5782	.5769	.5790.	.5777	.5782	.5769	.5774	.5761	.5778	.5765	.5774	.5761
18	1.5	In.	.6686	.6675	.6692	.6681	.6695	.6684.	.6698	.6688	.6704	.6694	.6698	.6688	.6692	.6681	.6695	.6684	.6692	.6681
18	2.5	In.	.6422	.6407	.6431	.6416	.6435	.6420	.6440	.6425	.6449	.6434	.6440	.6425	.6431	.6416	.6435	.6420	.6431	.6416
20	1.5	In.	.7474	.7463	.7480	.7469	.7483	.7472	.7486	.7476	.7492	.7482,	.7486	1.7476	.7480	.7469	.7483	.7472	.7480	.7469
20	2.5	In.	.7210	.7195	.7219	.7204	.7223	.7208.	.7228	.7213	.7237	.7222	.7228	.7213	.7219	.7204	.7223	.7208.	.7219	.7204
22	1.5	In.	.8261	.8250	.8267	.8256	.8270	.8259	.8273	.8263	.8279	.8269	.8273	.8263	.8267	.8256	.8270	.8259	.8267	.8256
22	2.5	In.	.7997	.7982	.8006	.7991	.8010	.7995	.8015	.8000	.8024	.8009	.8015	.8000	.8006	.7991	.8010	.7995	.8006	.7991
24	2	In.	.8916	.8903	.8923	.8910	.8927	.8927	.8914	.8918	.8939	.8926	.8931	.8918	.8923	.8910	.8927	.8914	.8923	.8910
24	3	In.	.8653	.8634	.8663	.8645	.8668	.8650	.8673	.8655	.8683	.8664	.8673	.8655	.8663	.8645	.8668	.8650	.8663	.8645
27	2	In.	1.0097	1.0084	1.0104	1.0091	1.0108	1.0095	1.0112	1.0099	1.012	1.0107	1.0112	1.0099	1.0104	1.0091	1.0208	1.0095	1.0104	1.0091
27	3	In.	.9835	.9816	.9845	.9827	.9850	.9832	.9855	.9837	.9866	.9847	.9855	.9837	.9845	.9827	.9850	.9832	.9845	.9827

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AXIAL Rolling Speeds

Blank Diameter Inches		Rolling Speed - FPM											Blank Diameter mm
		66	82	98	115	131	164	197	230	262	295	328	
		Rolling Speed - Meters/Minute											
		20	25	30	35	40	50	60	70	80	90	100	
		Component Rotating at ... RPM											
1/32	0.031	8000	10000	12000	14000	16000	20000	24000	28000	32000	36000	40000	1
5/64	0.078	3200	4000	4800	5600	6400	8000	9600	11200	12800	14400	16000	2
1/8	0.125	2000	2500	3000	3500	4000	5000	6000	7000	8000	9000	10000	3
5/32	0.156	1600	2000	2400	2800	3200	4000	4800	5600	6400	7200	8000	4
3/16	0.188	1300	1700	2000	2300	2700	3300	4000	4700	5300	6000	6700	5
1/4	0.250	1000	1300	1500	1800	2000	2500	3000	3500	4000	4500	5000	6
9/32	0.281	890	1100	1300	1600	1800	2200	2700	3100	3600	4000	4400	7
5/16	0.313	800	1000	1200	1400	1600	2000	2400	2800	3200	3600	4000	8
3/8	0.375	670	830	1000	1200	1300	1700	2000	2300	2700	3000	3300	9 - 10
7/16	0.438	570	710	860	1000	1100	1400	1700	2000	2300	2600	2900	11
1/2	0.500	500	630	750	880	1000	1300	1500	1800	2000	2300	2500	12 - 13
9/16	0.563	440	560	670	780	890	1100	1300	1600	1800	2000	2200	14
19/32	0.594	420	530	630	740	840	1100	1300	1500	1700	1900	2100	15
5/8	0.625	400	500	600	700	800	1000	1200	1400	1600	1800	2000	16 - 17
3/4	0.750	330	420	500	580	670	830	1000	1200	1300	1500	1700	18 - 19
13/16	0.813	310	380	460	540	620	770	920	1100	1200	1400	1500	20 - 21
7/8	0.875	290	360	430	500	570	710	860	1000	1100	1300	1400	22 - 23
15/16	0.938	270	330	400	470	530	670	800	930	1100	1200	1300	24
1	1.000	250	310	380	440	500	630	750	880	1000	1100	1300	25 - 27
1.1/8	1.125	220	280	330	390	440	560	670	780	890	1000	1100	28 - 29
1.3/16	1.188	210	260	320	370	420	530	630	740	840	950	1100	30 - 31
1.1/4	1.250	200	250	300	350	400	500	600	700	800	900	1000	32
1.5/16	1.313	190	240	290	330	380	480	570	670	760	860	1000	33
1.3/8	1.375	180	230	270	320	360	450	550	640	730	820	910	34 - 35
1.7/16	1.438	170	220	260	300	350	430	520	610	700	780	870	36 - 37
1.1/2	1.500	170	210	250	290	330	420	500	580	670	750	830	38 - 39
1.9/16	1.563	160	200	240	280	320	400	480	560	640	720	800	40 - 41
1.3/4	1.750	140	180	210	250	290	360	430	500	570	640	710	42 - 44
2	2.000	130	160	190	220	250	310	380	440	500	560	630	45 - 50

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