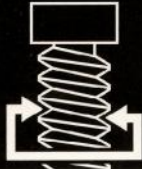


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Starrett Indicating Thread Gage Systems

Threaded fasteners are common for millions of different uses and vary in precision, depending on the application. All fasteners, such as screws, bolts, threaded components, etc., need to be measured. The Starrett Thread Gaging Systems listed in this section offer a *fast and accurate* way to control thread quality in a way that other methods cannot.

Starrett Thread Gaging Systems – Our systems are not simple, go/no-go gages. They will show the *variations* in dimensions to indicate exactly where the thread is within the allowable tolerance.

Bench and Portable Frames – Gages are available for bench use such as an inspection station where work is brought to the station, and also portable gages where the gage is brought to the work – whichever is most convenient.

Terminologies and Standards

Thread dimensions – Our standard listed gages measure functional size and pitch diameter, which involve angles, diameters, pitches, roundness, lead and taper. Our systems can also easily handle these and other special gaging applications.

Functional size is the size that includes the cumulative effect of variations in all dimensions. Functional size is the maximum material size that the thread can be in order to properly assemble it to its mating part.

Multi-rib rolls and full-form segments measure functional size. This set-up is the practical one to use when measuring for assembly.

Pitch diameter is defined as the diameter of a cylinder that passes through the thread profile to make the widths of the thread ridge and thread groove equal on both sides of the thread. Pitch diameter is the primary control and reference datum for measuring and manufacturing screw threads.

Single-element rolls (cone and vee) measure pitch diameter as well as out-of-roundness and taper.

An ideal thread is present when the multi-rib roll or full-form segment and the single-element roll provide identical indicator readings.

Thread gaging standards – There are many gaging standards, but the primary ones are:

Unified Inch Screw Threads are denoted by diameter and number of threads per inch. *Example:* .250-20 UNC (normally referred to as 1/4-20)

ISO Metric Screw Threads are denoted by the letter "M" for metric, then the diameter and then the pitch in millimeters. Pitch is the distance from a point on a thread to the corresponding point on the adjacent thread. *Example:* M6 x 1 has a 6 mm diameter and threads which are 1 mm from point to corresponding point. Common practice for quick determination is to measure from crest to adjoining crest.

Compliance – All Starrett Thread Gages adhere to United States military specifications and industrial ANSI and ASME standards. Gaging provides compliance with System, 21, 22 and 23 per U.S. Federal Standard H28/20.

Compatibility – Starrett Thread Gage rolls and segments are compatible with other major suppliers.

Optional Equipment

The following equipment are non-standard accessories that will enhance the use of our gaging systems.

Calibration Accessories

- ◆ **Roll Inspection Arbor** – For inspection of Starrett Nos. 1130, 1131, 1137, 1138 and 1140A Multi-Rib, and Cone and Vee Rolls for wear. Designed to be used in a Starrett optical comparator or equivalent in conjunction with comparator charts
- ◆ **Optical Comparator Charts** – For inspection of multi-rib and cone and vee rolls for wear
- ◆ **Stud Inspection Disk Kit** – For inspection of Nos. 1130, 1131, 1137 and 1138 frame assemblies. Kit aids in the inspection of the roll studs for squareness and diameter wear
- ◆ **Inspection Rings** – For inspection of Nos. 1140, 1141 and 1140A Body Assembly. Rings aid in the inspection of the reference mounting surface for Nos. 1140 and 1141 Segments and No. 1140A Adapter Plate

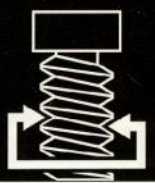
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Optional Accessories

- ◆ **Squareness Aligner** – This attachment is useful in aligning the threads to be checked to the thread gage for accurate engagement. Some aligners lock in position so the length of the thread requirements can be maintained
- ◆ **Mechanical Driven Gage Unit** – This attachment has belt-driven rolls to smoothly turn the product part and eliminate operator influence of size, squareness or concentricity readings that are taken of related surfaces
- ◆ **Ball Slide Units** – These gaging units are specifically designed to inspect various elements that are directly related to the thread, such as squareness and concentricity
- ◆ **2-Piece Indicator Holding Arm No. PT24882** – For use with No. 1141 Thread Gage. Unit attaches to the concentricity ring for checking concentricity or squareness of surfaces related to the thread
- ◆ **Body Extension** – For use with Nos. 1140, 1141 and 1140A Thread Gages. This attachment allows for the use of non-Starrett and non-AGD type indicators in these body assemblies



How to Select a Starrett Thread Gage System

Before following the seven steps below you first need to determine what diameter and TPI (or pitch) that you need to gage. "Step number" notations are also included on specification tables on the following pages.

1. Select the frame or body size for that diameter.
2. Decide on whether you require a single or double base, or a portable gage.
3. Decide on the indicator and the graduation you need. Also consider if you require SPC when gaging. If so, select an electronic indicator with output capability.
4. Select the rolls or segments for your thread pitch – cone and vee, multi-rib, or segment. Specify if left-hand thread.
5. Select the roll stud set necessary for your required pitch.
6. Select the template for the diameter of the thread to be checked.
7. Choose the thread master for each thread diameter and pitch (TPI).

Let's assume the use of the No. 1130 Gaging System, but the steps are identical for all systems.

Example: You need a single base functional gaging system for a 1/4 x 20 (.2500-20 UNC) thread. Follow the starred (★) items on the No. 1130 and 1131 specifications table on the next pages as follows:

Step 1 – Choose the .164"–1" **range**

Step 2 – Choose a **single base** PT24312 and thread gage **bench frame**,
Catalog No. 1130-1

Step 3 – You want a .0001" **graduation**, you need Catalog No. 25-111RTG

Step 4 – You want a **multi-rib roll set** for 20 TPI, No. PT24344

Step 5 – You need a **roll stud set** for 20 TPI, No. PT24370

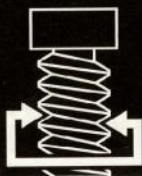
Step 6 – You need a **template** No. PT24381 for 1/4" (.2500) diameter

Step 7 – You need a thread master No. PT23231 for 1/4 x 20 (.2500-20 UNC) threaded plug gage. (See last page of this section.)

You are now in business!

Service and Expertise

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THREAD GAGING



Indicating-Type External Thread Gage Systems with three rolls

No. 1130 Series Bench

No. 1131 Series Portable

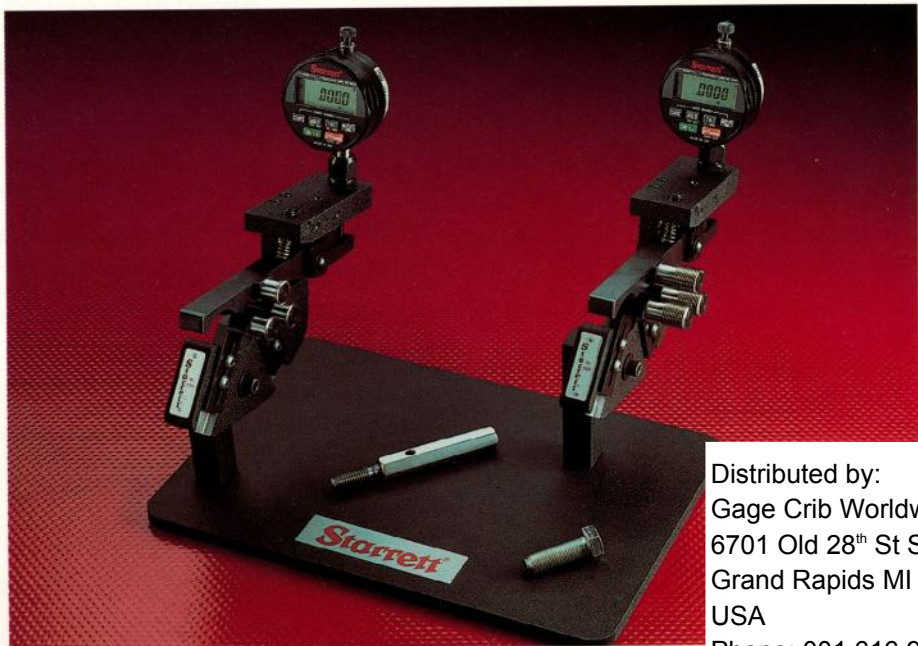
Two gaging series are available as follows:

The **No. 1130-0** has one frame with a capacity from #2 (.086" or 2.2 mm) up to 3/8" (9.5 mm).

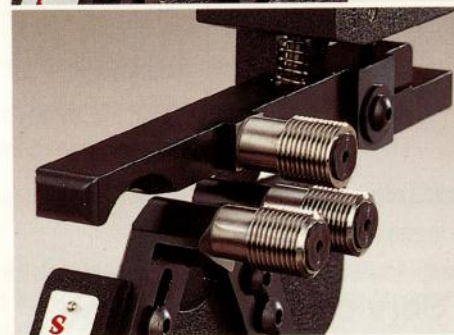
Nos. 1130-1, -2, -3 have three frames, ranging in capacity from #8 (.164" or 4.2 mm) up to 3" (76 mm). They are mounted on a baseplate for bench use, ideal for use at an inspection station. For ease of use, they are activated by lifting the front pivot arm.

No. 1131 Series are fundamentally the same gages, but they are available in three portable frames – ideal for bringing the gage to the work. For ease of use, these gages can be activated by depressing the lever.

- ◆ Gages provide actual measurements – not just go/no-go
- ◆ Gages have three rolls set 120° apart
- ◆ Each roll set can inspect **any screw diameter** with the same pitch
- ◆ Left-hand threads can be inspected using the same rolls by switching roll two with roll three
- ◆ Multi-rib rolls measure functional diameter
- ◆ Spacers and studs are included with the purchase of your thread gage frames when they are used with multi-rib rolls. When ordering replacement rolls, review the spacer and stud chart in the specifications for spacer length requirements
- ◆ Single-element rolls (cone and vee) measure pitch diameter
- ◆ Speedy setting templates allow for quick changeover to another diameter
- ◆ Each thread size requires a thread setting plug gage to set the gage comparator
- ◆ **Readouts** – three mechanical dial indicators with .0001", .00025" and 0.002 mm readouts and one Electronic Indicator with .0001"/0.002 mm resolution are offered as standard. Other indicators may also be specified. See Indicator Section



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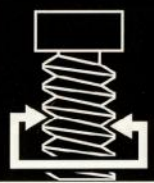


Top: No. 1130 Bench Style (roll gaging with electronic indicators); Left, center: Cone and Vee Rolls for pitch diameter measurement; Left, bottom: Multi-Rib Rolls for functional diameter measurement; Right: No. 1131 Portable Style (roll gaging with analog indicators).

- ◆ SPC capability – Storage of gage readout for analysis and documentation is possible when using electronic indicators such as our No. 2600 and No. 2700 Wisdom® Series with data collection devices such as the Starrett No. 772 Advanced Data Collection System

Right: On-site threading operation convenience is made possible with the three portable No. 1131 models and large "C" frame gages.





External Thread Gage Systems Nos. 1130 and 1131 Series Specifications

Step #1 Frame Assemblies

Model	Range		Catalog No.
	Inch	mm	
Bench	#2 (.086")-3/8"	2-10 mm	1130-0
	#8 (.164")-1"★	4-25 mm	1130-1
	1"-2"	25-50 mm	1130-2
	2"-3"	50-75 mm	1130-3
Portable	#8 (.164")-1"	4-25 mm	1131-1
	1"-2"	25-50 mm	1131-2
	2"-3"	50-75 mm	1131-3

Step #2 Base & Hangers

Description	Part No.
Single Base★	PT24312
Double Base	PT24315
Hanger Stand	PT24305

Step #3 Indicators

For Nos. 1130-0, 1, 2, 3 Frames

Graduation	Catalog No.	Contact No.
.0001"	25-111RTG★	PT06677-C (for No. 1130-0 Only)
.00025"	25-128RTG	
0.002 mm	25-161RTG	PT06677-D (for Nos. 1130-1, 2, 3)
.0001"/0.002 mm	F2710-1 Electronic Digital with Output	

For Nos. 1131-1, 2, 3 Frames

Graduation	Catalog No.	Contact No.
.0001"	25-111RTGP	PT06677-B
.00025"	25-128RTGP	
0.002 mm	25-161RTGP	
.0001"/0.002 mm	F2710-1 Electronic Digital with Output	

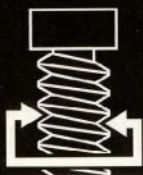
Step #4 Rolls

Inch Rolls

TPI	Cone and Vee Part No.		Multi-Rib Part Nos.	
	Fits Frame 1130-0*	Fits Frames 1130-1,2,3 / 1131-1,2,3	Fits Frame 1130-0*	Fits Frames 1130-1,2,3 / 1131-1,2,3
8		PT24338		PT24352
9		PT80431		PT80432
10		PT24337		PT24351
11		PT24336		PT24350
12		PT24335		PT24349
13		PT24334		PT24348
14		PT24333		PT24347
16	PT80773	PT24332	PT80786	PT24346
18	PT80774	PT24331	PT80787	PT24345
20	PT80775	PT24330	PT80788	PT24344★
24	PT80776	PT24329	PT80789	PT24343
28	PT80778	PT24328	PT80791	PT24342
32	PT80779	PT24327	PT80792	PT24341
36	PT80780		PT80793	
40	PT80781	PT24326	PT80794	PT24340
44	PT80782		PT80795	
48	PT80783	PT24325	PT80796	PT24339
56	PT80784		PT80797	
64	PT80785		PT80798	

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Step #4 continued on next page.



THREAD GAGING



External Thread Gage Systems Nos. 1130 and 1131 Series Specifications (continued)

Step #4 (continued) Metric Rolls Nos. 1130-1, 2, 3 / 1131-1, 2, 3 Frames

Pitch mm	Cone and Vee Part No.	Multi-Rib Part No.
3.00 mm	PT80800	PT80810
2.50 mm	PT80801	PT80811
2.00 mm	PT80802	PT80812
1.75 mm	PT80803	PT80813
1.50 mm	PT80804	PT80814
1.25 mm	PT80805	PT80815
1.00 mm	PT80806	PT80816
0.80 mm	PT80807	PT80817
0.75 mm	PT80808	PT80818
0.70 mm	PT80809	PT80819

Step #5 Roll Stud Kits

Fits Catalog No.	TPI/Pitch Range	Approx. Length		(3 required) Part No.
	Inch (mm)	Inch	mm	
1130-1/1131-1 1130-2/1131-2 1130-3/1131-3	All Cone & Vee Rolls and Multi-Rib Rolls 24-80 (1.1-0.2)	7/16"	11 mm	PT24369

Multi-Rib Rolls Only

1130-1/1131-1	16-20 (1.6-1.25 mm) ★	9/16"	14 mm	PT24370
1130-2/1131-2	14-15 (1.8-1.7 mm)	11/16"	18 mm	PT24371
1130-3/1131-3	8-13 (3-2.0 mm)	15/16"	24 mm	PT24372

Step #6 Setting Templates For No. 1130-0 Frame

Thread Size Inch*	Part No.
#2	PT80311
#3	PT80312
#4	PT80313
#5	PT80314
#6	PT80315
#8	PT80316
3/16"	PT80317
#10	PT80318
#12	PT80319
#14	PT80320
1/4"	PT80321
5/16"	PT80322
3/8"	PT80323

*Metric templates quoted on application.

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For Nos. 1130-1 / 1131-1 Frames

Inch		Metric	
Thread Size	Part No.	Thread Size	Part No.
#8	PT24378	4 mm	PT80330
#10	PT24379	5 mm	PT80331
#12	PT24380	6 mm	PT80332
#14	PT80237	7 mm	PT80333
3/16"	PT80238	8 mm	PT80334
1/4" ★	PT24381	9 mm	PT80335
5/16"	PT24382	10 mm	PT80336
3/8"	PT24383	11 mm	PT80337
7/16"	PT24384	12 mm	PT80338
1/2"	PT24385	14 mm	PT80339
9/16"	PT24386	15 mm	PT80340
5/8"	PT24387	16 mm	PT80341
11/16"	PT80239	17 mm	PT80342
3/4"	PT24388	18 mm	PT80343
13/16"	PT24404	20 mm	PT80344
7/8"	PT24389	22 mm	PT80345
15/16"	PT24398	24 mm	PT80346
1"	PT24390	25 mm	PT80347

Step #6 continued on next page.