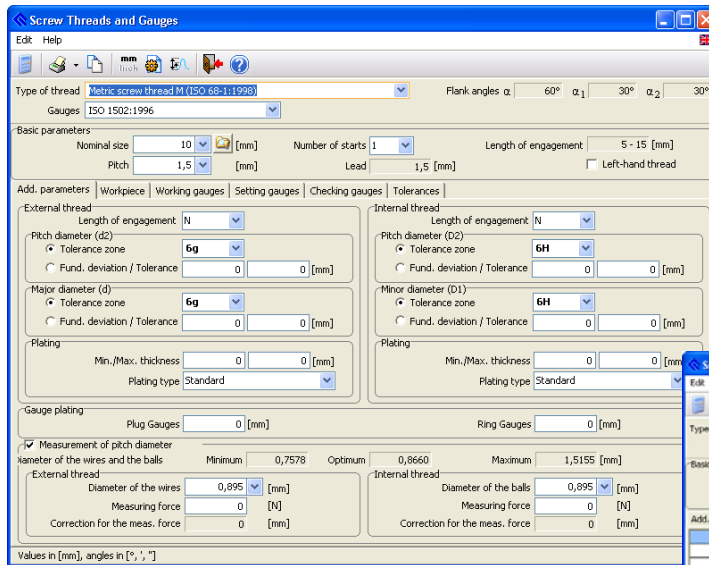
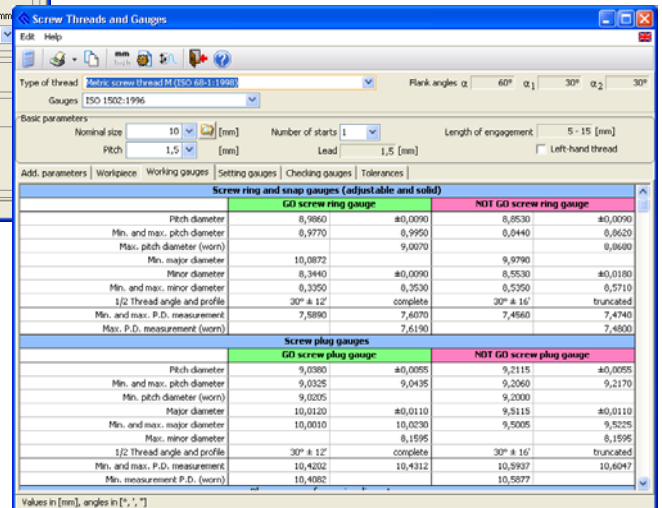


QMSys Threads and Gauges

QMSys Threads

Software for Determining the Parameters
Of Threaded Products and Gauges

Screw ring and snap gauges (adjustable and solid)			
	GO screw ring gauge	NOT GO screw ring gauge	
Pitch diameter	8,980	8,950	#0,0790
Min. and max. pitch diameter	8,9770	8,9530	8,9620
Max. pitch diameter (worn)	9,0070	8,9860	9,0070
Min. major diameter	10,0872	9,9790	10,0872
Minor diameter	8,3440	#0,0090	8,5530
Min. and max. minor diameter	8,3350	8,3530	8,5710
1/2 Thread angle and profile	30° ± 12'	complete	30° ± 16'
Min. and max. P.D. measurement	7,5890	7,6070	7,4740
Max. P.D. measurement (worn)	7,6190	7,6190	7,4800
Screw plug gauges			
	GO screw plug gauge	NOT GO screw plug gauge	
Pitch diameter	9,0380	#0,0095	9,2115
Min. and max. pitch diameter	9,0325	9,0435	9,2060
Min. pitch diameter (worn)	9,0205	9,2000	9,2170
Major diameter	10,0120	#0,0110	9,5115
Min. and max. major diameter	10,0010	10,0230	9,5205
Max. minor diameter	8,1595	8,1595	8,1595
1/2 Thread angle and profile	30° ± 12'	complete	30° ± 16'
Min. and max. P.D. measurement	10,4202	10,4312	10,5937
Min. measurement P.D. (worn)	10,4082	10,5877	10,6047



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Introduction

The software product QMSys **Threads and Gauges (QMSys Threads)** is designed for engineers, quality control managers, mechanics, etc., with the purpose to save time and prevent human errors during the process of determining rated and boundary thread parameters. The program is especially useful in the manufacture and control of threaded products and tools by saving time and costs for calculations and supplying standards. The calculated results are based on international standards and comprise information about values and tolerances of threaded products, working gauges, plug and ring gauges, as well as check gauges.

QMSys Threads and Gauges (QMSys Threads) software assists users in the following activities:

- Thread measurement and control – determining the rated and limiting values of parameters of external and internal threads
- Inspection of working and check gauges – determining the rated and limiting values of parameters of thread check gauges
- Product design – selection of threaded joints

The software comprises data base and methods for calculating the rated and limiting values of the following types of threads:

- Metric screw thread M, MJ
- Unified inch screw thread UN, UNR, UNJ
- Whitworth screw thread
- Metric miniature screw thread, unified miniature screw thread
- ISO, ANSI and API straight and taper pipe threads
- Metric and ACME trapezoidal threads
- Metric and ACME buttress screw threads
- Knuckle threads
- Steel conduit thread
- Gauges for non-standard and special threads
- Thread sizes which are not listed in the standards
- Automatic corrections for coatings, statistic and arithmetic tolerance computation

For determining the pitch diameter during measurement by the 3 wire/ball method, the rated and limiting values of the outcome from measuring by the method described in the publication **EA – 10/10** are additionally calculated.

Calculated results can be saved in a file or copied in another program.

Note: All numerical values of tolerances and deviations relate to parts with dimensions specified at 20°C.

Software Licensing

We deliver the QMSys Software installed and licensed on USB Memory stick. The advantages of this method are:

- The software can be used on any computer, which the USB Memory stick is connected to.
- Nothing will be installed on the computer. Therefore considerations for possible computer damages are not relevant.
- You don't need to unlock the software for any computer.
- In case you replace your computer, you don't need to reinstall the software.

You can receive further information on our web site: www.qsyst.com.

Free trial unlock keys

QMSYS software is available as a free trial for 14 days. Upon expiration of the trial period, the user can open the software in demonstration mode only.

You can request a trial unlock key by sending an email to sales@qsyst.com or qualisyst@qsyst.com, including your contact details (Name and Organization) and product names (or product license keys), and you will have the full version for a **14-day evaluation period**.



Software description

The list of type of thread selection and standard for the computation of the gauges are in the upper range of the program window.

The parameters for determining the thread are set in the "Basic parameters" window. Depending on the type of thread selected, different types of parameters are shown.

The following data is positioned on separate pages:

- Additional parameters of the thread
 - Basic profile and limit sizes of the workpiece
 - Thread working gauges for checking threaded products
 - Setting gauges
 - Checking gauges or Hi-Lo setting plugs
 - Tolerances, parameters for the computation of the gauges
- In the lower range of the window, the status line with the used units can be found.

Program menu and button bar

	Calculation Calculation of thread parameters.
	Print Print of computed results.
	Copy Copy of thread parameters in the clipboard.
	[mm]-[in] Unit "mm - inch" switch.
	Settings Calls a window for setting the program.
	Figure Shows drawings from the relevant standards.
	Help Calls Help in the program.
	Exit An exit from the program
	Field for selection or entry of nominal size, pitch and other parameters.
	Selection of standard thread sizes.

Software settings

	New Enters a new diameter of wires, respectively balls.
	Delete Deletes a chosen line from the table.



Plating and Coating

The following kinds of coating are considered automatically in the computation:

- Standard - change of the mass is equal to the plating thickness
- Anodize (aluminium) - change of the mass is 50% of the plating thickness
- Anodize (HAE-Magnesium) - change of the mass is 60% of the plating thickness
- Other changes of the mass in percentage of the plating thickness

Minimum and maximum plating thicknesses are entered. The computation of the corrections can take place arithmetically or statistically.

The most often method used is the arithmetic one, sometimes called the maximum - minimum calculation method. This method guarantees full assembly and working interchangeability of components. However, due to the demand of higher accuracy of the closed component, it results in too limited tolerances of partial components and therefore high manufacturing costs. The arithmetic method is therefore suitable for calculating dimensional circuits with a small number of components or in case that broader tolerance of the resulting dimension is acceptable. It is most often used in piece or small-lot production.

Statistical methods of calculation of dimensional chains are based on the calculus of probability. These methods assume that in a random selection of components during assembly, the limit values of deviations occur with more partial components simultaneously rarely, as is the case of combined probability. The probability of the occurrence of limit value of deviations in manufacturing individual dimensions on one component will be similarly small. With a certain, pre-selected risk of rejection of some components, the tolerances of partial components in the dimensional chain can be increased.

The statistical method guarantees only partial assembly interchangeability, with a low percentage of unfavourable cases (spoilage). With respect to larger tolerances of partial dimensions, however, it results in a decrease in manufacturing costs. It is mainly used in mass and large-lot production, where savings in manufacturing costs outbalance increased assembly and operating costs resulting from incomplete assembly interchangeability of components.

Example: Thread M10x1,5 6g and coating thickness 0,05-0,06mm, 0,05-0,07mm and 0,05-0,08mm.

Tolerance for:	Arithm. Method	Stat. Method	Arithm. Method	Stat. Method	Arithm. Method	Stat. Method
Pitch diameter after plating	0,132 mm					
Major diameter after plating	0,236 mm					
Plating	0,01 mm		0,02 mm		0,03 mm	
Pitch diameter before plating	0,092 mm	0,126 mm	0,052 mm	0,105 mm	0,012 mm	0,055 mm
Major diameter before plating	0,216 mm	0,235 mm	0,196 mm	0,233 mm	0,176 mm	0,228 mm

Pitch Diameter Measuring over Wires or Balls

Indicated values and pitch diameters are determined using measuring wires or balls by Berndt's iteration formula from the publication "*EA-10/10, Guidelines on the Determination of Pitch Diameter of Parallel Thread Gauges by Mechanical Probing*".

The program calculates automatically the optimum diameter of wires/balls and offers a suitable probing element from the catalogue. When the probing element catalogue is not complete, the optimum diameter of wires/balls is offered. When it is necessary, another value of the diameter of wires/balls can be selected or entered.

The measuring force is entered when it is known. When the check values of the pitch diameter are calculated, the deformation due to the measuring force is also taken into consideration.



Software Application

1. Select the standard for calculation of threaded products and gauges.
2. Enter nominal size and pitch or TPI. The software offers selection of thread sizes which are listed in the standards.
3. Select or enter the additional parameters:
 - Number of grooves for multi-start thread
 - Denotation for left-hand thread
 - Tolerance of the external thread
 - Tolerance of the internal thread
 - Length of thread engagement
 - Plating
4. With the key "Calculation", the thread workpieces and the screw gauges are computed.
5. Calculated results can be saved in a file or copied in another program.

Although the software is easy to use, we would like to emphasize on the fact that it is necessary to possess a good knowledge of the concerned standards and procedures for measuring and calculating screw threads in order to interpret the results.

Software Settings

Program settings comprise:

- Decimal places - number of right-of-comma positions
- Statistical computation of the corrections for coating
- Specification of non-standard and special threads
- Material of the ball probing elements
- Selection of method for the pitch diameter measurement – perpendicular to the thread axis (3wires/balls) or inclined towards the thread axis (2 wires/balls)
- Diameters of the set of measurement wires
- Diameters of the set of ball probing elements



Printout, Templates

Printout in the program is made by configurable templates in text format (*.RTF, *.TXT) with coded fields, e.g. \$FA01#.

Types of coded fields

- \$FA01# - individual field
- \$C0118# - field name

The user can provide or adapt the report by using the codings of the fields from the standard report. The RTF - template can contain pictures (e.g. Company Logo).

The following rules must be however fulfilled:

- The marking of a field consists of: " \$" + " Fieldname" + " #"
- Coded fields must be with the same font - e.g. \$FA01# is correct, \$FA01# is wrong.
- The sequence of the individual fields or tables can be changed.

Print options

The dialog window can be called through menu "Edit \ Print \ Templates".

Templates are adjusted separately for each thread. In the field „Name" enter the designation of the report, in the field "File" select the template file. Several templates per thread type can be selected.

	Add template	Selection of file for new template.
	Delete template	Deletes the setting for the selected template; the file will be not deleted.
	Set template as default	Marks the selected template as default.
	Open template	Opens the selected template for redaction.
	Standard template	Opens the standard template with all coded fields; field names are shown with code and text.
	Standard template	Opens the standard template with all coded fields; field names are shown with text.
	Standard template	Opens the standard template with all coded fields; field names are shown with code.



Metric Thread according to ISO 68-1, ISO 965-1, DIN 13, ASME 1.13M MJ-Profile according to ISO 5855-1:1999

Basic parameters

Input of the thread parameters

- select a standard thread according to ISO 261:1999 or ISO 5855-1:1999
- select a major diameter and pitch according to ISO 261:1998, for diameters from 300 mm to 1000 mm, DIN 13 up to 3rd row – it is necessary to take into account the recommendations of the standards how to select the pitch depending on the nominal size
- option for entering a non-standardized thread from 1 up to 1000 [mm]
- enter the number of grooves for multi-start thread
- denotation for left-hand thread

The lead of the thread and the normal length of engagement are determined automatically.

Additional parameters

Thread tolerances

- tolerance of the pitch diameter and the major diameter of the external thread
- tolerance of the pitch diameter and the minor diameter of the internal thread
- option for specifying non-standardized tolerances – select a basic deviation and enter the tolerance in [μm]

The program sets the standard tolerances by default:

M-Profile

	Major diameter up to 1,4 mm	Major diameter over 1,4 mm
External thread	6h	6g
Internal thread	5H	6H

MJ-Profile

	Pitch diameter	Major diameter	Minor diameter
External thread	4h	6h	-
Internal thread	4H	-	D ≤ 5mm - 6H D > 5mm - 5H

Length of thread engagement

Select the denotation of the length of engagement for external and internal thread

- S – small length
- N – normal length
- L – large length

The limit values for the length of engagement „N" are represented within the upper range of the window.

Gauges according to 1502:1996

Working gauges

- GO Screw ring and snap gauge
- NOT GO Screw ring and snap gauge
- GO Screw plug gauge
- NOT GO Screw plug gauge
- GO Ring and snap gauge for major diameter
- NOT GO Ring and snap gauge for major diameter
- GO Plug gauge for minor diameter
- NOT GO Plug gauge for minor diameter

Note: For adjustable ring and snap gauges the limit values are not fixed for the pitch diameter, since the screw gauge is adjusted with its setting plugs.

Setting gauges

- Setting plug for GO Screw ring gauge
- Setting plug for NOT GO Screw ring gauge
- Setting plug for GO Screw snap gauge
- Setting plug for NOT GO Screw snap gauge
- Thread setting plug for indicating gauges according to DIN 2241:2005
- Thread setting ring for indicating gauges according to DIN 2241:2005



Checking gauges

- GO Checking plug for GO Screw ring gauge
- NOT GO Checking plug for GO Screw ring gauge
- Wear Checking plug for GO Screw ring gauge
- GO Checking plug for NOT GO Screw ring gauge
- NOT GO Checking plug for NOT GO Screw ring gauge
- Wear Checking plug for NOT GO Screw ring gauge
- GO Checking plug for GO Ring gauge for minor diameter
- NOT GO Checking plug for NOT GO Ring gauge for minor diameter
- Wear Checking plug for GO Ring gauge for minor diameter

Gauges according to ANSI/ASME B1.16M:1984

Working gauges

- GO Screw ring and snap gauge - X and W gauge tolerances
- NOT GO Screw ring and snap gauge - X and W gauge tolerances
- GO Screw plug gauge - X and W gauge tolerances
- NOT GO Screw plug gauge - X and W gauge tolerances
- GO Ring gauge for major diameter - Z gauge tolerance
- NOT GO Ring gauge for major diameter - Z gauge tolerance
- GO Plug gauge for minor diameter - Z gauge tolerance
- NOT GO Plug gauge for minor diameter - Z gauge tolerance

Setting gauges

- Setting plug for GO Screw ring gauge - X and W gauge tolerances
- Setting plug for NOT GO Screw ring gauge - X and W gauge tolerances
- GO Thread setting ring for indicating gauges - W gauge tolerance
- NOT GO Thread setting ring for indicating gauges - W gauge tolerance

Hi-Lo setting plugs

- Hi-Lo setting plug for GO Screw ring gauge X tolerance
- Hi-Lo setting plug for GO Screw ring gauge W tolerance
- Hi-Lo setting plug for NOT GO Screw ring gauge X tolerance
- Hi-Lo setting plug for NOT GO Screw ring gauge W tolerance



Unified Thread according to ANSI/ASME B1.1:2003 UNJ-Profile according to ASME B1.15:1995

Basic parameters

Input of the thread parameters

- select a standard thread according to ANSI/ASME B1.1:2003, ASME B1.15:1995
- select a major diameter and TPI according to ANSI/ASME B1.1:2003
- option for entering a non-standardized thread from 0,06 up to 40 [in]
- enter the number of grooves for multi-start thread
- denotation for left-hand thread

The pitch, the lead and the normal length of engagement of the thread are determined automatically.

Additional parameters

Thread tolerances

- tolerance of the external thread
- tolerance of the internal thread

The program sets the standard tolerances by default:

	UN, UNR	UNJ
External thread	2A	3A
Internal thread	2B	3B

Length of thread engagement

The UN thread form specification uses "length of engagement" as a parameter in determining the tolerance of pitch diameters. The limit values for normal length of engagement are represented within the upper range of the window.

Gauges according to ANSI/ASME B1.2:1983

Working gauges

- GO Screw ring and snap gauge - X and W gauge tolerances
- NOT GO Screw ring and snap gauge - X and W gauge tolerances
- GO Screw plug gauge - X and W gauge tolerances
- NOT GO Screw plug gauge - X and W gauge tolerances
- GO Ring gauge for major diameter - Z gauge tolerance
- NOT GO Ring gauge for major diameter - Z gauge tolerance
- GO Plug gauge for minor diameter - Z gauge tolerance
- NOT GO Plug gauge for minor diameter - Z gauge tolerance

Setting gauges

- Setting plug for GO Screw ring gauge - X and W gauge tolerances
- Setting plug for NOT GO Screw ring gauge - X and W gauge tolerances
- GO Thread setting ring for indicating gauges - W gauge tolerance
- NOT GO Thread setting ring for indicating gauges - W gauge tolerance

Hi-Lo setting plugs

- Hi-Lo setting plug for GO Screw ring gauges X and W tolerance
- Hi-Lo setting plug for NOT GO Screw ring gauges X and W tolerance

Gauges according to ISO 1502:1996

Working gauges

- GO Screw ring and snap gauge
- NOT GO Screw ring and snap gauge
- GO Screw plug gauge
- NOT GO Screw plug gauge
- GO Ring and snap gauge for major diameter
- NOT GO Ring and snap gauge for major diameter
- GO Plug gauge for minor diameter
- NOT GO Plug gauge for minor diameter



Setting gauges

- Setting plug for GO Screw ring gauge
- Setting plug for NOT GO Screw ring gauge
- Setting plug for GO Screw snap gauge
- Setting plug for NOT GO Screw snap gauge
- Thread setting plug for indicating gauges according to DIN 2241:2005
- Thread setting ring for indicating gauges according to DIN 2241:2005

Checking gauges

- GO Checking plug for GO Screw ring gauge
- NOT GO Checking plug for GO Screw ring gauge
- Wear Checking plug for GO Screw ring gauge
- GO Checking plug for NOT GO Screw ring gauge
- NOT GO Checking plug for NOT GO Screw ring gauge
- Wear Checking plug for NOT GO Screw ring gauge
- GO Checking plug for GO Ring gauge for major diameter
- NOT GO Checking plug for NOT GO Ring gauge for major diameter
- Wear Checking plug for GO Ring gauge for major diameter

Gauges according to BS 919-1:2007

Working gauges

- Solid GO Screw ring gauge
- Solid NOT GO Screw ring gauge
- Adjustable GO Screw ring and snap gauge
- Adjustable NOT GO Screw ring and snap gauge
- GO Screw plug gauge
- NOT GO Screw plug gauge - low addendum
- NOT GO Screw plug gauge - high addendum
- GO Ring and snap gauge for major diameter
- NOT GO Ring and snap gauge for major diameter
- GO Plug gauge for minor diameter
- NOT GO Plug gauge for minor diameter

Note: For adjustable ring and snap gauges the limit values are not fixed for the pitch diameter, since the screw gauge is adjusted with its setting plugs.

Setting gauges

- Setting plug for GO Screw ring gauge
- Setting plug for NOT GO Screw ring gauge
- Setting plug for GO Screw snap gauge
- Setting plug for NOT GO Screw snap gauge

Checking gauges

- GO Checking plug for GO Screw ring gauge
- NOT GO Checking plug for GO Screw ring gauge
- Wear Checking plug for GO Screw ring gauge
- GO Checking plug for NOT GO Screw ring gauge
- NOT GO Checking plug for NOT GO Screw ring gauge
- GO Checking plug for GO Ring gauge for minor diameter
- NOT GO Checking plug for GO Ring gauge for minor diameter
- GO Checking plug for NOT GO Ring gauge for minor diameter
- NOT GO Checking plug for NOT GO Ring gauge for minor diameter



Parallel Whitworth Thread according to ANSI/ASME BS 84:2007

Basic parameters

Input of the thread parameters

- select a standard thread according to BS 84:2007
- select a TPI according to BS 84:2007
- option for entering a non-standardized thread from 0,06 up to 40 [in]
- enter the number of grooves for multi-start thread
- denotation for left-hand thread

The pitch, the lead and the normal length of engagement of the thread are determined automatically.

Additional parameters

Thread tolerances

- tolerance of the external thread - "medium" by default
- tolerance of the internal thread - "medium" by default
- option for truncated form threads with flat crests

Gauges according to BS 919-2:2007

Working gauges

- GO Screw ring gauge - General for tolerances "medium" and "free", Reference for tolerance "close"
- NOT GO Screw ring gauge
- GO Screw calliper gauge - General for tolerances "medium" and "free", Reference for tolerance "close"
- NOT GO Screw calliper gauge
- GO Screw plug gauge - General for tolerances "medium" and "normal", Reference for tolerance "close"
- NOT GO Screw plug gauge
- GO Ring gauge for major diameter
- NOT GO Ring gauge for major diameter
- GO Plug gauge for minor diameter
- NOT GO Plug gauge for minor diameter

Setting gauges

- Setting plug for GO Screw ring and calliper gauges
- Setting plug for NOT GO Screw ring and calliper gauges

Reference gauges

- Reference GO Screw plug gauge
- Reference setting plug for GO Screw ring and calliper gauges



Parallel Pipe Thread according to ISO 228-1: 2003

Basic parameters

The defining parameters of pipe thread according to ISO 228-1:2003 are:

- nominal size of the thread
- denotation for left-hand thread

The number of threads per inch and the pitch are automatically determined.

Additional parameters

Thread tolerances

- select the tolerance class of the external thread – it is "A" by default

Gauges according to ISO 228-2:1987

Working gauges

- GO Screw ring gauge
- NOT GO Screw ring gauge
- GO Screw plug gauge
- NOT GO Screw plug gauge

Checking gauges

- GO Checking plug for GO Screw ring gauge
- NOT GO Checking plug for GO Screw ring gauge
- Wear Checking plug for GO Screw ring gauge
- GO Checking plug for NOT GO Screw ring gauge
- NOT GO Checking plug for NOT GO Screw ring gauge
- Wear Checking plug for NOT GO Screw ring gauge



Taper Pipe Thread according to ISO 7-1:1994

Basic parameters

The defining parameters of pipe thread according to ISO 7-1994 are:

- nominal size of the thread
- denotation for left-hand thread

The number of threads per inch and the pitch are automatically determined.

Additional parameters

Type of internal thread

- Rp - parallel internal thread
- Rc - taper internal thread.

Gauges according to ISO 7-2:2000, EN 10266-3:2005

Working gauges

- Taper full form threaded plug gauge (Gauge No. 1)
- Taper full form threaded plug gauge with relief (Gauge No. 2)
- Parallel full form threaded ring gauge (Gauge No. 3)
- Taper plain ring gauge (Gauge No. 4)

Checking gauges

- Taper modified thread form check plug gauge (Gauge No. 5)
- Parallel modified thread form check ring gauge (Gauge No. 6)

Gauges according to DIN 2999

Working gauges

- Cylindrical GO/NOT-GO Screw ring gauge
- Tapered GO/NOT-GO Screw plug gauge

Checking gauges

- Tapered checking screw plug gauge

Gauges according to BS 21:1985

Working gauges, System A

- Tapered GO/NOT-GO Screw ring gauge
- Tapered GO/NOT-GO Screw plug gauge

Working gauges, System B

- Tapered GO/NOT-GO Screw ring gauge
- Tapered GO/NOT-GO Screw plug gauge
- Tapered GO/NOT-GO Plain ring gauge
- Tapered GO/NOT-GO Plain plug gauge



ANSI Pipe Threads according to ANSI B1.20.1, ANSI B1.20.3, ANSI B1.20.5, ANSI B1.20.7, NFPA 1963

Basic parameters

The defining parameters of pipe thread according to ANSI B1.20.1, ANSI B1.20.3, ANSI B1.20.5, ANSI B1.20.7, NFPA 1963 are:

- nominal size of the thread
- denotation for left-hand thread

The number of threads per inch and the pitch are automatically determined.

NPT, NPSC, NPTR general pipe thread. Gauges according to ANSI/ASME B1.20.1

Working gauges

- Taper threaded plug gauge
- Taper threaded ring gauge

Master gauges

- Taper threaded check plug gauge
- Taper threaded check ring gauge

NPSM, NPSL general pipe thread. Gauges according to ANSI/ASME B1.2

Working gauges

- GO Screw ring and snap gauge - X and W gauge tolerances
- NOT GO Screw ring and snap gauge - X and W gauge tolerances
- GO Screw plug gauge - X and W gauge tolerances
- NOT GO Screw plug gauge - X and W gauge tolerances
- GO Ring gauge for major diameter - Z gauge tolerance
- NOT GO Ring gauge for major diameter - Z gauge tolerance
- GO Plug gauge for minor diameter - Z gauge tolerance
- NOT GO Plug gauge for minor diameter - Z gauge tolerance

Setting gauges

- Setting plug for GO Screw ring gauge - X and W gauge tolerances
- Setting plug for NOT GO Screw ring gauge - X and W gauge tolerances
- Thread setting plug for indicating gauges - W gauge tolerance
- Thread setting ring for indicating gauges - W gauge tolerance

NPTF, F-PTF Dryseal pipe thread. Gauges according to ANSI/ASME B1.20.5

Working gauges

- L1 Taper thread plug gauge - basic step, 3 and 4 step
- L3 Taper thread plug gauge - basic step, 3 and 4 step
- Crest check plug gauge – 6 step
- Root check plug gauge – 6 step
- L1 Taper thread ring gauge - basic step, 3 and 4 step
- L2 Taper thread ring gauge - basic step, 3 and 4 step
- Crest check ring gauge – 6 step
- Root check ring gauge – 6 step

Master gauges

- Master plug gauge for L1 and L2 working ring gauges
- Master ring gauge for L1 and L3 working plug gauges
- Master plug gauge for 6-step working crest ring gauge
- Master plug gauge for 6-step working root ring gauge
- Master ring gauge for 6-step working crest plug gauge
- Master ring gauge for 6-step working root plug gauge



PTF-SAE Short Dryseal pipe thread, Gauges according to ANSI/ASME B1.20.5

Working gauges

- L1 Short Taper thread plug gauge - 3 step
- L3 Short Taper thread plug gauge - 3 step
- L1 Short Taper thread ring gauge - 3 step
- L2 Short Taper thread ring gauge - 3 step

Master gauges

- Master plug gauge for L1 and L2 working ring gauges
- Master ring gauge for L1 and L3 working plug gauges

NPSF, NPSI Dryseal pipe thread, Gauges according to ANSI/ASME B1.20.5

Working gauges

- NPSF L1 Short Taper thread plug gauge - 3 step
- NPSI L1 Taper thread plug gauge - 3 step

Master gauges

- Master plug gauge for L1 and L2 working ring gauges
- Master ring gauge for L1 and L3 working plug gauges

NPSH, NH Hose coupling thread, Gauges according to ANSI/ASME B1.20.5, ANSI/ASME B1.2

Working gauges

- GO Screw ring and snap gauge - X gauge tolerances
- NOT GO Screw ring and snap gauge - X gauge tolerances
- GO Screw plug gauge - X gauge tolerances
- NOT GO Screw plug gauge - X gauge tolerances
- GO Ring gauge for major diameter - Z gauge tolerance
- NOT GO Ring gauge for major diameter - Z gauge tolerance
- GO Plug gauge for minor diameter - Z gauge tolerance
- NOT GO Plug gauge for minor diameter - Z gauge tolerance

Setting gauges

- Setting plug for GO Screw ring gauge - X gauge tolerances
- Setting plug for NOT GO Screw ring gauge - X gauge tolerances

NFPA Fire-hose coupling thread, Gauges according to NFPA 1963, ANSI/ASME B1.2

Working gauges

- GO Screw ring and snap gauge - X gauge tolerances
- NOT GO Screw ring and snap gauge - X gauge tolerances
- GO Screw plug gauge - X gauge tolerances
- NOT GO Screw plug gauge - X gauge tolerances
- GO Ring gauge for major diameter - Z gauge tolerance
- NOT GO Ring gauge for major diameter - Z gauge tolerance
- GO Plug gauge for minor diameter - Z gauge tolerance
- NOT GO Plug gauge for minor diameter - Z gauge tolerance

Setting gauges

- Setting plug for GO Screw ring gauge - X gauge tolerances
- Setting plug for NOT GO Screw ring gauge - X gauge tolerances



ANSI Aeronautical pipe threads according to SAE AS71051:2008

Basic parameters

The defining parameters of pipe thread according to SAE AS71051, MIL-P-7105B are:

- nominal size of the thread
- denotation for left-hand thread

The number of threads per inch and the pitch are automatically determined.

Working gauges

- L1 Taper thread plug gauge - 3 step
- L3 Taper thread plug gauge - 3 step
- Crest check plug gauge – 6 step
- L1 Taper thread ring gauge - 3 step
- L2 Taper thread ring gauge - 3 step
- Crest check ring gauge – 6 step



ISO Trapezoidal Thread according to ISO 2901:1993, DIN 103-1:1993 ISO Stub Metric Trapezoidal Thread according to DIN 380:1995

Basic parameters

Input of the thread parameters

- select a standard thread according to ISO 2901:1993 or DIN 380:1995
- select a major diameter and a pitch according to ISO 2901:1993 – it is necessary to take into account the recommendations of the standards how to select the pitch depending on the nominal size
- option for entering a non-standardized thread from 1 up to 1000 [mm]
- enter the number of grooves for multi-start thread

The lead of the thread and the normal length of engagement are determined automatically.

Additional parameters

Thread tolerances

- tolerance of the pitch diameter and the minor diameter of the external thread
- tolerance of the pitch diameter of the internal thread
- option for specifying non-standardized tolerances – select a basic deviation and enter the tolerance in [μm]

The program sets the standard tolerances by default:

	Pitch diameter	Major diameter	Minor diameter
External thread	7e	4h	7h
Internal thread	7H	-	4H

Length of thread engagement

Select the denotation of the length of engagement for external and internal thread

- N – normal length
- L – large length

The limit values for length of engagement „N" are represented within the upper range of the window.

Gauges according to DIN 103:1993

Working gauges

- GO Screw ring and snap gauge
- NOT GO Screw ring and snap gauge
- GO Screw plug gauge
- NOT GO Screw plug gauge
- GO Ring and snap gauge for major diameter
- NOT GO Ring and snap gauge for major diameter
- GO Plug gauge for minor diameter
- NOT GO Plug gauge for minor diameter

Note: For adjustable ring and snap gauges the limit values are not fixed for the pitch diameter, since the screw gauge is adjusted with its setting plugs.

Setting gauges

- Setting plug for GO Screw snap gauge
- Setting plug for NOT GO Screw snap gauge

Checking gauges

- GO Checking plug for GO Screw ring gauge
- NOT GO Checking plug for GO Screw ring gauge
- Wear Checking plug for GO Screw ring gauge
- GO Checking plug for NOT GO Screw ring gauge
- NOT GO Checking plug for NOT GO Screw ring gauge
- Wear Checking plug for NOT GO Screw ring gauge



ACME Trapezoidal Thread according to ANSI/ASME B1.5:1997 ACME STUB Trapezoidal Thread according to ANSI/ASME B1.8:1988

Basic parameters

Input of the thread parameters

- select a standard thread according to ANSI/ASME B1.5:1997 or ANSI/ASME B1.8:1988
- select a major diameter and a TPI according to ANSI/ASME B1.5:1997
- option for entering a non-standardized thread from 0,06 up to 40 [in]
- enter the number of grooves for multi-start thread
- denotation for left-hand thread

The lead of the thread and the normal length of engagement are determined automatically.

Additional parameters

Thread tolerances

- application of ACME thread (General Purpose, Centralizing)
- profile of STUB ACME thread (Standard, Modified Form 1, Modified Form 2)
- tolerance of the external thread
- tolerance of the internal thread

The program sets the standard tolerances by default:

ACME - General Purpose	ACME - Centralizing	STUB ACME thread
2G	2C (5C)	2G

Length of thread engagement

The ACME thread form specification uses "length of engagement" as a parameter in determining the allowance of pitch diameters. The limit value for normal length of engagement is represented within the upper range of the window.

Gauges for ACME - General Purpose and STUB ACME threads

Working gauges

- GO Screw ring and snap gauge
- NOT GO Screw ring and snap gauge
- GO Screw plug gauge
- NOT GO Screw plug gauge
- GO Ring and snap gauge for major diameter
- NOT GO Ring and snap gauge for major diameter
- GO Plug gauge for minor diameter
- NOT GO Plug gauge for minor diameter

Setting gauges

- Setting plug for GO Screw snap gauge
- Setting plug for NOT GO Screw snap gauge

Gauges for ACME - Centralizing threads

Working gauges

- GO Screw ring and snap gauge
- NOT GO Screw ring and snap gauge
- GO Screw plug gauge for Pitch diameter
- NOT GO Screw plug gauge for Pitch diameter
- GO Screw plug gauge for Major diameter
- NOT GO Screw plug gauge for Major diameter
- GO Ring and snap gauge for major diameter
- NOT GO Ring and snap gauge for major diameter
- GO Plug gauge for minor diameter
- NOT GO Plug gauge for minor diameter

Setting gauges

- Setting plug for GO Screw snap gauge
- Setting plug for NOT GO Screw snap gauge



Metric Miniature Thread according to ISO/R 1501, DIN 14

Basic parameters

Input of the thread parameters

- select the major diameter and pitch according to ISO/R 1501, DIN 14

Additional parameters

Thread tolerances

- tolerance of the pitch diameter and the minor diameter of the internal thread
- The program sets the standard tolerances 4H 5H by default.

Length of thread engagement

Select the denotation of the length of engagement for external and internal thread

- S – small length
- N – normal length
- L – large length

The limit values for the length of engagement „N" are represented within the upper range of the window.

Gauges according to 1502:1996

Working gauges

- GO Screw plug gauge
- NOT GO Screw plug gauge
- GO Plug gauge for minor diameter
- NOT GO Plug gauge for minor diameter

Gauges according to ANSI/ASME B1.16M:1984

Working gauges

- GO Screw plug gauge - X and W gauge tolerances
- NOT GO Screw plug gauge - X and W gauge tolerances
- GO Plug gauge for minor diameter - Z gauge tolerance
- NOT GO Plug gauge for minor diameter - Z gauge tolerance



Unified Miniature Thread UNM according to ANSI/ASME B1.10:2004

Basic parameters

Input of the thread parameters

- select a major diameter and pitch according to ANSI/ASME B1.10:2004

The number of threads per inch and the normal length of engagement of the thread are determined automatically.

Additional parameters

Length of thread engagement

The limit values for the normal length of engagement are represented within the upper range of the window.

Gauges according to ANSI/ASME B1.16M:1984

Working gauges

- GO Screw plug gauge - X and W gauge tolerances
- NOT GO Screw plug gauge - X and W gauge tolerances
- GO Plug gauge for minor diameter - Z gauge tolerance
- NOT GO Plug gauge for minor diameter - Z gauge tolerance

Gauges according to 1502:1996

Working gauges

- GO Screw plug gauge
- NOT GO Screw plug gauge
- GO Plug gauge for minor diameter
- NOT GO Plug gauge for minor diameter



Metric Buttress Thread 33° according to DIN 513:1985 Metric Buttress Thread 45° according to DIN 2781:1990

Basic parameters

Input of the thread parameters

- select a standard thread according to DIN 513-2:1985 or DIN 2781:1990
- select a major diameter and a pitch according to DIN 513-2:1985 or DIN 2781:1990– it is necessary to take into account the recommendations of the standards how to select the pitch depending on the nominal size
- option for entering a non-standardized thread from 1 up to 1250 [mm]
- enter the number of grooves for multi-start thread

The lead of the thread and the normal length of engagement are determined automatically.

Additional parameters

Thread tolerances

- tolerance of the pitch diameter and the minor diameter of the external thread
- tolerance of the pitch diameter of the internal thread

The program sets the standard tolerances by default:

Metric Buttress thread according to DIN 513:1985

	Pitch diameter	Major diameter	Minor diameter
External thread	7e	h9 (ISO 286-2)	7h
Internal thread	7H	H10 (ISO 286-2)	4H

Metric Buttress thread according to DIN 513:1985

	Pitch diameter	Major diameter	Minor diameter
External thread	7e	e8 (ISO 286-2)	7h
Internal thread	7H	H8 (ISO 286-2)	4H

Length of thread engagement

Select the denotation of the length of engagement for external and internal thread

- N – normal length
- L – large length

The limit values for length of engagement „N" are represented within the upper range of the window.

Gauges according to ISO 1502:1996 or DIN 103:1993

Working gauges

- GO Screw ring and snap gauge
- NOT GO Screw ring and snap gauge
- GO Screw plug gauge
- NOT GO Screw plug gauge
- GO Ring and snap gauge for major diameter
- NOT GO Ring and snap gauge for major diameter
- GO Plug gauge for minor diameter
- NOT GO Plug gauge for minor diameter

Note: For adjustable ring and snap gauges the limit values are not fixed for the pitch diameter, since the screw gauge is adjusted with its setting plugs.

Setting gauges

- Setting plug for GO Screw snap gauge
- Setting plug for NOT GO Screw snap gauge

Checking gauges

- GO Checking plug for GO Screw ring gauge
- NOT GO Checking plug for GO Screw ring gauge
- Wear Checking plug for GO Screw ring gauge
- GO Checking plug for NOT GO Screw ring gauge
- NOT GO Checking plug for NOT GO Screw ring gauge
- Wear Checking plug for NOT GO Screw ring gauge



Knuckle Thread according to DIN 405:1997

Knuckle Thread with large depth according to DIN 20400:1990

Knuckle thread for lifting hooks according to DIN 15403:1969

Basic parameters

Input of the thread parameters

- select standard thread according to DIN 405-1, DIN 20400 or DIN 15403
- select major diameter and TPI (pitch) according to DIN 405-1, DIN 20400 or DIN 15403
- option for entering of a non-standardized thread from 1 up to 1000 [mm]
- enter number of grooves for multi-start thread
- denotation for left-hand thread

The lead of the thread and the normal length of engagement are determined automatically.

Additional parameters

Thread tolerances according to DIN 405-1:1997

- tolerance of the pitch and major diameter of external thread
- tolerance of the pitch and minor diameter of internal thread

The program sets the standard tolerances by default:

	Pitch diameter	Major diameter	Minor diameter
External thread	7h	6h	7h
Internal thread	7H	-	6H

Knuckle thread according to DIN 15403

Enter the maximum axial clearance; the diameter tolerance can be calculated arithmetically or statistically.

Length of thread engagement

Enter the length of engagement for external and internal thread. The limit values of the length of engagement „N“ are represented within the upper range of the window.

Gauges according to DIN 405-3:1997

Working gauges

- GO Screw ring gauge
- NOT GO Screw ring gauge
- GO Screw plug gauge
- NOT GO Screw plug gauge
- GO Screw snap gauge for minor diameter of external thread
- NOT GO Screw snap gauge for minor diameter of external thread
- GO Screw plug gauge for major diameter of internal thread
- GO Ring and snap gauge for major diameter
- NOT GO Ring and snap gauge for major diameter
- GO Plug gauge for minor diameter
- NOT GO Plug gauge for minor diameter

Setting gauges for screw snap gauge for minor diameter of external thread

- Setting plug for GO Screw snap gauge
- Setting plug for NOT GO Screw snap gauge

Checking gauges

- GO Checking plug for GO Screw ring gauge
- NOT GO Checking plug for GO Screw ring gauge
- Wear Checking plug for GO Screw ring gauge
- GO Checking plug for NOT GO Screw ring gauge
- NOT GO Checking plug for NOT GO Screw ring gauge
- Wear Checking plug for NOT GO Screw ring gauge
- GO Checking plug for GO Ring gauge for major diameter
- NOT GO Checking plug for NOT GO Ring gauge for major diameter
- Wear Checking plug for GO Ring gauge for major diameter



Steel Conduit Thread (DIN 40430:1971)

Basic parameters

Input of the thread parameters

- select a standard thread according to DIN 40430:1971

The lead of the thread and the normal length of engagement are determined automatically.

Gauges according to DIN 40431:1970

Working gauges

- GO Screw ring gauge
- GO Screw plug gauge
- NOT GO Ring and snap gauge for major diameter
- NOT GO Plug gauge for minor diameter

API Pipe Threads according to API Spec. 5B:2008

Basic parameters

The defining parameters of pipe thread according to API Spec. 5B:2008 are:

- select the thread type
- select the nominal size of the thread

Thread types according to API Spec. 5B:2008:

- LP - Line Pipe Thread
- CSG - Casing Short Round Thread
- LCSG - Casing Long Round Thread
- TBG - Non-upset Tubing Round Thread
- UP TBG - External-upset Tubing Round Thread
- UP LTBG - External-upset Long Tubing Round Thread
- IJ TBG - Integral Joint Tubing Round Thread
- BCSG - Casing Buttress Thread
- XCSG - Extreme-Line Casing Thread
- LTC - Enhanced Leak Resistance Thread

The number of threads per inch and the pitch are automatically determined.

Gauge parameter calculation

Thread workpiece and the following screw gauge are automatically computed:

Working gauges

- Taper threaded plug gauge
- Taper threaded ring gauge

Master gauges

- Reference master plug gauge
- Reference master ring gauge



STI Metric Thread according to DIN 8140, BS 4377, SAE MA1567

Basic parameters

Input of the thread parameters

- select a standard thread according to DIN 8140, BS 4377, SAE MA1567
- enter a major diameter and a pitch of a non-standardized thread
- denotation for MJ-profile
- denotation for left-hand thread

Additional parameters

- Length of thread engagement from 0.5d up to 3.0d
- Tolerance class 5H (4H5H), 6H (5H) or 6G (5G)

Gauges according to 1502:1996

Working gauges

- GO Screw plug gauge
- NOT GO Screw plug gauge
- GO Plug gauge for minor diameter
- NOT GO Plug gauge for minor diameter

Setting gauges

- Thread setting ring for indicating gauges according to DIN 2241:2005

Gauges according to ANSI/ASME B1.16M:1984

Working gauges

- GO Screw plug gauge - X and W gauge tolerances
- NOT GO Screw plug gauge - X and W gauge tolerances
- GO Plug gauge for minor diameter - Z gauge tolerance
- NOT GO Plug gauge for minor diameter - Z gauge tolerance

Setting gauges

- GO Thread setting ring for indicating gauges - W gauge tolerance
- NOT GO Thread setting ring for indicating gauges - W gauge tolerance



STI Inch Thread UN, UNJ according to NASM 33537, BS 3409

Basic parameters

Input of the thread parameters

- select a standard thread according to NASM 33537, BS 3409
- enter a major diameter and a pitch of a non-standardized thread
- denotation for UNJ-profile
- denotation for left-hand thread

Additional parameters

- Length of thread engagement from 0.5d up to 3.0d
- Tolerance class 2B or 3B

Gauges according to ANSI/ASME B1.2:1983

Working gauges

- GO Screw plug gauge - X and W gauge tolerances
- NOT GO Screw plug gauge - X and W gauge tolerances
- GO Plug gauge for minor diameter - Z gauge tolerance
- NOT GO Plug gauge for minor diameter - Z gauge tolerance

Setting gauges

- GO Thread setting ring for indicating gauges - W gauge tolerance
- NOT GO Thread setting ring for indicating gauges - W gauge tolerance

Gauges according to ISO 1502:1996

Working gauges

- GO Screw plug gauge
- NOT GO Screw plug gauge
- GO Plug gauge for minor diameter
- NOT GO Plug gauge for minor diameter

Setting gauges

- Thread setting ring for indicating gauges according to DIN 2241:2005

Gauges according to BS 919-1:2007

Working gauges

- GO Screw plug gauge
- NOT GO Screw plug gauge - low addendum
- NOT GO Screw plug gauge - high addendum
- GO Plug gauge for minor diameter
- NOT GO Plug gauge for minor diameter



STI Parallel Whitworth Thread according to ANSI/ASME BS 84:2007

Basic parameters

Input of the thread parameters

- select a standard thread according to BS 84:2007
- select a TPI according to BS 84:2007
- option for entering non-standardized thread from 0,06 up to 40 [in]
- denotation for left-hand thread

Pitch, lead and normal length of engagement of the thread are determined automatically.

Additional parameters

Thread tolerances

- Length of thread engagement from 0.5d up to 3.0d
- tolerance of the internal thread - "close" by default

Gauges according to BS 919-2:2007

Working gauges

- GO Screw plug gauge - General for tolerance "medium" , Reference for tolerance "close"
- NOT GO Screw plug gauge
- GO Plug gauge for minor diameter
- NOT GO Plug gauge for minor diameter

Reference gauges

- Reference GO Screw plug gauge

STI Parallel Pipe Thread according to ISO 228-1: 2003

Basic parameters

The defining parameters of pipe thread according to ISO 228-1:2003 are:

- select the nominal size of the thread
- denotation for left-hand thread

The number of threads per inch and the pitch are automatically determined.

Additional parameters

- Length of thread engagement from 0.5d up to 3.0d

Gauges according to ISO 228-2:1987

Working gauges

- GO Screw plug gauge
- NOT GO Screw plug gauge



STI Taper Pipe Thread according to ISO 7-1:1994

Basic parameters

The defining parameters of pipe thread according to ISO 7-1994 are:

- select the nominal size of the thread
- denotation for left-hand thread

The number of threads per inch and the pitch are automatically determined.

Additional parameters

- Length of thread engagement from 0.5d up to 3.0d

Type of internal thread

- Rp - parallel internal thread
- Rc - taper internal thread.

Gauges according to ISO 7-2:2000, EN 10266-3:2005

Working gauges

- Taper full form threaded plug gauge (Gauge No. 1)
- Taper full form threaded plug gauge with relief (Gauge No. 2)

Gauges according to DIN 2999

Working gauges

- Tapered GO/NOT-GO Screw plug gauge

Gauges according to BS 21:1985

Working gauges, System A

- Tapered GO/NOT-GO Screw plug gauge

Working gauges, System B

- Tapered GO/NOT-GO Screw plug gauge
- Tapered GO/NOT-GO Plain plug gauge

STI ANSI Pipe Threads according to ANSI B1.20.1, SAE AS71051:2008

Basic parameters

The defining parameters of pipe thread according to ANSI B1.20.1, SAE AS71051:2008 are:

- nominal size of the thread
- denotation for left-hand thread

The number of threads per inch and the pitch are automatically determined.

NPT, NPSC

Working gauges

- Taper threaded plug gauge

ANPT

Working gauges

- L1 Taper thread plug gauge - 3 step
- L3 Taper thread plug gauge - 3 step



Non-standard and Special threads

Basic parameters

Input of the thread parameters

- enter nominal size up to 1000 [mm]; 40 [in] , pitch or threads per inch option for entering of a non-standardized thread from 1
- enter number of grooves for multi-start thread

Additional parameters

Thread diameters and tolerances

- thread designation
- nominal and limit sizes of the major, pitch and minor diameter
- root and crest radius

Gauges according to 1502:1996

Working gauges

- GO Screw ring and snap gauge
- NOT GO Screw ring and snap gauge
- GO Screw plug gauge
- NOT GO Screw plug gauge
- GO Ring and snap gauge for major diameter
- NOT GO Ring and snap gauge for major diameter
- GO Plug gauge for minor diameter
- NOT GO Plug gauge for minor diameter

Note: For adjustable ring and snap gauges the limit values are not fixed for the pitch diameter, since the screw gauge is adjusted with its setting plugs.

Setting gauges

- Setting plug for GO Screw ring gauge
- Setting plug for NOT GO Screw ring gauge
- Setting plug for GO Screw snap gauge
- Setting plug for NOT GO Screw snap gauge
- Thread setting plug for indicating gauges according to DIN 2241:2005
- Thread setting ring for indicating gauges according to DIN 2241:2005

Checking gauges

- GO Checking plug for GO Screw ring gauge
- NOT GO Checking plug for GO Screw ring gauge
- Wear Checking plug for GO Screw ring gauge
- GO Checking plug for NOT GO Screw ring gauge
- NOT GO Checking plug for NOT GO Screw ring gauge
- Wear Checking plug for NOT GO Screw ring gauge
- GO Checking plug for GO Ring gauge for minor diameter
- NOT GO Checking plug for NOT GO Ring gauge for minor diameter
- Wear Checking plug for GO Ring gauge for minor diameter

Gauges according to ANSI/ASME B1.16M:1984

Working gauges

- GO Screw ring and snap gauge - X and W gauge tolerances
- NOT GO Screw ring and snap gauge - X and W gauge tolerances
- GO Screw plug gauge - X and W gauge tolerances
- NOT GO Screw plug gauge - X and W gauge tolerances
- GO Ring gauge for major diameter - Z gauge tolerance
- NOT GO Ring gauge for major diameter - Z gauge tolerance
- GO Plug gauge for minor diameter - Z gauge tolerance
- NOT GO Plug gauge for minor diameter - Z gauge tolerance



Setting gauges

- Setting plug for GO Screw ring gauge - X and W gauge tolerances
- Setting plug for NOT GO Screw ring gauge - X and W gauge tolerances
- GO Thread setting ring for indicating gauges - W gauge tolerance
- NOT GO Thread setting ring for indicating gauges - W gauge tolerance

Hi-Lo setting plugs

- Hi-Lo setting plug for GO Screw ring gauge X tolerance
- Hi-Lo setting plug for GO Screw ring gauge W tolerance
- Hi-Lo setting plug for NOT GO Screw ring gauge X tolerance
- Hi-Lo setting plug for NOT GO Screw ring gauge W tolerance

Gauges according to ANSI/ASME B1.2:1983

Working gauges

- GO Screw ring and snap gauge - X and W gauge tolerances
- NOT GO Screw ring and snap gauge - X and W gauge tolerances
- GO Screw plug gauge - X and W gauge tolerances
- NOT GO Screw plug gauge - X and W gauge tolerances
- GO Ring gauge for major diameter - Z gauge tolerance
- NOT GO Ring gauge for major diameter - Z gauge tolerance
- GO Plug gauge for minor diameter - Z gauge tolerance
- NOT GO Plug gauge for minor diameter - Z gauge tolerance

Setting gauges

- Setting plug for GO Screw ring gauge - X and W gauge tolerances
- Setting plug for NOT GO Screw ring gauge - X and W gauge tolerances
- GO Thread setting ring for indicating gauges - W gauge tolerance
- NOT GO Thread setting ring for indicating gauges - W gauge tolerance

Hi-Lo setting plugs

- Hi-Lo setting plug for GO Screw ring gauges X and W tolerance
- Hi-Lo setting plug for NOT GO Screw ring gauges X and W tolerance