

# Custom Steel & Chrome Ring Gages from .0600" to 12.2600"

## FOR MASTERS & GO/NOGO GAGING

Ring Gages are perfect for use as masters for bore gages and internal micrometers. Use Vermont Gage Ring Gages to efficiently inspect external dimensions of manufactured parts. With a Go and NoGo ring, an inspector can quickly pass/fail parts without taking time-consuming readings from an indicator. A Certificate of Accuracy accompanies every ring gage assuring size.

- *Class XX, X, Y, Z or ZZ*
- *See page 116 for tolerance specifications*
- *Go, NoGo or Master tolerances*
- *NIST traceable*
- *Tool Steel; 60/62 Rc (Cold Stabilized)*
- *Chrome Plated Tool Steel; 70/72 Rc*
- *Lapped to 4 microinch finish or better on Class XX or X*
- *Round within 1/2 of tolerance*
- *Marked with size and direction of tolerance*
- *Special Marking Available*
- *Certificate of Accuracy included*
- *See page 111 for Calibration Services*



### How to Order:

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#### Material

- [1] Tool Steel
- [2] Chrome Plated Tool Steel

#### Tolerance

- [1] Class XX
- [2] Class X
- [3] Class Y
- [4] Class Z
- [5] Class ZZ

#### Range

[01] .0600" to .0700"	[1.52mm to 1.78mm]
[02] .0701" to .1500"	[1.79mm to 3.81mm]
[03] .1501" to .2300"	[3.82mm to 5.84mm]
[04] .2301" to .3650"	[5.85mm to 9.27mm]
[05] .3651" to .5100"	[9.28mm to 12.95mm]
[06] .5101" to .8250"	[12.96mm to 20.95mm]
[07] .8251" to 1.1350"	[20.96mm to 28.83mm]
[08] 1.1351" to 1.5100"	[28.84mm to 38.35mm]
[09] 1.5101" to 2.0100"	[38.36mm to 51.05mm]
[10] 2.0101" to 2.5100"	[51.06mm to 63.75mm]
[11] 2.5101" to 3.0100"	[63.76mm to 76.45mm]
[12] 3.0101" to 3.5100"	[76.46mm to 89.15mm]
[13] 3.5101" to 4.0100"	[89.16mm to 101.85mm]
[14] 4.0101" to 4.7600"	[101.86mm to 120.90mm]
[15] 4.7601" to 5.5100"	[120.91mm to 139.85mm]
[16] 5.5101" to 6.2600"	[139.86mm to 159.00mm]
[17] 6.2601" to 7.0100"	[159.01mm to 178.05mm]
[18] 7.0101" to 7.7600"	[178.06mm to 197.10mm]
[19] 7.7601" to 8.5100"	[197.11mm to 216.15mm]
[20] 8.5101" to 9.2600"	[216.16mm to 235.20mm]
[21] 9.2601" to 10.0100"	[235.21mm to 254.25mm]
[22] 10.0101" to 10.7600"	[254.26mm to 273.30mm]
[23] 10.7601" to 11.5100"	[273.31mm to 292.35mm]
[24] 11.5101" to 12.2600"	[292.36mm to 311.40mm]

#### Direction of Tolerance

- [1] Go [1 member, (Minus) unilateral tolerance]
- [2] NoGo [1 member, (Plus) unilateral tolerance]
- [3] Master [1 member bilateral tolerance]

#### Package

- [1] Member only

**Size** (Specify size of gage members)

Configure part number and add size of gage member.  
Example: **231204310 - .2500"**

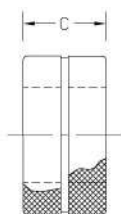
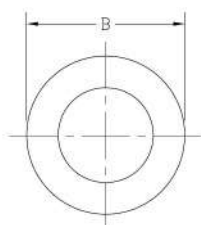
# Custom Steel & Chrome Ring Gages from .0600" to 12.2600"

PLAIN RINGS

Range	Tolerance Class	Price Member Only	Blank No	C Dim.	B Dim.
.0600" to .0700" 1.52mm to 1.78mm (Chrome not available) [01]	XX X Y Z, ZZ	\$215.00 \$185.00 \$175.00 \$155.00	00 00 00 00	3/16" 3/16" 3/16" 3/16"	15/16" 15/16" 15/16" 15/16"
.0701" to .1500" 1.79mm to 3.81mm (Chrome not available) [02]	XX X Y Z, ZZ	\$188.00 \$145.00 \$150.00 \$142.00	00 00 00 00	3/16" 3/16" 3/16" 3/16"	15/16" 15/16" 15/16" 15/16"
.1501" to .2300" 3.82mm to 5.84mm [03]	XX X Y Z, ZZ	\$144.00 \$126.00 \$118.00 \$110.00	0 0 0 0	3/8" 3/8" 3/8" 3/8"	15/16" 15/16" 15/16" 15/16"
.2301" to .3650" 5.85mm to 9.27mm [04]	XX X Y Z, ZZ	\$130.00 \$112.00 \$105.00 \$98.00	1 1 1 1	9/16" 9/16" 9/16" 9/16"	1-1/8" 1-1/8" 1-1/8" 1-1/8"
.3651" to .5100" 9.28mm to 12.95mm [05]	XX X Y Z, ZZ	\$132.00 \$112.00 \$105.00 \$99.00	2 2 2 2	3/4" 3/4" 3/4" 3/4"	1-3/8" 1-3/8" 1-3/8" 1-3/8"
.5101" to .8250" 12.96mm to 20.95mm [06]	XX X Y Z, ZZ	\$136.00 \$120.00 \$110.00 \$103.00	3 3 3 3	15/16" 15/16" 15/16" 15/16"	1-3/4" 1-3/4" 1-3/4" 1-3/4"
.8251" to 1.1350" 20.96mm to 28.83mm [07]	XX X Y Z, ZZ	\$138.00 \$122.00 \$112.00 \$105.00	4 4 4 4	1-1/8" 1-1/8" 1-1/8" 1-1/8"	2-1/8" 2-1/8" 2-1/8" 2-1/8"
1.1351" to 1.5100" 28.84mm to 38.35mm [08]	XX X Y Z, ZZ	\$160.00 \$138.00 \$128.00 \$120.00	5 5 5 5	1-5/16" 1-5/16" 1-5/16" 1-5/16"	2-1/2" 2-1/2" 2-1/2" 2-1/2"
1.5101" to 2.0100" 38.36mm to 51.05mm [09]	XX X Y Z, ZZ	\$195.00 \$172.00 \$160.00 \$152.00	6 6 6 6	1-1/2" 1-1/2" 1-1/2" 1-1/2"	4" 4" 4" 4"
2.0101" to 2.5100" 51.06mm to 63.75mm [10]	XX X Y Z, ZZ	\$250.00 \$220.00 \$192.00 \$178.00	7 7 7 7	1-1/2" 1-1/2" 1-1/2" 1-1/2"	4-1/2" 4-1/2" 4-1/2" 4-1/2"



Go



NoGo

## QTY DISCOUNTS

2 pcs. & Up... Less 10%  
Combine identical sizes  
for quantity discount  
(Excludes Class XX products)

Range	Tolerance Class	Price Member Only	Blank No	C Dim.	B Dim.
2.5101" to 3.0100" 63.76mm to 76.45mm [11]	XX X Y Z, ZZ	\$272.00 \$240.00 \$215.00 \$202.00	8 8 8 8	1-1/2" 1-1/2" 1-1/2" 1-1/2"	5" 5" 5" 5"
3.0101" to 3.5100" 76.46mm to 89.15mm [12]	XX X Y Z, ZZ	\$335.00 \$285.00 \$250.00 \$230.00	9 9 9 9	1-1/2" 1-1/2" 1-1/2" 1-1/2"	5-1/2" 5-1/2" 5-1/2" 5-1/2"
3.5101" to 4.0100" 89.16mm to 101.85mm [13]	XX X Y Z, ZZ	\$380.00 \$320.00 \$280.00 \$266.00	10 10 10 10	1-1/2" 1-1/2" 1-1/2" 1-1/2"	6-1/4" 6-1/4" 6-1/4" 6-1/4"
4.0101" to 4.7600" 101.86mm to 120.90mm [14]	XX X Y Z, ZZ	\$440.00 \$380.00 \$330.00 \$310.00	11 11 11 11	1-1/2" 1-1/2" 1-1/2" 1-1/2"	7-1/4" 7-1/4" 7-1/4" 7-1/4"
4.7601" to 5.5100" 120.91mm to 139.85mm [15]	XX X Y Z, ZZ	\$570.00 \$490.00 \$430.00 \$420.00	12 12 12 12	1-1/2" 1-1/2" 1-1/2" 1-1/2"	8-1/4" 8-1/4" 8-1/4" 8-1/4"
5.5101" to 6.2600" 139.86mm to 159.00mm [16]	XX X Y Z, ZZ	\$660.00 \$570.00 \$500.00 \$485.00	13 13 13 13	1-1/2" 1-1/2" 1-1/2" 1-1/2"	9-1/4" 9-1/4" 9-1/4" 9-1/4"
6.2601" to 7.0100" 159.01mm to 178.05mm [17]	XX X Y Z, ZZ	\$800.00 \$730.00 \$690.00 \$680.00	14 14 14 14	1-1/2" 1-1/2" 1-1/2" 1-1/2"	10-1/4" 10-1/4" 10-1/4" 10-1/4"
7.0101" to 7.7600" 178.06mm to 197.10mm [18]	XX X Y Z, ZZ	\$925.00 \$800.00 \$760.00 \$730.00	15 15 15 15	1-1/2" 1-1/2" 1-1/2" 1-1/2"	11-1/4" 11-1/4" 11-1/4" 11-1/4"
7.7601" to 8.5100" 197.11mm to 216.15mm [19]	XX X Y Z, ZZ	\$1,025.00 \$980.00 \$925.00 \$900.00	16 16 16 16	1-1/2" 1-1/2" 1-1/2" 1-1/2"	12-1/4" 12-1/4" 12-1/4" 12-1/4"
8.5101" to 9.2600" 216.16mm to 235.20mm [20]	XX X Y Z, ZZ	\$1,220.00 \$1,115.00 \$1,070.00 \$910.00	17 17 17 17	1-1/2" 1-1/2" 1-1/2" 1-1/2"	13-1/4" 13-1/4" 13-1/4" 13-1/4"
9.2601" to 10.0100" 235.21mm to 254.25mm [21]	XX X Y Z, ZZ	\$1,375.00 \$1,175.00 \$1,100.00 \$1,015.00	18 18 18 18	1-1/2" 1-1/2" 1-1/2" 1-1/2"	14-1/4" 14-1/4" 14-1/4" 14-1/4"
10.0101" to 10.7600" 254.26mm to 273.30mm [22]	XX X Y Z, ZZ	\$1,530.00 \$1,325.00 \$1,130.00 \$1,090.00	19 19 19 19	1-1/2" 1-1/2" 1-1/2" 1-1/2"	15-1/4" 15-1/4" 15-1/4" 15-1/4"
10.7601" to 11.5100" 273.31mm to 292.35mm [23]	XX X Y Z, ZZ	\$1,650.00 \$1,450.00 \$1,315.00 \$1,225.00	20 20 20 20	1-1/2" 1-1/2" 1-1/2" 1-1/2"	16-1/4" 16-1/4" 16-1/4" 16-1/4"
11.5101" to 12.2600" 292.36mm to 311.40mm [24]	XX X Y Z, ZZ	\$1,825.00 \$1,545.00 \$1,425.00 \$1,340.00	21 21 21 21	1-1/2" 1-1/2" 1-1/2" 1-1/2"	17-1/4" 17-1/4" 17-1/4" 17-1/4"

Chrome Plated Tool Steel - Add 50% to Steel price.

# Gage Fact Sheet

## What are Gages used for?

Fixed limit gages are primarily used to check dimensions and geometries; plug gages check internal and ring gages external dimensions and geometries. They effectively ensure that a part being measured is within its designed tolerance limits. Fixed limit gages are highly accurate, economical and easy to use.

## Principles of Go/NoGo Gaging

To use as a "Go/NoGo" functional check, try and fit both the "Go" and "NoGo" gages into or onto a part being measured. The measured part passes if the "Go" gage fits and the "NoGo" doesn't, otherwise the part fails. A "Go/NoGo" check is strictly a pass/fail test. The actual part size is never measured.

## Types of Fixed Limit Gages

Plug gages are available in two types, plain cylindrical and thread, and in several popular styles: reversible, taperlock and trilock. Style is usually determined by the size of the gage. Ring gages are also available as plain cylindrical and thread type gages.

## Wear Resistance and Tolerance

Gages are available in tool steel, Black Guard™, chrome plate, and carbide. Chrome plate and carbide are harder and therefore provide additional wear resistance. A choice of tolerance is also available. See chart for explanation of Gagemaker's tolerances.

## Calculate Gage Tolerance

Normal practice for determining gage tolerance is to allow 10% of product tolerance to be divided between the "Go" and "NoGo"

## GAGEMAKER'S TOLERANCE CHART (ASME B89.1.5)

Diameter Range	XXX	XX	X	Y	Z	ZZ
Inch						
<b>.010" - .825"</b>	.000010"	.000020"	.000040"	.000070"	.0001"	.0002"
<b>.825" - 1.510"</b>	.000015"	.000030"	.000060"	.000090"	.00012"	.00024"
<b>1.510" - 2.510"</b>	.000020"	.000040"	.000080"	.00012"	.00016"	.00032"
<b>2.510" - 4.510"</b>	.000025"	.000050"	.0001"	.00015"	.0002"	.0004"
<b>4.510" - 6.510"</b>	.000033"	.000065"	.00013"	.00019"	.00025"	.0005"
<b>6.510" - 9.010"</b>	.000040"	.000080"	.00016"	.00024"	.00032"	.00064"
<b>9.010" - 12.010"</b>	.000050"	.0001"	.0002"	.0003"	.0004"	.0008"
Metric						
<b>.254mm - 20.96mm</b>	.00025mm	.00051mm	.00102mm	.00178mm	.00254mm	.00508mm
<b>20.96mm - 38.35mm</b>	.00038mm	.00076mm	.00152mm	.00229mm	.00305mm	.00610mm
<b>38.35mm - 63.75mm</b>	.00051mm	.00102mm	.00203mm	.00305mm	.00406mm	.00813mm
<b>63.75mm - 114.55mm</b>	.00064mm	.00127mm	.00254mm	.00381mm	.00508mm	.01016mm
<b>114.55mm - 165.35mm</b>	.00084mm	.00165mm	.00330mm	.00483mm	.00635mm	.01270mm
<b>165.35mm - 228.85mm</b>	.00102mm	.00203mm	.00406mm	.00610mm	.00813mm	.01626mm
<b>228.85mm - 305.05mm</b>	.00127mm	.00254mm	.00508mm	.00762mm	.01016mm	.02032mm

gages. For plug gages "Go" is normally a plus tolerance and "NoGo" a minus tolerance. For ring gages the opposite is true; "Go" is normally a minus tolerance and "NoGo" a plus tolerance.

Using this practice as a guideline, gage tolerance is always included in the part tolerance and accounts for up to 10%. This means that 10% of good product could potentially fail the inspection but that no bad product would ever pass!

## Care and Use of Gages

- 1.) Dimensions to be gaged must be cleaned and free from burrs to prevent gaging interference.
- 2.) Gage should be turned slowly into or onto the part being checked. The fit should be snug but not forced. Air flats on a "Go" gage can facilitate the inspection of blind holes where air pressure is a problem.
- 3.) Temperature of the gage and the part should be the same. This is because of the effects of thermal

expansion on material. The normal temperature at which gages are calibrated is 68 degrees Fahrenheit. This is therefore the best temperature at which both part and gage should be when inspected. This effectively eliminates any error due to thermal expansion.

- 4.) Gages should be protected from exposure to excessive heat, moisture, and corrosive chemicals. After use, gages should be cleaned and then coated with a thin-film rust preventative and stored properly.
- 5.) Gages should be periodically calibrated to ensure accuracy. Gages and "Go" gages in particular, will wear with normal use and require recalibration. Frequency of calibration is dependent on such factors as frequency of use, part abrasiveness, tolerance, and applicable quality procedures. All gages should be monitored and maintained accordingly.