

Custom Long Length Reversibles up to 12" Long

UP TO 12" LONG

Reversible Plug Gages can be furnished in lengths up to 12" long. With the same specifications as our standard 2" gages (excluding straightness), these long members are perfect for gaging deep, hard-to-reach holes, slots and other dimensions.

- *Class XX, X, Y, Z or ZZ*
- *See page 116 for tolerance specifications*
- *Go, NoGo or Master tolerances*
- *NIST traceable*
- *Tool Steel; 60/65 Rc (Cold Stabilized)*
- *Chrome Plated Tool Steel; 70/72 Rc*
- *Up to 12" long (Class ZZ only)*
- *4 microinch finish or better on Class XX or X*
- *Depth Notches available – see page 115*
- *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
- [4] Black Guard™

Tolerance

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

Range

- | | |
|------------------------|------------------------|
| [02] .0151" to .0300" | [0.382mm to 0.762mm] |
| [03] .0301" to .0750" | [0.763mm to 1.905mm] |
| [04] .0751" to .1800" | [1.906mm to 4.572mm] |
| [05] .1801" to .2810" | [4.573mm to 7.137mm] |
| [06] .2811" to .4060" | [7.138mm to 10.312mm] |
| [07] .4061" to .5100" | [10.313mm to 12.954mm] |
| [08] .5101" to .6350" | [12.955mm to 16.129mm] |
| [09] .6351" to .7600" | [16.130mm to 19.304mm] |
| [10] .7601" to 1.0100" | [19.305mm to 25.654mm] |

Direction of Tolerance

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

Length

- [1] up to 3"
- [2] up to 4"
- [3] up to 5"
- [4] up to 6"
- [5] up to 9"
- [6] up to 12"

Size (Specify size of gage members)

Configure part number and add size and length of gage member.

Example: 171205140 - .2520" x 5.50"



Custom Long Length Reversibles up to 12" Long

		Steel						Black Guard™			
Range	Tolerance Class	Price up to 3"	Price up to 4"	Price up to 5"	Price up to 6"	Price up to 9"	Price up to 12"	Price up to 3"	Price up to 4"	Price up to 5"	Price up to 6"
.0151" to .0300" .382mm to .762mm (Chrome not available) [02]	XX	\$185.00	\$245.00								
	X	\$120.00	\$163.00								
	Y	\$95.00	\$125.00	\$170.00	\$300.00						
	Z	\$85.00	\$108.00	\$145.00	\$285.00			\$115.00	\$138.00	\$185.00	\$355.00
	ZZ	\$45.00	\$60.00	\$72.00	\$85.00	\$95.00	\$107.00	\$55.00	\$70.00	\$86.00	\$99.00
.0301" to .0750" .763mm to 1.905mm (Chrome not available) [03]	XX	\$98.00	\$132.00								
	X	\$68.00	\$90.00	\$165.00	\$220.00						
	Y	\$62.00	\$78.00	\$143.00	\$192.00						
	Z	\$52.00	\$66.00	\$104.00	\$120.00			\$72.00	\$90.00	\$140.00	\$160.00
	ZZ	\$40.00	\$44.00	\$56.00	\$60.00	\$70.00	\$80.00	\$50.00	\$64.00	\$78.00	\$90.00
.0751" to .1800" 1.906mm to 4.572mm (Chrome available to 6") [04]	XX	\$98.00	\$132.00								
	X	\$68.00	\$90.00	\$110.00	\$126.00						
	Y	\$62.00	\$78.00	\$95.00	\$115.00						
	Z	\$52.00	\$66.00	\$82.00	\$102.00			\$72.00	\$90.00	\$125.00	\$140.00
	ZZ	\$40.00	\$44.00	\$54.00	\$62.00	\$66.00	\$72.00	\$50.00	\$64.00	\$76.00	\$82.00
.1801" to .2810" 4.573mm to 7.137mm (Chrome available to 6") [05]	XX	\$98.00	\$132.00								
	X	\$68.00	\$90.00	\$110.00	\$126.00						
	Y	\$62.00	\$78.00	\$95.00	\$115.00						
	Z	\$52.00	\$66.00	\$82.00	\$100.00			\$72.00	\$96.00	\$125.00	\$135.00
	ZZ	\$40.00	\$44.00	\$60.00	\$66.00	\$72.00	\$78.00	\$50.00	\$70.00	\$76.00	\$78.00
.2811" to .4060" 7.138mm to 10.312mm (Chrome available to 6") [06]	XX	\$98.00	\$132.00	\$160.00	\$182.00						
	X	\$68.00	\$90.00	\$110.00	\$128.00						
	Y	\$62.00	\$78.00	\$95.00	\$115.00						
	Z	\$52.00	\$66.00	\$82.00	\$100.00			\$72.00	\$96.00	\$125.00	\$140.00
	ZZ	\$40.00	\$44.00	\$60.00	\$66.00	\$72.00	\$78.00	\$50.00	\$70.00	\$76.00	\$80.00
.4061" to .5100" 10.313mm to 12.954mm (Chrome available to 6") [07]	XX	\$98.00	\$125.00	\$165.00	\$195.00						
	X	\$68.00	\$96.00	\$116.00	\$135.00						
	Y	\$62.00	\$84.00	\$100.00	\$120.00						
	Z	\$52.00	\$66.00	\$86.00	\$106.00			\$72.00	\$96.00	\$132.00	\$147.00
	ZZ	\$46.00	\$50.00	\$60.00	\$66.00	\$72.00	\$84.00	\$55.00	\$75.00	\$85.00	\$90.00
.5101" to .6350" 12.955mm to 16.129mm (Chrome available to 6") [08]	XX	\$98.00	\$125.00	\$170.00	\$200.00						
	X	\$68.00	\$96.00	\$120.00	\$145.00						
	Y	\$62.00	\$84.00	\$105.00	\$125.00						
	Z	\$52.00	\$66.00	\$90.00	\$112.00			\$72.00	\$96.00	\$140.00	\$155.00
	ZZ	\$46.00	\$50.00	\$62.00	\$70.00	\$78.00	\$88.00	\$55.00	\$75.00	\$95.00	\$100.00
.6351" to .7600" 16.130mm to 19.304mm (Chrome available to 6") [09]	XX	\$98.00	\$130.00	\$175.00	\$205.00						
	X	\$68.00	\$100.00	\$125.00	\$150.00						
	Y	\$62.00	\$90.00	\$110.00	\$125.00						
	Z	\$52.00	\$75.00	\$100.00	\$116.00			\$75.00	\$100.00	\$140.00	\$155.00
	ZZ	\$46.00	\$60.00	\$72.00	\$80.00	\$94.00	\$105.00	\$60.00	\$80.00	\$95.00	\$100.00
.7601" to 1.0100" 19.305mm to 25.654mm (Chrome available to 6") [10]	XX	\$165.00	\$205.00	\$295.00	\$395.00						
	X	\$112.00	\$135.00	\$195.00	\$270.00						
	Y	\$105.00	\$125.00	\$180.00	\$250.00						
	Z	\$98.00	\$120.00	\$170.00	\$230.00			\$135.00	\$170.00	\$250.00	\$325.00
	ZZ	\$72.00	\$78.00	\$90.00	\$105.00	\$125.00	\$145.00	\$88.00	\$100.00	\$115.00	\$135.00

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

Carbide available upon request.

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