


ANCHOR BRONZE
& Metals, Inc.
Quality & Deliveries You Can Trust
MADE IN THE USA

Telephone: 440-549-5653

e-mail: sales@anchorbronze.com

TOLERANCES & FINISHING ALLOWANCES

Cast Copper Alloy Bar & Plate (UNS "C" 800 & 900 series of CAST copper alloy numbers) are produced to "Nominal" sizes. This means finishing allowance already remains to finish to the published size. For example, if you order a CAST C95400 aluminum bronze bar to 3" solid dia. the actual cast size will be 3.063" (+/- .010") and will finish to 3.000" diameter or less. If you need a tin-leaded bronze tube in a cast alloy, for example, 2" ID x 3" OD the AS CAST ID will be 2" (-.031") ID x 3" (.031") OD and will finish to 2.000" ID x 3.000" OD.

Cast Bronze Finishing Allowances

Hollow Tube (Round Only)

Tin Bronzes and Leaded Tin Bronzes

Size	ID	OD
Up to 4" dia, excl	-.031"	+.031"
4" dia. to 5" dia, Incl	-.063"	+.063"
Over 5" dia.	-.094"	+.094"
Over 8" dia.	-.125"	+.125"

Cast Bronze Finishing Allowances

Solid Round Bar, Rectangle, Hexagons

Tin Bronzes and Leaded Tin Bronzes

Size	BAR OD	RECTANGLES & HEXAGONS
Up to 4" dia, excl	+.031"	+.031"
Over 4" TO 5", Incl	+.063"	+.063"
Over 5"	+.094"	+.094"
Over 5"	+.125"	+.125"

Cast Bronze Diameter Tolerances

Solid Round Bar, Tube, Squares, Rectangles, Hexagons

Tin Bronzes and Leaded Tin Bronzes

Size	ROUNDS ID & OD	RECTANGLES & HEXAGONS
Up to 4", excl	+- .005"	+- .016"
4" to 5", Incl	+- .008"	+- .016"
Over 5"	+- .016"	+- .016"
Over 8"	+- .032	+- .032"

Cast Bronze Finishing Allowances

Hollow Tube (Round Only)

Aluminum Bronzes and Manganese Bronzes

Size	ID	OD
Up to 3" dia, Incl	-.125"	+.063"
Over 3" to 4", Incl	-.125"	+.094"
Over 4" to 5-1/2", Incl	-.188"	+.125"
Over 5-1/2"	-.250"	+.188"

Cast Bronze Finishing Allowances

Solid Round Bar, Rectangles, Hexagons

Aluminum Bronze & Manganese Bronzes

Size	BAR OD	RECTANGLES & HEXAGONS
Up to 3", Incl	+.063"	+.063"
Over 3" TO 4", Incl	+.093"	+.093"
Over 4" to 5-1/2", Incl	+.125"	+.125"
Over 5-1/2"	+.188"	+.188"

Cast Bronze Diameter Tolerances

Solid Round Bar, Tube, Squares, Rectangles, Hexagons

Aluminum Bronzes & Manganese Bronzes

Size	SOLID ROUNDS OD	RECTANGLES & HEX
Up to 3", Incl	+- .010"	+- .020"
Over 3" TO 4", Incl	+- .015"	+- .025"
Over 4" to 5-1/2", Incl	+- .020"	+- .025"
Over 5-1/2"	+- .025"	+- .025"

THE DIFFERENCE BETWEEN FINISHING ALLOWANCES AND TOLERANCES

For example, 3" ID x 4" OD C95400 CAST Aluminum Bronze Tube. Referring to the Finishing Allowance Charts you will see that the Finishing Allowance is 3" (-.125") ID x 4" (+.094") OD. Therefore the cast AIM size is 2.875" ID x 4.094" OD. However, as with anything, there is a tolerance to these dimensions. The tolerances for this example, will be 2.875" (+.015" / -.050") ID x 4.094" (+/- .015") OD. The ACTUAL tube size can be 2.890"/2.860" ID x 4.079"/4.109" OD. In Cast Alloys this is what is called a NOMINAL 3" ID x 4" OD Tube and will finish to 3.000" ID x 4.000" OD.

Let us look at a Rectangle. NOMINAL 1" x 4" C86300 cast Manganese Bronze Rectangle will be 1" (+ .094") THICK x 4" (+ .094") WIDE. Therefore the CAST AIM is 1.094" THICK x 4.094" WIDE. Referring to the Tolerance Chart the actual cast size can be 1.094" (+/ .020") x 4.094" (+/ .040"). The Rectangle size can be 1.074"/ 1.114" THICK x 4.074"/4.114" WIDE. In Cast Alloys this is what is called a NOMINAL 1" THICK x 4" WIDE Rectangle and will finish to 1.000" Thick x 4.000" wide.

UNDERSTANDING CAST TOLERANCES & FINISHING ALLOWANCES WILL SAVE YOU TIME & MONEY

For Example, a buyer asks a supplier for C93200 (SAE 660) Bronze Tube and the buyer is finishing to 8.000" OD. A Buyer unaware of NOMINAL specifications, may ask for 8.250" OD adding the clean up allowance themselves. Since 8.250" OD is non-standard the buyer will be offered NOMINAL 8.500" (+ .125") OD or NOMINAL 9.000" (+ .125") OD WHEN THE NOMINAL 8" (+ .125") OD WOULD HAVE FINISHED TO 8.000" OD OR LESS. If buyers are unaware of the NOMINAL Finishing Allowances per the ASTM specifications they can waste many thousands of dollars over time by purchasing sizes with unnecessary extra finishing allowance.

UNDERSTANDING WROUGHT COPPER ALLOY TOLERANCES 100 THROUGH 700 SERIES

Wrought Copper Alloy Bar & Plate (UNS "C" 100 through 700 series of WROUGHT copper alloy numbers) are produced to size within a plus and minus tolerance per the ASTM standards. For example if you order a 1" dia. brass rod the OD tolerance will be +/- .002". If you are finishing to 1.000" OD or less, you will need to order the next OD size up for example 1.125" OD. For rolled (wrought) plate , for example, 1/2" thickness tolerance would be +/- .028". If you are finishing to 0.500" thickness or less you would need to order the next standard thickness up which for example may be 0.625" thick.