

PLASTIC BOTTLE CORPORATION

28055 North Ashley Circle, Suite 110
Libertyville, IL 60048-9635
847-367-1900
Fax: 847-367-1990
www.plasticbottle.com

WHY SHOULD YOU KNOW ABOUT A BOTTLE NECK INSIDE DIMENSION?

For all bottles, especially plastic bottles, jugs, and jars, the neck I.D. (Inside Dimension, aka I) is an important specification. Why? The neck I.D. may be important because you might be using or sourcing a dispensing closure or sprayer with a Valve Seal mechanism which requires a specific I.D. so that the Valve in the cap properly seats into the neck so as to help prevent leakage, especially during shipment.

And if you are not using a closure with a Valve Seal, the neck I.D. is still important because by specifying a neck I.D., you are also determining the Land thickness, which is the sealing surface at the top of the neck that contacts the bottle cap liner or the inside of the bottle cap that has some sort of Liner-less Cap sealing mechanism that seats on the Land, the top of the neck.

Years ago, the Plastic Bottle Institute, a division of The Society of the Plastics Industry, Inc., (SPI) developed Good Practices, Tolerances, and Definitions for all parts of blow molded bottles, jugs, and jars. At first plastic bottles, jugs, and jars were Extrusion Blow Molded, as billions are still produced today with both Calibrated/Impacted necks and Trimmed and Reamed necks. As technology moved along, Injection Molding of the necks was also developed. In all cases, bottle, jug, and jar necks, which in the industry are called the Finish, either have industry wide SPI dimensional specifications and tolerances which have been developed over almost 100 years of trials and measurements for use with "standard" caps produced by numerous companies or specifically developed tolerances for custom closures or sprayers and etc.

Virtually all of the plastic resins used in the production of plastic bottles, jugs, jars, and closures have Shrink Rates as they cool and require plus or minus (+/-) tolerances. Therefore, for example, if you have a High Density Polyethylene plastic bottle with an SPI 28-410 neck and you purchase a readily available 28-410 Polypropylene or Low Density Polyethylene cap, both the bottle neck and the cap are produced to industry tolerances so that the cap will properly and easily mate with the bottle neck. For instance, for a 28MM – 410 bottle neck, the diameter tolerance is +/- 0.010".

Now, back to the I.D. discussion. If, for example, you neck on a plastic bottle is a 28-410 neck, the Outside Dimension of the thread, (the T) is 1.088" – 1.068" and the Inside Dimension of the thread (the E), not the inside of the neck, is .994" - .974". Thus a tolerance of +/- .010" and a mean E or .984". So, for example, if you have a Valve Seal cap with an I (I.D.) requirement of .883" - .893", .888" mean, and an E mean of .984" your Land thickness will be: .984" minus .888" = .094" divided by 2 for each side of the neck = a Land of .048". However,. If you have a cap with a Land Seal and you want a Land of, say, .070" you would call out an I or I.D. mean of .844" or so. (.984" minus .844" = .140" divided by 2 for each side of the neck = .070" Land. And why would you want a larger/thicker Land? Because a thicker land offers a greater sealing surface for better contact with a liner or induction seal and, therefore, greater protection against leakage.

Different closures may have different and specific I.D. requirements and there also may be requirements dictated by fill tube diameters, or I.D. requirements for insertion of an orifice reducer, or other sort of dispensing plug. Lots of reasons.

Confused? Please call Stuart Feen, President, Plastic Bottle Corporation, for more discussion related to a specific cap and neck.