NECESSITY OF OBTAINING CLOSURE SAMPLES AND INFORMATION PRIOR TO A PLASTIC BOTTLE PRODUCTION RUN

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Virtually all manufactured parts have a plus or minus (+/-) range of dimensional acceptability (tolerances), and plastic bottles and closures are no different, except that their ranges may be greater than some types of products and less than some other types. Because closures and bottle necks represent a variety of manufacturing variabilities and tolerances, even if they are within specifications, which can affect mating possibilities of one to the other, we always need to know what closures, sprayers or finger tip sprayers/pumps are to be used on our bottles. When we receive the order, we ask for the closure, sprayer, or finger tip sprayer/pump manufacturer's specifications and ask for samples of the closure, sprayer or pump to be used on our bottle.

Definitions and Discussion

CT means a regular screw cap with a continuous thread. This is the most common type of cap or closure, having smooth or ribbed sides (skirts) and a rough or smooth top. They come in virtually any color and are commonly designated as 400, 410, and 415, as in, 24-415. This type of closure is usually lined with a paper, plastic, foil, film or combination liner in order to provide the best sealing of the product within the bottle for product integrity and to avoid leakage in shipment. The Plastic Bottle Institute, a division of The Society of the Plastics Industry, Inc., has published Dimensions and Tolerances for Plastic Bottles for a number of years and these dimensions and tolerances cover most of the 400, 410, and 415 standard necks plus some others. For a variety of reasons there should never be an assumption of what is standard without all parties of and suppliers to the transaction being aware of what the other's dimensions and tolerances are.

CRC means a Child Resistant Closure which may be of a single piece or two piece design. If a two piece CRC, it usually has a CT inner cap with the palm or push down and turn outer shell. There is also a two piece pull up and turn CRC. CRCs usually have special "H" requirements that are not standard 400 or 410, even though they may be designated as 28-400 or 24-410 etc. The two piece push down style especially requires careful attention to the "H", since even if the neck is too short the closure can usually be applied to the neck. But when the end user tries to push down to take the closure off of the bottle, the closure bottoms out on the bottle shoulder and the outer shell cannot properly engage the inner cap, leaving the consumer with a very well sealed bottle that they cannot open. This is not a good situation.

An ORIFICE REDUCER is an injection molded piece that fits into the neck of the bottle to reduce the size of the opening from a river to a very small streamlet. Each neck I.D. (inside diameter) must be carefully set and maintained for each type, style, and size of orifice reducer to be used. Because of the tremendous possible variety there is no such thing as a standard I.D.

A LINED closure is one that has a paper, plastic, metal foil, film or combination liner. Dispensing closures are sometimes lined and other types of usually unlined closures are sometimes lined for various reasons.

A LINERLESS non-dispensing closure is usually a closure that has been designed to be used without a liner because it has some sort of anti-leaking feature molded into the inside top of the cap. A crabs claw is such a feature. LINERLESS closures were first developed as a way to reduce the closure cost by not having the dual expenses of the liner material and the application of the liner. LINERLESS closures represent a greater possibility for leaking than lined closures. Even though we are regularly measuring the necks during manufacture, there may be certain anomalies that, while they might be picked up with visual and physical inspection, might show up faster and easier with actual checking the specific closure on the specific bottle.

An UNLINED CT closure is sometimes one that was designed to be used with a liner, but which, for whatever reason, does not have a liner. This is a very risky situation, especially for leakage of liquid products and is not, except for very special situations, acceptable.

DISPENSING closures are those that via a pull/push, spout, twist, or flip top allow products to be dispensed. Dispensing closures are usually linerless closures with some sort of sealing mechanism such as: crabs claw, valve seal, land seal or some combination of the seals, but not always. The land is the surface at the top of the neck. The land seal is riskiest from a leaking point of view and we absolutely must have cap samples for testing with the bottle necks when we run the bottles. Some dispensing closures have a "valve", which is a partial cone that fits into the neck of the bottle and seals against the inside of the neck. Here, and with the valve/land seal as well, we must have the closure manufacturers' neck I.D. specifications and tolerances and lots of samples for testing while running. The valve seal/land seal combination is the least risky, but there is still risk.

TRIGGER SPRAYERS, FINGER TIP SPRAYERS, ANTI-ROTATIONAL or RATCHET CAP SPRAYERS OR DISPENSING CLOSURES represent special actual and potential problems and need to be looked at individually with reference to all applicable manufacturer's specifications.

When taking any order we first need to ask what closure is to be used with the bottle. We need to know the closure size and manufacturer. If the closure is a regular, non-dispensing 400, 410, or 415 size with a non-induction seal or pressure sensitive liner, then we might be o.k. without getting samples from the customer as long as we get all of the dimensional specs. However, to be entirely safe we should still ask for samples of these least problematic of closures for testing.

For any other closure, pump, or sprayer we need to have 200 samples for testing bottles while we run, and we also need to have the specified NECK FINISH print for that closure. We should also have the closure print, but we absolutely must have the print or printed numerical specifications for the neck finish. We need to know, among other things the REQUIRED:

- "H"
- "S"
- "T"
- "E"
- "I"
- I.D. lead-in radius
- Min land thickness
- Any other neck specs the closure manufacturer wishes to call out

If the closure has an induction seal or pressure sensitive liner, then we MUST be certain to obtain from the closure manufacturer the MINIMUM LAND their closure requires for use with induction seal or pressure sensitive liners. This will in turn define the I.D.

Lastly, while talking about the neck, it is always nice to know the diameter of the customer's fill tubes. The buyer or purchasing agent may not know this, so it is especially important to ask them if they have checked the samples we sent to them on their filling lines and especially with their fill tubes. An I.D. that is consistent with all of the above requirements is then specified on orders for that customer for that bottle with the particular closure.