



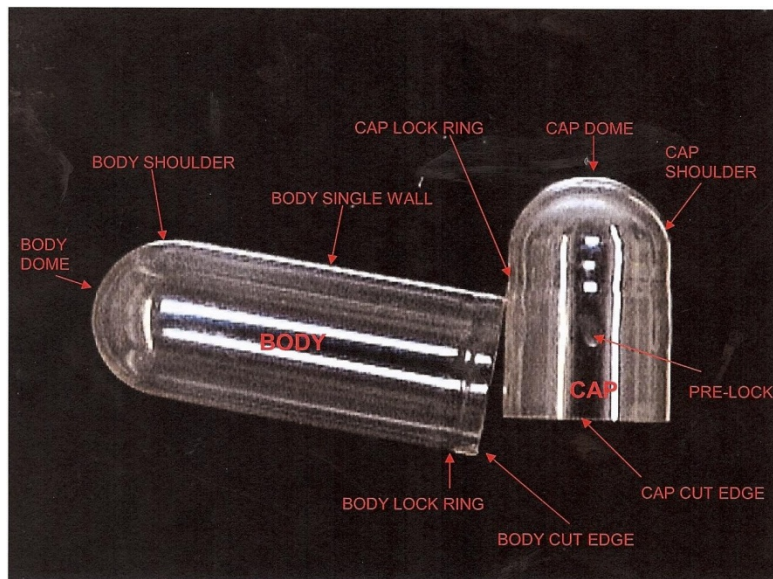
Technical Service Best Practices

Eliminating Mechanical Defects in Capsule Closing

Some of the most troublesome filled capsule defects occur in the capsule closing process, and are termed splits, telescoped capsules, folds and cap tucks. These defects occur during capsule closing, as the edges of the cap and body collide; in many cases causing product leakage. Because of the possibility of product leaking, the defects may be critical in AQL criteria and will lead to additional processing.

There are many factors which may contribute to closed capsule defects, including challenging formulations, worn tooling, improper machine set-up, and poor capsule quality. Factors involving the equipment are often the cause, and once in order can help even when running challenging formulations. Here are some tips to ensure optimal machine conditions for closing capsules successfully.

Proper Closing Station Set-Up





In the process of closing capsules on filling equipment, there is pressure applied to the dome of the body of the capsule, causing the cut edge of the body to move out of the lower tooling toward the cut edge of the cap. As the body of the capsule enters the cap, there should be minimal movement of the cap allowed within the machine tooling. This movement is controlled by the counter-pressure applied by the filling equipment on the dome of the cap. If the gap between the counter-closing function and the cap dome is too high, the cap will be pushed upward, losing the tight stabilizing effect of the tooling walls, available only at the base of the bore. For this reason, many equipment suppliers offer size specific format rings for the counter closing function of the filler. When changing capsule sizes, use the appropriate modifiers to ensure closed capsule quality.

Many people fail to consider the impact of the empty capsule cap length in closing station set-up. The cap length specifications differ between capsule vendors, and may require slight set-up adjustments to account for these differences. For machines with non-stationary counter-closing (i.e. counter-bearing, upper-closing pin), it is a simple machine adjustment wherein the upper-closing is set at .003-.005" above the dome of the cap when the upper closing is at its lowest position. For machines with non-stationary closing, shimming of the closing station may be required to establish a gap of .003-.005". Once the proper gap is applied, use the upward movement of lower closing pins to achieve your proper closed length. The minor time investment to fine tune the counter closing on your machine can save valuable time and materials caused by inspection and re-work.

Tooling Condition and Care

Empty capsules are manufactured with great care and extreme precision. Exact capsule wall thickness is engineered and achieved through careful formulation, dipping and drying processes, so that capsules will separate, fill, and close with exactness. To maintain the same precision performance in capsule filling requires



equipment and tooling which is maintained within an acceptable range of wear, and with careful attention to prevent damage to parts.

Many of the ingredients used to fill capsules are abrasive in nature, and over time, will wear out critical dimensions within the tooling. Two areas of particular concern are located in the upper cap tooling. The area where the edge of the cap rests in the tooling is called the “cap seat”. Below this, the bore narrows to an area called the “body passage”. These areas of the tooling are guides for joining as the edges of body and cap come together in closing. When the cap seat and or body passage is worn, the opportunity for misalignment of the capsule arises. The issue is compounded when abrasive or sticky material is being encapsulated, as it moves to available, but undesirable space during closing.

It is advantageous for companies to establish a program of measuring tooling for wear, and planning ahead for replacement when necessary. Start by obtaining measurements and tolerances from your equipment vendor. The tools you will use to measure the dimensions are called “plug gauges”, and may be ordered by size through common supply stores.

Finally, a word about tooling care. While machine components may appear sturdy, they are easily dinged and damaged by being dropped or knocked against each other during disassembly and cleaning. Even small scratches and dents to bores affect the proper flow of capsules in tooling. Establish a culture of care for equipment and components within your operation. Discourage the practice of stacking parts, and dumping them together into cleaning sinks. Management can assist by providing proper carts and storage accessories for the tooling. Establishing these practices will assist you in your quest to eliminate closing defects in your capsule filling operation.

For more information, please contact Technical Support:

Steve Lee - 909.583.3927

Brian Dexheimer - 602.684.0316