

New Process Control Technologies Improve Medical Device Performance

In a perfect world, every component would be manufactured exactly to specification. But perfection drives costs higher so it makes sense to accommodate variations — tolerances — as long as they do not compromise the finished assembly.



But there is a catch. If a device features four or five nested components, the components may be at the “worst case” limits of their design. Tight-fitting parts make assembly difficult and slow, and excessive friction can degrade the operation of the finished device. These accumulated “stacked tolerances” can be very difficult to resolve in manufacturing.

A cost-effective way to address stacked tolerances is to use a dry lubricant based on polytetrafluoroethylene (PTFE). PTFE is a powder and is mixed into a carrier fluid. The mixture is applied by dipping the parts into a liquid bath. The carrier fluid then evaporates away leaving a smooth, dry PTFE coating on the part.

Dry lubricants are versatile. They are compatible with most plastics and metals. They conform to virtually any surface; they readily penetrate into complex shapes and blind vias. Dry lubricants are safe, clean, non-migrating and are available with ISO 10993 certification. A brief heat-treating process can turn the coating into a hard, durable and attractive finish.

But most importantly, dry lubricants improve the performance of a finished device. They can instantly reduce the coefficient of friction on a treated part to as low as 0.06. This translates into a 25-30% reduction in actuation forces, greatly improving performance. Many medical devices would not be commercially viable without a dry lubricant.

Calibrating Your Coating

The ratio of PTFE to the carrier is normally specified as a ratio, by weight. The carrier fluid evaporates from the dip tank which causes the PTFE/carrier ratio to wander out of spec and produce uneven coatings. The best process is to monitor the PTFE-fluid ratio.

Uniquely, MicroCare Medical offers an advanced automatic fluid meter for PTFE content. The Duraglide® Kwik-Check™ test meter delivers fast and precise PTFE content determination with an accuracy to two decimal places. Operation is simple, automatic and completely eliminates guess-work by operators. A simple conversion chart is used to determine the amount of “top-off” fluid needed to maintain proper ratios.



If you have questions about Duraglide® lubricants or the new Kwik-Check™ meter, contact your local MicroCare representative.

About MicroCare

MicroCare Corporation is the manufacturer of the many cost-effective, environmentally-sensitive chemical products and tools used for critical cleaning, coating and lubrication. Since 1983, MicroCare has been helping customers to improve their products and processes in industries as diverse as electronics, metal finishing, transportation, medical devices and aerospace. MicroCare constantly innovates to help companies lower their costs and improve their quality.

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