Meter/Mix/Dispensing of LORD Silicone Gap Filler Materials

Description

Due to the high volume/high flow rate applications that are commonly associated with LORD silicone gap filler materials, automated meter/mix/dispense (MMD) processes are utilized in an effort to minimize material waste and cycle times, as well as reducing the overall cost. This document will cover a number of topics that customers/users will need to consider when evaluating automated dispense systems and processes.

LORD has partnered with many equipment manufacturers that specialize in dispensing these types of materials. For any questions, concerns, or assistance regarding the automated MMD processes of LORD silicone gap filler materials, please contact your local LORD representative, or e-mail ElectronicMaterials@lord.com.

Choosing the Proper Equipment

There are many things to consider when selecting automated dispense equipment. The volume of material used in each application, desired flow rates, bead patterns, placement and volume accuracy will all be items that factor into the final decision on equipment type and specific manufacturers.

LORD silicone gap filler materials are also heavily filled and the filler particles are abrasive, which also factors into the type of equipment that should be selected for use. Gear/rotor pump systems, as well as certain piston pump systems, do not work well with this material as both contain tight tolerances around their moving parts, which maximizes the amount of wear that these systems can experience and therefore significantly impacts the Preventative Maintenance (PM) schedule. Systems such as rod displacement and progressive cavity are preferred as there are far fewer contact surfaces and these systems are better designed to handle filled materials or products that include glass beads.

Filler Separation

Within the shelf life of the material and under normal storage conditions, a minimal amount of silicone “bleed” (a thin layer of oily fluid) will appear on the top surface of the material in the pail/drum. This is a normal condition inherent to the material and is often removed during the material that is purged when the air is bled from the system during pail/drum installation/changeover. For MMD systems that do not require an air purge, it is recommended to work with these manufacturers directly regarding how this bleed is re-integrated when processed through that particular system.

Automated dispense systems should also not incorporate tight turns and 90 degree fittings, as these conditions can cause filler to build up in these areas during normal material flow. Any pressure fitting, threaded component or sealed joint should also be clean (no dirt, debris, material on threads) and assembled properly to prevent leak paths. Leak paths can cause the liquid silicone to be filtered from the material and push out of the system through these leak paths under standard system pressures. Additionally, any automated dispense system that will be left unused for significant periods of time (>8 hours) should be relieved of all system pressure to minimize any possibility of silicone separation.

Cure Inhibition

Contact with surfaces that contain cure-inhibiting materials should be avoided. If a contact material is in question, it is recommended to apply a test patch of the silicone gap filler material to the surface and allow it to set for the normal cure time. Inhibition is indicated by uncured residue on the test surface. For automated metering systems, a repair kit can usually serve as a good sample for compatibility testing in addition to any metal components the material may encounter.

The following is a list of chemical compounds that may inhibit or poison an addition-cured silicone:

Compounds Containing Sulfur
- Sulfides
- Thio compounds

Organotin Compounds
- Tin alkoxides
- Tin carboxylates
- Tin catalysts

Compounds Containing Nitrogen
- Amines
- Amides
- Nitriles
- Cyanates
- Oximo, Nitroso, Hydrazo, and Azo compounds
- Chelates
  - EDTA and NTA

Compounds Containing Phosphorous
- Phosphines
- Phosphites

Compounds Containing Unsaturated Bonds
- Alkenes and Olefins
- Alkynes
- Acrylates

These compounds can commonly be found in the following materials:
- Latex, vinyl, or neoprene gloves
- Mold release, including those in injection molding plastics
- Natural rubber, rubber bands
- Rubber o-rings, including some used in meter/mix/dispense (MMD) equipment
- EPDM and Melamine
- RTV silicones containing organo-tin catalysts
- Tin-cured urethanes or amine-accelerated urethanes
- PVC tapes and masking tapes
- Modelling clay containing sulfur
- Polyesters
- Plastics containing residual plasticizers

Cleanup

Disposable containers and utensils are recommended when working with silicones. However, when disposable materials are impractical, uncured silicone can be removed by cleaning equipment with solvent. Observe appropriate precautions when using flammable solvents.

Solvent-cleaned utensils should be thoroughly dried before reuse; any remaining solvent can contaminate the next application.

Shelf Life/Storage

Refer to the applicable technical data sheet for the shelf life duration of each product. Shelf life is maximized when product is stored at 25°C in its original, unopened container. LORD silicone gap filler material may evolve minute quantities of hydrogen gas. Do not repackage or store material in unvented containers. Adequately ventilate work area to prevent the accumulation of gas.

Cautionary Information

Before using this or any LORD product, refer to the Safety Data Sheet (SDS) and label for safe use and handling instructions.

For industrial/commercial use only. Must be applied by trained personnel only. Not to be used in household applications. Not for consumer use.

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