

Avoiding cure inhibition when working with platinum catalyzed silicones

When working with platinum-catalyzed silicones, avoiding cure inhibition is key to a fully cured and functional material. The platinum catalyst can be inhibited, or “poisoned”, when the material comes in contact with specific substances.



HOW DO I KNOW IF CURE INHIBITION IS OCCURRING?

Cure inhibition occurs in varying degrees, from the worst case scenario of remaining in a liquid state to tacky and/or greasy textures on the surface but cured in the middle. One of the most common substances that inhibits the cure are sulfides used in latex rubber compounds. They can also be found in petroleum products, such as mineral spirits, some solvents and wood. There are also many other types of inhibiting substances commonly used in material handling, assembly processes, etc. See below for a general list:

COMMON PLATINUM INHIBITOR COMPOUNDS

Sulfur-containing compounds:

- Latex rubber (gloves & tubing)
- Neoprene rubber
- Natural rubber
- Polysulfides
- Wood (spatulas & tongue depressors)
- Organic oils
- Some grades of Xylene (low sulfur options are available)

Tin-containing compounds:

- Tin-catalyzed silicones
- Tin plasticizers (some plastics and PVC)

Metals:

- Various metals including silver, tin, lead, and mercury

Epoxy & amine-cured materials:

- Some phenolic resins
- Epoxy resins
- Some polyurethane materials

Nitrogen-containing compounds:

- Amines
- Amides
- Cyanates
- Nitriles

HOW CAN I INVESTIGATE WHAT IS CAUSING CURE INHIBITION?

Compounds that can cause platinum-cure inhibition can be found in materials used for material preparation, device components, and/or assembly processes. If cure inhibition is suspected, it is recommended to make a "witness sample" when developing a curing process to ensure there is no cure inhibition occurring. See details below on creating a witness sample.



A witness sample should be taken from the same mixed batch of material you plan to use. Apply a small amount to a glass slide, aluminum dish, etc.



Put the suspect material in contact with the silicone. Once the silicone has been contaminated with the suspect material, cure it per your normal curing process.



After curing, check for complete cure. If you find any areas where the silicone is still tacky to the touch or if it is not thoroughly cured on the inside, the silicone is experiencing cure inhibition.

If you are experiencing issues with curing and suspect inhibition, please contact a NuSil expert at silicone@avantorsciencesgcc.com or call + 1 805 684 8780