



Resinlab®

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SILICONE ADDITION CURE INHIBITION

Inhibition is caused by the contamination of addition cure materials with trace quantities of certain types of chemicals. The catalyst is a chemical containing platinum atoms, which are not only affected by working-time control agents, but can also be poisoned by contaminants. These chemicals interfere with the cure reaction and thus prevent conversion of material to a solid. Extremely small quantities of inhibitors or contaminants may be sufficient to produce this effect. Fortunately, only a small number of material types can cause inhibition. However, unlike a working-time control agent, once a contaminant attaches to the platinum, any negative effects on the cure are permanent.

Certain materials, chemicals, curing agents and plasticizers can inhibit the cure of addition cure adhesives. Most notable of these include:

- Organotin and other organometallic compounds as contained in many urethane materials.
- Silicone rubber containing organotin catalyst.
- Sulfur, polysulfones or other sulfur-containing materials such as rubbers.
- Amines, urethanes or amine-containing materials such like epoxy hardeners.
- Unsaturated hydrocarbon plasticizers common to vinyl compounds.
- Some solder flux residues.

A secondary list of materials less common to the work place can also inhibit the cure. This includes tin, phosphorus, arsenic, antimony, selenium or tellurium,

Usually the effect of these inhibitors/contaminants is localized to a specific area of the contamination and does not propagate very far into the bulk of the polymer. The effect is usually caused by direct contact with incompatible substrate materials, but may also be due to inadvertent contamination by dirty rags, airborne mists or (cure oven) vapors. In packaging materials / cartridges care in the selection of O-rings and other materials is important as Buna-N O-rings can cause inhibition.

Prevention / corrective measures:

A clean work environment and keeping the silicone as physically separate as possible from sources of these (organic) materials is best. Good work practices and preparation can prevent this from happening. In some cases using hexane to wipe suspect surfaces, then apply 93-023 primer which contains Pt catalyst, or in some cases the addition of extra Pt catalyst to the product can increase the protection against inhibition. While it is not uncommon, it is fairly rare and the causes are usually pretty obvious to determine and correct through standard work practices without resorting to adding more Pt catalyst. Only when the substrates or intended contact surfaces are troublesome is this practice sometimes followed.