



## Materials Engineering Branch

### TIP\*



No. 014 Prohibition on the Use of Anaerobic Compounds

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It had been common practice for spacecraft hardware manufacturers to use anaerobic-type compounds, such as the Loctite, to lock screws and bolts and to key ball bearings onto shafts or into housings. These polymers are one-component liquids in the uncured state and depend on metal surfaces and lack of oxygen to catalyze and polymerize them into solid form. Therefore, if excess liquid remains on exposed surfaces around the screws or around the bearing, the liquid will not cure and becomes a volatile contaminant in vacuum. In addition, in bearing applications the liquid can inadvertently enter the bearing to contaminate the lubricant. It is recommended that anaerobic locking materials not be used on flight hardware.

Low outgassing polymeric materials that have been successfully used as substitutes for the Loctites are:

- Uralane 5753A/B with or without Cabosil TS-720, which provides a medium strength lock.
- Solithane 113, which provides a low to medium strength lock.
- DC 6-1106 A/B, which provides a low to medium strength lock. Need to be aware of surface contamination potential of silicones.
- Torr Seal A/B, which provides a high strength lock. For fastener heads only.
- Epon 828/Versamid 140 with or without Cabosil TS-720, which provides a high strength lock. For fastener heads only.
- Scotchweld 2216 (Grey), which provides a high strength lock. For fastener heads only.