



Materials Engineering Branch

TIP*



No. 038 Outgassing of Marking Inks

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Due to the high outgassing properties of marking inks, we recommend the following precautions:

Use as little ink as possible. Engraving, etching or approved removable labels¹ should be used in lieu of ink where possible. Only apply essential information directly to flight hardware. Other information can be provided in writing on the Cert Log that accompanies the hardware.

Use the lowest outgassing materials available. The Materials Engineering Branch has tested room temperature curing marking inks with TML's between 6 and 16%. We have also prepared pigmented epoxies that meet the outgassing requirements of ASTM E-595 that can be used as marking materials.

Use as high a temperature cure as possible. One ink that we tested had a TML of 8% when cured at room temperature. The same ink had a TML of 3.5% when cured at 88°C for 2 hours. It is important to recognize that the %CVCM can be even more important than the %TML. Consequently, reducing %CVCM are of primary importance. Such efforts usually result in lower %TML.

Do not rely on over coating to prevent outgassing from a material. Although some materials may be more effective as overcoats than others, tests performed in our laboratories show that many over coating materials generally believed to be effective, are not.

¹ If removable labels are used, be sure to clean all adhesive residues from the hardware after the labels are removed.