

Ultra Low Outgassing™ Silicone Materials

The Aerospace Industry has used silicone adhesives and coatings for over five decades because of their ability to retain elasticity and low modulus over a broad temperature range (-130°C to 260°C). These properties provide excellent utility in space, where spacecrafts are repeatedly exposed to these extreme temperatures.

The National Aeronautics & Space Administration (NASA) and the European Space Agency (ESA) recommend testing low outgassing materials to meet the ASTM E-595, prior to use in space. These materials should meet the specifications outlined in NASA SP-R-0022A and ESA PSS-014-702, which require a maximum Total Mass Loss (TML) of 1% and Collected Volatile Condensable Material (CVCM) of 0.1%. TML and CVCM levels higher than this specification can cause outgassing and



caused excessive power degradation on six satellites. The large solar panel temperatures reach greater than 120°C and surface temperature strongly affects contamination buildup by volatilizing larger molecules. The Aerospace Corporation performed a general

ing silicone that are potential sources of contamination.

Any optical application in the spacecraft (e.g., optical telescope) is very sensitive to contamination of any kind. Optical engineers want the lowest possible outgassing material to limit the risk of creating any contamination.

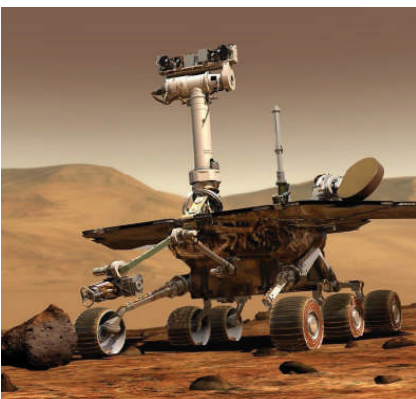
NuSil Technology's newly developed product line of Ultra Low Outgassing™ Controlled Volatility Materials (SCV) have a TML and CVCM with a greater order of magnitude one decimal place over. ■

“Although a standard for many years, many in the industry question whether these specifications are low enough.”

subsequent contamination of expensive equipment.

A major satellite producer suspects gaseous emission contamination has

contamination analysis comparing two different temperature solar arrays. This analysis cites various materials, includ-



Product	TML	CVCM	Durometer	Viscosity	Color	Comments
SCV-2590	≤ 0.1%	≤ 0.01%	50	8000 cP	Clear	
SCV1-2590	≤ 0.1%	≤ 0.01%	50	3000 cP	Clear	
SCV2-2590	≤ 0.1%	≤ 0.01%	40	3500 cP	Clear	Low temp
SCV-2596	≤ 0.1%	≤ 0.01%	70	Thick	Black	2 ohm cm
SCV1-2596	≤ 0.1%	≤ 0.01%	80	Paste	Tan	0.006 ohm cm
SCV-2590-2	≤ 0.1%	≤ 0.01%	50	8000 cP	Black	
SCV1-2599	≤ 0.1%	≤ 0.01%	75	Paste	White	1.25W/mK