

Update: HFC 245fa Blown Foam Development with External Tank Spray Foams

SIMON DAVIS

Lockheed Martin Manned Space Systems
Marshall Space Flight Center/Bldg. 4739
Huntsville, AL 35812 USA
Phone: 256-544-6482
Fax: 256-544-2774
E-mail: Simon.Davis@msfc.nasa.gov

The MSFC Thermal Protection Systems (TPS) Materials Research Laboratory is currently investigating environmentally friendly blowing agents for use in the insulations of the Space Shuttle's External Tank. The original TPS foam materials of the External Tank were blown with chlorofluorocarbon 11, which is now regulated because of its high Ozone Depletion Potential (ODP). Hydrochlorofluorocarbons (HCFCs), with an ODP that is one tenth that of CFCs, have been widely adopted as an interim blowing agent in urethane insulations. In FY96, Lockheed Martin completed the production qualification and validation of HCFC 141b blown insulations. Because of the expected limited commercial lifetime of HCFC 141b, research efforts are underway to identify and develop alternatives with zero ODP. HFC 245fa (1,1,1,3,3 pentafluoropropane) has been chosen by the manufacturer as a third-generation blowing agent to be marketed commercially. Preliminary work evaluating this third-generation candidate has demonstrated promising material mechanical property data. Favorable results from small-scale spray activities have justified evaluations using production foam processing spray parameters. With the scale-up of the spray equipment, however, additional processing issues have been identified. This paper will present data collected to date regarding the use of this blowing agent in External Tank spray foams.