

M & M 2015 Microscopy and Microanalysis

Speaker: Philip M. Howard
NASA Kennedy Space Center
NE-L6
(321) 867-9408

Space Shuttle Stiffener Ring Foam Failure Analysis, A Non-conventional Approach.

The Space Shuttle Program made use of the excellent properties of rigid polyurethane foam for cryogenic tank insulation and as structural protection on the solid rocket boosters. When foam applications de-bond, classical methods of failure analysis did not provide root cause of the failure of the foam. Realizing that foam is the ideal media to document and preserve its own mode of failure, thin sectioning was seen as a logical approach for foam failure analysis to observe the three dimensional morphology of the foam cells. The cell foam morphology provided a much greater understanding of the failure modes than previously achieved.