

ECSS-Q-ST-70-29C: The determination of offgassing products from materials and assembled articles to be used in a manned space vehicle crew compartment

Purpose:

Determine the identity and quantity of volatile offgassed products from materials and assembled articles.

Material screening test

- Quantity of Carbon Monoxide [mg/g]
- Quantity of total organics (pentane equivalent) [mg/g]
- Identification of contaminants in excess of 10 mg/g of material

General test for materials/assembled articles

- Identification and quantification of all contaminants present
- Use of T-values for acceptance
- Acceptance Limits
- Screening test
 - Carbon Monoxide : <25 mg/g material
 - Total Organics : <100 mg/g material
- General test
 - No definitive acceptability defined by this test. Data are evaluated by the Safety Office of the relevant project
 - for assessment of toxic hazard due to volatile contamination evolved from the item under test
 - for assessment of the impacts on the potential toxicity of the total quantity of offgassed products from all contaminant generating items for a given mission
 - Following primary acceptance criteria are relevant:
 - *The quantity of each individual offgassed product shall result in a predicted Spacecraft concentration below the SMAC value*
 - *Toxic Hazard Index (T) shall not exceed 0.5. T is determined by calculating the ratio of the projected concentration of each offgassed product to its SMAC value and summing up these ratios for all offgassed products*

$$T = C_1/SMAC_1 + C_2/SMAC_2 + \dots + C_n/SMAC_n$$

General test conditions

- Temperature 50 C
- Atmosphere : synthetic air or clean/dry air
- Pressure : 1 Atmosphere at 50 C
- Duration : 72 hrs
- Mass (material) 5g/liter test volume

Sampling : +/- 250 ml gas on trap after max. 12 hrs recovery to reach RT; flow rate sampling is +/- 25 ml/min.