

USA Integrated Logistics CIL Sheet**Critical Item:** Filter **Quantity:** 1**Find Number:** ME286-0068-0003**Criticality Category:** 1**FMEA/CIL No:** STS88-0254 **System/Area:** MPS /
PAD (MLP), OPF**NASA Part No:** ME286-0068-0003 **PMN/Name:** S70-0958-01
MPS QD/Filter Set**Mfg./Part No:** Wintec
6267-520-3 **Drawing/Sheet No:** GW70-420958**Function:** Prevent facility GHe contaminants greater than 10 microns absolute from entering the Orbiter MPS Hydrogen and Oxygen lines at 50V41PD16 and 50V41PD15 during 400 PSIG pre-launch processing MPS leak checks in the OPF.**Critical Failure Mode/Failure Mode No:** Pass contaminates/FMN: STS88-0254.001**Failure Cause:** Manufacturing defect, wear, or corrosion.**Failure Effect:** Possible contaminated GHe supplied to Orbiter MPS GH₂ and/or GO₂ lines during 400 PSIG MPS system checkout in the OPF. This could result in failure of one or more Fuel Control Valves (FCV) if large enough or sufficient quantity of debris was introduced into the system. This failure may not be evident until vehicle flight. If a line blockage occurred, it could potentially prevent GH₂ or GO₂ from returning to the External Tank (ET) during flight. This could result in the loss of ET ullage pressure and the consequential loss of ET structural integrity. Or if one Space Shuttle Main Engine (SSME) is non-functional during a RTLS/TAL and if one of the two remaining GH₂ or GO₂ Fuel Control Valves becomes non-functional due to contamination from this equipment, this could potentially result in the loss of crew and vehicle (reference Orbiter FMEA/CILs 03-1-0504-3 and 03-1-0519-3).

ACCEPTANCE RATIONALE

Design:

- Non-separable, KC-fitting design
- Materials:
 - Body: 300 series corrosion resistant steel
 - Element: welded, single layer, Dutch Weave, stainless steel, wire mesh
- Upstream filtration: S70-0695 -02 and -08 GN₂/GHe MPS Regulation and Control Panels in the OPF, filters A112846 and A83093 (10 microns absolute)
- This is a final filter that sees fluid that meets SE-S-0073, STS Fluid Procurement and Use Control Specification.\
- Contaminate capacity: 8.4 milligrams
- Pressure (PSIG):
 - Typical Operating Pressure: 400 plus or minus 25
 - Max. Allowable Working Pressure: 1500
 - Rated Flow: 100 SCFM @ 600
 - Proof: 2250
 - Burst: 6000
 - Element Collapse: 400 differential in either direction
- This final filter meets SN-C-0005, Space Shuttle Contamination Control Requirements.

Test: The ME286-0068 filter procurement specification requires the following tests:

- Acceptance Tests. Per ME286-0068, acceptance tests include product examination, proof pressure, cleanliness, bubble point, and drying per ARP 901.
- Performance Tests. Per ME286-0068, one filter from each lot is subjected to the following tests: clean pressure drop, vibration, filtration and contamination capacity, and differential pressure.
- Micron rating of filter is assured annually by bubble point testing per ARP 901.

Inspection:

- OMI V6A77 requires an annual filter replacement with a filter that has been tested and cleaned to MA0110-301 Level 100A.
- OMRSD File VI, Volume 1, 800.97 requires an annual filter replacement.

Failure History:

- The PRACA database was queried and 16 failures were found on this component in the critical failure mode. All were failing bubble point test requirement of 10 microns absolute after cleaning and during routine testing. None involved collapse of the filter element. Most failed the 10 micron requirement by 11-13 microns. Worst-case failure was at 45 microns, which still does not exceed the system's cleanliness requirement of 100 microns absolute per MA0110-311.
- The GIDEP failure data interchange system was queried and no failure data was found on this component in the critical failure mode.

Operational Use:

- Correcting Action:
There is no action that is currently taken to mitigate the failure effect.
- Timeframe:
Since no correcting action is employed, timeframe does not apply.
- Delta P pressure can be monitored.