

TANK TYPE Simple PMD	MOUNT Bosses	LOCATION Polar	PMD DEVICE Sponge & Vane, note 5
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This Propellant tank is a lightweight spherical titanium bi-propellant fuel tank. It contains a titanium vane-type Propellant Management Device mounted at the polar ports. The tank is supported by four (4) tapped bosses at the propellant port and by a flex plate attached to three (3) tapped bosses on the pressurant side.

Part Number 80481-1

SIZE: 13.33-inch ID Sphere
SIZE: 338.58-MM ID

ISO 9001 & AS 9100 REGISTERED

APPLICABLE DOCUMENTS	
Protoflight Test Procedure	50-000649
Bubble Point Test Procedure	50-000651
Fracture Analysis Plan	54-000226
PMD Analysis	54-000237
Design Verification	56-000221
Cleaning	CPP 3982

TANK CHARACTERISTICS			
Operating Pressure, psig	300	Total Volume, ci	1,232
Proof Pressure, psig	550	Prop Volume, ci	95% FF
Cryo Proof, psig	N/A	Minimum Wall, inch	0.018
Burst Pressure, psig, note 7	620	Max Design Wt, lbs	4.00
Actual Burst, psig	620	Flight Actual Wt, lbs	3.96
120 sec. HOLD (see 80213-1) PMD Wt, lbs			

PROTOFLIGHT ENVIRONMENTAL TESTS
Wet & Dry Sine & Random Vibration

DESIGN ANALYSIS
Stress (Wada 324)
Fracture Mechanics

QUALIFICATION TESTS
Qual was performed on 80213-1.

Notes:

1. Tooling owned by Northrop Grumman
2. This tank is annealed
3. Stress & Fracture mechanics Analysis 80213-5 used on ITALSAT is 239
4. Simple Vanes (Four Vanes)
5. Fracture Critical
6. Design Burst Pressure for 80213-1 adjusted for temperature of 120°F (650 psig for 70°F)
7. Qual was performed on 80213-1

TANK CHARACTERISTICS (Metrics)			
Operating Pressure, Bar	20.68	Total Volume, l	20.2
Proof Pressure, Bar	37.92	Prop Volume, l	95% FF
Cryo Proof, Bar	N/A	Minimum Wall, MM	0.457
Design Burst, Bar	42.75	Max Design Wt, kg	1.81
Actual Burst, Bar	42.75	Flight Actual Wt, kg	1.80
120 sec. HOLD (see 80213-1) PMD Wt, kg			

Acceptance Tests
Compatibility Test
Random Vibration Test
Post Random Vibration Leakage Test
Sinusoidal Vibration Test
Post Sinusoidal Vibration Leakage Test
Burst Pressure Test

FORGINGS		
HEMI P/N	SUPPLIER	Die No
80-213061-1 (2)	ARTURUS	3046

PROTOFLIGHT TESTS
Preliminary Inspection of Product
Pre-Proof Volumetric Capacity
Ambient Proof Pressure
Visual Inspection
Post-Proof Volumetric Capacity
Differential Pressure Test & Mass Flow Rate Test
External Leakage Test
Tank Assembly Bubble Point Test
Sine & Random Vibration Test (Dry & Wet) & Visual Inspection
Negative Pressure Capability
Tank Assembly Bubble Point Test
External Leakage Test
Radiographic Inspection
Dye Penetrant Inspection
Mass Measurement & Final Visual Inspection
Clean & Packaging
Data Review

TUBE TYPE AND SIZE	
TITANIUM	SIZE
80-481009-3, press (1)	.250 O.D. x .020 Wall
80-481009-3, outlet (2)	.250 O.D. x .020 Wall

TUBE SIZE (Metrics)	
80-481009-3, press (1)	6.350 O.D. x .508 MM Wall
80-481009-3, outlet (2)	6.350 O.D. x .508 MM Wall

ACCEPTANCE TEST
Acceptance Test was performed on 80213-1
Examination of Product
External Pressure Test
Volumetric Capacity prior to Proof Pressure Test
Proof Pressure Test and Post-Proof Volume Test
Leakage Test
Cleanliness Verification

VACUUM RATED
Yes

