



TANK/FUEL TYPE	MOUNT	LOCATION	PMD DEVICE
Note 3, NTO	Lugs	Girth	Note 3

This tank is a spherical pressure vessel constructed of 6Al-4V Titanium. Mounting is accomplished by lugs parallel with & adjacent to the mid-plane. Oxidizer feed is provided by an outlet tube on the same plane as the mounting lugs. An internal vortex damper is featured at the mouth of the outlet tube to prevent forming gas through the outlet tube.

**ISO 9001 & AS 9100 REGISTERED**

**ATK Part Number 80379-1**

**SIZE: 19.06 -inch ID Sphere**  
**SIZE: 484 -MM ID Sphere**

APPLICABLE DOCUMENTS	TANK CHARACTERISTICS	ACCEPTANCE TESTS
Acceptance Test Procedure 50-000453	Operating Pressure, psig 280 Total Volume, ci 3,660	Preliminary Examination of Product
Fracture Analysis Plan 54-000140	Proof Pressure, psig 525 Prop Volume, ci 3,660	Pre-Proof Volume Determination
Cleaning CPP 3743	Cryo Proof, psig No Max Design Wt, lbs 10.7	Proof Pressure Test
	Burst Pressure, psig 754 Minimum Wall, inch 0.023	Post-Proof Volume Determination
		External Leakage Test
		Penetrant Inspection
		Radiographic Inspection
		Final Exam - Weight Measurement
		Final Visual Examination
		Cleanliness Verification

**Notes:**

- 1: Tooling owned by ATK.
- 2: This tank is similar to 80274 except no diaphragm
- 3: This tank has a Vortex Suppressor located over the outlet
- 4: Tube protector is SK 1356
- 5: Launched Feb 17, 1996 aboard a Delta II Vehicle
- 6: Will rendezvous with asteroid 433 in early 1999
- 7: Fracture Critical

**TANK CHARACTERISTICS (Metrics)**

Operating Pressure, Bar	19.31	Total Volume, l	59.98
Proof Pressure, Bar	36.20	Prop Volume, l	59.98
Cryo Proof, Bar	No	Max Design Wt, Kg	4.85
Burst Pressure, Bar	51.99	Minimum Wall, MM	0.584

**FORGINGS**

FORGINGS P/N	SUPPLIER	Die
80-182061-1 (2)		
<b>RING FORGING RING SIZE. (Rough Machined)</b>		
80-274065-1, Retainer	19.06 +.12 OD x 17.55 -.12 ID x 1.5 +.12 Lg	
80-274063-1, Lug	21.25 +.06 OD x 19.31 -.06 ID x .85 +.06 Lg	

**TUBE TYPE AND SIZE**

TITANIUM	SIZE
80-378007-5 (2 Ea)	.250 OD x .028 Wall
80-378006-5	.375 OD x .028 Wall

**TUBE TYPE AND SIZE (Metrics)**

TITANIUM	SIZE
80-378007-5 (2 Ea)	6.35 x .711 MM
80-378006-5	9.52 x .711 MM

The NEAR oxidizer tank is based on the EXOSAT 19-inch diaphragm tank. The modification to the basic design was more extensive than the fuel tank. The changes included the elimination of the elastomeric diaphragm, removal of the machined-in diaphragm retaining feature on the diaphragm support ring & the propellant hemisphere, addition of an outlet tube near the tank equator, modification of the pressurant & propellant tube configurations & tube supports, & the addition of a vortex suppressor. Stress & fracture mechanics analyses were conducted to verify the new tank design under the new operational requirements. The tank met all the mission requirements with positive safety margins. Qualification was based on similarity, since all the above changes did not affect the tank shell nor the girth weld. A vortex suppressor is used to prevent the formation of a vortex at the oxidizer outlet port. No other propellant management devices are used.

