

NASA - Amazing Facts: Space Shuttle External Tank

Amazing Facts: Space Shuttle External Tank

08.03.11

- The tank, at 154 feet, was taller than the Statue of Liberty (151 feet) and was the structural backbone of the shuttle vehicle.
- There were approximately 480,000 separate parts in each external tank.
- The external tank held 535,000 gallons of propellants -- 390,000 gallons liquid hydrogen and 145,000 gallons liquid oxygen -- which fuel space shuttle main engines through 17-inch-diameter feedlines.
- The external tank was covered with spray-on foam insulation that kept the liquid hydrogen at -423 degrees F. and liquid oxygen at -297 degrees F., even in the hot sun.
- The tank's propellants would stay liquid only if kept at cold, or cryogenic, temperatures. The tank's foam insulation maintained these temperatures to minimize ice build-up while the tank was on the launch pad and to protect the tank from booster, main engine and aerodynamic heating during launch.
- When fully loaded, the cold propellant caused the tank to shrink up to 7 inches.
- The skin of the external tank was less than 0.25 inches thick, yet held more than 1.5 million pounds of propellant.
- The external tank was the only major expendable shuttle element.
- The external tank weighed 1.6 million pounds at space shuttle liftoff, equal to the weight of 32,000 elementary school children.
- During flight, when the shuttle main engines cut off at an altitude of about 370,000 feet, or about 70 miles above the Atlantic Ocean and about eight minutes, 30 seconds into flight, the tank separated from the orbiter. It continued to climb to 686,000 feet, then fell, breaking apart in the atmosphere, and splashed into the ocean in a specified footprint. Its disintegration was carefully engineered, holding together until it reached the lower atmosphere so the debris footprint was small.
- 11,000 pounds were stripped from the tank after the first half-dozen shuttle flights and another 7,500 pounds during the 1990s to increase the shuttle's capacity to haul components to the International Space Station. For example, the tank for STS-1 in 1981 weighed 77,000 pounds empty; after STS-91, launched in June 1998, tanks weighed 58,500 pounds.