



Role of Helium in Rockets

[Source: TH](#)

Two [NASA](#) astronauts aboard Boeing's Starliner will remain on the [International Space Station \(ISS\)](#) for an extended period due to a faulty propulsion system, which has been **affected by helium leaks**.

- Past missions affected by helium leaks include [ISRO's Chandrayaan 2](#) and [ESA's Ariane 5](#).
- **About Helium (He):**
 - It is the **second-lightest element after hydrogen**, characterized as a colorless, odorless, tasteless, and inert gas with an **atomic number of 2**.
 - Helium is a **stable, non-reactive noble gas**. While non-toxic, it **cannot be breathed** on its own as it displaces the oxygen needed for respiration.
 - It has a **very low boiling point (-268.9° C)**, allowing it to remain a gas even in super-cold environments, making it useful for [cryogenics](#).
 - **This helps reduce rocket weight and energy needs, which lowers fuel consumption and engine costs.**
 - **Rocketary Applications:**
 - Maintains consistent fuel flow by pressurising tanks.
 - Assists in cooling systems for storing rocket fuel and oxidizer at very low temperatures.
 - Fills empty space in tanks as fuel is used, keeping pressure stable.
 - Helium is also used in industrial welding, leak detection systems, etc.
- Some launches such as [ESA's Ariane 6](#) have experimented with other inert gasses like argon and nitrogen, which can be cheaper alternatives. However, **helium remains the most widely used gas in the space industry**.

Read More: [Cryogenics](#), [Astronauts Stuck in ISS](#).

PDF Refernece URL: <https://www.drishtiiias.com/printpdf/role-of-helium-in-rockets>