

ISOTOPE



3

He

Helium



Helium-3

Light weight. Heavy lifter.



Feature of the Month

Helium-3

Helium-3 (He-3) is a rare stable isotope that plays an important role in high-tech industries, scientific research, healthcare and border security.

HOW IS IT PRODUCED?



Tritium is a by-product of the daily operations of a **CANDU** reactor



Tritium is extracted concentrated, and safely stored in a Tritium removal facility



As Tritium decays, it transforms into **He-3**



Using custom-designed equipment, **He-3** is extracted from Tritium



DID YOU KNOW?



The Moon contains large quantities of He-3.

It is estimated that at least one million tons of He-3 is rooted within the Moon's rich soil known as regolith.

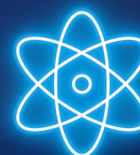
WHY IS HE-3 SO VALUABLE?



Extremely rare on Earth



Critical applications in science, medicine, and security



Non-radioactive and has exceptional neutron capture capabilities

Helium-3

He-3 is used across a wide range of applications, including:



QUANTUM COMPUTING

He-3 is used to reach near-absolute-zero temperatures, which reduces noise and interference in calculations.



FUSION

He-3 is an ideal fuel for fusion reactors when paired with deuterium, offering the advantage of producing trace amounts of neutrons.



MEDICAL IMAGING

He-3 is used for highly detailed Magnetic Resonance Imaging (MRI) of airways in the lung.



SECURITY

He-3 is used in border security for Radiation Portal Monitors to detect radioactive materials.



NEUTRON RESEARCH

He-3 is used in high-energy particle colliders to study the shadow world of anti-matter.

Helium-3

In 2021, Laurentis Energy Partners (Laurentis) announced a new program to extract He-3 from Tritium stored at Ontario Power Generation's (OPG) Darlington Nuclear Generating Station.



The Tritium is extracted from heavy water at the CANDU nuclear station. Once extracted, the He-3 is obtained using custom-designed equipment that Laurentis installed at Darlington. This innovative process has made Laurentis and OPG the world's largest civilian producers of this very rare isotope.

References

[BBC. What is Helium-3 and could we get it from the moon?](#)

[Helium-3 Applications and Recovery Technique](#)

[Helium-3 isotope He-3: Properties and Applications](#)

[Helium-3 Moon Mining: Powering Fusion Reactors by 2029](#)

[Laurentis Energy Partners launches Helium-3 production](#)

[NASA. Harnessing Power from the Moon](#)

[New Helium Developments in Alberta and Saskatchewan](#)

[Ontario Power Generation. The Power of Nuclear Isotopes](#)

[What is Helium-3 and why is it so important?](#)

[Why Helium-3 for Homeland Security?](#)

[World Nuclear News. Helium-3 to be extracted from Canadian tritium](#)

