

INDUSTRY EXPERTISE

Understanding Am-241/Be Sealed Sources: **A Practical Primer**

Americium-241/Beryllium sealed sources are a specialty in the sealed-source world — used across well-logging, industrial gauging, and research. They are also one of the harder source types to procure. Here is what buyers and Radiation Safety Officers should understand before sourcing one.

By **Nazia Khan** · Marketing & Technology Director, Gammatron, Inc.

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What Is an Am-241/Be Source?

A doubly-encapsulated source of steady neutron radiation.

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Where Are They Used?

Well-logging, gauging, research, and process measurement.

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Why Are They Hard to Source?

Only a handful of licensed manufacturers worldwide.

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FAILED SOURCES SINCE 1973

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Am-241

THE ISOTOPE AT OUR CORE

What Is an Am-241/Be Source?

An Am-241/Be sealed source is a doubly-encapsulated source containing americium-241 oxide and beryllium powder. The americium emits alpha particles that interact with the beryllium to produce a steady neutron stream — the alpha-n reaction — giving a compact, reliable, long-lived source.

With Am-241's half-life of roughly 432 years, these sources carry a Recommended Working Life of about 30 years — far longer than most sealed-source materials — with predictable output and stable activity across a device's service life.

Where Are They Used?

The most common application is oilfield well-logging, where neutron sources run downhole in wireline tools to measure porosity, density, and hydrocarbons. Their penetration and consistent output suit harsh downhole conditions, where a failed source means a costly trip back to surface.

They also appear in **industrial gauging** (thickness, density, moisture), in **research facilities** for calibration and detector testing, and in specialty process measurement where a long-lived, low-maintenance neutron source is required.

"An Am-241/Be sealed source is a doubly-encapsulated radiation source containing a mixture of americium-241 oxide and beryllium powder."

Why Are They Difficult to Source?

Only a handful of manufacturers worldwide produce Am-241/Be sources to commercial standards. The work demands specialized facilities, licensed handling of americium feedstock, controlled fabrication, and neutron-specific quality assurance.

In the U.S., very few facilities are licensed to make and recycle them — the expertise was built over decades by a few firms, and high barriers keep the field narrow. For buyers, lead times run long and supplier choice matters.

What to Look For

- **Capsule material** — 304 or 17-4 stainless, or MP-35 alloy, chosen for environmental and pressure conditions.
- **ANSI/ISO classification** — ISO 2919 / ANSI N43.6 Class 66646 is standard; 666×6 above 30,000 psi.
- **Activity and output** — curies (Ci) of Am-241, with the corresponding neutron emission rate (n/s).
- **Recommended Working Life** — typically 30 years.

- **Documentation** — source and leak-test certificates, and chain of custody end to end.

Recycling vs. New Source

Disused Am-241/Be sources can often be recycled — recovered, reprocessed, and remanufactured into a new source rather than disposed of. Recycling runs about one-third the cost of buying new and preserves the value of legacy assets.

Regulatory Context

These sources are regulated as byproduct material under 10 CFR Part 30, with possession, manufacture, transfer, and disposition all licensed; higher-activity sources fall under 10 CFR Part 37. A licensed specialty supplier whose license covers your activities simplifies the whole regulatory picture.

Closing

Am-241/Be sources are foundational across regulated industries but sit in a narrow niche. Buyers, RSOs, and procurement teams benefit from a supplier who knows the technology, the regulations, and the lifecycle — not just a reseller. Gammatron has manufactured and recycled Am-241 and Am-241/Be sources since 1973.

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Nazia leads brand, marketing, and the company's IT and internal systems work — bridging the commercial and the technical for a 50-year specialty company.