SELENIUM 75 (Se-75) SEALED RADIOACTIVE SOURCES

The successful use of gamma radiography depends on the ability to provide sufficient radiation to penetrate the weld and produce an image of acceptable resolution and contrast on the processed radiographic film.

Isotopes with low gamma energies don't give a good quality due to the inability to penetrate the object being imaged but well Se-75 which Gamma Spectrum is from 66 keV to 401 keV, with two lines of high intensity at 136 keV and 265 keV. The resultant average energy of 217 keV is lower than the 353 keV for Ir-192. This means that the Se-75 give better image quality compare to Ir-192 due to less energy.

- **Half Life:** (119.8 days) is **60 % more** than Ir-192 (74 days).
- **Exposure Rate Constant at 1 m:** 0,203 R-m^2/hr-Ci.
- **Less Dose Rate:** comparing with Ir-192 (55µSv/hr/GBq at 1 meter for Se-75 and 130µSv/hr/GBq at 1 meter for Ir-192).
- **Radiation Area:** is more favourable (± 13 meters) when compared with Ir-192 (± 28 meters).
- **HVL:** Fe 24 mm, Tg 2,7 mm.
- **TVL:** Fe 58 mm, Tg 8,2 mm.
- **Only One reloading per year** with a source of Se-75 (100 Ci).

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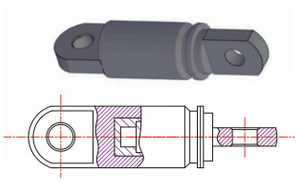
SELENIUM 75 (Se-75)
SEALED RADIOACTIVE SOURCES

Description

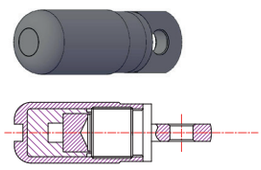
Double Capsule containing the isotope as pressed selenium powder. Internal Vanadium capsule pulse laser welded, external stainless steel capsule argon arc welded.

Technical Specifications

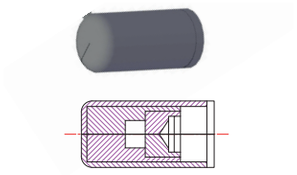
Main Application	Gamma radiography
Se-75 Half Life	119.8 days
Recommended Working Life	2 years
Se-75 Capsules Types	SR, GS
Material	Vanadium / Stainless Steel
Activity (depending dimensions)	Max 200 Ci (7400 GBq)
Identification	Unique Serial Number
Certificate Material Special Form	RUS/6223/S-96



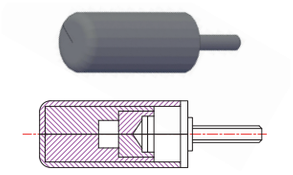
SR-17 Capsule



SR-18 Capsule



GS-M11 Capsule



GS-M12 Capsule

Focal Spot Sizes

Active Diameter (mm)	Active Height (mm)
1.0	1.0
1.5	1.5
2.0	2.0
2.5	2.5
3.0	3.0
3.5	3.5

Activity Range

GBq	Ci
74 - 222	2 - 6
370 - 555	10 - 15
740 - 1295	20 - 35
1,480 - 2,220	40 - 60
2,590 - 3,515	70 - 95
3,700 - 4,810	100 - 130

Capsule Dimensions and Safety Performance Testing

Se-75 Capsule Type	External Dimensions ∅ (mm) x h (mm)	External Capsule Material	ISO classification
SR-17 for EXERTUS CIRCA/RID-Se4P/Light	6.7 x 27	Steel 12X18H10T (321AISI)	C 63545
SR-18 for EXERTUS DUAL 60/120	7.15 x 23.5	Steel 12X18H10T (321AISI)	C 63545
GS-M11	6 x 12	Steel 12X18H10T (321AISI)	C 63545
GS-M12	6 x 20	Steel 12X18H10T (321AISI)	C 63545

Safety

All sealed sources conform to :

- Regulations for the Safe Transport & Radioactive Material 1996 Edition (as revised 2000) from the I.A.E.A.
- The International Standard Organisation recommendations ISO 2919:1999.
- The French NF M61-002: 1984 AFNOR standards.

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