

- $2 \cdot 10^8$  n/s at 14 MeV
- continuous or pulsed mode
- small diameter: 25 mm (1")
- minimum shielding required



The SODITRON is a small diameter sealed neutron tube; it is well suited for laboratory or industrial portable neutron generators, and can be installed in geophysical probes (oil industry excepted).

The equimolecular loading of deuterium-tritium gas provides a self replenishing of the target, thus increasing the tube lifetime.

The SODITRON operates either in continuous mode or in pulsed mode and emits up to  $2 \times 10^8$  neutrons at 14 MeV per second.

It offers obvious advantages in comparison with isotopic sources, such as no radiation hazard when the tube is not in operation.

### TYPICAL APPLICATIONS

- On-line analysis of raw materials
- Mineral prospection
- Disarmament inspection
- Detection of explosives
- Research
- Education ...



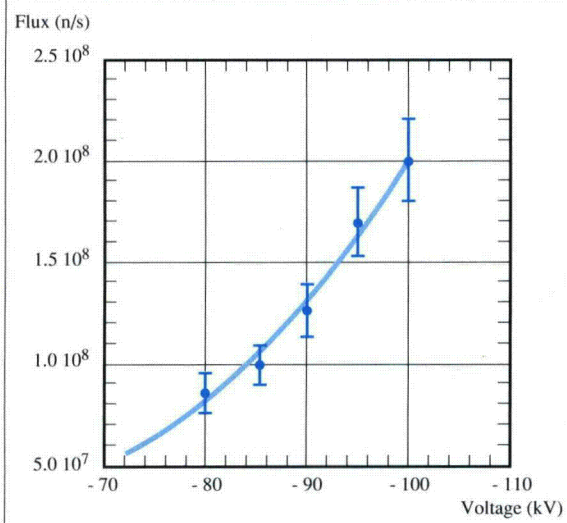
## TECHNICAL DATA

### Physical

- Neutron energy: 14 MeV
- Neutron emission:
  - adjustable up to  $2 \times 10^8$  neutron per second /  $4 \pi$  sr
  - peak in pulsed mode: up to  $10^5$  n/s depending on pulse width and pressure
  - pulse flux: up to  $10^7$  neutrons /p. at 10 Hz
- Pulse rate: up to 20 kHz
- Pulse width: from 5  $\mu$ s to continuous mode
- Rise and fall time: from 1 to 5  $\mu$ s depending on the pressure
- Tritium:  $< 10^{11}$  Bq (2.6 Ci)

### Electrical

- Accelerating voltage : up to - 100 kV  
(typical value - 90 kV)
- Target current : up to 100  $\mu$ A
- Target dissipation :  $< 10$  Watts
- Ion source voltage : 2 kV  $\pm 10\%$
- Ion source current : 750  $\mu$ A typ
- Replenisher voltage : 1 V typ., 3 V max
- Replenisher current : 1 A typ., 2 A max



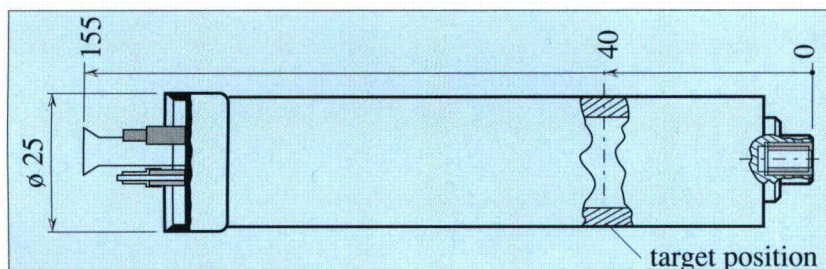
(Variation of neutron production rate with applied VHV)

### Mechanical

- Presentation : ceramic wall tube
- Diameter : 25 mm (1")
- Length : 155 mm (6.1")
- Weight : 200 g

### Environment

- Operating temperature range : + 5 to + 125° C
- Insulation by mean of: oil, Fluorinert or SF 6 under 4 atm. with optional radiator



(Dimensions mm)

### Maintenance

- The SODITRON can operate after storage without previous reconditioning
- Lifetime: better than 300 hours (for 200  $\mu$ s pulses at 500 Hz and at 90 kV)

### Option

- The SODITRON can be delivered in Deuterium-Deuterium version:
  - neutron energy: 2.5 MeV
  - D-D level of emission: about 100 times less than D-T
  - no tritium: no radioactivity

## RULES IN FORCE

The neutron tubes are listed under the heading of equipment submitted to authorization under nuclear non proliferation rulings and to verification of the final destination. The sale requires a validated export license and an undertaking not to re-export. It is required to return the tube to SODERN at end of life or at the latest 10 years after delivery date.