SODERN
NEUTRON TARGET

CUSTOMISED TARGETS ON REQUEST

SODERN, as a leading company in neutron instrumentation, carries on with the neutron targets manufacturing activity that the **French Atomic Energy Agency** has stopped in year 2000.

Such targets are integrated into fast neutron emitting devices such particle accelerators or sealed neutron tubes.

3 types of targets are available :

~ Tritiated targets
~ Deuterated targets
~ Phantom targets

Beyond our customers are :

For <u>analytical applications</u>
(Calibration & activation)

From Asia: University of Chiang Mai Thailand)
From Europe: PTB, FhG, GSF (Germany), ENEA (Italy), IPSN (CEA Cadarache France), IRMM (Geel Belgium),

For <u>Neutron therapy</u>
(tumour treatment, materials irradiation)

From Europe: ETCA (France), WIS/BWB (Germany), CEA/DAM (Valduc France)

For <u>Fundamental research</u>
(Neutron-matter interaction)

From Europe: University of technology of Dresde (Germany), INFN (Italy),
From Asia: JAERI (Japan Atomic Energy Research Institute)

ISO-9001 ANSI + RAB GMS ACCREDITED

EADS SODERN

Manufacturing process

All SODERN's neutron targets are manufactured by depositing a thin titanium layer on a metallic substrate. This deposit is then impregnated with deuterium, tritium or a mixture of both gases. Tritiated & deuterated targets are made following the same three step process :

- Machining and preparation of the substrate surface,
- Metal coating by evaporation under vacuum,
- Impregnation with tritium or deuterium.

The quality of the substrate is very important. For example, the quality type OFHC (or CuA) is usually required for copper.

Specific deuterium or tritium targets are manufactured on request, according to the requirements of the users. Indeed, SODERN has developed several technologies for tritium targets, allowing to select the best configuration for each kind of use. Activity of targets lies between 1 and 1000 Curie.

Technical specifications

Tritiated targets

Small standard targets

Circular metallic substrate made of copper with a diameter lower than 70 mm.

Large and special targets

- Large targets

SODERN's targets are produced with a diameter up to 310 mm. Usual dimensions already manufactured have the following diameters : 146, 152, 232 mm.

- Special targets

With various shape (different from circular): disc, cup, cylinder…
With a substrate made of aluminium, stainless steel, silver, gold…
With various dimensions for the deposit on the substrate.

…can be also manufactured on request.

TARGET PACKING

Deuterated targets

These targets are manufactured using the same process as the tritium targets.

Phantom targets

Phantom target have the same specifications regarding the deposit but without impregnation are also available.

DAN/FP/01 - 02/03

20 Avenue Descartes
94451 Limeil Brévannes - France
Tel : +33 1 45 95 70 11 - Fax : +33 1 45 95 70 70
http://www.sodern.fr Email: neutronics@sodern.fr