

Objective

The irradiation facility “Beta Secondary Standard 2 (BSS 2)” was extended for several capabilities, marked below in **red** (available from 2012)

Literature

P. Ambrosi et al.: *The PTB Beta Secondary Standard BSS 2 for rad. protection.* J Instrum 2 P11002 (2007)

R. Behrens and G. Buchholz: *Extensions to the BSS 2.* J Instrum 6 P11007 (2011) and Addendum

R. Behrens and G. Hilgers: *Photon spectra from beta sources of the BSS 2.* J Instrum 6 P09006 (2011)

Radiation sources

¹⁴⁷Pm, ⁸⁵Kr, ⁹⁰Sr/⁹⁰Y, and ¹⁰⁶Ru/¹⁰⁶Rh (planned)



Quantities

Dose and dose rate of

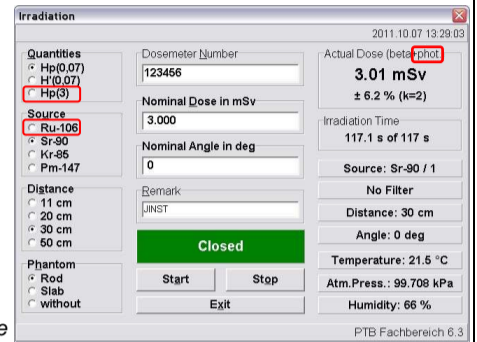
- $H'(0.07)$ for all nuclides
- $H_p(0.07)$ for all nuclides
- $H_p(3)$ for ⁹⁰Sr/⁹⁰Y and ¹⁰⁶Ru/¹⁰⁶Rh

Source with coding pins (top) and closed shutter (front)

Technique

- All parameters computer controlled (**LAN connected**)
- Dose pre-selectable
- Dose corrected for radioactive decay and ambient conditions
- Safe source handling
- Beam flattening filter for homogenous radiation fields
- **Rod phantom included**

Screenshot of the software

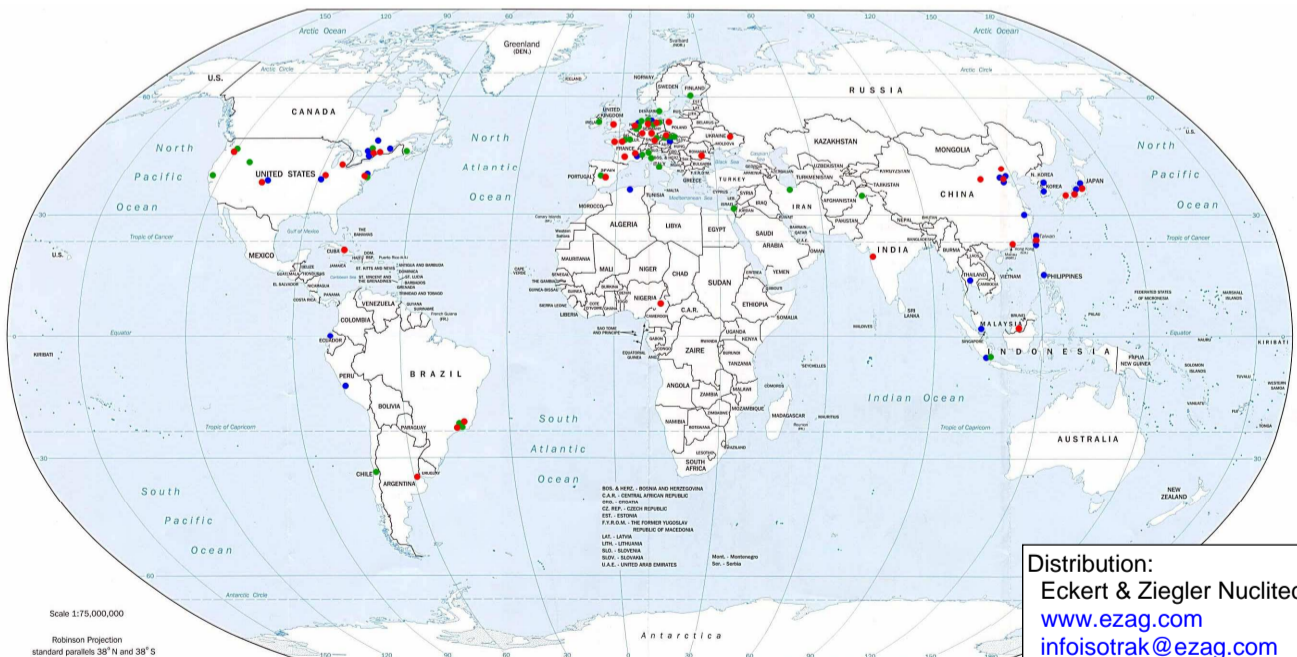


Details of the radiation fields

Radionuclide; Nom. activity	Half-life	Beta energy mean; maximum	Dose rate $H_p(0.07)$ (fresh sources)	Dose rate ratio $H_p(3)/H_p(0.07)$	Field diameter for $H_p(0.07)$ -dose homogeneity of $\pm 1\%$; $\pm 3\%$	Photon contrib. to $H_p(0.07)$; $H_p(3)$
¹⁴⁷ Pm; 3.7 GBq	2.62 y	0.06 MeV; 0.23 MeV	7 mSv/h @ 20 cm with filter	—	$\varnothing = 2$ cm; 4 cm	0.6 %; —
⁸⁵ Kr; 3.7 GBq (0.1 GBq*)	10.7 y	0.2 MeV; 0.69 MeV	150 mSv/h @ 30 cm with filter 54 mSv/h @ 50 cm with filter* (4 mSv/h @ 30 cm with filter*)	—	$\varnothing = 4$ cm; 10 cm $\varnothing = 12$ cm; 20 cm ($\varnothing = 4$ cm; 10 cm)	0.025 %; — 0.028 %; — (0.025 %; —)
⁹⁰ Sr/ ⁹⁰ Y; 0.46 GBq	28.8 y	0.8 MeV; 2.3 MeV	450 mSv/h @ 11 cm	0.50	$\varnothing = 2$ cm; 4 cm	0.04 %; 0.08 %
			140 mSv/h @ 20 cm	0.49	$\varnothing = 3$ cm; 6 cm	0.04 %; 0.08 %
			60 mSv/h @ 30 cm	0.48	$\varnothing = 7$ cm; 11 cm	0.04 %; 0.08 %
			40 mSv/h @ 30 cm with filter	0.43	$\varnothing = 8$ cm; 28 cm	0.06 %; 0.14 %
¹⁰⁶ Ru/ ¹⁰⁶ Rh*; 0.02 GBq	1.02 y	1.2 MeV; 3.5 MeV	25 mSv/h @ 11 cm	0.76	$\varnothing = 2$ cm; 3 cm	0.20 %; 0.26 %
			7 mSv/h @ 20 cm	0.77	$\varnothing = 5$ cm; 7 cm	0.23 %; 0.30 %
			2.5 mSv/h @ 30 cm with filter	0.76	$\varnothing = 14$ cm; 24 cm	0.17 %; 0.22 %

* Special sources and calibrations available on request: ¹⁰⁶Ru/¹⁰⁶Rh, ⁸⁵Kr with reduced activity or ⁸⁵Kr with a calibration at 50 cm

Distribution worldwide since 1978 (including previous versions): More than 130 devices



Distribution:
Eckert & Ziegler Nuclitec GmbH
www.ezag.com
infoisotrak@ezag.com

• BSS1 Version 1
1978 - 1983

• BSS1 Version 2
1984 - 1996

• BSS2
since 1998

