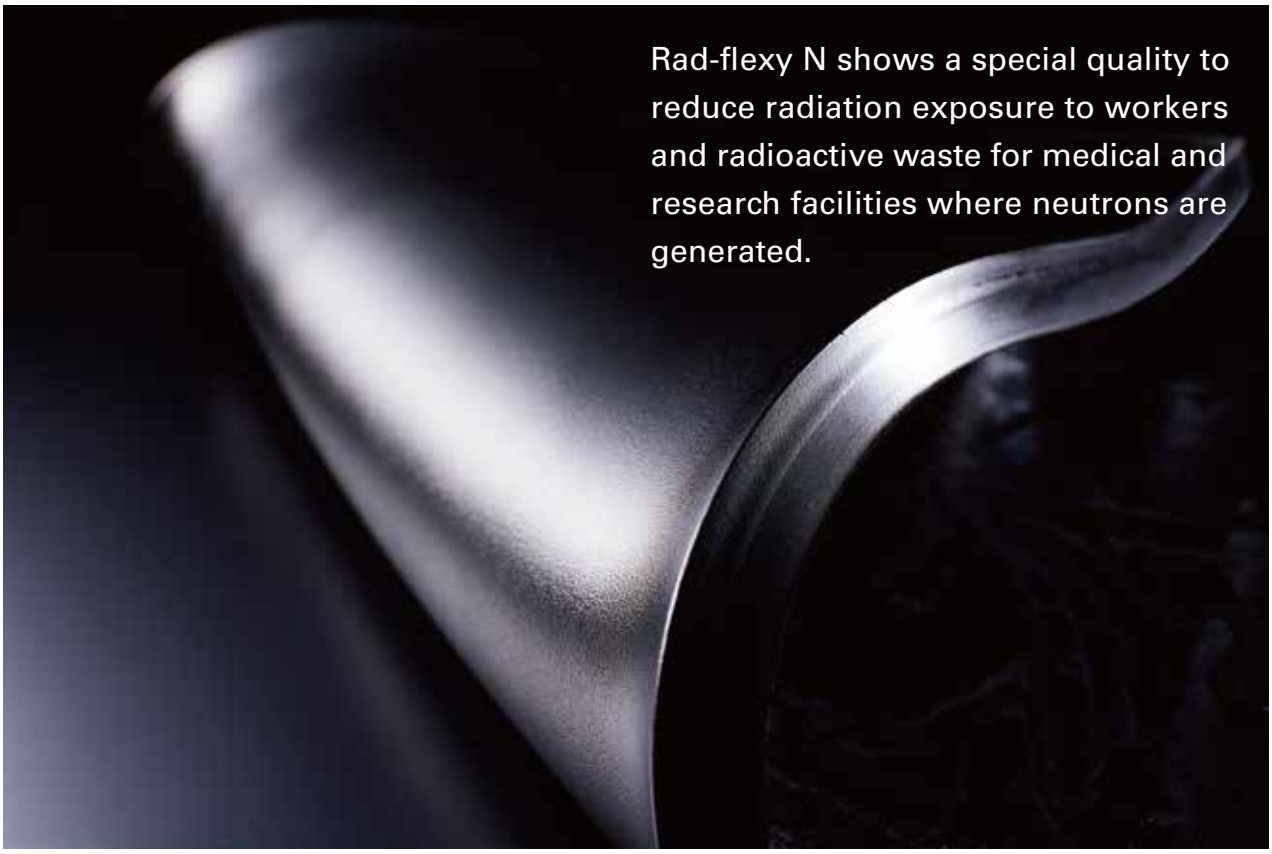
Rad-flexy N (neutron absorber)



Rad-flexy N shows a special quality to reduce radiation exposure to workers and radioactive waste for medical and research facilities where neutrons are generated.

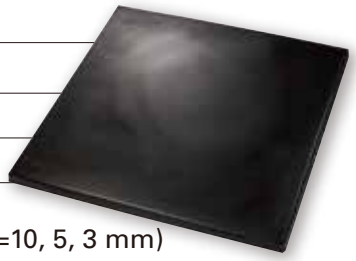
By mitigating neutron-induced radioactivation of concrete and metals, **Rad-flexy N**

- keeps the air dose in the facility* at a safe level and reduces exposure to the workers;
- reduces the volume of radioactive wastes generated when decommissioning the facility and contributes to preservation of environment;
- prevents malfunction of peripheral devices;
- is radiation-resistant against gamma-ray.

*(medical facilities) for proton beam therapy and heavy particle radiotherapy, PET, BNCT, etc.

sheet type

coating type



specification	boron carbide content：20wt%
	density：1.2 g/cm^3
	color ：black
	form：sheet type (30 cm×30 cm square, thickness=10, 5, 3 mm) coating type
characteristics	high elasticity, good processability
	radiation-resistant ： up to 5 MGy（gamma-ray）
	water-resistant and anti-erosive
where to apply	walls inside accelerator facilities, also applicable on curved surfaces around equipment
usage	◎reduction of exposure to the workers
	◎reduction of quantities and disposal costs of radioactive wastes

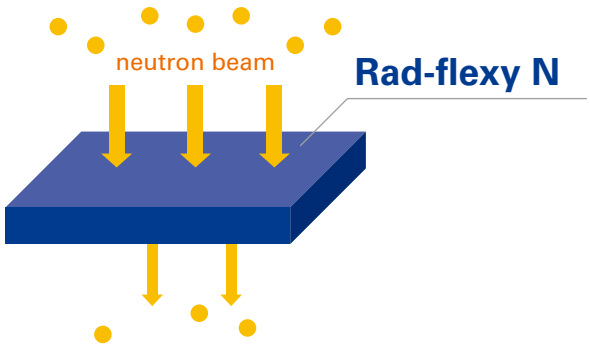
※This material has been developed jointly with Hazama Ando Corporation.

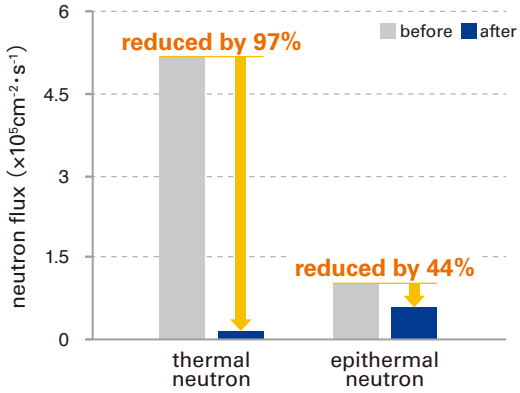
Bridges

neutron absorption effect

A neutron beam was irradiated from above Rad-flexy N (10 mm thick) and the neutron flux at the top and bottom of Rad-flexy N were obtained by using foil activation method (gold foils) attached on top and bottom sides.

〈image of neutron absorption test〉





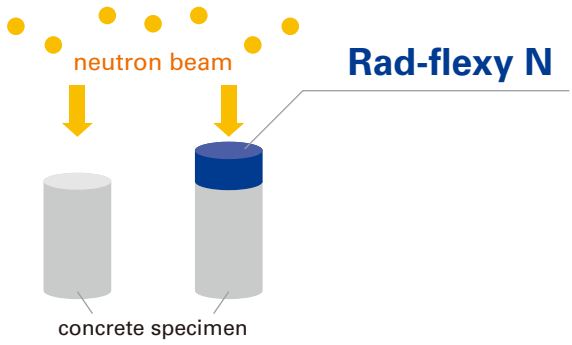
【Neutron absorption test】
was conducted
by Hazama Ando Corp.
The figures are test results.

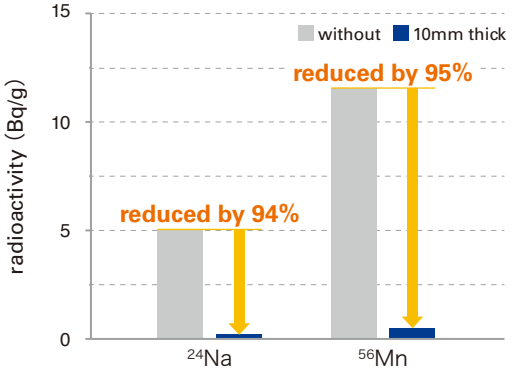
【conditions of assessment】 total neutron flux : 6.2×10^5 $cm^{-2}\cdot s^{-1}$ thermal neutron flux : 5.2×10^5 $cm^{-2}\cdot s^{-1}$ irradiation time : 3 hours

neutron reduction effect

Rad-flexy N was placed on top of the concrete specimen and a neutron beam was applied from above.→ Radioactive isotopes ^{24}Na and ^{56}Mn induced by irradiation in the concrete specimen were compared

〈image of neutron activation test〉





【radioactivation assessment】
was conducted
by Hazama Ando Corp.
The figures are test results.

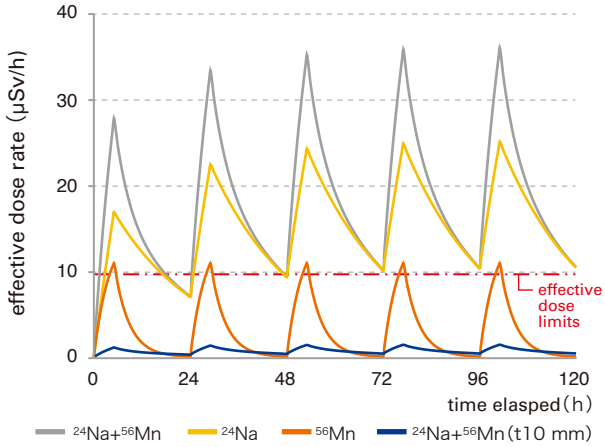
【conditions of assessment】total neutron flux : 6.9×10^5 $cm^{-2}\cdot s^{-1}$ thermal neutron flux : 5.9×10^5 $cm^{-2}\cdot s^{-1}$ irradiation time : 4 hours

simulation of nuclide production by radioactivation

Change over time of radionuclides produced by irradiated thermal neutrons in concrete and the effect of the material (10 mm thick)

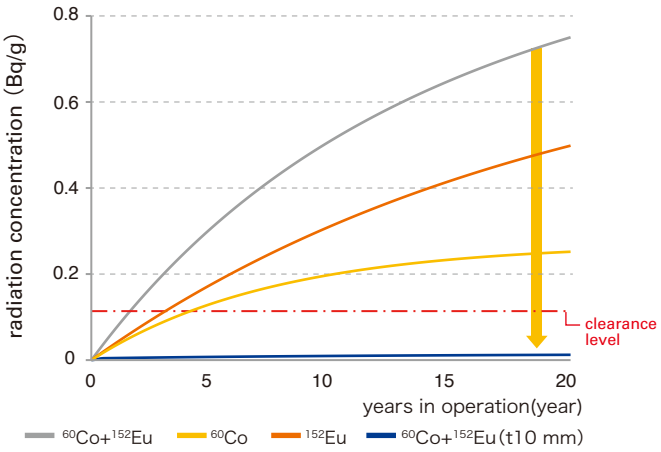
【during operation】reduced exposure to the workers

▶ Dose reduced to the level close to that of natural environment



【at decommissioning】reduced disposal costs of radioactive wastes and environmental burdens

▶ wastes can be disposed of as general wastes



【conditions of assessment】 thermal neutron flux : 1.0×10^6 $cm^{-2}\cdot s^{-1}$ irradiation time : 5 h/day, size of the wall : 3.0×2.4 m, height : 1.0 m

Bridges
Engineering & Solutions
https://bridges-jp.com

Bridges Co.,Ltd.
〈Main Office〉
Kanda Nishiki cho 3-21, Chiyoda-ku, Tokyo TEL.03-5282-8500
〈Brunch Office〉
Kashima, Chubu, Sapporo, Kansai

〈manufactured in cooperation with〉
ヨシザワLA株式会社
http://www.yoshizawa-la.co.jp/