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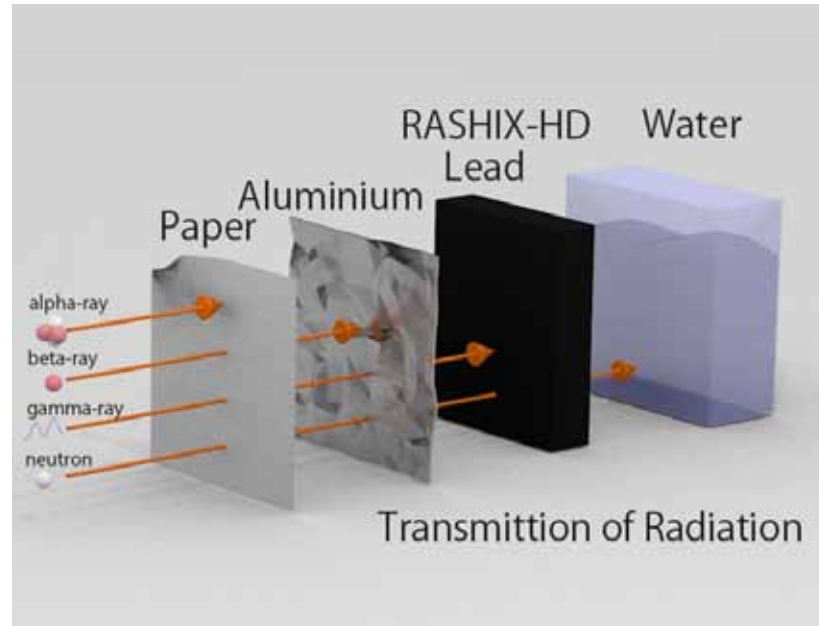


**RASHIX-HD**

Lead-Free Radiation Shielding Ceramics  
For the sake and security

# Lead-Free Shielding : RASHIX-HD

RASHIX-HD, which has extremely high density (4.9 g/cm<sup>3</sup>), is able to shield radiation efficiently. RASHIX-HD shields also gamma-ray that transmit usual material, not only alpha and beta-ray. Leads are well known as shielding material of gamma-ray, but RASHIX-HD does not contain leads and any other heavy metals.



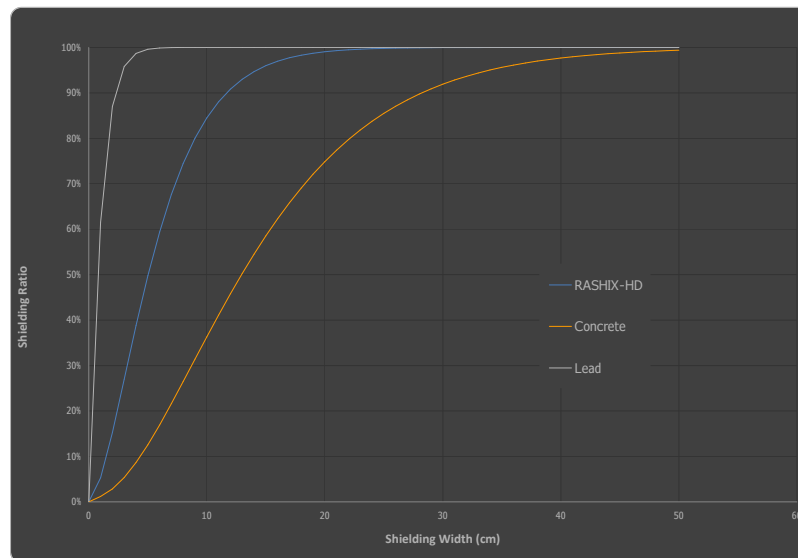
Four types of radiation make up radiation: alpha-radiation, beta-radiation, gamma and X-radiation and neutron radiation. Alpha and beta-radiation have only small transmittance; alpha particles are not able to penetrate a paper; thin aluminum provides protection against beta particles. Because gamma and X-radiation are the energy emitted in the form of electro-magnetic radiation, they have strong transmittance, and are not able to be shielded by general constructions. Neutron radiation are not able to travel in the water but leads.



For instance, RASHIX-HD reduces the gamma-ray emitted from 137Cs to 1/6 of concrete.

Superior radiation shielding property of RASHIX is examined by laboratories at universities and is verified by radioactive waste enclosure test.

By Tokyo Metropolitan Industrial Technology Research Institute: IRI Tokyo, Okayama Science College, and Osaka Prefecture University, its shielding ability of gamma-ray from 137Cs and/or 60Co is tested and verified.



Thickness [cm]	Shielding Ratio		
	RASHIX-HD	Concrete	Lead
0	0.0%	0.0%	0.0%
1	5.3%	1.2%	61.5%
2	15.2%	2.9%	87.0%
3	27.0%	5.4%	95.8%
4	38.8%	8.6%	98.7%
5	49.8%	12.6%	99.6%
6	59.4%	16.9%	99.9%
7	67.6%	21.6%	100.0%
8	74.4%	26.5%	100.0%
9	80.0%	31.4%	100.0%
10	84.5%	36.3%	100.0%
15	96.0%	58.5%	100.0%
20	99.1%	74.9%	100.0%
30	100.0%	91.9%	100.0%

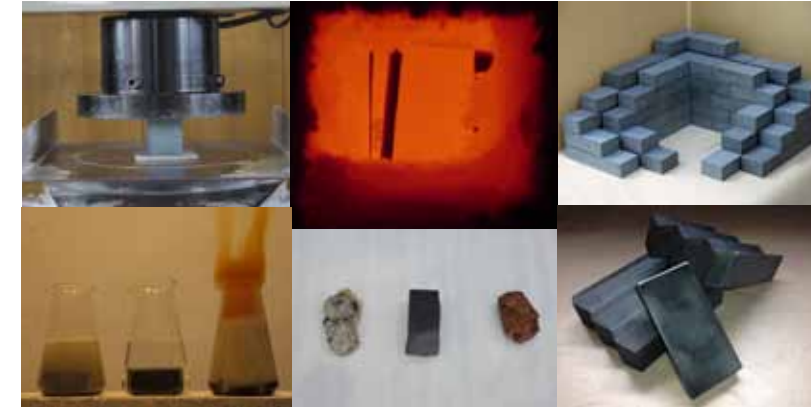
# Features of RASHIX-HD

High Strength

Mass Production

Re Usable

Surprising Specific Gravity



Safe and Harmless

Various Forms

Chemical Proof

No Deterioration

# Usage of RASHIX-HD

Shielding for Radiation Workers



Shielding of Nuclear Fallout Shelters

Containers of Radioactive wastes



Shielding of Oversight center of Nuclear Power Plant

X-ray Shielding for Medical Center



Shielding for Linac and ion Beam Therapy