

The Relationship between Gray & Sievert Units

Sievert value

=

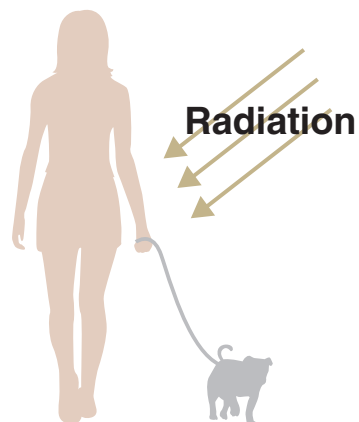
Gray value

×

Radiation weighting factor *1

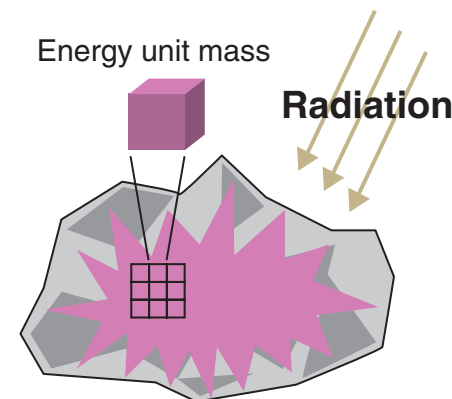
×

Tissue weighting factor *2



Sievert (Sv)

This unit is used for assessing how much risk radiation poses to people in terms of inducing cancer or genetic damage.
(1 Sievert = 1,000 mSv)



Gray (Gy)

This unit represents how much energy was received by an object or person hit by radiation.
A dose of 1 gray corresponds to 1 joule of energy absorbed by 1 kilogram of matter.

◆ Radiation weighting factor

Types of Radiation	Radiation weighting factor
Photon (gamma or x-rays)	1
Electrons (beta rays)	1
Proton	2
Alpha particles, fission fragments, heavy nuclei	20
Neutron radiation	2.5-20 (Determined by the continuous function of energy)

◆ Tissue weighting factor

Tissue/Organ	Tissue weighting factor	Tissue/Organ	Tissue weighting factor
Breast	0.12	Esophagus	0.04
Red bone marrow	0.12	Thyroid	0.04
Colon	0.12	Salivary gland	0.01
Lung	0.12	Skin	0.01
Stomach	0.12	Bone surface	0.01
Gonads	0.08	Brain	0.01
Bladder	0.04	Remaining tissues /organs	0.12
Liver	0.04		

*1: Represents the difference in effect according to the type of radiation.

*2: Represents how susceptible different tissues, such as internal organs, are to radiation.