

Cables and wires under ionizing radiation

Specific cables and wires designed and manufactured to be exposed to ionizing radiation, should be tested (i.e. according IEC 544-5) and classified for that specific purpose. Cables & wires for other (general) usages are not individually tested to that purpose. For regular cables & wires when exposed to radiation, radiation resistance can be estimated by using typical values of the materials they are made from.

These values do not represent radiation resistance characteristics evaluated by results of made tests on complete cables. Nevertheless, these values are applicable to estimate cables radiation resistance characteristics relatively.

Radiation resistance is defined by the radiation index (RI) according IEC 544-4 as decade logarithm of the absorbed dose in Gray (Gy) of the material after exposure having 50% elongation of brake of its unaged value at least.

Table 28-1 shows typical max. dose in "Gy" or in former "rad" unit values.

Conversion values:
100 kGy = ca. 10 Mrad; 1Gy = 1 J/kg; 1 Mrad = ca. 10 kGy

Material-Type	Absorbed dose in Gy ca.	Absorbed dose in rad ca.
PVC	8 x 10 ⁵	8 x 10 ⁷
PE LD	1 x 10 ⁵	1 x 10 ⁷
PE HD	7 x 10 ⁴	7 x 10 ⁶
VPE (XLPE)	1 x 10 ⁵	1 x 10 ⁷
PS	5 x 10 ⁴	5 x 10 ⁶
PA	1 x 10 ⁵	1 x 10 ⁷
PP	1 x 10 ³	1 x 10 ⁵
PETP	1 x 10 ⁷	1 x 10 ⁷
PUR	5 x 10 ⁵	5 x 10 ⁷
TPE-E	1 x 10 ⁵	1 x 10 ⁷
TPE-O	1 x 10 ⁵	1 x 10 ⁷
NR	8 x 10 ⁵	8 x 10 ⁷
SIR	2 x 10 ⁵	2 x 10 ⁷
EPR	1 x 10 ⁶	1 x 10 ⁸
EVA	1 x 10 ⁵	1 x 10 ⁷
CR	2 x 10 ⁵	2 x 10 ⁷
CSM	5 x 10 ⁴	5 x 10 ⁶
PVDF	1 x 10 ⁵	1 x 10 ⁷
ETFE	1 x 10 ⁵	1 x 10 ⁷
FEP	3 x 10 ⁵	3 x 10 ⁵
PFA	1 x 10 ³	1 x 10 ⁵
PTFE	1 x 10 ³	1 x 10 ⁵

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