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C2Po2B-07 [11]: Influence of Ionizing Radiation on the Design of Cryogenic Valves and Components

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In several scientific application, where cryogenics is used to cool down cavities or superconductive magnets, ionizing radiation can occur. Ionizing radiation accelerates the aging process of organic materials and leads to a degradation of semiconductors.

Nonetheless, cryogenic applications in high physics facilities require a precise and reliable control of the flow, the temperature and the pressure. Sensors and valves are thus specified to be able to work in an ionizing radiation environment.

This publication illustrates how the function of cryogenic valves can be guaranteed under radiation conditions (tightness and control accuracy), which are the advantages and the risks of different solutions and how radiation harming must be taken in consideration in the maintenance plan.

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