Specifications

Passive Neutron Dosimeters

Objective

The purpose of this order is to procure 100 passive neutron dosimeters for environmental monitoring at FAIR.

The Radiation Protection Department requires 50 dosimeters without a lead layer for measurements in low-energy neutron fields (< 20 MeV) and 50 dosimeters with a lead layer for measurements in the energy range up to 5 GeV.

A Li-6 TLD card, which is particularly sensitive to thermal neutrons, is used as the sensitive element at the center of the sphere. The spheres serve as moderators and provide suitable neutron fluence-to-ambient dose (H*(10)) conversion.

With the expansion of radiation protection monitoring during the FAIR commissioning phase and operation, a significant increase in the number of monitoring locations and, consequently, in the demand for neutron dosimeters is expected. The dosimeter spheres are therefore to be used at the designated monitoring locations for the continuous surveillance of neutron radiation.

The procurement of 100 passive neutron dosimeters will ensure that the necessary equipment is available for the commissioning and reliable operation of FAIR from radiation protection point of view.

Technical Specifications

Serial No.	Requirement	Technical Specifications
1	Quantity	Delivery of a total of 100 passive neutron dosimeter spheres.
2	Material	The dosimeter spheres are to be manufactured from high-quality, high-density polyethylene (without e.g. adhesives) in accordance with the provided technical drawings. Lead parts are to be manufactured from pure lead (>99.9%). (Lead parts may be bonded using a small amount of adhesive.)
3	Specifications	50 dosimeter spheres without a lead layer and 50 dosimeter spheres with a lead layer.
4	Detector Element	The TLD card, provided by the client, should be inserted into the center of the sphere in accordance with the technical drawings.

5	Dimensions and Tolerances	All dimensions, tolerances, and other design specifications must be taken from and adhered to as specified in the technical drawings provided by the client.
6	Technical Drawings	The technical drawings are provided by the client and serve as the basis for manufacturing.
7	Prototype Construction	For quality control purposes, a spherical dosimeter with lead layer must be manufactured as a prototype prior to production of the entire amount and provided for the client for inspection and approval.