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Process Control Methods in Radiation Technologies

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Radiation processing has become a well-known and well-accepted technology worldwide using different type gamma irradiation facilities, electron accelerators and X-ray machines. The technology is applied at various fields like radiation sterilization of medical devices, manufacturing of polymer products used in industry and health care, irradiation of various food and agricultural products, as well as the emerging technologies like synthesis of advanced materials and environmental protection. The successful implementation of these technologies depends very much on reliable quality assurance, i.e. the measurement of absorbed dose during process validation and control, the continuous check of machine parameters and the use of mathematical modelling in certain stages of the technology. It is achieved by using harmonized and standardized dosimetry procedures performed with different type and category product specific dosimetry systems. Dosimetry, as part of the total quality system provides quality assurance and documentation that the irradiation process was performed according to the pre-set specifications. Accurate and traceable dosimetry measurements, based on suitable calibration procedures, provide independent means for quality control in radiation processing.

In all validation steps (as described in ISO Standard 11137), i.e. during process definition, installation-, operational- and performance qualification, as well as in routine process control, various reference standard and routine dosimetry systems are applied for quality control. In the course of the presentation the main dosimetry procedures, required during the validation steps will be discussed. Thus the selection and use of reference and routine dosimeters for the characterization of the irradiation facility and the establishing of the irradiation technology as well as for routine process control will be highlighted through practical examples. Besides the challenges and solutions relevant to different irradiation facility designs and recent radiation technology requirements will be shown with respect to available process control methods.

Country/Organization invited to participate

Hungary

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