

641—42.2(136C) Definitions. The definitions provided in 641—Chapters 37 and 40 may also apply to the provisions of this chapter. Additionally, the following definitions set forth below are specific to this chapter.

“Accessible surface” means surface of equipment or of an equipment part that can be easily or accidentally touched by persons without the use of a tool.

“Added filtration” means any filtration that is in addition to the inherent filtration.

“Analytical X-ray equipment” means equipment used for X-ray diffraction or fluorescence analysis.

“Analytical X-ray system” means a group of components utilizing X-rays or gamma rays to determine the elemental composition or to examine the microstructure of materials.

“Beam-limiting device” means a field defining collimator, integral to the therapeutic radiation machine, that provides a means to restrict the dimensions of the useful beam.

“Beam-scattering foil” means a thin piece of material (usually metallic) placed in the beam to scatter a beam of electrons in order to provide a more uniform electron distribution in the useful beam.

“Bent beam linear accelerator” means a linear accelerator geometry in which the accelerated electron beam must change direction by passing through a bending magnet.

“Cold pasteurization” means the process of using radiation for destroying disease-causing microorganisms in commercial products.

“Contact therapy system” means a therapeutic radiation machine with a short target-to-skin distance (TSD), usually less than five centimeters.

“Dose monitor unit” or *“DMU”* means a unit response from the beam monitoring system from which the absorbed dose can be calculated.

“External beam radiation therapy” means therapeutic irradiation in which the source of radiation is at a distance from the body.

“Fail-safe characteristics” means a design feature that causes beam port shutters to close, or otherwise prevents emergence of the primary beam, upon the failure of a safety or warning device.

“Field flattening filter” means a filter used to homogenize the absorbed dose rate over the radiation field.

“Filter” means material placed in the useful beam to change beam quality or its intensity profile in therapeutic radiation machines.

“Gantry” means that part of a radiation therapy system supporting and allowing movements of the radiation head around a center of rotation.

“Interruption of irradiation” means the stopping of irradiation with the possibility of continuing irradiation without resetting of operating conditions at the control panel.

“Iowa approved” means recognized or accepted by the department as meeting the training and experience requirements established by the Mammography Quality Standards Act as amended to August 1, 2025, CFR, or any additional criteria set forth by the department. This may include but is not limited to formal approval by the department based on documentation of education, training, certification, and clinical experience.

“Isocenter” means the center of the sphere through which the useful beam axis passes while the gantry moves through its full range of motions.

“Local components” means part of an analytical X-ray system and includes X-ray areas that are struck by X-rays, such as radiation source housings, port and shutter assemblies, collimators, sample holders, cameras, goniometers, detectors, and shielding, but does not include power supplies, transformers, amplifiers, readout devices, and control panels.

“Megavolt (MV)” or *“mega electron volt (MeV)”* means the energy equal to that acquired by a particle with one electron charge in passing through a potential difference of one million volts in a vacuum. (Note: Current convention is to use MV for photons and MeV for electrons.)

“Monitor unit” or *“MU”* means the same as “dose monitor unit.”

“Moving beam radiation therapy” means radiation therapy with continuous displacement of one or more mechanical axes relative to the patient during irradiation. It includes arc therapy, skip therapy, conformal therapy, intensity modulation, and rotational therapy.

“Nominal treatment distance” means:

1. For electron irradiation, the distance from the scattering foil, virtual source, or exit window of the electron beam to the entrance surface of the irradiated object along the central axis of the useful beam.

2. For X-ray irradiation, the virtual source or target to isocenter distance along the central axis of the useful beam. For nonisocentric equipment, this distance shall be that specified by the manufacturer.

“Normal operating procedures” means step-by-step instructions necessary to accomplish the analysis. These procedures shall include sample insertion and manipulation, equipment alignment, routine maintenance by the registrant or licensee, and data recording procedures, which are related to radiation safety.

“Open-beam configuration” means an analytical X-ray system in which an individual could accidentally place some part of the individual’s body in the primary beam path during normal operation.

“Periodic quality assurance check” means a procedure that is performed to ensure that a previous calibration continues to be valid.

“Practical range of electrons” corresponds to classical electron range where the only remaining contribution to dose is from bremsstrahlung X-rays. A further explanation may be found in “Clinical Electron Beam Dosimetry: Report of AAPM Radiation Therapy Committee Task Group 25” (Medical Physics 18(1): 73-109, Jan/Feb 1991) and ICRU Report 35, “Radiation Dosimetry: Electron Beams with Energies Between 1 and 50 MeV,” International Agency on Radiation Units and Measurements, September 15, 1984.

“Primary beam” means radiation that passes through an aperture of the source housing by a direct path from the X-ray tube or a radioactive source located in the radiation source housing.

“Radiation field” means the same as “useful beam.”

“Radiation head” means the structure from which the useful beam emerges.

“Radiation therapy physicist” means an individual qualified in accordance with 641—subrule 41.5(3).

“Redundant beam monitoring system” means a combination of two dose monitoring systems in which each system is designed to terminate irradiation in accordance with a preselected number of dose monitor units.

“Self-shielded particle accelerator” means a particle accelerator with the accelerator installed in an enclosure independent of the existing architectural structures, except the floor on which it may be placed. The enclosure must have been evaluated by a qualified expert and that evaluation approved by an appropriate regulatory authority through a device evaluation. The self-shielded accelerator is intended to contain at least that portion of material being irradiated, provide radiation attenuation, and exclude personnel from its interior during generation of radiation. A particle accelerator used within a shielded part of a building, or which may temporarily or occasionally incorporate portable shielding, is not a self-shielded particle accelerator.

“Shadow tray” means a device attached to the radiation head to support auxiliary beam blocking material.

“Shielded facility” means an accelerator facility where shielding is required to be constructed on site in order to ensure compliance with the requirements of 641—Chapter 40 or where shielding supplied with the accelerator has been evaluated by qualified experts and that evaluation approved by an appropriate regulatory authority through a device evaluation.

“Stationary beam radiation therapy” means radiation therapy without displacement of one or more mechanical axes relative to the patient during irradiation.

“Target” means that part of an X-ray tube or accelerator onto which is directed a beam of accelerated particles to produce ionizing radiation or other particles.

“Tenth-value layer” or *“TVL”* means the thickness of a specified material that attenuates X-radiation or gamma radiation to an extent such that the air kerma rate, exposure rate, or absorbed dose rate is reduced to one-tenth of the value measured without the material at the same point.

“Therapeutic radiation machine” means X-ray or electron-producing equipment designed and used for external beam radiation therapy.

“Virtual source” means a point from which radiation appears to originate.