

TITLE 32: ENERGY
CHAPTER II: ILLINOIS EMERGENCY MANAGEMENT AGENCY
SUBCHAPTER b: RADIATION PROTECTION

PART 380
ANALYTICAL TYPES OF X-RAY EQUIPMENT

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Section 380.10 Scope

This Part establishes special requirements for x-ray diffraction units, x-ray spectrographic fluorescence equipment, etc. The provisions of this Part are in addition to, and not in substitution for, other applicable provisions of Agency regulations.

(Source: Amended at 33 Ill. Reg. 2240, effective January 23, 2009)

Section 380.20 Definition

"Analytical x-ray machines or equipment" means any machine utilizing x-rays for examination of the microscopic structure, or elemental or chemical composition of materials. This includes all types of x-ray diffraction and spectrographic equipment.

Section 380.30 Labeling

- a) A label bearing the words "Caution – Radiation – This Equipment Produces Radiation When Energized" shall be placed near any switch which energizes a tube.

- b) A sign bearing the words "Caution – High Intensity X-Ray Beam", or words having a similar intent, shall be placed in the area immediately adjacent to each tube head. The sign shall be so located that it is clearly visible to any person operating, aligning, or adjusting the unit, or handling or changing a sample.
- c) A clearly visible indication of the presence of an x-ray beam shall be provided on or immediately adjacent to each tube head.
- d) A clearly visible indication of the status (i.e., open or closed) of each shutter shall be provided.

Section 380.40 Radiation Exposure Standards

Radiation exposure to individuals, either within the control area or in the environs of the installation, shall be so controlled that the maximum permissible dose equivalent values, as set forth in 32 Ill. Adm. Code 340, are not exceeded.

Section 380.50 Tests and Inspections

- a) Tests and inspections of all safety devices shall be performed at least monthly to insure their proper operation.
- b) Surveys and monitoring sufficient to insure that operations are conducted safely shall be provided.
- c) Records of tests and inspections, surveys, and monitoring sufficient to show compliance with Agency regulations shall be maintained and kept available for inspection by a representative of the Agency, upon demand.

(Source: Amended at 33 Ill. Reg. 2240, effective January 23, 2009)

Section 380.60 Operating Procedures and Instructions

- a) Individuals having access to analytical x-ray machines or equipment shall be provided with specific written instructions concerning the radiation hazards, safe working practices, and made aware of the symptoms of an acute localized exposure to radiation. These instructions shall be posted near the controls of the x-ray machine.
- b) Medical personnel examining work-connected injuries shall be informed of the possibility of radiation exposure to the worker from the devices regulated in this Part.

- c) Operators shall be instructed in the procedures for reporting an actual or suspected radiation overexposure. When it has been determined that an overexposure to an individual has occurred, it shall be reported to the Agency without undue delay.
- d) In cases where the primary x-ray beam is not intercepted by the experimental apparatus under all conditions of operation, protective measures shall be provided, such as auxiliary shielding, to avoid exposure to the primary x-ray beam.
- e) If, for any reason, it is necessary to temporarily intentionally alter safety devices, such as bypassing interlocks or removing shielding, such action shall be:
 - 1) specified in writing and posted near the x-ray tube housing so that other persons will know the existing status of the machine; and
 - 2) terminated as soon as possible.
- f) Whenever possible, an interlocking device that prevents the entry of any portion of an individual body or extremities into the primary beam, or causes the primary beam to be shut off upon entry into its path, shall be provided.
- g) Unused tube ports shall be closed in such a fashion that accidental opening is not possible.

(Source: Amended at 33 Ill. Reg. 2240, effective January 23, 2009)

Section 380.70 Monitoring

Operators of analytical x-ray equipment shall be provided with finger or wrist radiation monitoring devices as required by 32 Ill. Adm. Code 340.520.

(Source: Amended at 33 Ill. Reg. 2240, effective January 23, 2009)