

**3701:1-48-05      Performance requirements for industrial radiography equipment.**

Equipment used in industrial radiographic operations must meet the following minimum criteria:

(A)

- (1) Each radiographic exposure device, source assembly or sealed source, and all associated equipment must meet the requirements specified in American National Standards Institute, N432-1980 "Radiological Safety for the Design and Construction of Apparatus for Gamma Radiography," (published as NBS handbook 136, issued January 1981). This publication may be purchased from the "American National Standards Institute, Inc., 25 West 43rd Street, New York, New York 10036, telephone (212) 642-4900."
- (2) Engineering analysis may be submitted by an applicant or licensee to demonstrate the applicability of previously performed testing on similar individual radiography equipment components. Upon review, the director may find this an acceptable alternative to actual testing of the component pursuant to the above referenced standard.

(B) In addition to the requirements specified in paragraph (A) of this rule, the following requirements apply to radiographic exposure devices, source changers, source assemblies and sealed sources.

- (1) The licensee shall ensure that each radiographic exposure device has attached to it a durable, legible, clearly visible label bearing the:
  - (a) Chemical symbol and mass number of the radionuclide in the device;
  - (b) Activity and the date on which this activity was last measured;
  - (c) Model (or product code) and serial number of the sealed source;
  - (d) Manufacturer's identity of the sealed source; and
  - (e) Licensee's name, address, and telephone number.
- (2) Radiographic exposure devices intended for use as type B transport containers must meet the applicable requirements of Chapter 3701:1-50 of the Administrative Code.
- (3) Modification of radiographic exposure devices, source changers, and source assemblies and associated equipment is prohibited, unless the design of any replacement component, including source holder, source assembly, controls or guide tubes would not compromise the design safety features of the system.

(C) In addition to the requirements specified in paragraphs (A) and (B) of this rule, the following requirements apply to radiographic exposure devices, source assemblies, and associated equipment that allow the source to be moved out of the device for radiographic operations or to source changers.

- (1) The coupling between the source assembly and the control cable must be

designed in such a manner that the source assembly will not become disconnected if cranked outside the guide tube. The coupling must be such that it cannot be unintentionally disconnected under normal and reasonably foreseeable abnormal conditions.

- (2) The device must automatically secure the source assembly when it is cranked back into the fully shielded position within the device. This securing system may only be released by means of a deliberate operation on the exposure device.
- (3) The outlet fittings, lock box, and drive cable fittings on each radiographic exposure device must be equipped with safety plugs or covers which must be installed during storage and transportation to protect the source assembly from water, mud, sand or other foreign matter.
- (4)
  - (a) Each sealed source or source assembly must have attached to it engraved on it, a durable, legible, visible label with the words: "DANGER-RADIOACTIVE."
  - (b) The label may not interfere with the safe operation of the exposure device or associated equipment.
- (5) The guide tube must be able to withstand a crushing test that closely approximates the crushing forces that are likely to be encountered during use, and be able to withstand a kinking resistance test that closely approximates the kinking forces that are likely to be encountered during use.
- (6) Guide tubes must be used when moving the source out of the device.
- (7) An exposure head or similar device designed to prevent the source assembly from passing out of the end of the guide tube must be attached to the outermost end of the guide tube during industrial radiography operations.
- (8) The guide tube exposure head connection must be able to withstand the tensile test for control units specified in American National Standards Institute, N432-1980 "Radiological Safety for the Design and Construction of Apparatus for Gamma Radiography," (published as NBS handbook 136, issued January 1981). This publication may be purchased from the "American National Standards Institute, Inc., 25 West 43rd Street, New York, New York 10036, telephone (212) 642-4900."
- (9) Source changers must provide a system for ensuring that the source will not be accidentally withdrawn from the changer when connecting or disconnecting the drive cable to or from a source assembly.
- (D) All radiographic exposure devices and associated equipment in use after January 10, 1996, must comply with the requirements of this rule.
- (E) Notwithstanding paragraph (A)(1) of this rule, equipment used in industrial radiographic operations need not comply with the requirements of section 8.9.2(c) of the endurance test as specified in American National Standards Institute, N432-1980 "Radiological Safety for the Design and Construction of Apparatus for Gamma Radiography," (published as NBS handbook 136, issued January 1981), if the prototype equipment has been tested using a torque value representative of the

torque that an individual using the radiography equipment can realistically exert on the lever or crankshaft of the drive mechanism. This publication may be purchased from the "American National Standards Institute, Inc., 23 West 43rd Street, New York, New York 10036, telephone (212) 642-4900."

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