

## Part II. Equipment and Projectors of the Professional Type

- Δ 540.10 Motion Picture Projection Room Required.** Every professional-type projector shall be located within a projection room. Every projection room shall be of permanent construction and approved for the type of building in which it is located. All projection ports, spotlight ports, viewing ports, and similar openings shall be provided with glass or other approved material to completely close the opening. Such rooms shall not be considered hazardous (classified) locations as defined in Article 500.

Informational Note: See NFPA 101-2021, *Life Safety Code*, for further information on protecting openings in projection rooms handling cellulose nitrate motion picture film.

The audience area of a motion picture theater is covered by Article 520. Article 540 addresses projection rooms for theaters. Every professional projector is required to be located within a permanent projection room that is closed from the theater by glass or other material over all projection, spotlight, viewing, or other ports. Modern projectors contain rectifiers as an integral part of their equipment, thereby eliminating generators and other associated equipment described in 540.11. In accordance with 540.31, nonprofessional projectors that utilize cellulose acetate (safety) film are not required to be installed within a projection room.

### 540.11 Location of Associated Electrical Equipment.

**(A) Motor Generator Sets, Transformers, Rectifiers, Rheostats, and Similar Equipment.** Motor-generator sets, transformers, rectifiers, rheostats, and similar equipment for the supply or control of current to projection or spotlight equipment shall, where nitrate film is used, be located in a separate room. Where placed in the projection room, they shall be located or guarded so that arcs or sparks cannot come in contact with film, and the commutator end or ends of motor-generator sets shall comply with one of the conditions in 540.11(A)(1) through (A)(6).

**(1) Types.** Be of the totally enclosed, enclosed fan-cooled, or enclosed pipe-ventilated type.

**(2) Separate Rooms or Housings.** Be enclosed in separate rooms or housings built of noncombustible material constructed so as to exclude flyings or lint with approved ventilation from a source of clean air.

**(3) Solid Metal Covers.** Have the brush or sliding-contact end of motor-generator enclosed by solid metal covers.

**(4) Tight Metal Housings.** Have brushes or sliding contacts enclosed in tight metal housings.

**(5) Upper and Lower Half Enclosures.** Have the upper half of the brush or sliding-contact end of the motor-generator enclosed by a wire screen or perforated metal and the lower half enclosed by solid metal covers.

**(6) Wire Screens or Perforated Metal.** Have wire screens or perforated metal placed at the commutator of brush ends. No dimension of any opening in the wire screen or perforated metal shall exceed 1.27 mm (0.05 in.), regardless of the shape of the opening and of the material used.

**(B) Switches, Overcurrent Devices, or Other Equipment.** Switches, overcurrent devices, or other equipment not normally required or used for projectors, sound reproduction, flood or other special effect lamps, or other equipment shall not be installed in projection rooms.

*Exception No. 1: In projection rooms approved for use only with cellulose acetate (safety) film, the installation of appurtenant electrical equipment used in conjunction with the operation of the projection equipment and the control of lights, curtains, and audio equipment, and so forth, shall be permitted. In such projection rooms, a sign reading "Safety Film Only Permitted in This Room" shall be posted on the outside of each projection room door and within the projection room itself in a conspicuous location.*

*Exception No. 2: Remote-control switches for the control of auditorium lights or switches for the control of motors operating curtains and masking of the motion picture screen shall be permitted to be installed in projection rooms.*

**(C) Emergency Systems.** Control of emergency systems shall comply with Article 700.

**540.12 Work Space.** Each motion picture projector, floodlight, spotlight, or similar equipment shall have clear working space not less than 750 mm (30 in.) wide on each side and at the rear of the equipment.

*Exception: One such space shall be permitted between adjacent pieces of equipment.*

**540.13 Conductor Size.** Conductors supplying outlets for arc and xenon projectors of the professional type shall not be smaller than 8 AWG and shall have an ampacity not less than the projector current rating. Conductors for incandescent-type projectors shall conform to normal wiring standards as provided in 210.24.

**540.14 Conductors on Lamps and Hot Equipment.** Insulated conductors having a rated operating temperature of not less than 200°C (392°F) shall be used on all lamps or other equipment where the ambient temperature at the conductors as installed will exceed 50°C (122°F).

**540.15 Flexible Cords.** Cords approved for hard usage, as provided in Table 400.4, shall be used on portable equipment.

**540.20 Listing Requirements.** Projectors and enclosures for arc, xenon, and incandescent lamps and rectifiers, transformers, rheostats, and similar equipment shall be listed.