

- (1) All 125-volt, single-phase, 15- and 20-ampere receptacles that are readily accessible to unqualified personnel and that are used for other than motion picture and television production equipment
- (2) Equipment, other than motion picture and television production equipment, that is readily accessible to unqualified personnel and supplied from a 125-volt, single-phase, 15- or 20-ampere branch circuit

Listed GFCI protection for personnel that is identified for portable use shall be permitted to be an integral part of the attachment plug or be located in the power-supply cord within 300 mm (12 in.) of the attachment plug. Listed cord sets incorporating GFCI for personnel shall be permitted.

N (B) Where GFCI Protection is Not Permitted. Egress lighting shall not be protected by a GFCI.

N (C) Receptacles Supplied by Portable Cords. GFCI protection shall be listed, labeled, and identified for portable use where it is provided using GFCI receptacles and the branch circuits supplying receptacles use flexible cord.

N 530.45 Production Vehicles and Trailers. Where the wiring of production vehicles and trailers are supplied by a grounded ac service or by a grounded separately derived ac source, they shall comply with 530.45(A) through (F) of this section.

N (A) Internal Panelboards (Where Used). A listed and appropriately rated panelboard or other equipment specifically listed for this purpose shall be used. The grounded conductor termination bar shall be insulated from the enclosure.

N (B) Grounding. The panelboard shall have an equipment grounding bus with terminals for all equipment grounding conductors or other approved equipment grounding means.

N (C) Power-Supply Grounding. The equipment grounding conductor in the supply cord or feeder shall be connected to the equipment grounding bus or other approved equipment ground means in the panelboard.

N (D) Insulated Grounded Conductor (Neutral Conductor). The grounded circuit conductor (neutral conductor) shall be insulated from the equipment grounding conductors and from equipment enclosures and other grounded parts.

N (E) Required Bonding. All exposed non-current-carrying metal parts that are likely to become energized shall be effectively bonded to the grounding terminal or enclosure of the panelboard. A bonding conductor shall be connected between any panelboard and an accessible terminal on the chassis of the portable trailer or vehicle.

N (F) Production Vehicles and Trailers with Onboard Generators. Production vehicles and trailers with onboard generators shall comply with the requirements of 551.30.

N 530.46 Protection. Flexible cords and cables accessible to personnel shall be arranged to minimize tripping hazard potential,

and shall be permitted to be covered with a nonconductive matting secured to the walkway surface or protected with another approved cable protection method if the matting or other protection method does not constitute a greater tripping hazard than the uncovered cables.

Part IV. Dressing Rooms

Δ 530.61 Fixed Wiring in Dressing Rooms. Fixed wiring in dressing rooms shall be installed in accordance with the wiring methods covered in Chapter 3.

Part V. Portable Substations

530.71 General. Wiring and equipment in portable substations rated 50 to 1000 volts, nominal, shall conform to the requirements of the sections applying to installations in permanently fixed substations. Where limited space is available, when approved, working spaces shall be permitted to be reduced where the following conditions apply:

- (1) The equipment is arranged so that the qualified operator can work safely.
- (2) The equipment is guarded so that other persons in the vicinity cannot accidentally come into contact with current-carrying parts or bring conducting objects into contact with them while they are energized.

530.72 Over 1000 Volts, Nominal. Wiring and equipment of portable substations rated over 1000 volts, nominal, shall comply with the requirements of Part IV of Article 490.

ARTICLE

540

Motion Picture Projection Rooms

Part I. General

540.1 Scope. This article applies to motion picture projection rooms, motion picture projectors, and associated equipment of the professional and nonprofessional types using incandescent, carbon arc, xenon, or other light source equipment that develops hazardous gases, dust, or radiation.

Informational Note: See NFPA 40-2019, *Standard for the Storage and Handling of Cellulose Nitrate Film*, for further information.

Motion picture projection rooms are not hazardous locations as classified in Article 500. Some older types of film, such as cellulose nitrate film, are highly flammable and rarely used today. The more commonly used cellulose acetate film is not volatile at ordinary temperatures and does not emit flammable gases. Therefore, wiring methods for projection rooms are not required to be suitable for hazardous locations.

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.