

Chapter E 640

SOUND-RECORDING AND SIMILAR EQUIPMENT

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E 640.01 Scope. This chapter shall apply to installations of equipment and wiring used for sound-recording and reproduction, centralized distribution of sound, public address, speech-input systems and electronic organs.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

E 640.02 Application of other chapters. (1) Except as modified by this chapter, wiring and equipment from source of power to and between devices connected to the interior wiring systems shall comply with the requirements of Wis. Adm. Code chapters E 100 to E 400, inclusive, of this code.

(2) Wiring and equipment for public-address, speech-input, radio-frequency, audio-frequency systems, and amplifying equipment associated with radio receiving stations in centralized distribution systems, shall comply with chapter E 725.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

E 640.03 Number of conductors in raceway. The number of conductors in a conduit or other raceway shall comply with tables 1 to 7 inclusive of chapter E 900 except as follows:

(1) **EXCEPTION No. 1.** Special permission may be granted for the installation of two 2-conductor lead-covered cables in $\frac{3}{4}$ -inch conduit, provided the cross-sectional area of each cable does not exceed .11 square inch.

(2) **EXCEPTION No. 2.** Special permission may be granted for the installation of two 2-conductor No. 19 lead-covered cables in $\frac{1}{2}$ -inch conduit, provided the sum of the cross-sectional areas of the cables does not exceed 82% of the internal cross-sectional area of the conduit.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

E 640.04 Wireways and auxiliary gutters. (1) Wireways and auxiliary gutters shall comply with the requirements of chapters E 362 and E 374.

(2) Where used for sound-recording and reproduction the following exceptions are made:

(a) **Exception No. 1. Number of conductors in raceway.** Conductors in wireways or gutters shall not fill the raceway to more than 75% of its depth.

(b) *Exception No. 2. Auxiliary-gutter covers.* Where the cover of auxiliary gutters is flush with the flooring and is subject to the moving of heavy objects it shall be of steel at least $\frac{1}{4}$ -inch in thickness; where not subject to moving of heavy objects, as in the rear of patch or other equipment panels, the cover shall be at least No. 10 MS (USS Revised) gauge.

(c) *Exception No. 3. Metal-trough raceways.* Metal-trough raceways may be installed in concealed places provided they are run in a straight line between outlets or junction boxes. Covers of boxes must be accessible. Edges of metal must be rounded at outlet or junction boxes and all rough projections smoothed to prevent abrasion of insulation or conductors. Raceways made of sections shall be bonded and grounded as prescribed in section E 250.076.

(d) *Exception No. 4. Grounding wireways and auxiliary gutters.* Metal wireways and auxiliary gutters shall be grounded in accordance with the requirements of chapter E 250. Where the wireway or auxiliary gutter does not contain power supply wires, the grounding conductor need not be larger than No. 14 copper or its equivalent. Where the wireway or auxiliary gutter contains power supply wires, the grounding conductor shall not be smaller than the size called for in section E 250.095.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

E 640.05 Conductors. Amplifier output circuits carrying audio-program signals of 70 volts or less and whose open circuit voltage will not exceed 100 volts, may employ class 2 wiring as covered in chapter E 725.

Note: The above is based on amplifiers whose open-circuit voltage will not exceed 100 volts when driven with a signal at any frequency from 60 to 100 cps sufficient to produce rated output (70.7 volts) into its rated load. This also accepts the known fact that the average program material is 12 db below the amplifier rating—thus the average RMS voltage for an open-circuit 70 volt output would be only 25 volts.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

E 640.06 Grouping of conductors. Conductors of different systems grouped in the same conduit or other metallic enclosure, or in portable cords or cables, shall comply with the following requirements:

(1) **POWER-SUPPLY CONDUCTORS.** Power-supply conductors shall be properly indicated and shall be used solely for supplying power to the equipment to which the other conductors are connected.

(2) **LEADS TO MOTOR-GENERATOR OR ROTARY CONVERTER.** Input leads to a motor-generator or rotary converter shall be run separately from the output leads.

(3) **CONDUCTOR INSULATION.** The conductors shall be insulated individually, or collectively in groups, by insulation at least equivalent to that on the power-supply and other conductors.

(a) *Exception:* Where the power-supply and other conductors are separated by a lead sheath or other continuous metallic covering.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

E 640.07 Flexible cords. Flexible cords and cables shall be of types P, K, S, SJ, ST, SJO, and SJT or other types specifically approved for the purpose for which they are to be used. The conductors of flexible

cords, other than power-supply conductors, may be of a size not smaller than No. 26 provided such conductors are not in direct electrical connection with the power-supply conductors and are equipped with current-limiting means so that the maximum power under any condition will not exceed 150 watts.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

E 640.08 Terminals. Terminals shall be marked to show their proper connections. Terminals for conductors other than power-supply conductors shall be separated from the terminals of the power-supply conductors by a spacing at least as great as the spacing between power-supply terminals of opposite polarity.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

E 640.09 Storage batteries. Storage batteries shall comply with the following:

(1) **INSTALLATION.** Storage batteries shall be installed in accordance with chapter E 480.

(2) **CONDUCTOR INSULATION.** Storage-battery leads shall be rubber-covered or thermoplastic-covered.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

E 640.10 Overcurrent protection of "A", "B" and "C" circuits. Overcurrent protection shall be provided as follows:

(1) "A" circuit, where supplied by branch-lighting circuits, or by storage batteries of more than 20-ampere-hour capacity, shall have overcurrent protection not exceeding 15 amperes.

(2) "B" circuits shall have overcurrent protection not exceeding one ampere. The overcurrent protection shall be placed in each positive lead.

(3) "C" circuits where supplied from branch lighting circuits or from storage batteries of more than 20-ampere-hour capacity shall have overcurrent protection not exceeding one ampere.

(4) Overcurrent devices shall be located as near as practicable to the battery.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

E 640.11 Amplifiers and rectifiers; type. (1) They shall be suitably housed and shall be of a type approved for the purpose unless otherwise expressly permitted by the administrative authority.

(2) Amplifiers and rectifiers shall be so located as to be readily accessible.

(3) Amplifiers and rectifiers shall be so located as to provide sufficient ventilation to prevent undue temperature rise within the housing.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

E 640.12 Hazardous locations. Equipment used in hazardous locations shall be specifically approved for the purpose.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

E 640.13 Protection against physical damage. Amplifiers, rectifiers, loud-speakers and other equipment shall be so located or protected as to guard against physical damage such as might result in fire or personal hazard.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.