Chapter E 373

CABINETS AND CUTOUT BOXES

E 373.01 Scope. The provisions of this chapter shall apply to the installation of cabinets and cutout boxes. Installations in hazardous locations shall conform to the provisions of Wis. Adm. Code chapters E 500 to E 517 inclusive.

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

A. INSTALLATION

E 373.02 Damp or wet locations. In damp or wet locations, cabinets and cutout boxes of the surface type shall be so placed or equipped as to prevent moisture or water from entering and accumulating within the cabinet or cutout box, and shall be mounted so there is at least ¼ inch air space between the enclosure and the wall or other supporting surface. Cabinets or cutout boxes installed in wet locations shall be weatherproof.

Note: It is recommended that boxes of non-conductive material be used with non-metallic sheathed cable when such cable is used in locations where there is likely to be moisture present.

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

E 373.03 Position in wall. In walls of concrete, tile, or other noncombustible material, cabinets shall be so installed that the front edge of the cabinet will not set back of the finished surface more than ¼ inch. In walls constructed of wood or other combustible material, cabinets shall be flush with the finished surface or project therefrom.

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

E 373.04 Unused Openings. Unused openings in cabinets or cutout boxes shall be effectively closed to afford protection substantially equivalent to that of the wall of the cabinet or cutout box. Where metal plugs or plates are used with non-metallic cabinets or cutout boxes, they shall be recessed at least ¼ inch from the outer surface.

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

E 373.05 Conductors entering cabinets or cutout boxes. Conductors entering cabinets or cutout boxes shall be protected from abrasion and shall conform to the following:

(1) OPENINGS TO BE CLOSED. Openings through which conductors enter shall be adequately closed.

(2) METAL CABINETS AND CUTOUT BOXES. Where metal cabinets or cutout boxes are installed with open wiring or concealed knob-and-tube work, conductors shall enter through insulating bushings or, in dry places, through flexible tubing extending from the last insulating support and firmly secured to the cabinet or cutout box.

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

E 373.06 Deflection of conductors. Conductors entering or leaving cabinets or cutout boxes and the like shall conform to the following:

(1) WIDTH OF GUTTERS. Conductors shall not be deflected within a cabinet unless a gutter having a width in accordance with table E 373.06 (1) is provided.

TABLE E 373.06 (1)

MINIMUM BENDING SPACE IN INCHES

AWG or Circular—Mil Size of Wire	Wires per Terminal				
	1	2	3	4	5
14–8	Not Specified				
6	1½				
4-3	2				
2	2½				
1	3				
0–00	3½				
000–0000	4	6	8		
250 MCM	4½	6	8	10	
300–350 MCM	5	8	10	12	
400–500 MCM	6	8	10	12	14
600–700 MCM	8	10	12	14	16
750–900 MCM	8				
1,000–1,250 MCM	10				
1,500–2,000 MCM	12				

(2) INSULATION AT BUSHINGS. Where ungrounded conductors of No. 4 or larger enter a raceway in a cabinet, pull box, junction box, or auxiliary gutter, the conductors shall be protected by a substantial bushing providing a smoothly rounded insulating surface, unless the conductors are separated from the raceway fitting by substantial insulating material securely fastened in place. Where conduit bushings are constructed wholly of insulating material, a locknut shall be installed both inside and outside the enclosure to which the conduit is attached.

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

E 373.07 Space in enclosures. Cabinets and cutout boxes shall be selected which have sufficient space to accommodate all conductors installed in them without crowding.

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

E 373.08 Single switch enclosures. Single switch enclosures shall not be used as junction boxes, troughs or raceways for conductors feeding through or tapping off to other switches, unless designs suitable for the purpose are employed to provide adequate space for this purpose.

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

E 373.09 Side or back wiring spaces or gutters. Cabinets and cutout boxes shall be provided with back wiring spaces, gutters, or wiring compartments as required by subsections E 373.11 (3) and (4).

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

B. CONSTRUCTION SPECIFICATIONS

E 373.10 Material. Cabinets and cutout boxes shall conform to the following:

(1) METAL CABINETS AND BOXES. Metal cabinets and cutout boxes shall be well galvanized, plated with cadmium or other approved metallic finish, enameled, or otherwise properly coated, inside and out, to prevent corrosion.

Note: It is recommended that the protective coating be of conductive material, such as cadmium, tin or zinc, in order to secure better electrical contact.

(2) STRENGTH. The design and construction of cabinets and cutout boxes shall be such as to secure ample strength and rigidity. If constructed of sheet steel, the metal shall be of not less than No. 16 MS (USS revised) gauge in thickness.

(3) COMPOSITION CABINETS. Composition cabinets shall be submitted for approval prior to installation.

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

E 373.11 Spacing. The spacing within cabinets and cutout boxes shall conform to the following:

(1) GENERAL. The spacing within cabinets and cutout boxes shall be sufficient to provide ample room for the distribution of wires and cables placed in them, and for a separation between metal parts of devices and apparatus mounted within them as follows:

(a) *Base.* There shall be an air space of at least 1/16 inch, except at points of support, between the base of the device and the wall of any metal cabinet or cutout box in which the device is mounted.

(b) *Doors.* There shall be an air space of at least 1 inch between any live metal part (including live metal parts of enclosed fuses) and the door, unless the door is lined with an approved insulating material or is of a thickness of metal not less than No. 12 MS (USS revised) gauge in thickness, when the air space shall be not less than ½ inch.

(c) *Doors and walls; link fuses.* There shall be a space of at least 2 inches between open link fuses and metal-lined walls or metal, metal-lined or glass-paneled doors.

(d) *Live parts.* Except as noted above, there shall be an air space of at least ½ inch between the walls, back, gutter partition, if of metal, or door of any cabinet or cutout box and the nearest exposed current-carrying part of devices mounted within the cabinet where the potentials do not exceed 250 volts. This spacing shall be increased to at least one inch where the potentials exceed 250 volts.

(2) SWITCH CLEARANCE. Cabinets and cutout boxes shall be deep enough to allow the closing of the doors when 30-ampere branch-circuit panelboard switches are in any position, or when combination cutout switches are in any position, or when other single-throw switches are opened as far as their construction will permit.

(3) WIRING SPACE. Cabinets and cutout boxes which contain devices or apparatus connected within the cabinet or box to more than 8 conductors, including those of branch circuits, meter loops, subfeeder circuits, power circuits and similar circuits, but not including the supply circuit or a continuation thereof, shall have back wiring spaces or one or more side wiring spaces, side gutters or wiring compartments.

(4) WIRING SPACE; ENCLOSURE. Side wiring spaces, side gutters or side wiring compartments of cabinets and cutout boxes shall be rendered tight enclosures by means of covers, barriers or partitions extending from the bases of the devices, contained in the cabinet, to the door, frame, or sides of the cabinet; provided, however, that where the enclosure contains only those conductors which are led from the cabinet at points directly opposite their terminal connections to devices within the cabinet, such covers, barriers or partitions may be omitted. Partially enclosed back wiring spaces shall be provided with covers to complete enclosure. Wiring spaces that are required by subsection (3) and which are exposed when doors are open, shall be provided with covers to complete the enclosure.

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