

STANDATA interpretation 21-ECI-012

Electrical

2021 Canadian Electrical Code, Part I Section 12 – Installation of boxes, cabinets, outlets, and terminal fittings

Date Issued: January 2024

Page 1 of 2

Purpose

Clarifies requirements for installation of boxes, cabinets, outlets, and terminal fittings.

Discussion

Industry has requested clarification on the phrase “*equivalent device*” as described in CE Code, Part I Rule 12-3000 1) and how it relates to conduit fittings.

Code References

C22.1:21 – 2021 Canadian Electrical Code, Part I

12-3000 Outlet boxes (see Appendix B)

- 1) A box or an equivalent device shall be installed at every point of outlet, switch, or junction of conduit, raceways, armoured cable, or non-metallic-sheathed cable.

12-3034 Maximum number of insulated conductors in a box (see Appendix B)

- 1) Boxes shall be of sufficient size to provide usable space for all insulated conductors contained in the box, subject to the following:
 - a) an insulated conductor running through a box with no connection therein shall be considered as one insulated conductor;

Unless stated otherwise, all Code references in this STANDATA are to the Canadian Electrical Code, Part I 2021

Issued by the Provincial Electrical Administrator

[Original signed]

Kevin Glubrecht

Alberta Municipal Affairs – Technical and Corporate Services

Email: safety.services@gov.ab.ca Phone: 1-866-421-6929

To sign up for our List Subscription Service: municipalaffairs.gov.ab.ca/am_list_subscription_services

<https://www.alberta.ca/electrical-standata.aspx>

- b) each insulated conductor entering or leaving a box and connected to a terminal or connector within the box shall be considered as one insulated conductor;
 - c) an insulated conductor of which no part leaves the box shall not be counted; and
 - d) No. 18 and No. 16 AWG fixture-wires supplying a luminaire mounted on the box containing the fixture-wires shall not be counted.
- Δ 2) Except as specified in Subrule 3) and subject to the details given in Subrule 1), boxes of the nominal dimensions given in Table 23 shall not contain more insulated conductors of a given size than permitted by the Table, and the number of conductors shall be reduced for each of the following conditions as applicable:
- a) one insulated conductor, of the largest size in the box, for each fixture stud or hickey within the box;
 - b) one insulated conductor, of the largest size terminated under the conductor connector, for every pair of conductor connectors with insulating caps; and
 - c) two insulated conductors for each flush-mounted device on a single strap within the box.
- 3) Where a box contains a device having a dimension greater than 2.54 cm between the mounting strap and the back of the device, the total usable space shall be reduced by the space occupied by the device, calculated as 32 cm³ multiplied by the depth of the device in centimetres.
- 4) Subject to the details given in Subrules 1) and 3), boxes having nominal dimensions or volume other than those shown in Table 23, or any box containing insulated conductors of different sizes, shall have the amount of usable space per insulated conductor as specified in Table 22, but the number of insulated conductors so calculated shall be reduced for each of the conditions of Subrule 2) as applicable with the exception of Subrule 2 b), provided that such exception is based on the size of the largest insulated conductor that is included with every pair of conductor connectors.
- 5) The total usable space in a box considered under Table 22 shall be considered to be the internal volume of the box and shall disregard any space occupied by locknuts, bushings, box connectors, or clamps.
- 6) Where sectional boxes are ganged, or where plaster rings, extension rings, or raised covers are used in conjunction with boxes, ganged or otherwise, and are marked with their volume measurement, the space in the box shall be the total volume of the assembled sections.

Application

This interpretation applies to the use of conduit fittings in special applications.

Interpretation

The term “*equivalent device*” in rule 12-3000 1) includes “conduit fittings” in special applications (i.e., connection to solenoids, photocells, etc.). Wire leads from these devices must be integral to the device. Where the device has a bonding conductor and the conduit fitting has no provisions for attaching a bonding conductor, a separate bonding conductor must be provided in the conduit system to the fitting. The fitting must also comply with the requirements of Rule 12-3034 maximum number of insulated conductors in a box and Table 22 regarding the volume limitations.

This INTERPRETATION is applicable throughout the Province of Alberta.