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NEC Fact Sheet Concerning Flexible Power Supply Cords

PURPOSE: This document was developed to ensure consistency and provide clear guidance to HVI members. Utilizing as a baseline the National Fire Protection Association’s (NFPA) response to HVI’s interpretation request for clarification of the National Electrical Code (NEC), this fact sheet clarifies the appropriate use of fixed-wire or flexible power supply cords for ventilating appliances where the power connection is concealed by a ceiling. The information in this document reflects HVI’s review of the NFPA interpretation and is presented within the context of current industry practices.

BACKGROUND: With model codes now requiring mechanical ventilation of dwelling units, installation of ventilating appliances (e.g., exhaust fans, supply fans, and heat or energy recovery ventilators (HERVs); also referred to as “ventilating equipment”) within ceilings has become increasingly common, especially in multi-family applications. While ceiling installation of ventilating appliances is generally a straightforward process, one item that frequently raises questions from installers and code officials is whether the National Electrical Code (NFPA 70) requires ventilating appliances located within a structural ceiling, dropped ceiling, or suspended ceiling to be powered using a fixed-wire connection, or whether NFPA 70 permits use of a flexible power supply cord for this purpose.

CODE ANALYSIS: The 2017, 2020, and 2023 versions of NFPA 70 400.10(A) identify permitted uses of flexible cords. 400.10(A)(8) permits the use of a flexible cord for “appliances where the fastening means and mechanical connections are specifically designed to permit ready removal for maintenance and repair, and the appliance is intended or identified for flexible cord connection.” Additionally, 422.16(A) permits flexible cords to be used “to connect appliances to facilitate their frequent interchange...” or “to facilitate the removal or disconnection of appliances that are fastened in place, where the fastening means and mechanical connections are specifically designed to permit ready removal for maintenance and repairs, and the appliance is intended or identified for flexible connection.” Frequently, ventilation appliances, such as unitary heat or energy recovery ventilators (HERVs), are provided from the manufacturer with a flexible power supply cord that is a component of their safety listing. The flexible power supply cord facilitates disconnection of the appliance for maintenance and repair and therefore qualifies as a use permitted under 400.10(A)(8).

While flexible power supply cords are permitted in some applications, 400.12 prohibits their use when “concealed by... ceilings or located above suspended or dropped ceilings... unless specifically permitted in 400.10.” Code officials’ and installers’ interpretations of 400.10 have varied over time, so The Home Ventilating Institute asked NFPA if they could provide some clarity on this topic. NFPA responded as follows:

The lead-in statement of 400.12, “unless specifically permitted in 400.10...” provides a linkage between the two sections covering the uses permitted and uses not permitted for flexible cords... However, what is intended by this statement is that in order to use flexible cords above any type

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of ceiling for the connection of utilization equipment, that level of specificity would need to be included in the permission specified in 400.10(A)(8). The permission provided in 400.10(A)(8) is a general allowance of cords for that application, but it does not obviate the specific restrictions specified in 400.12(1) through (7).”

In other words, a fixed-wire connection is required by NFPA 70 for ventilating equipment concealed by ceilings.

Additionally, NFPA LiNK, NFPA’s information source on the NEC, provides the following interpretation on this topic:

Flexible cords and power supply cables are not limited to use with portable equipment. However, 400.12 prohibits the use of flexible cords and flexible power supply cables as a substitute for the fixed wiring of a structure or where concealed behind building walls, floors, or ceilings (including structural, suspended, or dropped-type ceilings). The requirements of 400.10 and 400.12 need to be applied together, rather than independently. While 400.10(A)(6) permits the use of cords to supply utilization equipment that is frequently replaced or serviced, it does not specifically permit that use for an installation that is prohibited by 400.12.

While a fixed-wire connection is required by NFPA 70 for ventilating appliances concealed by ceilings, a flexible power supply cord may be used in an attic under certain conditions. According to NFPA staff, the requirement for a fixed-wire connection does not apply to ventilating appliances using a flexible power supply cord located in an *accessible*¹ attic where “the fastening means and mechanical methods are specifically designed to permit ready removal for maintenance and repair, and the appliance is intended or identified for flexible cord connection,”² provided that the flexible supply cord is not:

- (1) Used as a substitute for the fixed wiring of a structure;
- (2) Run through holes in walls, structural ceilings, suspended ceilings, dropped ceilings, or floors;
- (3) Run through doorways, windows, or similar openings;
- (4) Attached to building surfaces;
- (6) Installed in raceways, except as otherwise permitted in the NFPA 70; or
- (7) Subject to physical damage.³

CONCLUSION: NFPA 70 requires a fixed-wire connection for ventilating appliances whose power connection is concealed by a ceiling. This requirement does not apply to ventilating appliances with a flexible power supply cord located in an *accessible* attic where the conditions of 400.10(A)(8) and 400.12(1), (2), (3), (4), (6), and (7) are satisfied.

¹ With respect to wiring methods, NFPA 70 defines “accessible” as “capable of being reached quickly for operation, renewal, or inspections without requiring those to whom ready access is requisite to take actions such as to use tools (other than keys), to climb over or under, to remove obstacles, or to resort to portable ladders, and so forth.”

² NFPA 70 400.10(A)(8).

³ NFPA 70 400.12, items (1), (2), (3), (4), (6), and (7).