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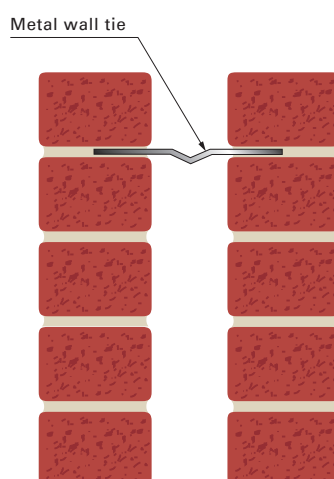
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1. Introduction

Electrical installation designers have to consider whether it is permissible to install thermoplastic (pvc) insulated and sheathed cables in external cavity walls. The Electrical Safety Council considers that installing such cables in this way is generally an undesirable practice, as it is unlikely that all of the applicable requirements of *BS 7671* listed in this topic will be fully met.

Typical cavity wall construction (cross-section)



2. Requirements of *BS 7671*

Regulation 522.8.1:

Damage to cables during installation. Obstructions in a cavity wall, such as metal wall ties or mortar projections, create a risk of unseen damage occurring to the cable sheath and conductor insulation during installation.

Regulation 522.8.4:

Strain on cables lacking support. Long unsupported vertical drops may place undue strain on the conductors, leading to damage.

Regulation 522.5.3:

Materials liable to cause mutual or individual deterioration. Expanded polystyrene sheets, granules or foam may be used in buildings for thermal insulation purposes. If this material comes into contact with thermoplastic (pvc) cable sheathing, plasticiser can migrate from the thermoplastic to the polystyrene. The thermoplastic sheathing then becomes less flexible and the polystyrene becomes soft and tacky. Such contact should be avoided.

Regulation 523.7:

Cables in thermal insulation. Thermal insulation is often installed in cavity walls during or after construction. Cables in the cavity may not then be able to carry the load current without overheating due to their current-carrying capacity being reduced. For example, where a cable is surrounded by thermally insulating material over a length of 500 mm or more, the cable current-carrying capacity is to be taken as half the 'clipped direct' (Reference Method C) rating unless more precise information is available (Regulation 523.7). Cables should be installed where they will not come into contact with thermal insulation (present or reasonably to be expected in the future) unless the current-carrying capacity is adequately maintained by, for example, increasing the cross-sectional area of the conductors at the design stage.

Regulations 522.9.1 and 522.10.1:

Presence of flora and fauna. Designers and installers may not necessarily detect or predict the presence of flora or fauna in a cavity wall. The wiring system should be selected to withstand all the external influences expected, or damage to cables may occur from, for example, mould or rodents.

3. Requirements of the *Building Regulations*

Building Regulations 2000, Approved Document C, 2004 Edition, Section 5: Walls, paragraph 5.13 b Cavity external walls, requires, amongst other things, that a cavity external wall is at least 50 mm wide, and the cavity is to be bridged only by wall ties or by cavity trays provided to prevent moisture being carried to the inner leaf.

A cavity is intended to provide a gap to prevent water penetration. Cables could bridge this protection if they touch both the inner and outer leaves of a cavity wall. Furthermore, the cables could provide a route for water to drain directly into accessories, with potentially dangerous results.

4. NHBC Requirements

It is noteworthy that the National House-Building Council states, in Section 8.1 - S2 of *NHBC Standards*, that no cables other than electricity meter tails are to be located in the cavity of an external wall. Where meter tails do have to pass through the cavity, however, this does not preclude the requirements of *BS 7671* referred to in this topic having to be met.



Topics referred to in this text:

None



Topics not referred to in this text, which are related and may be of interest:

C5-37 CABLES: In thermal insulation
M169-1 MUTUAL DETRIMENTAL INFLUENCES: General



BS 7671 (Requirements for electrical installations)

Some of the most important requirements are found in:

| | |
|---|-------------|
| Selection and erection of wiring systems in relation to external influences | Section 522 |
| Cables in thermal insulation | 523.7 |