

EXTERNAL INFLUENCES RECOGNISED IN SECTION 522

This Guide lists, with a brief overview, the fifteen different external influences¹ recognised by Section 522² of BS 7671. Electrical installation designers must consider these influences to ensure every wiring system³ will have adequate protection for the expected in-service conditions. The intention of this Guide is to provide persons carrying out construction, initial verification and periodic inspection with a quick reference check list, to ensure the wiring system is appropriate to withstand any detrimental effect at the particular location.

Regulation Group and title ⁴		The installed wiring system at the particular location must:
522.1	Ambient temperature	Be suitable for the range of ambient temperatures experienced during both erection and use.
522.2	External heat sources	In relation to local heat sources, such as hot water systems and luminaires be mounted at an appropriate distance or protected, for example, by shielding.
522.3	Presence of water or high humidity	Be suitable for and have an appropriate degree of protection against any water exposure (including condensation). Where required, provisions should be made to allow moisture to escape.
522.4	Presence of solid foreign bodies	Have an appropriate degree of protection against the ingress of solid foreign bodies, such as dust and, where required, measures to prevent accumulation of such particulates.
522.5	Presence of corrosive or polluting substances	Be protected to minimise degradation from any polluting substances, including water having a salt content, such as in coastal locations. Where required, be positioned to avoid contact with materials liable to give rise to other conditions, such as electrolytic action.

¹ External influences are also referenced within other regulations given in BS 7671, for example, impact and mechanical stress are mentioned in Regulation 521.9.1.

² Section 522 (Selection and erection of wiring systems in relation to external influences).

³ A wiring system is an assembly made up of a cable or busbars and parts which secure and, if necessary, enclose the cable or busbars (Part 2 of BS 7671 refers).

⁴ A number of regulation group titles in Section 522 contain external influence codes (see Appendix 5). These codes, for clarity, are omitted from the titles in this Guide.

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522.6	Impact ⁵	Be selected and installed to minimise the likelihood of damage during installation or use caused by impact, abrasion, penetration, tension or compression.
522.7	Vibration	Have appropriate supports and appropriate fixings for the expected conditions. Cables with flexible cores may be required.
522.8	Other mechanical stresses	Be protected from damage by having sufficient numbers of appropriate supports, bends of appropriate radius, enclosures without sharp edges and means to permit expansion (where required). Where buried in the structure, adequate access points and suitable protection must be included.
522.9	Presence of flora and/or mould growth	Include measures such as suitable positioning or planned maintenance.
522.10	Presence of fauna	Be positioned, have mechanical characteristics or additional mechanical protection sufficient to resist damage to the system by the animals expected, for example, livestock in agricultural locations.
522.11	Solar and ultraviolet radiation	Be suitable for the effects of such radiation, for example, by colour or be adequately shielded or positioned to resist detrimental effects.
522.12	Seismic effects	Be suitably fixed for any likely seismic hazards. Connections between the fixed wiring and essential equipment, such as safety services should have adequate flexibility.
522.13	Movement of air	Have appropriate supports for the expected conditions. Consideration should also be given to the effects of vibration and other mechanical stresses.
522.14	Nature of processed or stored materials	Have appropriate measures for any particular fire risks to minimise fire spread in accordance with Section 422 and Section 527, respectively.
522.15	Building design	Have appropriate supports to avoid excessive stress in the event of structural movement. A flexible wiring system may be required where such movement is expected.

⁵ Included in this group are the use of SELV or PELV and additional protection by an RCD. These are omitted because they are not a measure against impact.