# ELECTRICAL CONTAINMENT SYSTEMS

UK Compliance Guide | Cable Tray, Ladder, Trunking, Basket & Conduit

A practical guide to designing, installing and verifying electrical containment in industrial and commercial premises. The correct system depends on cable loading, environment, mechanical support, fire safety and the operational requirements of the building.

## 01 | Applicable standards and duties

**BS 7671** governs the electrical installation, including wiring systems, selection and erection, cable support, segregation, external influences and protection against fire. **BS EN 61537** addresses cable tray and cable ladder systems; **BS EN 50085** covers cable trunking and ducting systems; and **BS EN 61386** covers conduit systems, as applicable. Manufacturer load and installation data must also be followed.

## 02 | Selecting the containment system

**Cable ladder:** often used for large power and submain cables. **Cable tray:** supports general power and control cabling. **Wire basket:** commonly used for lighter data/control services where appropriate. **Trunking:** provides enclosed cable routes and can assist with segregation. **Conduit:** offers local mechanical protection and final connections. Selection must reflect cable type, weight, route, exposure and maintenance needs.

## 03 | Load capacity, spans and supports

Containment, brackets, fixings and structural anchors must be selected for the installed cable load and any reasonable future allowance. Support spacing, cantilevers, joint positions and permissible deflection should follow the manufacturer's verified loading data. Additional supports may be required at changes in direction, heavy fittings, risers and transitions.

## 04 | Cable sizing, grouping and thermal effects

Containment must provide sufficient usable space for installation, cable bend radii and maintenance. Cable grouping, ventilation, ambient temperature and installation method can affect current-carrying capacity under BS 7671. Enclosed trunking and densely loaded tray or ladder require particular consideration. Space allowance alone does not establish cable current rating.

## 05 | Mechanical protection and external influences

Assess impact, corrosion, water ingress, temperature, UV exposure, chemicals, vibration and washdown conditions. Material, finish and ingress protection must suit the environment. Industrial plant areas may require heavier-duty systems or additional guarding.

## 06 | Fire safety and cable support

BS 7671 requires wiring systems to be supported so they are not liable to premature collapse in the event of fire. Metallic supports or other suitable arrangements should be used where necessary; non-metallic ties alone must not be relied upon to prevent collapse. Support strategy should consider the entire route, not just escape corridors.

## 07 | Fire compartmentation and penetrations

Where containment passes through fire-resisting walls or floors, penetrations must be appropriately sealed to maintain the required fire performance. Use compatible, appropriately tested fire-stopping arrangements for the actual cables, containment and substrate. Record locations and installations where required by the project fire strategy.

## 08 | Segregation of electrical services

Power, control, instrumentation, data and safety-related circuits may need separation or barriers to meet BS 7671 and equipment/system requirements. Consider electromagnetic interference, circuit voltage, insulation ratings and the requirements of fire alarm, emergency and communications systems. Shared containment should not be assumed acceptable without assessment.

## 09 | Earthing, bonding and continuity

Metal containment is not automatically an electrical protective conductor. Where it is used as a protective conductor, the complete system must satisfy the applicable BS 7671 requirements for continuity, impedance and fault withstand. Otherwise, bonding or earthing arrangements must be determined from the installation design and the nature of the metalwork. Joint continuity should be verified where required.

## 10 | Cable installation and workmanship

Maintain suitable bending radii, avoid sharp edges and provide grommets, bushes or edge protection at entries. Use appropriate cleats, saddles and ties; account for short-circuit forces on large single-core cables. Keep covers, joints and accessories accessible where needed and ensure supports do not damage building structure or other services.

## 11 | Interfaces with other building services

Coordinate routes with ductwork, pipework, sprinklers, structural steelwork, cranes, production equipment and maintenance zones. Avoid obstructing access panels, fire dampers, valves, escape routes and plant removal paths. Changes to existing installations should be assessed before new containment is attached.

## 12 | Inspection, verification and handover

Inspection should confirm suitable system selection, secure fixings, support spacing, joint integrity, cable protection, segregation, fire stopping and accessibility. Electrical testing should cover any protective-conductor function or bonding arrangement as applicable. Provide relevant drawings, schedules, manufacturer information and records of concealed works.

## CONTAINMENT COMPLIANCE CHECKLIST

| | |
|---|---|
| System choice | Tray, ladder, basket, trunking or conduit suitable for cable duty |
| Loading | Manufacturer load/span limits and fixing capacities checked |
| Environment | Corrosion, ingress, impact and temperature considered |
| Cable design | Grouping, thermal effects, fill and bend radii assessed |
| Fire support | Wiring system protected against premature collapse in fire |
| Fire stopping | Penetrations reinstated to required fire performance |
| Segregation | Power, control, data and safety systems coordinated |
| Earthing | Metalwork continuity / CPC arrangements assessed |
| Workmanship | Supports, edges, entries, joints and cable fixing inspected |
| Handover | Records, drawings and inspection information provided |

## The QUEST approach

QUEST Electrical installs cable ladder, tray, basket, trunking and conduit as part of industrial and commercial electrical infrastructure projects. Containment is coordinated with LV switchgear, distribution boards, large submains, machinery supplies, lighting and control systems, with attention to safe installation, future access and the requirements of operational sites.

**QUEST ELECTRICAL** | Containment Systems | Submains | LV Distribution | Industrial Electrical Installations

**Important:** This guide is general information, not a project-specific design or certification. Apply the current editions of relevant standards, manufacturer data, site conditions and competent engineering judgement. Specialist environments, including hazardous areas, may require additional measures.