

The Definitive Guide to Cable Troughing

What is Cable Troughing?

Cable Troughing, which is often called Cable Raceway, Cable Routing System, Cable Management Trough, Electrical or Industrial Cable Routing, is a specialised system designed to protect, organise and route electrical cables within a defined pathway. Essentially, it provides a secure and accessible channel for cables, wires and ducts, preventing damage and ensuring efficient cable route management.



Paul Forester is Operations Director at E-Tech Components, leading specialist distributor of Power Cable Accessories & Electrical Components. His professional journey began at the original BICC Components offices in Prescot, now Prysmian, where he was introduced to the electrical industry and gained valuable experience in Crimping Systems, Electrical Machines and Transformers. In 2004, he joined E-Tech Components and got involved with many aspects of the business. From warehouse and sales to operations and boardroom, Paul and E-Tech have grown and evolved massively since then. Step-by-step, "connection-by-connection", and with continuous support of E-Tech's partners, Paul became one of the most influential Crimping Systems & Cable Components' Experts in the UK.

THE DEFINITIVE GUIDE TO CABLE TROUGHING

Transformer Technology Issue 40

Glassfibre Reinforced Concrete (GRC Cable Troughs)

Cable troughs are typically made from durable materials. One of the most common are Glass Reinforced Plastic (GRP Cable Troughs). Lightweight, strong and corrosion-resistant, these cable troughs are easy to handle and install. They're ideal for harsh environments due to their chemical and UV resistance, and they're also fire and non-conductive for safety. With low maintenance needs, a long lifespan and recyclability, GRP cable troughs are cost-effective and environmentally friendly cable routing solutions.

GRPs are significantly lighter than traditional concrete options. This makes transportation and installation much easier and quicker. Strong and resistant to breakage, they can be easily worked with using standard hand tools. Resistant to rust and rot, they also boast excellent fire resistance, making them suitable for demanding environments.

Concrete Cable Troughs

Renowned for their durability, fire resistance and load-bearing capacity, these cable troughs are a robust and secure choice for cable protection. However, we believe PVC / plastic cable troughs have several advantages over their concrete counterparts. Carry on reading this article to learn about the limitations of concrete.

ADVANTAGES OF PLASTIC CABLE TROUGHING

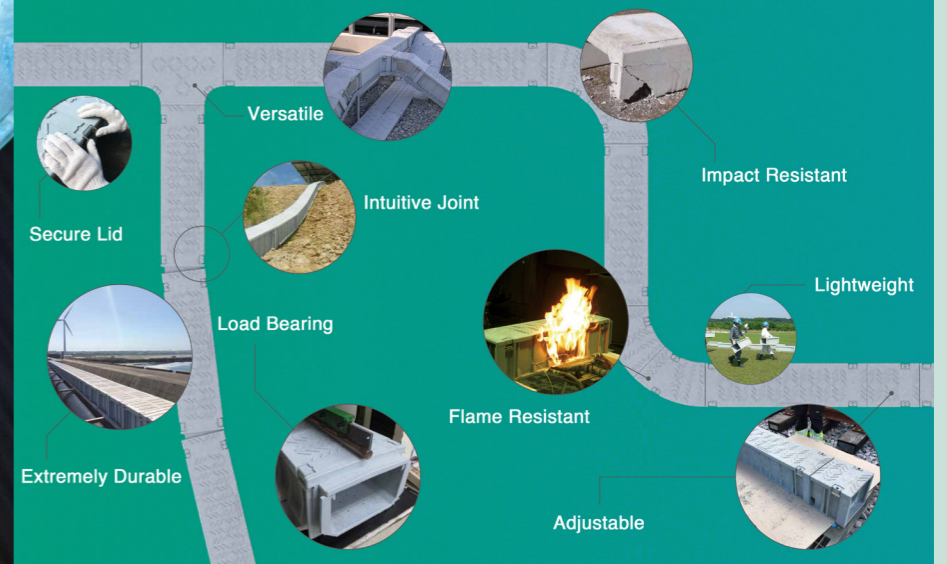


Photo: Shutterstock

PVC Cable Troughs / Plastic Cable Troughs

Lightweight, corrosion-resistant and cost-effective, make them easy to install and maintain. Their versatility in size and shape allows for adaptability to various cable layouts.

Applications

Coming in various sizes and configurations to accommodate different cable capacities and installation requirements, they are widely used in a range of different environments, including Construction Projects, Utilities & Telecommunications, Highways, Rail / Traction, Renewable Energy, Power Plants, Stadiums, Airports, Data Centres, and more.

Key Components of a Cable Troughing System

These include the base, which provides a stable foundation, and the cover, which protects cables from physical damage and environmental factors. Dividers are optional components that can be used to separate different cable groups within the trough. Bends, gradients and elevated systems are suitable for navigating obstacles, allowing the route to go around or over them. Additionally, accessories such as junctions, reducers/adaptors and end caps ensure complete system assembly.

Why Use Cable Troughs?

Providing a defined pathway for cables, cable raceways prevent them from being carelessly routed. The result is a professional and visually appealing installation. Improving the overall aesthetics of a project, cable raceways ultimately make it easier to identify and trace cables. Because cables are contained within the trough, this makes them **readily visible and accessible for inspection, maintenance or modifications**. In turn, this reduces downtime because technicians can quickly locate and address any issues without disrupting other components.

In addition to enhancing aesthetics, cable troughing serves as a protective barrier, **shielding cables from damage**

due to impacts, crushing, abrasion or adverse environmental conditions.

This protection is especially crucial in environments with heavy machinery or significant foot traffic. For example, railway cable troughs are essential where linemen or rail professionals frequently access the tracks, often at night, for maintenance and repairs. Additionally, the enclosed structure of a cable trough system shields cables from moisture, dust and other non-environmental contaminants that can degrade their performance and lifespan. This is crucial in harsh or corrosive environments.

Improving the overall aesthetics of a project, cable raceways ultimately make it easier to identify and trace cables. In addition to enhancing aesthetics, cable troughing serves as a protective barrier, shielding cables from damage due to impacts, crushing, abrasion or adverse environmental conditions.

PLASTIC vs CONCRETE CABLE TROUGHING

- ✓ **Weight** ✗
- ✓ **Material & Labour Costs** ✗
- ✓ **Installation, Inspection & Maintenance Time** ✗
- ✓ **Durability & Corrosion Resistance** ✗
- ✓ **Adaptability & Flexibility** ✗
- ✓ **Sustainability & Environmental Friendliness** ✗

By containing cables in a non-combustible cable trough, **the risk of fire spreading is minimised**. In the event of a short circuit or overheating, the trough can help to prevent the fire from reaching other combustible materials. Moreover, cable management raceways help prevent accidental contact with exposed live

wires, reducing the risk of electric shocks for both workers and the public.

Lastly, cable routing systems are modular and customisable, **enabling quick and easy installation to meet bespoke project requirements**. This design reduces labour costs and project timelines while providing flexibility during both the design and installation processes. Essentially, project managers can add or remove sections as needed. Sure, there is an initial investment in cable raceways. However, it can lead to long-term cost savings by preventing damage to cables, reducing downtime and improving safety. This can result in lower maintenance costs and increased productivity.

Plastic Cable Troughs vs. Concrete: Why Plastic is the Preferred Choice

Plastic cable troughs / PVC cable troughs offer a multitude of advantages over concrete cable troughs. Their significantly reduced

weight makes them exceptionally easy to handle, transport and install, often requiring less personnel and equipment. Ultimately, installations can be expedited with reduced labour costs too.

Compared to their concrete counterparts, plastic cable troughs are

highly adaptable, allowing for easy modifications in cable routing or quantities, and providing flexibility throughout a particular project's lifecycle. Their corrosion resistance and low maintenance ensure long-term durability and performance in various environmental conditions. Using PVC cable troughs is an excellent way to ensure compliance while providing easy access for inspection, repairs and maintenance. These troughs are approved by major railway authorities, including Network Rail, New South Wales, Banedanmark, and Japan Railways.

Compared to their concrete counterparts, plastic cable troughs are highly adaptable, allowing for easy modifications in cable routing or quantities, and providing flexibility throughout a particular project's lifecycle.

From a financial perspective, PVC or plastic cable troughs are generally more cost-effective than concrete, both in terms of material and installation expenses. Additionally, the recyclability of plastic makes it a more environmentally friendly option compared to concrete. In the age of sustainable construction practices, it's no wonder that solutions like Green Trough are gaining popularity.

Installation of Cable Troughs

Installing cable troughing might seem complex, but with the right approach, it can be a straightforward process.

First, determine the cable routing path and required trough size, ensuring the installation area is free from obstructions and that all necessary tools and equipment are gathered. Next, securely fix the base of the cable trough to the desired surface using appropriate fasteners, making sure the base is level for proper alignment and stability. Once the base is in place, carefully route the cables through the trough, organising and securing them with cable ties, bundles or other methods.

Afterwards, align the cover with the base and secure it with the provided fasteners, ensuring a tight fit to protect the cables from external elements. If needed, install bends, junctions or other accessories to accommodate changes in cable routing. Finally, verify that all cables are properly routed and secured within the trough, checking for any gaps or damage to the trough and its components. Keep in mind that each manufacturer may have additional steps or unique features in the process based on their specific solutions.

Laws & Regulations

Adhering to relevant laws and regulations is crucial for ensuring the safety and compliance of your electrical installation.

Cable troughing, as a critical component of cable route management, is subject to specific standards and guidelines.

From a financial perspective, PVC or plastic cable troughs are generally more cost-effective than concrete, both in terms of material and installation expenses.

BS EN 50086 provides requirements for cable trays and trunking systems, including cable troughing, covering design, materials, testing and installation aspects. Local building regulations may outline specific requirements to ensure fire safety and structural integrity too. Additionally, adherence to electrical safety regulations, such as those issued by the relevant national authority (e.g., *IET Wiring Regulations in the UK*), is essential for preventing electrical hazards.

Cable troughs must be selected and installed to meet fire resistance requirements, preventing the spread of flames and smoke. They must also be capable of supporting the weight of the installed cables and any additional loads, such as personnel or equipment. Additionally, cable troughs should be resistant to the environmental conditions of the installation area, such as humidity, temperature extremes and corrosive substances. Furthermore, cables within the trough must be easily accessible for inspection, maintenance and modification. By understanding and complying with these regulations, you can ensure that your cable routing system meets the highest safety and performance standards.

