

### Materials

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Most cable tray systems are fabricated from a corrosion-resistant metal (low-carbon steel, stainless steel or an aluminum alloy) or from a metal with a corrosion-resistant finish (zinc or epoxy). The choice of material for any particular installation depends on the installation environment (corrosion and electrical considerations) and cost.

#### Aluminum

Cable trays fabricated of extruded aluminum are often used for their high strength-to-weight ratio, superior resistance to certain corrosive environments, and ease of installation. They also offer the advantages of being light weight (approximately 50% that of a steel tray) and maintenance free, and since aluminum cable trays are non-magnetic, electrical losses are reduced to a minimum.

T&B cable tray products are formed from the 6063 series alloys which by design are copper free alloys for marine applications. These alloys contain silicon and magnesium in appropriate proportions to form magnesium silicide, allowing them to be heat treated. These magnesium silicon alloys possess good formability and structural properties, as well as excellent corrosion resistance.

The unusual resistance to corrosion, including weathering, exhibited by aluminum is due to the self-healing aluminum oxide film that protects the surface. Aluminum's resistance to chemicals in the application environment should be tested before installation.

#### Steel

T&B steel cable trays are fabricated from structural quality steels using a continuous roll-formed process. Forming and extrusions increase the mechanical strength.

The main benefits of steel cable tray are its high strength and low cost. Disadvantages include high weight, low electrical conductivity and relatively poor corrosion resistance.

The rate of corrosion will vary depending on many factors such as the environment, coating or protection applied and the composition of the steel. T&B offers finishes and coatings to improve the corrosion resistance of steel. These include pre-galvanized, hot dip galvanized (after fabrication), epoxy and special paints.

#### Stainless Steel

Stainless steel offers high yield strength and high creep strength, at high ambient temperatures.

T&B stainless steel cable tray is roll-formed from AISI Type 316/316L stainless steel.

Stainless Steel is resistant to dyestuffs, organic chemicals, and inorganic chemicals at elevated temperatures. Higher levels of chromium and nickel and a reduced level of carbon serve to increase corrosion resistance and facilitate welding. Type 316 includes molybdenum to increase high temperature strength and improve corrosion resistance, especially to chloride and sulfuric acid. Carbon content is reduced to facilitate welding.

## Finishes

### Galvanized Coatings

The most widely used coating for cable tray is galvanizing. It is cost-effective, protects against a wide variety of environmental chemicals, and is self-healing if an area becomes unprotected through cuts or scratches.

Steel is coated with zinc through electrolysis by dipping steel into a bath of zinc salts. A combination of carbonates, hydroxides and zinc oxides forms a protective film to protect the zinc itself. Resistance to corrosion is directly related to the thickness of the coating and the harshness of the environment.

### Pre-Galvanized

Pre-galvanized, also known as mill-galvanized or hot dip mill-galvanized, is produced in a rolling mill by passing steel coils through molten zinc. These coils are then slit to size and fabricated.

Areas not normally coated during fabrication, such as cuts and welds, are protected by neighboring zinc, which works as a sacrificial anode. During welding, a small area directly affected by heat is also left bare, but the same self-healing process occurs.

G90 requires a coating of .90 ounces of zinc per square foot of steel, or .32 ounces per square foot on each side of the metal sheet. In accordance with A653/A653M-06a, pre-galvanized steel is not generally recommended for outdoor use or in industrial environments.

### Hot-Dip Galvanized

After the steel cable tray has been manufactured and assembled, the entire tray is immersed in a bath of molten zinc, resulting in a coating of all surfaces, as well as all edges, holes and welds.

Coating thickness is determined by the length of time each part is immersed in the bath and the speed of removal. Hot dip galvanizing after fabrication creates a much thicker coating than the pre-galvanized process, a minimum of 3.0 ounces per square foot of steel or 1.50 ounces per square foot on each side of the sheet (according to ASTM A123, grade 65).

The process is recommended for cable tray used in most outdoor environments and many harsh industrial environment applications.

### Other Coatings

Epoxy and special paint coatings are available on request.