Production of Aluminum Alloy and Stainless Steel Cable Trays



Overview

Cable trays We offer a wide range of cable tray systems to support tubing, electrical cables and instrumentation.

Key Takeaways

Aluminum alloy and stainless steel cable trays are produced using specialized roll-forming and fabrication processes, with material selection and surface treatments tailored for strength, corrosion resistance, and application requirements.

Aluminum Alloy Cable Trays

Material Selection and Alloying: Aluminum trays commonly use alloys such as 6063-T5, which provide a balance of strength, corrosion resistance, and electrical conductivity (≥50% IACS) suitable for data centers and industrial applications. Pure aluminum is soft and ductile, so alloying elements like magnesium, silicon, copper, and zinc are added to enhance mechanical properties. Heat-treatable alloys (2000, 6000, 7000 series) can undergo thermal treatments to further increase strength, while non-heat-treatable alloys (1000, 3000, 4000, 5000 series) rely on work hardening.

Recycled aluminum can be used to reduce carbon emissions, with small titanium additions compensating for strength loss. Manufacturing Process: Aluminum sheets or coils are fed into cable tray roll forming machines, which progressively bend, cut, and punch the metal into ladder, ventilated, or solid channel trays. Micro-arc oxidation or other surface treatments can enhance hardness and corrosion resistance, particularly for outdoor or coastal installations.

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Advantages: Aluminum trays are 42% lighter than galvanized steel, reducing structural load and easing installation. They are highly corrosion-resistant due to the natural oxide layer, making them suitable for outdoor and coastal environments.

Stainless Steel Cable Trays

Material Selection: Stainless steel trays are made from chromium-containing steel, which forms a passive oxide layer for excellent corrosion resistance. This makes them ideal for harsh environments such as chemical plants, marine applications, and food or pharmaceutical facilities. Stainless steel is more expensive than mild steel but offers superior durability and aesthetic appeal.

Manufacturing Process: Stainless steel sheets or coils are processed using automated roll forming machines, similar to aluminum trays, with customized dies for ladder, channel, or wire mesh designs. Additional surface treatments, such as passivation or nano-ceramic coatings, can further enhance corrosion resistance and service life. Advantages: Stainless steel trays provide long-term corrosion resistance, structural strength, and low maintenance requirements, making them suitable for high-demand industrial and commercial applications.

General Production Considerations

Surface Treatments: Hot-dip galvanizing for steel or micro-arc oxidation for aluminum improves corrosion resistance and service life. Mechanical Properties: Yield strength, thickness, and alloy composition are critical for load-bearing capacity and durability. Cost Factors: Aluminum trays are lighter but more expensive, while stainless steel offers premium corrosion resistance at higher cost.

Machinery: Cable tray roll formers automate bending, punching, and cutting, allowing high precision and mass production. Machines can be automatic, semi-automatic, or customized depending on production volume and tray design.

Conclusion

The production of aluminum alloy and stainless steel cable trays involves careful material selection, alloying, surface treatment, and precision roll-forming. Aluminum trays are lightweight and corrosion-resistant, ideal for large-scale or outdoor installations, while stainless steel trays provide superior durability and resistance in harsh environments. Both types rely on advanced machinery to ensure consistent quality, structural integrity, and adaptability to various industrial and commercial applications.

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Article Content

Cable trays

Cable trays We offer a wide range of cable tray systems to support tubing, electrical cables and instrumentation. Our cable trays are produced in fit for purpose materials like stainless steel,

Future Materials & Finishes in Cable Tray Manufacturing

Discover how innovations in stainless steel, aluminum, and eco-friendly coatings are transforming cable tray manufacturing. Learn about the latest trends shaping durable, sustainable,

How to Produce Cable Trays: A Comprehensive Guide

Discover the detailed process on how to produce cable trays, covering everything from material selection to assembly and surface treatment.

Cable Tray: Material Properties

Since these alloys, singly or in various combinations, show increasing solid solubility in aluminum with increasing temperature, it is possible to subject them to thermal treatments which will produce

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Cable tray

ABB designs and manufactures cable tray systems, including perforated tray, cable ladder, channel tray and strut (metal framing), directly from production facilities in Canada and Saudi Arabia.

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In designing supports for a cable tray system, consideration should be given to the loads associated with future cable additions and any additional loading that may be applied to the cable tray system (e.g.,

Introduction: Cable Tray Materials

Most cable tray systems are fabricated from a corrosion-resistant metal (low-carbon steel, stainless steel or an aluminium alloy) or from a metal with a corrosion-resistant finish (zinc...

Cable Trays

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Materials: Galvanized steel, aluminum-magnesium alloys, and stainless steel. Specifications: Widths from 50-900 mm, depths of 25-150 mm,

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Cable Trays

Cable trays include cable trunking, cable ladder, perforated cable tray, wire mesh cable tray and the matching accessories, etc, which are often made with such materials as hot dip galvanized steel,

Cable Tray Technical Guide A practical guide to product selection and ...

A practical guide to product selection and installation This guide for engineers and installers has been developed by ABB as a practical reference regarding cable tray characteristics, installation, and

Comprehensive Analysis of Cable Trays Raw Material

Discover the key aspects of cable trays raw material, including costs, trends, and innovations. Learn how materials like steel, aluminum, and composites shape the industry.

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Cable Trays Market Size, Share, Growth, Analysis, 2034

Cable Trays Market Size, Share & Trends Analysis Report By Product Architecture (Ladder Cable Trays, Wire Mesh (Basket) Trays, Solid Bottom/Trough Trays), By Material (Steel (Hot-Dip/Pre

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