# Fiber Optic Aluminum Cable Tray Construction Scheme




## Overview

The purpose of this AE Note is to outline the use of fiber optic cables in “tray rated” environments. The question arises as to what listing is required for an optical fiber cable installed in a cable tray.

## Key Takeaways

Fiber optic aluminum cable trays are constructed using corrosion-resistant aluminum alloys, assembled modularly, and installed to provide safe, organized routing for fiber optic cables.

### Material Selection

Aluminum is chosen for cable trays due to its lightweight nature, high corrosion resistance, and mechanical strength. The natural oxide layer (alumina) protects the tray from atmospheric corrosion, making it suitable for indoor and outdoor environments. Aluminum alloys are selected based on strength, hardness, and resistance to stress corrosion, cracking, and pitting.

### Tray Types and Design

Fiber optic cable trays can be ladder, trough, wire mesh, or solid-bottom types. Ladder trays are common for long runs, providing mechanical support and easy access for fiber optic cables. Wire mesh trays allow for flexible routing and ventilation, while solid-bottom trays offer maximum protection from dust and debris.

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## Construction Process

Fabrication of Components: Aluminum sheets or extrusions are cut and formed into tray sections, including side rails, rungs, and support brackets. Components are often pre-drilled for modular assembly. Surface Treatment: Aluminum trays may undergo anodizing or powder coating to enhance corrosion resistance and durability, especially in harsh environments.

Assembly: Tray sections are joined using bolts, rivets, or welding depending on the design. Modular fittings such as elbows, tees, and reducers are added to accommodate changes in routing. Support Installation: Trays are mounted on walls, ceilings, or floor supports using brackets, hangers, or threaded rods.

Proper spacing ensures load distribution and prevents sagging. Cable Routing: Fiber optic cables are carefully laid into the tray, avoiding sharp bends and excessive tension. Cable ties or clamps may be used to secure bundles without damaging the fiber.

Inspection and Testing: After installation, trays are inspected for alignment, secure connections, and compliance with load ratings. Fiber optic cables are tested for signal integrity to ensure no damage occurred during installation.

## Compliance and Safety

Fiber optic aluminum cable trays must comply with NEC Article 392, which defines tray types and installation standards. While fiber optic cables do not require a specific tray rating, the tray must support the cable mechanically and allow for safe, organized routing.

## Maintenance Considerations

Aluminum trays require minimal maintenance due to corrosion resistance. Periodic inspections ensure that fasteners remain tight, trays are free of debris, and fiber cables are properly supported. This process ensures a durable, safe, and efficient cable management system for fiber optic networks in industrial, commercial, and data center environments.

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## Article Content

AEN052 Cable Trays and Optical Cables

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GUIDE CABLE TRAYS TECHNICAL

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This system allows you to route fiber-optic cables between equipment, providing both the physical protection and bend radius management crucial to optical cable performance.

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