# Standard Damping Ratio of Steel Cable Trays



## Overview

Properly sizing your cable tray is critical for safety and compliance. Our free calculator helps you determine the correct tray size based on NEC and IEC standards.

## Key Takeaways

The standard damping ratio for steel cable trays typically ranges from 0. 7% to 3%, with a maximum of 10% allowed in certain seismic design codes. Typical Values from ExperimentsExperimental studies on steel cable trays show that damping ratios increase with the number of cables installed.

For an unloaded steel tray, the damping ratio is around 0. 7%, consistent with standard values for steel structures. When fully loaded with cables (up to twenty in the referenced study), the damping ratio can rise to 3% due to additional energy dissipation from cable-tray interactions and friction between cables and tray surfaces.

These values are dimensionless and expressed as a fraction of critical damping, making them suitable for transient and dynamic analyses of cable tray systems under shock or seismic excitation (NAFEMS study).

## Design Code Considerations



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For seismic design, such as in the AP1000 nuclear plant design, cable trays and their supports are allowed a maximum damping ratio of 10%, provided the configuration is similar to validated test setups. This higher value accounts for uncertainties in dynamic response and ensures structural integrity under seismic loads. The damping ratio used in design can be based on experimental test results of representative cable tray systems, which include both the tray and the supported cables.

### Practical Implications

Finite Element Modeling: Use damping ratios between 0. 7% and 3% for typical steel trays in dynamic simulations. Seismic Design: Consider up to 10% damping if validated by tests or code provisions.

Cable Loading: Expect damping to increase with the number and arrangement of cables, which should be accounted for in transient analyses. In summary, for standard steel cable trays, a damping ratio of 1–3% is typical, while design codes may allow up to 10% for seismic applications, depending on experimental validation and tray configuration.

## Article Content

Westinghouse AP1000 Design Control Document Rev. 19

The tests show that, for unloaded trays, the damping ratio closely approximates the 7 percent used for bolted structures, and a minimum damping value of 20 percent is maintained with cable ties at

GUIDE CABLE TRAYS TECHNICAL

Specifies requirements for metal cable trays and associated fittings designed for use in accordance with the rules of Canadian Electrical Code, Part I and the National Electrical Code®

Damping coefficients by experiments and the application to transient

This paper studies the case of damping estimates for steel trays supporting cable bundles. Free vibration signals were experimentally acquired using a steel beam with and without attached cables,

IEC Standard for Cable Tray: Complete Technical Guide

It applies to cable trays made of steel, stainless steel, aluminum, or other metallic materials. The standard ensures these systems can handle the

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

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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.,

Steel Structure Calculation for Cable Tray | PDF | Structural Load ...

This document provides a calculation report for the steel structure of a cable tray rack. It includes details on the scope, references, loading assumptions, load combinations, and allowable deflections used

IEC 61537:2023 | IEC

IEC 61537:2023 specifies requirements and tests for cable tray systems and cable ladder systems intended for the support and accommodation of cables and possibly other electrical equipment in

Free Cable Tray Fill Calculator | NEC & IEC Compliant Sizing | Shielden

Properly sizing your cable tray is critical for safety and compliance. Our free calculator helps you determine the correct tray size based on NEC and IEC standards.

SWIFTS CABLE TRAY

With the new Swiftclip, lengths and fi ttings of Swifts cable tray can be fi tted without the use of specialist tools – making it even faster, safer and easier to fi t.

Wire Mesh Tray Technical Guide

GC ASTM A123 standard The cable trays or accessories, manufactured from untreated steel sheet or wire, are degreased and pickled before being immersed in a bath of molten zinc.

V.C. Summer Nuclear Station, Units 2 and 3, Rev. 3 to Updated ...

The damping ratio used for the cable tray system is dependent on the level of seismic input and the amount of cable fill within the trays. As shown in Figure 3.7.1-13, the 20 percent constant damping

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

B-Line series Cable Tray Design Considerations

As an industry leader in cable tray, Eaton offers one of the widest ranges of cable management solutions available in the market today with its B-Line series portfolio. With unmatched quality and service, we

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GUIDE CABLE TRAYS TECHNICAL

In accordance with its continuous impro-vement policy, Legrand reserves the right to change the specifications and illus-trations without notice. All illustrations, descriptions and technical information

A Survey of Cable Tray and Conduit Damping Research (EGG-EA

(SSE). Cable tray systems consist of cables, trays, conduits, and supports. Since each system is unique, it is difficult to assign precise damping values for seismic design. Regulatory Guide 1.61 specifies

Annex A: Numerical Damping Values

E.g.: for a steel building with first frequency of 3Hz, the logarithmic decrement is: 0.045 x 3 + 0 = 0.135 (> 0.05) C. Other values for the logarithmic decrement are suggested by: ... In this reference,

Damping Analysis on Steel Strand Cables of A Cable-Stayed ...

ABSTRACT Stay cables are the main components of cable-stayed bridges. Stay cable vibrations are considered one of the major concerns in long-span cable-stayed bridges. Inadequate damping of

Structural Damping Ratio

Structural Damping Structural damping ratio is the damping due to internal friction in the pipe steel material. A value of 0.005 (0.5 %) to be used if no other information is available, which is considered

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This video was associated with the source search result. Verify technical details against current product documentation and project requirements.

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