



TOUGHStrut

- Specification -

(CTI-TS-PS-001-A01)



SECTION CTI-TS-PS-001

BOLTED FRAMING STRUT SYSTEMS

This section specifies metallic bolted framing strut systems.

1.0 GENERAL

1.1 SUMMARY

- A. TOUGHStrut bolted framing channel straight sections, non-slotted and continuous slotted, associated fittings, brackets, hangers, clamps and hardware to provide a mechanical support assembly for mechanical electrical piping services and infrastructure.
- B. TOUGHStrut overhead trapeze supports for cable tray systems, conduit systems, piping systems and other similar mechanical, electrical, and piping systems.
- C. TOUGHStrut ground mount supports for cable tray systems, conduit systems, piping systems and other mechanical, electrical, and piping systems.
- D. TOUGHStrut wall mount supports for cable tray systems, conduit systems, piping systems and other mechanical, electrical, and piping systems.
- E. To warranty the performance of the TOUGHStrut; this specification must be followed. Deviation to this specification is not permitted without owner or owner representative prior approval.

1.2 DEFINITIONS

- A. TOUGHStrut bolted framing strut systems are to include but are not limited to; channel straight sections, fittings, brackets, all threaded rod, hardware, and accessories to form a mechanical support system.
- B. TOUGHStrut bolted framing strut systems must be manufactured from materials as listed in Section 2.2-A and in compliance with the standards listed in Section 4.0 of this specification.
- C. TOUGH Strut bolted framing strut systems must be furnished in the material finishes listed in Section 2.2-B in compliance with the standards listed in Section 4.0 of this specification.

1.3 CONSIDERATIONS

- A. TOUGHStrut bolted framing strut systems channel straight sections, fittings, brackets, all threaded rod, hardware, and accessories must be supplied from the same manufacturer and as listed in Section 3.0 of this specification.



2.0 PRODUCTS

2.1 CHANNELS AND COMPONENTS

A. TOUGHStrut Channel

Channel straight sections shall be supplied as single sections or welded in combinations to meet the manufacturer catalogue design loads and the designs as indicated on the manufacturer submittal and application drawings.

B. TOUGHStrut Fittings

Fittings shall be supplied to join the channel straight sections to meet the manufacturer catalogue design loads and the designs as indicated on the manufacturer submittal and design drawings.

C. TOUGHStrut Hardware

Hardware shall be supplied to fasten and support the channel straight sections to meet the manufacturer catalogue design loads and the designs as indicated on the manufacturer submittal and design drawings.

D. TOUGHStrut Compatibility

TOUGHStrut accessories and hardware must be compatible with the material or finish of the bolted framing strut channel and fittings.

E. TOUGHStrut Fit and Function

TOUGHStrut accessories and items necessary to constitute a complete mechanical support system must be supplied by the same manufacturer.

2.2 DIMENSIONS

A. TOUGHStrut shall be manufactured and supplied to the following listed nominal dimensions.

1. Strut Channel Lengths: [10] [20] feet / [3.048] [6.096] meters
2. Strut Channel Widths: [1-5/8] inch / [41.0] millimeters
3. Strut Channel Heights: [13/16] [1-5/8] inch / [21.0] [41.0] millimeters
4. Strut Channel Thickness: [12] [14] gauge / [2.0] [2.6] millimeters
5. Fittings Thickness: [30] gauge / [6.0] millimeters
6. Hardware Diameters: [3/8] [1/2] inch / [10.0] [12.0] millimeters
7. Combination Heights: [1-5/8] [3-1/4] inch / [41.0] [82.0] millimeters



2.3 MATERIALS AND MATERIAL FINISHES

B. TOUGHStrut Materials

Materials shall meet the minimum mechanical properties of the following listed specifications:

1. Plain Steel

- Strut Channel [ASTM A1011 SS Grade 33]
- Strut Fittings [ASTM A1011 SS Grade 33]

2. Pre-Galvanized Steel

- Strut Channel [ASTM A653 SS Grade 33]
- Strut Fittings [ASTM A907 SS Grade 33]
- Hardware [ASTM B633]

3. Hot-Dip Galvanized Steel

- Strut Channel [ASTM A1011 SS Grade 33]
- Strut Fittings [ASTM A907 SS Grade 33]
- Hardware [ASTM F1136 Grade 3] [ASTM F593 / F594]

4. Stainless Steel:

- Strut Channel [ASTM A240 / A240M Type 316]
- Strut Fittings [ASTM A240 / A240M Type 316]
- Hardware [ASTM F593 / F594 Type 316]

C. TOUGHStrut Finishes

Finishes shall meet the following listed specifications:

1. Pre-Galvanized

- Strut Channel [G60 and G90]
- Strut Fittings [ASTM B633 (SC3)]
- Hardware [ASTM B633 (SC1)]

2. Hot-Dip Galvanized

- Strut Channel [ASTM A123]
- Strut Fittings [ASTM A123]
- Hardware [Zinc Plated ASTM F1136] [Stainless Steel Type 316]

2.4 DESIGN LOADS AND SAFETY

A. Design Loads: Manufacturer published catalogue design loads shall be used.

B. Safety Factor: Manufacturer published design loads shall include a 5.0 factor of safety.

2.5 FASTENING

A. Fastening: All hardware shall be tightened to the recommended manufacturer values:

- Hardware Size [3/8] inch Torque 6 ft-lbs
- Hardware Size [1/2] inch Torque 19 ft-lbs



3.0 MANUFACTURERS

Subject to compliance with this specification, all bolted framing strut systems shall be manufactured by:

A. CT INNOVATIONS.

Phone : +1-618-431-3111
Web : www.toughinnovations.com
E-mail : support@toughinnovations.com

B. OTHER as approved by the owner or owner appointed responsible engineer.

4.0 REFERENCE STANDARDS

TOUGHStrut must be designed, manufactured and supplied in accordance with the latest addition of the following listed Industry Standards:

A. American Society for Testing and Materials (ASTM) International:

1. [ASTM A1011 SS Grade 33] Steel, Sheet, and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
2. [ASTM A653 SS Grade 33] Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. [ASTM A907 SS Grade 33] Standard Specification for Steel, Sheet and Strip, Heavy Thickness Coils, Carbon, Hot-Rolled, Structural Quality.
4. [ASTM B633] Standard Specification for Normalized High-Strength Low-Alloy Structural Steel Plates.
5. [ASTM A240 / A240M] Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
6. [ASTM F593] Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
7. [ASTM F594] Standard Specification for Stainless Steel Nuts.
8. [ASTM F1136 / F1136M] Standard Specification for Zinc/Aluminum Corrosion Protective Coatings for Fasteners.
9. [ASTM A123] Specification for Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed and Forged Steel Shapes, Plates, Bars and Strip.

B. American Iron and Steel Institute:

1. [AISI Type 316] Stainless Steel type 316.

C. Metal Framing Manufacturers Association:

1. [MFMA-4] Metal Framing Standards Publication.



5.0 MANUFACTURER SUBMITTAL DOCUMENTS

- A. TOUGHStrut Submittal Drawings
Manufacturer is to submit drawings of strut channel straight sections, fittings, brackets, hardware accessories, and miscellaneous items that form a complete bolted framing strut support system.
- B. TOUGHStrut Application Drawings
Manufacturer shall submit bolted framing installation application drawings.
- C. TOUGHStrut Data
Manufacturer shall submit product data on the bolted framing strut system including types, materials, finishes and dimensions.
- D. TOUGHStrut Installation Instructions
Manufacturer shall submit bolted framing installation instructions.
- E. TOUGHStrut Storage and Handling
Manufacturer shall submit storage and handling instructions for the bolted framing strut system.
- F. TOUGHStrut Support Instructions
Manufacturer shall submit recommendations for the efficient design and installation of steel supports for the cable ladder tray system.

6.0 QUALITY ASSURANCE

- A. TOUGHStrut bolted framing strut systems shall comply with the latest revision of MFMA-120 [Metal Framing Standards Publication].
- B. TOUGHStrut bolted framing strut systems shall be supplied with consistent quality, appearance, be new and free from defects.
- C. TOUGHStrut bolted framing strut systems shall be supplied in compliance with the applicable standards as listed in Section 4.0 of this specification.
- D. TOUGHStrut bolted framing strut channel, fittings and accessories shall be supplied from the same manufacturer.
- E. TOUGHStrut bolted framing strut systems shall be installed in a neat and tidy manner. The manufacturer is not responsible for and shall not be liable for any claims or damages resulting from the bolted framing strut systems installation.

End of Section