



ANSI E1.2 - 2012
Entertainment Technology—
Design, Manufacture and Use of Aluminum
Trusses and Towers

Document number Rig/2011-2031r2

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This edition of ANSI E1.2 was approved by the American National Standards Board of Standards Review on January 15, 2013.

This standard was originally published when the Entertainment Services and Technology Association was operating under the name of PLASA North America. ESTA has reverted to its original name, and this document has been rebranded with the current corporate name and logo. No changes have been made to the contents of the standard.

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The ESTA Technical Standards Program

The ESTA Technical Standards Program was created to serve the ESTA membership and the entertainment industry in technical standards related matters. The goal of the Program is to take a leading role regarding technology within the entertainment industry by creating recommended practices and standards, monitoring standards issues around the world on behalf of our members, and improving communications and safety within the industry. ESTA works closely with the technical standards efforts of other organizations within our industry, including USITT and VPLT, as well as representing the interests of ESTA members to ANSI, UL, and the NFPA. The Technical Standards Program is accredited by the American National Standards Institute.

The Technical Standards Council (TSC) was established to oversee and coordinate the Technical Standards Program. Made up of individuals experienced in standards-making work from throughout our industry, the Council approves all projects undertaken and assigns them to the appropriate working group. The Technical Standards Council employs a Technical Standards Manager to coordinate the work of the Council and its working groups as well as maintain a "Standards Watch" on behalf of members. Working groups include: Control Protocols, Electrical Power, Event Safety, Floors, Fog and Smoke, Followspot Position, Photometrics, Rigging, and Stage Lifts.

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The Rigging Working Group, which authored this Standard, consists of a cross section of entertainment industry professionals representing a diversity of interests. ESTA is committed to developing consensus-based standards and recommended practices in an open setting.

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Interest category codes:

CP = custom-market producer DE = designer
DR = dealer rental company G = general interest
MP = mass-market producer U = user

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An asterisk (*) next to a clause number indicates that there is a matching explanatory clause in the informative Appendix A.

FOREWORD (This foreword is not part of the standard. It contains no mandatory requirements.)

Prior to the original 2000 version of this standard, there were no specific American National Standards covering the design, manufacture and use of aluminum trusses in the entertainment industry. In an attempt to improve safety and standards in the industry, the Entertainment Services and Technology Association (ESTA) convened a series of meetings to prepare a draft standard. Columbus McKinnon Corporation kindly hosted these meetings at their facilities in Buffalo, New York and Abingdon, Virginia,

It is the intention of ESTA that this standard be put forward as the basis for an American National Standard to the American National Standards Institute. It should be noted that other ANSI Standards may be relevant, depending on the application and intended use of the aluminum trusses.

The preparation of the standard was entrusted to the Truss Team working as part of the Rigging Work Group for the Technical Standards Council (TSC) of ESTA. The Truss Team is generally comprised of manufacturers and their structural engineering advisors.

It has been assumed in the drafting of this standard that the execution of its design provisions are entrusted to appropriately qualified and experienced people, and that the fabrication and use is carried out by qualified and suitably experienced people and organizations.

This standard presents a coordinated set of rules that may serve as a guide to government and other regulatory bodies and municipal authorities responsible for the guarding and inspection of the equipment falling within its scope. The suggestions leading to accident prevention are given both as mandatory and advisory provisions; compliance with both types may be required by employers of their employees.

Safety codes and standards are intended to enhance public safety. Revisions result from committee consideration of factors such as technology advances, new data, and changing environmental and industry needs. Revisions do not imply that previous editions were inadequate.

Compliance with this Standard does not of itself confer immunity from legal obligations.

1 Scope

This document describes the design, manufacture and use of aluminum trusses, towers and associated aluminum structural components such as head blocks, sleeve blocks, bases, and corner blocks in the entertainment industry. It does not cover individual, separate rigging hardware such as 1/2 couplers and shackles.

The standards described herein are for a variety of uses that are confined to the entertainment industry and apply to a range of structures subjected to normal atmospheric conditions.

The standards described herein do not cover aerospace alloys, the detail design of castings, curved shell structures or structures subjected to severe thermal or chemical conditions. They are not intended to be used for the design of containment vessels, airborne structures or vessels or for any application where a specific standard exists.

If "truss" is referred to in a particular clause in this standard, then it shall equally apply to 'tower' and vice versa. It shall also apply to associated aluminum hardware.

2 Definitions

2.1 abrasion: loss of material due to wear.

2.2 allowable load: maximum static equivalent load that can be safely imposed on truss / tower in addition to the self-weight.

2.3 ancillary: supplementary

2.4 AWS: American Welding Society.

2.5 bent member, truss or tower: component or assembly that has permanent deviation from the intended center line.

2.6 bolted connection: a connection of two modules using bolts.

2.7 camber: intended vertical deviation of a truss, usually radiused.

2.8 chord: the element of a module that will carry the axial forces associated with flexural, axial, or combined flexural and axial loading.

2.9 competent person: a person who is capable of identifying existing and predictable hazards in the workplace and who is authorized to take prompt corrective measures to eliminate them.

2.10 components: parts of a whole.

2.11 connecting plates: plates welded to the end frames of a module that are used to connect adjacent modules together.

2.12 consumables: items that require regular replacement with use.

2.13 CPL (center point load): a concentrated load that is applied at the midspan of a truss or tower.

2.14 crack: a crevice type discontinuity in the material.