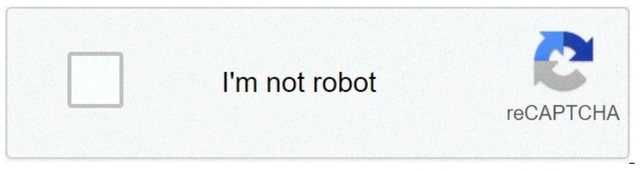

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Aluminum design manual

Aluminum Structural Design with The 2015 Aluminum Design Manual (AD11) PDH:11.0 On-Demand Seminar | Online Member $549.00 | Non-Member $649.00 The Aluminum Association has just released the 10th edition of Aluminum Design Manual, an essential reference for all professionals working with aluminum in structural applications. The manual, which was last updated in 2010, is available to purchase through the Aluminum Association online bookstore at www.aluminum.org. “The Aluminum Design Manual is absolutely indispensable for engineers designing buildings and other load bearing structures using aluminum,” said John Weritz, Vice President for Standards and Technology at the Aluminum Association. “Referenced in the 2015 International Building Code, compliance to that important standard makes the Aluminum Design Manual an essential document that allows engineers to create safe and innovative structures using modern, light-weight, corrosion resistant aluminum alloys. The Design Manual is split into several key sections, including: Specification for Aluminum Structures — Provides rules for determining the strength of aluminum structural components, connections and structures using either the allowable strength or load and resistance factor design method. Safety factors for buildings and bridges and resistance factors for buildings are also provided. Commentary to the Specification for Aluminum Structures — Provides background for the provisions in the Specification for Aluminum Structures and references to the research on which the Specification is based. Design Guide — Addresses structural design issues not included in the Specification for Aluminum Structures, including diagrams, adhesive bonded joints, aluminum composite material, extrusion design, corrosion prevention, fire protection, sustainability and design references for aluminum structural components in bridges, rail cars, ships, pressure vessels, pipe and storage tanks. Material Properties – Includes alloy and temper designation systems for wrought and cast aluminum alloys; comparative characteristics of wrought alloys; typical mechanical and physical properties, including thermal expansion, electrical conductivity and density (all in US and SI units) and typical tensile strengths at various temperatures. Section Properties — Lists dimensions and section properties for aluminum channels, I-beams, angles, tees, zees, square and rectangular tube, round tube, pipe, and roofing and siding; sheet metal and wire gauges and section property formulas for various geometric shapes. Design Aids — Provides buckling constants for welded and unwelded alloys, 24 allowable stress tables for various alloy-tempers welded and unwelded, allowable load tables for flexure for channels and I-beams, tread plate, roofing and siding; fastener strengths, minimum bend radii for aluminum sheet and plate, wire, and rod, allowable stresses for fillet welds and complete and partial groove welds, and formulas for moment, shear, and deflections for 50 beam cases. 2005 • 562 Pages • 17.82 MB • English Posted April 14, 2020 • Uploaded by rafael07 Report Page 2 Copyright © 2005, The Aluminum Association, Inc. All rights reserved No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form, or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of The Aluminum Association, Inc. Page 3 ABLE OF T ONTENTS C Copyright © 2005, The Aluminum Association, Inc. All rights reserved No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form, or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of The Aluminum Association, Inc. Page 4 Aluminum Design Manual Table of Contents PART TITLE IA Specification for Aluminum Structures – Allowable Stress Design IB Specification for Aluminum Structures – Building Load and Resistance Factor Design IIA Commentary on Specification for Aluminum Structures – Allowable Stress Design IIB Commentary on Specification for Aluminum Structures – Building Load and Resistance Factor Design III Design Guide IV Materials V Material Properties VI Section Properties VII Design Aids VIII Illustrative Examples of Design IX Guidelines for Aluminum Sheet Metal Work in Building Construction Appendix 1 Metric Guide for Aluminum Structural Design Index Page 6 FOREWORD The Aluminum Design Manual includes aluminum structural design specifications and accompanying commentary, a supplemental design guide, material properties, section properties, design aid tables and graphs, illustrative design examples and guidelines for aluminum sheet metal work in building construction. This edition of the Aluminum Design Manual is the product of the efforts of the Aluminum Association Engineering and Design Task Force, whose members are listed below. The Aluminum Association Engineering and Design Task Force Steve Sunday, Alcoa Inc., chair Frank Armao, Lincoln Electric Co. Randy Killian, Conservatek Industries, Inc. Randy Kissell, The TGB Partnership Greg McKenna, Kawneer Company, Inc. Craig C. Menzemer, University of Akron George Olive, Larson Engineering of Missouri Gerald Orrison, Temcor Teoman Peköz, Cornell University Frank Shoup, Alcoa Inc. Mike Skillingberg, The Aluminum Association, Inc. Page 8 Aluminum Design Manual PART I-A Specification for Aluminum Structures– Allowable Stress Design The Aluminum Association, Inc. 900 19th Street, NW, Washington, DC 20006 Eighth Edition, January 2005 Page 9 FOREWORD The first edition of the Specification for Aluminum Structures was published in November, 1967, followed by subsequent edi- tions in 1971, 1976, 1982, 1986, 1994, and 2000. This eighth edition of the allowable stress design Specification, developed as a consensus document, includes new or revised provisions concerning • shear yield strengths • welded strengths • adding 6063-T52, 6351-T6, and 7005-T53 • materials for screws used to connect aluminum parts • factors on welded tensile ultimate strength and compressive yield strength • welded connections (groove, fillet, plug and slot, and stud welds) • screw pull-over • revision of Section 1.2, Materials • revision of Section 5, Mechanical Connections • revision of Section 6, Fabrication and Erection • a new Section 8, Castings • weighted average strengths • design stresses for wind loads • fatigue strength for welds with permanent backing • net effective areas for channels, I beams, zees, angles, and tees • single angles in flexure • tapered thickness element strength • web crippling of extrusions • compressive strength of complex cross sections • strength of elements in bending in their own plane • unbraced length in bending These improvements and additions are the result of studies sponsored by the Aluminum Association and others. The Aluminum Association gratefully acknowledges the efforts of the Engineering and Design Task Force in drafting this Specification and the Engineering Advisory Committee in reviewing it. The Aluminum Association Engineering and Design Task Force Steve Sunday, Alcoa Inc., chair Frank Armao, Lincoln Electric Co. Randy Killian, Conservatek Industries, Inc. Randy Kissell, The TGB Partnership Greg McKenna, Kawneer Company, Inc. Craig C. Menzemer, University of Akron George Olive, Larson Engineering of Missouri Gerald Orrison, Temcor Teoman Peköz, Cornell University Frank Shoup, Alcoa Inc. Mike Skillingberg, The Aluminum Association, Inc. The Aluminum Association Engineering Advisory Committee Includes the members of the Engineering and Design Task force and the following persons: Robert E. Abendroth, Iowa State University Francisco Castano, Geometrica, Inc. Terence Cavanagh, Terrapin Testing, Inc. Karen C. Chou, Minnesota State University, Mankato Cynthia Ebert, Larson Engineering of Missouri January 2005 I-A-3 Page 10 Andrew J. Hinkle, S & K Technologies Dimitris Kosteas, Technical University of Munich LeRoy Lutz, Computerized Structural Design Brian Malloy, Alcoa Engineered Products Ray Minor, Hapco American Flag Carl Wagus, American Architectural Manufacturers Association Robert W. Walton, Texas Wall Systems Guidelines for the Preparation of Technical Inquiries on the Specification for Aluminum Structures Technical inquiries to obtain an interpretation or request a revision to the Specification for Aluminum Structures should be directed to: VP, Technology The Aluminum Association 900 19th Street, NW Washington, DC 20006 Fax: 202-862-5164 email: Comments on other parts of the Aluminum Design Manual are also welcome. Inquiries should be typewritten and include the inquirer’s name, affiliation, and address. Each inquiry should address a single section of the Specification unless the inquiry involves two or more interrelated sections. The section and edition of the Speci- fication should be identified. Requests for interpretations should be phrased, where possible, to permit a “yes” or “no” answer and include the necessary background information, including sketches where appropriate. Requests for revisions should include proposed wording for the revision and technical justification. Inquiries are considered at the first meeting of the Engineering and Design Task Force following receipt of the inquiry. I-A-4 January 2005 Privacy Policy We use cookies so that we can remember you and understand how you use our site. If you do not agree with our use of cookies, please change the current settings found in our Cookie Policy. Otherwise, you agree to the use of the cookies as they are currently set. The Aluminum Association has released the 10th edition of the Aluminum Design Manual—a reference for design/construction professionals working with the material in structural applications. The guide is referenced in the 2015 International Building Code (IBC), and it allows engineers to create safe and innovative structures using modern, lightweight, corrosion-resistant aluminum alloys. Chapters of the guide include “Specification for Aluminum Structures,” “Commentary to the Specification for Aluminum Structures,” “Material Properties,” “Section Properties,” and “Design Aids.” Illustrated design examples of more than 30 structural design calculations are also included. To purchase the guide, visit www.aluminum.org. Got News? Click here to share your story! ARLINGTON, VA, Feb. 04, 2020 (GLOBE NEWSWIRE) -- The Aluminum Association today released the 2020 Aluminum Design Manual, an essential reference for engineers, designers, detailers and architects working with aluminum in structural applications. For the first time, the manual will include an Excel spreadsheet containing section property tables for common aluminum shapes. “For decades, the Aluminum Design Manual has been a critical resource for anyone designing or engineering a structure with aluminum,” said John Weritz, vice president for standards and technology at the Aluminum Association. “In fact, Chapter 20 of the International Building Code requires compliance with Part I of the Aluminum Design Manual for aluminum construction. The addition of pre-populated spreadsheets in the 2020 manual will make it easier for designers to continue to use data-based decisions when engineering aluminum products.” Updates to the new version of the manual include: Changes to the section on Specifications for Aluminum Structures, including new provisions for block shear, pull-out strength of screws in screw chases, weld-affected strengths, post-weld heat treated strengths, new alloy-tempers, and flanges and webs with concentrated forces.Addition of a “Code of Standard Practice” section – providing a common understanding of acceptable standards when contracting for structural aluminum.A separate Excel spreadsheet containing section property tables for common aluminum shapes including I-shapes, channels, angles, tees, zees, round and rectangular tube, pipe, and roofing and siding. The spreadsheet is bundled with all electronic copies and hard copies will have a link to the spreadsheet on the Table of Contents page. The 2020 Aluminum Design Manual is available for purchase as both a searchable electronic download and hard copy through the Aluminum Association’s bookstore at www.aluminum.org. The purchase price for either version is $395 for members and $495 for non-members. ### About The Aluminum AssociationThe Aluminum Association represents aluminum production and jobs in the United States, ranging from primary production to value added products to recycling, as well as suppliers to the industry. The Association is the industry’s leading voice, providing global standards, business intelligence, sustainability research and industry expertise to member companies, policymakers and the general public. The aluminum industry helps manufacturers produce sustainable and innovative products, including more fuel-efficient vehicles, recyclable packaging, greener buildings and modern electronics. In the U.S., the aluminum industry supports $174 billion in economic activity and nearly 700,000 jobs. For more information visit , on Twitter @AluminumNews or at Facebook.com/AluminumAssociation. Add a review and share your thoughts with other readers. Be the first. Add a review and share your thoughts with other readers. Be the first.