

# CEMA APPLICATION GUIDE FOR UNIT HANDLING CONVEYORS

PREVIEW COPY



Prepared by the Engineering Conference of the  
CONVEYOR EQUIPMENT MANUFACTURERS ASSOCIATION

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## Preface

The purpose of this book is to be the single best resource for experienced and novice engineers to learn about the design, application, and maintenance of the most widely used types of unit handling conveying equipment available on the market today. This book is an ideal desk reference for any engineer new to the world of unit material handling or anyone interested in learning intermediate level information about the design and use of unit handling conveying equipment. The use of this book in conjunction with current CEMA Unit Handling standards gives an engineer the necessary tools to design and apply unit handling equipment.

The information contained in this book is presented with the intent of educating material handling engineers about current design and application of unit handling product and its components. The content is arranged in chapters by product type first, followed by chapters for system design, followed by chapters for component design. Wherever possible, each of the product chapters is subdivided into the following sections that provide comprehensive details about each product: definition, design, application, accessories, technical data, maintenance considerations, and safety considerations. Additionally, there are many graphs, charts, and pictures to enhance the understanding of topics discussed. As always, the responsibility for the ultimate safety, reliability, and functionality of any conveyor system rests with those who design and build it.

**While the formulas, recommendations, and data are based on industry practice and are believed to be reliable, CEMA does not, and can not, assume any role in, or responsibility for, the safety, reliability or functionality of any conveyor system or component which it did not design. The formulas and principles in this book are guidelines only and are applicable to the design of a high percentage of conveyors that are required to operate under reasonably normal conditions. However, conveyor design is as much art as it is science and some conveyors will operate under conditions that are beyond the scope of this book. These design challenges require broad experience for a satisfactory solution. A qualified designer or engineer from a CEMA member company should be consulted in such cases, as well as in the design of conveyors critical to a process, very wide or fast conveyors, and complex conveyor systems.**

## Acknowledgements

The Conveyor Equipment Manufacturers Association is indebted to the members of The Engineering Conference, The Unit Handling Section for their direct contributions, the Bulk Handling Conveying Section for paving the way for such an endeavor, and many other individuals who contributed their time, effort and resources to the planning and compilation of this book. Thanks also to the member companies who made available the time and talent of their salesmen, engineers, draftspersons and marketing specialists who all played a tremendously valuable roll in the creation of this book. The strength and backbone of any organization is its membership, and CEMA members have proven once again through their dedication and industry knowledge that CEMA truly is the voice of the North American conveying industry.

CEMA and all its members would like to express our appreciation to Gary Giuliano for his work in organizing, writing and producing this 1st Edition of the CEMA Application Guide for Unit Handling Conveyors. We are most grateful for his extraordinary effort and dedication without which this book would never have been completed.

## Introduction

The *CEMA Application Guide for Unit Handling Conveyors* began as an idea at the 77th Annual CEMA Engineering Conference in 2004. In 2004 the CEMA Bulk Handling group was finishing up work on the 6th Edition of the *Belt Book*. The Unit Handling members of CEMA felt that it was well past time to have a similar book to represent the unit side of the conveyor industry. The unit handling committee attendees that year came up with the idea to create a book, which would accompany the already existing 400 series standards, to show others in the industry what unit handling conveyor is and how it should be applied. The idea was approved unanimously by all the member companies represented and the project was dubbed “The Unit Book.”

At the CEMA Fall Meeting of that same year, a proposal for the Unit Book was given to the member company ORs (official representatives). The proposal was approved and work began on the first chapter, belt conveyor, shortly thereafter.

By 2006, things were moving along quite well. There were over 30 chapters in the development plan. Best of all, the chapters were all being created by the best minds in the industry representing over 17 different companies. Conveyor and conveyor component chapters were all in process and monthly teleconferences were established as well as a web site repository to help manage the ever increasing activity.

Over the next two years the unit handling engineering representatives from the CEMA membership continued to develop the content of the book. By the end of 2008 the book was going through its final checks and getting ready for a 2009 publication.

The teamwork to get this work product to fruition was spectacular. This book is the culmination of hundreds of hours of content development, meetings, conference calls, and proofing by some of the best engineers in the conveyor equipment and conveyor component industry. We believe that you will find the material contained within this book educational and applicable to conveyor component, conveyor assembly, and conveyor system design.

The conveyor terminology used in this and other CEMA documents is in accordance with terms defined in latest version of CEMA 102 “Conveyor Terms and Definitions”. This standard is the accepted authority on the subject and as such has been approved as an American National Standard by the American National Standards Institute (ANSI).

For the purposes of this publication, some further clarification is necessary. Where this is the case, a needed definition not covered in the CEMA 102 document will be defined in the text of the area where it appears. There is one area that applies to the entire Unit Book which needs clarification. Industry sales, concept development, engineering, project management, installation and maintenance personnel refer to the materials being transported on unit load conveyors by many different terms. Often the words “conveyable”, “product”, “carton”, “box”, “load” and even “unit” are used indiscriminately when a non-specific reference is intended. For the purposes of this Unit Book, the term “load” or “unit load” will be used unless a specific type, style or configuration of load is being referenced.