# STANDARDS OF THE EXPANSION JOINT MANUFACTURERS ASSOCIATION, INC.

**NINTH EDITION**

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## FOREWORD

Since 1958, when the Expansion Joint Manufacturer's Association (EJMA™ ) first published these Standards, continuing technological improvements in the application and design of Expansion Joints have been reported through the cooperative efforts of its association members by expanding the scope and content of this publication. Founded three years earlier in 1955, the Expansion Joint Manufacturer's Association began with a group of companies experienced in the application, design, and fabrication of Expansion Joints. The first EJMA™ Standard edition was, of necessity, somewhat brief and covered only applications involving axial movement. But as research and extensive testing results were catalogued, more detailed design data has been included in the EJMA™ Standard. The EJMA™ Standards are intended for application to metallic bellows expansion joints having only the convolution shapes shown in the Standards and having convolution welds only in the meridional direction with the exception of the bellows attachment welds.

The EJMA™ Technical Committee is dedicated to continuously improving the utility and technical content of the Standards. Suggestions and comments from industry users are welcomed and should he forwarded to the Secretary of this Association in writing.

It is important to note that the EJMA™ Standard is a trade association document containing recommendations for application of expansion joint products and in-depth technical information for use in designing expansion joint products. It is not a manufacturing standard or a quality assurance document. The type of non-destructive examination and the extent of quality assurance testing to be applied to given product should be addressed by other documents such as the ASME B31.3 Piping Code, the ASME Pressure Vessel Code or another user provided specification. The Standard does not limit or dictate the manufacturing process to be used for construction of expansion joints, nor does it establish specific engineering requirements deemed necessary for the safe application, design and manufacture of Expansion Joints. If there is a strong preference for a certain type of manufacturing process, the user should provide this information. Industry users are cautioned that these Standards should not be considered as a design handbook, and must not replace sound engineering judgment, education and experience.

As of this writing, the EJMA™ Standard thoroughly covers the design of expansion joint bellows elements. However, the Standard does not cover the design of hardware associated with restraint of pressure thrust. Pressure thrust restraint hardware is as important as the bellows element in the design and fabrication of an expansion joint assembly. Users are strongly advised to obtain documented design results for bellows elements and pressure thrust restraint hardware for any critical application.

## NO WARRANTY EXPRESSED OR IMPLIED

The engineering Standards herein are recommended by the Expansion Joint Manufacturers Association, Inc. to assist users, engineers, architects and others who specify, design and install Expansion Joints in piping systems to obtain the most efficient service from Expansion Joint installations. These Standards are based upon sound engineering principles, research and field experience in the manufacture, design, installation and use of Expansion Joints. These Standards may be subject to revision as further investigation or experience may show is necessary or desirable. Utilization of these Standards remains entirely optional. Nothing herein shall constitute a warranty of any kind, expressed or implied. Accordingly, all warranties of whatever nature, expressed or implied, are herewith specifically disclaimed and disavowed.

## MEMBERSHIP LIST
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American BOA, Inc. - Cumming, GA

Badger Industries, Inc. - Zelienople, PA

Expansion Joint Systems, Inc. - Santee, CA

Flexider S.r.l.- Torino, Italy

Hyspan Precision Products, Inc.- Chula Vista, CA

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Senior Flexonics, Inc., Pathway Division – New Braunfels, TX

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U.S. Bellows, Inc. – Houston, TX

WahlcoMetroflex, Inc.- Lewiston, ME

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## 1.1 SCOPE

The EJMA™ Standards are only intended for application to metallic bellows expansion joints.

## 1.2 DEFINITION OF TERMS

The Expansion Joint Manufacturers Association, Inc. has adopted the following definitions of Expansion Joint components and related equipment.

### ANGULAR ROTATION

The displacement of the longitudinal axis of the Expansion Joint from its initial straight line position into a circular arc. Angular rotation is occasionally referred to as "rotational movement." This is not torsional rotation which is described further in this section.

### AXIAL COMPRESSION

The dimensional shortening of an Expansion Joint along its longitudinal axis. Axial compression has been referred to as axial movement, traverse or compression.

### AXIAL EXTENSION

The dimensional lengthening of an Expansion Joint along its longitudinal axis. Axial extension has been referred to as axial movement, traverse, elongation or extension.

### BELLOWS

The flexible element of an Expansion Joint consisting of one or more convolutions and the end tangents with $L_b / D_b \leq 3$, with no more than five plies.

### CONTROL RODS

Devices, usually in the form of rods or bars, attached to the Expansion Joint assembly whose primary function is to distribute the movement between the two bellows of a universal Expansion Joint. Control rods are not designed to restrain bellows pressure thrust.

### CONVOLUTION

The smallest flexible unit of a bellows. The total movement capacity of a bellows is proportional to the number of convolutions.

### COVER

A device used to provide limited protection of the exterior surface of the bellows of an expansion joint from foreign objects or mechanical damage. A cover is sometimes referred to as a shroud.

### DIRECTIONAL ANCHOR

A directional or sliding anchor is one which is designed to absorb loading in one direction while permitting motion in another. It may be either a main or intermediate anchor, depending upon the application involved. When designed for the purpose, a directional anchor may also function as a pipe alignment guide. In the design of a directional anchor, an effort should be made to minimize the friction between its moving or sliding parts, since this will reduce the loading on the piping and equipment and insure proper functioning of the anchor.