



ANSI/CEMA 501.1-2015
A Revision of ANSI/CEMA 501.1-2003 (R2009)
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CEMA Standard 501.1

Specifications for

Welded Steel Wing Pulleys



***Conveyor Equipment
Manufacturers Association***

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**CONVEYOR EQUIPMENT MANUFACTURERS ASSOCIATION
(CEMA)**

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END

FOREWORD and SUMMARY of CHANGES

These recommended load ratings should be of benefit to the entire industry and, in particular, establish a basis for economical pulley selection. This standard is not intended in any way to limit the design of any manufacturer.

In 1966 the Wing Pulley Subcommittee of the Mechanical Power Transmission Association (MPTA) was formed to study a recommended standard for pulley load ratings and dimensions. This committee composed of pulley and conveyor engineers studied the available information on pulley design and theoretical stress analysis and data from actual tests. All parts of the pulley and shaft assembly were included in this study. This standard was later approved as ANSI/MPTA 501-1977 and was subsequently revised MPTA 501.1-1984.

In November 1985 the standard was transferred to the Conveyor Equipment Manufacturers Association (CEMA). The Conveyor Pulley Subsection of the Conveyor Equipment Manufacturers Association was assigned the responsibility for maintenance of the standard.

On January 27, 1988 the standard was approved as ANSI/CEMA 501.1-1988.

In 1995 CEMA reviewed the document and determined that no changes were required. It was reaffirmed as an ANSI/CEMA Standard in 1996.

In 2003 the Conveyor Pulley Subsection reviewed the standard and made four changes. The document was subsequently approved as ANSI/CEMA 501.1-2003

- 1) Revised the Scope to clarify that the standard is not applicable to cone clamping keyless locking devices
- 2) Added Section 2.6 - Shaft Run-out
- 3) Added information to section 3.2, and a footnote to Table 3, describing the origin of the Load Ratings
- 4) Made Section 3 consistent with CEMA Standard B105.1 - Specifications for Welded Steel Conveyor Pulleys with Compression Type Hubs.

In 2014 the Conveyor Pulley Subsection reviewed the standard and made five changes.

- 1) Clarify scope to include dimensional and application constraints.
- 2) Scope of standard increased to include 42 and 48 inch diameter wing pulleys.
- 3) Additional information added to clarify TIR.
- 4) Metric equivalents and examples added.
- 5) Added appendix 4 describing Mine Duty and Engineered Pulleys.

*The Conveyor Pulley Subsection of the Conveyor Equipment Manufacturers Association
has the responsibility for maintenance of this standard.*

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ANSI CEMA 501.1 – 2015 – Specifications for Welded Steel Wing Pulleys

1. SCOPE

Standard Steel Wing Pulleys

Standard welded steel wing pulleys are defined by CEMA 501.1. This standard establishes load ratings, allowable variations from nominal dimensions, permissible crown dimensions, and overall dimensions normally necessary to establish clearances for location of adjacent parts. The standard covers pulleys up to 48 inches (1220mm) in diameter for shaft diameters up to 8 inches (203mm) and face widths up to 66 inches (1676mm). The standard encompasses the majority of combinations of welded steel wing pulleys with compression type hubs that are normally used in current belt conveyor and elevator practice.

The standard applies to a series of straight and crown-faced welded steel wing pulleys that have a number of steel wing plates that extend radially from the longitudinal axis of two compression hubs and are equally spaced about the pulley circumference. The purpose of the compression hubs is to provide a clamp fit on the shaft. The wings are supported or joined by welded steel plates so arranged as to form the shape of two frustums of cones or regular pyramids joined at their bases. A contact bar is attached to the outer longitudinal edge of each wing to provide contact area with the belt.

This standard is restricted to pulleys which do not transmit torque. This standard is not applicable to pulleys with continuous (uninterrupted) rims, or cast pulleys. This standard applies to pulleys using compression type hubs. It does not cover pulleys welded to the shaft or pulleys using high pressure keyless locking assemblies.

The tabulated ratings for wing pulleys and shaft combinations are based on using non-journalled shafting through the pulley hubs, with pulleys centrally located between two bearings. Belt tension limits are also provided.

Welded steel wing pulleys covered by CEMA 501.1 should not be used with steel cable or other high modulus conveyor belts because of the eccentricity inherent in the construction of a wing pulley.

The need for wing-type pulleys can be reduced or eliminated by proper conveyor design, operation, and maintenance. A wing-type pulley is a pulley with a discontinuous surface. Between the contact bars are recessed areas that prevent fine or granular material from being caught between the tail pulley and the conveyor belt. Spillage material falls into these recesses and proceeds out of the open ends as the pulley revolves.

The pulley diameters, face widths and shaft sizes shown are those that are nominally used in current belt conveyor and elevator practice. These only are covered by this standard; all other sizes and capacities are not covered by this standard.