

**ANSI / CEMA B105.1-2009**

A REVISION OF  
ANSI/CEMA B105.1-2003  
(Approved May 19, 2009)

**PREVIEW COPY**

**CEMA Standard B105.1**

**Specifications for**

**Welded Steel  
Conveyor Pulleys**

**With Compression Type Hubs**



*Conveyor Equipment  
Manufacturers Association*

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## FOREWORD

Welded steel conveyor pulleys have been in common use since the 1930's. MPTA formed a Steel Pulley Engineering Committee in 1958 to develop recommended pulley load ratings. This Committee consisted of pulley and conveyor engineers who studied available information on pulley design, theoretical stress analysis, and data from actual tests. All parts of the pulley and shaft assembly were included in the study. In May, 1960, recommended load ratings for standard conveyor pulleys were published. The committee has continued its work since then and published the following:

October, 1961 - WELDED STEEL CONVEYOR PULLEY STANDARD, which covered the overall dimensions representing standard practice in welded steel conveyor pulley design at that time.

March, 1962 - MPTA submitted both of the above standards with a letter ballot to a list of substantially concerned organizations. On the basis of suggestions received, the standards were combined and revised.

June, 1966 - The combined revised standard was approved as B105.1 U. S. STANDARD SPECIFICATION FOR WELDED STEEL CONVEYOR PULLEYS.

June, 1974 - The MPTA submitted MPTA 301-1974 to ANSI as a proposed revision of B105.1.

July 23, 1976 - The standard was approved as ANSI B 105.1-1976

December 30, 1983 - The standard was approved as ANSI B105.1-1983

November, 1987 - The standard was transferred to the Conveyor Equipment Manufacturers Association (CEMA).

In 1987, the CEMA Engineering Committee reviewed the standard and decided to revise the method used for determining Drive Shaft diameters so that the method would conform to the ANSI B106.1M-1985 "Design of Transmission Shafting" standard. Also, a runout tolerance on pulley diameters was added. This industry standard is not intended in any way to limit the design of any manufacturer.

ANSI B106.1M was withdrawn in 1994. 1995, the CEMA Eng. Conference determined that the methods used by this former standard were technically sound and consistent with modern fatigue analysis methods. Therefore, the relevant data from ANSI B106.1M remains incorporated in this standard, and in Chapter 8 of CEMA's Publication "Belt Conveyors for Bulk Materials."

In the 2003 edition, the Conveyor Pulley Subsection:

- 1) Revised the Scope to clarify that the standard is not applicable to cone clamping keyless locking devices
- 2) Added Section 2.6 Shaft Runout
- 3) Added information to Section 3.2 and a footnote to Table 2 describing the origin of the Load Ratings

For this 2009 edition, the Conveyor Pulley Committee made the following changes to the 2003 Standard::

- 1) Added capability to use keyless locking devices in Scope and 3.6 Hub and bushing types
- 2) Added data and trapezoidal crown to 2.5 Crown
- 3) Clarified applications where better than standard tolerance is recommended in 2.6 Shaft Runout
- 4) Added Section 2.7 limiting belt speed to 800 fpm.
- 5) Added overload information for 6<sup>th</sup> belt book into 3.4 Overloads
- 6) Standard has had selection method and examples intermingled. Created a generic selection method (4.1 – 4.7) and put examples into Appendix IV.
- 7) Inserted figures and tables in area of use rather than grouped at the end.
- 8) Reduced maximum PIW to 800 in Table 1 of Section 4.1 Pulley Diameter selection.
- 9) Added resultant load updates from 6<sup>th</sup> Belt Book into Section 4.2 and added discussion of use without weight.
- 10) Created section 4.3 overhung loads, added Appendix III for more background and historical reference.
- 11) Added overhung load multiplier to section 4.4 Shaft Fatigue.
- 12) Added Section 4.5 Pulley Fatigue Life.
- 13) Added overhung load and fatigue factors into Section 4.6 Pulley Selection.
- 14) Clarified deflection versus stress control in Table 2. and added shaded area to clarify loads potentially exceeding 800 piw.

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

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