



**ASA/ANSI S2.75-2017/Part 1**

**Reaffirmed by ANSI June 19, 2020**

**AMERICAN NATIONAL STANDARD**

# **Shaft Alignment Methodology, Part 1: General Principles, Methods, Practices, and Tolerances**

**Secretariat:**

**Acoustical Society of America**

**Approved on June 6, 2017:**

**American National Standards Institute, Inc.**

## **Abstract**

This standard establishes methodology consistent with industry best practices for the measurement, analysis, and correction of alignment of shafts on rotating machinery coupled by means of a flexible coupling where such shafts are supported by two bearings in independent, horizontally mounted machine cases. Electric motors driving a pump, fan, or similar machine are examples of this type of machinery. Rigidly coupled machines are outside of the scope of Part 1 of this standard. The methodology addresses conditions for machinery mounting which directly affects shaft alignment, methods for measuring the amount of shaft misalignment, and practices for relocating machine cases to achieve proper shaft alignment. Tolerances are provided in a system of Alignment Quality Grades. Ancillary information for shaft alignment is provided in eight Annexes. Part 2 of this standard provides definitions of terminology unique to the alignment of machinery that has been in common use among engineers and technicians working in the field.

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ANSI/ASA S2.75-2017/Part 1

Accredited Standards Committee S2, Mechanical Vibration and Shock

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Standards Secretariat  
Acoustical Society of America  
300 Walt Whitman Road, Suite 300  
Melville, NY 11747

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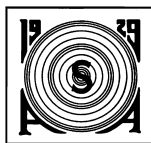
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## Foreword

[This Foreword is for information only, and is not a part of ANSI/ASA S2.75-2017/Part 1 American National Standard Shaft Alignment Methodology, Part 1: General Principles, Methods, Practices, and Tolerances. As such, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the standard.]

This standard comprises a part of a group of definitions, standards, and specifications for use in mechanical vibration and shock. It was developed and approved by Accredited Standards Committee S2, Mechanical Vibration and Shock, under its approved operating procedures. Those procedures have been accredited by the American National Standards Institute (ANSI). The Scope of Accredited Standards Committee S2 is as follows:

*Standards, specification, methods of measurement and test, and terminology in the field of mechanical vibration and shock, and condition monitoring and diagnostics of machines, including the effects of exposure to mechanical vibration and shock on humans, including those aspects which pertain to biological safety, tolerance and comfort.*

This standard is not comparable to any existing ISO Standard.

At the time this Standard was submitted to Accredited Standards Committee S2, Mechanical Vibration and Shock for approval, the membership was as follows:

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D.E. Wasserman

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Suggestions for improvements to this standard will be welcomed. They should be sent to Accredited Standards Committee S2, Mechanical Vibration and Shock, in care of the Standards Secretariat of the Acoustical Society of America, 1305 Walt Whitman Road, Suite 300, Melville, New York 11747. Telephone: 631-390-0215; FAX: 631-923-2875; E-mail: [asastds@acousticalsociety.org](mailto:asastds@acousticalsociety.org).

## American National Standard

# Shaft Alignment Methodology, Part 1: General Principles, Methods, Practices, and Tolerances

## 1 Scope and purpose

This Standard is the application of alignment concepts concerning relative positions of rotating shafts connected by mechanical means. It contains specific tolerances, factors affecting alignment, and an overview of various measurement methods, following the core technical components of Measure, Analyze, Correct, and Document.

The intended users are craftspersons, front line supervisors, maintenance managers, procedure writers, construction managers, and engineers who design, install, or maintain rotating machinery.

The potential consequences of not following this standard are accelerated wear of machine components (bearings, couplings, and seals), shortened machine life, unscheduled outages, and hazards to personnel.

This standard covers the general configuration of two machines (usually horizontal) and four-bearing systems with rotating shafts. It does not cover vertical machines, strategies for aligning multiple (three or more) machine train systems, large and heavy machines with significant shaft sag, Cardan shaft with universal joints, three bearing machines (diesel generator sets), nor bore alignments. The principles presented here may also be applicable to these other machine configurations.

The purpose of this standard is to establish guidelines of acceptability for alignment of rotating machinery. The guidelines are based on industry best practices and experience gained in reliability. The requirements and recommendations placed here are intended to result in consistent and uniform final operating conditions at the machine.

## 2 Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ANSI/ASA S2.75-2017/Part 2 – Shaft Alignment Methodology, Part 2: Vocabulary

ANSI/ASME B4.1-1967 (R2009) Preferred Limits and Fits for Cylindrical Parts

ANSI/ASME B17.1-1967 (R2013) Keys and Keyseats

ISO 21940-32:2012 Mechanical vibration – Rotor balancing – Part 32: Shaft and fitment key convention

## 3 Terms and definitions

For the purposes of this standard, the terms and definitions in ANSI/ASA S2.75-2017/Part 2 apply, in addition to the following: