



American National Standard for

Rotary Pumps

for Nomenclature, Definitions, Application and Operation



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American National Standard

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Foreword (Not part of Standard)

Purpose and aims of the Hydraulic Institute

The purpose and aims of the Hydraulic Institute (HI) are to promote the advancement of the pump manufacturing industry and further the interests of the public and to this end, among other things:

- a) Develop and publish standards.
- b) Address pump systems.
- c) Expand knowledge and resources.
- d) Educate the marketplace.
- e) Advocate for the industry.

Purpose of Standards and Guidelines

- a) HI Standards and Guidelines are adopted in the public interest and are designed to help eliminate misunderstandings between the manufacturer, the purchaser, and/or the user and to assist the purchaser in selecting and obtaining the proper product for a particular need.
- b) Use of HI Standards and Guidelines is completely voluntary. Existence of HI Standards does not in any respect preclude a member from manufacturing or selling products not conforming to the standards.

Definition of a Standard of the Hydraulic Institute

Quoting from Article XV, Standards, of the By-Laws of the Institute, Section B:

“An Institute Standard defines the product, material, process or procedure with reference to one or more of the following: nomenclature, composition, construction, dimensions, tolerances, safety, operating characteristics, performance, quality, rating, testing and service for which designed.”

Definition of a Hydraulic Institute Guideline

A HI Guideline is not normative. The guideline is tutorial in nature, to help the reader better understand the subject matter.

Comments from users

Comments from users of this standard are appreciated, to help HI prepare even more useful future editions. Questions arising from the content of this standard may be directed to the HI Technical Director of the Hydraulic Institute. If appropriate, the inquiry will then be directed to the appropriate technical committee for provision of a suitable answer.

Revisions

American National Standards of HI are subject to constant review, and revisions are undertaken whenever it is found necessary because of new developments and progress in the art. If no revisions are made for five years, the standards are reaffirmed using the ANSI canvass procedure.

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This document does not contain a complete statement of all requirements, analyses, and procedures necessary to ensure safe or appropriate selection, installation, testing, inspection, and operation of any pump or associated products. Each application, service, and selection is unique with process requirements that shall be determined by the owner, operator, or its designated representative.

Units of measurement

Metric units of measurement are used, and corresponding US customary units appear in parentheses. Charts, graphs, and sample calculations appear in both metric and US customary units. Because values given in metric units are not exact equivalents to values given in US customary units, it is important that the selected units of measure to be applied be stated in reference to this standard. If no such statement is provided, metric units shall govern.

Consensus

Consensus for this American National Standard was achieved by use of the canvass method. The following organizations, recognized as having an interest in the standardization of pumps, were contacted prior to the approval of this revision of the standard. Inclusion in this list does not necessarily imply that the organization concurred with the submittal of the proposed standard to ANSI.

Leistriz Advanced Technologies Corp.	HRSD - Hampton Roads Sanitation District
Petrofac	WC Livoti Consulting
Hydraulic, Measurement, & Inspection Consulting	LVVWD- Las Vegas Valley Water District
Company Unknown	Irving Oil
Patterson Pump Company	Kemet Inc.
Moving Water Industries (MWI)	Brown and Caldwell
Summit Pump, Inc.	

Committee list

Although this standard was processed and approved for submittal to ANSI by the canvass method, a working committee met many times to facilitate its development. At the time it was developed, the committee had the following members:

Chair – Scott Wild, Leistriz Advanced Technologies Corp.
Vice-chair – Kelly Barnes, Boerger LLC

Committee members

Edison Brito
Mark Lawson
Michael Mueller
Alternate members
Randy Bennett
Bryce Wells
Bernhard Wessendorf

Company

PSG, a Dover Company
CIRCOR Pumping Technologies
Flowserve Corporation
Company
Leistriz Advanced Technologies Corp.
Flowserve Corporation
Boerger LLC

3 Rotary pumps

3.0 Introduction

3.0.1 Purpose

This standard sets out requirements, recommendations, and statements to define, select, apply, operate, and maintain rotary pumps. Requirements convey criteria to be fulfilled if compliance with the document is to be claimed and from which no deviation is permitted. Recommendations convey that, among several possibilities, one is particularly suitable, without excluding or prohibiting others.

3.0.2 Scope

This standard applies to industrial/commercial rotary positive displacement pumps. It includes types and nomenclature; definitions; design and application; and installation, operation, and maintenance. It does not include standards on magnetic drives for sealless pumps (see ANSI/HI 4.1-4.6 *Sealless, Magnetically Driven Rotary Pumps for Nomenclature, Definitions, Application, Operation, and Test*) nor rotary pumps primarily used for fluid power applications. For information on rotary pump tests, see ANSI/HI 3.6 *Rotary Pump Tests*.

A comprehensive overview of features and attributes of rotary pumps is presented in Sections 3.1.1 through 3.1.7.2.2, which contain descriptive material covering the basic technologies highlighted in Figure 3.1. These include a description of each configuration, typical applications, and general operating ranges for commercially available designs for viscosity, flow, and pressure. Operating ranges stated represent only a single hydraulic parameter and do not indicate that all maximum conditions can be met simultaneously. Suppliers should be contacted for such details.

3.0.3 Capability chart

The capability tables (see Tables 3.0.3a and b) and consolidated range charts (see Figures 3.0.3b and c) with individual technology descriptions provide an overview of operating ranges and application characteristics for the industrial rotary pumps covered in this document. These ranges are not absolute because custom designs at alternate speeds, clearances, or with special materials may be available based on a thorough understanding of the application between the user and the manufacturer. The maximum parameter listed is only an indication of the range for that parameter and typically not all maximum values can be obtained simultaneously. Relative capabilities (i.e., abrasive handling, shear sensitivity, and pulsation) are highly dependent on application conditions and the pump technology to which the comparison is made. Shear sensitivity relates to the effect the pump has on the liquid. The abrasive handling capabilities ratings allow material enhancements. Consultation with the supplier is recommended to confirm specific application recommendations and to investigate special designs, which are often available to provide unique solutions.