PROCESS INDUSTRY PRACTICES

TECHNICAL REVISION
June 2021

Machinery

PIP REEP007
Guidelines for Minimum and Maximum Flow Rates for Centrifugal Pumps

PURPOSE AND USE OF PROCESS INDUSTRY PRACTICES

In an effort to minimize the cost of process industry facilities, this Practice has been prepared from the technical requirements in the existing standards of major industrial users, contractors, or standards organizations. By harmonizing these technical requirements into a single set of Practices, administrative, application, and engineering costs to both the purchaser and the manufacturer should be reduced. While this Practice is expected to incorporate the majority of requirements of most users, individual applications may involve requirements that will be appended to and take precedence over this Practice. Determinations concerning fitness for purpose and particular matters or application of the Practice to particular project or engineering situations should not be made solely on information contained in these materials. The use of trade names from time to time should not be viewed as an expression of preference but rather recognized as normal usage in the trade. Other brands having the same specifications are equally correct and may be substituted for those named. All Practices or guidelines are intended to be consistent with applicable laws and regulations including OSHA requirements. To the extent these Practices or guidelines should conflict with OSHA or other applicable laws or regulations, such laws or regulations must be followed. Consult an appropriate professional before applying or acting on any material contained in or suggested by the Practice.

This Practice is subject to revision at any time.

PUBLISHING HISTORY

October 2005 *Issued*
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1. Scope

This Practice provides recommended minimum and maximum flow rates for conventional centrifugal pumps (i.e., pumps with mechanical seals) to achieve safe operation while optimizing operating costs. This Practice describes how to use hydraulic and mechanical criteria to determine a recommended safe operating flow range for centrifugal pumps. This Practice does not provide hard limits for a pump's flow range because of factors that cannot be precisely defined.

2. References

Applicable parts of the following Practices, industry codes and standards, and references shall be considered an integral part of this Practice. The edition in effect on the date of contract award shall be used, except as otherwise noted. Short titles are used herein where appropriate.

2.1 Process Industry Practices (PIP)

- PIP RESP73H - *Application of* ASME B73.1 - 2020 *Specification for Horizontal End Suction Centrifugal Pumps for Chemical Process*
- PIP RESP73V - *Application of* ASME B73.2 - 2016 *Specification for Vertical In-Line Centrifugal Pumps for Chemical Process*

2.2 Industry Codes and Standards

- American Petroleum Institute (API)
  - API 610/ISO 13709 - *Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries*
- American Society of Mechanical Engineering (ASME)
  - ASME B73.1 - *Specification for Horizontal End Suction Centrifugal Pumps for Chemical Process*
  - ASME B73.2 - *Specification for Vertical In-Line Centrifugal Pumps for Chemical Process*

2.3 Additional References

- *Centrifugal pumps which suction specific speeds are acceptable Hydrocarbon Processing, April 1982, 195-197, J.L. Hallam*
- *Selection criteria for suction impellers of centrifugal pumps, World Pumps, 2001, J.F. Gulich*

2.4 Other References (Not Cited in Practice Narrative)

The following references are not cited in the narrative of this Practice but are shown here as good sources for further information.

- PIP REEP006 - *Pump Selection Guidelines*
- PIP REIE686/API RP686 - *Recommended Practices for Machinery Installation and Installation Design*
- PIP RESP003H - *Specification for Horizontal Centrifugal Pumps for Water Service*
- PIP RESP003V - *Specification for Vertical Centrifugal Pumps for Water Service*
- API 682 - *Pumps-Shaft Sealing Systems for Centrifugal and Rotary Pumps*