



PROCESS  
INDUSTRY  
PRACTICES

October 2022

**Hygienic Process**

**PIP PHSREP001**  
**Specification for Hygienic Pumps in Food, Consumer**  
**Goods and Pharmaceutical Industries**  
**(Centrifugal, Positive Displacement and**  
**Air Operated Diaphragm Pumps)**

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## 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.

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**PIP PHSREP001**  
**Specification for Hygienic Pumps in Food, Consumer Goods and Pharmaceutical Industries (Centrifugal, Positive Displacement and Air Operated Diaphragm Pumps)**

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PHSREP001-D/DM – Horizontal Centrifugal Pumps for Water Service (U.S. Customary Units/SI Units)

## 1. Scope

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This Practice provides requirements for design and manufacture of pumps used in the food, consumer goods and pharmaceutical industries.

This Practice covers pumps used in the following services:

- a. Direct contact with finished product
- b. Direct contact with an ingredient or excipient used in formulation of finished product
- c. Direct contact with final formulation of an active pharmaceutical ingredient
- d. Used as a part of a Clean in Place (CIP) or Sanitize in Place (SIP) system designed to clean process contact surfaces in any of the above situations

The following pump types used in hygienic service are covered by this Practice:

- a. Rotary Pumps
  - i. Rotodynamic
    - a. Horizontal In-line centrifugal
    - b. Vertical In-line centrifugal
  - ii. Positive Displacement
    - a. Lobe/gear/piston positive displacement
    - b. Peristaltic positive displacement
    - c. Screw positive displacement
- b. Air-Operated Diaphragm Pumps

This Practice excludes pumps used in chemical processes in development of bulk active pharmaceutical ingredients. This Practice excludes pumps made to the below specifications:

- a. For services within the capabilities of ANSI/ASME pumps, refer to *PIP RESP73V* or *PIP RESP73V*.
- b. For high power vertical submerged centrifugal pumps, refer to *PIP RESP003S*.
- c. For high power horizontal centrifugal pumps for water service, refer to *PIP RESP003H*.
- d. Fire water pumps are covered by *NFPA 20* and are not covered by this Practice.

## 2. References

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Applicable parts of the following Practices and industry codes and standards 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.