



American National Standard for

# Pump Intake Design

ANSI/HI 9.8-1998



6 Campus Drive  
First Floor North  
Parsippany, New Jersey  
07054-4406  
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**Pump Intake Design**

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## **Foreword (Not part of Standard)**

### **Purpose and aims of the Hydraulic Institute**

The purpose and aims of the Institute are to promote the continued growth and well-being of pump manufacturers and further the interests of the public in such matters as are involved in manufacturing, engineering, distribution, safety, transportation and other problems of the industry, and to this end, among other things:

- a) To develop and publish standards for pumps;
- b) To collect and disseminate information of value to its members and to the public;
- c) To appear for its members before governmental departments and agencies and other bodies in regard to matters affecting the industry;
- d) To increase the amount and to improve the quality of pump service to the public;
- e) To support educational and research activities;
- f) To promote the business interests of its members but not to engage in business of the kind ordinarily carried on for profit or to perform particular services for its members or individual persons as distinguished from activities to improve the business conditions and lawful interests of all of its members.

### **Purpose of Standards**

- 1) Hydraulic Institute Standards 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.
- 2) Use of Hydraulic Institute Standards is completely voluntary. Existence of Hydraulic Institute 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.”

### **Comments from users**

Comments from users of this Standard will be appreciated, to help the Hydraulic Institute prepare even more useful future editions. Questions arising from the content of this Standard may be directed to the Hydraulic Institute. It will direct all such questions to the appropriate technical committee for provision of a suitable answer.

If a dispute arises regarding contents of an Institute publication or an answer provided by the Institute to a question such as indicated above, the point in question shall be referred to the Executive Committee of the Hydraulic Institute, which then shall act as a Board of Appeals.

## Revisions

The Standards of the Hydraulic Institute 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 canvas procedure.

Over the past several decades, long-term performance results for many different centrifugal and axial flow pumping facilities have become available. Based on some less than satisfactory results, the industry has recognized a need for updating the standard approaches to designing pump intake structures and suction piping. In response to this evolving need, the Hydraulic Institute has improved and expanded its recommendations for designing intake structures for centrifugal, vertical turbine, mixed-flow, and axial-flow pumps and added intake designs for solids-bearing liquids.

This standard is a result of the combined efforts of a balanced committee that was formed to reflect the perspectives of sump designers, hydraulic researchers, pump manufacturers, and end users. It replaces ANSI/HI 1.1-1.5-1994 Section 1.3.3.6 and ANSI/HI 2.1-2.5-1994 Section 2.3.5.

The intent of this current edition of the pump intake design standard is to provide designers, owners and users of pumping facilities a foundation upon which to develop functional and economical pumping facility designs. The material has been prepared with the deliberate goals of both increasing understanding of the subject and establishing firm design requirements.

## Scope

This standard provides intake design recommendations for both suction pipes and all types of wet pits. While specific intake design is beyond the scope of the pump manufacturer's responsibility, their comments may be helpful to the intake designer.

## Units of Measurement

Metric units of measurement are used; and corresponding US units appear in brackets. Charts, graphs and sample calculations are also shown in both metric and US units.

Since values given in metric units are not exact equivalents to values given in US 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 standard was achieved by use of the canvas method. The following organizations, recognized as having interest in the pump intake designs 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.

Ahlstrom Pumps, LLC	CH2M Hill
Alden Research Laboratory, Inc.	Chas S. Lewis & Co., Inc.
Bechtel Corporation	Crane Pump & Systems
Black & Veatch	David Brown Union Pump Company
Brown & Caldwell	DeWante & Stowell
Camp Dresser & McKee	Dow Chemical