
TECHNICAL RESOURCES

Publications and Educational Materials From



Submersible Wastewater Pump Association

THE AUTHORITATIVE SOURCE FOR TECHNICAL INFORMATION ABOUT SUBMERSIBLE WASTEWATER PUMPS

***See the accompanying form for ordering information.
For information on bulk copy discounts, contact SWPA Headquarters.***

There are a number of Technical Resources and informational items you can use to learn more about submersible wastewater pumps and the submersible wastewater pump industry, obtain essential information for specifying submersible wastewater pumps, and assist you with the design, installation, and operation of submersible wastewater pumping systems. The most significant of these resources are published by the Submersible Wastewater Pump Association (SWPA) and the Hydraulic Institute (HI).

The Association's Technical Committee is composed of knowledgeable experts from all segments of the industry. It is the Technical Committee's purpose and responsibility to coordinate all of the Association's technical programs, services and activities. That includes creating the technical information published and disseminated by the Association as well as insuring the ongoing correctness of those materials by reviewing, revising, updating, and expanding them as necessary.

SWPA'S CURRENT TECHNICAL RESOURCES

- ***Submersible Sewage Pumping Systems (SWPA) Handbook, 3rd Edition***
- ***Start-Up & Field Check-Out Procedures Manual for Submersible Sewage Lift Stations***
- ***The Very Versatile Submersible Training Video***

Continued >>

SWPA'S CURRENT TECHNICAL RESOURCES – CONTINUED

- ***Submersible Wastewater Pumping Systems Users and Specifiers Guide – SWPA's Membership Roster and Product Reference Guide***
- ***Standardized Presentation Format for Pump and Motor Characteristics***
- ***Common Terminology and Definitions for a Typical Submersible Lift Station***
- ***Press Information Kit Describing Grinder Pumps in Pressure Sewers***
- ***Common Terminology and Definitions for a Grinder Pump Station (Included in the Press Information Kit Describing Grinder Pumps in Pressure Sewers)***

SWPA'S PLANNED NEW TECHNICAL RESOURCES

Technical Resources under development by the Association and their expected publication dates include the following:

- ***Submersible Sewage Pumping Systems (SWPA) Handbook -- Condensed Edition*** (A tutorial/guideline intended as an introduction to understanding the design and application of submersible pumps. *Expected publication date: first quarter, 2007.*)
- ***Grinder Pumps in Pressure Sewers*** (A primer describing the advantages of these products and reporting on how and where they are best used. *Expected publication date: first quarter, 2007.*)
- ***System Component Guidelines*** (Based on "The Systems Approach", these will be performance based guidelines for designing, operating and maintaining the major components in a submersible wastewater pumping system and will provide descriptive information on the components in a system as well as describe how those components interact with, impact, and affect each other. *Expected publication dates to be announced*).

SWPA's current Technical Resources, as well as the Association's Technical Resources that are under development, are described on the following pages. For additional information, contact SWPA Headquarters or visit the SWPA Web Site at www.swpa.org.

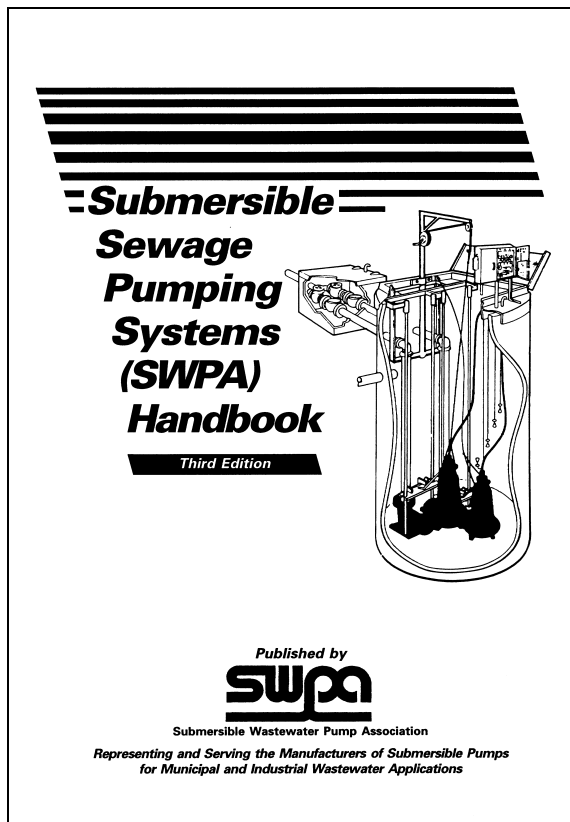
AMERICAN NATIONAL STANDARD FOR SUBMERSIBLE PUMP TESTS

Another Technical Resource you can use to learn more about submersible wastewater pumps is ***American National Standard for Submersible Pump Tests (ANSI/HI 11.6-2001)***, published by the Hydraulic Institute (HI). It is also described below. For additional information, visit the HI Web Site at www.pumps.org or contact HI at 973-267-9700.

Expanded and Updated:

SUBMERSIBLE SEWAGE PUMPING SYSTEMS (SWPA) HANDBOOK, THIRD EDITION

178 pages



Developed by a task force of industry experts, this one-of-a-kind publication familiarizes and assists those responsible for designing, installing and operating lift stations using submersible solids-handling pump systems.

CHAPTERS, GLOSSARIES AND APPENDIXES

Fundamentals and Components -- Wet wells. Types and sizes of stations. Site selection considerations.

Sizing the System -- Planning the sewage system. How to size the lift station.

Selection of Submersible Pumps -- Submersible system components. Factors in selection. Choosing the right pump.

Grinder Pumps and Pressure Sewers -- Applications. Advantages. Design criteria. Equipment. Construction. Operation and Maintenance.

Controls for Submersible Pumps -- Power Supply; Voltages and Phases available and Why?; Standby Power Sources; Motor Controllers; Level Control Systems; Hazardous Area Applications; Operation Sequences, Auxiliary Equipment; Auxiliary Equipment; and Grinder Pump Controls.

Variable Speed Pumping -- Basic information. Considerations and design guidelines about variable speed pumping and variable frequency drives. Descriptions of each contributing component of the variable speed pumping system, how it interacts with other components. Advantages and disadvantages of applying such a design to submersible pumping equipment.

Dry Pit Submersible Pumps -- General Description; Advantages; Applications; Pump Station Design; Pump Mounting Arrangements; and Electrical Design.

Mechanical Controls and Components -- Valve types and uses. Selecting access covers.

Installation and Start-Up -- Preparatory steps. Equipment. Start-up, including pump and control system testing.

Operation and Maintenance -- Procedures for maintenance and troubleshooting.

Glossaries -- System and electrical terms.

Appendixes -- Pump and electrical system references, including friction loss tables.

START-UP AND FIELD CHECK-OUT PROCEDURES MANUAL FOR SUBMERSIBLE SEWAGE LIFT STATIONS

28 pages

Based on field research, SWPA's **Start-Up and Field Check-Out Procedures Manual for Submersible Sewage Lift Stations** features step-by-step

procedures to put a lift station into service and lists start-up and check-out procedures at three separate levels, based on the equipment available.

The **Start-Up and Field Check Out Procedures Manual** includes procedures for flow and performance evaluation based on equipment available.

Also included: a listing of periodic station checks and inspections; notes on operation and maintenance; a sample Start-Up Report Form; guidelines for establishing and maintaining a Station Log Book; a Glossary of Terms; and a listing of Standards Setting Organizations whose actions impact submersible pumps.

As a reference tool, the SWPA **Start-Up and Field Check-Out Procedures Manual** also includes a drawing showing SWPA's *Common Terminology for the Components of a Typical Submersible Lift Station*.

→ Also Available ←

A CD-ROM with **BOTH** the *Submersible Sewage Pumping Systems (SWPA) Handbook, 3rd Edition* **AND** the *Start-Up and Field Check-Out Procedures Manual for Submersible Sewage Lift Stations*

"THE VERY VERSATILE SUBMERSIBLE" VIDEO TRAINING PROGRAM

A One-of-a-Kind Video Training Program on CD. **"The Very Versatile Submersible"** has been designed for use at training seminars, schools, and informational meetings. **"The Very Versatile Submersible"** discusses some of the ways this proven machine serves pump specifiers and users throughout the world. **"The Very Versatile Submersible" is...**

→ A video training tool aimed at informing the

viewer of the advantages and multiple uses of submersible wastewater pumping equipment. → An eight-minute presentation that describes the versatile submersible as *"a finely tuned machine designed to operate within the liquid being pumped. It moves suspended solids as well as liquids. The submersible takes little space...operates at a high hydraulic efficiency ...and is easily maintained and serviced."*

Distributors, contractors, specifiers, users, wastewater facilities managers, regulatory agencies, standards-making groups, classes at engineering schools, and others interested in learning more about submersible wastewater pumps can use *"The Very Versatile Submersible"* to provide sound background information about these pumps or as a discussion starter in various educational and training environments.

STANDARDIZED PRESENTATION FORMAT FOR PUMP AND MOTOR CHARACTERISTICS

The format includes the minimum information needed by a specifier or designer to adequately evaluate using specific equipment for an individual application. Information is presented in a consistent format so the designer or specifier can make an informed comparison between different brands or types of equipment. A series of

standardized pump/motor definitions of the terms that the data represent is included.

Complimentary hard copies are available from SWPA Headquarters upon request. For additional information, see SWPA's **2007 Membership Roster and Product Reference Guide** or visit the SWPA web site at <http://www.swpa.org/roster/pdfs/definitions2007.pdf>.

SUBMERSIBLE WASTEWATER PUMPING SYSTEMS USERS AND SPECIFIERS GUIDE

The **Submersible Wastewater Pumping Systems Users and Specifiers Guide** is also SWPA's Membership Roster and Product Reference Guide. Published annually as a service to the submersible wastewater pump industry, the 2007 edition is an 84-page document published with information about the industry, the Association, and its members.

This distinctive publication includes basic industry information as well as information about the Association and its programs and

services. In addition, it includes information about the products the Association's manufacturer members sell and the services provided by SWPA's Associate Members.

SWPA's **Submersible Wastewater Pumping Systems Users and Specifiers Guide** can be viewed on the Association's web site at <http://www.swpa.org/roster/index.html>.

Complimentary copies of publication are available in hard copy or electronic formats from SWPA headquarters.

COMMON TERMINOLOGY AND DEFINITIONS FOR A TYPICAL SUBMERSIBLE LIFT STATION

This document includes one Drawing of a Typical Submersible Pump Lift Station* and a second drawing showing common terminology of the components of a Typical Submersible Pump Station as well as SWPA's definitions of those terms and terminology. SWPA has established its Common Terminology to insure consistency in all SWPA publications as well as consistency to the greatest extent possible with terminology and definitions published by other industry organizations.

The terms used by SWPA in this context are not intended to be complete but to contain commonly used terms that might be unfamiliar to readers. The terms are included in SWPA's established terminology, which has been created to coordinate and insure the consistency of terminology within all SWPA publications as well as between SWPA publications and accepted industry standards and guidelines. For a more complete listing of wastewater industry terms and definitions, visit the SWPA Web Site at www.swpa.org.

*SWPA defines a Lift Station as a structure that contains pumps, piping, and mechanical and electrical equipment

for pumping including valves, basins, control panels, drives, and starters.

PRESS INFORMATION KIT DESCRIBING GRINDER PUMPS IN PRESSURE SEWERS

SWPA HAS published a comprehensive Press Information Kit describing **Grinder Pumps in Pressure Sewers** which includes a white paper entitled “A Pressure Sewer Overview – A Proven Approach to Moving Wastewater from One Point to Another”, a series of Frequently Asked Questions (FAQ’s) and Answers about grinder pumps and pressure sewers, and a compilation of Grinder Pump Definitions, Drawings, and Common Terminology.

SWPA has established its Common Terminology to insure consistency in all SWPA publications as well as consistency to the greatest extent possible with terminology and definitions published by other industry organizations.

Grinder pumps are used to power small diameter pressurized sewer systems in areas where gravity piping is uneconomical or impractical. Grinder systems work especially well in hilly or rocky terrains. They sharply reduce construction and equipment costs. In fact, grinder pumps make it possible to serve many developments and communities in terrain where service was previously impractical.

The White Paper’s Executive Summary begins by saying: “For many years, pressure sewer systems have been an effective method to move residential wastewater through small diameter pipes to collection facilities where

other methods are less economical or less feasible.”

The keys to understanding the differences between conventional gravity sewer systems and pressure sewer systems are the piping network and the reduction of solids size in the wastewater. These systems use grinder type pumps to reduce the solids present to particles, which can easily be moved through small diameter pipes.

The application of grinder pumps and pressure sewers is a cost-effective, long life answer to allow more sites, existing and new, access to public sewer systems.

The White Paper’s introduction states: “Pressure sewers can be used where gravity systems just won’t work because of uphill topography, surface rock, high water tables, waterfront locations, very flat land, extreme cold weather, stream crossings, restricted access and constraints on blasting. It also describes applications of grinder pump pressure sewer technology.”

There are 21 FAQs (and answers) that include definitions, cost and power explanations, system descriptions, life expectancy and other topics of interest to engineers, builders, developers and homeowners.

The definitions and drawings establish a common terminology for centrifugal and progressing cavity style grinder pumps.

NEW SWPA TECHNICAL RESOURCES PLANNED

Visit the SWPA Web Site at www.swpa.org for additional information and special pre-publication offers on these upcoming Technical Resources.

To expand its publishing efforts to meet the current, ongoing, and future needs of the industry it serves, SWPA is developing new Technical Resources.

Based on “[The Systems Approach](#)” these soon-to-be published documents will be:

- **Grinder Pumps in Pressure Sewers**
- **Submersible Sewage Pumping Systems (SWPA) Handbook – Condensed Edition**

- ***System Component Guidelines***

Each of these new SWPA Technical Resources is described on the following pages. These publications will present fundamentals with an emphasis on the design, construction,

Continued >>

New Technical Resources Planned – Continued

installation, operation, and maintenance of a system of carefully integrated components that require considerable engineering expertise for optimum performance.

Submersible wastewater pump stations contain a number of complex, interdependent components that must be properly matched to each other to ensure long and satisfactory

performance as well as extended life.

Using this approach will assist consulting engineers, specifiers, users, and others gain a better understanding of the interaction between engineers, specifiers, users, and others gain a better understanding of the interaction between the pump, valves, control panels, VFDs, basins, mechanical seal materials, and other components and how they interact to produce a system to create optimum performance, minimum maintenance, and long life.

SUBMERSIBLE SEWAGE PUMPING SYSTEMS (SWPA) HANDBOOK -- CONDENSED EDITION

Recognizing that industry standards have not adequately addressed submersible pumps and submersible pumping systems, SWPA formed a Working Group for the development of a tutorial/guideline document that will be published as an introduction to the design and proper application of these products.

To aid in the speedy and correct development of this document, the Working Group used the revised and updated ***Submersible Sewage Pumping Systems (SWPA) Handbook, 3rd Edition*** as the basis for the development of the new tutorial/guideline publication.

Upon publication, the ***Submersible Sewage Pumping Systems (SWPA) Handbook -- Condensed Edition*** will promote an increased understanding of submersible pump design and the proper application of these products. It will include numerous full color graphics.

The ***Submersible Sewage Pumping Systems (SWPA) Handbook -- Condensed Edition*** is expected to be about 56 pages and include sections on:

- Submersible Pumps and System Components
- Sizing the System
- Selection of Submersible Pumps
- Grinder Pumps and Pressure Sewers
- Controls for Submersible Pumps
- Adjustable Speed Pumping
- Mechanical Controls and Components
- Dry Well Submersible Pumps
- Installation and Start-Up

A glossary will also be included.

The publication is being created in a horizontal 8-1/2" x 11" page format so that two pages can be read on a computer screen at once. It will be offered in both hard copy and electronic formats.

GRINDER PUMPS IN PRESSURE SEWERS

This publication is being developed by SWPA's Grinder Pumps in Pressure Sewers Committee under the umbrella of the Association's Marketing Committee.

The Committee's Mission Statement is: To serve as a technical, marketing, and public relations information resource center to the membership, the industry, the marketplace and

the general public on grinder pumps in pressure sewer systems.

The Committee's specific goals are to:

1. Increase awareness of grinder pumps and pressure sewer systems;
2. Serve as a technical, marketing, and public relations information resource center

Continued ➤➤

Grinder Pumps in Pressure Sewers – Continued

to the membership, the industry, the marketplace, and the general public on grinder pumps in pressure sewer systems;

3. Provide an educational and information based forum about how these systems and pumps operate.

Grinder Pumps in Pressure Sewers is being developed to educate specific target audiences -- engineers, builders, and developers -- by describing the many aspects of pressure sewer systems and how they work.

Grinder Pumps in Pressure Sewers will feature numerous photographs, charts, graphs,

and other visuals and sections on:

- A General Description of Grinder Pumps in Pressure Sewers
- Advantages of Pressure Sewer Systems
- System Design Criteria System Design Criteria
- Equipment Requirements
- Up Front Planning
- Installation and Start-Up
- Operations and Maintenance

In its Appendix, **Grinder Pumps in Pressure Sewers** will also include an extensive glossary along with SWPA's Common Terminology and related drawings for these products.

SYSTEM COMPONENTS GUIDELINES

SWPA initiatives call for creating a series of publications based on its established product codes that will focus on "The Systems Approach". These will be performance based guidelines for designing, operating, and maintaining the major components in a submersible wastewater pumping system and will provide descriptive information on the components in a system and how those components interact with, impact on, and affect each other, including equipment guidelines, in a standard format.

SWPA's established product categories for component parts and accessories are: Access Covers, Alternators, Basins (Fiberglass), Cords/Cables, Control Components, Control Panels, Electric Motors, Fiberglass Enclosures, Guide Rail Systems, Lift Station Accessories, Phase Converters, Phase Monitors, Pipe Penetration Seals, Poly Basins and Accessories, Seals, Stainless Steel

Enclosures, Valves, Variable Frequency Drives, and Wet Wells

Each publication in the series will utilize components of the SWPA Common Terminology Project. The contents of each publication in the series (as related to the subject of the publication) will include:

- Purpose of the component in the system
- General information about the component in the system
- Specifics on how the component impacts the system, why it's important, and what needs to be considered in relation to the component in the system
- Applications of the component in the system
- Other information as appropriate for the component
- An Appendix with Glossaries, Acronyms, Codes, Specifications and Standards and Bibliography of Additional Sources of Information as appropriate to the component

AMERICAN NATIONAL STANDARD FOR SUBMERSIBLE PUMP TESTS (ANSI/HI 11.6-2001)

As an integral part of its strategic initiative to work with Standards Setting Organizations and Code Development Organizations, SWPA worked with the

Hydraulic Institute (HI) to develop **American National Standard for Submersible Pump Tests (ANSI/HI 11.6-2001)**.

Continued ➤➤

ANSI/HI 111.6-2001 – Continued

The landmark ANSI/HI Submersible Pump Tests Standard provides valuable information on procedures for centrifugal submersible pump performance testing.

Developed in collaboration with HI, this 40+ page this Standard meets one of the long-standing, major challenges in the wastewater pump industry: *the development and acceptance of a test standard written specifically for submersible pumps.*

ANSI/HI Submersible Pump Tests primarily applies to tests of centrifugal submersible pumps driven by induction motors. A centrifugal submersible pump is defined as a close-coupled impeller pump/motor unit designed to operate submerged in liquid,

including wet-pit and dry-pit environments. This Standard does not apply to submersible vertical turbine pumps or to accessory items, such as discharge elbows, suction fittings, or sliding connections.

Fundamentally based on the ANSI/HI Centrifugal Pump Test Standard (ANSI/HI 1.6), this Standard was initiated by a SWPA Test Standards Subcommittee.

This Standard was processed and approved for submittal to ANSI by HI, and is now accepted and utilized by all segments of the pump industry.

The ANSI/HI *Submersible Pump Tests*, HI product code M126, is available from the Hydraulic Institute in three formats.

For additional information, including how to order the ANSI/HI Submersible Pump Test Standards, visit the HI Web Site at www.pumps.org or contact HI at 973-267-9700.

FOR ADDITIONAL INFORMATION, CONTACT:

**SUBMERSIBLE WASTEWATER PUMP ASSOCIATION
1866 SHERIDAN ROAD, SUITE 201
HIGHLAND PARK, IL 60035-2545
PHONE: (847.681.1868)
FAX: (847.681.1869)
E MAIL: SWPAEXDIR@SBCGLOBAL.NET**

**SEE THE FOLLOWING PAGE
FOR A SWPA TECHNICAL RESOURCES ORDER FORM**

**DISCOUNTS ARE AVAILABLE
FOR ORDERS OF 25 OR MORE COPIES
OF ANY SWPA TECHNICAL RESOURCE.
FOR INFORMATION ON THESE DISCOUNTED PRICES,
CONTACT SWPA HEADQUARTERS.**



Submersible Wastewater Pump Association

TECHNICAL RESOURCES ORDER FORM

*Discounts are available for orders of 25 or more copies of any SWPA Technical Resource.
For information on these discounted prices, contact SWPA Headquarters.*

Return this completed order form, along with your check, to:

Submersible Wastewater Pump Association

1866 Sheridan Road, Suite 201 ♦ Highland Park, IL 60035-2545

For information, call (847.681.1868) ♦ FAX (847.681.1869) or E Mail (swpaexdir@sbcglobal.net)

Payment in U. S. funds MUST accompany this order.

We DO NOT accept credit card payments. Allow 4-6 weeks for delivery.*

Send me _____ copy (ies) of the *Submersible Sewage Pumping Systems (SWPA) Handbook, 3rd Edition* @ \$29.95 per copy plus \$4.50 shipping and handling per copy for U. S. Shipments* (\$6.50 per copy for Canadian shipments.* Contact SWPA Headquarters for S&H costs to other destinations).

Send me _____ copy (ies) of the *Start-Up and Field Check-Out Procedures Manual for Submersible Sewage Lift Stations* * @ \$5.00 per copy plus \$2.50 shipping and handling per copy for U. S. Shipments* (\$4.50 per copy for Canadian shipments.* Contact SWPA Headquarters for S&H costs to other destinations).

Send me _____ copy (ies) of the CD-ROM with the *Submersible Sewage Pumping Systems (SWPA) Handbook, 3rd Edition* * and the *Start-Up and Field Check-Out Procedures Manual for Submersible Sewage Lift Stations* @ \$31.95 per copy plus \$4.50 shipping and handling per copy for U. S. Shipments* (\$6.50 per copy for Canadian shipments.* Contact SWPA Headquarters for S&H costs to other destinations.)

Send me _____ copy (ies) of *The Very Versatile Submersible Video CD* @ \$4.95 per copy plus \$2.50 shipping and handling per copy for U. S. Shipments*. (\$4.00 per copy for Canadian shipments.* Contact SWPA Headquarters for S&H costs to other destinations.)

Send me _____ special package(s) consisting of one copy each of the *Submersible Sewage Pumping Systems (SWPA) Handbook 3rd Edition*, *Start-Up and Field Check-Out Procedures Manual for Submersible Sewage Lift Stations* and *The Very Versatile Submersible* Video CD @ \$39.95 plus \$7.50 shipping and handling per package* (\$9.00 per package for Canadian shipments.* Contact SWPA Headquarters for S&H costs to other destinations.)

Send me these complimentary items:

- Hard copy of SWPA's *2007 Submersible Wastewater Pumping Systems Users and Specifiers Guide*
- CD version of SWPA's *2007 Submersible Wastewater Pumping Systems Users and Specifiers Guide* (also available for download from SWPA's Web Site).
- Press Information Kit Describing Grinder Pumps in Pressure Sewers (also available for download from SWPA's Web Site)

My check for \$ _____ is enclosed. **Incomplete or incorrect information can delay shipments.**

Name _____

Company _____

Street Address (No P. O. Boxes, Please) _____

City _____ State _____ ZIP _____

Phone (AC _____) _____ e-mail _____ Date _____

* Overnight and 2nd Day Air shipping are available at an additional charge. Contact SWPA headquarters for details.