

FLOWAY® PUMPS

Vertical Turbine Pumps

Water industry

Excellent
Minerals
Solutions

WEHR
MINERALS



The strength of Floway® Pumps lies in the superiority of our engineering expertise, low vibration designs and highest quality materials.

First choice for water industry pumping solutions



1: Raw water service pumps
2: Water pumps



- Market leading products
- Whole life cycle solutions for any application
- Industry leading low vibration
- Customer-focused product development
- Expert installation and engineering support
- Total care, from basic service support to aftermarket sales and service

Floway® Pumps has a 75 year history of providing customers around the world with the right product and the highest quality for their specific process.

Our products are recognized worldwide for superior quality, top hydraulic performance and long service life.

Sample of cities across the US relying on Floway® Pumps pumping solutions:

- Las Vegas, NV
- Phoenix, AZ
- Los Angeles, CA
- Niagara Falls, NY
- Atlanta, GA
- Orlando, FL
- Seattle, WA

By concentrating solely on the vertical pump product line, Floway® Pumps has become a dominant force in today's highly diversified market. Floway Pumps are recognized worldwide for superior quality, top hydraulic performance and long service life.

In applications where the cost of ownership often outweighs capital cost as a priority, we help our customers address such issues as longevity, efficiency of operation and ease of maintenance.

- Through continuous improvements to materials, product design, engineering and manufacturing, we minimize downtime and reduce the risk of disruption to our customers' operations.
- By ensuring that we have a global presence, our customers will experience the synergy benefits of standardized processes worldwide.
- Working in close partnership with our customers allows us to develop end-to-end engineering solutions to the technical challenges they face, delivering genuine competitive advantage.

Over 75 years experience has provided the expertise to manufacture a versatile line of vertical turbine pumps for a wide range of applications.

Typical services

- High service
- Raw water (clear liquid)
- Finished water
- Booster
- Effluent disposal
- Lake or river water intake
- Makeup water
- Secondary recovery
- Service water
- Aquifer storage and recovery (ASR)
- Backwash
- Well water
- Screen wash
- Reverse osmosis
- Corrosive water services, sea water - brackish water



1: Booster pumps
 2: High service pumps
 3: Sump pumps
 4: Booster pumps

Weir Minerals has the geographical presence to service all the major water and wastewater markets around the world.

End to end **engineering solutions**

Floway® Pumps are built around the versatility of the vertical pump design. Depending upon exact job specifications, our engineers select the best combination of pump components and materials of constructions to meet virtually any water application.

Excellent engineering solutions

Floway® Pumps utilizes an in-house staff of licensed professional engineers to ensure maximum control over design specifications. Engineering capabilities include:

- 3D solid modeling
- In-house hydraulic design
- Products engineered to customer specifications
- Special material selection
- Computational Fluid Dynamics (CFD) analysis
- Stress and deflection analysis using Finite Element Analysis (FEA)
- Lateral and torsional rotor dynamic analysis
- Structural natural frequency analysis (using FEA) and design for VFD operation
- Design for low vibration

Industry leading low vibration

Floway® Pumps is dedicated to manufacturing pumps with industry leading low vibration levels.

Optional features:

- Premium machined and balanced motor
- Specially tolerated motor coupling machined by Floway Pumps
- Jacking posts for precise motor/pump shaft alignment
- Impellers balanced per API 610
- Reduced run-out on motor base

Customer focused product development

As a service to our customers, at Floway Pumps we have developed two specification selection programs to allow customers to specify projects and product details.

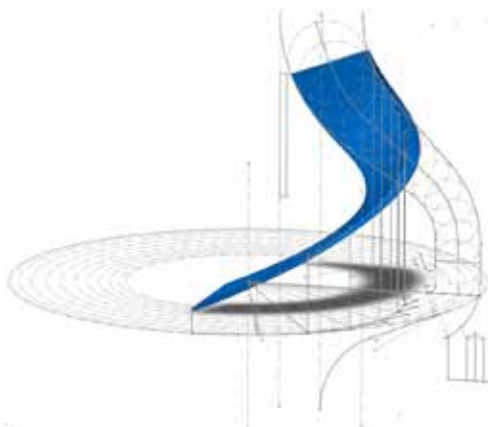
The SCORE selector program is a web based program which allows customers to search pump selection by flow and head specifics.

Build A Spec™ is a specification assistance program that breaks down the following components:

- Discharge head design
- Sealing arrangements
- Column construction
- Bowl construction

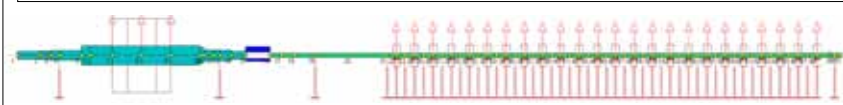
The Floway® Pumps specification tools can be accessed at our company website, www.weirminerals.com

In house hydraulic design



3D solid modeling

Lateral and Torsional Rotordynamic Analysis



Floway® Pumps has the capability to support customer operations worldwide with consistent products and local engineering expertise. As part of The Weir Group, we have the reach and resource to grow into emerging markets alongside our customers.

Weir Minerals has operations across:

- North America
- South America
- Africa
- Europe & UK
- Australasia
- Former Soviet Union

Performance testing

A major engineering function of any pump manufacturer is hydraulic performance testing under a variety of operational conditions. Testing ensures that pump performance matches specifications and that all components are operating properly.

Testing and analysis capabilities include:

- Three testing pits for flows to 45,000 GPM (10,220 m³/hr)
- Hydrostatic testing equipment for pressures to 5,000 PSI (345 Bars)
- NPSH testing equipment available for flows to 30,000 GPM (6,814 m³/hr)
- Pressures to 2,500 PSI (172 Bars)
- Electrical power through 3,000 HP (2,235 KW)
- All measuring equipment calibrated on a scheduled basis with traceability to National Institute of Standards and Technology (NIST)
- Vibration testing available including spectrum analysis (FFT) with multiple simultaneous channels. Proximity probes available for measuring dynamic shaft vibration

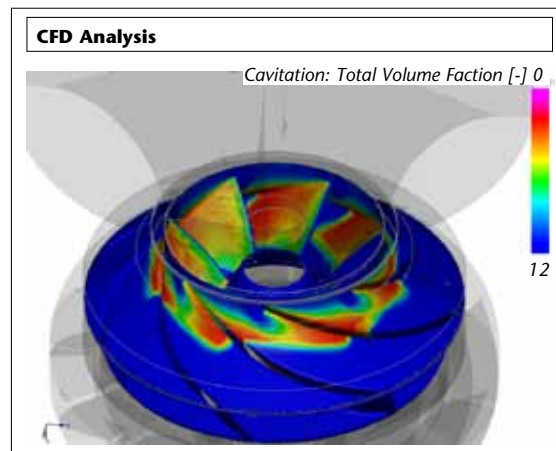
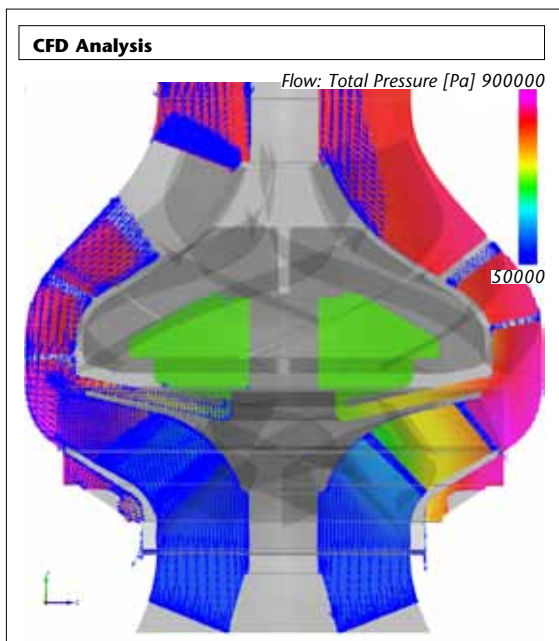
- Impact testing available to determine the structural natural frequencies (Reed Critical Frequency) of the pump/motor structure
- Capable of testing a complete engine driven pump
- Both 50 Hz and 60 Hz power available
- Pump testing using a Variable Frequency Drive (VFD) available upon request
- Coating spark test (low voltage/high voltage)
- Pump thrust testing
- Noise testing

Non-Destructive Testing (NDT)

- Dye Penetrant (LP)
- Magnetic Partical Inspection (MP)
- Radiography Exam (RT)
- Ultrasonic Testing (UT)
- Positive Material Identification (PMI)
- Hardness Testing (Rockwell and Brinell)
- CMTR upon request
- AWS Certified Welding Inspection (CWI)

Coating

- NSF certified coating available when requested
- Two part epoxy
- Fusion bonded epoxy
- Most any coating available for potable or non-potable service



Floway® Pumps takes pride in the fact that all of our products are manufactured in house, giving total control and maximum capabilities.



1: Water re-use pumps
2: Field installation
3: Booster pumps



Meeting global standards through excellent manufacturing processes

Manufactured to meet global certifications and standards:

Electrical standards

- NEMA
- IEEE
- IEC

Construction standards

- ANSI B16.5 Class 150 through 1500 flange ratings

- Welding to ASME section IX on all listed materials
- ASTM standards met for all materials supplied - castings, forgings, and wrought materials
- Stress relief carbon steel to ASME Section VIII
- DIN
- BS
- Hydraulic Institute
- CE Marking
- API 610

Unlike our competitors, the unparalleled Flowway® pump product is manufactured all under one roof. That means that every step from designing to manufacturing and the finished product is controlled in our state of the art facility in Fresno, California, USA



Quality assurance

Quality control never ends at Flowway® Pumps. It begins with the quotation phase and continues throughout the order process, manufacturing phase, warranty period, customer follow-up and service. This dedication to quality has given us the reputation for having one of the finest products in the vertical turbine pump industry. Certifications include:

- ISO 9001:2008 Quality Management Systems
- ISO 14001:2004 Environmental Management Systems
- OHSAS: 18001:2007 Occupational Health and Safety Management Systems



In house manufacturing capabilities

Fabrication - The Flowway® Pumps fabrication facility is staffed by ASME Boiler Code Section IX certified welders.

Machining - Computer controlled lathes, large boring mills, and individual production equipment ensure an efficient and flexible manufacturing process.

Balancing - Dynamic and static balancing of rotating elements ensure low vibration performance.

Inspection - Product is inspected at multiple stages throughout the manufacturing process to ensure a quality product. Capabilities include a Coordinate Measuring Machine (CMM) that can measure complex curvatures for comparison to 3D solid models. The CMM is also used to measure large parts where conventional measurement techniques are limited.

Final Assembly - All pump components are assembled to customer specifications for top efficiency, long service life, and high quality appearance.



1: Testing facility

2: Machining of discharge head

3: NSF certified epoxy coating being applied to pump

4: Final assembly

Floway[®] vertical pumps for the water industry

Typical options of construction

- Semi-open or enclosed impellers
- Bowl and impeller wear rings
- Thrust balanced impellers (reduced downthrust on motor bearings)
- Flanged or threaded column pipe

VF and VFR (VS6)



F and FR (VS1)



VU (VS1)



Vertical pump features and services

VF & VFR

Vertical close coupled, single or multistage turbine with fabricated head discharging above ground, with a below ground suction mounted in a fabricated barrel or can

Capacity to 35,000 GPM (7,950 m³/hr)

Pressure to 1,500 PSI (103 Bars)

Typical service - booster applications for various water process services

F & FR

Vertical close coupled single or multistage turbine with fabricated head discharging above ground

Capacity to 35,000 GPM (7,950 m³/hr)

Setting to 600 ft (183 m)

Pressure to 1,500 PSI (103 Bars)

Typical service - large wet pits, well pumps, water treatment plants, lake and river intake, and various water process applications

VU

Vertical close coupled, single or multistage turbine, with a fabricated head discharging below ground

Capacity to 35,000 GPM (7,950 m³/hr)

Setting to 600 ft (183 m)

Pressure to 1500PSI (103 Bars)

Typical service - large wet pit for flood control, water treatment plants and any surface water source

- Product lubricated, water flush or oil lubricated shafting
- Hard chrome bearing journals
- Special materials of construction (stainless steel, bronze, duplex, super duplex)
- Electrical motors available in Vertical solid (VSS) or vertical hollow (VHS) shaft construction
- Abrasive service – Special materials and construction to increase pump life
- Shaft sealing options include mechanical seals, packing boxes, water flush, oil lubricated or grease packed configurations
- Hydro-Seal construction – eliminates above grade shaft sealing element

VC

Vertical close coupled, single or multistage turbine, with fabricated head configured for an above ground suction and discharge mounted in a fabricated barrel or can
 Capacity to 35,000 GPM (7,950 m³/hr)
 Pressure to 3,000 PSI (207 Bars)
 Typical service - in-line, above ground, closed suction booster applications and water treatment plants

Low-lift

Vertical mixed flow single or multistage with fabricated discharge head. These pumps can be mounted at 45 degree or 90 degree with above or below ground discharge
 Capacity to 35,000 GPM (7,950 m³/hr)
 Setting to 50 ft (15.2 m)
 Pressure to 35 PSI (2.41 Bars)
 Typical service - large wet pit for flood control, water treatment plants and other low-lift applications

A & AF

Vertical close coupled, single or multistage turbine with cast iron head with an above ground discharge
 Capacity to 5,000 GPM (1,140 m³/hr)
 Setting to 600 Ft (183 m)
 Pressure to 300 PSI (20.7 Bars)
 Typical services - wet pit, well pumps, and booster applications for water treatment plants, various water process applications

VC (VS6)



Lowlift (VS3)



A and AF (VS1)



Column assembly and impeller configurations

Column assemblies



Flanged column pipe (open lineshaft for product lubrication shown)

Standard construction 16" (41cm) diameter and larger column pipe recommended when ease in assembly is required. Flanged column pipe can be furnished in either oil, water flush or product lubricated construction.



Flanged column pipe (enclosed lineshaft for oil lubrication shown)

Applications include pumpages with suspended particles which require bearing protection and deep well pumps.

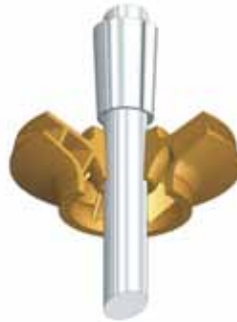
Note: Not recommended for use on high pressure short setting pumps.



Threaded column pipe (open lineshaft for product lubrication shown)

Pump setting with water levels over 30' (9m) require driver non-reverse ratchet and lineshaft pre-lubrication. Available for 3" (8cm) through 14" (34cm) threaded pipe size. Threaded column generally preferred for well pumps where clearance is minimal.

Impellers



Enclosed type impeller with tapered collet shaft mounting

Standard construction features tapered friction drive collet furnished on pump bowls through size 22" (56cm).

Features - Easy installation, lateral adjustment and low hydraulic thrust



Semi-open type impeller with tapered collet shaft mounting

Standard construction features tapered friction drive collet. Semi-open impeller construction is available on pump bowls through size 27" (69cm) and on larger sizes when required.

Features - Reduced chances of plugging impellers when handling solids

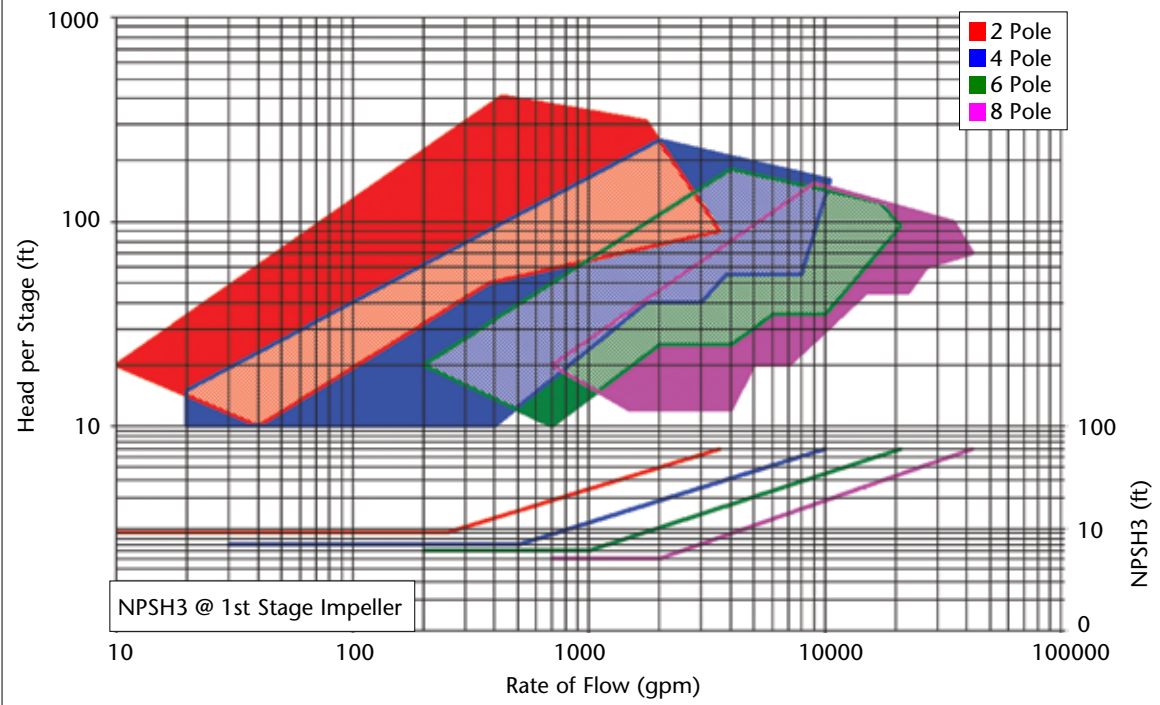


Enclosed type impeller with double keyed shaft mounting

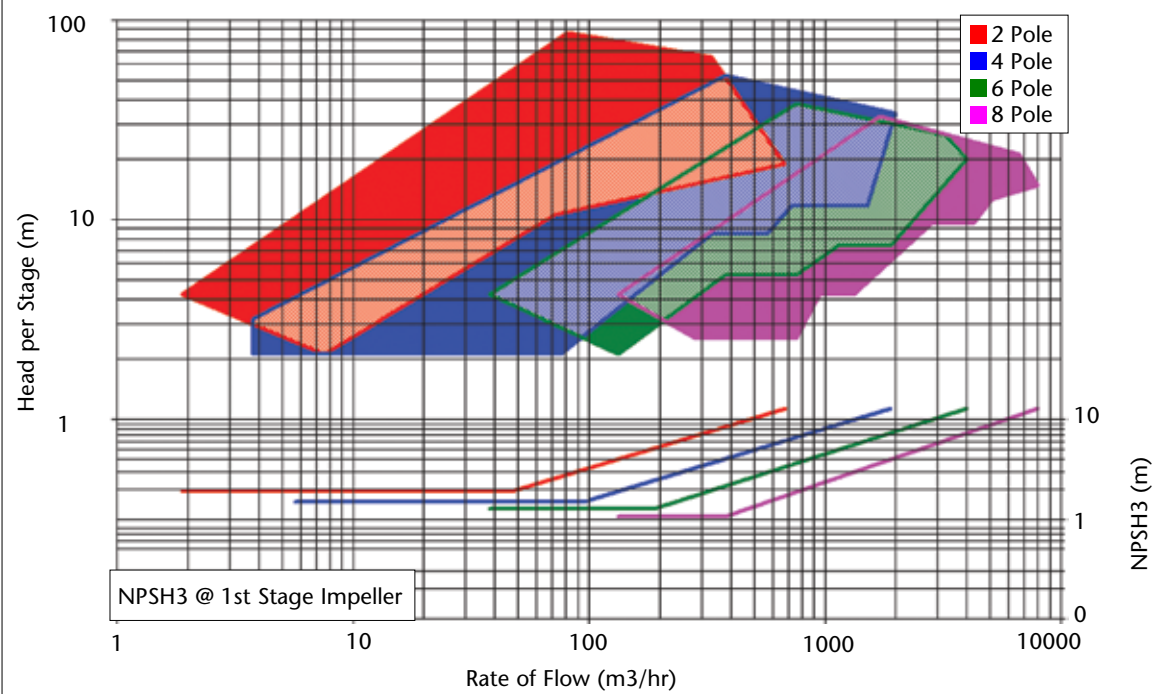
The double keyed impeller shaft mounting features both axial and radial keys. This construction is standard on bowl sizes 23" (58cm) and larger. It is also available as optional construction on bowl size 22" (56cm) and smaller enclosed and semi-open type impellers.

Features - Allows for ease of removal and replacement of impeller wear parts

Floway® Coverage Chart 60Hz



Floway® Coverage Chart 50Hz



Performance data shown is approximate. For actual pump performance contact your local Floway representative or visit Floway's online pump selector website at www.weirminerals.com

Geographical footprint

Weir Minerals has the geographical presence to service all the major minerals markets around the world. This global supply capability provides a competitive advantage in this relatively fragmented market.

Weir Minerals has operations across:

- North America
- Latin America
- Africa
- Former Soviet Union
- Europe
- Australia
- Asia

Customer profile

Our customers range from the world's largest minerals and mining multinationals to single pumpset operators.

We support customer operations worldwide with consistent products and local engineering expertise. As part of the Weir Group, we have the reach and resource to build close, long term relationships with all our customers, helping them to achieve ...

The Lowest Cost of Ownership

Service and support

This global capability with our own dedicated service teams combined with the service centres of our sister companies within the Weir Group and those of our strategic partners provide support in virtually every developed market.

WARMAN® Centrifugal Slurry Pumps
GEHO® PD Slurry Pumps
LINATEX® Rubber Products
VULCO® Wear Resistant Linings
CAVEX® Hydrocyclones
FLOWAY® PUMPS Vertical Turbine Pumps
ISOGATE® Slurry Valves
MULTIFLO® Mine Dewatering Pumps
HAZLETON® Specialty Slurry Pumps
LEWIS® PUMPS Vertical Chemical Pumps
WEIR MINERALS SERVICES™



For further information on any of these products, service or support services contact your nearest sales office or visit:

www.weirminerals.com

Weir Floway, Inc. dba Weir Minerals Floway Pumps

2494 S Railroad Avenue
PO Box 164
Fresno, CA 93707 USA

Tel: +1 559 442 4000
Fax: +1 559 442 3098
Email: floway@weirminerals.com

Excellent
Minerals
Solutions

