

**FLOWAY® PUMPS**

Vertical Turbine Pumps

**General Industry and Industrial**

Excellent  
Minerals  
Solutions

**WEIR**  
MINERALS



Weir Minerals are specialists in delivering and supporting equipment solutions including pumps, hydrocyclones, valves and wear resistant linings for global mining and mineral processing, the power sector, and general industry.

Focusing upon what we do best, Weir Minerals delivers what matters to you most. This simple philosophy combined with being part of the global Weir Group provides you with added benefits over alternative suppliers.

Weir Minerals brings together an extensive global service and manufacturing presence combined with an investment capability able to develop, support and sustain market leading technologies that deliver enhanced performance in your process critical applications.

# First choice for general industry

**Weir Minerals is renowned for their world leading wear and corrosion resistant products through many general and industrial processes.**

- 1 : Water supply vertical pumps
- 2 : Cooling tower pumps
- 3 : Floway vertical snow making pump



Whatever the manufacturing process, there is always an application that requires better equipment to ensure critical process reliability. This is where Weir Minerals Division pumps, valves and mill liners come into their own.

Weir Minerals is renowned for their world leading wear and corrosion resistant products throughout many industrial processes. They are generally hidden away in some corner quietly performing some arduous and critical application without fuss. Reliability, long wear life, high efficiency and ease of maintenance are all hallmarks of our world famous pumps, valves and mill liners.





Through a customer focused strategy, Weir Minerals has used its unique technologies to develop an unrivalled range of processing equipment for some of your most critical processes. This means that today's Weir Minerals is much more than a pump company.

# and industrial **pumping solutions**

## Typical markets

- Snow Making
- Condensate
- Cooling Tower
- Geothermal
- Power
- HVAC
- Automotive
- Nuclear Power (non safety related)
- Amusement Park/Aquarium

## Floway vertical turbine pumps

Weir Minerals Floway Pumps has a long history of providing customers around the world with the highest quality vertical pump products. More than 75 years experience has provided the expertise to manufacture a versatile line of vertical turbine pumps for a wide range of applications in the general industry and industrial markets.

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

- 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.



1 : Floway snow making pumps

2 : Floway cooling tower pumps

## Vertical **pumps**

**World leading vertical turbine pumps**

**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 customers' application.

#### Engineering capabilities

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

- 3D CAD modeling
- In house hydraulic design
- Products engineered to customer specifications
- Special material selection
- Flow analysis
- Intake design review
- Stress, torsional and seismic analysis
- Natural frequency analysis and construction for VFD operation
- Low vibration design (PMLV™)

#### Industry leading low vibration

Floway is dedicated to manufacturing pumps with industry leading low vibration levels. We offer Precision Manufactured Low Vibration (PMLV™) pumps with vibration levels at one half of the standards set by the Hydraulic Institute.

PMLV features:

- Premium machined and balanced motor
- Specially toleranced motor coupling machined by Floway
- Jacking posts for precise motor/pump shaft alignment
- Impellers balanced per API 610
- Reduced run-out on motor base
- Extends MTBF by more than 200%

#### Customer focused product development

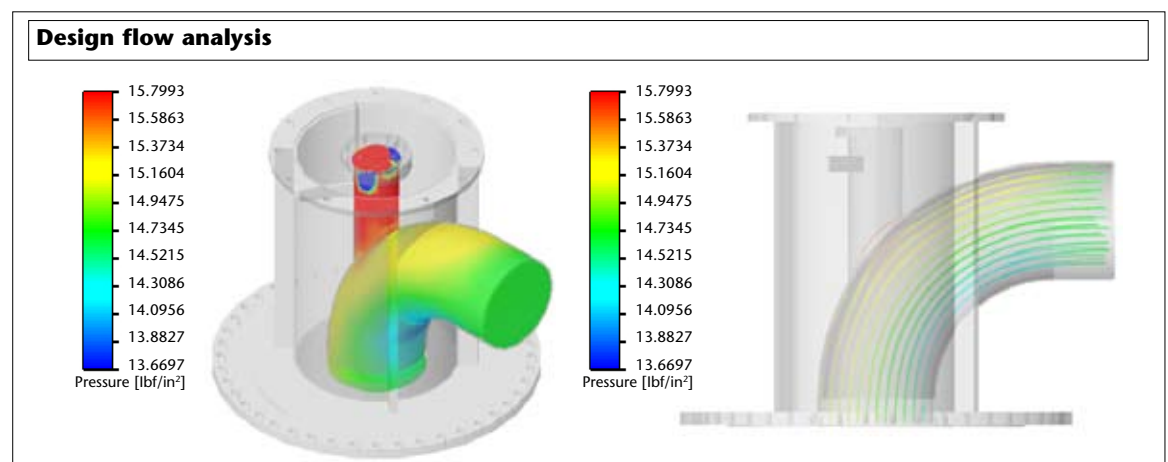
As a service to our customers, Floway has developed two specification selection programs to allow customers to specify projects and product details.

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 builds a word based specification from user selected construction options.

## End to end engineering solutions

**Total solutions for your vertical  
pumping applications**



Our customers' demand top efficiencies, low vibration performance and high quality appearance. To ensure exact performance specifications, we offer full hydraulic testing and analysis under a variety of operational conditions.

## Testing solutions for your critical applications

### Flow testing

A major engineering function of any pump manufacturer is hydraulic flow 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 40,000 GPM (9,085 m<sup>3</sup>/hr)
- Hydrostatic testing equipment for pressures to 5,000 PSI (345 Bars)
- NPSH testing equipment available for flows to 30,000 GPM (6,814 m<sup>3</sup>/hr)
- Pressures to 2,500 PSI (172 Bars)
- Electrical power through 2,500 HP (1864 KW)
- All pressure flow measuring equipment calibrated on a scheduled basis with traceability to National Bureau of Standards
- Four vibration monitors available including full spectrum real time analysis. Proximity probes available for measuring dynamic shaft run-out.
- Critical "Reed" Frequency testing - three exciter sizes available for pump and motor structural testing
- Capable of testing a complete engine driven pump
- Both 50 Hz and 60 Hz power available
- Variable Frequency Driven pump testing with job VFD available
- Coating spark test (low voltage/high voltage)
- Non-Destructive testing, NDT includes dye penetrant, magnetic particle, radiography, ultrasonic and noise level

### Mechanical testing

- Dye Penetrant (LP)
- Magnetic Particle 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 approved coating available when required.
- Two part epoxy
- Fusion bonded epoxy



1 : Testing a vertical pump

2 : Floway's state of the art testing facility

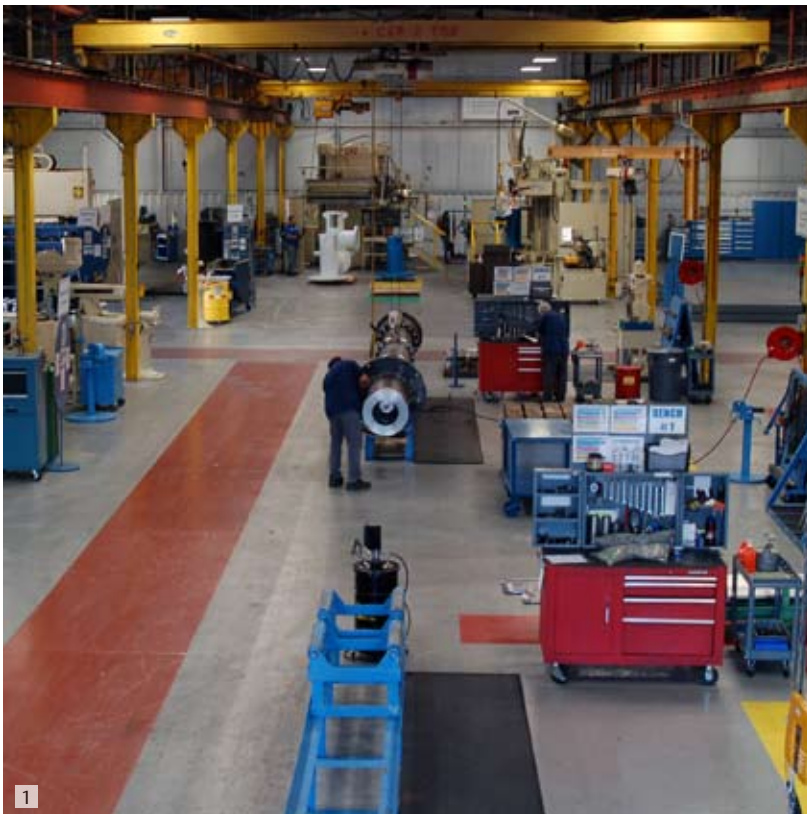
3: On-site engineering solutions

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

Unlike our competitors, Floway's unparalleled 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.

# Meeting global standards through excellent manufacturing processes

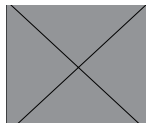
**Excellent manufacturing, from design to final assembly, is reason for our reputation as an innovative manufacturer of the highest quality vertical pumps.**



1 : Floway's state of the art manufacturing facility

2 : Fabrication of discharge head

Member of  
**Hydraulic**





### Quality assurance

Quality control never ends at Floway. 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

- ISO 9001:2000
- ISO 14001
- OHSAS 18001:2007

### In house manufacturing capabilities

**Fabrication** - The Floway 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.

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

### Manufactured to meet global certifications and standards:

#### Electrical standards

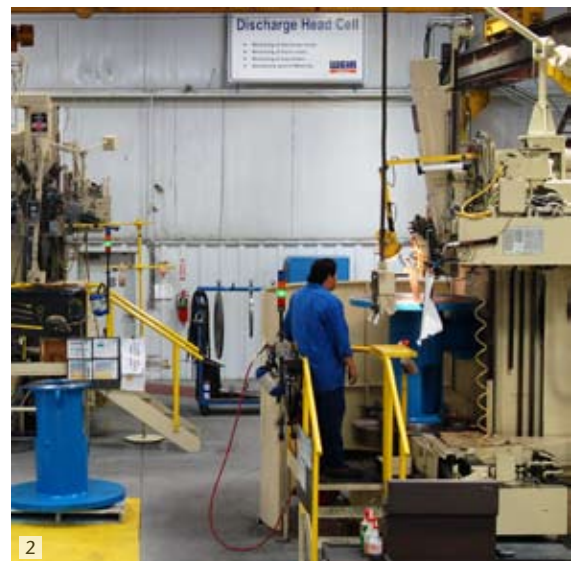
- NEMA
- IEEE
- 50 Hz - 60 Hz
- IEC

#### Mechanical standards

- ANSI B16.5 class 150 through 1500 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

#### International standards

- DIN
- BS
- Hydraulic Institute
- CE Marking



- 1 : Shafting cell
- 2 : Discharge head cell
- 3 : Bowls
- 4 : Discharge head
- 5 : Assembly station

#### 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
- Product lubricated, water flush or oil lubricated shafting
- Harden bearing journals
- Special materials of construction (stainless steel, bronze, duplex, super duplex)
- PMLV™ construction
- Electrical motors available in Vertical solid (VSS) or vertical hollow (VHS) shaft construction
- Abrasive service – special materials and construction to increase pump life

# Vertical pumps

## World's leading vertical turbine pumps

### Floway VF & VFR



### Floway F & FR



### Floway VU



### Floway VC



### 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. Typical service: booster applications for various water process services

Capacity to 35,000 GPM (7,950 m<sup>3</sup>/hr)  
Setting to 100 ft (15.2 m)  
Pressure to 1,500 PSI (103 Bars)

### F & FR

Vertical close coupled single or multistage turbine with fabricated head discharging above ground. Typical service: large wet pits, well pumps, lake and river intake, and various water process applications

Capacity to 35,000 GPM (7,950 m<sup>3</sup>/hr)  
Setting to 1,200 ft (365.8 m)  
Pressure to 1,500 PSI (103 Bars)

### VU

Vertical close coupled, single or multistage turbine, with a fabricated head discharging below ground. Typical service: large wet pit for flood control, and various surface water sources

Capacity to 35,000 GPM (7,950 m<sup>3</sup>/hr)  
Setting to 100 ft (30.5 m)  
Pressure to 200 PSI (13.8 Bars)

### 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. Typical service: in-line, above ground and closed suction booster applications

Capacity to 35,000 GPM (7,950 m<sup>3</sup>/hr)  
Setting to 100 ft (15.2 m)  
Pressure to 3,000 PSI (207 Bars)



- Shaft sealing elements available in mechanical seal, packed box, water flush, oil lubricated, grease packed configurations or stilling tube
- Hydro-Seal construction – eliminates above grade shaft sealing element

### Low-lift

Vertical mixed flow single or multistage with fabricated discharge head. These pumps can also be mounted at 45 degree with above ground discharge.  
Typical service: large wet pit for flood control river, lake and other low-lift applications

Capacity to 35,000 GPM (7,950 m<sup>3</sup>/hr)  
Setting to 50 ft (15.2 m)  
Pressure to 35 PSI (2.41 Bars)

### A & AF

Vertical close coupled, single or multistage turbine with cast head with an above ground discharge.  
Typical services: wet pit, well pumps, booster applications and various water process applications

Capacity to 5,000 GPM (1,140 m<sup>3</sup>/hr)  
Setting to 600 Ft (182.9 m)  
Pressure to 300 PSI (20.7 Bars)

### Submersible

The submersible pump utilizes a submersible motor coupled directly to the bowl assembly and is designed to operate completely submerged in the fluid being pumped.

Capacity to 7000 GPM (1590 m<sup>3</sup>/hr)  
Settings to 1500 ft (457 m)  
Pressure to 750 psi (52 Bars)

### Xpress<sup>SM</sup>

Pre-engineered for fast delivery and competitive prices.  
Typical services: cooling tower, water supply and HVAC. Contact the factory for additional details.



# Column assembly and impeller configurations

## Column assemblies



### Flanged column assemblies

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.



### Enclosed lineshaft assembly with water flush or oil lubrication

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

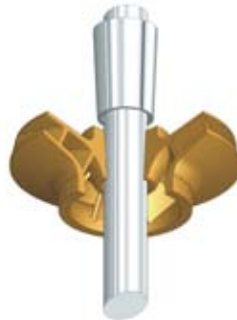
Note: Not recommended for use on high pressure short setting pumps



### Product lubricated column and shaft assemblies

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.

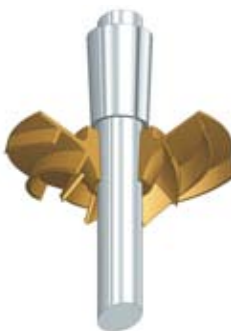
## Impellers



### 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 — Lateral adjustment for increasing or reducing flow rates. Reduced chances of plugging impellers when handling solids.

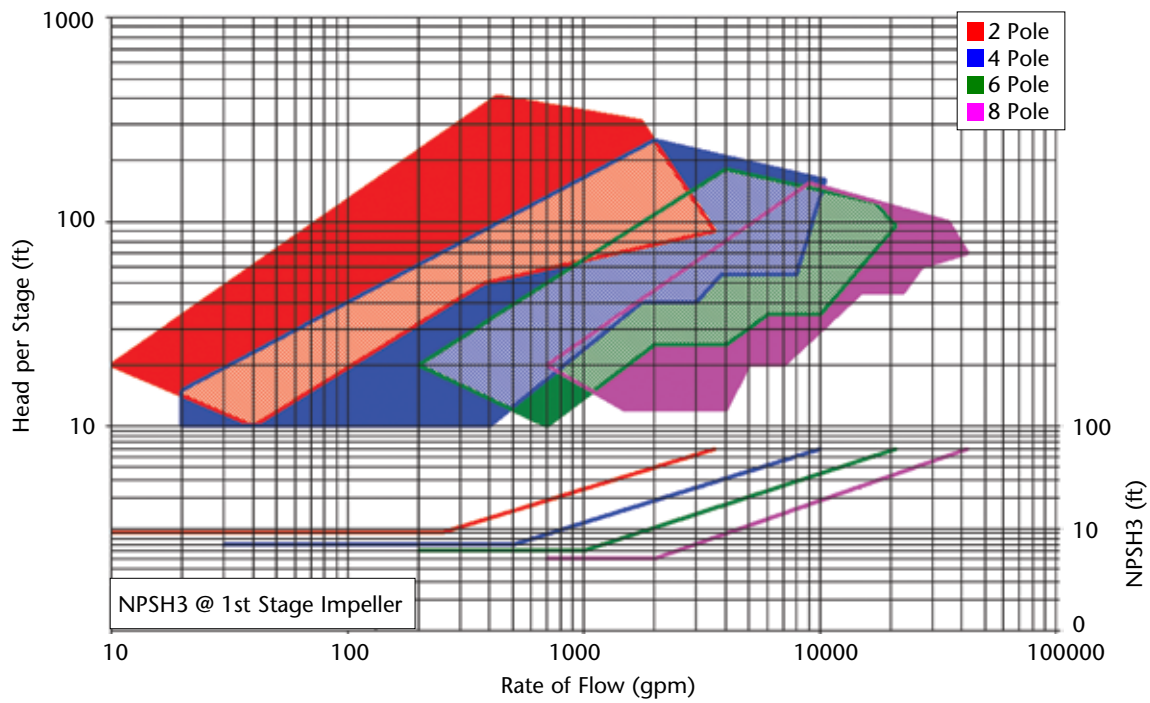


### Enclosed type impeller with double keyed shaft mounting

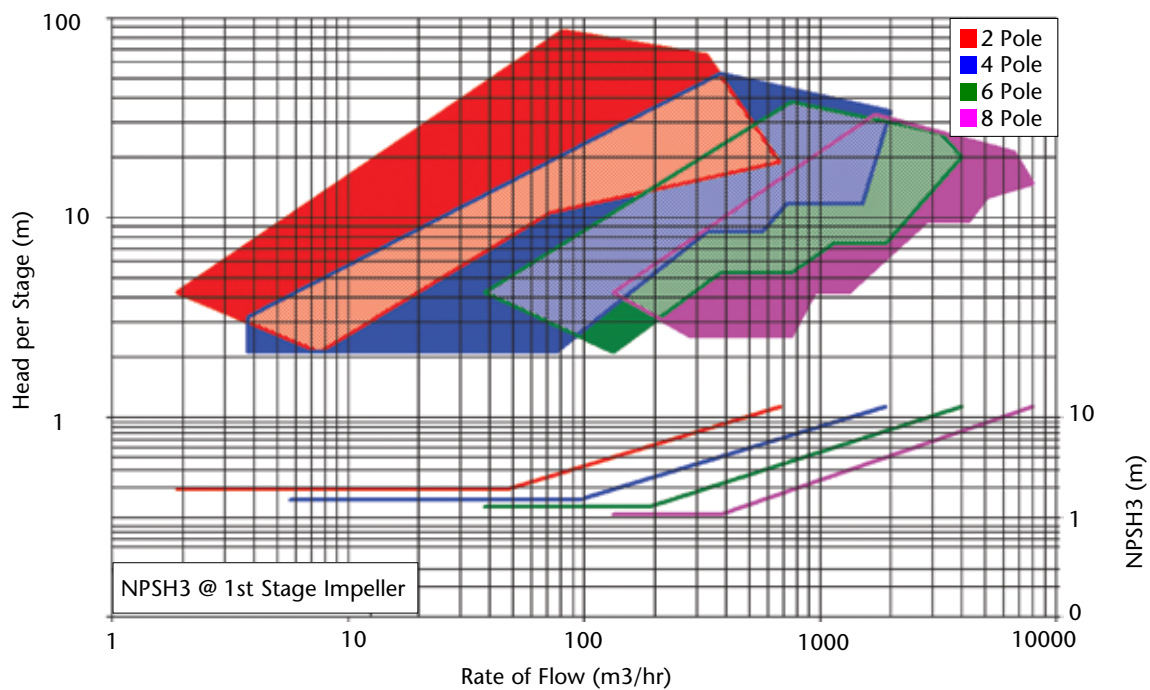
The double keyed impeller shaft mounting features both axial and radial key. This construction is standard on bowl sizes 23" (58cm) and larger. It is also available as optional construction on bowl size 22" (56cm) and smaller enclosed and semi-open type impellers.

Features — Allows for ease of removal and replacement of impeller wear parts.

**Floway Coverage Chart 60Hz**



**Floway Coverage Chart 50Hz**





## 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
- Russia
- 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  
**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  
**BEGEMANN PUMPS™** Centrifugal Process Pumps



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

[www.weirminerals.com](http://www.weirminerals.com)

### Weir Floway, Inc.

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](mailto:floway@weirminerals.com)

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Minerals  
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