

TRILLIUM FLOW TECHNOLOGIES™

# Floway® Pumps

Mining and Mineral Processing

WEIR Minerals

Authorised Distributor of Floway® Pumps

## Floway® Pumps are built for durability for your mining process. Corrosive resistant alloys and innovative design keep your operations running smoothly.

For over 80 years, the Floway team has delivered reliable pumping solutions for customers around the world. Floway is committed to delivering market leading products and services which meet the technical and commercial challenges in minerals processing.

We understand the importance of providing a strong technologies and engineering resource dedicated to minimizing downtime and preventing disruption to the customer's operation.

For your specific system, our qualified team ensures the precise design and manufacturing quality is in accordance to your specifications.

Our global reach allows us to use a wide range of resources and technologies for your system. By centralizing shared functions such as materials sourcing, research, testing, marketing and administration, we are able to maximize our technological support and provide the best solution possible.

We understand your system is crucial to your bottom line and that is why we have increased our local presence to service our customers directly on-site. During the design stage, we are able to provide technical expertise and engineering excellence to maximize your process. We select the best possible solution of materials and pump construction to optimize your growth.

Our global service capability allows us, upon request, to put someone on site.

Through our highly skilled service facilities, we are dedicated to repairing and improving performance both in the shop and on-site. We offer our customers a range of services to ensure their equipment performance, safety and efficiency are thriving in a demanding industry.

Our customers require a rapid response and on-site support from someone who understands the local conditions.

Trillium Flow Technologies has a geographical footprint that plays a major role in establishing our closeness with the customers' operations. Our global reach allows us to provide quick, knowledgeable support wherever your facility is located worldwide.

## Our Reliable Commitment to Service

**We Provide**

- Application expertise
- Installation supervision and support
- Ease of maintenance
- Understanding the customers' processes
- Local aftercare and engineering service
- Local solutions backed by global design resources

**Aftermarket Service and Support**

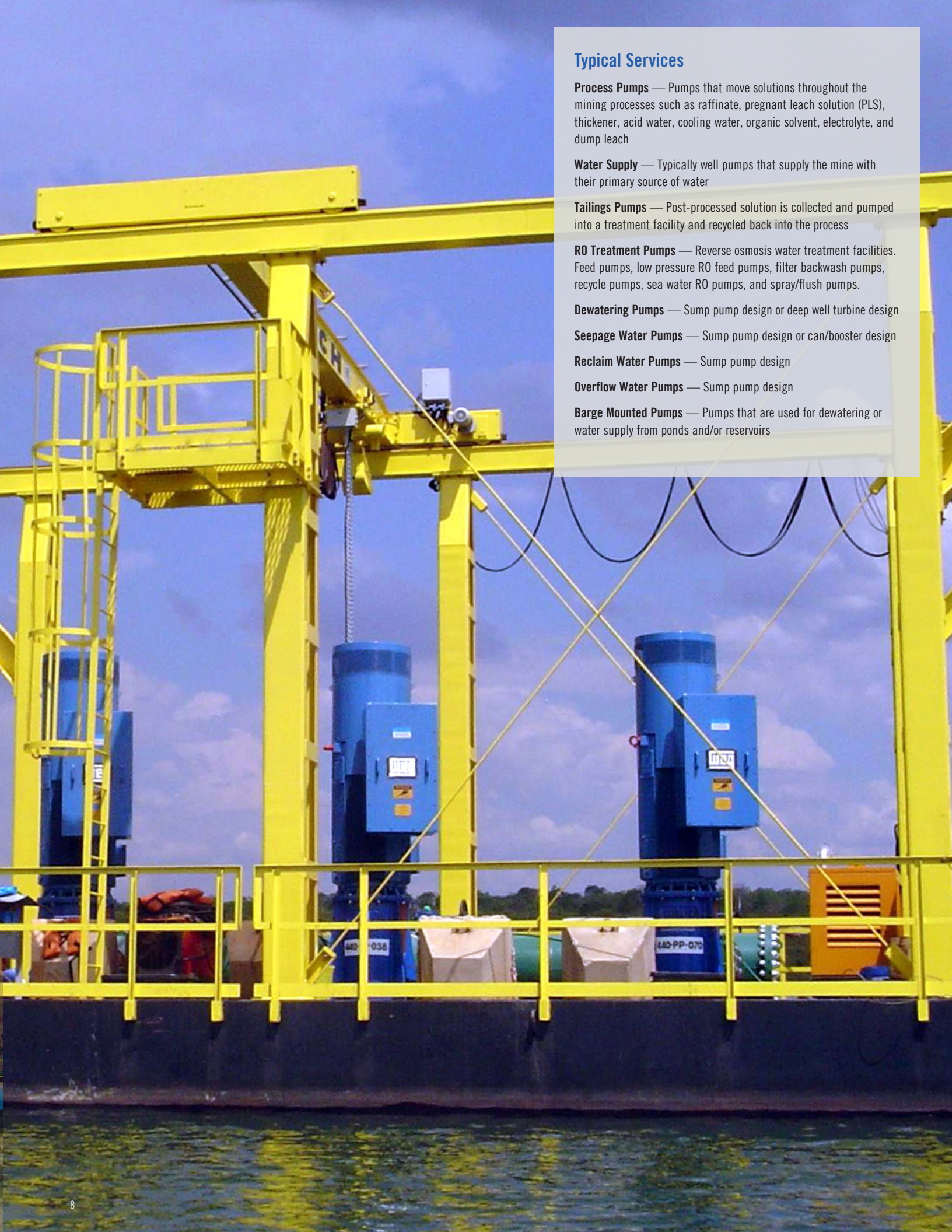
Our Aftermarket sales and service department is dedicated to providing excellent service to our customers. We want to assure each customer that choosing Floway genuine replacement parts is the optimal solution for your system. Our robust design allows for ease of maintenance and longer wear life. Contact us today by email for your pump equipment and parts replacement needs.

floway@trilliumflow.com

**Global Service Facilities located in**

- Africa
- Australia
- Chile: Santiago, Antofagasta, Calama,
- Copiapo, Iquique
- Mexico: Monterrey, Cananea
- Peru: Lima, Arequipa, Cajamarca





## Typical Services

**Process Pumps** — Pumps that move solutions throughout the mining processes such as raffinate, pregnant leach solution (PLS), thickener, acid water, cooling water, organic solvent, electrolyte, and dump leach

**Water Supply** — Typically well pumps that supply the mine with their primary source of water

**Tailings Pumps** — Post-processed solution is collected and pumped into a treatment facility and recycled back into the process

**RO Treatment Pumps** — Reverse osmosis water treatment facilities. Feed pumps, low pressure RO feed pumps, filter backwash pumps, recycle pumps, sea water RO pumps, and spray/flush pumps.

**Dewatering Pumps** — Sump pump design or deep well turbine design

**Seepage Water Pumps** — Sump pump design or can/booster design

**Reclaim Water Pumps** — Sump pump design

**Overflow Water Pumps** — Sump pump design

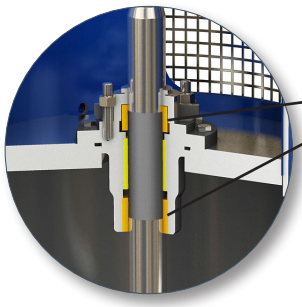
**Barge Mounted Pumps** — Pumps that are used for dewatering or water supply from ponds and/or reservoirs

# The Floway VTSP

## Our Floway VTSP is a unique patented design to specifically handle solids up to 10% by weight while providing superior abrasion resistance.

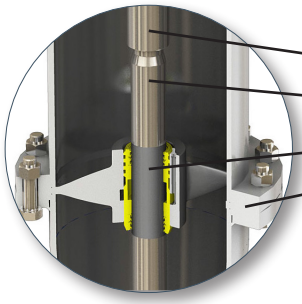


We listened to our customers when they asked for a solids handling VTP with a precise yet simplified design. The result is the innovative Floway VTSP, the first solids handling vertical turbine pump. Our Floway VTSP is the solution to longer pump life with capability to handle solids of 10% by weight and excisions up to 20%. The solution is simple - the Floway VTSP.

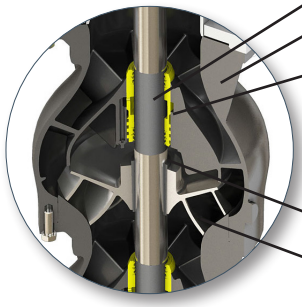


Shaft seal features:

- Mechanical seal designed for slurry services
- Isolation device to keep solids away from seal
- No leakage. No adjustment required
- No external flush required



- Threaded or double keyed shaft couplings as required
- 416 SS or 17-4-PH metal shafting
- Hard-coated shaft in bearing area
- Fabricated flanged column sections



- Hard-coated shaft in bearing area
- Cast iron bowls with abrasion resistant coating on hydraulics

Floway VTSP bearing assembly features:

- Grease packed and sealed from pumpage
- Staged seal design for extended wear life
- Hard-coated shaft and bearing journals
- No external flush required
- Patented design

- 316 SS collets

Semi-open impeller features:

- Adjustable as pump wears to maintain performance without disassembly
- Hardened stainless steel material for increased abrasion resistance and extended wear life
- No wear-rings to wear out

## Through continuous improvements to materials, product design, engineering and manufacturing, we minimize downtime and reduce the risk of disruption to our customers' operations.

VTSP Pump

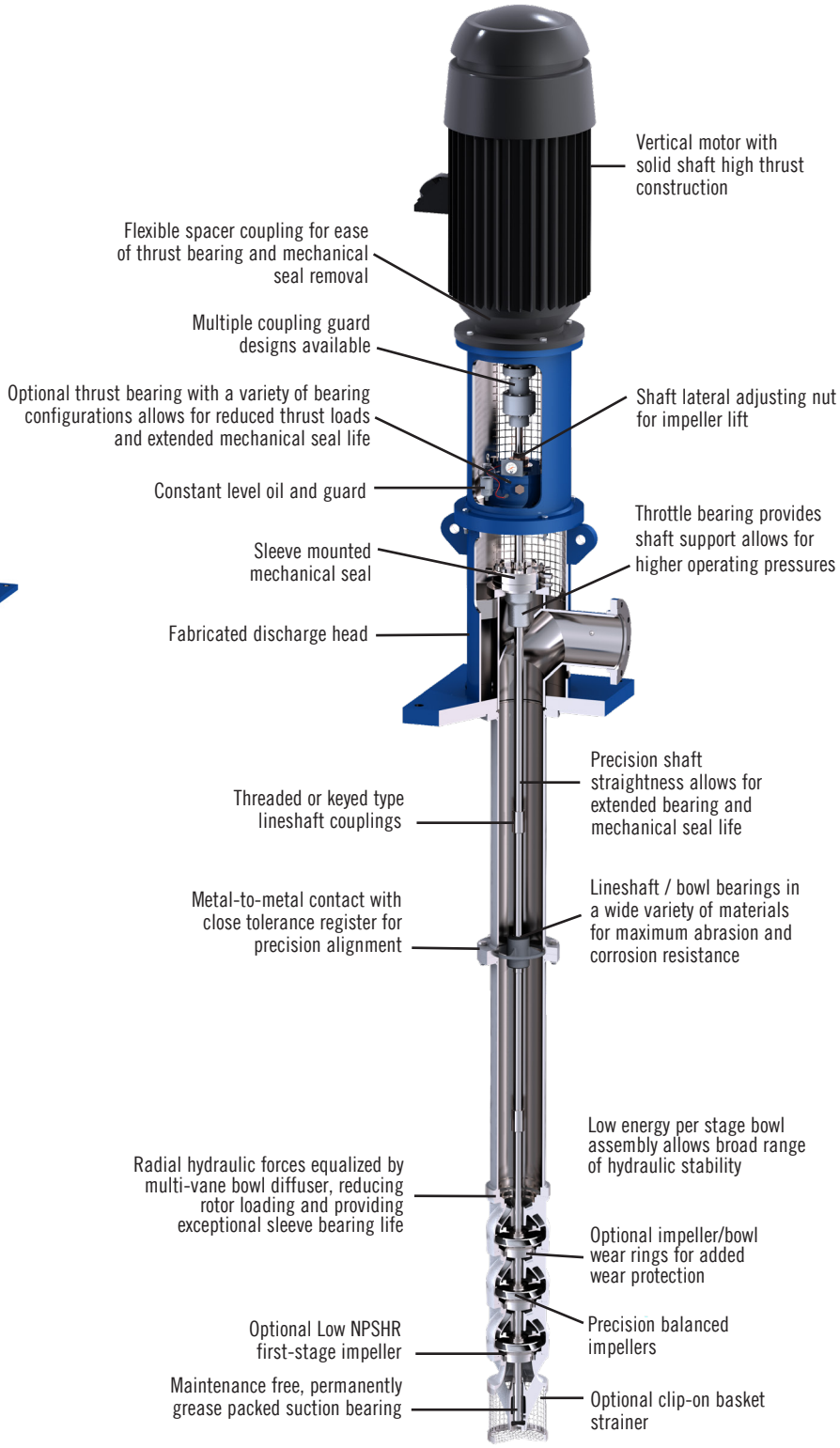


VTP - Wet Pit



VTP - Barrel/Can





# Engineered to Order

## Meeting customer specifications is simply the first step in delivering whole life-cycle performance. From design and installation, through service, maintenance and upgrade, we ensure continuity of excellence.

### Industry Leading Low Vibration Levels

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

**Optional features:**

- Premium machined and balanced motor
- Dynamically balanced motor coupling
- Jacking posts for precise motor/pump shaft alignment
- Reduced run-out on motor base
- Confidential manufacturing techniques
- Nozzle loading analysis

### Excellent Engineering Solutions

Floway 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
- Engineered products to customer specifications
- Computational Fluid Dynamics (CFD) analysis
- Stress and deflection analysis using Finite Element Analysis (FEA)
- Lateral and torsional rotor dynamic analysis
- Designs for VFD operation using structural natural frequency (FEA)
- Design for low vibration

### Performance Testing

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

**Testing and analysis capabilities include:**

- Three test pits for flows ranging from 50 GPM to 45,000 GPM (10,220 $m^3$/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 3,400 HP (2,535 KW)
- Equipment calibration to National Institute of Standards and Technology (NIST)
- Vibration testing available including spectrum analysis (FFT) with multiple simultaneous channels.
- Available impact testing to determine the structural natural frequencies (Reed Critical Frequency) of the pump/motor structure
- Engine driven string testing capability
- Both 50 Hz and 60 Hz frequency available
- Pump testing using a Variable Frequency Drive (VFD) available upon request
- Coating spark test
- Pump thrust testing
- Noise testing

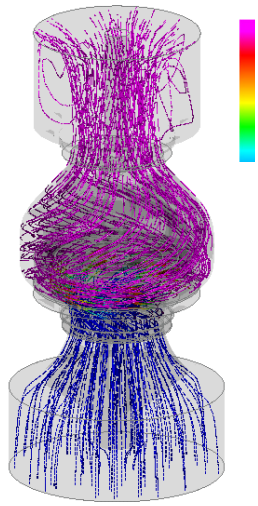
### Non-Destructive Testing (NDT)

- 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)

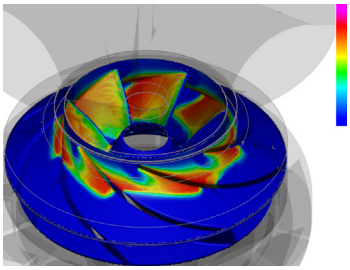
### Coating

- Two-part epoxy
- Fusion bonded epoxy
- Wide range of coatings available

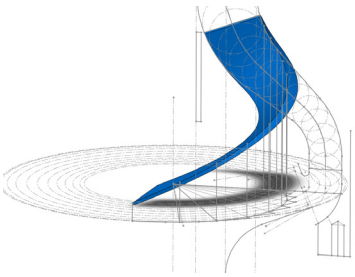
360° Hydraulic Balance



CFD Analysis



In-house hydraulic design



### Floway Pumps Optional Features

- Semi-open or enclosed impellers
- Bowl and impeller wear rings
- Thrust balanced impellers (reduced down-thrust on motor bearings)
- Flanged or threaded column pipe
- Product lubricated, water flush or oil lubricated shafting
- Hardened bearing and shaft journals Electrical motors available in Vertical Solid Shaft (VSS) or Vertical Hollow Shaft (VHS) construction
- Shaft sealing options including mechanical seals, packing boxes, water flush, oil lubricated or grease packed configurations
- Engineered to order options upon request

### Certification Standards

- NEMA
- IEEE
- IEC

### Construction Standards

- Hydraulic Institute
- NSF/ANSI 61 & 372
- 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
- CE Marking
- API 610

### 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 servicing. 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




### Wear/Corrosion Resistant Materials

To increase the pump longevity and enhance efficiency, Floway offers the following materials of construction:

- Austenitic-304L (J92500)
- 316L (J92800)
- Super Austenitic-904L (N08925)
- AL6XN (J94651)
- 317LM (J93000)
- Duplex SS-2205 (J92205)
- 255 (J32250)
- CD4MCu (J93370)
- Super Duplex SS-2507 (J93380)
- Alloy 20 (N08020)
- Super Austenitic 254SM0 (J31254)
- Titanium
- Compatible wrought alloys are available for above cast materials

## Trillium Pumps USA Inc.

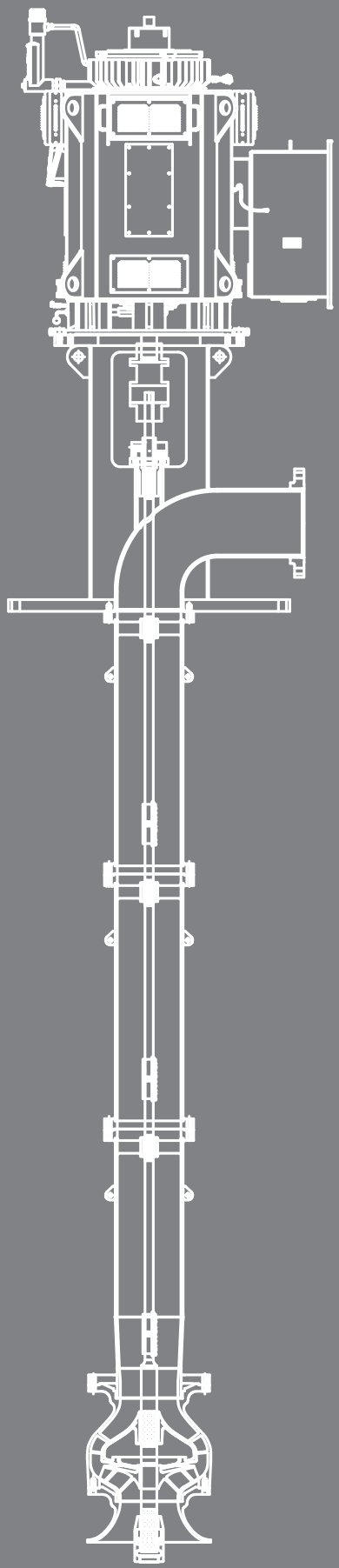
2494 S. Railroad Ave.
Fresno, California 93706 USA

T: 559-442-4000
F: 559-442-3098
floway@trilliumflow.com

**www.trilliumflow.com**


Minerals

Authorised Distributor of Floway® Pumps
www.global.weir




Copyright © 2017, 2019 Trillium Flow Technologies. All rights reserved.
Floway is a registered trademark of Trillium Pumps USA, Inc.



Mining Brochure
Version 3, October 2019