# Lewis Pumps™ sulphuric acid pumps

Formerly known as Chas. S. Lewis & Co., Inc., Weir Minerals Lewis Pumps, manufactured its first sulphuric acid pump in 1914, beginning a specialization which has continued to the present time. Today, the company is the world's acknowledged leader in the design and manufacture of pumping equipment for sulphur chemistry applications.

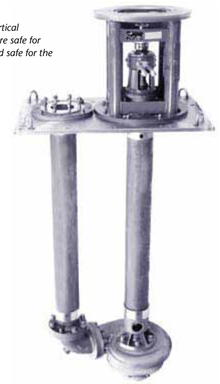
With material selections featuring the proprietary LEWMET® alloys to provide maximum corrosion resistance, the hydraulic and mechanical engineering concepts embodied in Lewis Pumps™ sulphuric acis pumpsassure the plant operator of outstanding performance and reliability in high temperature sulphuric acid and oleum.

**Mechanical features**

- Heavy-duty construction specifically developed for superior service in strong sulphuric acid and oleum.
- Hardened LEWMET® nickel-chrome alloy used for critical wearing parts subjected to high velocities, corrosion and abrasion.
- Specially formulated alloy shafts of premium yield strength, precision straightened and fitted with PTFE cover for high-temperature applications.
- One-piece shafts provide highest available standard of straightness and balance for smooth operation.
- Casing and other heavy wetted parts made of an exclusive alloyed iron incorporating generous corrosion allowances for long life.
- Dual-volute casing and balanced wear ring designs reduce hydraulic loadings, minimizing shaft deflection while prolonging the life of wearing parts and ball bearings.

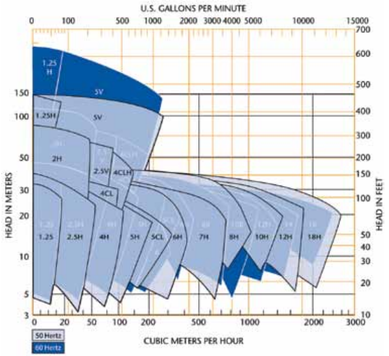
**GENERAL DESIGN CONCEPTS**

Because of the dangers inherent in pumping hot concentrated sulphuric acid, Weir Minerals Lewis Pumps supplies vertical pumps for this service; the fluid pumped never touches the shaft stuffing box, thereby avoiding the safety and environmental problems associated with horizontal pumps.



*Lewis Pumps™ vertical chemical pumps are safe for your operators and safe for the environment.*

**Sulphur & sulphuric acid pumps coverage chart**




## LEWIS PUMPS™
Vertical Chemical Pumps

Weir Minerals Lewis Pumps is known internationally in the sulphur, sulphuric acid and phosphoric acid industries with equipment installed in more than 120 countries worldwide. Founded in 1891 as Chas. S. Lewis & Co., Inc., today Weir Minerals Lewis Pumps is the recognized world leader for pumps and valves in these difficult pumping applications.

**Product highlights**

- Sulphuric Acid Pumps – Flow rates to 13,000 gpm / 3000 $M^3/H$
- Molten Sulphur Pumps – heads to 500 ft /150 mlc and pump lengths to 275" / 7000 mm
- Phosphoric Acid Pumps – vertical centrifugal and axial flow pumps offered in specialized metallurgy
- LEWMET® Alloys – suitable for use in strong sulphuric acid to 460° F / 240°C & phosphoric acid
- Sulphuric Acid Valves – gate, globe, and butterfly to 30" / 750 mm diameter

Weir Minerals Lewis Pumps customer service commitment has been a major contributor to our worldwide success. This philosophy is reflected in our ability, in an emergency, to ship standard replacement wear parts within 72 hours to most international airports. Senior Weir Minerals Lewis Pumps sales engineers are available to assist your plant personnel address a wide variety of operations maintenance and installation questions.

**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
**WEIR MINERALS SERVICES**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## LEWIS PUMPS™
Vertical Chemical Pumps

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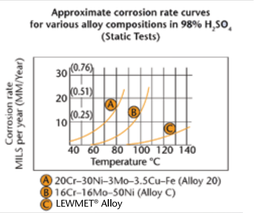
## Comprehensive Product Line
Vertical pumps, acid valves, and alloys

## Lewis Pumps™ LEWMET® alloys for sulphuric acid

**Approximate corrosion rate curves for various alloy compositions in 98% $H_2SO_4$**




Drawing upon metallurgical experience gained during decades of operation as a manufacturer of pumping equipment for sulphuric acid manufacture, Weir Minerals Lewis Pumps introduced the first LEWMET® alloy in 1971 for use in high-performance pump components.

The family of LEWMET® alloys were specifically designed to provide superior erosion resistance combined with outstanding corrosion resistance in the operating environment of contact process sulphuric acid producing plants.

Having seen the superior performance of LEWMET® alloys in the difficult service conditions of the typical absorbing tower circulating pump, knowledgeable plant operators soon recognized the problem-solving potential of LEWMET® alloys in other applications.

Consult your Weir Minerals Lewis Pumps sales engineer for a LEWMET® alloy solution for your metallurgical requirements.

## Lewis Pumps™ sulphuric acid valves

Weir Minerals Lewis Pumps manufactured its first sulphuric acid valve in 1975, continuing a specialization in sulphuric acid equipment which began in 1914. Today, Weir Minerals Lewis Pumps has established itself as a leader in the design and manufacture of piping and control valves for sulphuric acid applications. With material selections featuring the proprietary LEWMET® alloys to provide maximum corrosion resistance, the mechanical engineering concepts embodied in our valves assure the plant operator of consistent flow control in high temperature sulphuric acid and oleum.

Typically, pump impellors made of LEWMET® alloy operate successfully with acid velocities often exceeding 30 meters/second at the impeller exit. Although the flow through piping in a sulphuric acid plant is generally limited to 2-3 meters/second, the velocity may be many times that value in the intricate passageways of a valve. Thus, valves featuring LEWMET® alloy are providing owners with unequalled performance in sulphuric acid plant operations.

***Butterfly valves (middle in photo)***
*All LEWMET® alloy construction for control service. Sizes 4" - 24" (100 - 600mm)*

***Globe valves (left in photo)***
*All LEWMET® alloy construction-modified parabolic port – Sizes 1/2" - 6" (15 - 150mm)*

***Gate valves (right in photo)***
*All LEWMET® alloy construction – Sizes 1/2" - 4" (15 - 100mm). Alloyed iron body, LEWMET® alloy discs and seats – Sizes 6" - 30" (150 - 750mm).*

## Lewis Pumps™ phosphoric acid pumps

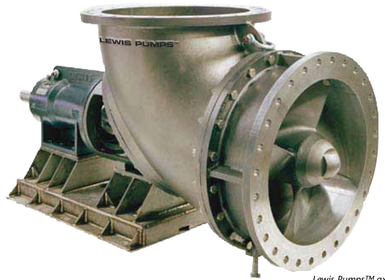
As a metallurgically-based manufacturer of pumps used in the production of fertilizer acids, Weir Minerals Lewis Pumps first began developing alloys for $P_2O_5$ service in 1957. Today, Weir Minerals Lewis Pumps can select from a wide range of materials, including both commercially available alloys as well as the proprietary LEWMET® alloys which have been specifically designed to provide maximum performance in acids containing high levels of fluorine and chlorine. Both austenitic alloys, providing the highest degree of corrosion resistance, and duplex alloys, exhibiting superior performance in the more abrasive environments, are available.

**Cantilever-shafted models**

- Used in applications where abrasion may be a problem
- Available in standard setting lengths up to 2150mm for both submerged and external mounting

**Mechanical features**

- Heavy-duty construction - no submerged bearings
- Double volute casing balances radial reactions and minimizes shaft deflection
- External shaft adjustment to renew impeller clearance, maintaining capacity and efficiency




*Lewis Pumps™ axial flow pump*

**Axial-flow models**

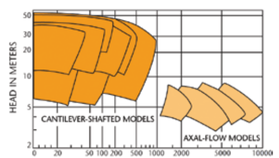
- Used for phosphoric acid concentration in vacuum evaporation circuits and in flash cooler service, requiring high flows at low pumping pressures

**Mechanical features**

- Rugged construction - both cast pump components and weldments are available as the application requires
- One-piece precision-bored bearing housing, registered to elbow, positions rotating element for smooth trouble-free operation
- Separate elbow and casing design assures easy field alignment of pump with drive belts in place

*Lewis Pumps™ cantilever-shafted pump*

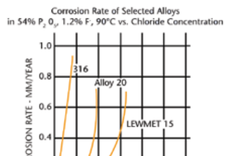
**Phosphoric acid pumps coverage chart**




*Consult Factory for:*

- *Detailed performance charts for specific model and size*
- *Performance ratings beyond this chart*

**Alloy selection guide**




## Lewis Pumps™ molten sulphur pumps

Building on its own prior experience of manufacturing heavy-duty sulphuric acid pumps, Weir Minerals Lewis Pumps began production of vertical submerged molten sulphur pumps in 1940. Combining expertise in pump hydraulics, metallurgy and mechanical engineering, Lewis Pumps™ vertical submerged pump can be supplied for every sulphur application.

Weir Minerals Lewis Pumps offers a family of steam-jacketed sulphur pumps to meet a diversity of applications for the production, transfer, and processing of sulphur from its points of production (from mineral or hydrocarbon sources) to the major points of use in sulphuric acid plants.

**GENERAL DESIGN CONCEPTS**

Because of the unique properties of molten sulphur, Weir Minerals Lewis Pump supplies vertical pumps for these services. In turn, these pumps fall into two general classifications: Submerged-bearing models and Cantilever shafted models.

***Cantilever shafted models***

*Used for applications in which the impurities in dirty sulphur will result in unacceptable wear or fouling of submerged bearing clearances. Available in standard lengths up to 84" / 2150mm for most applications.*

***Submerged-bearing models***

*Used for relatively clean sulphur applications. Can be supplied in setting lengths up to 275" / 7000mm beneath the coverplate with a one-piece shaft design.*