

Mineral Processing Solutions



One Source

Integrating testing, design, engineering, fabrication, and services to ensure customised total packages

One Source, many solutions



FLSmidth brings together the experience and reliability of leading global brands and services to provide complete systems and solutions for your application

As a One Source supplier, FLSmidth integrates testing, detailed design engineering, global procurement, expert process control, and localised services to deliver a complete flowsheet of products and process support for the minerals processing industries.

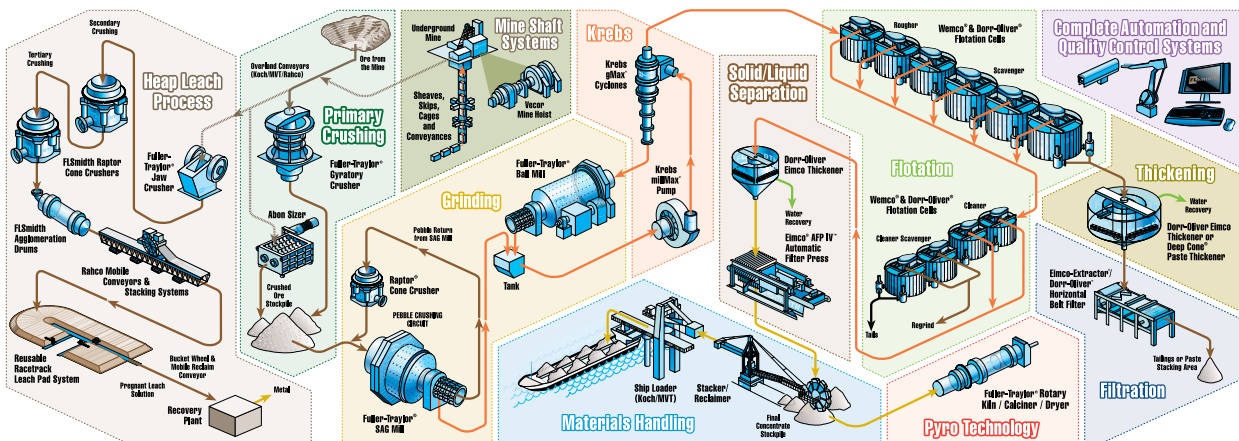


FLSmidth is the One Source for the world's largest installed base of original equipment, enhanced products, technologies and services unmatched in the mining and minerals processing industries. FLSmidth offers a broad range of equipment and processes including: metallurgical testing, ore characterisation, design, engineering, crushing, grinding, classifying, flotation, thickening and clarifying, vacuum and pressure filtration, pyroprocessing, material handling, slurry handling, automation, along with OEM quality replacement parts, modernisation services and other after-sale services.

To successfully compete in today's challenging world economy, companies often require innovative solutions to ensure their plant operating systems function at peak efficiency. Utilizing the latest in equipment technology, resources and materials, we deliver the optimum design, equipment and process support needed. Selecting FLSmidth as your partner brings this solid foundation, along with more than a century of experienced support, to your business.

Product Brands:

- **ABON®** - feeding, sizing, crushing and screening equipment since the 1920s
- **Buffalo™** - feeding and crushing equipment for mining and general industries since 1975
- **Dawson Metallurgical Laboratories** - metallurgical testing for ore amenability, process development, flowsheet layout and plant design since the 1930s
- **Decanter™** - global leader in centrifugation and filtration technologies
- **Dorr-Oliver®** and **EIMCO®** - over 100 years of technical innovation in liquid/solid separation solutions including product offerings from WEMCO® and Shriver®
- **ESSA®, FLSmidth Automation and PERI** - automation and quality control systems
- **Fuller-Traylor™/FFE** - dating back to 1903, Fuller-Traylor mills, crushers and pumps have a reputation for ruggedness and reliability
- **KREBS®** - hydrocyclone separation and severe-duty slurry pumping solutions since 1952. Krebs also supplies Technequip Valves
- **Knelson™** - gravity concentration solutions
- FLSmidth Material Handling Brands – **KOCH®, MVT™, RAHCO®, Roymec™** and **Conveyor Engineering™** combine to design, manufacture and service bulk handling systems including mobile conveyors, radial stackers, portable conveyors, fixed/overland conveyors and at-the-face mining conveyors
- **Ludowici®** - Vibrating screens, feeders, centrifuges, cyclones and wear resistant materials
- **Mayer Bulk, M.I.E. Enterprises, and Phillips Kiln Services** - customer services groups
- **MAAG® Gear** - the competence center for engineered gear solutions
- **Meshcape™** - screen media
- **Möller™** - design, engineering, procurement, erection, and commissioning of pneumatic conveying systems and silos
- **Pfister®** - the expert for continuous gravimetric weighing and dosing.
- **Pneumapress®** - Advanced vertical pressure filtration
- **Raptor®** cone crushers - These well-designed, robust and durable machines offer outstanding productivity
- **Summit Valley™** - leaders in precious metals recovery systems
- **VECOR™** - mine hoist technology



Comminution



FLSmidth offers primary and secondary crushing and milling equipment for every mineral application. With the best overall solution, we assure the most optimum heavy duty equipment is provided for your demanding requirements.



Crushing

FLSmidth has more than a century of experience in crushing and is a world-class supplier of crushing equipment for the mining, cement and aggregate industries. The demand for this expertise is supported by more than 1,700 installed crushers, feeder-breakers and sizers.

All of our crushing and sizing equipment is available for surface or underground installation, for stationary or mobile applications, and for climatic conditions that range from tropical to arctic.

Crushing products

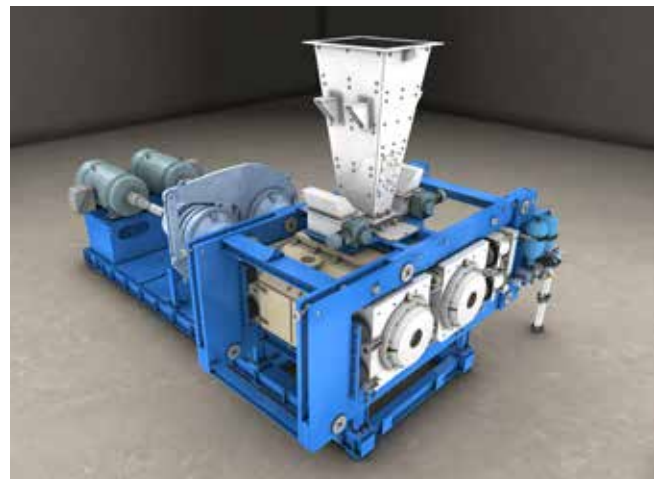
- Gyratory crushers
- Cone crushers
- ABON® low speed sizers
- Roll crushers
- Jaw crushers
- Feeder-breakers
- Hammermills
- Vertical shaft impactors
- Plants & systems
- Crusher gears
- Raptor® cone crushers

Grinding

FLSmidth is your One Source for grinding products and systems. Since 1902, we have supplied over 2,500 mills. Many of the largest plants operating today use our world-renowned SAG and ball mills, both gearless and gear driven, and in some of the most extreme environments. Our understanding of the mining, industrial minerals, and power industries has resulted in a complete line of grinding mills and systems for wet and dry processing of metallic and non-metallic materials.

Grinding products

- Ball mills
- SAG/AG mills
- HPGR high pressure grinding rollers
- Rod mills
- Mill gears
- Limestone preparation systems
- Mill performance enhancements
- Mill feeding systems



FLSmidth offers rugged and dependable SAG/AG mills, HPGRs and Ball Mills



Separation



Flotation

FLSmidth is the world's largest supplier of flotation equipment. The combined strength of WEMCO® and Dorr-Oliver® flotation technology, under the FLSmidth® brand, accounts for more than two-thirds of all annual flotation sales globally. Our ability to provide either naturally aspirated or forced-air flotation technology, utilising a universal tank design, creates greater flexibility and more control over coarse and fine particles for maximum recovery.

FLSmidth is at the forefront of the industry's trend to install fewer, but larger, units rather than multiple smaller cells, to save space, power, maintenance and auxiliaries. FLSmidth pioneered the way for large cell technology. From its first

257m³ cell installed in 2003, to providing 73 Supercell™ flotation machines with capacities of 300m³ currently being installed in various concentrator plants throughout Chile and now with the 600m³ capacity cell, FLSmidth continues to bring value to customers with lower upfront costs and more energy efficiency.

Flotation products

- 300-600m³ SuperCell™ flotation machines
- WEMCO® SmartCell™ flotation cells
- Dorr-Oliver® flotation cells
- Naturally-aspirated flotation
- Forced-air flotation
- Flash flotation
- Column flotation

Thickening

FLSmidth supplies the world's largest thickeners with the highest torque ratings. From the well-known brands of EIMCO® and Dorr-Oliver®, our sedimentation equipment is utilized around the world and recognized as the leader in minerals-duty thickening applications such as concentrate, tailings, preleach and CCD.

We offer a wide range of thickening and clarification equipment with enhanced flocculation to accelerate settling, and higher flow and loading rates to help reduce space requirements.

Our engineers will work with you to determine the correct heavy-duty thickener and clarifier sizing and find the most cost-effective mechanism for your application, without compromising quality or dependability.

Thickening products

- Hi-Rate™ thickeners
- Hi-density thickeners
- Deep Cone® paste thickeners
- Paste production storage mechanisms
- Conventional clarifiers & thickeners
- Delta-Stak® clarifiers
- E-CAT® clarifier/thickener
- Reactor-Clarifiers™ solids contacts units
- Tray thickeners
- Superthickeners / Caisson™ thickeners
- Cable-Torq® / SwingLift thickeners and clarifiers
- Feed dilution systems
- Sedimentation drives

Classification

FLSmidth manufactures durable and flexible classifying and degritting equipment to settle, dewater, concentrate, remove and recover solids. From advanced Krebs® gMAX® series hydrocyclones to heavy media separation systems, we deliver cutting-edge solid-particle recovery

and classification technology backed by the powerful and reliable brand names of Krebs®, WEMCO®, Dorr-Oliver®, EIMCO®, Ludowici®, and Technequip™.

Classification products

- Hydrocyclones for a variety of applications
- Screw & rake classifiers
- Multiphase desanders
- Solids handling systems
- MonoSizers & HydroSizers
- HMS drums & cyclones
- WEMCO® reamer jigs
- Vibrating screens
- Centrifuges

Filtration

Since 1910, FLSmidth has manufactured pressure and vacuum filters and continues to supply filtration technology for minerals and industrial processing flowsheets throughout the world.

Whether using for concurrent or countercurrent cake formation, cake discharge, washing, dewatering, settling or drying, you are sure to have the most efficient and cost-effective filtration equipment solutions tailored to your needs from industry-leading brands, built on years of experience.

Filtration products

Pressure filtration

- AFP IV™ filter presses
- Shriver® filter presses
- Pneumapress® automatic pressure filters
- Vertical pressure filters
- Beltpress filters
- Granular media filters

Vacuum filtration

- Horizontal belt filters
- Vacuum drum filters
- Horizontal pan filters
- Vacuum disc filters
- Indexing belt filters
- Press belt drum filters
- SOD & Precoat filters





Material handling



FLSmidth is a leader in engineering and supplying material handling solutions to the cement and minerals industries. For the latest in conveying, stockpiling, loading and unloading technologies, FLSmidth delivers.

FLSmidth is your One Source for both mechanical transport equipment and systems and pneumatic conveying technologies, bringing more than 60 years of experience from trusted brand names like KOCH®, MVT™, RAHCO®, Conveyor Engineering™, Möller™, Roymec™, and FLSmidth® Pneumatic Transport.

Our material handling products and systems include traditional trough-type belt conveyors, fixed/overland conveyors, portable conveyors, at-the-face mining conveyors, stacker/reclaimer systems, mobile conveyors, radial stackers, bulk material and bag loading and unloading systems for barges and ships, shuttle conveyors, chain feeders, belt feeders, apron feeders, spreading technologies, complete crushing and screening plants, and ancillary equipment such as high capacity tripper cars.

Considered the worldwide market leader with hundreds of installations, including the world's longest pipe conveyor, spanning 8.2 km in Peru, we deliver advanced expertise in fully enclosed pipe conveyors in both in-plant and overland applications.

Material handling products

- Overland conveyors
- InPlant conveyors
- Mobile stacking conveyors
- Mobile reclaim conveyors
- Fixed and shiftable conveyors
- Portable conveyors
- Steep angle conveyors
- Belt conveyors
- Pipe conveyors
- Bucket chain excavators
- Bucket wheel stacker-reclaimers
- Scraper reclaimers
- Stackers
- Mobile bridge boom stacker
- Shiploaders / ship unloaders
- Overburden & tailings handling systems
- Reusable & permanent leach pads
- Race track systems
- Radial stackers
- Grasshopper conveyors
- Dual truck mobile sizers
- Triple track mobile sizers
- Semi-mobile stations
- Drive over dump stations
- Apron feeders
- Belt feeders
- Chain feeders
- Drag chain conveyors
- Chutework & gates
- MAAG® gear units

Mine shaft systems

For over 80 years, FLSmidth has provided innovative solutions to all facets of ore handling in underground mining operations with specialized expertise, while maintaining a leading position in the field of mine hoist technology through the well-known Vecor™ brand. Used worldwide, our products have long been considered “the standard” of the industry.

Mine shaft systems products

- Mine hoists
- Head sheaves
- Cages
- Skips
- Mine cars
- Loading stations
- Spill pockets
- Conveyance suspension
- Ross chain feeders





Pyroprocessing



FLSmidth offers a wide range of thermal treatment systems for the minerals industries. Each system and technology is based on extensive raw material analysis and careful review of product quality requirements. This analysis allows us to develop the optimum process flowsheet from our extensive line of proprietary technologies.

Pyroprocessing products

- Rotary kilns & dryers
- Preheaters
- Coolers
- Fluid bed systems
- Gas suspension systems
- Incinerators
- Smelting
- Combustion systems
- Pilot processing plants
- Pyro gears
- Pulverized fuel dosing systems

Pumps & valves



FLSmidth is a leading supplier of high performance slurry handling equipment offering complete slurry pump, vertical pump, centrifugal pump, pneumatic pump, valve and gate valve assemblies under industry-leading brand names such as Krebs®, Technequip™, Dorr-Oliver®, and EIMCO®. We specialize in equipment that is rugged and durable, able to handle heavy slurries, or even extremely corrosive or abrasive materials. Our products include the popular KREBS® millMAX® severe-duty slurry pumps, Dorr-Oliver® ODS® pumps, and Technequip™ knife gate valves. Whether your objective is to increase wear life, lower power consumption, increase mill throughput, or enjoy less downtime, we develop slurry handling products exclusively to your particular requirements.

Pumps

- KREBS® millMAX® severe-duty slurry pumps
- Filtrate pumps
- Gorator pumps
- Air-Operated (ODS®) Diaphragm pumps

Valves

- Technequip™ knife gate valves
- Tech-Taylor™ valves
- T1 Vacuum Breaker™ valves

Precious metals recovery



FLSmidth is a global provider of processing equipment used in the precious metals industry. Through their Summit Valley™ brand, FLSmidth offers complete Merrill Crowe plants, carbon ADR plants, and precious metal refineries. FLSmidth Knelson offers the Knelson™ Concentrator which has been synonymous with gravity recovery since 1978. Today we are recognized as a leader in this field and an integrator of metallurgical processing and vertical milling solutions.

Precious metals recovery products:

- Electrowinning cells
- Mercury (Hg) retorts
- Carbon regeneration kilns
- Custom equipment
- Carbon ADR plants
- Solution heater
- Carbon columns
- Carbon strip
- Acid wash
- Merrill-Crowe systems
- Zinc powder feeder & slurry cone
- Deaeration tower
- Refinery
- Flux mixer
- Gold/silver molds and stands
- Mercury retorts
- Sludge handling
- Knelson™ gravity concentrators
- Stirred mills

Process control



With more than 30 years of experience in total plant automation and quality control systems, FLSmidth has supplied more than 700 control systems and 500 laboratory automation systems worldwide.

With comprehensive services for modernisation, optimisation and maintenance, we deliver state-of-the-art technology solutions for cost effective operation and increased plant availability.

Our solutions range from local panels to large plant-wide control system solutions, from sample preparation equipment to integrated and fully robotised laboratory automation solutions. Complete service offerings from parts to real-time training simulators are available as well.

High level automation products

- HMI & supervisory systems
- Enhanced engineering workstations
- SAG and ball mill grinding circuit high level control
- Kiln high level control
- Kiln temperature scanning systems
- Process reporting

Automated laboratory products

- Robotics automation
- Sampling and sample transport
- Laboratory / LIMS
- Conventional automation
- Blending controls
- On-line analysis

Customer services



Plant & field services

FLSmidth is your One Source for spare parts, service, maintenance, asset management and operational services. Our Customer Services support mineral processing equipment and systems including raw material testing, process design, equipment installation, troubleshooting, process and mechanical analysis and commissioning of new plants.

Customers are our most important assets. Once we have designed and installed your processing systems, we do everything possible to ensure that those systems continue to operate at optimum levels, all the time. We deliver on this promise.

Technical services

- Erection & commissioning
- Operations & maintenance
- Expert services
- Technical assistance
- Training

Operation and maintenance

Our Customer Services experts have the know-how to help plan your preventive maintenance and shutdown programs, manage scheduled repairs, and can even implement these programs for you.

- Mill management
- Plant maintenance
- Asset management

Rebuilds & modernisations

Keep your equipment current with the latest advancements to enhance your operations and provide for better efficiencies. FLSmidth can rebuild your equipment or provide the most current state-of-the-art equipment improvements and/or system upgrades for operational efficiency and enhanced functionality.

Quality & reliable OEM parts

Contact our trained service personnel to get authentic, high quality, original equipment manufacturer (OEM) spare and replacement parts for your FLSmidth®, Fuller®, Traylor™, ABON®, EIMCO®, Raptor®, Conveyor Engineering™, Krebs®, KOCH®, Knelson™, Ludowici®, Möller™, MVT™, Pneumapress®, RAHCO®, WEMCO®, Dorr-Oliver®, Shriver®, Summit Valley™, and FLSmidth supplied equipment. FLSmidth is the only place to find field engineers and technicians trained specifically to deal with the unique characteristics of this equipment.

Products

- Original OEM spares
- Product review & improvement
- Life cycle analysis
- Repairs & Retrofits

Supercenters

FLSmidth® Supercenters provide localized service with facilities customized to our global customers' needs. Supercenters are able to offer strategic OEM spare parts stock, training facilities, satellite testing facilities and world-class personnel ready to assist with specific requirements.

Engineering & testing



Engineering services

FLSmidth provides the services required to engineer, procure and construct in virtually every major industrial market – from mining, metals & minerals to hydrocarbon processing and hazardous incineration.

Our full-time engineering teams are trained in each discipline. These teams provide the best available solutions to your project using the most current resources, training and software.

Testing

FLSmidth continues to look for ways to improve service to our clients and recently constructed a new Minerals Testing Center. This facility has created expanded services for increased process testing capabilities.

The Minerals Testing Center houses the

- Separation Technology Group
- Dawson Metallurgical Laboratory
- Analytical Laboratory
- Ore Characterization & Process Mineralogy Laboratory

Testing capabilities

- Ore Amenability Testing
- Process Development
- Flowsheet Layout
- Plant design

- Detailed engineering
- Constructability analysis
- Quantitative XRD rietveld mineralogy
- SEM and optical microscopy
- Automated mineral analysis
- NIR data base development
- Clay analysis
- AAS, ICP, ICP-MS, LECO and fire assay
- Hydrometallurgical testing
- Flotation concentration
- Grinding & classification
- Bench testing
- Pilot testing

Research and development group

FLSmidth is committed to strong and on-going Research and development which is focused on developing new and improved equipment and processing technologies that provide solutions to the ever-changing needs of our customers and the industries that we serve. Our R&D and technology centers are globally located. In addition to our own facilities, we foster and fund cooperative R&D efforts with global universities and contracted research organizations. Interaction with our customers sets the foundation of many of our R&D activities as seen by the numerous projects being conducted jointly with customers throughout the world.

One Source

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