

Wear solutions

Sustainable productivity
enhancements with advanced
wear resistant solutions



FLS

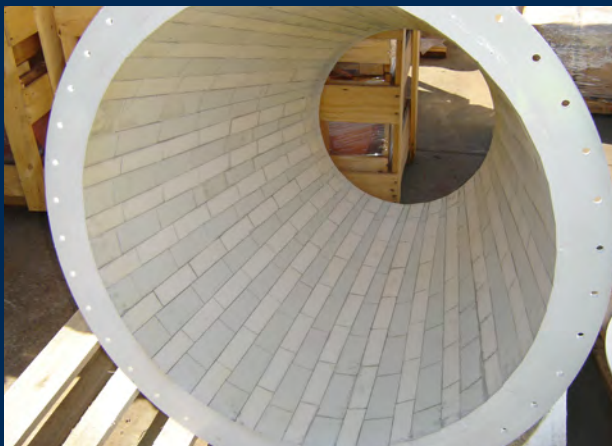
Wear resistant linings & products

FLS offers a range of wear products that have been engineered to meet the most arduous, abrasive and high-impact duties experienced by our mineral processing and bulk handling machines in the industry.

FLS offers a complete range of advanced ceramics in a multitude of types, shapes and sizes designed to optimise the productive life of mineral processing and bulk handling equipment.

We design and manufacture wear resistant linings according to individual equipment, functions and operating parameters.

With a wide range of wear resistant materials available, FLS Wear Solutions work intimately with customers and our design engineers, to carefully select appropriate wear resistant materials that extend the life of high wear components, reduce operating costs and enhance sustainable productivity.



Ceramic alumina tiles

FLS utilise a selection of standard alumina ceramic tile sizes.

High alumina content 92% alumina tiles, with a fine crystalline structure, enables FLS to confidently extend plant and equipment life by reducing wear of components. FLS high density alumina tiles are a proven performer.

FLS utilise high density alumina tiles into a range of applications in the coal, gold, copper, iron ore and other hard rock mineral processing industries.



Ideal for

Wear protection of mineral processing and bulk handling equipment in various industries:

- Hard Rock
- Gold
- Copper
- Coal
- Minerals
- Gravel
- Sand
- Lime

Standard items

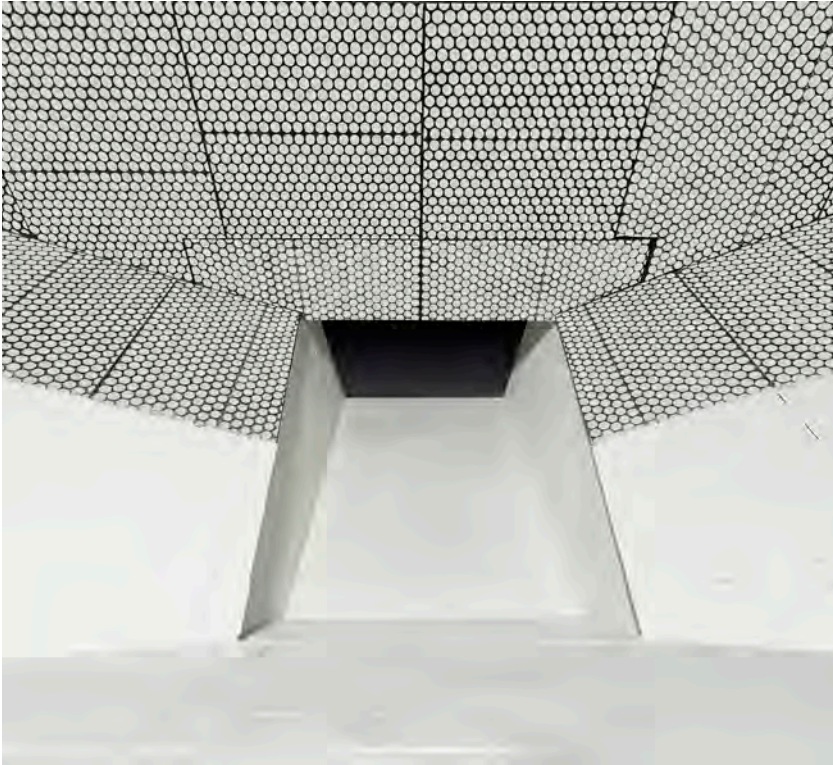
- Rectangular tiles
- Pipe tiles
- Weld-On tiles
- Hexagonal tiles
- Microtiles

Features and benefits

- Standard 92% Alumina tile range provide superior protection for sliding abrasion applications in mineral processing equipment and chutes.
- Resist corrosion from salts and chemicals.
- Standard-sized tiles and adhesive are readily available off the shelf for quick delivery.
- Customised tile shapes for repeat applications, reduce tile cutting time and waste costs, improving installation productivity.
- FLS can provide complete fabricated tiled units from our factories.

Chute linings

Plant chutes handle the bulk of the work in a processing system.



The entire mineral product flows, in the process of crushing, milling, cleaning and classifying, across these chutes creating unique wear and hang-up problems on our entry and discharge chutes.

FLS experts select chute linings to ensure maximum wear resistance and operating life.

Ideal for

Chutes that are subjected to high abrasion wear due to high feed rates, material impact and sliding abrasion found in:

- Hard rock
- Gold
- Copper
- Coal
- Minerals
- Iron ore
- Copper
- Nickel
- Cement
- Gravel
- Sand
- Lime

Standard items

- FerroCer®
- LUDOLINER™
- Rectangular tiles
- Weld-On tiles
- Hexagonal tiles
- WEAR MAX®

Features and benefits

- Ceramic Tiles offer superior wear protection from sliding abrasion.
- FerroCer® Impact wear panels offer superior wear protection to equipment chutes subjected to high impact from large rocks and high feed rates.
- LUDOLINER™ Impact wear panels protect equipment chutes subjected to impact from medium sized rocks and high feed rates.
- WEAR MAX® is a quick, easy to apply, harder wearing solution for sliding abrasion applications.

FerroCer® impact wear panels

FerroCer® high impact modular wear panels are designed to offer the longest possible wear life, helping you extend your production cycles and bring down your cost per ton.

Ideal for

Equipment subjected to high impact from large rocks and high feed rates in:

- Gold (Comminution)
- Copper & Nickel (Grinding Circuit Impact Positions).
- Iron Ore (Comminution to Screen & Gravity plant).
- Cement (Comminution & Raw Mill)
- Material Handling Systems (ROM / dump pockets / feed chutes).

Standard items

- **FerroCer 44**
150mm x 150mm x 44 mm P/N 400017030
- **FerroCer 44 Edge**
150mm x 225mm x 44 mm P/N 400020275
- **FerroCer 22**
150mm x 150mm x 22 mm P/N 400038066
- **FerroCer 22 Edge**
150mm x 225mm x 22 mm P/N 400072022

Features and benefits

Equipment subjected to high impact from large rocks and high feed rates in:

- Significantly longer wear life
- Safer and easier to install
- Low weight and compact shape
- Single-bolt installation
- No specialised tools required
- Reduced downtime
- Reduced maintenance and operating costs



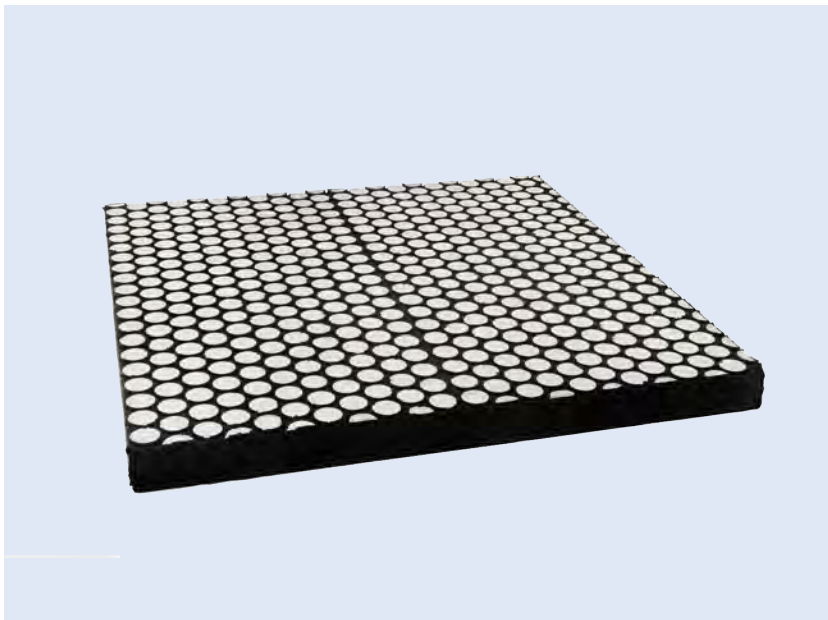
From the moment they are installed, hard-mineral mine operators can reduce maintenance shut-downs, operational downtime and operating costs.

This combined with easy installation and affordable pricing means that FerroCer® wear panels deliver the lowest total cost of ownership (TCO) on the market.

LUDOLINER™

Impact wear panels

LUDOLINER™ is an easy-to-fit system of bolt-on wear panels combining the properties of Alumina, Ceramic and Rubber for exceptional wear and impact resistance.



LUDOLINER™ Impact wear panels feature the abrasion resistant properties of high density alumina with the impact and noise absorbing properties of rubber on a steel bolt on backing plate.

Ideal for

- Mining and quarrying equipment that are subjected to high feed rates, material impact and sliding abrasion.
- Reducing environmental noise
- Transfer points in conveyor systems.
- Screen chutes
- Silos & Bins
- Deflectors
- Lining of Feeders
- Stackers & Reclaimers

Standard items

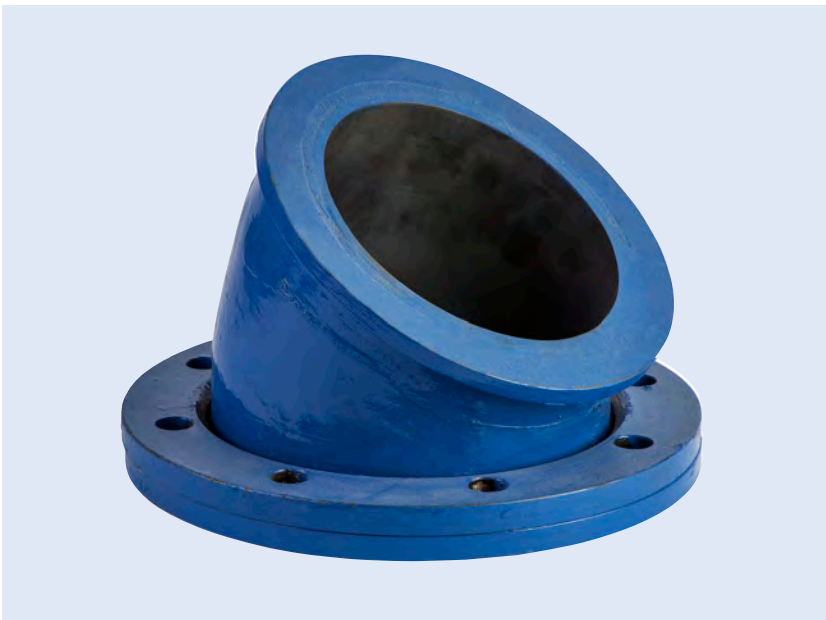
- 300 x 300mm
- 500 x 500mm
- Thickness available - 32mm

Features and benefits

- LUDOLINER™ Impact wear panels are designed to protect equipment chutes that are subjected impact from medium sized rocks and high feed rates.
- Easy maintenance
- Stud mounting configuration
- Reduces noise pollution
- Increased equipment life
- Less downtime
- Improved profitability

Silicon carbide and alumina lined piping systems

Alumina and silicon carbide ceramic lined piping systems offer excellent protection for sliding abrasion applications, extending the life of our piping systems.



As ceramic manufacturing technologies continue to improve, Silicon Carbide Ceramics are fast becoming the material of choice for highly-aggressive wear applications to our hard rock mineral processing equipment. More complex shapes and increased diameters allow this material to be a successful value proposition compared to traditional materials.

FLS have extensive experience and knowledge in the use and manufacturing of Silicon Carbide allowing us to drive sustainable productivity enhancements.

Ideal for

Complete piping systems including:

- Pipe
- Valves
- Nozzles
- Cylinders and plungers
- Hydrocyclones
- Pumps
- High temperature applications.

Materials

- 92% Alumina
- Silicon Carbide

Features and benefits

- Advanced ceramic linings offer superior wear protection from sliding abrasion, resist chemical corrosion and high temperatures (1400°C).
- Alumina linings of Vickers Hardness of 1100kg/mm² have uniform density and 0% porosity.
- Silicon Carbide of Vickers Hardness of 2000kg/mm² provides multiple times extended wear life providing outstanding value for cost compared to traditional pipe linings.
- Silicon Carbide can be formed with reduced wall thicknesses compared to alumina and basalt, reducing associated slurry pumping energy costs.
- Silicon Carbide can be manufactured in monolithic forms, which reduces potential wear joints, and premature failure.

Rapid seal clamps

Rapid seal clamps ease the severity and duration that a slurry pipeline leakage can cause, providing plant operators with immediate assistance by effectively stopping the discharge and providing a reliable wear resistant patch.

Ideal for

- Slurry pipelines including: coal, iron ore, copper, gold, nickel, cement and fertilizer.

Standard items

- 90NB - 150NB
- 150NB - 300NB
- 300NB - 500NB
- 500NB - 1000NB

Features and benefits

- Simple and easy to use
- Consists of ceramic embedded into resilient polyurethane with a sturdy binding strap.
- Installed in a matter of seconds using a simple ratchet system.
- Reusable



1. Once equipment is shut down and replaced, the clamp can be removed and reused.

WEAR MAX[®] ceramic epoxy

When your situation demands a quick, hard-wearing solution, you can depend on FLS WEAR MAX[®] ceramic epoxycoating.

Fabricated from a proprietary mixture of epoxy and wear resistant alumina ceramic beads, WEAR MAX[®], is a cost effective and proven solution to sliding wear problems commonly occurring in bulk handling and processing equipment.

WEAR MAX[®] adheres to most clean, dry surfaces including metal, ceramic, rubber and concrete.

WEAR MAX[®] cure rate results in a quick turnaround time for repairs, reduced down time and overall cost savings when you want to get equipment back into service quickly.

Supplied in convenient sized kits, complete with all necessary mixing equipment, WEAR MAX[®] may be your sites' handiest tool kit.



Ideal for

Protects equipment from sliding abrasion wear:

- Centrifuges
- Screen Bowels
- Vibrating Screens
- Thickeners
- Flotation Tanks
- Silos
- Pipes, Elbows, Tee junctions and Launderers worn by abrasive slurries.
- Chutes and surfaces worn by sliding abrasion.
- Chutes where light impact is present.
- Paste backfill applications.

Cured properties (typical)

- Hard cured after 4hrs at 23°C
- Maximum hardness after 24hrs at 23°C.
- Maximum operating temperature 70°C.
- Density - 2.1 kg/litre
- Compression strength - 70 MPa
- Tensile bond strength - 10MPa
- Flexural strength - 15MPa

Features and benefits

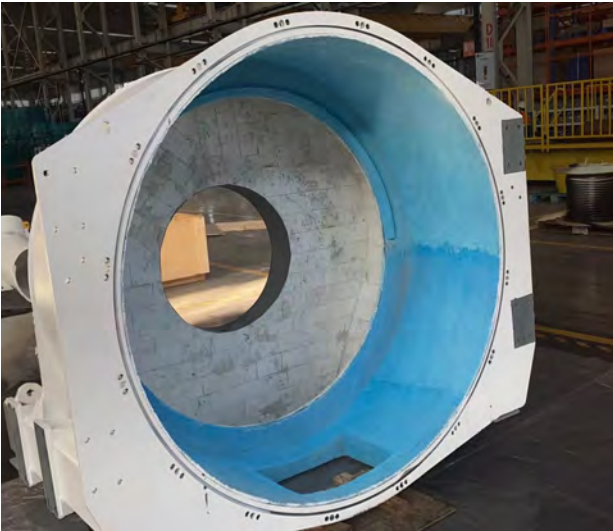
- Combines the hard wearing properties of alumina ceramic with the flexible installation properties of epoxy.
- Supplied in convenient sized kits, complete with all necessary mixing equipment.
- Easy & quick to mix and apply to equipment.
- Cure rate allows quick equipment turnaround with minimum down time.
- Cure rate: WEAR MAX[®] 4hrs at 23°C
- Coverage: a 7kg kit covers 0.27m² at 12mm thick.
- Shelf life: 3 years unopened

WEAR MAX® designed by experts in wear solutions

WEAR MAX® for durable, wear reducing solutions right when you need them. Your business depends on your equipment having longer wear life.



WEAR MAX® is applied to all wear surfaces of centrifuge feed distributor



Centrifuge housing with WEAR MAX® for longer wear life



WEAR MAX® applied on reclaimer bucket wear surfaces

Advanced engineered ceramic specialty items

FLS utilises a range of wear products engineered to meet the most arduous, abrasive and high-impact duties experienced by our mineral processing and bulk handling machines in the industry.

Materials available

The range of Ceramic solutions includes:

- Alumina, of varying compositions
- Silicon Carbides
- Stabilised Zirconia products
- Silicon Nitride
- Zirconia toughened alumina
- Zirconia

Features and benefits

- The variety of materials available results in the most appropriate ceramic being used in service.
- There are many differing manufacturing techniques available which allow flexibility in design, producing the best engineered solution.
- Constant research and development with latest technology materials and applications ensures that FLS wear products are engineered to meet the arduous, abrasive and high-impact duties experienced by our mineral processing and bulk handling machines in industry.



FLS experts utilise a complete range of advanced ceramic wear resistant materials in a multitude of types, shapes and sizes to develop wear products that extend the productive life of our mineral processing equipment.

FLS wear solutions experts work intimately with our design engineers and customers, to carefully select the appropriate wear resistant materials to extend the life of high wear components in our mineral processing equipment, reduce operating costs and enhance sustainable productivity.

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