



Wear-Resistant Piping Solutions

Product Catalog



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WEAR-RESISTANT PIPING SOLUTIONS

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COMPANY PROFILE

ANGZHENG PIPELINE EQUIPMENT CO., LTD.

Angzheng Pipeline Equipment Co., Ltd. is a professional manufacturer and supplier of wear-resistant piping products and solutions. Our main products include bimetal wear-resistant pipes, ceramic-lined pipes, inner-wall quenched pipes, hardfacing pipes, carbon steel fittings, flanges, connectors and valves, etc.

Our products are widely used in mining & mineral processing, power & coal, cement & building materials, ceramics, steel & metallurgy, chemical industry and other fields, and are suitable for conveying highly abrasive and corrosive media such as slurry, tailings, coal powder, ash, cement slurry, ceramic slurry, mineral powder and other materials.

With rich industry experience and advanced production technology, we can provide material selection, structural design and customized wear-resistant piping solutions according to different working conditions such as medium type, flow rate, pressure, temperature and wear degree, helping customers extend the service life of equipment and reduce overall operating costs.

We are committed to providing our global customers with reliable product quality, professional technical support and efficient service.



PRODUCT RANGE:

Bimetal Wear-Resistant Pipes /
Ceramic-Lined Pipes / Inner-Wall
Hardened Pipes / Hardfaced Pipes /
Carbon Steel Fittings /
Connectors & Valves



INDUSTRIES:

Mining & Mineral Processing / Power
& Coal / Cement & Building Materials
/ Ceramics / Steel & Metallurgy /
Chemical Industry



CONVEYED MEDIA:

Mineral Slurry / Tailings / Pulverized
Coal / Ash & Slag / Cement Slurry /
Ceramic Slurry / Mineral Powder

BIMETAL WEAR-RESISTANT PIPE SERIES



OVERVIEW

Bimetal wear-resistant pipes combine a steel outer pipe with a high-chromium white cast iron lining, providing structural strength, toughness, and abrasion and corrosion resistance. They are suitable for applications involving both corrosive media and particle erosion. Where wear is the primary concern, a heat-treated high-chromium cast iron lining with a martensitic matrix can be selected. Straight pipes are manufactured by centrifugal casting, with elbows and specially shaped fittings also available.

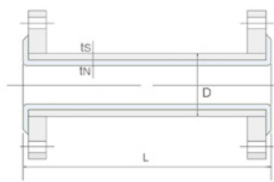
FEATURES

- Excellent Corrosion Resistance**
Harnesses the corrosion-resistant properties of high-chromium cast iron (KmTBCr26Mo3CuRe).
- Superior Shock Resistance**
Withstands both mechanical and thermal shock.
- Easy Installation and Connection**
Supports on-site cutting and welding for flexible installation.
- High Pressure Resistance**
Combines high pressure resistance with reliable bonding between layers.

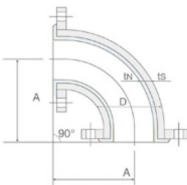
MAIN SPECIFICATIONS

Performance Index	Hardness (Liner) HRC	Tensile Strength N/mm ²	Impact Toughness α J/cm ²	Pressure Rating MPa	Temperature Resistance °C
Bimetal Composite Pipe	> 56	480	5	≤ 4.0	> 500°C

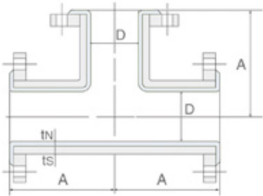
Straight Pipe



Elbow



Tee



DN	D	t _s	t _n	L
Nominal Diameter	Outside Diameter	Steel Pipe Wall Thickness	Composite Layer Thickness	Standard Length

APPLICATION

- Mining & Mineral Processing**
Mineral slurries, tailings, concentrates, and backfill.
- Cement, Ceramics & Building Materials**
Cement, clinker, slag, limestone powder, and ceramic mortar.

- Power & Coal**
Pulverized coal, fly ash, bottom ash, and coal slurry.
- Metallurgy & Steel**
Ore fines, coke fines, sinter, and metallurgical dust.

CERAMIC COMPOSITE PIPE SERIES



OVERVIEW

Ceramic composite wear-resistant pipes are manufactured using self-propagating high-temperature synthesis (SHS) and centrifugal technology. The pipe consists of corundum ceramic, a transition layer, and steel, combining the strength and toughness of steel with the excellent wear, corrosion, and heat resistance of ceramic.

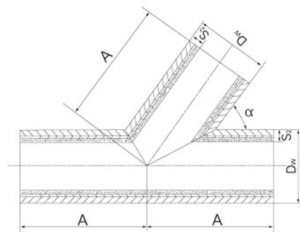
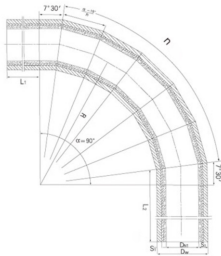
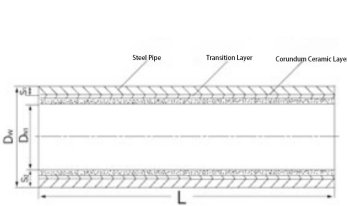
It provides high wear resistance, high-temperature resistance, corrosion resistance, impact resistance, and good weldability.

FEATURES

- **High Wear Resistance**
Mohs hardness up to **9.0**, with excellent wear resistance.
- **Impact Resistance**
High strength and strong bonding provide good impact resistance.
- **Low Flow Resistance**
Smooth inner surface ensures low flow resistance.
- **Heat Resistance**
Stable at high temperatures, with a melting point of about **2100° C**.
- **Corrosion & Scale Resistance**
Resistant to acids, alkalis, seawater, and scaling.
- **Low Cost & Easy Installation**
Lightweight, durable, easy to install, and cost-effective.

MAIN SPECIFICATIONS

Material	Hardness HV kg/mm ²	Compressive Strength MPa	Surface Quality	Ceramic Layer Density	Compressive Shear Strength (Interlayer Bond Strength) MPa	Mechanical Impact Resistance (50 J point contact on the pipe body, number of impacts when the ceramic layer cracks) cycles	Thermal Shock Resistance (temperature when the ceramic layer cracks after three heat-quench cycles) °C
SHS Composite Pipe	1100-1400	300-650	Smooth	3.85-3.95	15-30	15	1000



Straight Pipe



Elbow



Tee

APPLICATION



Power Generation

Pulverized coal, fly ash, and ash slurry.



Mining & Coal Processing

Mineral fines, tailings slurry, and coal slurry.



Cement, Ceramics & Building Materials

Cement, lime powder, gypsum slurry, and ceramic slurry.



Metallurgy & Chemical Processing

Slag fines, process dust, and abrasive slurries.

16Mn WEAR-RESISTANT PIPE SERIES



OVERVIEW

16Mn is a low-alloy high-strength structural steel with a carbon content of approximately 0.1%–0.25%. Its main alloying elements include manganese, silicon, vanadium, niobium, and titanium, with a total alloy content of less than 3%.

According to strength level, it can be classified into 300, 350, 400, and 450 MPa grades. Common grades include Q295, Q345, Q390, Q420, and Q460.

In the grade designation, “Q” represents yield strength, and the following number indicates the minimum yield strength of the steel. The suffix letters A, B, C, and D indicate different quality grades based mainly on the contents of impurity elements such as sulfur and phosphorus, together with variations in carbon and manganese content.

Among them, Grade A and Grade B steels are commonly referred to as 16Mn steel, such as Q345B and Q355B.

FEATURES

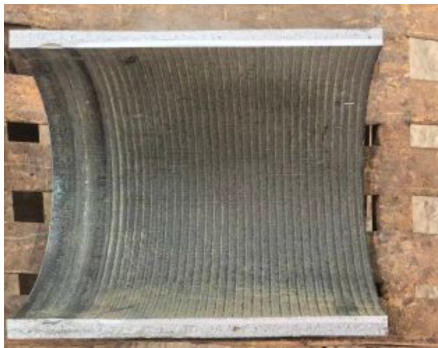
● **Balanced Strength & Toughness**

● **Excellent Formability**

● **Reliable Welding Performance**

● **Easy Machining & Fabrication**

INDUCTION-HARDENED WEAR-RESISTANT PIPE SERIES



OVERVIEW

Our inner-surface induction hardening process enhances the wear resistance of a range of pipe materials, including high-chromium cast iron, 16Mn and 55Mn steels, as well as bimetallic pipes. Using specialized induction equipment, the inner surface is rapidly heated and quenched to form a hardened wear-resistant layer. Heat-treatment parameters are tailored to each material and application to balance inner-surface hardness with the structural performance of the pipe.

The target hardness and hardening depth can be adjusted to suit operating conditions and customer requirements. Achievable values depend on the base material, pipe dimensions, and heat-treatment parameters.

FEATURES

- **Ultra-High Hardness**
Inner-wall hardness reaches **50–70 HRC**, with excellent wear, corrosion, and impact resistance.
- **Adjustable Wear Layer**
Wear-resistant layer thickness can be controlled from **2–20 mm** to suit different operating conditions.
- **Easy Processing & Installation**
Hard inside and tough outside; suitable for cutting and welding without damaging the wear-resistant layer.
- **Long Service Life**
Suitable for long-term use below **300° C**, with a service life about **5–8 times longer** than ordinary pipe fittings.

SURFACING WEAR-RESISTANT PIPE SERIES



OVERVIEW

Weld overlay wear-resistant pipes consist of an outer steel pipe and an inner high-chromium wear-resistant alloy layer. Using fully automated CNC internal weld overlay equipment, the alloy is deposited directly onto the pipe’s inner surface through a specialized welding process, creating a strong metallurgical bond with the steel substrate. The wear layer achieves a hardness of 50–65 HRC, with thickness and hardness customizable to customer requirements.

Combining a hard inner surface with a tough outer steel body, these pipes offer convenient transportation, flexible installation, and easy fabrication. They can be freely cut and welded without deformation or detachment of the wear-resistant layer during these operations. The chromium carbide weld overlay provides excellent abrasion resistance, high-temperature resistance, and impact resistance. Together with the toughness of the steel substrate, the composite structure offers resistance to mechanical and thermal shock, high fabrication accuracy, reliable weldability, and an extended service life.

OVERLAY MATERIAL COMPARISON

Overlay Alloy	Wear-Resistance Mechanism	Key Strength	Suitable Conditions
High-Chromium Alloy	Hard chromium carbides	Abrasion resistance	Low to moderate impact; abrasive wear
High-Manganese Steel	Work hardening under impact	Toughness & impact resistance	Heavy impact and compressive loading

FEATURES

- **High Wear Resistance**
Wear resistance is over 20 times that of low-carbon steel and more than 5 times that of stainless steel and high-manganese steel.
- **Easy Fabrication**
The wear-resistant overlay plate can be formed and cut like ordinary steel plate and fabricated into various wear-resistant components.
- **High Impact Resistance**
The mild-steel base plate provides excellent impact resistance while maintaining high wear resistance.
- **High Cost Performance**
The cost-performance ratio is about 2–4 times higher than conventional materials, with costs about 50% lower than manual hardfacing of equivalent materials.

PRODUCT SHOWCASE



APPLICATION

- **Mining & Mineral Processing**
Slurry, tailings, ore fines, and backfill materials.
- **Power & Coal Industry**
Pulverized coal, fly ash, ash, and coal slurry.
- **Cement & Building Materials**
Cement powder, clinker, slag, and limestone powder.
- **Steel & Metallurgy**
Ore fines, coke fines, sinter, dust, and slag.

CERAMIC WEAR-RESISTANT PIPE SERIES

Wear-Resistant Ceramic Tile



Wear-Resistant Ceramic Ring



OVERVIEW

Steel-ceramic embedded wear-resistant elbows use a composite structure of a steel outer shell and a high-purity alumina ceramic wear layer, combining the high hardness and excellent wear resistance of ceramics with the toughness, machinability, and weldability of steel.

The liner is made of $\text{Al}_2\text{O}_3 \geq 95\%$ sintered ceramic and is firmly fixed to the inner wall of the steel pipe through high-strength adhesive bonding and mechanical anchoring, helping prevent loosening or detachment under impact and long-term operation. The ceramic wear layer can be customized according to service conditions, typically 6–9 mm thick, and offers wear resistance more than 10 times that of ordinary steel. The product also features good impact resistance, relatively low weight, easy installation and maintenance, and long service life, making it suitable for highly abrasive material conveying applications.

Al ₂ O ₃ Content	Wear Layer Thickness	Ceramic Hardness	Operating Temperature	Thermal Stability	Weight	Cost
≥ 95%	6–9 mm	HRA ≥ 80	-50°C to 400°C	Good	Approx. 50% of Bimetal Elbows	Approx. 60–80% of Bimetal Elbows

PRODUCT COMPARISON

Product / Liner	Wear Resistance	Impact Response	Suitable Conditions
Bimetal High-chrome liner	High Abrasive wear	Moderate impact Grade dependent	Severe abrasion, moderate impact. Fine / coarse solids. Ceramic slurry, tailings, backfill.
SHS ceramic Composite lining	High Fine abrasion	Brittle lining Control direct impact	High abrasion, low impact. Fine powders and slurries. Fly ash, ceramic slurry.
16Mn Untreated steel	Baseline Unhardened steel	Ductile body Grade dependent	Mild abrasion, impact-prone duties. Fine / coarse solids. General slurry and bulk transfer.
Induction hardened	Enhanced By hardening	Depends on base material	High abrasion, controlled impact. Fine / coarse solids. Slurry and backfill.
Weld overlay Selected alloy	Alloy dependent Matched to wear	High impact with suitable alloy	Fine / coarse solids. Alloy selection for severe abrasion or high-impact duties.
Alumina ceramic Tiles / rings	High Fine abrasion	Brittle lining Protect from impacts	Severe abrasion, low impact. Fine solids and slurries. Ceramic slurry, mineral fines.

SELECTION NOTES

Qualitative guide. Particle size, velocity, impact angle and liner thickness govern selection. Suitability also depends on the chemical properties of the conveyed medium and product purity requirements.

OTHER PRODUCTS ACCESSORIES



PTFE-Lined Steel Fitting



PE-Lined Steel Pipe



**Plastic Coated Pipe And
Outside And Inside**



Carbon Steel



Fittings & Valves

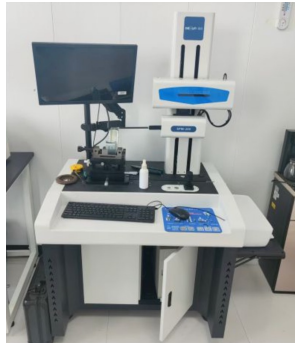
PRODUCTION EQUIPMENT



TESTING CAPABILITIES & QUALITY CONTROL



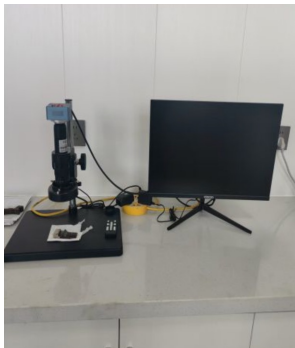
Spark Optical Emission Spectrometer



Surface Profilometer



Metallographic Specimen Grinding and Polishing Machine



Digital Microscope



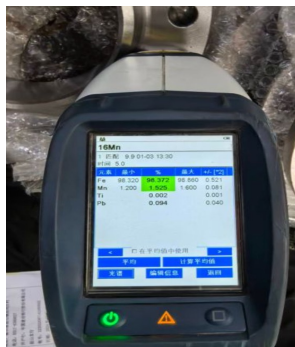
Salt Spray Test Chamber



Pendulum Impact Testing Machine



Portable Hardness Tester



Handheld Alloy Analyzer

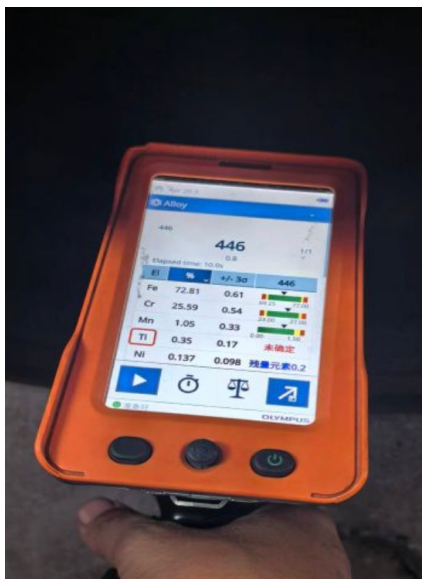


Digital Rockwell Hardness Tester

TESTING CAPABILITIES & QUALITY CONTROL



Low-Temperature Bath for Impact Specimens



Handheld XRF Alloy Analyzer



Universal Testing Machine

PROJECT & APPLICATION



ENQUIRY & SELECTION CHECKLIST

01 MATERIAL	DETAILS TO PROVIDE
Medium & composition	Slurry, tailings, coal, ash or ceramic slurry. Main constituents and proportions.
Conveying state	Dry powder / granules / slurry / gas–solid / liquid–solid
Solids content	Mass concentration (wt%) or volume concentration (vol%)
Particle characteristics	Average and maximum size (mm or μm), size distribution, hardness and shape
Corrosiveness	pH, acids / alkalis, chlorides and other corrosive constituents

02 OPERATION	DETAILS TO PROVIDE
Flow rate / velocity	Flow rate (m^3/h) or velocity (m/s). Specify phase / basis.
Pressure & temperature	Normal / maximum pressure and surge pressure (MPa). Normal / maximum temperature ($^{\circ}\text{C}$).
Installation direction	Horizontal / vertical / inclined. State the inclination if known.

03 DIMENSIONS	DETAILS TO PROVIDE
Pipe dimensions	Nominal diameter DN, base-pipe outside diameter (mm) and wall thickness (mm)
Wear layer	Required lining / overlay thickness (mm), if specified
Straight pipes	Length per piece (mm or m)
Elbows	Angle: 30° / 45° / 60° / 90° / other. Bend radius R (mm) or R/D, with D basis.
Connections	Flanged / welded / clamp / grooved. Include standard, pressure rating and mating dimensions.

QUANTITY & DRAWINGS

Provide quantities by item, existing drawings / sketches and required delivery date. Include company, project and contact details.

Unknown parameters may be left open for our engineering review.

WEAR-RESISTANT PIPING SOLUTIONS

ANGZHENG PIPELINE



**ANGZHENG
PIPELINE**

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