

# Bi Metal Clad pipe

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new

## Bi-metal clad pipe

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Outer of straight pipe is common steel pipe, cladding realized by forming high chromium lining via centrifugal forming technique.

### Physical Properties:

Flexure Strength	Tensile Strength	Elongation	Cross Section Stretch Ratio	Impact Toughness	Hardness of Wearable Layer	Hydrostatic Testing Pressure
MN/m <sup>2</sup>	MN/m <sup>2</sup>	%	%	J/c m <sup>2</sup>	HRC	Mpa
>610	>700	5	5.1	>15	>38	5.6-12.9

### Performance index:

项目	硬度 HRC	冲击值 (AKJ/cm <sup>2</sup> )	磨耗量 (g/24h)	承压等级 (Mpa)	抗拉强度 (N/mm <sup>2</sup> )
指标	≥80	≤3	0.0008~0.002	≤4.0	420

### Mechanical property :

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## Application Fields

- Paper Making: For conveying pulp.
- Shipping: For clearing shipping channels and sediment transportation.
- Metal Mines: For conveying tailings, concentrates and backfill minerals.
- Coal Preparation Plants: For conveying dense media, mixture and coal slurry.
- Power Plants: For deashing, deslagging, coal dropping, powder transportation

## Bi-metal clad lateral wye



## Bi Metal Clad flanged pipe



Bi Metal Clad flanged pipe is cast with mold vanishing vacuum suction casting cladding process.

## Bi Metal Clad elbow



### Technology requirements

1. Wear-resistant elbow is made of bimetal wear-resistant composite.
2. The general manufacturing method is made by the combination of the vacuum absorption casting process of the vanishing mold, and the manufacturing process of the commodity shall be indicated in other processes.
3. Adopt composite alloy steel wear-resistant layer, each elbow shall be eccentric compound, and the outside of the elbow shall be thickened according to the working condition to achieve the life design of the outside and inside. In order to reduce the resistance of coal powder transportation, the elbow should be smooth and excessive, and the shrimp waist welding method should not be adopted, so as to ensure that the inner diameter of the throughflow at all parts is 510mm, and no convex platform can be found.
4. Wear-resistant lining is made of high chromium alloy (not lower than KMTBCr28), with service life over 2 years and annual wear less than 5mm. The outer wear resistant lining thickness is 28mm, the inner wear resistant lining thickness is 22mm, and the hardness of HRC is greater than 55. Outer pipe of lining part 558\*10, connecting pipe 508\*10, outer ring 558\*22, material is 10 steel. Seamless pipes (or welded pipes) can be used, and their performance should meet the requirements of GB2087, GB8163.

## Bimetal Clad Pipe Bend



Bi-metal Clad Pipe and Bend are cast with mold vanishing vacuum suction casting cladding process.

### Advantages Compared with Traditional Wear Resistant

Alloy Cast Iron, Alloy Cast Steel, General Clad Steel Pipe and Cast Stone Pipe:

Good wear-resistance, giving full play to wear-resistance of high chromium cast iron.

#### Withstanding high pressure:

Bimetal cladding pipe and bend can be used for any pressure rating. Close bonding of outer and lining by adopting special process make cladding interlayer molten-joint to ensure reliable operation.

Good mechanical impact and thermal impact resistance property.

#### Convenient in connection for installation:

Bimetal cladding pipe and bend can be cut and welded as you like.

#### Manufacturing Process of Bi Metal Clad pipe:

Bi Metal Clad pipe are cast with mold vanishing vacuum suction casting cladding process. Outer of straight pipe is common steel pipe, cladding realized by forming high chromium lining via centrifugal forming technique.

#### Bimetal lined with high chrome alloy pipe



Bimetallic lined with high chrome alloy pipe High chromium alloy material by a special process of a one-time casting shape.

#### High chromium alloy wear - resistant pipe features

1. High wear resistance: the wear resistance of composite wear plate is more than 20 times higher than that of low carbon steel, 5 times higher than that of stainless steel and high manganese steel, and 1 times higher than that of cast high chromium iron.
2. High impact resistance: due to the use of soft steel substrate, composite wear-resistant steel plate has high impact resistance, which fully reflects the advantages of both wear resistance and impact resistance of composite materials. This is the casting wear - resistant material is inferior.

3. Convenient processing performance: composite wear-resistant steel plate can be deformed and welded, which can be easily processed into various wear parts just like ordinary steel plate.

4. High performance price ratio: although the unit price of composite wear-resistant steel plate is increased, its performance price is about 2-4 times higher than that of ordinary materials, taking into account the service life, maintenance cost and shutdown loss of the parts. Due to the reasonable use of materials, composite wear-resistant steel sheet is 50% cheaper than manual surfacing of the same material. The composite wear-resistant steel plate is especially suitable for surface strengthening of the machine parts which directly grind with sediment, ore, dust, coal cinder, etc.



Outer of bend uses hot-bending bend and lining is cast with high-chromium cast iron. Bends and other profile sections can be clad in whole and this process has changed the traditional practice to fabricate bend and other profile sections by drawing polyline without changing flow pattern of material inside piping, greatly reducing conveyance resistance of material.

## Advantages Compared with Traditional Wear Resistant

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1. Good wear-resistance, giving full play to wear-resistance of high chromium cast iron.

2. Withstanding high pressure:

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3. Good mechanical impact and thermal impact resistance property.

The bimetal wear-resistant tube inner wall KMTBCr28 has stable quality and good comprehensive performance. Adding a certain amount of rare earth elements can improve the alloy quality of steel, refine the grain and form a protective film on the surface. A certain amount of Mo was added to make the alloy have certain antioxidant effect and increase service life at high temperature. A certain amount of boron carbide can be added to control the hardness in the range of HRC45 ~ 65, and solve the contradiction between the hardness and weldability of wear-resistant steel.

## Quality requirements

The inner and outer surface of bimetal wear-resistant elbow should be smooth and clean, without burrs, burrs, cracks, loose, pores or bubbles; The inner wall of the wear-resisting elbow should be smooth without accumulated powder. The bend should have good thermal shock resistance. When there is a sharp change in temperature or welding connection, the inner layer of the wear-resistant pipe will not break and spalling due to the expansion or contraction of the inner layer. The dimensional deviation shall meet the requirements of product drawings and order agreement, and shall meet the provisions of GB3092, GB8162 and GB8163 without special requirements. The thickness deviation of lining is  $\pm 1.2\text{mm}$ .

## Specification requirements:

1. The inlet and outlet of the wear-resistant elbow shall be the straight pipe section with the same wear-resistant material of the elbow. Except special instructions, the length of the straight pipe section imported is 200mm and the length of the straight pipe section exported is 400mm.
2. The connection between wear-resistant elbow and pipe is made by welding. Elbow on interfaces with the transition of materials, the interface transition pipe to  $\Phi 508 \times 10$  mm in diameter, material of 10 # steel (described in clause 4.1 of the connecting pipe 508 \* 10), in order to meet the needs of the field of welding. There should be no special requirement for product field welding to ensure good performance of product welding at ambient temperature.
3. The length of inlet and outlet straight pipe segments of wear-resistant elbow is L1 and L2, which refers to the total length of straight pipe segments, including the length of solderable segment.

## Service life requirement:

Service life: ensure that the elbow does not leak during 2 years of operation. Under the premise of guaranteeing the weight of the wear-resistant elbow, the service life of the wear-resistant elbow under the working state shall not be less than 16600 hours. During the service life, make sure the wear-resistant elbow is free of wear and powder leakage. In wear-resisting bend life period abnormal operating conditions, the product should guarantee the high temperature of 350 °C, lining of wear-resisting layer fracture, peeling off.

## Requirement of the surface:

The outer wall shall be painted uniformly and uniformly, and the outer side of the elbow shall be marked with obvious elbow number, Angle, curvature radius and medium flow direction.

## Technical parameters:

Pulverized coal pipe diameter      wall thickness:  $\Phi 508 \times 10$  mm (made of steel no. 10)

Working medium: air powder mixture

Pressure capacity: 0.35MPa

Medium design temperature: 17000Pa

Design of medium pressure: 80 °C (maximum 100 °C)

Medium velocity: 18 ~ 32m/s

Coal fineness: R90 = 20 ~ 22%

Wind coal ratio: 1.3-1.8kg /kg

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