

Rare earth alloy tube, bi-metal composite pipe, ceramic composite pipe

Product comparison shows

Rare earth alloy tube

The material is the eighties by my unit and North Jiaotong University jointly developed a wear-resistant alloy materials. Through continuous improvement over the years, this alloy material has been serialized, the plant can meet various working conditions.



1. Powder feeding wear elbow boiler plant, ash slagging tube, after nearly two decades of use, won recognition.
2. The wear-resistant material with a number of other materials can not be universal advantages, such as bi-metallic materials can not produce coal grinding plant, Milling, ash, slag system some equipment accessories. Such as slag scraper, coal mixer, spiral, etc., can use this material for power plant operation, maintenance and management, a great convenience.
3. Ingredients designed with multi-carbon alloy system to ensure that the material holding the comprehensive performance indicators. This material combined with our resources

Characteristics, using a small amount of multi-alloy body, in the original alloy FeCr, FeMn, Ni, Re, again on the basis of FeSi added FeV, FeNb, Cu, and other alloying elements to ensure product performance.

Grade	Chemical Composition								
	C	Cr	Mn	Mo	Ni	Si	S	P	Re
ZG40CrMnONiRe (JM6a)	0.35 ~ 0.42	1.0 ~ 1.40	1.0 ~ 1.40	0.30 ~ 0.60	0.50 ~ 0.80	0.80 ~ 1.20	≤ 0.4	≤ 0.4	≤ 0.2

4. Mechanical properties using improved detection methods, ensure the stability of the material properties.

Grade	Tensile strength σ_b Mpa	Impact toughness a_k j/cm ²	Hardness HRC
ZG40CrMnONiRe (JM6a)	0.35 ~ 0.42	1.0 ~ 1.40	1.0 ~ 1.40

5. Wear resistance, high wear-resistant alloy of rare earth material has a strong anti-wear performance, joined the FeV, microstructure FeNb, Cu took place after the material change, microstructure of lath



martensite Belleville body. More fine grains, higher strength, more plasticity, and further passivated metal substrate, so that the wear resistance of the original material has been improved.

6. High temperature, corrosion resistance, abrasion resistance is improved. Ni alloy elements Cr content elements directly determines the temperature performance of the material. The elements Cr, Cu element determines the content of the corrosion resistance of the material, components of these elements. Reasonable, so that the new wear-resistant alloys of rare earth materials also have several properties, such as both have high wear resistance, but also have high corrosion resistance, it can adapt to the harsh working conditions.
7. Advanced technology, stable performance, centrifugal casting, resin sand molding basis, the company introduced the EPC vacuum suction casting new process based on product structure, purpose, use and quantity of tooling, high dimensional accuracy, uniform material structure, stable performance, especially wear-resistant spiral, coal mixers, fork tubes, and export hopper, hemispherical dome joints, such as the cone shaped pieces done fighting the whole cast, uniform wall thickness.
8. Welding performance, can be cut, the implementation of low-carbon steel butt for operation and construction of various workplace environments, and easy to install.
9. Good hardenability properties, due to the wear-resistant alloy material Biaoliruyi under air quenching conditions, internal and external surface hardness of HRC difference of 1 to 2, to ensure that the wear performance.

Disadvantages: The disadvantage is the low rare earth alloy wear-resistant anti-collision capability, transportation, installation process to be handled with care.

Steel - high chromium wear-resistant bimetallic composite pipe

The product uses an ordinary wall seamless steel, high chrome cast steel lined composite made by centrifugal molding process to form. Hot simmer elbow bend the outer wall, the inner layer selection of high-chromium steel, high alloy steel with both wear resistance, but also pressure, have a higher mechanical properties.



1. **Good overall performance.** Wear-resistant composite pipe series is the use of dual-metal composite casting process, ordinary carbon steel pipe tube wall, lined with high-chromium alloy. Both have high wear resistance alloy casting, but also has high mechanical strength and impact resistance, the use of safe and reliable.
2. **High wear resistance.** High chromium cast hard for M7C3 type carbide, with high toughness and high hardness (HV150-180), Rockwell hardness HRC50 or more, and thus good wear resistance.
3. **Strong corrosion resistance, high temperature, high wear resistance.** Because Ka carbide composition and structural characteristics as well as high levels of Cr solid solution matrix has a higher heat resistance, corrosion resistance, high temperature or corrosive environments can show resistance to corrosion. In the wet state, there are corrosive media and particle erosion effect of cross-phase conditions, the use of white cast using 28Cr steel. Under dry working conditions, the choice can be obtained by heat treatment martensitic matrix of high chromium cast steel materials.



- Advanced composite technology, and stability.** Molding high dimensional accuracy, uniform wear layer thickness, and homogeneous, stable performance, especially for straight tube and can be shaped tube overall composite (for elbows, tees, crosses, tapered tube, adjustable tube , unequal wall thickness pipe, eccentric pipe can do a whole complex).
- Pipeline system runs a small resistance.** Various channels to achieve the overall complex, changed the traditional process for making bend discount line, does not change the flow of the material in the bend of the track, big reduces material handling resistance.
- Good thermal shock properties,** due to the thermal expansion coefficient of the main product of the inner and outer layers of pretty, for a drastic temperature changes and constantly changing conditions occasions, will not fall off the inner produce failure occurs.
- Install, easy to use.** Can be flange, quick connectors, direct welding, etc. installed. Due to the high impact resistance of composite pipe in pipe systems localized plugging, you can arbitrarily cut according to the situation, unloading change, welding, installation, maintenance is very convenient.

Disadvantages : Because the composite double-layer metal, slightly heavier than the weight of the pipe is generally wearable technology. But the cost is high.

Ceramic tile lined pipe

Wear resistant Al₂O₃ ceramic chip is the main raw material, with rare oxide flux, the melting temperature from 170 °C special just ceramics.

- Wear-resistant ceramic towel tube outer sheet of 20 # steel, its performance and size deviation comply GB3092, the provisions of GB38162, GB38163, to ensure the concentricity of wear-resistant ceramic tubes and overall quality, its interface size, dimensions, distribution interface and other design parameters to meet the requirements, and detailed consideration of the wall thickness of the transition period to ensure solid and reliable welding. Production of mutual mistake interconnect card type ceramic chip body for energy storage and steel welding and the use of high-strength structural adhesive stickers. Ceramic chip form: Mosaic patch, three surface pressure, back pressure on three sides, positive and negative curvature of the self-locking tiles. According to wear elbow between the force structure by inlay puzzle actual situation, ceramic pieces. Compact structure, forming a full range of mechanical self-locking force, usually three tiles have an energy storage stud welding. Paste agent used for domestic brands or imported products, to prevent the adhesive failure at medium high temperature, wear-resistant ceramic chip to ensure the pipes off, wear failure does not occur in 800 operating hours.



Product Features:

Ceramic technical indicators:

Project Name	Technical indicators	Note
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Al2O3 Composition %	95	
Bulk density g/cm ³	3.65	
Compressive strength MPa	1030	
Flexural strength MPa	212	
Impact toughness Kj/m ²	10.2	
Hardness HRV	85	
Modulus of elasticity GPa	304	
Coefficient of expansion 10 ⁻⁶ /°C	6.6	
Acid resistance (24 Hours)	stable	15%H ₂ SO ₄ Test solution
Acid resistance (24 Hours)	stable	IN NaOH Test solution

Binder technical indicators:

Our company uses the Australian Macquarie treasure MEGAPOXY high-strength structural adhesive, this genus modified epoxy structural adhesive polymer, excellent resistance to aging, the formation of a buffer force is strong and wear resistant ceramic adhesive layer and, after curing anti-water, anti-corrosion excellent; toughness, resistance to displacement effect is remarkable.

Project Name	Technical indicators	Note
Bulk density g/cm ³	1.32	
Compressive strength MPa	40	
Shear strength MPa	26	
Impact toughness Kj/m ²	10	
Hardness HRV	9.5	
Modulus of elasticity GPa	2.2	
Coefficient of expansion 10 ⁻⁶ /°C	20.1	
Softening temperature °C	263	
Coking temperature °C	335	
Acid resistance (24 Hours)	stable	15%H ₂ SO ₄ Test solution
Acid resistance (24 Hours)	stable	IN NaOH Test solution

Disadvantages: Adverse local composite ceramic SMD tube is: Because ceramics are brittle materials, for



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high-speed flow medium and large particles can not guarantee the safety performance impact will occur during the medium flow was further worn outside the media crushed steel and ceramics SMD tube affected by high temperatures, generally above 280 °C can not guarantee a good performance bond and fall off, and plugging repair process, because the high temperature part of the solder joints thereby affecting the stick between ceramic and steel knot performance, so the temperature is high and the place is not big media particles suitable for use SMD ceramic composite pipe.

Contact by Mr. Sum Xu

tel:+86-21-33780199 fax:+86-21-61851035

E-mail: sumxu@163.com | sales@sunnysteel.com

Sunny Steel Enterprise Ltd.
[Pipes, Fittings and Flanges.](#)