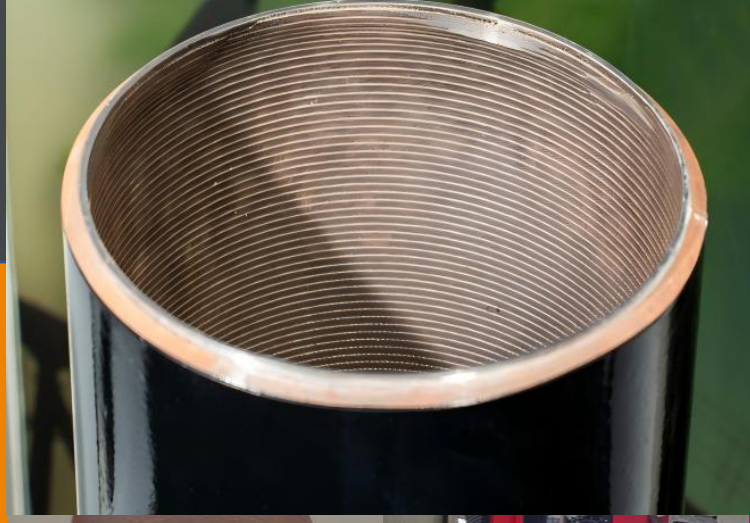
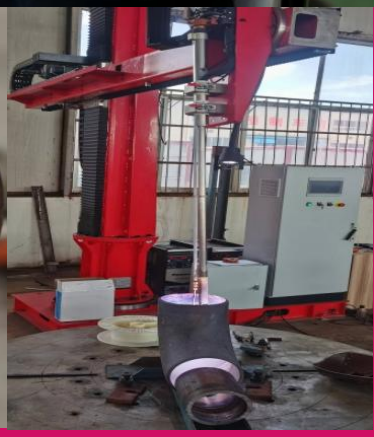
Jindao Engineering Installation Co., Ltd.

Corrosion protection coating 30 years of oilfield service

Inner Surface Surfacing Welding of Pipelines



Pipeline Surfacing Welding with No Joint Coating:
This process is an anti-corrosion welding technology applied in the pipeline field. Its core lies in pre-surfacing a corrosion-resistant alloy layer on the inner wall of pipe ends and other components, combined with a composite welding process. It eliminates the traditional inner-wall anti-corrosion joint coating procedure after welding, and solves the long-standing industry challenge of anti-corrosion protection for "dead-end" welds in pipelines of various diameters, especially for small-diameter and long-distance pipelines.



Erosion-Resistant Fully Surfaced Welding Pipe Fittings:
Erosion-resistant fully surfaced welding pipe fittings are a type of special composite pipe fittings designed specifically for high-wear and high-impact working conditions. They adopt a double-layer structure of "ductile substrate + wear-resistant surfacing layer".

The substrate is made of materials such as carbon steel and low-alloy steel, which ensures the overall strength and impact resistance of the pipe fittings and avoids brittle fracture caused by excessively high hardness. The surfacing layer is fabricated from dedicated wear-resistant materials including high-chromium cast iron, tungsten carbide composite alloy, and nickel-based alloy. Among these materials, the chromium content of high-chromium cast iron can reach 15%-30%, and the hardness of the tungsten carbide surfacing layer is as high as HRC60-70 — second only to diamond — forming a robust "metal armor" to resist wear and tear.

Advantages

- Eliminate anti-corrosion blind spots, achieve fusion bonding between the overlay weld layer and weld seam, and form a continuous protective barrier.
- Factory prefabrication plus on-site rapid welding eliminates the joint coating procedure, reducing risks and improving efficiency.
- Adaptable to diverse working conditions, delivering superior cost-effectiveness throughout the entire life cycle.
- The high-hardness overlay weld layer offers excellent erosion and wear resistance, significantly extending the service life of pipe fittings.
- Strong metallurgical bonding ensures no delamination, with outstanding impact and high-temperature resistance, suitable for extremely complex working conditions.
- Supports customized overlay welding and repair services, featuring low initial investment and optimal life-cycle cost efficiency.

Application Scope

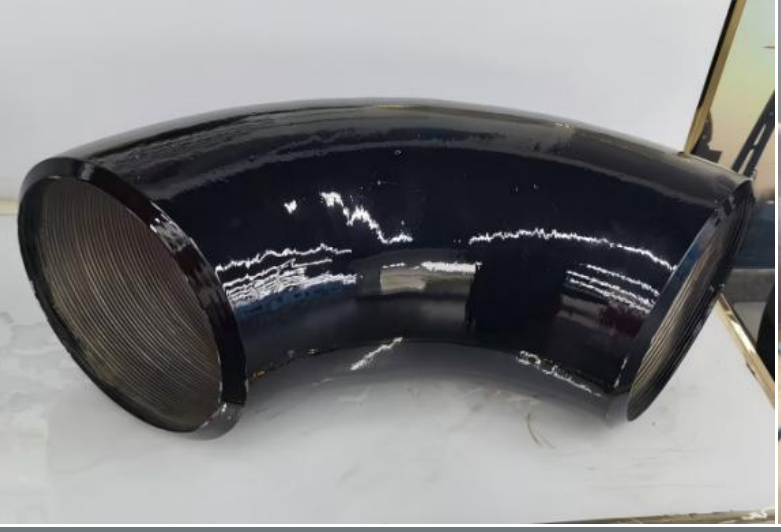
① ② ③ ④

① **Long-distance oil and gas pipelines** - For crude oil and natural gas long-distance pipelines laid in deserts and mountainous areas, especially welds over 2 kilometers where robotic internal joint coating is not feasible.

② **Small-diameter pipeline systems** - Suitable for small-diameter pipes and process pipes in the chemical and nuclear power fields. These pipelines have narrow spaces where traditional joint coating equipment cannot enter.

③ **Corrosive medium transportation pipelines** - Used for transporting acidic sewage, brine, and chemical raw materials. Corrosion-resistant alloys can be selected for the overlay weld layer.

④ **Transportation of high-velocity, solid particle - containing media** - Core coverage includes vulnerable pipe fittings such as elbows and tees of ore and tailings slurry transportation pipelines in the mining industry; pulverized coal transportation in thermal power plants of the power industry; steel slag transportation in the metallurgical industry; and pipe fittings of blast furnace coal injection pipelines.



Inspection

Nondestructive Testing (NDT) shall be performed on the surfacing layer and heat-affected zone. According to the pressure rating of the pipe fittings or pipes, Ultrasonic Testing (UT), Magnetic Particle Testing (MT) or Penetrant Testing (PT) shall be selected to detect internal and surface latent defects. All inspection procedures and acceptance criteria shall comply with national universal specifications, such as Welding Procedure Qualification for Pressure Equipment (NB/T 47014) and Wear-resistant Surfacing Electrodes (GB/T 984, material grade of the inner surface surfacing layer of surfacing pipes). Complete inspection records shall be filed for quality traceability.

MATERIAL GRADES OF SURFACING LAYERS

Corrosion-resistant Surfacing Materials (Suitable for Surfacing Joint-free Technology)

Stainless Steel Series: ER304L, ER309L, ER316L
Nickel-based Alloy Series: ERNiCrMo-3, ERNiCr-3

Wear-resistant Surfacing Materials (Suitable for Erosion-resistant Full-surfacing Pipe Fittings)

High-chromium Cast Iron Series: D507, D517, D667
Tungsten Carbide Composite Series: Cast Tungsten Carbide Surfacing Electrodes
Nickel-based Wear-resistant Alloy Series: Ni60, NiWC

Tel/Whatsapp: +8613356647766
Email: Stephen_yu10@163.com
Address: Gudao Town, Hekou District, Dongying City, Shandong Province
Website: www.jdcoatingservice.com