

Steel Industry **- Design and Transformation of full-fiber** **lightweight Structure of Steel (Iron) ladle dryers**

Introduction of steel (iron) ladle dryers:

The steel (iron) ladle dryers generally use gas or oil as fuel to heat the steel (iron) ladle, and the burner is generally located in the center of the dryer. The furnace has a partially reducing atmosphere, the furnace temperature is 800-1000°C, and the temperature that the dryer can bear is about 1000-1200°C.

Analysis of the original structure of the steel (iron) ladle dryer:

Originally, it adopts a tiled structure of polycrystalline mullite fiber felt with an insulation thickness of 250mm. Because the dryer is used intermittently and is frequently hoisted, the frequency of damage to the tiled structure is relatively high, usually with a service life of 6-8 months. Although the mullite fiber felts have a good insulation effect, due to their high price, the cost of maintenance is correspondingly high, resulting in increased workload, a waste of the capitals, and a growth in production costs.

Performance comparison between the current structure of the steel (iron) ladle dryer and the original structure:

It is recommended to use a tiled composite structure of CCEWOOL ceramic fiber blankets + CCEWOOL ceramic fiber modules with pickaxe. **The theoretical basis for selecting this structure is:**

1. The dryer can bear the temperature to 1200°C. Because the dryer is used intermittently, the use of zirconium-containing products as refractory materials can fully meet the working requirements; however, the selection of polycrystalline products reduces their working temperature, which is completely a waste.

2. The classification temperature of zirconium-containing products is 1400°C, and the temperature for a long-term use is not lower than 1200°C. Considering that the working environment is a partial reduction atmosphere, but not for long-term use, zirconium-containing products for intermittent use can fully meet the requirements. The fixed form of CCEWOOL ceramic fiber modules with pickaxe is anchoring.

After adopting the tiled composite structure of CCEWOOL ceramic fiber modules + ceramic fiber blanket, the thermal insulation effects of the structure are better than the original structure, and the energy saving effect is very remarkable.