

## Iron and Steel - Coke Oven



A coke oven is a complex and continuously operating thermal equipment used to heat coal to 950-1050°C under oxygen-deprived conditions, resulting in the production of coke and various by-products. Whether it is a dry quenching coke oven or a wet quenching coke oven, as a device for producing red-hot coke, a coke oven mainly consists of a carbonization chamber, combustion chamber, heat storage chamber, furnace roof, inclined passage, small flue, and foundation, among other components.



CCEWOOL fiber back-up boards and ceramic fiber boards not only fully meet the above requirements but also offer unparalleled advantages compared to conventional lightweight insulation bricks. They effectively address the issues associated with the high thermal conductivity, poor insulation performance, significant heat storage losses, energy wastage, and harsh working environments of the original furnace lining structure. After thorough research into various lightweight insulation materials and relevant performance

testing and trials, it has been found that CCEWOOL fiber back-up boards and ceramic fiber boards have the following advantages when compared to traditional lightweight insulation bricks:

A. Low thermal conductivity, excellent insulation performance: At the same temperature, the thermal conductivity of ceramic fiber bricks and fiber back-up boards is only about one-third of that of ordinary lightweight insulation bricks. Under the same conditions, when using a structure composed of ceramic fiber bricks or fiber back-up boards, the total insulation thickness can be reduced by more than 50mm, significantly reducing heat storage losses and energy wastage.

B. Ceramic fiber bricks and fiber back-up boards have a high compressive strength, fully meeting the requirements for compressive strength of insulation bricks in furnace linings.

C. Minimal linear shrinkage at high temperatures, high-temperature resistance, and long service life.

D. Low bulk density, effectively reducing the weight of the furnace body.

E. Excellent resistance to thermal shock, capable of withstanding extreme temperature fluctuations from cold to hot.

F. Precise geometric dimensions and excellent construction performance, facilitating cutting and installation.

Please note that this translation is provided for informational purposes, and it's important to ensure accuracy and clarity when using it in specific contexts or documentation related to coke ovens and refractory materials.

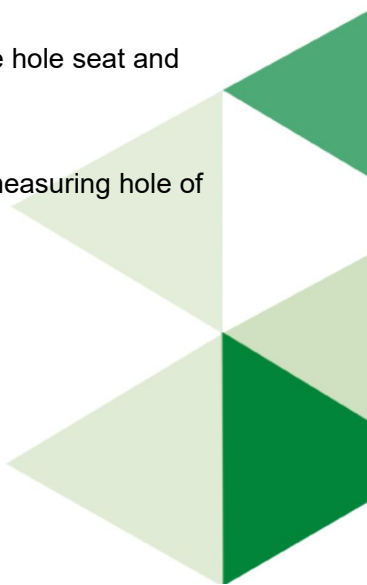
## **The application of ceramic fiber products to the coke oven and its auxiliary equipment**



Due to the requirements of various components in the coke oven, ceramic fiber products cannot be applied to the working surface of the oven. However, because of their excellent low volume density and low thermal conductivity, their forms have developed to be functional and complete. The certain

compressive strength and excellent insulation performance have made it possible for ceramic fiber products to replace light insulation brick products as the backing lining in industrial furnaces of various industries. Their better thermal insulation effects have been demonstrated in carbon baking furnaces, glass melting furnaces, and cement rotary furnaces after replacing light insulation bricks. Meanwhile, the second further development of ceramic fiber ropes, ceramic fiber paper, ceramic fiber cloth, etc. have enabled ceramic fiber rope products to gradually replace ceramic fiber blankets, expansion joints, and expansion joint fillers as asbestos gaskets, equipment and pipeline sealing, and pipeline wrapping, which have achieved good application effects.

The specific product forms and application parts in application are as follows:

1. CCEWOOL ceramic fiberboards used as the insulation layer at the bottom of the coke oven
  2. CCEWOOL ceramic fiberboards used as the insulation layer of the coke oven's regenerator wall
  3. CCEWOOL ceramic fiberboards used as the thermal insulation layer of the coke oven top
  4. CCEWOOL ceramic fiber blankets used as the inner lining of cover for the coal charging hole at the top of the coke oven
  5. CCEWOOL ceramic fiberboards used as the insulation for the end door of the carbonization chamber
  6. CCEWOOL ceramic fiberboards used as the insulation for the dry quenching tank
  7. CCEWOOL zirconium-aluminum ceramic fiber ropes used as a protective plate/stove shoulder/door frame
  8. CCEWOOL zirconium-aluminum ceramic fiber ropes (diameter 8mm) used as a bridge pipe and water gland
  9. CCEWOOL zirconium-aluminum ceramic fiber ropes (diameter 25mm) used in the base of the riser tube and furnace body
  10. CCEWOOL zirconium-aluminum ceramic fiber ropes (diameter 8mm) used in the fire hole seat and furnace body
  11. CCEWOOL zirconium-aluminum ceramic fiber ropes (diameter 13mm) used in the measuring hole of temperature in the regenerator chamber and the furnace body
  12. CCEWOOL zirconium-aluminum ceramic fiber ropes (diameter 6 mm) used in the suction-measurement pipe of the regenerator and the furnace body
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13. CCEWOOL zirconium-aluminum ceramic fiber ropes (diameter 32mm) used in exchange switches, small flues, and flue elbows
14. CCEWOOL zirconium-aluminum ceramic fiber ropes (diameter 19mm) used in the small flue connecting pipes and small flue socket sleeves
15. CCEWOOL zirconium-aluminum ceramic fiber ropes (diameter 13mm) used in the small flue sockets and the furnace body
16. CCEWOOL zirconium-aluminum ceramic fiber ropes (diameter 16 mm) used as external expansion joint filler
17. CCEWOOL zirconium-aluminum ceramic fiber ropes (diameter 8 mm) used as expansion joint filler for the regenerator wall sealing
18. CCEWOOL ceramic fiber blankets used for heat preservation of the waste heat boiler and the hot air pipe in coke dry quenching process
19. CCEWOOL ceramic fiber blankets used for insulation of exhaust gas flues at the bottom of the coke oven

