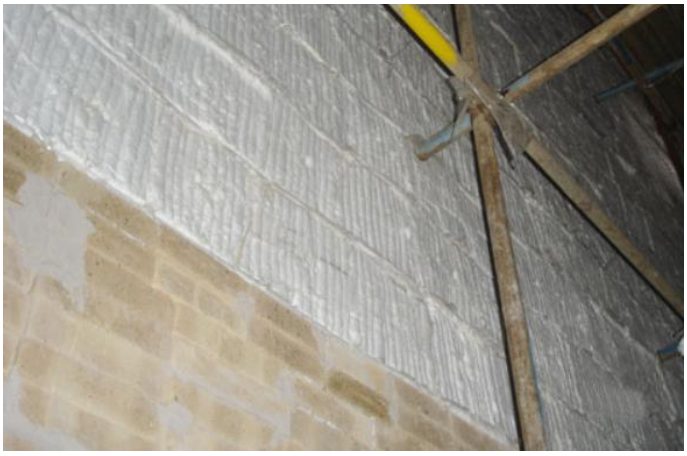
CCEWOOL Thermomax Inc.
salesusa@ccewool.com
www.ccewool.com

Petrochemical - One-stage reformer

A primary reformer is one of the key equipment in large-scale synthetic ammonia production plants. Its production process involves the conversion of methane (CH4) in the feedstock gas (natural gas or field gas, along with light oil) into hydrogen (H2) and carbon dioxide (CO2), utilizing high temperature and high pressure conditions with the help of a catalyst and steam.



Primary reformers come in various designs, including top-fired box-type, side-fired double-chamber, small cylindrical types, etc. Natural gas is commonly used as the fuel, and it operates under an excess air condition. The furnace is typically divided into radiation, transition, convection, and flue sections that connect the radiation and convection sections. The operational temperature inside the furnace ranges from 900 to 1050°C, and the operating pressure is

between 2 to 4 MPa. The daily production capacity can vary from 600 to 1000 tons, with an annual production capacity of 300,000 to 500,000 tons.

In the convection section of a primary reformer and, particularly, in the sidewalls and lower part of the end walls of a side-fired double-chamber primary reformer, there is a high gas flow velocity, requiring high resistance to erosion for the refractory lining. Therefore, high-strength refractory fiber castables or lightweight bricks are often used for lining in these areas. Refractory fiber modules and folded blocks are typically used for the upper parts of the radiation chamber, sidewalls, and end walls.

Considering the operational temperature range of 900 to 1050°C, the generally weak reducing atmosphere inside the furnace, and years of experience in fiber lining design and furnace production, refractory lining materials for a primary reformer are typically selected based on these factors. For the working face, CCEWOOL zirconium alumina-type and zirconium-containing ceramic fiber products are commonly used. High-purity CCEWOOL products can be chosen for the back lining. Lightweight high-alumina refractory bricks are used for the lower parts of the sidewalls and end walls, with CCEWOOL RCF Board DB serving as the backing lining.