

Abstract:

An ethylene cracking furnace comprising a high pressure steam drum (1), a convection section (2), a radiant section (3), multiple groups of radiant coils (4) arranged vertically in the firebox of radiant section, burners (5) and transfer line exchangers (6), each radiant coil comprising a first-pass tube (7), a second-pass tube (8) and a connection member (9); feedstocks being introduced into an inlet end of the first-pass tube and outflow from an outlet end of the second-pass tube, said first-pass tube (7) and said second-pass tube (8) are non-split coils, and the centerlines of the respective radiant tubes (7, 8) are within a common plane; said connection member (9) is a tridimensional structural member comprising an inlet bending tube (10), a return bending tube (11) and an outlet bending tube (12); said inlet bending tubes (10) and said outlet bending tubes (12) are arranged at two sides of the plane containing the centerlines of said first-pass tubes (7) and said second-pass tubes (8), respectively; the projections of the respective connection members (9) in a side view are the same curve line that is symmetrical, continuous and closed; the inner diameters of said radiant coils (7, 8) is varied at least once along the length of the tubes.

Figure 2