Claims

1. Reformer furnace (10) for performing an endothermic process, comprising a reaction space (11), a firing space (12) and a flue gas channel (13) in fluid connection with the firing space; wherein
the reaction space is formed by a plurality of vertical reaction tubes (14) passing through the firing space, wherein the reaction tubes comprise in the tube interior a catalyst for converting a gaseous input material, wherein
the reaction tubes are arranged in line and form one or more reaction tube rows (15); and wherein
the firing space is formed by a plurality of refractory walls (16), comprises a first end face (17) and a second end face (18) and
comprises a plurality of burners (19) arranged at the first end face which produce flames (20) oriented in the direction of the second end face, wherein
the burners are arranged in line and form a plurality of burner rows (21), wherein
a burner row for firing the reaction tubes is arranged parallel to a reaction tube row; and wherein
the flue gas channel for withdrawing burner offgases (32) is arranged in the region of the second end face of the firing space and runs parallel to the burner rows and outside the firing space,
characterized in that
the flue gas channel has a transition region (22) and a withdrawal region (23), wherein the flue gas channel is connected to the second end face of the firing space via the transition region and the transition region of the flue gas channel has a reduced channel diameter compared to the withdrawal region of the flue gas channel, and
that the channel diameter of the transition region successively narrows from the second end face of the firing space in the direction of the withdrawal region, subsequently has a constant diameter and subsequently successively widens in the direction of the withdrawal region.

2. Reformer furnace according to Claim 1, characterized in that the ratio of the channel diameter of the transition region to the channel diameter of the withdrawal region is 1:2 to 1:10, preferably 1:5 to 1:7 and particularly preferably 1:6.

3. Reformer furnace according to Claims 1 or 2, characterized in that the withdrawal region of the flue gas channel has a constant diameter (25) and/or a constant height (26) over the entire channel length.

4. Reformer furnace according to any of Claims 1 to 3, characterized in that the flue gas channel is in the form of a one-piece construction, wherein the transition region and the withdrawal region of the flue gas channel are joined to one another with a mechanical or atomic-level join.

5. Reformer furnace according to any of Claims 1 to 4, characterized in that no internals, in particular no cover slabs provided with means of burner offgas entry in the form of slots, holes, swirl plates or gaps, are provided between the withdrawal region of the flue gas channel and the second end face of the firing space.

6. Reformer furnace according to any of Claims 1 to 5, characterized in that a plurality of flue gas channels are provided.

7. Reformer furnace according to Claim 6, characterized in that the ratio of the number of flue gas channels to the number of burner rows is 1:1 to 1:4, preferably 1:2 or 1:3, particularly preferably 1:3.

8. Reformer furnace according to any of Claims 1 to 7, characterized in that the first end face of the firing space and the burners are arranged at the bottom and the second end face of the firing space and the flue gas channel are arranged at the top, wherein the burners produce upwardly oriented flames.

9. Reformer furnace according to Claim 8, characterized in that a feed for the gaseous input material and a discharge for the reaction product of the endothermic process are each arranged at the bottom end of a reaction tube.

10. Reformer furnace according to any of Claims 1 to 9, characterized in that the ratio of the height of the transition region to the height of the withdrawal region of the flue gas channel is 1:1 to 5:1, preferably 1.5:1 to 3:1 and particularly preferably 2:1.

11. Use of a reformer furnace according to any of Claims 1 to 10 for producing synthesis gas from a carbon-containing input material, in particular natural gas.