Claims

1. A furnace for performing an endothermic process, comprising
   a plurality of process tubes containing a catalyst for converting a gaseous feed, wherein
   said process tubes are arranged in rows within the furnace, each row of process tubes thereby defining a process tube row,
   a plurality of inner burners arranged in rows, each row of inner burners being arranged between and parallel to process tube rows, thereby defining an inner burner row, and
   a plurality of outer burners arranged in rows, each row of outer burners being arranged between and parallel to a process tube row and a furnace wall, thereby defining an outer burner row,
   characterized in that
   a number of burners of an outer burner row is smaller than a number of burners of an inner burner row.

2. The furnace of claim 1, wherein a ratio of the number of burners of an outer burner row to the number of burners of an inner burner row is in a range of 0,25 to 0,75, preferably in a range of 0,4 to 0,6, more preferably in a range of 0,45 to 0,55.

3. The furnace of claim 2, wherein the ratio of the number of burners of an outer burner row to the number of burners of an inner burner row is 0,5.

4. The furnace of any one of claims 1 to 3, wherein each inner burner row of the furnace comprises the same number of burners and/or each outer burner row of the furnace comprises the same number of burners.

5. The furnace of any one of claims 1 to 4, wherein the outer burners are configured for operating with a firing rate which is in the range of 85 to 115 % of the firing rate of the inner burners, preferably in a range of 90 to 110 % of the firing rate of the inner burners, more preferably in a range of 95 to 105 %

of the firing rate of the inner burners.

6. The furnace of any one of claims 1 to 5, wherein the outer burners and the inner burners are configured for operating with an equal nominal firing rate.

7. The furnace of any one of claims 1 to 6, wherein the inner row burners and the outer row burners are constructed identically.

8. The furnace of any one of claims 1 to 7, wherein the outer burners of an outer burner row are aligned offset, along the direction of the burner rows, to the inner burners of an inner burner row.

9. The furnace of any one of claims 1 to 8, wherein a distance between two inner burners of an inner burner row is IB2IB, and the distance between two outer burners of an outer burner row is OB2OB, and wherein the inner and outer burners in the rows are arranged in such a way that a ratio of IB2IB to OB2OB is 0,3 to 0,81, preferably 0,4 to 0,71 and more preferably 0,5 to 0,61.

10. The furnace of any one of claims 1 to 9, wherein the inner burner rows, the outer burner rows and the process tube rows are ended by vertically sided walls arranged perpendicular to the inner burner rows, the outer burner rows and the process tube rows, and wherein the inner burner rows, the outer burner rows and the process tube rows are divided into sections with the distance from an end inner burner or an end outer burner to the vertically sided wall being B2W, the distance between two adjacent inner or outer burners in the section being B2B, and half the distance in-between two sections being B2S, wherein the inner and outer burners in the rows are arranged in such a way that the ratios B2B/B2W and B2B/B2S are greater than 1,3, preferably greater than 1,6 and more preferably greater than 1,8.

11. The furnace of any one of claims 1 to 10, wherein the burner rows and the process tube rows are ended by vertically sided walls arranged perpendicular to the burner rows and the process tube rows, and wherein the burner rows and the process tube rows are divided into sections with, on

each row of process tubes, the distance from a wall end process tube to the vertically sided wall being T2W, the distance between two adjacent inner process tubes in a section being T2T, and the distance between two symmetry end process tubes of two adjacent sections being T2S, wherein the process tubes in the rows are arranged in such a way that the ratios T2T/T2W and T2T/T2S are greater than 0,5 and smaller than 2, preferably greater than 0,75 and smaller than 1,75.

12. The furnace of any one of claims 1 to 11, wherein the outer burners are positioned such that the distance of the central axis of the outer burners to the furnace wall is less than 25 % of the distance between the outermost tubes and the furnace wall, preferably less than 10 %, more preferably less than 5 %, most preferably less than 2 %.

13. The furnace of any one of claims 1 to 12, wherein the burners are mounted to a furnace roof configured for a down-fired arrangement or the burners are mounted to a furnace floor configured for an up-fired arrangement.

14. The furnace of any one of claims 1 to 13, the furnace being a steam methane reforming furnace.

15. A process for operating a furnace for performing an endothermic process with a plurality of catalyst containing process tubes for converting a gaseous feed, wherein
said process tubes are arranged in rows within the furnace, each row of process tubes thereby defining a process tube row,
a plurality of inner burners arranged in rows within the furnace, each row of inner burners being arranged between and parallel to process tube rows, thereby defining an inner burner row, and
a plurality of outer burners arranged in rows within the furnace, each row of outer burners being arranged between and parallel to a process tube row and a furnace wall, thereby defining an outer burner row,
whereby the burners of an outer burner row are heating at least one row of adjacent process tubes and

the burners of an inner burner row are heating at least two rows of adjacent process tubes,
characterized in that
a number of burners of the outer burner row is smaller than a number of burners of the inner burner row.

16. The process of claim 15, wherein the outer burners are operating with a firing rate which is in the range of 85 to 115 % of the firing rate of the inner burners, preferably in the range of 90 to 110 % of the firing rate of the inner burners, more preferably in a range of 95 to 105 % of the firing rate of the inner burners.

17. The process of claim 15 or 16, wherein the outer burners and the inner burners are operating with an equal nominal firing rate.

18. The process of any one of claims 15 to 17, wherein the inner burners are combusting gases at a burner discharge velocity of u m/s, and wherein the outer burners are combusting gases at a burner discharge velocity in range of 0,85 to 1,15 u m/s, preferably 0,90 to 1,10 u m/s, more preferably 0,95 to 1,05 u m/s.

19. The process of any one of claims 15 to 18, wherein the inner burners and the outer burners are operating with a same nominal burner discharge velocity of u m/s.

20. The process of any one of claims 15 to 19, wherein the endothermic process is a steam methane reforming process.

21. Use of the furnace of any one of claims 1 to 14 in a steam methane reforming (SMR) process.

22. Use of the furnace of any one of claims 1 to 14 in a hydrocarbon steam cracking process.