6. The plate fin heat exchanger of claim 1, wherein the perforation diameter (D) is in the range of 1 mm to 4 mm.

7. The plate fin heat exchanger of claim 1, wherein the perforations are circular.

8. The plate fin heat exchanger of claim 1, wherein the perforations are in the shape of ellipses, rectangles, or parallelograms.

9. The plate fin heat exchanger of claim 1, wherein the adjacent parallel rows of perforations are offset in alternating fashion such that the position of the parallel rows of perforations repeats every other row of perforations.

10. The plate fin heat exchanger of claim 1, wherein the adjacent parallel rows of perforations are offset such that the position of the parallel rows of perforations on the fins of the folded fin sheet repeat exactly at least once every 10 fin wavelengths and more preferably at least once every 5 fin wavelengths, in at least 50% of the heat exchanger plate fin passages containing such perforated fins, more preferably in at least 80% of the plate fin passages and most preferably in 100% of the plate fin passages.

11. The plate fin heat exchanger of claim 1, wherein the folded fin sheet comprises a surface texture.

12. The plate fin heat exchanger of claim 1, wherein the fin height is in the range of 0.25 inches to 1 inch, more preferably in the range of 0.4 inches to 0.75 inches, and most preferably in the range of 0.5 inches to 0.6 inches.

13. The plate fin heat exchanger of claim 1, wherein the folded fin sheet is an easyway heat transfer fin or distributor fin.

~~14. The plate fin heat exchanger of claim 1, wherein the plate-fin passages are adapted to accept a fluid stream, and wherein the fluid stream undergoes heat transfer without phase change over at least 80%, more preferably over at least 90%, and most preferably over 100% of the length of the plate-fin passages.~~

~~15.~~14. A process for exchanging heat between at least two streams in a plate fin heat exchanger constructed in accordance with claim 1, wherein at least one stream undergoes heat transfer without phase change over at least 80% of the length of the plate-fin passages, and wherein the Reynolds Number of the at least one stream is in the range of 800 to 100,000 and more preferably in the range of 1,000 to 10,000.

~~16.~~15. A process for separating nitrogen, oxygen and/or argon from air by cryogenic distillation, which utilizes the plate fin heat exchanger of claim 1, wherein at least one stream undergoes heat transfer without phase change over at least 80% of the length of the plate-fin passages, more preferably over at least 90% of the length of the plate-fin passages, and most preferably over 100% of the length of plate-fin passages.

~~17.~~16. A method for manufacturing a plate fin heat exchanger which comprises the steps of:

(a) providing at least one perforated sheet, the at least one perforated sheet comprising a plurality of perforations arranged in parallel rows, wherein such parallel rows of perforations on the perforated sheet comprise a first spacing between the parallel rows of perforations (S1), a second spacing between sequential perforations within the parallel row of perforations (S2), a third spacing (or offset) between the perforations in adjacent parallel rows of perforations (S3), and a perforation diameter (D), wherein the ratio of the first spacing between the parallel rows of perforations to the perforation diameter (S1/D) is in the range of 0.75 to 2.0;

(b) folding the at least one perforated sheet into fins to form a folded perforated sheet such that the angle between the fins and the parallel rows of perforations is less than or equal to five degrees ($\leq 5°$);

(c) positioning a first side bar adjacent to a first side of the at least one folded perforated sheet, a second side bar adjacent to a second side of the at least one folded perforated sheet, a first distributor fin adjacent to a first end of the at least one folded perforated sheet, a second distributor fin adjacent to a second end of the at least one folded perforated sheet, a first endbar adjacent to the first distributor fin , and a second endbar adjacent to the second distributor fin to form a preliminary plate fin passage;

(d) placing the preliminary plate fin passage of step (c) between a first parting sheet and a second parting sheet thereby forming a plate fin passage therebetween;

(e) combining the plate fin passage of step (d) with other plate fin passages to form the plate fin heat exchanger; and

(f) brazing the plate fin heat exchanger.

~~18.~~17. A method for manufacturing a plate fin heat exchanger according to claim ~~17~~16, further comprising applying a surface texture to at least one perforated sheet prior to folding the at least one perforated sheet in step (b).