1. A thermal desalination system, comprising an evaporator having at least one group of effects having at least two effects, wherein each group consists of:

    (a) at least one vapor inlet;

    (b) at least one water inflow line, configured to be fed by a single feed water line;

    (c) at least one concentrate outflow line, configured to be drained into a common concentrate drainage line; and

    (d) at least one distillate outflow line.

    Wherein said groups are configured to be serially connected through their respective common concentrate drainage lines;

    wherein a main feed water line is configured to feed the at least one water inflow line of the first group in the series and the common concentrate drainage line of any preceding group is configured to feed the at least one water inflow line of its adjacent following group.

2. The system according to claim 1 wherein each effect consists of a first vapor and water outlet and a second vapor and water outlet.
3. The system according to claim 1 wherein an inlet chamber is configured to be disposed between two adjacent effects.
4. The system according to claim 3 wherein the inlet chamber is configured to receive vapor and water from the first vapor and water outlet of its adjacent preceding effect.
5. The system according to claim 3 wherein the inlet chamber is configured to receive vapor and water from the second vapor and water outlet of its adjacent preceding effect.

6. The system according to claim 4, wherein the inlet chamber is configured to establish a fluid communication between at least one of the first and second vapor and water outlets of its adjacent preceding effect and the vapor inlet of its adjacent following effect.
7. The system according to claim 5, wherein the inlet chamber is configured to establish a fluid communication between at least one of the first and second vapor and water outlets of its adjacent preceding effect and the vapor inlet of its adjacent following effect.
8. The system according to claim 1 wherein the main feed water line consists of at least one heater.
9. The system according to claim 8 wherein at least one inlet chamber is configured to establish a fluid communication between at least one of the first and second vapor and water outlets of its adjacent preceding effect and the at least one heater.
10. The system according to claim 1 wherein the inlet chamber consists of a droplet separator.
11. The system according to claim 10 wherein the droplet separator is configured to establish a fluid communication with at least one of the first and second vapor and water outlets.
12. The system according to claim 11 wherein the number of heaters along the main feed water line is approximately equal to the number of effects in the evaporator.
13. The system according to claim 12 wherein each heater consists of a vapor inlet, a distillate outlet and a vapor outlet.
14. The system according to claim 13 wherein each inlet chamber in the series is configured to be in a fluid communication with a vapor inlet of a corresponding heater.

15. The system according to claim 1 wherein the common concentrate drainage line consists of a concentrate pump.
16. The system according to claim 15 wherein the concentrate pump is configured to pump concentrate from the common concentrate drainage line of an adjacent preceding effect into the water inflow line of an adjacent following effect.
17. The system according to claim 1 wherein the system is configured to receive a main vapor line into the vapor inlet of the first effect of the first group.
18. The system according to claim 1 wherein the at least one distillate outflow line of each group in the series is drained into a common main distillate line.
19. The system according to claim 1 wherein the last effect of the last group in the series is configured to be connected to a condenser.
20. The system according to claim 17 wherein the common main distillate line is configured to be connected to the condenser.
21. The system according to claim 20 wherein the condenser is configured to condense the vapors coming from the last effect of the last group in the series.
22. The system according to claim 13 wherein the vapor outlets of the heaters are drained into a common vapor outlet line.
23. The system according to claim 20 wherein the condenser is configured to condense the vapor of the common vapor outlet line.
24. The system according to claim 1 wherein the multi-effect evaporator consists of 20 effects.
25. The system according to claim 1 wherein the first group in the series is configured to be fed by the main feed water line and all other groups are configured to be fed by concentrate.

26. The system according to claim 1 wherein all effects in a group are configured to be fed by a parallel water inlet.

27. The system according to claim 1 wherein the at least one distillate outflow line of all groups and distillate outlets of all heaters are drained into a common main distillate line which is configured to be connected to the condenser.

What is claimed is:

1. A thermal desalination system adapted to produce distilled water from feed water, comprising a forward feed evaporator comprising a main water feed line, a main vapor feed line, a distilled water main line and a plurality of effect groups, wherein each effect group comprises:

a) a common concentrate drainage line,

b) a parallel water inlet, and

c) a plurality of effects, each of said effects comprising:

i) at least one vapor inlet;

ii) at least one water inflow line fed by said parallel water inlet;

iii) at least one concentrate outflow line draining into said common concentrate drainage line;

iv) at least one first vapor and distilled water outlet in fluid communication with said distilled water main line; and

v) heat transfer apparatus for receiving thereon feed water from said at least one water inflow line, and therein inlet vapor from said at least one vapor inlet and to condense a part of said inlet vapor to produce distilled water to drain out of said at least one first vapor and distilled water outlet into said distilled water main line, leaving the remainder of the inlet vapor as a first outlet vapor, and to produce from said feed water a second outlet vapor, leaving the remainder of said feed water as a concentrate to drain out of said at least one concentrate outflow line; wherein said main water feed line provides feed water to the parallel water inlet of a most upstream effect group of said plurality of effect groups; wherein the common concentrate drainage line of any upstream effect group feeds the parallel water inlet of its adjacent downstream effect group such that said effect groups are serially connected through their respective common concentrate drainage lines; wherein the concentrate temperature decreases from said most upstream effect group to a most downstream effect group of said plurality of groups, while the concentrate becomes increasingly concentrated from said most upstream effect group to said most downstream effect group where the combination of said decreasing temperature and said increasing concentration minimizes corrosion and scaling in the effects.

2. The system according to claim 1 wherein each of said effects further comprise at least one second vapor outlet for exit of said second outlet vapor from said effect.

3. The system according to claim 2 wherein each of said effect groups further comprises an inlet chamber disposed between two adjacent effects.

4. The system according to claim 3 wherein said inlet chamber receives said first outlet vapor and distilled water from said at least one first vapor and water outlet of its adjacent preceding effect.

5. The system according to claim 3 wherein said inlet chamber receives said second outlet vapor from said at least one second vapor outlet of its adjacent preceding effect and forwards said second outlet vapor into an adjacent downstream effect, where it will constitute inlet vapor.

6. The system according to claim 3 wherein the main water feed line comprises at least one heater.

7. The system according to claim 6 wherein said inlet chamber establishes a fluid communication between said at least one first vapor and water outlet of its adjacent preceding effect and said at least one heater such that said first outlet vapor passes into said heater.

8. The system according to claim 3 wherein the inlet chamber consists of a droplet separator, and wherein the droplet separator establishes a fluid communication with said at least one first vapor and water outlet and said at least one second vapor outlet.

9. The system according to claim 3 wherein the main water feed line comprises a plurality of heaters approximately equal to the number of effects in the evaporator.

10. The system according to claim 9 wherein each of said plurality of heaters comprises a main water feed line inlet, a main water feed line outlet, a heater vapor inlet, a distillate

outlet and a heater vapor outlet, wherein said distillate outlet is in fluid communication with said distilled water main line, and wherein said feed water is warmed by said first outlet vapor as it passes through said heater and wherein a part of said first outlet vapor condenses to produce heater distilled water which drains out of said distillate outlet into said distilled water main line, leaving the remainder of said first outlet vapor to form heater outlet vapor.

11. The system according to claim 10 wherein each of said inlet chambers in the series is configured to be in a fluid communication with a heater vapor inlet of a corresponding heater.

12. The system according to claim 1 wherein said common concentrate drainage line consists of a concentrate pump.

13. The system according to claim 12 wherein the concentrate pump is configured to pump concentrate from the common concentrate drainage line of an adjacent preceding effect into the water inflow line of an adjacent following effect.

14. The system according to claim 1 wherein said main vapor feed line feeds inlet vapor into said at least one vapor inlet of said most upstream effect.

15. The system according to claim 1 wherein said most downstream effect is connected to a condenser and wherein said condenser is configured to condense the vapors coming from said most downstream effect.

16. The system according to claim 15 wherein said distilled water main line is configured to be connected to said condenser.

17. The system according to claim 15 wherein said heater outlet vapor from the heater vapor outlets of the heaters are drained into a common vapor removal line.

18. The system according to claim 17 wherein the condenser condenses the heater

outlet vapor of the common vapor removal line.

19. The system according to claim 1 wherein said plurality of effect groups consists of 20 effects.

20. The system according to claim 1 wherein said feed water is sea water.