CLAIMS

1. A method of providing improved stability and filtration of fluid process stream flow in a process vessel comprising:

passing the fluid process streams through a processing zone within the process vessel, the processing zone containing one or more beds of processing elements; and

prior to passing the fluid process streams through the processing zone, passing the fluid process streams through an entry zone located upstream of the processing zone,

wherein the entry zone contains a bed of stability-improving materials having a porosity in the range from 67% to 87%, a density in the range from 30 - 60 lbs/ft^3, and a weight per piece of 12 - 300 grams, and wherein the stability-improving materials have internal void capable of capturing undesired species from the fluid process stream flow,

and wherein the weight per piece of the stability-improving material is 2500-4000 times greater than the weight per piece of the processing elements in the processing zone.

2. The method of claim 1, wherein the entry zone comprises a single bed of stability-improving materials.

3. The method of claim 1, wherein there is a treating zone downstream the entry zone.

4. The method of claim 3 whereby the stability-improving material stabilize and prevent movement of the treating elements in the treating zone.

5. The method of claim 1, where the internal void contains a network of interconnected pores.

6. The method of claim 1, where the internal void is tortuous.

7. The method of claim 1, where the internal void is 20% - 42% of the entry zone volume.

8. The method of claim 1, where the internal void is 20% - 40% of the entry zone volume.

9. The method of claim 1, where the internal void is 25% - 42% of the entry zone volume.

10. The method of claim 1, where the internal void is 25% - 35% of the entry zone volume.

11. The method of claim 1, where the internal void is 30% - 40% of the entry zone volume.

12. The method of claim 1, where the internal void is 30% - 35% of the entry zone volume.

13. The method of claim 1, where the internal void is 20% - 35% of the entry zone volume.

14. The method of claim 1, where the weight per piece is 12 - 200 grams.

15. The method of claim 1, where the weight per piece is 30 - 200 grams.

16. The method of claim 1, where the weight per piece is 70 - 200 grams.

17. The method of claim 1, where the weight per piece is 70 - 300 grams.

18. The method of claim 1, where the weight per piece is 35 - 300 grams.

19. The method of claim 1, where the weight per piece is 25 - 200 grams.

20. The method of claim 1 whereby the stability-improving material stabilize and prevent movement of the processing elements in the processing bed.

21. The method of claim 1, wherein the fluid process stream flow exiting the entry zone flows directly into the processing bed.

22. The method of claim 1 wherein the composition of the stability-improving materials in the entry zone comprises one or more of iron, tungsten, zirconium, titania, and alumina.

23. The method of claim 1 wherein the composition of the stability-improving materials in the entry zone comprises one or more oxides of iron, tungsten, zirconium, titania, and alumina.

24. The method of claim 1 wherein the composition of the stability-improving materials in the entry zone comprises one or more carbides of iron, tungsten, zirconium, titania, and alumina.

25. The method of claim 1, wherein the stability-improving materials in the entry zone are secured to the internal walls of the process vessel.

26. A method of providing improved stability and filtration of fluid process stream flow in a process vessel comprising:

passing the fluid process streams through a processing zone within the process vessel, the processing zone containing one or more beds of processing elements; and prior to passing the fluid process streams through the processing zone, passing the fluid process streams through a treating zone located upstream of the processing zone and containing treating elements, and through an entry zone located upstream of the treating zone,

wherein the entry zone contains a bed of stability-improving materials having a porosity in the range from 67% to 87%, a density in the range from 30 – 60 lbs/ft^3, and a weight per piece of 12 – 300 grams,

and wherein the stability-improving materials have internal voids capable of filtering particles from the fluid process stream flow,

and wherein the stability-improving materials in the entry zone and the treating elements in the treating zone are different materials,

and wherein the weight per piece of the stability-improving material is 2 - 25 times greater than the weight per piece of the treating elements in the treating zone,

and wherein the weight per piece of the stability-improving material is 2500 - 4000 times greater than the weight per piece of the processing elements in the processing zone.