CLAIMS:

We claim:

1. A devolatilization vessel, comprising:

a first set of one or more devolatilization plates, wherein each plate of the first set of one or more devolatilization plates has a first plurality of holes;

a second set of one or more devolatilization plates, and wherein each plate of the second set of one or more devolatilization plates has a second plurality of holes and a diameter of the second plurality of holes are different than a diameter of the first plurality of holes;

a first distributor above the first set of one or more devolatilization plates and the second set of one or more devolatilization plates; and

a second distributor above the second set of one or more devolatilization plates.

2. The devolatilization vessel of claim 1, wherein the first distributor is configured to provide a first polymer solution through the first set of one or more devolatilization plates and through the second set of one or more devolatilization plates; and wherein the second distributor is configured to provide a second polymer solution through the second set of one or more devolatilization plates.

3. The devolatilization vessel of claim 2, wherein a flow path of the first polymer solution through the first set of one or more devolatilization plates and through the second set of one or more devolatilization plates is longer than a flow path of the second polymer solution through the second set of one or more devolatilization plates.

4. The devolatilization vessel of claim 1, wherein the diameter of the first plurality of holes of the first set of one or more devolatilization plates is smaller than the diameter of the second plurality of holes of the second set of one or more devolatilization plates.

5. The devolatilization vessel of claim 4, wherein each of the first plurality of holes of the first set of one or more devolatilization plates have a diameter from 5 mm to 10 mm and wherein each of the second plurality of holes of the second set of one or more devolatilization plates have a diameter from 25 mm to 50 mm.

6. The devolatilization vessel of claim 1, wherein the first set of one or more devolatilization plates are disposed above the second set of one or more devolatilization plates.

7. The devolatilization vessel of claim 1, wherein the second distributor is further disposed below the first set of one or more devolatilization plates and above the second set of one or more devolatilization plates.

8. A devolatilization vessel, comprising:

a first set of one or more devolatilization plates, each plate having:

a first set of holes at a center region of the plate, the holes of the first set of holes having a first diameter, and

a second set of holes at an edge region of the plate, the holes of the second set of holes having a second diameter, wherein the second diameter is larger than the first diameter;

a second set of one or more devolatilization plates, each plate having a plurality of holes, wherein the second set of one or more devolatilization plates is below the first set of one or more devolatilization plates; and

a distributor above the first set of one or more devolatilization plates and the second set of one or more devolatilization plates.

9. The devolatilization vessel of claim 8, wherein the distributor is configured to flow a first polymer solution through the first set of one or more devolatilization plates and through the second set of one or more devolatilization plates, and the distributor is configured to flow a second polymer solution through the first set of one or more devolatilization plates bypassing the second set of one or more devolatilization plates.

10. The devolatilization vessel of claim 8, wherein the first diameter is from 5 mm to 10 mm; and the second diameter is from 25 mm to 50 mm.

11. The devolatilization vessel of claim 8, wherein an outer diameter of the first set of one or more devolatilization plates is larger than an outer diameter of the second set of one or more devolatilization plates.

12. The devolatilization vessel of claim 8, wherein the distributor is configured to provide a first flow path and a second flow path different than the first flow path, wherein the first flow path is through the first set of holes of the first set of one or more devolatilization plates and then through the second set of one or more devolatilization plates.

13. The devolatilization vessel of claim 12, wherein the second flow path is through the second set of holes of the first set of one or more devolatilization plates and bypasses the second set of one or more devolatilization plates.

14. A polymerization system, comprising;

one or more reactors:

a devolatilization vessel coupled to the one or more reactors, the devolatilization vessel comprising:

a first set of one or more devolatilization plates, wherein each plate of the first set of one or more devolatilization plates has a first plurality of holes;

a second set of one or more devolatilization plates, wherein each plate of the second set of one or more devolatilization plates has a second plurality of holes and a diameter of the second plurality of holes are different than a diameter of the first plurality of holes: and

a distributor configured to provide a first flow path through both the first set of one or more devolatilization plates and the second set of one or more devolatilization plates, and configured to provide a second flow path through either the first set of one or more devolatilization plates or the second set of one or more devolatilization plates; and

a pelletizer coupled to the devolatilization vessel.

15. A process of forming a polymer comprising:

forming a first polymer solution having a first viscosity;

forming a second polymer solution having a second viscosity;

flowing the first polymer solution and the second polymer solution at separate times to a devolatilization vessel; and

removing volatiles from the first polymer solution and the second polymer solution at separate times in the devolatilization vessel to form a devolatilized first polymer melt and a devolatilized second polymer melt;

wherein the devolatilization vessel comprises:

a first set of one or more devolatilization plates, wherein each plate of the first set of one or more devolatilization plates has a first plurality of holes;

a second set of one or more devolatilization plates, and wherein each plate of the second set of one or more devolatilization plates has a second plurality of holes and a diameter of the second plurality of holes are different than a diameter of the first plurality of holes;

a first distributor above the first set of one or more devolatilization plates and the second set of one or more devolatilization plates; and

a second distributor above the second set of one or more devolatilization plates.

16. The process of claim 15, wherein the first polymer melt has a lower neat viscosity than the second polymer melt.

17. The process of claim 15, wherein removing volatiles from the first polymer solution and the second polymer solution comprises:

flowing the first polymer solution through the first set of devolatilization plates and the second set of devolatilization plates to remove volatiles from the first polymer solution; and

flowing the second polymer solution through the second set of devolatilization plates to remove volatiles from the second polymer solution.

18. The process of claim 15, wherein removing volatiles from the first polymer solution and the second polymer solution comprises:

flowing the first polymer from the first distributor;

flowing the second polymer from the second distributor;

flowing the first polymer solution through a low viscosity flow path via the first set of one or more devolatilization plates and then through the second set of one or more devolatilization plates; and

flowing the second polymer solution through a high viscosity flow path via the second set of one or more devolatilization plates.

19. The process of claim 18, wherein the high viscosity flow path bypasses the first set of one or more devolatilization plates.

20. The process of claim 18, wherein removing volatiles from the first polymer solution and the second polymer solution comprises:

flowing the first polymer solution and the second polymer solution utilizing a same distributor;

flowing the first polymer solution on a low viscosity flow path through a first set of one or more devolatilization plates and through a second set of one or more devolatilization plates; and

flowing the second polymer solution through a high viscosity flow path via the first set of one or more devolatilization plates.