CLAIMS

What is claimed is:

1. A static mixer, comprising:

a static mixer housing, comprising,

an inlet port for receiving a fluid,

a channel in fluid communication with the inlet port,

a raised rib along a perimeter of the channel,

a Y-style flow splitter for splitting the fluid into a first stream and a second stream within channels,

a second Y-style flow splitter for splitting the first stream into a third stream and a fourth stream within channels and a third Y-style flow splitter for splitting the second stream into a fifth stream and a sixth stream within channels,

a first T-style junction for rejoining and mixing the third stream and the fourth stream within a channel,

a second T-style junction for rejoining and mixing the fifth stream and the sixth stream within a channel, and

a third T-style junction for rejoining and mixing the streams; and

a plastic film, the plastic film sealed to the raised rib, forming a static mixer capable of mixing the fluids.

2. The static mixer of claim 1, wherein the channel comprises one of a semi-circular geometry, a trapezoidal geometry, a rectangular geometry, or a chevron geometry.

3. The static mixer of claim 1, wherein the static mixer housing is formed of one of high-density polyethylene (HDPE), acrylonitrile-butadiene-styrene (ABS), nylon 6, nylon 66, nylon 46, or polyether sulfone.

4. The static mixer of claim 1 further comprising additional T-style junctions.

5. The static mixer of claim 4 further comprising additional flow splitters.

6. The static mixer of any of claims 1-5 wherein the flow splitters are Y-style splitters.

7. The static mixer of any of claims 1-6 wherein the plastics film is formed of a polyethylene material.

8. The static mixer of any of claims 1-7 further comprising a port having at least two inlet ports.

9. The static mixer of any of claims 1-8 further comprising a concave nub, a convex nub, or a radiused inflection at a flow splitter.

10. The static mixer of any of claims 1-9, wherein the channels have a constant inner dimension.

11. The static mixer of any of claims 1-9, wherein the channels have inner dimensions that are not constant in size.

12. A static mixer system comprising one or more static mixers according to any of claims 1-11 connected in series.

13. A static mixer system comprising one or more static mixers according to any of claims 1-11 connected in parallel.

14. A static mixer, comprising:

a static mixer housing, comprising,

an inlet port to receive two or more fluids to form a mixed fluid,

a channel in fluid communication with the inlet port,

a Y-style flow splitter for splitting the mixed fluid into a first stream and a second stream within channels, and

a first T-style junction for rejoining and mixing the first stream and the second stream within a channel,

wherein a fluid flow of at least one of the two or more fluids is discontinuous.

15. The static mixer of claim 14, wherein the channel comprises one of a semi-circular geometry, a trapezoidal geometry, a rectangular geometry, or a chevron geometry.

16. The static mixer of claim 14, wherein the static mixer housing is formed of one of high-density polyethylene (HDPE), acrylonitrile-butadiene-styrene (ABS), nylon 6, nylon 66, nylon 46, or polyether sulfone.

17. The static mixer of claim 14 further comprising additional T-style junctions.

18. The static mixer of claim 14 further comprising additional flow splitters.

19. The static mixer of any of claims 14-18 wherein the flow splitters are Y-style splitters.

20. The static mixer of any of claims 14-19 wherein the first T-style junction is located outside the static mixer.

21. The static mixer of any of claims 14-20, further comprising a raised rib along a perimeter of the channel.

22. The static mixer of claim 21, further comprising a plastic film, the plastic film sealed to the raised rib, forming a static mixer capable of mixing the two or more fluids.

23. The static mixer of any of claims 14-22, wherein two fluids are introduced into the static mixer.

24. A static mixer, comprising:

a static mixer housing, comprising,

an inlet port to receive at least two fluids, wherein at least one of the fluids is introduced in an intermittent manner,

a channel in fluid communication with the inlet port,

a Y-style flow splitter for splitting the at least two fluids into a first stream and a second stream within channels,

a first T-style junction for rejoining and mixing the first stream and the second stream within a channel; and

an outlet port.

25. The static mixer of claim 24, further comprising a plurality of flow splitters.

26. The static mixer of claim 24, further comprising a plurality of T-style junctions.

27. The static mixer of claim 24, wherein the inlet port comprises two inlets.

28. The static mixer of claim 24, wherein the inlet port comprises two inlets of differing inner diameters.