CLAIMS

1. A composition comprising:

a fluid; and

a milled material dispersed in said fluid, said milled material comprised of particles having sharp conchoidal surfaces, said particles having a complex three-dimensional surface area, said particles having an aspect ratio larger than 0.7 for promoting kinetic boundary layer mixing in a non-linear-viscosity zone.

2. The composition according to claim 1 wherein said complex three-dimensional surface area comprises a smooth, sharp surface.

3. The composition according to claim 1 wherein said complex three-dimensional surface area comprises a smooth, sharp, blade-like surface.

4. The composition according to claim 1 wherein said complex three-dimensional surface area comprises a smooth, curved surface.

5. The composition according to claim 1 wherein said milled material is jet milled material.

6. The composition according to claim 1 wherein said milled material is impact jet milled material.

7. The composition according to claim 1 wherein said milled material is ball milled material.

8. The composition according to claim 1 wherein said milled material is roller milled material.

9. The composition according to claim 1 further comprising an additive dispersed in said fluid.

10. The composition according to claim 1 wherein said particles have a Mohs hardness value of greater than 2.5

11. The composition according to claim 1 wherein said particles have a hardness sufficient to deform said fluid as it flows around said particles, thereby promoting kinetic mixing through the tumbling or rolling effect of the particles.

12. The composition according to claim 1 wherein said particles are of a size that remain primarily in the boundary layer of said fluid, said particles having an appropriate size with respect to the boundary layer such that fluid forces flowing over said boundary layer cause rolls or tumbles of said particles, for creating kinetic rolling thereby producing mixing in said boundary layer.

13. The composition of claim 1 wherein said particles promote boundary layer renewal of said fluid by kinetic mixing.

14. The composition according to claim 1 wherein said material is selected from a group consisting of porous materials, manmade materials, and naturally occurring minerals.

15. The composition according to claim 1 wherein pressure from said fluid acts to change the size of said particles while maintaining said complex three-dimensional surface area so that said particles tend to stay in said boundary layer.

16. The composition according to claim 15 wherein said fluid is between a screw and a barrel of mechanical equipment.

17. The composition according to claim 15 wherein said mechanical equipment is an extruder.

18. The composition according to claim 15 wherein said mechanical equipment is a blow molding device.

19. The composition according to claim 15 wherein said mechanical equipment is an injection molding device.

20. The composition according to claim 14 wherein said mechanical equipment is a pump or process equipment having connections that are open ended single path or are continuous for recycle operations.

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2. The composition according to claim 1 wherein said complex three-dimensional surface area comprises a smooth, sharp surface.

3. The composition according to claim 1 wherein said complex three-dimensional surface area comprises a smooth, sharp, blade-like surface.

4. The composition according to claim 1 wherein said complex three-dimensional surface area comprises a smooth, curved surface.

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9. The composition according to claim 1 further comprising an additive dispersed in said fluid.

10. The composition according to claim 1 wherein said particles have a Mohs hardness value of greater than 2.5

11. The composition according to claim 1 wherein said particles have a hardness sufficient to deform said fluid as it flows around said particles, thereby promoting kinetic mixing through the tumbling or rolling effect of the particles.

12. The composition according to claim 1 wherein said particles are of a size that remain primarily in the boundary layer of said fluid, said particles having an appropriate size with respect to the boundary layer such that fluid forces flowing over said boundary layer cause rolls or tumbles of said particles, for creating kinetic rolling thereby producing mixing in said boundary layer.

13. The composition of claim 1 wherein said particles promote boundary layer renewal of said fluid by kinetic mixing.

14. The composition according to claim 1 wherein said material is selected from a group consisting of porous materials, manmade materials, and naturally occurring minerals.

15. The composition according to claim 1 wherein said fluid is between a screw and a barrel of mechanical equipment.

16. The composition according to claim 15 wherein said mechanical equipment is an extruder.

17. The composition according to claim 15 wherein said mechanical equipment is a blow molding device.

18. The composition according to claim 15 wherein said mechanical equipment is an injection molding device.

19. The composition according to claim 15 wherein said mechanical equipment is a pump or process equipment having connections that are open ended single path or are continuous for recycle operations.

20. The composition according to claim 1 wherein said fluid is a plastic.

21. The composition according to claim 1 wherein said fluid is a polymer.

22. An improved additive for use in a fluid flowing through equipment where the flowing fluid has a stream velocity (U) and a boundary layer flow velocity (u), wherein (U) and (u) are affected by filler loading, heat transfer, shear effects and chemical reactions, wherein the improvement comprises:

particles having a sharp conchoidal surface and a complex three-dimensional surface area, said particles having a diameter approximately equal to a theoretical starting diameter;

wherein said particle theoretical starting diameter is defined by a height measured to a surface where $u = 0.99U$.

23. The improved additive according to claim 22 wherein said complex three-dimensional surface area comprises a smooth, sharp surface.

24. The improved additive according to claim 22 wherein said complex three-dimensional surface area comprises a smooth, sharp, blade-like surface.

25. The improved additive according to claim 22 wherein said complex three-dimensional surface area comprises a smooth, curved surface.

26. The improved additive according to claim 22 wherein said particles comprise a jet milled material.

27. The improved additive according to claim 22 wherein said particles comprise an impact jet milled material.

28. The improved additive according to claim 22 wherein said particles comprise a ball milled material.

29. The improved additive according to claim 22 wherein said particles comprise a roller milled material.

30. The improved additive according to claim 22 wherein said particles have a Mohs hardness value of greater than 2.5

31. The improved additive according to claim 22 wherein said particles have a hardness sufficient to deform said fluid as it flows around said particles, thereby promoting kinetic mixing through the tumbling or rolling effect of the particles.

32. The improved additive according to claim 22 wherein said particles are of a size that remain primarily in a boundary layer of said flowing fluid, said particles having an appropriate size with respect to the boundary layer such that fluid flowing over said boundary layer cause rolls or tumbles of said particles, for creating kinetic rolling thereby producing mixing in said boundary layer.

33. The improved additive of claim 22 wherein said particles promote boundary layer renewal of said flowing fluid by kinetic mixing.

34. The improved additive according to claim 22 wherein said particles are selected from a group consisting of porous materials, manmade materials, and naturally occurring minerals.

35. The improved additive according to claim 22 wherein said fluid is between a screw and a barrel of the equipment.

36. The improved additive according to claim 22 wherein said equipment is a pump or process equipment having connections that are open ended single pass or are continuous for recycle operations.

37. The improved additive according to claim 22 wherein said particle diameter results in particle interaction in a boundary layer of said flowing fluid to achieve one of an increase in additive dispersion in said fluid, or to increase surface quality of said fluid exiting said equipment.

38. The improved additive according to claim 22 wherein said particles are incorporated into said fluid by providing pellets which have said particles contained therein, and forming the fluid from said pellets, said fluid having the particles dispersed therein.

39. The improved additive according to claim 22 wherein said particles are incorporated into oil.

40. The improved additive according to claim 22 wherein said particles are incorporated into a paint.

41. The improved additive according to claim 22 wherein said particles are incorporated into a fire retardant.

42. The improved additive according to claim 22 wherein said particles are incorporated into a heat transfer fluid.

43. The improved additive according to claim 22 wherein said particles are incorporated into a pigment.

44. The improved additive according to claim 22 wherein said particles have an aspect ratio is greater than 0.7

45. The improved additive according to claim 22 wherein said fluid is a plastic.

46. The improved additive according to claim 22 wherein said fluid is a polymer.