CLAIMS

1. A slurry and/or chemical blend supply apparatus comprising a blend module that combines two or three or more flowing component streams to form a blended slurry and/or chemical blend in a pipe, wherein said blend module comprises a pipe for each component stream and at least one flow controller in each of at least two of the component pipes to control the flow rate of the components and wherein said component pipes are connected and combined into a single pipe to form the blended slurry or blended chemical blend stream wherein said blend module further comprises a blend module pump; and said two or three or more component pipes flow two or three or more component streams selected from the group consisting of raw slurry, water, one or more chemical components, one or more chemical components blended with water, partially blended slurry, fully blended slurry, partially blended chemical blend and fully blended chemical blend; and further wherein said at least two or three or more component pipes in said blend module are connected and combined into a single pipe upstream of and within 2 feet of said blend module pump, and said apparatus further comprises a distribution module in fluid communication with said blend module downstream of said blend module pump, said distribution module comprising one or more distribution tanks in fluid communication with one or more global loops and in fluid communication with said single pipe upstream of said blend module pump for returning at least a portion of said chemical blend or blended slurry from said one or more distribution tanks to said single pipe upstream of the said blend module pump; and optionally further comprising A), B) or C)

A) a feed module, said feed module comprising a first pump and at least one feed tank for holding raw slurry, said first pump for transporting raw slurry from a slurry supply container into said feed tank, said feed module further comprising at least one circulation loop and a second pump in the at least one circulation loop connected to the at least one feed tank, said second pump for pumping said raw slurry from the feed tank through the circulation loop and back to the feed tank, wherein the circulation loop further comprises a pipe that supplies only a portion of the raw slurry from the circulation loop to said blend module when the blend module is blending slurry, said circulation loop further comprises a back pressure controller, and a pressure sensor that measures a pressure in the circulation loop that is used to regulate a valve in said back pressure controller to maintain said raw slurry circulating through all of the circulation loop continuously;

B) wherein said distribution module further comprises additional one or more pipes and at least one valve in each of said one or more pipes connecting at least one of said component pipes in said blend module to said one or more distribution tanks for dosing at least one of said components directly into said one or more distribution tanks; or

C) wherein said distribution module further comprises at least one pressure regulator, at least one pump, at least one global loop, and at least one pressure vessel element comprising one or more pressure vessels, each pressure vessel element is in fluid communication with a pressurized

gas source, said at least one pressure regulator and said at least one pump; said at least one pump is in fluid communication with said at least one distribution tank for transferring slurry or chemical blend from said at least one distribution tank into said at least one pressure vessel element continuously or nearly continuously at the same time slurry or chemical blend is supplied continuously or nearly continuously to said at least one global loop from said at least one pressure vessel element.

2. The apparatus of claim 1 further comprising an analytical module that is in fluid communication with said blend module and/or said distribution module and wherein at least a portion of the blended slurry or chemical blend stream from the blend module or the distribution module flows to the analytical module, said analytical module comprising one or more analytical apparatuses selected from the group consisting of in-line liquid particle counter, particle size distribution analyzer, pH sensor, hydrogen peroxide sensor, density sensor and conductivity sensor.

3. The apparatus of claims 1 or 2 further comprising A).

4. The apparatus of claims 1 , 2 or 3 further comprising B).

5. The apparatus of claims 1, 2, 3 or 4 further comprising C).

6. The apparatus of any of the preceding claims , wherein said blend module combines three or more component streams, said blend module comprises, three or more pipes, one pipe for each of said three or more component streams and at least one flow controller in at least three of the pipes to control the flow rate of each of the three or more component streams and wherein first and second pipes of said three or more pipes are combined into a single pipe to form a partially blended slurry or partially blended chemical blend stream and a third pipe of said three or more pipes is combined with the said single pipe to combine a third component stream with the partially blended slurry or partially blended chemical blend stream into a second single pipe.

7. The apparatus of any one of the preceding claims claims wherein said one or more component pipes are combined in stages.

8. The apparatus of any of the preceding claims wherein said blend module comprises a split mixer comprising at least three feed pipes for each of three component streams, said feed pipes are each connected to a receiving pipe with a middle feed pipe located between the other two feed pipes, at least two split pipes connected to opposite ends of said receiving pipe and a rejoinder pipe connected where said at least two split pipes come together.

9. The apparatus of claim 8 wherein the least reactive of said components is introduced into the middle feed pipe.

10. The apparatus of any of the preceding claims wherein in said blend module said three or more component pipes for three or more component streams selected from the group consisting of raw slurry, water, one or more chemical components, one or more chemical components blended with water, partially blended slurry, fully blended slurry, partially blended chemical blend and fully blended chemical blend and further wherein said at least three component pipes are connected and combined into a single pipe upstream of and within 1 foot of said blend module pump.

11. The apparatus of any of the preceding claims wherein the blend module pump is selected from the group consisting of a centrifugal pump, a diaphragm pump and a peristaltic pump.

12. The apparatus of any of the preceding claims wherein upstream of said blend module pump is a first junction of pipes and a second junction of said component pipes wherein said first junction is closer to said pump, in said first junction a first stream comprising one or more chemical components and water is combined with a second stream comprising raw slurry, said first stream flowing from said second junction wherein at said second junction a third and a fourth stream are combined, wherein said third stream comprises water and said fourth stream comprises one or more chemical components to make said first stream.

13. The apparatus of claim 12 wherein said blend module further comprises a static mixer in the pipe for said first stream.

14. The apparatus of any of the preceding claims wherein said blend module further comprises at least one component pipe for flowing at least one stream of fully blended slurry or fully blended chemical blend into said blend module to combine with said components of said blended slurry or chemical blend to form additional fully blended slurry or additional fully blended chemical blend.

15. The apparatus of claim 14 wherein said blend module further comprises two component pipes for flowing two streams of fully blended slurry or fully blended chemical blend into said blend module to form additional fully blended slurry or additional fully blended chemical blend.

16. The apparatus of claim 2 and any of claims 3-15 when dependent on claim 2, wherein said at least a portion of the blended slurry and/or chemical blend stream downstream of said blend module pump flows to and is analyzed by said analytical module.

17. The apparatus of claim 2 or any of claims 3- 16 when dependent on claim 2, further wherein at least a portion of the stream that flows to said analytical module flows to a waste stream downstream of the analytical module.

18. The apparatus of claim 2 or any of claims 3- 16 when dependent on claim 2, wherein at least a portion of the blended slurry or chemical blend stream from the analytical module is transported to the blend module.

19. The apparatus of any of the preceding claims wherein at least a portion of the blended slurry or chemical blend stream from the distribution module is transported to the blend module as an additional component stream that is blended in said blend module.

20. The apparatus of any of the preceding claims wherein said blend module further comprises at least one filter element.

21. The apparatus of claim 20 wherein said blend module further comprises at least one filter element and wherein said at least one filter element is located downstream of said blend module pump.

22. The apparatus of claim 4 and claims 5-21 when dependent on claim 4 wherein said at least one valve and said one or more pipes for dosing the distribution tank are connected downstream of said flow controller in said at least one of said component pipes.

23. The apparatus of any of the preceding claims wherein said distribution module further comprises and one or more pumps.

24. The apparatus of claim 27 wherein said distribution module comprises two distribution tanks, and two or more pumps.

25. The apparatus of any of the preceding claims further wherein each of said one or more distribution tanks comprises one or more level sensors.

26. The apparatus of any of the preceding claims wherein said apparatus further comprises two or more distribution tanks, each distribution tank is connected to at least one global loop that may be the same global loop or different global loops.

27. The apparatus of claim 26 wherein said apparatus comprises two distribution tanks, wherein each distribution tank is connected to a different global loop.

28. The apparatus of claim 26, wherein said apparatus blends and supplies blended slurry to one of said two distribution tanks and blends and supplies chemical blend to the other of said two distribution tanks.

29. The apparatus of claim 5 and any claims 6-28 when dependent on claim 5, wherein said pump operates at a higher pressure than the pressure in the pressure vessel element into which said pump is transferring slurry or chemical blend.

30. The apparatus of claim 29, wherein said apparatus comprises first and second pressure vessel elements, first and second pumps and first and second pressure regulators, wherein the first pressure vessel element, the first pump and the first pressure regulator operate together to supply slurry or chemical blend to the at least one global loop, and the second pressure vessel element, the second pump and the second pressure regulator operate together to supply slurry or chemical blend to the at least one global loop.

31. The apparatus of claim 30, wherein first pressure vessel element, first pump and first pressure regulator and said second pressure vessel elements, second pumps and pressure regulator alternate their operation to supply the same global loop.

32. The apparatus of any of the preceding claims wherein said distribution module further comprises one or more filter elements.

33. The apparatus of claim 32 wherein at least one of said one or more filter elements is located in the global loop.

34. The apparatus of claim 32 wherein at least one of said one or more filter elements is a filter loop.

35. The apparatus of claim 2 or any of claims 3-34 when dependent on claim 2, wherein said distribution module further comprises one or more sample ports and one or more tubes or sample loops in fluid communication with said one or more sample ports that each provide slurry and/or chemical blend to the analytical module.

36. The apparatus of any of the preceding claims wherein:
said distribution module further comprises one or more back pressure controllers and pressure sensors on each of the one or more global loops; or

said distribution module further comprises one or more flow sensors on each of the one or more global loops.

37. The apparatus of claim 1 further comprising an analytical module, said analytical module comprising one or more analytical apparatuses selected from the group consisting of in-line liquid particle counter, particle size distribution analyzer, pH sensor, hydrogen peroxide sensor, density sensor and conductivity sensor.

38. The apparatus of claim 37 or claims 3-36 when dependent upon claim 2 wherein said analytical module further comprises in-line single dilution equipment for performing a single dilution of a sample, said in-line dilution equipment being located upstream of said at least one of said one or more analytical apparatuses, and comprising at least one peristaltic pump, at least one flow sensor and at least one needle valve to dilute the slurry and/or chemical blend sample prior to analyzing the diluted sample.

39. The apparatus of any of claims 37-38 or 3-36 when dependent upon claim 2 wherein said analytical module further comprises in-line double dilution equipment for performing a double dilution of a sample, said in-line dilution equipment being located upstream of at least one of said one or more analytical apparatuses and comprising more than one flow sensor, more than one needle valve and more than one pneumatically controlled valve to dilute the slurry and/or chemical blend sample prior to analyzing the diluted sample.

40. The apparatus of any of claims 37-39 or 3-36 when dependent upon claim 2, wherein said analytical module comprises first and second analytical apparatuses and an inlet pipe for flowing a sample to said one or more analytical apparatuses wherein said pipe comprises at least one junction to direct said sample to at least a first analytical apparatus or to at least a second analytical apparatus.

41. The apparatus of any of claims 37-40 or 3-36 when dependent upon claim 2, wherein said analytical module comprises an inlet pipe for flowing a sample to one or more analytical apparatuses wherein said inlet pipe comprises at least one junction and at least one valve to direct said sample to in-line dilution equipment prior to flowing said diluted sample into said liquid particle counter or said particle size distribution analyzer, said liquid particle counter or said particle size distribution analyzer connected to a downstream waste stream for said diluted sample.

42. The apparatus of claim 41 wherein said at least one junction and said valve can alternatively direct said sample to one or more analytical apparatuses in said analytical module without dilution, said one or more analytical apparatuses without dilution are selected from the group

consisting of one or more pH sensors, one or more hydrogen peroxide sensors, one or more density sensors and one or more conductivity sensors.

43. The apparatus of any of claims 37-42 or 3-36 when dependent upon claim 2 wherein said analytical module comprises piping downstream of said one or more analytical apparatuses to return said sample to a module of said slurry and/or chemical blend supply apparatus after analysis in said one or more analytical apparatuses.

44. The apparatus of any of claims 37-43 or 3-36 when dependent upon claim 2 wherein said analytical module further comprises at least one dilution fixture for diluting slurry and/or chemical blend in UPW to create a diluted sample prior to analyzing the diluted sample by said analytical module.

45. The apparatus of any of claims 37-44 or 3-36 when dependent upon claim 2 wherein the analytical module further comprises two analytical apparatuses selected from the group consisting of pH sensors, hydrogen peroxide sensors, density sensors, conductivity sensors and liquid particle counters and particle size distribution analyzers.

46. The apparatus of any of claims 37-45 or 3-36 when dependent upon claim 2 wherein said analytical module comprises two or more pH sensors and one or more conductivity sensors upstream of one or more peroxide sensors, wherein downstream of the pH and conductivity sensors and upstream of the one or more peroxide sensors, said analytical module comprises a pipe junction to split a sample stream so that only a portion of the sample stream flows to said one or more peroxide sensors.

47. The apparatus of any of claims 37-46 or 3-36 when dependent upon claim 2, further comprising means to redirect all or a portion of a stream into said analytical module comprising a 3-way valve and a restriction orifice.

48. The apparatus of any of claims 37-47 or 3-36 when dependent upon claim 2, comprising a blend module and a distribution module and an optional feed module, and further comprising more than one sample ports and more than one sample tubes or sample loops connected to said sample ports in said one or more other modules, said one or more sample ports and more than one sample tubes or sample loops being in fluid communication with said analytical module for analyzing samples from more than one sample port in said apparatus.

49. The apparatus of claim 3 and any preceding claim when dependent on claim 3 wherein said feed module further comprises a liquid particle counter and/or particle size distribution analyzer.

50. The apparatus of claim 49 wherein said feed module further comprises an in-line liquid particle counter and/or particle size distribution analyzer and further comprises more than one sample port for analyzing a sample of raw slurry from more than one location in the feed module.

51. The apparatus of any of the preceding claims further comprising one or more filter elements, one or more membranes, or other treatment means for the removal of large or small particles from said slurry.

52. The apparatus of claim 50 further comprising one or more filter elements, one or more membranes, or other treatment means for the removal of large or small particles from said slurry wherein said slurry is directed to one or more filter elements, one or more membranes or other treatment means after analysis by said liquid particle counter or particle size distribution analyzer.

53. The apparatus of any of claims 3 and any preceding claim when dependent on claim 3 further comprising a filter loop in the feed module.

54. The apparatus of any of the preceding claims further comprising means to change the direction of at least part of a stream, said means comprising a three-way valve, pipes and a restricted orifice in one of said pipes, said three-way valve capable of directing the stream into said pipe having said restricted orifice therein.

55. The apparatus of any of the preceding claims further comprising a carboy compartment for removing samples of the blended slurry or chemical blend from the apparatus.

56. The apparatus of claim 2, 37-48 or 3-36 when dependent on claim 2 wherein said distribution module further comprises two or more sample loops that provide slurry and/or chemical blend to the analytical module and return it to the distribution module.

57. The apparatus of any of the preceding claims further comprising one or more strainer components.

58. The apparatus of claim 57 further wherein said strainer components are located upstream of at least one flow controllers or at least one pump.

59. The apparatus of any of the preceding claims further comprising one or more filter loops, said one or more filter loops comprising a piping loop and at least one filter element, and a pump within said piping loop.

60. The apparatus of any of the preceding claims further comprising one or more filter elements in a global loop upstream of the tools.

61. The apparatus of any of the preceding claims further comprising at least one feed tank or at least one distribution tank wherein said tank comprises one or more eductors in the bottom portion of said tank.

62. The apparatus of claim 61 wherein said tank comprises one or more side walls, and further comprising piping connected to said eductors, said piping penetrates the side wall in the bottom portion of said tank.

63. The apparatus of claims 61 or 62 wherein said tank further comprises a double exit loop.

64. The apparatus of any one of the preceding claims, wherein said apparatus blends and supplies greater than 10 liters per minute of blended slurry or chemical blend continuously to at least one global loop that is in fluid communication with a plurality of tools.

65. The apparatus of claim 64 wherein said apparatus supplies 10 or more tools.

66. The apparatus of any of the preceding claims wherein raw slurry and/or chemical blend in said one or more global loops is continuously or near continuously circulating in at least one of said one or more global loops.

67. The apparatus of any of the preceding claims , wherein said one or more distribution tanks each comprise tank level indicators, and the apparatus further comprises one or more blend modules that blend blended slurry and/or chemical blend when a tank level indicator in said one or more distribution tanks indicates that the level of blended slurry and/or chemical blend in that distribution tank is below a previously defined level.

68. The apparatus of claim 67, wherein said blend module will stop blending when said one of said one or more tank level indicators in said one or more distribution tanks to which blended slurry and/or chemical blend is being supplied by said blend module, measures that the level of blended

slurry and/or chemical blend being supplied by said blend module is at or above a previously defined level.

69. The apparatus of any of claims 6-68 when dependent on claim 5, wherein said at least one feed tank comprises a tank level indicator that will cause said apparatus to sound an alarm when said tank level indicator in said at least one feed tank measures that the level of raw slurry in the feed tank is below a previously defined level.

70. The apparatus of any of the preceding claims, wherein said one or more global loops comprise one or more filter elements that continuously or near continuously filter the blended slurry and/or chemical blend in the global loop.

71. The apparatus of any of the preceding claims, wherein said one or more global loops comprise said one or more filter elements upstream of tools in fluid communication with the one or more global loops.

72. A process of blending and supplying a slurry and/or chemical blend to a plurality of tools said process comprising the step of blending in a blend module at least two or three or more component streams in a slurry and/or chemical blend supply apparatus, the blend module comprising a pipe for each component stream and a blend module pump, the at least two or three or more component streams being selected from the group consisting of raw slurry, water, one or more chemical components, one or more chemical components blended with water, partially blended slurry, fully blended slurry, partially blended chemical blend and fully blended chemical blend streams, by flowing the at least two or more component streams through flow controllers that provide measured amounts of the streams to be combined and combining at least two streams to form a single stream of a blended slurry or a chemical blend, such that said component streams are combined in a single pipe upstream of and within 2 feet of said blend module pump thereby forming a blended slurry or chemical blend, and flowing said blended slurry or chemical blend to a distribution module in fluid communication with said blend module downstream of said blend module pump, said distribution module comprising one or more distribution tanks in fluid communication with one or more global loops and in fluid communication with said single pipe upstream of said blend module pump for returning at least a portion of said chemical blend or blended slurry from said one or more distribution tanks to said single pipe upstream of the said blend module pump and said process optionally comprising the step of A), B) or C):

A) providing a feed module, said feed module comprising a first pump and at least one feed tank for holding raw slurry, transporting via a first pump raw slurry from a slurry supply container into said feed tank, said feed module further comprising at least one circulation loop and a

second pump in the at least one circulation loop connected to the at least one feed tank, pumping said raw slurry via said second pump from the feed tank through the circulation loop and back to the feed tank, wherein the circulation loop further comprises a pipe that supplies only a portion of the raw slurry from the circulation loop to said blend module when the blend module is blending slurry, said circulation loop further comprises a back pressure controller, and a pressure sensor for measuring a pressure in the circulation loop and regulating a valve in said back pressure controller to maintain said raw slurry circulating through all of the circulation loop continuously;

B) said distribution module further comprises additional one or more pipes and at least one valve in each of said one or more pipes connecting the at least one of said component pipes in said blend module to said one or more distribution tanks, and dosing at least one of said components directly into said one or more distribution tanks; or

C) said distribution module further comprises, at least one pressure regulator, at least one pump, , and at least one pressure vessel element comprising one or more pressure vessels, each pressure vessel element is in fluid communication with a pressurized gas source, said at least one pressure regulator and said at least one pump; said at least one pump is in fluid communication with said at least one distribution tank, and transfering slurry or chemical blend from said at least one distribution tank into said at least one pressure vessel element continuously or nearly continuously at the same time slurry or chemical blend is being supplied continuously or nearly continuously to said at least one global loop from said at least one pressure vessel element.

73. The process of claim 72 further comprising providing an analytical module that is in fluid communication with said blend module and/or said distribution module and flowing at least a portion of the blended slurry or chemical blend stream from the blend module or the distribution module to the analytical module, said analytical module comprising one or more analytical apparatuses selected from the group consisting of in-line liquid particle counter, particle size distribution analyzer, pH sensor, hydrogen peroxide sensor, density sensor and conductivity sensor.

74. The process of claims 72 or 73 further comprising A).

75. The process of claims 72, 73 or 74 further comprising B).

76. The process of claims 72, 73, 74 or 75 further comprising C).

77. The process of any of claims 72-76 further wherein the combining step to form said single stream occurs within 1 foot of the blend module pump.

78. The process of claim 77 wherein the pump is a centrifugal pump.

79. The process of any of claims 72-78 wherein said combining step comprises combining three of said component streams.

80. The process of any of claims 72-79 wherein prior to said combining step is a first step of combining at least two of said component streams to form a first partially blended slurry or first partially blended chemical blend stream.

81. The process of claim 80 wherein after said first step of combining but before said combining step is a second step of combining at least two of said component streams to form a second partially blended slurry or a second partially blended chemical blend stream.

82. The process of claim 81 wherein one of said at least two component streams that are combined in said second step of combining is said first partially blended slurry or said first partially blended chemical blend.

83. The process of any of claims 72-82 further comprising A) and the steps of pumping raw slurry from a slurry supply container into said feed tank and circulating said raw slurry around a circulation loop connected to said feed tank.

84. The process of claim 83 further comprising the step of providing a raw slurry stream to the blend module from said circulation loop, blending said raw slurry steam in the blend module with one or more other component streams to make a blended slurry by flowing said raw slurry stream and said one or more component streams through at least one flow controller for each said streams and combining said streams downstream of the flow controllers by combining the pipes for each stream into a single pipe containing all of the streams to create a blended slurry.

85. The process of any of claims 72-84 wherein said process further comprises the step of blending chemical blend, providing said chemical blend to a global loop.

86. The process of any of claims 72-85 wherein said process further comprises the step of combining said pipes for each stream in stages and directing the single pipe into a pump.

87. The process of any of claims 72-86 wherein said process further comprises the step of directing at least a portion of said blended slurry or chemical blend, downstream of said combining step, to one or more of the following: one or more tools, an analytical apparatus, an analytical module, a global loop, or to a filter element.

88. The process of claim 83 or 84 wherein said process further comprises the step of pumping the raw slurry in a circulation loop from said slurry supply container for a period of time prior to and/or simultaneously with pumping the raw slurry from the slurry supply container into said feed tank.

89. The process of any of claims 83, 84 or 88 wherein said process further comprises the step of passing raw slurry through a strainer before one or more pumps in the feed module.

90. The process of any of claims 83, 84, 88 or 89 wherein said process further comprises the step of filtering said raw slurry from said slurry supply container prior to and/or simultaneously with transporting it to said feed tank or to said circulation loop.

91. The process of any of claims 83, 84 or 88-90 wherein said process further comprises the step of filtering said raw slurry in a filter loop in communication with the slurry supply container prior to transferring the slurry to the feed tank.

92. The process of any of the claims 83, 84 or 88-91 wherein said process further comprises the step of by-passing the feed tank and transporting raw slurry to the blend module when there is an urgent demand for raw slurry in the blend module.

93. The process of any of the claims 83, 84 or 88-92 wherein said process further comprises the step of circulating raw slurry from the feed tank through a circulation loop and back to the feed tank.

94. The process of any of claims 83, 84 or 88-93 comprising the step of transferring at least a portion of the slurry in the circulation loop of the feed module to a blend module when the blend module is blending slurry.

95. The process of any of the claims 83, 84 or 88-94 wherein said process further comprises the step of, stopping the transfer of the slurry from the circulation loop in the feed module to the blend module when the blend module is not blending slurry.

96. The process of any of the claims 83, 84 or 88-95 wherein said process further comprises the step of filtering the slurry while it circulates in the circulation loop.

97. The process any of the claims 83, 84 or 88-94 wherein said process further comprises the step of filtering the slurry in the circulation loop when the slurry is not being transferred to the blend

module, and not filtering the slurry in the circulation loop when the slurry is being transferred to the blend module.

98. The process of any of claims 72-97 wherein said process further comprises the step of analyzing raw slurry, chemical blend or blended slurry from one or more of said feed, blend or distribution modules using one or more analytical apparatuses.

99. The process of one or more of claims 72-98 wherein said process further comprises the step of diluting at least a portion of the slurry to form a diluted slurry prior to analyzing the slurry.

100. The process of any of claims 72-99 wherein said process further comprises the step of diluting said diluted slurry to form a twice diluted slurry prior to analyzing said slurry.

101. The process of any of claims 72-100 wherein said process further comprises the step of transporting the slurry or chemical blend to an analytical module via sample tubes or via sample loops.

102. The process of any of claims 72-101 wherein said process further comprises the step of returning the slurry or chemical blend to the slurry and/or chemical blend supply apparatus, optionally to the same module, after said analyzing step.

103. The process of any of claims 72-102 wherein said process further comprises controlling the flow and/or dilution of slurry or chemical blend in an analytical module using one or more pieces of equipment selected from the group consisting of: a needle valve, a peristaltic pump, a rotometer and a dilution fixture.

104. The process of any of claims 72-103 wherein said process further comprises the step of returning the slurry or the chemical blend to a distribution tank or sending it to a waste stream.

105. The process of any of claims 72-104 wherein said process further comprises the step of drawing slurry or chemical blend from multiple modules sequentially for analysis by one or more analytical apparatuses in an analytical module.

106. The process of any of claims 72-105 wherein said process further comprises the step of using one or more measurements made by an analytical module by a computer for the apparatus for directing the apparatus to take action based on one or more of the measurements.

107. The process of claim 106 wherein said process further comprises the step of directing raw slurry and/or blended slurry and/or partially blended slurry and/or one or more chemical component streams and/or partially blended chemical blend and/or a chemical blended stream to a waste stream from any module in the apparatus, or directing the slurry to pass through one or more filters, or pass through treatment means, or adjusting the composition in the blend module or adding a metered amount of one or more components to the distribution tank from the blend module, or sending raw slurry to the blend module, or sounding an alarm.

108. The process of any of claims 72-107 wherein said process further comprises the step of analyzing raw slurry using a particle size distribution analyzer or a liquid particle counter prior to or at the beginning of transferring raw slurry to the feed tank from the slurry supply container so that the transfer can be terminated if said analyzing step determines that the raw slurry is out of specification.

109. The process of any of claims 72-108 wherein said process further comprises the step of analyzing raw slurry using a particle size distribution analyzer or a liquid particle counter prior to transferring raw slurry to the blend module so that the transfer can be terminated if said analyzing step determines the raw slurry is out of specification.

110. The process of any of claims 72-109 wherein said process further comprises the step of analyzing blended slurry using a particle size distribution analyzer or a liquid particle counter or one or more other analytical apparatuses prior to or during transferring blended slurry to the distribution tank from the blend module so that the transfer can be terminated if said analyzing step determines the slurry is out of specification.

111. The process of any of claims 72-110 wherein said process further comprises the step of passing slurry and/or chemical blend through a strainer in one or more pipes in the slurry and/or chemical blend supply apparatus upstream of one or more of the pieces of equipment selected from the group consisting of flow controllers, pumps, needle valves, analytical apparatuses or other restricted valves or orifices.

112. The process of any of claims 72-111 wherein said process further comprises the step of controlling the flow through the circulation loop or global loop by measuring a flow rate using a flow sensor and using the measured flow rate to adjust a pump speed and measuring a pressure and using the pressure in the circulation loop or global loop to adjust the pump speed, and/or using a pressure sensor to adjust a back pressure controller, said back pressure controller being located near the return of the circulation loop or global loop.

113. The process of any of claims 72-112 wherein said process further comprises the step of filtering the slurry and/or chemical blend in one or more modules, optionally in each of the feed, blend and distribution modules.

114. The process of any of claims 72-113 wherein said process further comprises the step of filtering slurry or chemical blend in a separate filter loop, said filter loop comprising a pipe loop, a filter loop pump, and one or more filters in fluid communication with the pipe loop.

115. The process of claim 114 wherein said process further comprises the step of flowing said raw slurry stream through a strainer upstream of said flow controller.

116. The process of claim 114 or 115 wherein said flowing step and said combining step combines three of said component streams.

117. The process of any of claims 114-116 wherein said process further comprises the step of prior to said combining step, a first step of combining at least two of said component streams to form a first partially blended slurry and/or first partially blended chemical blend stream.

118. The process of any of claims 114-117 wherein said process further comprises the step of combining said first partially blended stream (slurry or chemical blend) with another component stream in said combining step.

119. The process of any of claims 114-118 wherein said process further comprises, after said first step of combining but before said combining step, a second step of combining at least two of said component streams to form a second partially blended (slurry and/or chemical blend) stream or a fully blended (slurry and/or chemical blend) stream, said combining step therefore becoming a third step of combining.

120. The process of claim 119 wherein said process further comprises the step of wherein one of said at least two component streams that are combined in said second step of combining is said first partially blended slurry or first partially blended chemical blend.

121. The process of any of claims 114-120 wherein said process further comprises the step of combining all the component streams combined in all of the combining steps within 2 feet upstream of a pump.

122. The process of any of claims 119-121 wherein said process further comprises the step of combining a fully blended slurry or fully blended chemical blend in any one of said first, second or third combining steps or in an optional additional fourth combining step of blending component streams in said blend module.

123. The process of any of claims 72-122 wherein said process further comprises the step of flowing said fully blended slurry or fully blended chemical blend from a distribution tank or from an analytical module or from the blend module or from a container of blended slurry or chemical blend.

124. The process of any of claims 72-123 wherein said step of combining blended slurry or blended chemical blend may be preceded by any one or more of the steps selected from the group consisting of: filtering said blended slurry or chemical blend, analyzing said blended slurry or chemical blend, or flowing said blended slurry or chemical blend from said distribution tank to said blend module.

125. The process of any of claims 72-124 wherein the blended stream after any of the combining steps is selected from the group consisting of partially blended slurry stream or partially blended chemical blend stream, fully blended slurry, fully blended chemical blend, additional fully blended slurry and additional fully blended chemical blend stream.

126. The process of any of claims 72-125 wherein said process further comprises the step of analyzing the slurry and/or chemical blend from one or more modules of the slurry and/or chemical blend supply apparatus, using one or multiple in-line analytical modules.

127. The process of any of claims 72-126 wherein said process further comprises one or more of the following steps in response to the analyzing step performed by said one or more in-line analytical modules: alerting a technician, directing slurry into a treatment means, dosing said distribution tank with one or more components.

128. The process of any of claims 72-127 wherein said process further comprises the steps of dosing said distribution tank with one or more components by flowing one or more components from said blend module to said distribution tank and terminating the dosing step.

129. The process of any of claims 72-128 wherein said process further comprises the step of blending slurry or chemical blend by flowing two or more component streams into a split mixer.

130. The process of any of claims 72-129 wherein said process further comprises the step of transporting blended slurry or chemical blend from the blend module to the distribution module, the distribution module may comprise a distribution tank for receiving the blended slurry or chemical blend, and the process may further comprise pumping the blended slurry or chemical blend from the distribution tank through a global loop to one or more CMP or other tools.

131. The process of any of claims 72-130 wherein said process step of pumping the slurry or chemical blend around the global loop further includes the step of transporting at least a portion of the blended slurry or chemical blend in the global loop back to the one or more distribution tanks.

132. The process of any of claims 72-131 wherein said process further comprises the step of measuring the pressure is said global loop and the flow rate of blended slurry or chemical blend in the global loop and adjusting the speed of the pump and the back pressure controller in response to those measurements to regulate the flow of the blended slurry or chemical blend in the global loop.

133. The process of any of claims 72-132 wherein said process further comprises the step of measuring the level of slurry or chemical blend in the distribution tank and blending slurry or chemical blend if the level in the distribution tank is below a predefined level.

134. The process of any of claims 72-133 wherein said process further comprises the step of providing a distribution module comprising first and second distribution tanks, at least one pump and at least one global loop, further comprising terminating the flow of slurry or chemical blend from a blend module to said first distribution and directing the flow of slurry or chemical blend to said second distribution tank.

135. The process of any of claims 72-134 wherein said process further comprises the steps of providing a slurry or chemical blend supply apparatus comprising first and second distribution tanks, first and second distribution pumps, and first and second global loops; terminating the flow of blended slurry or chemical blend to and through the first distribution tank, the first pump, and the first global loop and instead directing the blended slurry or chemical blend to flow to and through the second distribution tank, the second pump and the second global loop.

136. The process of any of claims 72-135 wherein said process further comprises the step of providing a slurry and/or chemical blend supply apparatus comprising first and second distribution tanks, first and second distribution pumps, and first and second global loops; and pumping via the first pump blended slurry or chemical blend from the first distribution tank to the first global loop, and

pumping via the second pump blended slurry or chemical blend from the second distribution tank to the second global loop.

137. The process of any of claims 72-136 wherein said process further comprises the step of blending a first and second blended slurry or a first and second chemical blend or first blended slurry and second chemical blend in the blend module and directing said first streams to said first distribution tank and said second streams to said second distribution tank.

138. The process of any of claims 72-137 wherein said process further comprises the step of controlling the blending by the blend module of the first and second blended slurries or the first and second chemical blends or the first blended slurry and the second blended chemical blend based on demand by the first or second global loop or tank level sensors in said first or second distribution tanks.

139. The process of any of claims 72-138 wherein said process further comprises the step of supplying raw slurry to the feed tank and/or to the blend module in response to demand from the slurry and/or chemical blend supply apparatus for blended slurry in distribution module.

140. The process of any of claims 72-139 wherein said process further comprises the step of increasing or decreasing the speed of the global loop supply pump in response to an increase or decrease in the consumption of blended slurry and/or chemical blend by the tools in fluid communication with the global loop.

141. The process of any of claims 72-140 wherein said process further comprises the step of starting or stopping the blending in the blend module based a level sensor measurement in at least one distribution tank.

142. The process of any of claims 72-141 wherein said process further comprises the step of increasing the feed module pump speed on the circulation loop when the blend module consumes an increased amount of raw slurry and decreasing the feed module pump speed on the circulation loop when the blend module consumes a decreased amount of raw slurry.

143. The process of any of claims 72-142 when dependent on claim 73, wherein said process further comprises the step of operating the slurry and/or chemical blend supply apparatus such that the distribution module is continuously circulating slurry and/or chemical blend through a global loop and the analytical module is continuously analyzing at one or more pre-set intervals individual samples of at least some slurry or chemical blend.

144. The process of any of claims 72-143 when dependent on claim 73, further wherein during said operating step, said analytical module analyzes individual samples from two or more sample loops from two or more modules in the apparatus.

145. The process of any of claims 72-144 further wherein during said operating step said feed module is continuously circulating slurry in a circulation loop.

146. The process of any of claims 72-145 further wherein during said operating step slurry or chemical blend is flowing through and is present in more than 75% of the total linear flowing distance of all of the pipes, tanks, and other parts and equipment that slurry or chemical blend flow through of the slurry and/or chemical blend supply apparatus when slurry and/or chemical blend is being supplied to the global loop.

147. The process of any of claims 72-146, wherein the process further comprises the step of flowing slurry and/or chemical blend into a tank by passing the slurry and/or chemical blend through an eductor.

148. The process of any of claims 72-147, wherein the process further comprises the step of transporting slurry and/or chemical blend from the exit opening at the bottom of each tank through a circulation loop to the return pipe in the tank and flowing the slurry and/or chemical blend out of one or more eductors located at the end of the return pipe inside the tank wherein said return pipe penetrates the sidewall of the tank at about the same level from the bottom of the tank as the eductor is located.

149. The process of any of claims 72-148 further comprising the step of flowing slurry or chemical blend out of the exit opening at the bottom of a tank into a double line exit loop.

150. The process of any of claims 72-149 further comprising the step of redirecting the flow of at least a portion of a slurry or chemical blend stream using a restricted orifice and a three-way valve.

151. The process of any of claims 72-150 further comprising the step of pumping slurry or chemical blend from a distribution tank into one or more pressure vessel elements, each of said one or more pressure vessel elements comprising one or more pressure vessels.

152. The process of any of claims 72-151 further comprising the step of maintaining the one or more pressure vessels of the one or more pressure vessel elements under a constant elevated pressure via a pressure regulator connected to a pressurized gas source.

153. The process of any of claims 72-152 further comprising the step of continuously pumping the slurry or chemical blend from a distribution tank at a pressure greater than the pressure in the one or more pressure vessels to continuously supply the one or more pressure vessel elements with slurry or chemical blend, so that said one or more pressure vessels can continuously supply one or more global loops with slurry or chemical blend.

154. The process of any of claims 72-153 further comprising the step of switching from the supply from the distribution tank of slurry or chemical blend by a first pump to a first pressure vessel element to the supply from the distribution tank of slurry or chemical blend by a second pump to a second pressure vessel element in the distribution module to supply one or more global loops with slurry or chemical blend.

155. The process of any of claims 72-154 further wherein the first pump supplying the first pressure vessel element and the second pump supplying the second pressure vessel element, both supply the same global loop.

156. The process of any of claims 72-155 further comprising the step of sounding an alarm when a sensor detects a slurry or chemical blend that is out of specification, while the global loop continues to supply slurry or chemical blend to the tools.

157. The process of any of claims 72-156 further comprising the step of circulating 10-30 LPM of slurry or chemical blend in at least one global loop continuously.

158. The process of any of claims 72-157 further wherein the slurry and/or chemical blend supply apparatus supplies 8 or more tools simultaneously and continuously for days or weeks or more at a time.