IN THE CLAIMS

1. A mist system for fire protection of a light and ordinary hazard occupancy, the system comprising:

a fluid supply; and

a plurality of nozzles spaced about the occupancy and coupled to the fluid supply so as to provide fluid to the nozzles at an operating pressure of less than about 500 pounds per square inch (psi) and define a hydraulic demand being the greater of: (i) five hydraulically remote nozzles each having a coverage area ranging from 36 sq. ft. to a maximum of about 256 sq. ft; or (ii) a hydraulic design area ranging from about 900 square feet to about 1044 square feet.

2. The system of claim 1, wherein the plurality of nozzles are disposed above a protection area of the occupancy at a maximum ceiling height of under ten feet to define a nozzle-to-nozzle spacing being a minimum six feet by six feet (6 ft. x 6 ft.) and a maximum spacing of 16 feet by 16 feet (16 ft. x 16 ft.), the hydraulic demand being the greater of five hydraulic remote sprinkler or 900 sq. ft (84 sq. m.).

3. The system of claim 2, wherein the maximum ceiling height is 9 ft – 10 in. (3 m).

4. The system of claim 3, wherein the maximum ceiling height is 8 ft (2.4).

5. The system of any one of the above claims, wherein the operating pressure ranges from about 140 psi. to about 250 psi. to provide an effective flux density of at least 0.037 gpm/sq. ft. for the coverage area.

6. The system of any one of the above claims, wherein each of the plurality of nozzles have a K-factor of about 0.81 gpm/psi^{½}.

7. The system of any one of the above claims, wherein the protection area beneath the plurality of nozzles defines a maximum 1024 sq. ft.

8. The system of claim 7, wherein the hydraulic demand is defined by a water duration of sixty minutes to all the nozzles in the protection area so as to provide protection to a light hazard only occupancy.

9. The system of claim 1, wherein the plurality of nozzles are disposed above a protection area of the occupancy at a maximum ceiling height of about seventeen feet to define a minimum nozzle-to-nozzle spacing of six feet by six feet (6 ft. x 6 ft.) and a maximum nozzle-to-nozzle spacing of 12 feet by 12 feet (12 ft. x 12 ft.).

10. The system of claim 8, wherein the plurality of nozzles are disposed at the maximum ceiling height of 16 feet – five inches and spaced at the nozzle-to-nozzle spacing of 12 ft. x 12 ft., the operating pressure ranging from about 110 psi. to about 250 psi. to provide an effective flux density of at least 0.043 gpm/sq. ft.

11. The system of claims 8-9, wherein each of the plurality of nozzles have a K-factor of about 0.59 gpm/psi^{½}.

12. The system of claim 11, wherein the hydraulic demand is defined by: the greater of the most remote five nozzles or a hydraulic design area of 900 sq. ft. area for a maximum ceiling height of about ten feet; (ii) the greater of the most remote five nozzles or a hydraulic design area

of 975 sq. ft. area for a maximum ceiling height of about thirteen feet; and (iii) the greater of the most remote five nozzles or a hydraulic design area of 1044 sq. ft. for a maximum ceiling height of about seventeen feet.

13. The system of claim 11, wherein the protection area is less than 1500 square feet, the hydraulic demand is defined by a water duration of sixty minutes to all the nozzles in the protection area so as to provide protection to a light hazard only occupancy.

14. The system of any one of the above claims, wherein the plurality of nozzles are installed beneath a ceiling having a maximum slope of one foot of rise for each twelve feet of run.

15. The system of claim 1, each of the plurality of nozzles providing an effective flux density of less than 0.1 gallons per minute per square foot (gpm/sq. ft.) for the operating pressure.

16. A mist system for fire protection of light and ordinary hazard occupancy defining a protection area being at least one of: (i) greater than 1024 sq. ft and (ii) beneath a ceiling having a maximum ceiling height of about 13 ft., the system comprising:

a fluid supply;

a plurality of nozzles coupled to the fluid supply to define a hydraulic demand of the system being the greater of: (i) five most hydraulically remote sprinklers or a 900 square foot area, the plurality of nozzles including:

a first plurality of nozzles spaced about the occupancy to protect no more than 30% of the protection area at a nozzle to nozzle spacing ranging between about 6 ft x 6 ft. to about 12 ft. x 12 ft. , the first plurality of nozzles being coupled to the fluid supply so as to provide the fluid to

the first plurality of nozzles at an operating pressure in the range of about 102 psi. to about 250 psi.;

a second plurality of nozzles spaced about the occupancy for the protection of a remainder of the protection area at a nozzle to nozzle spacing ranging between about 6 ft x 6 ft. to about 16 ft. x 16 ft. , the second plurality of nozzles being coupled to the fluid supply so as to provide the fluid to the second plurality of nozzles at an operating pressure in the range of about 110 psi. to about 250 psi.

17. The system of claim 16, wherein the protection area is no more than 1024 sq. ft. and the maximum ceiling height is about ten feet, the second plurality of nozzles being spaced about the occupancy at a nozzle to nozzle spacing ranging between about 6 ft x 6 ft. to about 16 ft. x 16 ft., the second plurality of nozzles being coupled to the fluid supply so as to provide the fluid to the nozzles at an operating pressure in the range of about 140 psi. to about 250 psi.

18. The system of claim 16, the second plurality of nozzles being spaced about the occupancy at a nozzle to nozzle spacing ranging between about 6 ft x 6 ft. to about 12 ft. x 12 ft., the second plurality of nozzles being coupled to the fluid supply so as to provide the fluid to the nozzles at an operating pressure in the range of about 110 psi. to about 250 psi.

19. The system of claim 16, wherein the occupancy is ordinary hazard without storage and the maximum ceiling height is about ten feet, the first plurality of nozzles having a maximum nozzle to nozzle spacing of about 12 ft. x 12 ft.

20. The system of claim 16, wherein the occupancy is ordinary hazard without storage and the maximum ceiling height is about 13 ft., the first plurality of nozzles having a maximum nozzle to nozzle spacing of about 10 ft. x 10 ft.

21. The system of claim 16, wherein the occupancy is ordinary hazard with storage having a maximum storage height of 8 ft. and the maximum ceiling height is about ten feet, the first plurality of nozzles having a maximum nozzle to nozzle spacing of about 8 ft. x 8 ft.

22. The system of claim 16, wherein the occupancy is ordinary hazard without storage and the maximum ceiling height is about ten feet, the first plurality of nozzles having a maximum nozzle to nozzle spacing of about 10 ft. x 10 ft.

23. The system of claim 13, wherein the occupancy is ordinary hazard without storage and the maximum ceiling height is about 13 ft., the first plurality of nozzles having a maximum nozzle to nozzle spacing of about 8 ft. x 8 ft.

24. The system of claim 16, wherein the occupancy is ordinary hazard with storage having a maximum storage height of 5 ft. and the ceiling height is about eight feet (8ft.), the first plurality of nozzles having a maximum nozzle to nozzle spacing of about 8 ft. x 8 ft.

25. A mist system for fire protection of a light and ordinary hazard occupancy defining a protection area of greater than 1024 sq. ft., the system comprising:

a fluid supply; and

a plurality of fluid distribution devices coupled to the fluid supply, the devices including:

a plurality of sprinklers spaced about the occupancy to protect no more than 30% of the protection area at a sprinkler to sprinkler spacing ranging between about 6 ft x 6 ft. to

about 15 ft. x 15 ft., the plurality of sprinklers being coupled to the fluid supply so as to define a hydraulic demand of the system being the greater of the five most remote sprinkler or a design area ranging between 900 sq. ft. to 1500 sq. ft., each of the plurality of sprinklers having a maximum operating pressure of 175 psi.; and

a plurality of nozzles spaced about the occupancy for the protection of a remainder of the protection area at a nozzle to nozzle spacing ranging between about 6 ft x 6 ft. to about 16 ft. x 16 ft. , the first plurality of nozzles being coupled to the fluid supply so as to provide the fluid to the first plurality of nozzles at an operating pressure in the range of about 110 psi. to about 250 psi.

26. The system of claim 25, wherein the hydraulic demand is:

(i) the greater of the five most remote sprinklers or 900 sq. ft. for a maximum ceiling height of ten feet (10 ft.);

(ii) the greater of the five most remote sprinklers or 1013 sq. ft. for a maximum ceiling height of fifteen feet (15 ft.);

(iii) the greater of the five most remote sprinklers or 1125 sq. ft. for a maximum ceiling height of twenty feet (20 ft.).

27. The system of claim 25, wherein the protection area is no more than about 1000 sq. ft. and the maximum ceiling height is about ten feet, the plurality of nozzles being spaced about the occupancy at a nozzle to nozzle spacing ranging between about 6 ft x 6 ft. to about 16 ft. x 16 ft., the plurality of nozzles being coupled to the fluid supply so as to provide the fluid to the nozzles at an operating pressure in the range of about 140 psi. to about 250 psi.

28. The system of claim 25, wherein the maximum ceiling height is about 17 ft., the plurality of nozzles being spaced about the occupancy at a nozzle to nozzle spacing ranging between about 6 ft x 6 ft. to about 12 ft. x 12 ft., the plurality of nozzles being coupled to the fluid supply so as to provide the fluid to the nozzles at an operating pressure in the range of about 110 psi. to about 250 psi.

29. The system of claim 25, wherein the maximum ceiling height is about ten feet, the first plurality of nozzles having a maximum nozzle to nozzle spacing of about 16 ft. x 16 ft.

30. A mist system for fire protection of a light hazard only occupancy having a ceiling with a maximum ceiling height of about seventeen feet, the system comprising:

a fluid supply; and

a plurality of nozzles each having a K-factor of about 0.6 gpm/psi.$^{1/2}$ spaced about the occupancy and coupled to the fluid supply so as to provide fluid to the nozzles at an operating pressure ranging from about 110 psi. to about 250 psi., the plurality of nozzles being spaced at a nozzle-to-nozzle spacing ranging from a minimum of 6 ft. x 6ft. to a maximum of 12 ft. x 12 ft., the system having a hydraulic demand being a water duration of sixty minutes to a hydraulic design area of no more than 1500 sq. ft.

31. A mist device for the protection of at least one of a light hazard occupancy only and a light and ordinary hazard occupancy having a ceiling with a maximum ceiling height of at least 8 ft., the device comprising:

a body having an upper portion and a lower portion, the upper portion defining an internal passage having an inlet and an outlet for the discharge of a fluid, the upper and lower portions being axially spaced and aligned along a device axis;

an orifice insert disposed within the passageway distally of the inlet to define a K-factor of the device being less than 1 gpm/ $psi^{1/2}$.;

a pair of frame arms extending between the upper and lower body portion and centered about the device axis;

a seal assembly disposed in the outlet including a thermally sensitive element to support the seal assembly; and

means for diffusing the fluid at a flux density of less than 0.1 gpm/sq. ft. for a fluid pressure at the inlet of less than 500 psi. to define a coverage area of the device of over than 132 sq. ft. when disposed beneath the ceiling.

32. The device of claim 31, wherein said means provides for the flux density to be less than 0.05 gpm/sq. ft. to define the coverage area as being 256 sq. ft., wherein when the fluid pressure is less than 175 psi. and the device is disposed beneath the maximum ceiling height of about 8 ft.

33. The device of claim 32, wherein the flux density is 0.037 gpm/sq. ft. and the pressure is at a minimum 140 psi.

34. The device of claim 31, wherein a K-factor is 0.81 gpm/$psi.^{1/2}$.

35. The device of claim 31, wherein said means provides for the flux density to be less than 0.05 gpm/sq. ft. to defines the coverage area as being 144 sq. ft., wherein when the fluid pressure is less than 175 psi. and the device is disposed beneath the maximum ceiling height of about16 ft.-5 in.

36. The device of claim 35, wherein the flux density is 0.043 gpm/sq. ft. and the pressure is at a minimum 110 psi.

37. The device of claim 36, wherein the body defines a K-factor is 0.59 gpm/psi.$^{1/2}$.

38. A mist device for the protection of at least one of a light hazard occupancy and a light and ordinary hazard occupancy having a ceiling with a maximum ceiling height of about 10 ft., the device comprising:

a body having an upper portion and a lower portion, the upper portion defining an internal passage having an inlet and an outlet for the discharge of a fluid to define a K-factor of less than 1 gpm/ psi$^{1/2}$, the upper and lower portions being axially spaced and aligned along a device axis;

a pair of frame arms extending between the upper and lower body portion and centered about the device axis;

a seal assembly disposed in the outlet including a thermally sensitive element to support the seal assembly;

a diffuser assembly including:

a load screw engaged with the lower body portion; and

a diffuser element disposed atop the load screw so as to be located between the upper and lower portions of the body internally of the frame arms centrally aligned along the device axis, the diffuser element including:

an upper surface and a lower surface, the upper surface including a central cone portion extending proximally toward the outlet of the passageway; and

a plurality of through holes.

39. The device of claim 38, wherein each through hole being defined by a pair of circles partially overlapping one another, the pair of circles having different diameters so as to form a key-hole shaped through hole.

40. The device of claim 38, wherein the plurality of through holes include a first pair of diametrically opposed through holes, a second pair of diametrically opposed through holes disposed perpendicular to the first pair.

41. The device of claim 40, wherein each of the first and second pair of through holes are disposed at a forty-five degree angle relative to the pair of frame arms.

42. The device of claim 41, further comprising a plurality of touchdown regions, each touchdown region surrounding a through hole.

43. The device of claim 42, further comprising a plurality of channels formed along the upper surface and radially disposed about the cone so as to define converging adjacent channels and adjacent diverging channels, the adjacent converging channels having an overlapping portion such that the adjacent converging channels are in communication with one another, a through hole and touchdown being centered between adjacent diverging channels.

44. The device of claim 42, wherein the diffuser assembly defines a maximum coverage area of 256 square feet for a maximum ceiling height of about 9 ft. – 10 in.

45. The device of claim 38, further including an orifice insert disposed within the passageway distally of the inlet to define the K-factor, the K-factor ranging between 0.7 to about 0.9 gpm/psi^{½}.

46. The device of claim 45, wherein the K-factor is 0.81 gpm/psi$^{1/2}$.

47. A mist device for the protection of at least one of a light hazard occupancy and a light and ordinary hazard occupancy, the device comprising:

a body having an upper portion and a lower portion, the upper portion defining an internal passage having an inlet and an outlet for the discharge of a fluid to define a K-factor of less than 1 gpm/ psi$^{1/2}$., the upper and lower portions being axially spaced and aligned along a device axis;

a pair of frame arms extending between the upper and lower body portion and centered about the device axis;

a seal assembly disposed in the outlet including a thermally sensitive element to support the seal assembly; and

a diffuser element, the diffuser element being disposed about a distal end of the lower portion of the body externally of the frame arms centrally aligned along the device axis, the diffusing element including:

an upper surface and a lower surface spaced from and extending substantially parallel to the upper surface, the upper surface defining a central region and an outer region each disposed substantially perpendicular to the device axis, the upper surface further defining an intermediate region extending at an angle to each of the central and peripheral regions to space the central and peripheral regions axially apart, the upper surface extending about the device axis so as to define a truncated cone about the device axis; and

at least one of a plurality of slots and a plurality of through holes extending from the upper surface to the lower surface, each of the plurality of slots having a slot opening along

the outer region and extending radially inward toward the device axis to define a slot length, an initial portion, an intermediate portion and a terminal portion, each of the plurality slots defining slot widths from the initial to the terminal portion.

48. The device of claim 47, wherein the diffuser element defines a maximum coverage area of the device of over 144 sq. ft. for a maximum ceiling height of about 17 ft.

49. The device of claim 47, wherein the plurality of slots include a first group of slots and at least a second group of slots, the slot width of the first group of slots varying along the slot length, the slot width of the second group of slots being constant along the slot lengths;

50. The device of claim 49, wherein the first group of slots includes radiused portions in the terminal portion the slot, the radiused portions being spaced apart such that the slot width of the terminal portion is wider than the slot width in the initial and intermediate portions, the first group of slots being radially disposed about the device axis, the first group of slots including a first type of slot, a second type of slot, and a third type of slot, the first type of slots being centered along a first axis aligned with the frame arms and centered along a second axis perpendicular to the first axis, the second type of slots having a slot width wider at the terminal portion that is wider than the slot width of the terminal portion of the first type of slot, the second type of slot being centered along a third axis disposed at a 45 degree angle between the first and second axes, the third type of slots having a slot width at the terminal portion that is smaller than the slot width of the terminal portion of the first type of slot, the third type of slot being disposed between the second type of slot and the first type of slot disposed along the first axis, a slot of the second group being disposed between the second type of slot and the first type of slot disposed along the second axis.

51. The device of claim 50, wherein the diffuser element the plurality of slots includes a third group of slots having an initial portion in communication with a first type of slot disposed along the first axis, the slot width of the third type of slots widening from the initial portion to the terminal portion of the slots.

52. The device of claim 51, wherein the third group of slots are aligned with the pair frame arms such that the second type of slots are disposed at a forty-five degree angle relative to the pair of frame arms.

53. The device of claim 47, wherein each of the plurality of through holes is elongated to define a major axis and a minor axis, each of the through holes including a pair of radiused end portions having centers of curvature spaced along a major axis, the plurality of through holes including a first group of through holes and at least a second group of through holes, the pair of radiused end portions of the first group of through holes having equal radii, the pair of radiused end portions of the second group of through holes having varying radii.

54. The device of claim 47, wherein the central region has a central bore for engaging the lower portion of the body.

55. The device of claim 47, further including an orifice insert disposed within the passageway distally of the inlet to define the K-factor, the K-factor ranging between 0.5 to about 0.7 gpm/psi^{½}.

56. The device of claim 55, wherein the K-factor is 0.59 gpm/psi^{½}.

57. A mist device comprising:

a body having an upper portion and a lower portion, the upper portion defining an internal passage having an inlet and an outlet for the discharge of a fluid to define a K-factor of less than 1 gpm/psi$^{1/2}$, the upper and lower portions being axially spaced and aligned along a device axis;

a pair of frame arms extending between the upper and lower body portion and centered about the device axis;

a seal assembly disposed in the outlet including a thermally sensitive element to support the seal assembly;

a diffuser element axially spaced from the outlet to define a coverage area of the device of maximum of 256 sq. ft. at a maximum ceiling height of about ten feet for an operating fluid pressure at the inlet ranging between 140 psi. to 250 psi.

58. The device of claims 38-46 and 57, wherein when the device is installed 78 inches above a collection area to determine a spray pattern distribution for the device given a fluid test pressure at the inlet of the device to generate a volume of flow from the device, the collection area having three zones: zone one, zone two and zone three, zone one being defined by a sixty degree span about a first plane intersecting the device axis and perpendicular to a second plane intersecting the device axis, the pair of frame arms being disposed in the second plane, zone three being defined by a sixty degree span centered about the second plane, and the zone two being defined by a thirty degree span about a third plane intersecting the device axis and disposed between the first and second planes and extending forty-five degrees relative to each of the first and second planes, the spray pattern of the device providing:

(i) wherein the test pressure is 100 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having a two foot radial width with its outer edge located six feet (6 ft.) about the device axis with over 58% of the total volume being distributed in a region eight to twenty feet about the device axis;

(ii) wherein the test pressure is 175 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having a two foot radial width with its outer edge located six feet (6 ft.) about the device axis with over 50% of the total volume being distributed in a region eight to twenty feet about the device axis; and

(iii) wherein the test pressure is 245 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having a two foot radial width with its outer edge located six feet (6 ft.) about the device axis with over 33% of the total volume being distributed in a region eight to twenty feet about the device axis.

59. The device of claim 58, wherein the test pressure is 100 psi., the distribution pattern provides:

(i) within zone 1 the highest percentage of the flow volume in a first region 8 ft. to 10 ft. about the device axis and about 13% of the total flow being distributed over a second region eight to twenty feet about the device axis;

(ii) within zone 2 the highest percentage of the flow volume in a first region 6 ft. to 8 ft. about the device axis and about 45% of the total flow being distributed over a second region six to twenty feet about the device axis;

(iii) within zone 3 the highest percentage of the flow volume in a first region 8 ft. to 10 ft. about the device axis and about 12% of the total flow being distributed over a second region eight to twenty feet about the device axis.

60. The device of claim 59, wherein the first region of zone 2 a flow volume of 0.9 gpm of water is collected six to eight feet about the device axis.

61. The device of claim 58, wherein the test pressure is 175 psi., the distribution pattern provides:

(i) within zone 1 the highest percentage of the flow volume in a first region 8 ft. to 10 ft. about the device axis and about 15% of the total flow being distributed over a second region eight to twenty feet about the device axis;

(ii) within zone 2 the highest percentage of the flow volume in a first region 6 ft. to 8 ft. about the device axis and about 44% of the total flow being distributed over a second region six to twenty feet about the device axis;

(iii) within zone 3 the highest percentage of the flow volume in a first region 4 ft. to 6 ft. about the device axis and about 13% of the total flow being distributed over a second region eight to twenty feet about the device axis.

62. The device of claim 61, wherein the first region of zone 2 a flow volume of 1.1 gpm of water is collected six to eight feet about the device axis.

63. The device of claim 58, wherein the test pressure is 245 psi., the distribution pattern provides:

(i) within zone 1 the highest percentage of the flow volume in a first region 8 ft. to 10 ft. about the device axis and about 15% of the total flow being distributed over a second region eight to twenty feet about the device axis;

(ii) within zone 2 the highest percentage of the flow volume in a first region 6 ft. to 8 ft. about the device axis and about 44% of the total flow being distributed over a second region six to twenty feet about the device axis;

(iii) within zone 3 the highest percentage of the flow volume in a first region 4 ft. to 6 ft. about the device axis and about 13% of the total flow being distributed over a second region eight to twenty feet about the device axis.

64. The device of claim 63, wherein the first region of zone 2 a flow volume of 0.8 gpm of water is collected six to eight feet about the device axis.

65. The device of claim 57, wherein the device when installed in a small compartment test under FM 5560:

(i) maintains the temperature at the ceiling beneath 315C;

(ii) maintains greater than 60% of the mattress in the ignition bunk;

(iii) do not operate nozzles installed in the hallway of the compartment.

66. The device of claim 57, wherein the device when installed in a large fire compartment test FM 5560:

(i) maintains the temperature at the ceiling directly above the ignition beneath 315 C;

(ii) do not operate nozzles installed in the doorway of the compartment.

67. A mist device comprising:

a body having an upper portion and a lower portion, the upper portion defining an internal passage having an inlet and an outlet for the discharge of a fluid to define a K-factor of less than 1 gpm/ $psi^{1/2}$, the upper and lower portions being axially spaced and aligned along a device axis;

a pair of frame arms extending between the upper and lower body portion and centered about the device axis;

a seal assembly disposed in the outlet including a thermally sensitive element to support the seal assembly; and

a diffuser element disposed axially from the outlet of the body to define a maximum coverage area of the device of 144 sq. ft. at maximum ceiling height of about 17 ft. for an operating fluid pressure at the inlet ranging between 110 psi. to 250 psi.

68. The device of claims 47-56 and 67, wherein when the device is installed 78 inches above a collection area to determine a spray pattern distribution for the device given a fluid test pressure at the inlet of the device to generate a volume of flow from the device, the collection area having three zones: zone one, zone two and zone three, zone one being defined by a sixty degree span about a first plane intersecting the device axis and perpendicular to a second plane intersecting the device axis, the pair of frame arms being disposed in the second plane, zone three being defined by a sixty degree span centered about the second plane, and zone two being defined by a thirty degree span about a third plane intersecting the device axis and disposed between the first and second planes and extending forty-five degrees relative to each of the first and second planes, the spray pattern of the device providing:

(i) wherein the test pressure is 100 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having an inner edge and outer edge with a one foot radial distance between the inner and outer edge, the outer edge located fourteen feet (14 ft.) about the device axis with over 45% of the total volume being distributed in a region twelve to twenty feet about the device axis;

(ii) wherein the test pressure is 175 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having an inner edge and outer edge with a one foot radial distance between the inner and outer edge, the outer edge located eight feet (8 ft.) about the device axis with over 63% of the total volume being distributed in a region eight to twenty feet about the device axis; and

(iii) wherein the test pressure is 245 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having an inner edge and outer edge with a one foot radial distance between the inner and outer edge, the outer edge located sixteen feet (16 ft.) about the device axis with over 33% of the total volume being distributed in a region eight to twenty feet about the device axis.

69. The device of claim 68, wherein the test pressure is 100 psi., the distribution pattern provides:

(i) within zone 1 the highest percentage of the flow volume in a first region 12 ft. to 14 ft. centered the device axis and about 15% of the total flow being distributed over a second region eight to twenty feet about the device axis;

(ii) within zone 2 the highest percentage of the flow volume in a first region 14 ft. to 18 ft. about the device axis and about 25% of the total flow being distributed over a second region fourteen to twenty feet about the device axis;

(iii) within zone 3 the highest percentage of the flow volume in a first region 8 ft. to 10 ft. about the device axis and about 10% of the total flow being distributed over a second region eight to twenty feet about the device axis.

70. The device of claim 69, wherein the first region of zone 2 a flow volume of 0.4 gpm of water is collected sixteen to twenty feet about the device axis.

71. The device of claim 68, wherein the test pressure is 175 psi., the distribution pattern provides:

(i) within zone 1 the highest percentage of the flow volume in a first region 8 ft. to 10 ft. about the device axis and about 15% of the total flow being distributed over a second region eight to twenty feet about the device axis;

(ii) within zone 2 the highest percentage of the flow volume in a first region 12 ft. to 14 ft. about the device axis and about 18 % of the total flow being distributed over a second region twelve to twenty feet about the device axis;

(iii) within zone 3 the highest percentage of the flow volume in a first region 6 ft. to 8 ft. about the device axis and about 11% of the total flow being distributed over a second region six to twenty feet about the device axis.

72. The device of claim 71, wherein the first region of zone 2 a flow volume of 0.5 gpm of water is collected twelve to fourteen feet about the device axis.

73. The device of claim 68, wherein the test pressure is 245 psi., the distribution pattern provides:

(i) within zone 1 the highest percentage of the flow volume in a first region 12 ft. to 14 ft. about the device axis and about 15% of the total flow being distributed over a second region twelve to twenty feet about the device axis;

(ii) within zone 2 the highest percentage of the flow volume in a first region 14 ft. to 16 ft. about the device axis and about 44% of the total flow being distributed over a second region fourteen to twenty feet about the device axis; and

(iii) within zone 3 the highest percentage of the flow volume in a first region 14 ft. to 16 ft. about the device axis and about 23% of the total flow being distributed over a second region eight to twenty feet about the device axis.

74. The device of claim 73, wherein the first region of zone 2 a flow volume of 0.8 gpm of water is collected sixteen to eighteen feet about the device axis.

75. The device of claim 67, wherein the device when installed an open space fire test under FM 5560:

(i) maintain temperatures directly over ignition, at the ceiling, below 315C;

(ii) maintain greater than 50% of mattress commodity; and

(iii) do not operate more than five nozzles.

76. The device of claim 67, wherein the device when installed in a large fire compartment test under FM 5560:

(i) maintains the temperature at the ceiling directly above the ignition beneath 315 C;

(ii) do not operate nozzles installed in the doorway of the compartment.

WHAT WE CLAIM IS:

1. A mist system for fire protection of a light and ordinary hazard occupancy, the system comprising:

a fluid supply; and

a plurality of nozzles spaced about the occupancy and coupled to the fluid supply so as to provide fluid to the nozzles at an operating pressure of less than about 500 pounds per square inch (psi) and define a hydraulic demand being the greater of: (i) five hydraulically remote nozzles each having a coverage area ranging from 36 sq. ft. to a maximum of about 256 sq. ft; or (ii) a hydraulic design area ranging from about 900 square feet to about 1044 square feet, wherein the plurality of nozzles include at least one of:

(a) a first mist device comprising: a body having an upper portion and a lower portion, the upper portion defining an internal passage having an inlet and an outlet for the discharge of a fluid to define a K-factor of less than 1 gpm/ $psi^{1/2}$, the upper and lower portions being axially spaced and aligned along a device axis; a pair of frame arms extending between the upper and lower body portion and centered about the device axis; a seal assembly disposed in the outlet including a thermally sensitive element to support the seal assembly; a diffuser assembly including: a load screw engaged with the lower body portion; and a diffuser element disposed atop the load screw so as to be located between the upper and lower portions of the body internally of the frame arms centrally aligned along the device axis, the diffuser element including: an upper surface and a lower surface, the upper surface including a central cone portion extending proximally toward the outlet of the passageway; and a plurality of through holes, wherein each through hole being defined by a pair of circles partially overlapping one

another, the pair of circles having different diameters so as to form a key-hole shaped through hole;

(b) a second mist device comprising: a body having an upper portion and a lower portion, the upper portion defining an internal passage having an inlet and an outlet for the discharge of a fluid to define a K-factor of less than 1 gpm/ $psi^{1/2}$., the upper and lower portions being axially spaced and aligned along a device axis; a pair of frame arms extending between the upper and lower body portion and centered about the device axis; a seal assembly disposed in the outlet including a thermally sensitive element to support the seal assembly; and a diffuser element, the diffuser element being disposed about a distal end of the lower portion of the body externally of the frame arms centrally aligned along the device axis, the diffusing element including: an upper surface and a lower surface spaced from and extending substantially parallel to the upper surface, the upper surface defining a central region and an outer region each disposed substantially perpendicular to the device axis, the upper surface further defining an intermediate region extending at an angle to each of the central and peripheral regions to space the central and peripheral regions axially apart, the upper surface extending about the device axis so as to define a truncated cone about the device axis; and at least one of a plurality of slots and a plurality of through holes extending from the upper surface to the lower surface, each of the plurality of slots having a slot opening along the outer region and extending radially inward toward the device axis to define a slot length, an initial portion, an intermediate portion and a terminal portion, each of the plurality slots defining slot widths from the initial to the terminal portion, wherein the plurality of slots include a first group of slots and at least a second group of slots, the slot width of the first group of slots varying along the slot length, the slot width of the second group of slots being constant along the slot lengths, the first group of slots includes

radiused portions in the terminal portion the slot, the radiused portions being spaced apart such that the slot width of the terminal portion is wider than the slot width in the initial and intermediate portions, the first group of slots being radially disposed about the device axis, the first group of slots including a first type of slot, a second type of slot, and a third type of slot, the first type of slots being centered along a first axis aligned with the frame arms and centered along a second axis perpendicular to the first axis, the second type of slots having a slot width wider at the terminal portion that is wider than the slot width of the terminal portion of the first type of slot, the second type of slot being centered along a third axis disposed at a 45 degree angle between the first and second axes, the third type of slots having a slot width at the terminal portion that is smaller than the slot width of the terminal portion of the first type of slot, the third type of slot being disposed between the second type of slot and the first type of slot disposed along the first axis, a slot of the second group being disposed between the second type of slot and the first type of slot disposed along the second axis;

(c) a third mist device comprising: a body having an upper portion and a lower portion, the upper portion defining an internal passage having an inlet and an outlet for the discharge of a fluid to define a K-factor of less than 1 gpm/psi^{½}, the upper and lower portions being axially spaced and aligned along a device axis; a pair of frame arms extending between the upper and lower body portion and centered about the device axis; a seal assembly disposed in the outlet including a thermally sensitive element to support the seal assembly; a diffuser element axially spaced from the outlet to define a coverage area of the device of maximum of 256 sq. ft. at a maximum ceiling height of about ten feet for an operating fluid pressure at the inlet ranging between 140 psi. to 250 psi., wherein when the device is installed 78 inches above a collection area to determine a spray pattern distribution for the device given a fluid test pressure at the inlet

of the device to generate a volume of flow from the device, the collection area having three zones: zone one, zone two and zone three, zone one being defined by a sixty degree span about a first plane intersecting the device axis and perpendicular to a second plane intersecting the device axis, the pair of frame arms being disposed in the second plane, zone three being defined by a sixty degree span centered about the second plane, and the zone two being defined by a thirty degree span about a third plane intersecting the device axis and disposed between the first and second planes and extending forty-five degrees relative to each of the first and second planes, the spray pattern of the device providing: (i) wherein the test pressure is 100 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having a two foot radial width with its outer edge located six feet (6 ft.) about the device axis with over 58% of the total volume being distributed in a region eight to twenty feet about the device axis; (ii) wherein the test pressure is 175 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having a two foot radial width with its outer edge located six feet (6 ft.) about the device axis with over 50% of the total volume being distributed in a region eight to twenty feet about the device axis; and (iii) wherein the test pressure is 245 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having a two foot radial width with its outer edge located six feet (6 ft.) about the device axis with over 33% of the total volume being distributed in a region eight to twenty feet about the device axis; and

(d) a fourth mist device comprising: a body having an upper portion and a lower portion, the upper portion defining an internal passage having an inlet and an outlet for the discharge of a fluid to define a K-factor of less than 1 gpm/ psi½, the upper and lower portions

being axially spaced and aligned along a device axis; a pair of frame arms extending between the upper and lower body portion and centered about the device axis; a seal assembly disposed in the outlet including a thermally sensitive element to support the seal assembly; and a diffuser element disposed axially from the outlet of the body to define a maximum coverage area of the device of 144 sq. ft. at maximum ceiling height of about 17 ft. for an operating fluid pressure at the inlet ranging between 110 psi. to 250 psi., wherein when the device is installed 78 inches above a collection area to determine a spray pattern distribution for the device given a fluid test pressure at the inlet of the device to generate a volume of flow from the device, the collection area having three zones: zone one, zone two and zone three, zone one being defined by a sixty degree span about a first plane intersecting the device axis and perpendicular to a second plane intersecting the device axis, the pair of frame arms being disposed in the second plane, zone three being defined by a sixty degree span centered about the second plane, and zone two being defined by a thirty degree span about a third plane intersecting the device axis and disposed between the first and second planes and extending forty-five degrees relative to each of the first and second planes, the spray pattern of the device providing: (i) wherein the test pressure is 100 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having an inner edge and outer edge with a one foot radial distance between the inner and outer edge, the outer edge located fourteen feet (14 ft.) about the device axis with over 45% of the total volume being distributed in a region twelve to twenty feet about the device axis; (ii) wherein the test pressure is 175 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having an inner edge and outer edge with a one foot radial distance between the inner and outer edge, the outer edge located eight feet (8 ft.) about the device axis with over 63% of the total

volume being distributed in a region eight to twenty feet about the device axis; and (iii) wherein the test pressure is 245 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having an inner edge and outer edge with a one foot radial distance between the inner and outer edge, the outer edge located sixteen feet (16 ft.) about the device axis with over 33% of the total volume being distributed in a region eight to twenty feet about the device axis.

2. The system of claim 1, wherein the operating pressure ranges from about 140 psi. to about 250 psi. to provide an effective flux density of at least 0.037 gpm/sq. ft. for the coverage area.

3. The system of claim 1, wherein each of the plurality of nozzles have a K-factor of one of 0.59 gpm/psi^{½} and 0.81 gpm/psi^{½}.

4. The system of any one of the above claims, wherein the plurality of nozzles are installed beneath a ceiling having a maximum slope of one foot of rise for each twelve feet of run.

5. The mist system of claim 1, wherein the occupancy defines a protection area being at least one of: (i) greater than 1024 sq. ft and (ii) beneath a ceiling having a maximum ceiling height of about 13 ft.,

the plurality of nozzles including:

a first plurality of nozzles spaced about the occupancy to protect no more than 30% of the protection area at a nozzle to nozzle spacing ranging between about 6 ft x 6 ft. to about 12 ft. x 12 ft. with an operating pressure in the range of about 102 psi. to about 250 psi.; and

a second plurality of nozzles spaced about the occupancy for the protection of a remainder of the protection area at a nozzle to nozzle spacing ranging between about 6 ft x 6 ft. to about 16 ft. x 16 ft. with an operating pressure in the range of about 110 psi. to about 250 psi.

6. The mist system of claim 1, wherein the occupancy defines a protection area of greater than 1024 sq. ft., the system

including:

a plurality of sprinklers spaced about the occupancy to protect no more than 30% of the protection area at a sprinkler to sprinkler spacing ranging between about 6 ft x 6 ft. to about 15 ft. x 15 ft., the plurality of sprinklers being coupled to the fluid supply so as to define a hydraulic demand of the system being the greater of the five most remote sprinkler or a design area ranging between 900 sq. ft. to 1500 sq. ft., each of the plurality of sprinklers having a maximum operating pressure of 175 psi.,

wherein the plurality of nozzles are spaced about the occupancy for the protection of a remainder of the protection area at a nozzle to nozzle spacing ranging between about 6 ft x 6 ft. to about 16 ft. x 16 ft. with an operating pressure in the range of about 110 psi. to about 250 psi.

7. The mist system of claim 1, wherein the plurality of nozzles each having a K-factor of about 0.6 gpm/psi.$^{1/2}$ are spaced about the occupancy and coupled to the fluid supply so as to provide fluid to the nozzles at an operating pressure ranging from about 110 psi. to about 250 psi., the plurality of nozzles being spaced at a nozzle-to-nozzle spacing ranging from a minimum of 6 ft. x 6ft. to a maximum of 12 ft. x 12 ft., the system having a hydraulic demand being a

water duration of sixty minutes to a hydraulic design area of no more than 1500 sq. ft. for fire protection of a light hazard only occupancy having a ceiling with a maximum ceiling height of about seventeen feet.

8. A mist device comprising:

a body having an upper portion and a lower portion, the upper portion defining an internal passage having an inlet and an outlet for the discharge of a fluid to define a K-factor of less than 1 gpm/ $psi^{1/2}$, the upper and lower portions being axially spaced and aligned along a device axis;

a pair of frame arms extending between the upper and lower body portion and centered about the device axis;

a seal assembly disposed in the outlet including a thermally sensitive element to support the seal assembly;

a diffuser assembly including:

a load screw engaged with the lower body portion; and

a diffuser element disposed atop the load screw so as to be located between the upper and lower portions of the body internally of the frame arms centrally aligned along the device axis, the diffuser element including:

an upper surface and a lower surface, the upper surface including a central cone portion extending proximally toward the outlet of the passageway; and

a plurality of through holes,

wherein each through hole being defined by a pair of circles partially overlapping one another, the pair of circles having different diameters so as to form a key-hole shaped through hole.

9. The device of claim 8, further comprising a plurality of touchdown regions, each touchdown region surrounding a through hole a plurality of channels formed along the upper surface and radially disposed about the cone so as to define converging adjacent channels and adjacent diverging channels, the adjacent converging channels having an overlapping portion such that the adjacent converging channels are in communication with one another, a through hole and touchdown being centered between adjacent diverging channels, wherein the plurality of through holes include a first pair of diametrically opposed through holes, a second pair of diametrically opposed through holes disposed perpendicular to the first pair and a plurality of touchdown regions, each touchdown region surrounding a through hole.

10. A mist device comprising:

a body having an upper portion and a lower portion, the upper portion defining an internal passage having an inlet and an outlet for the discharge of a fluid to define a K-factor of less than 1 gpm/ $psi^{1/2}$., the upper and lower portions being axially spaced and aligned along a device axis;

a pair of frame arms extending between the upper and lower body portion and centered about the device axis;

a seal assembly disposed in the outlet including a thermally sensitive element to support the seal assembly; and

a diffuser element, the diffuser element being disposed about a distal end of the lower portion of the body externally of the frame arms centrally aligned along the device axis, the diffusing element including:

an upper surface and a lower surface spaced from and extending substantially parallel to the upper surface, the upper surface defining a central region and an outer region each disposed substantially perpendicular to the device axis, the upper surface further defining an intermediate region extending at an angle to each of the central and peripheral regions to space the central and peripheral regions axially apart, the upper surface extending about the device axis so as to define a truncated cone about the device axis; and

at least one of a plurality of slots and a plurality of through holes extending from the upper surface to the lower surface, each of the plurality of slots having a slot opening along the outer region and extending radially inward toward the device axis to define a slot length, an initial portion, an intermediate portion and a terminal portion, each of the plurality slots defining slot widths from the initial to the terminal portion,

wherein the plurality of slots include a first group of slots and at least a second group of slots, the slot width of the first group of slots varying along the slot length, the slot width of the second group of slots being constant along the slot lengths, the first group of slots includes radiused portions in the terminal portion the slot, the radiused portions being spaced apart such that the slot width of the terminal portion is wider than the slot width in the initial and intermediate portions, the first group of slots being radially disposed about the device axis, the first group of slots including a first type of slot, a second type of slot, and a third type of slot, the first type of slots being centered along a first axis aligned with the frame arms and centered

along a second axis perpendicular to the first axis, the second type of slots having a slot width wider at the terminal portion that is wider than the slot width of the terminal portion of the first type of slot, the second type of slot being centered along a third axis disposed at a 45 degree angle between the first and second axes, the third type of slots having a slot width at the terminal portion that is smaller than the slot width of the terminal portion of the first type of slot, the third type of slot being disposed between the second type of slot and the first type of slot disposed along the first axis, a slot of the second group being disposed between the second type of slot and the first type of slot disposed along the second axis.

11. The device of claim 10, wherein each of the plurality of through holes is elongated to define a major axis and a minor axis, each of the through holes including a pair of radiused end portions having centers of curvature spaced along a major axis, the plurality of through holes including a first group of through holes and at least a second group of through holes, the pair of radiused end portions of the first group of through holes having equal radii, the pair of radiused end portions of the second group of through holes having varying radii.

12. A mist device comprising:

a body having an upper portion and a lower portion, the upper portion defining an internal passage having an inlet and an outlet for the discharge of a fluid to define a K-factor of less than 1 gpm/psi$^{1/2}$, the upper and lower portions being axially spaced and aligned along a device axis;

a pair of frame arms extending between the upper and lower body portion and centered about the device axis;

a seal assembly disposed in the outlet including a thermally sensitive element to support the seal assembly;

a diffuser element axially spaced from the outlet to define a coverage area of the device of maximum of 256 sq. ft. at a maximum ceiling height of about ten feet for an operating fluid pressure at the inlet ranging between 140 psi. to 250 psi. wherein when the device is installed 78 inches above a collection area to determine a spray pattern distribution for the device given a fluid test pressure at the inlet of the device to generate a volume of flow from the device, the collection area having three zones: zone one, zone two and zone three, zone one being defined by a sixty degree span about a first plane intersecting the device axis and perpendicular to a second plane intersecting the device axis, the pair of frame arms being disposed in the second plane, zone three being defined by a sixty degree span centered about the second plane, and the zone two being defined by a thirty degree span about a third plane intersecting the device axis and disposed between the first and second planes and extending forty-five degrees relative to each of the first and second planes, the spray pattern of the device providing:

(i) wherein the test pressure is 100 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having a two foot radial width with its outer edge located six feet (6 ft.) about the device axis with over 58% of the total volume being distributed in a region eight to twenty feet about the device axis;

(ii) wherein the test pressure is 175 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having a two foot radial width with its outer edge located six feet (6 ft.) about the device axis with over 50% of the total volume being distributed in a region eight to twenty feet about the device axis; and

(iii) wherein the test pressure is 245 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having a two foot radial width with its outer edge located six feet (6 ft.) about the device axis with over 33% of the total volume being distributed in a region eight to twenty feet about the device axis.

13. The device of claim 12, wherein the test pressure is one of

(a) 100 psi., the distribution pattern provides:

(i) within zone one the highest percentage of the flow volume in a first region 8 ft. to 10 ft. about the device axis and about 13% of the total flow being distributed over a second region eight to twenty feet about the device axis;

(ii) within zone two the highest percentage of the flow volume in a first region 6 ft. to 8 ft. about the device axis and about 45% of the total flow being distributed over a second region six to twenty feet about the device axis;

(iii) within zone three the highest percentage of the flow volume in a first region 8 ft. to 10 ft. about the device axis and about 12% of the total flow being distributed over a second region eight to twenty feet about the device axis;

(b) 175 psi., the distribution pattern provides:

(i) within zone one the highest percentage of the flow volume in a first region 8 ft. to 10 ft. about the device axis and about 15% of the total flow being distributed over a second region eight to twenty feet about the device axis;

(ii) within zone two the highest percentage of the flow volume in a first region 6 ft. to 8 ft. about the device axis and about 44% of the total flow being distributed over a second region six to twenty feet about the device axis;

(iii) within zone three the highest percentage of the flow volume in a first region 4 ft. to 6 ft. about the device axis and about 13% of the total flow being distributed over a second region eight to twenty feet about the device axis; and

(c) 245 psi., the distribution pattern provides:

(i) within zone one the highest percentage of the flow volume in a first region 8 ft. to 10 ft. about the device axis and about 15% of the total flow being distributed over a second region eight to twenty feet about the device axis;

(ii) within zone two the highest percentage of the flow volume in a first region 6 ft. to 8 ft. about the device axis and about 44% of the total flow being distributed over a second region six to twenty feet about the device axis;

(iii) within zone three the highest percentage of the flow volume in a first region 4 ft. to 6 ft. about the device axis and about 13% of the total flow being distributed over a second region eight to twenty feet about the device axis.

14. A mist device comprising:

a body having an upper portion and a lower portion, the upper portion defining an internal passage having an inlet and an outlet for the discharge of a fluid to define a K-factor of less than 1 gpm/ $psi^{½}$, the upper and lower portions being axially spaced and aligned along a device axis;

a pair of frame arms extending between the upper and lower body portion and centered about the device axis;

a seal assembly disposed in the outlet including a thermally sensitive element to support the seal assembly; and

a diffuser element disposed axially from the outlet of the body to define a maximum coverage area of the device of 144 sq. ft. at maximum ceiling height of about 17 ft. for an operating fluid pressure at the inlet ranging between 110 psi. to 250 psi., wherein when the device is installed 78 inches above a collection area to determine a spray pattern distribution for the device given a fluid test pressure at the inlet of the device to generate a volume of flow from the device, the collection area having three zones: zone one, zone two and zone three, zone one being defined by a sixty degree span about a first plane intersecting the device axis and perpendicular to a second plane intersecting the device axis, the pair of frame arms being disposed in the second plane, zone three being defined by a sixty degree span centered about the second plane, and zone two being defined by a thirty degree span about a third plane intersecting the device axis and disposed between the first and second planes and extending forty-five degrees relative to each of the first and second planes, the spray pattern of the device providing:

(i) wherein the test pressure is 100 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having an inner edge and outer edge with a one foot radial distance between the inner and outer edge, the outer edge located fourteen feet (14 ft.) about the device axis with over 45% of the total volume being distributed in a region twelve to twenty feet about the device axis;

(ii) wherein the test pressure is 175 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having an inner edge and outer edge with a one foot radial distance between the inner and outer edge, the outer edge located eight feet (8 ft.) about the device axis with over 63% of the total volume being distributed in a region eight to twenty feet about the device axis; and

(iii) wherein the test pressure is 245 psi., the distribution pattern including the highest percentage of the flow volume distributed in a ring centered about the device axis having an inner edge and outer edge with a one foot radial distance between the inner and outer edge, the outer edge located sixteen feet (16 ft.) about the device axis with over 33% of the total volume being distributed in a region eight to twenty feet about the device axis.

15. The device of claim 14, wherein the test pressure is one of

(a) 100 psi., the distribution pattern provides:

(i) within zone one the highest percentage of the flow volume in a first region 12 ft. to 14 ft. centered the device axis and about 15% of the total flow being distributed over a second region eight to twenty feet about the device axis;

(ii) within zone two the highest percentage of the flow volume in a first region 14 ft. to 18 ft. about the device axis and about 25% of the total flow being distributed over a second region fourteen to twenty feet about the device axis;

(iii) within zone three the highest percentage of the flow volume in a first region 8 ft. to 10 ft. about the device axis and about 10% of the total flow being distributed over a second region eight to twenty feet about the device axis;

(b) 175 psi., the distribution pattern provides:

(i) within zone one the highest percentage of the flow volume in a first region 8 ft. to 10 ft. about the device axis and about 15% of the total flow being distributed over a second region eight to twenty feet about the device axis;

(ii) within zone two the highest percentage of the flow volume in a first region 12 ft. to 14 ft. about the device axis and about 18 % of the total flow being distributed over a second region twelve to twenty feet about the device axis;

(iii) within zone three the highest percentage of the flow volume in a first region 6 ft. to 8 ft. about the device axis and about 11% of the total flow being distributed over a second region six to twenty feet about the device axis; and

(c) 245 psi., the distribution pattern provides:

(i) within zone one the highest percentage of the flow volume in a first region 12 ft. to 14 ft. about the device axis and about 15% of the total flow being distributed over a second region twelve to twenty feet about the device axis;

(ii) within zone two the highest percentage of the flow volume in a first region 14 ft. to 16 ft. about the device axis and about 44% of the total flow being distributed over a second region fourteen to twenty feet about the device axis; and

(iii) within zone three the highest percentage of the flow volume in a first region 14 ft. to 16 ft. about the device axis and about 23% of the total flow being distributed over a second region eight to twenty feet about the device axis.

16. The mist system of claim 1 substantially as herein described with reference to any embodiment disclosed.

17. The device of claims 8, 10, 12, or 14 substantially as herein described with reference to any embodiment disclosed.