WHAT IS CLAIMED IS:

1. An abrasive article comprising:

a substrate;

a tacking film overlying the substrate;

abrasive particles comprising a coating layer overlying the abrasive particles bonded to the tacking film, wherein a bond between the coating layer and the tacking film defines a metallic bonding region; and

a bonding layer overlying the abrasive particles and the tacking film.

2. An abrasive article comprising:

a substrate comprising an elongated body having an aspect ratio of length:width of at least about 10:1;

a tacking film overlying the substrate comprising a solder material having a melting point of not greater than about 450°C;

abrasive particles bonded to the tacking film; and

a bonding layer overlying the abrasive particles and tacking film.

3. An abrasive article for cutting a workpiece formed by a process comprising:

providing a wire substrate;

forming a tacking film comprising a metal material overlying a surface of the wire substrate;

placing abrasive particles in the tacking film;

treating the tacking film to form a metallic bonding region between the abrasive particles and the tacking film; and

forming a bonding layer over the tacking film and the abrasive particles.

4. An abrasive article for cutting a workpiece formed by a process comprising:

providing a wire substrate;

forming a tacking film comprising a metal material overlying a surface of the wire substrate;

applying a flux material to the tacking film, wherein the flux material comprises abrasive particles mixed therein;

treating the tacking film to form a metallic bonding region between the abrasive particles and the tacking film; and

forming a bonding layer over the tacking film and the abrasive particles.

5. The abrasive article of any of claims 1, 2, 3, or 4, wherein the substrate comprises an inorganic material.

6. The abrasive article of claim 5, wherein the substrate comprises a material selected from the group of materials consisting of metals, metal alloys, and a combination thereof.

7. The abrasive article of claim 6, wherein the substrate comprises a metal comprising a transition metal element.

8. The abrasive article of claim 7, wherein the substrate comprises steel.

9. The abrasive article of any of claims 1, 2, 3, or 4, wherein the substrate comprises an elongated member having an aspect ratio of length:width of at least about 10:1, at least about 100:1, or at least about 10000:1.

10. The abrasive article of any of claims 1, 2, 3, or 4, wherein the substrate comprises an average length of at least about 50 m.

11. The abrasive article of claim 12, wherein the substrate comprises an average length of at least about 100 m, at least about 500 m, or at least about 1000 m.

12. The abrasive article of any of claims 1, 2, 3, or 4, wherein the substrate comprises an average width of not greater than about 1 cm.

13. The abrasive article of claim 12, wherein the substrate comprises an average width of not greater than about 1 mm, not greater than about 0.8 mm, not greater than about 0.5 mm. at least about 0.03 mm, or at least about 0.01 mm.

14. The abrasive article of any of claims 1, 2, 3, or 4, wherein the substrate comprises a wire.

15. The abrasive article of any of claims 1, 2, 3, or 4, wherein the substrate comprises a plurality of filaments braided together.

16. The abrasive article of any of claims 1, 2, 3, or 4, wherein the tacking film is in direct contact with a surface of the substrate.

17. The abrasive article of claim 16, wherein the tacking film is bonded directly to a surface of the substrate.

18. The abrasive article of any of claims 1, 2, 3, or 4, wherein the tacking film overlies a majority of an external surface of the substrate.

19. The abrasive article of claim 18, wherein the tacking film overlies essentially the entire external surface of the substrate

20. The abrasive article of any of claims 1, 2, 3, or 4, wherein the tacking film comprises a material selected from the group of materials consisting of metal, metal alloys, metal matrix composites, and a combination thereof.

21. The abrasive article of any of claims 1, 2, 3, or 4, wherein the tacking film comprises a transition metal element.

22. The abrasive article of claim 21, wherein the tacking film comprises an alloy of transition metal elements.

23. The abrasive article of claim 21, wherein the tacking film comprises a metal selected from the group of metals consisting of lead, silver, copper, zinc, tin, titanium, molybdenum, chromium, iron, manganese, cobalt, niobium, tantalum, tungsten, palladium, platinum, gold, ruthenium, and a combination thereof.

24. The abrasive article of claim 21, wherein the tacking film comprises a metal alloy of tin and lead.

25. The abrasive article of claim 21, wherein the tacking film comprises tin.

26. The abrasive article of claim 25, wherein the tacking film consists essentially of tin.

27. The abrasive article of any of claims 1, 2, 3, or 4, wherein the tacking film comprises a solder material.

28. The abrasive article of any of claims 1, 2, 3, or 4, wherein the tacking film has a melting point of not greater than about 450°C.

29. The abrasive article of any of claims 1, 2, 3, or 4, wherein the tacking film has a melting point of not greater than about 400°C.

30. The abrasive article of claim 29, wherein the tacking film has a melting point of not greater than about 375°C, not greater than about 350°C, not greater than about 300°C, or not greater than about 250°C.

31. The abrasive article of claim 28, wherein the tacking film comprises a material having melting point of at least about 100°C, at least about 125°C, or at least about 150°C.

32. The abrasive article of any of claims 1, 2, 3, or 4, wherein the tacking film comprises an average thickness of not greater than about 80% of an average particle size of the abrasive particles.

33. The abrasive article of claim 32, wherein the average thickness of the tacking film is not greater than about 70% of an average particle size of the abrasive particles, not greater than about 60% of an average particle size of the abrasive particles, not greater than about 50% of an average particle size of the abrasive particles, not greater than about 40% of an average particle size of the abrasive particles, or not greater than about 30% of an average particle size of the abrasive particles.

34. The abrasive article of any of claims 1, 2, 3, or 4, wherein the abrasive particles comprise a material selected from the group of materials consisting of oxides, carbides, nitrides, borides, oxynitrides, oxyborides, diamond, and a combination thereof.

35. The abrasive article of any of claims 1, 2, 3, or 4, wherein the abrasive particles comprise a superabrasive material.

36. The abrasive article of any of claims 1, 2, 3, or 4, wherein the abrasive particles comprise diamond.

37. The abrasive article of claim 36, wherein the abrasive particles consist essentially of diamond.

38. The abrasive article of any of claims 1, 2, 3, or 4, wherein the abrasive particles comprise a Vickers hardness of at least about 10 GPa.

39. The abrasive article of any of claims 1, 2, 3, or 4, wherein the abrasive particles comprise an average particle size of not greater than about 500 microns.

40. The abrasive article of claim 39, wherein the abrasive particles comprise an average particle size of not greater than about 300 microns, not greater than about 250 microns, not greater than about 200 microns, not greater than about 150 microns, or not greater than about 100 microns.

41. The abrasive article of claim 39, wherein the abrasive particles comprise an average particle size of at least about 0.1 microns, at least about 0.5 microns, or at least about 1 micron.

42. The abrasive article of any of claims 1, 2, 3, or 4, wherein the coating layer comprises a material selected from the group of materials consisting of metals, metal alloys, and a combination thereof.

43. The abrasive article of claim 42, wherein the coating layer comprises a transition metal element.

44. The abrasive article of claim 43, wherein the coating layer comprises a metal selected from the group of metals consisting of titanium, vanadium, chromium, molybdenum, iron, cobalt, nickel, copper, silver, zinc, manganese, tantalum, tungsten, and a combination thereof.

45. The abrasive article of claim 44, wherein the coating layer comprises a majority content of nickel.

46. The abrasive article of claim 45, wherein the coating layer consists essentially of nickel.

47. The abrasive article of claim 42, wherein the coating layer overlies at least about 50% of the exterior surface area of the abrasive particle, at least about 75% of the exterior surface area of the abrasive particle, or at least about 90% of the exterior surface area of the abrasive particle.

48. The abrasive article of claim 47, wherein the coating layer overlies essentially the entire exterior surface area of the abrasive particle.

49. The abrasive article of any of claims 1, 2, 3, or 4, wherein the metallic bonding region comprise a diffusion bond region characterized by a region of interdiffusion between at least one chemical species of the coating layer and one chemical species of the tacking film.

50. The abrasive article of any of claims 1, 2, 3, or 4, wherein the bonding layer is bonded directly to a coating layer overlying the abrasive particles.

51. The abrasive article of any of claims 1, 2, 3, or 4, wherein the bonding layer is bonded directly to a portion of the tacking film.

52. The abrasive article of any of claims 1, 2, 3, or 4, wherein the bonding layer overlies at least about 90% of the surfaces of the abrasive particles and tacking film.

53. The abrasive article of claim 52, wherein the bonding layer overlies essentially all of the surfaces of the abrasive particles and tacking film.

54. The abrasive article of any of claims 1, 2, 3, or 4, wherein the bonding layer comprises a material selected from the group of materials consisting of metals, metal alloys, cermets, ceramics, composites, and a combination thereof.

55. The abrasive article of claim 54, wherein the bonding layer comprises a transition metal element.

56. The abrasive article of claim 55, wherein the bonding layer comprises an alloy of transition metal elements.

57. The abrasive article of claim 54, wherein the bonding layer comprises a metal selected from the group of metals consisting of lead, silver, copper, zinc, tin, titanium, molybdenum, chromium, iron, manganese, cobalt, niobium, tantalum, tungsten, palladium, platinum, gold, ruthenium, and a combination thereof.

58. The abrasive article of claim 54, wherein the bonding layer comprises nickel.

59. The abrasive article of claim 58, wherein the bonding layer consists essentially of nickel.

60. The abrasive article of any of claims 1, 2, 3, or 4, wherein the bonding layer comprises an average thickness of at least about 10% of an average particle size of the abrasive particles.

61. The abrasive article of claim 60, wherein the bonding layer comprises an average thickness of at least about 20% of the average particle size of the abrasive particles, at least about 30% of the average particle size of the abrasive particles, at least about 40% of the average particle size of the abrasive particles, or at least about 50% of the average particle size of the abrasive particles.

62. The abrasive article of claim 60, wherein the bonding layer comprises an average thickness of not greater than about 130% of the average particle size of the abrasive particles, not greater than about 110% of the average particle size of the abrasive particles, not greater than about 100% of the average particle size of the abrasive particles, not greater than about 95% of the average particle size of the abrasive particles, or not greater than about 90% of the average particle size of the abrasive particles.

63. The abrasive article of any of claims 1, 2, 3, or 4, wherein the bonding layer comprise an average thickness of at least about 2 microns.

64. The abrasive article of claim 63, wherein the bonding layer comprise an average thickness of at least about 5 microns, at least about 10 microns, at least about 15 microns, or at least about 20 microns.

65. The abrasive article of claim 63, wherein the bonding layer comprise an average thickness of not greater than about 100 microns, not greater than about 90 microns, not greater than about 80 microns, or not greater than about 70 microns.

66. The abrasive article of any of claims 1, 2, 3, or 4, further comprising an abrasive grain concentration of at least about 60 particles per mm of wire.

67. The abrasive article of claim 66, wherein the abrasive grain concentration is at least about 100 particles per mm of wire, at least about 150 particles per mm of wire, at least about 200 particles per mm of wire, at least about 250 particles per mm of wire, or at least about 300 particles per mm of wire.

68. The abrasive article of claim 66, wherein the abrasive grain concentration is not greater than about 750 particles per mm of wire, not greater than about 700 particles per mm of wire, not greater than about 650 particles per mm of wire, or not greater than about 600 particles per mm of wire.

69. The abrasive article of any of claims 1, 2, 3, or 4, further comprising an abrasive grain concentration of at least about 0.5 carats of diamond per meter of wire.

70. The abrasive article of claim 69, further comprising an abrasive grain concentration of at least about 1.0 carats of diamond per meter of wire, at least about 1.5 carats of diamond per meter of wire, at least about 2.0 carats of diamond per meter of wire, at least about 3.0 carats of diamond per meter of

wire, at least about 4.0 carats of diamond per meter of wire, or at least about 5.0 carats of diamond per meter of wire.

71. The abrasive article of claim 69, further comprising an abrasive grain concentration of not greater than about 15.0 carats of diamond per meter of wire, not greater than about 14.0 carats of diamond per meter of wire, not greater than about 13.0 carats of diamond per meter of wire, not greater than about 12.0 carats of diamond per meter of wire, not greater than about 11.0 carats of diamond per meter of wire, or not greater than about 10.0 carats of diamond per meter of wire.

72. A method of forming an abrasive article comprising:
providing a substrate;
forming a tacking film overlying a surface of the substrate, the tacking film comprising a solder material;
placing abrasive particles comprising a coating layer on the tacking film;
treating the tacking film to bind the coating layer and the tacking film to each other; and
forming a bonding layer over the tacking film and the abrasive particles.

73. A method of forming an abrasive article comprising:
providing a substrate comprising an elongated body having an aspect ratio of length:width of at least about 10:1;
forming a tacking film comprising a metal overlying a surface of the substrate, the tacking film having melting point of not greater than about 450°C;
placing abrasive particles in the tacking film; and
forming a bonding layer over the tacking film and the abrasive particles.

74. A method of forming an abrasive article comprising:
providing a substrate comprising a wire;
forming a tacking film comprising a metal material overlying a surface of the substrate;
placing abrasive particles in the tacking film;

treating the tacking film to form a metallic bonding region between the abrasive particles and the tacking film; and

forming a bonding layer over the tacking film and the abrasive particles.

75. The method of any of claims 72, 73, or 74, wherein providing a substrate comprises providing a wire connected to a feed spool and a receiving spool.

76. The method of claim 75, wherein providing a substrate comprises spooling the wire at a rate of not less than about 5 m/min from the feed spool to the receiving spool.

77. The method of any of claims 72, 73, or 74, wherein the substrate comprises an elongated body having an aspect ratio of length:width of at least about 10:1.

78. The method of any of claims 72, 73, or 74, wherein forming a tacking film comprises a method selected from the group consisting of deposition, spraying, printing, dipping, die coating, electroplating, and a combination thereof.

79. The method of any of claims 72, 73, or 74, wherein the tacking film is bonded directly to a surface of the substrate.

80. The method of any of claims 72, 73, or 74, wherein the tacking film is bonded to the substrate at a bonding region defined by interdiffusion of elements of the tacking film and the substrate.

81. The method of any of claims 72, 73, or 74, wherein the tacking film overlies a majority of an external surface of the substrate.

82. The method of claim 81, wherein the tacking film overlies essentially the entire external surface of the substrate.

83. The method of any of claims 72, 73, or 74, wherein the tacking film comprises a material selected from the group of materials consisting of metal, metal alloys, metal matrix composites, and a combination thereof.

84. The method of claim 83, wherein the tacking film comprises a transition metal element.

85. The method of claim 84, wherein the tacking film comprises a metal alloy of tin and lead.

86. The method of claim 84, wherein the tacking film comprises tin.

87. The method of any of claims 72, 73, or 74, wherein the tacking film has a melting point of not greater than about 450°C.

88. The method of claim 87, wherein the tacking film has a melting point of not greater than about 250°C.

89. The method of any of claims 72, 73, or 74, wherein the tacking film comprises an average thickness of not greater than about 80% of an average particle size of the abrasive particles.

90. The method of any of claims 72, 73, or 74, wherein the tacking film comprises an average thickness of not greater than about 25 microns.

91. The method of any of claims 72, 73, or 74, wherein placing the abrasive particles on the tacking film comprises placing the abrasive particles directly in contact with the tacking film to bind the abrasive particles to the tacking film.

92. The method of any of claims 72, 73, or 74, wherein placing the abrasive particles on the tacking film comprises a process selected from the

group consisting of spraying, gravity coating, dipping, die coating, electrostatic coating, and a combination thereof.

93. The method of any of claims 72, 73, or 74, wherein placing the abrasive particles on the tacking film can include placing the abrasive particles on an additional layer overlying the tacking film.

94. The method of claim 93, wherein placing an additional layer comprises a flux material.

95. The method of claim 93, wherein the additional layer is a coating overlying essentially all of the surface of the tacking film.

96. The method of claim 93, wherein the additional layer is formed through a deposition process.

97. The method of any of claims 72, 73, or 74, wherein treating comprises a process selected from the group consisting of heating, curing, drying, and a combination thereof.

98. The method of any of claims 72, 73, or 74, wherein treating comprises heating the tacking film to a temperature of not greater than about 450°C.

99. The method of any of claims 72, 73, or 74, wherein treating comprises heating the tacking film to melt the tacking film and form a metallic bonding region between the tacking film and the coating layer.

100. The method of any of claims 72, 73, or 74, wherein forming a bonding layer comprises a process of coating the bonding layer directly on the abrasive particles and the tacking film.

101. The method of any of claims 72, 73, or 74, wherein the process of forming the bonding layer comprises a process selected from the group of

processes including plating, spraying, printing, dipping, and a combination thereof.

102. The method of any of claims 72, 73, or 74, wherein the bonding layer comprises a material selected from the group of materials consisting of organic materials, inorganic materials, and a combination thereof.

103. The method of any of claims 72, 73, or 74, wherein the bonding layer comprises fillers.

104. The method of claim 103, wherein the fillers comprise secondary abrasive particles.

WHAT IS CLAIMED IS:

1. An abrasive article comprising:

a substrate;

a tacking film overlying the substrate;

abrasive particles comprising a coating layer overlying the abrasive particles bonded to the tacking film, wherein a bond between the coating layer and the tacking film defines a metallic bonding region, wherein the tacking film comprises an average thickness of at least about 10% and not greater than about 30% of an average particle size of the abrasive particles and wherein the tacking film comprises an electroplated layer; and

a bonding layer overlying the abrasive particles and the tacking film.

2. The abrasive article of claim 1, wherein the substrate comprises an inorganic material.

3. The abrasive article of claim 1, wherein the substrate comprises an average length of at least about 50 m.

4. The abrasive article of claim 1, wherein the substrate comprises an average width of not greater than about 1 cm.

5. The abrasive article of claim 1, wherein the metallic bonding region comprises a diffusion bond region characterized by a region of interdiffusion between at least one chemical species of the coating layer and one chemical species of the tacking film.

6. The abrasive article of claim 1, wherein the bonding layer overlies at least about 90% of the surfaces of the abrasive particles and tacking film.

7. The abrasive article of claim 1, wherein the bonding layer comprises a material selected from the group of materials consisting of metals, metal alloys, cermets, ceramics, composites, and a combination thereof.

8. The abrasive article of claim 1, wherein the bonding layer comprises an average thickness of at least about 10% of an average particle size of the abrasive particles.

9. An abrasive article comprising:

a substrate comprising an elongated body having an aspect ratio of length:width of at least about 10:1;

a tacking film overlying the substrate comprising a solder material including tin, the tacking film having a melting point of not greater than about 450°C;

abrasive particles having an average particle size within a range between about 0.1 microns and about 100 microns bonded to the tacking film, wherein the tacking film comprises an average thickness of at least about 10% and not greater than about 30% of the average particle size of the abrasive particles and wherein the tacking film comprises an average thickness at least about 0.1 microns and not greater than 4 microns; and

a bonding layer overlying the abrasive particles and tacking film, wherein the bonding layer comprises a thickness of at least about 10% and not greater than about 95% of the average particle size of the abrasive particles.

10. The abrasive article of claim 9, wherein the abrasive particles comprise an average particle size of at least about 1 micron and not greater than about 100 microns.

11. The abrasive article of claim 9, wherein the abrasive article comprises an abrasive grain concentration of at least about 60 particles per mm of wire and at least about 1.0 carats per meter of wire.

12. The abrasive article of claim 1, wherein the coating layer overlies at least about 50% of the exterior surface area of the abrasive particle.

13. The abrasive article of claim 9, wherein the tacking film comprises tin and lead.

14. The abrasive article of claim 9, wherein the tacking film comprises an electroplated layer.

15. The abrasive article of claim 9, wherein the bonding layer comprises nickel.

16. The abrasive article of claim 9, wherein the abrasive particles are arranged in a substantially single layer without any agglomeration.

17. The abrasive article of claim 9, wherein the tacking layer consists essentially of tin.

18. The abrasive article of claim 9, further comprising an abrasive grain concentration of at least about 60 particles per mm and not greater than about 750 particles per mm.

19. The abrasive article of claim 9, further comprising an abrasive grain concentration of at least about 0.5 carats of diamond per kilometer of wire.

20. The abrasive article of claim 9, further comprising an abrasive grain concentration of not greater than about 15.0 carats of diamond per kilometer of wire.