CLAIMS

1 A tiecoat coating composition for use in a coating system for a metallic substrate comprising at least three coating layers in which a primer coating layer overlies the metallic substrate, a tiecoat coating layer overlies the primer coating layer, and a finish coating layer overlies the tiecoat coating layer, the primer coating layer is formed from a primer composition, the tiecoat coating layer is formed from a tiecoat composition, and the finish coating layer is formed from a finish composition, the primer composition comprises a primer carrier medium and a primer corrosion inhibitor, the primer corrosion inhibitor having a galvanic cathodic mechanism, and the finish composition is formulated to give a predetermined surface texture and/or appearance, wherein the tiecoat composition comprises a tiecoat carrier medium and a tiecoat corrosion inhibitor, the tiecoat corrosion inhibitor has a barrier mechanism, in which the tiecoat composition further comprises a further tiecoat corrosion inhibitor, in which the further tiecoat corrosion inhibitor has a passivation mechanism.

2 A tiecoat composition according to claim 1, in which the tiecoat corrosion inhibitor comprises one of or a mixture of graphene nanoplates, graphene oxide nanoplates, reduced graphene oxide nanoplates, bilayer graphene nanoplates, bilayer graphene oxide nanoplates, bilayer reduced graphene oxide nanoplates, few-layer graphene nanoplates, few-layer graphene oxide nanoplates, few-layer reduced graphene oxide nanoplates, graphene / graphitic nanoplates of 6 to 14 layers of carbon atoms, graphite flakes with at least one nanoscale dimension and 40 or less layers of carbon atoms, graphite flakes with at least one nanoscale dimension and 25 to 30 layers of carbon atoms, graphite flakes with at least one nanoscale dimension and 20 to 35 layers of carbon atoms, or graphite flakes with at least one nanoscale dimension and 20 to 40 layers of carbon atoms.

3 A tiecoat composition according to claim 1 or 2, in which the tiecoat corrosion inhibitor comprises nanoplates of one of or a mixture of 2D materials and or layered 2D materials, in which the 2D materials are one of or a mixture of graphene, graphene oxide, reduced graphene oxide, hexagonal boron nitride, molybdenum disulphide, tungsten diselenide, silicene, germanene, Graphyne, borophene, phosphorene, or a

2D in-plane heterostructure of two or more of the aforesaid materials, and the layered 2D materials are one of or a mixture of graphene, graphene oxide, reduced graphene oxide, hexagonal boron nitride, molybdenum disulphide, tungsten diselenide, silicene, germanene, Graphyne, borophene, phosphorene, or a 2D vertical heterostructure of two or more of the aforesaid materials.

4 A tiecoat composition according to any of the preceding claims, in which the tiecoat corrosion inhibitor comprises graphene / graphitic platelets and/or nanoplates of 2D materials which have a D50 particle size of less than 45 µm.

5 A tiecoat composition according to any of the preceding claims, in which the tiecoat corrosion inhibitor is present in the range of 0.05 wt% to 0.6 wt% of the tiecoat composition.

6 A tiecoat composition according to any of the preceding claims, in which the tiecoat corrosion inhibitor is present in the range of 0.1 wt% to 0.5 wt% of the tiecoat composition.

7 A tiecoat composition according to any of the preceding claims, in which the further tiecoat corrosion inhibitor is present in the range of 0.05 wt% to 1.0 wt% of the tiecoat composition.

8 A tiecoat composition according to any of the preceding claims, in which the further tiecoat corrosion inhibitor is present in the range of 0.05 wt% to 0.8 wt% of the tiecoat composition.

9 A tiecoat composition according to any of the preceding claims, in which the further tiecoat corrosion inhibitor is present in the range of 0.05 wt% to 0.6 wt% of the tiecoat composition.

10 A tiecoat composition according to any of the preceding claims, in which the further tiecoat corrosion inhibitor is present in the range of 0.1 wt% to 0.5 wt% of the tiecoat composition.

11 A tiecoat composition according to any of the preceding claims, in which the further tiecoat corrosion inhibitor is present at a rate of 0.1 wt% or 0.5 wt% of the tiecoat composition.

12 A tiecoat composition according to any of the preceding claims, in which the further tiecoat corrosion inhibitor is present at a rate of 0.1 wt% of the tiecoat composition.

13 A tiecoat composition according to any of the preceding claims, in which the further tiecoat corrosion inhibitor comprises at least one of an ion exchanged pigment, a silica, a calcium exchanged silica, an oxyaminophosphate salt of magnesium, and / or a mixture of an organic amine, a phosphoric acid and/or an inorganic phosphate and a metal oxide, a metal hydroxide, zinc chromate, zinc molybdate, zinc tungstate, zinc vanadate, zinc phosphite, zinc polyphosphate, zinc borate, zinc metaborate, magnesium chromate, magnesium molybdate, magnesium tungstate, magnesium vanadate, magnesium phosphate, magnesium phosphite, magnesium polyphosphate, magnesium borate, magnesium metaborate, calcium chromate, calcium molybdate, calcium tungstate, calcium vanadate, calcium phosphate, calcium phosphite, calcium polyphosphate, calcium borate, calcium metaborate, strontium chromate, strontium molybdate, strontium tungstate, strontium vanadate, strontium phosphate, strontium phosphite, strontium polyphosphate, borate, strontium metaborate, barium chromate, barium molybdate, barium tungstate, barium vanadate, barium phosphate, barium phosphite, barium polyphosphate, barium borate, barium metaborate, aluminium chromate, aluminium molybdate, aluminium tungstate, aluminium vanadate, aluminium phosphate, aluminium phosphite, aluminium polyphosphate, aluminium borate, and / or aluminium metaborate.

14 A tiecoat composition according to any of the preceding claims, in which the further tiecoat corrosion inhibitor is a composition comprising silica.

15 A tiecoat composition according to any of the preceding claims, in which the tiecoat carrier medium comprises a curable resin.

16 A tiecoat composition according to claim 15, in which the curable resin comprises an epoxy resin.

17 A coating system for a metallic substrate comprising at least three coating layers in which a primer coating layer overlies the metallic substrate, a tiecoat coating layer overlies the primer coating layer, and a finish coating layer overlies the tiecoat coating layer, wherein the primer coating layer is formed from a primer composition, the tiecoat coating layer is formed from a tiecoat composition according to any of claims 1 to 16, and the finish coating layer is formed from a finish composition, wherein the primer composition comprises a primer carrier medium and a primer corrosion inhibitor, the primer corrosion inhibitor having a galvanic cathodic mechanism, and the finish composition is formulated to give a predetermined surface texture and/or appearance.

18 A coating system according to claim 17, in which the primer corrosion inhibitor is one of or a mixture of zinc, inorganic salts of magnesium and or inorganic salts of manganese.

19 A coating system according to claim 17 or 18, in which the further tiecoat corrosion inhibitor is encased in the tiecoat carrier medium of the tiecoat coating layer formed from the tiecoat composition.

20 A coating system according to claim 17 or 18, in which the further tiecoat corrosion inhibitor is substantially homogeneously dispersed through the tiecoat coating layer.