

CLAIMS

1. A corrosion-resistant permanent magnet comprising a magnet body and a composite coating provided on and covering surfaces of the magnet body, the
5 composite coating comprising, in the order recited,
 - a first metal oxide layer in physical contact with the magnet body,
 - a metal layer,
 - a second metal oxide layer,
 - a linker layer, and
 - 10 - a layer formed from poly(2-chloro-p-xylylene).
2. The magnet of claim 1, wherein the magnet body is a rare earth metal iron boron permanent magnet.
- 15 3. The magnet of claim 2, wherein the magnet body is a sintered magnet body having $\text{Nd}_2\text{Fe}_{14}\text{B}$ crystals and a neodymium iron boron material surrounding the $\text{Nd}_2\text{Fe}_{14}\text{B}$ crystals, said neodymium iron boron material being richer in neodymium than the $\text{Nd}_2\text{Fe}_{14}\text{B}$ crystals.
- 20 4. The magnet of any one of claims 1 to 3, wherein the metal of the metal layer is aluminum or titanium or an alloy of aluminum or titanium.
5. The magnet of any one of claims 1 to 4, wherein the oxide of the first metal oxide layer is Al_2O_3 or TiO_2 or a mixed oxide of Al_2O_3 and TiO_2 .
- 25 6. The magnet of any one of claims 1 to 5, wherein the oxide of the second metal oxide layer is Al_2O_3 or TiO_2 or a mixed oxide of Al_2O_3 and TiO_2 .
7. The magnet of any one of claims 1 to 6, comprising a further metal layer and,
30 optionally, a further metal oxide layer between the second metal oxide layer and the linker layer, wherein
 - the metal layer is in physical contact with the first metal oxide layer,

- the second metal oxide layer is in physical contact with the metal layer,
 - the further metal layer is in physical contact with the second metal oxide layer,
 - the further metal oxide layer, if present, is in physical contact with the further metal layer,
 - 5 - the linker layer is in physical contact with the further metal layer or, if present, the further metal oxide layer, and
 - the poly(2-chloro-p-xylylene) layer is in physical contact with the linker layer.
8. The magnet of claim 7, wherein the metal of the further metal layer is aluminum.
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9. The magnet of any one of claims 1 to 6, wherein the metal layer is omitted, and the composite coating further comprises, in the order recited, on the layer formed from poly(2-chloro-p-xylylene),
- a third metal oxide layer,
 - 15 - a further linker layer, and
 - a further layer formed from poly(2-chloro-p-xylylene).
10. The magnet of claim 9, further comprising an intermediate metal oxide layer between the layer formed from poly(2-chloro-p-xylylene) and the third metal oxide layer.
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11. The magnet of claim 9 or 10, wherein the oxide of the first metal oxide layer is Al_2O_3 and the oxide of the second metal oxide layer is TiO_2 , or the oxide of the first metal oxide layer is TiO_2 and the oxide of the second metal oxide layer is Al_2O_3 , or the oxides of the first and second metal oxide layers are Al_2O_3 , or the oxides of the first and second metal oxide layers are TiO_2 , and/or wherein the oxide of the third metal oxide layer is TiO_2 or Al_2O_3 .
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12. The magnet of claim 10 or 11, wherein the oxide of the intermediate metal oxide layer is Al_2O_3 or TiO_2 , and is different from the oxide of the third metal oxide layer.
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13. A method for producing a corrosion-resistant permanent magnet, the method comprising
- providing a non-magnetized magnet body,
 - forming a first metal oxide layer on surfaces of the magnet body,
 - 5 - forming a metal layer on the first metal oxide layer,
 - forming a second metal oxide layer on the metal layer,
 - optionally, forming at least one further layer on the second metal oxide layer,
 - forming a linker layer on the second metal oxide layer or, if present, on the at least one further layer,
 - 10 - forming a layer of poly(2-chloro-p-xylylene) on the linker layer, and
 - magnetizing the magnet body.
14. The method of claim 13, the method comprising forming the at least one further layer, wherein the at least one further layer is a further metal layer.
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15. The method of claim 14, further comprising forming a further metal oxide layer on the further metal layer.
16. The method of any one of claims 13 to 15, wherein the oxide of the first metal
- 20 oxide layer and/or the oxide of the second metal oxide layer is an oxide as indicated in claim 5 or 6.
17. The method of any one of claims 13 to 16, wherein the metal of the metal layer is a metal as indicated in claim 4.
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18. The method of any one of claims 14 to 17, wherein the metal of the further metal layer is a metal as indicated in claim 8.
19. A method for producing a corrosion-resistant permanent magnet, the method
- 30 comprising
- providing a non-magnetized magnet body,
 - forming a first metal oxide layer on surfaces of the magnet body,

- forming a second metal oxide layer on the first metal oxide layer,
 - forming a linker layer on the second metal oxide layer,
 - forming a layer of poly(2-chloro-p-xylylene) on the linker layer,
 - optionally, forming an intermediate metal oxide layer on the poly(2-chloro-p-xylylene) layer,
 - forming a third metal oxide layer on the poly(2-chloro-p-xylylene) layer or, if present, on the intermediate metal oxide layer,
 - forming a further linker layer on the third metal oxide layer,
 - forming a further layer of poly(2-chloro-p-xylylene) on the further linker layer,
 - and
 - magnetizing the magnet body.
20. The method of claim 19, wherein the oxide of the first metal oxide layer is Al_2O_3 and the oxide of the second metal oxide layer is TiO_2 , or the oxide of the first metal oxide layer is TiO_2 and the oxide of the second metal oxide layer is Al_2O_3 , or the oxides of the first and second metal oxide layers are both Al_2O_3 or are both TiO_2 , and/or the oxide of the third metal oxide layer is TiO_2 or Al_2O_3 .
21. The method of claim 19 or 20, comprising forming the intermediate metal oxide layer, wherein the oxide of the intermediate metal oxide layer is Al_2O_3 or TiO_2 , and is different from the oxide of the third metal oxide layer.
22. An intravascular blood pump comprising an electric motor, wherein the electric motor comprises a permanent magnet as claimed in any one of claims 1 to 12.