CLAIMS

We claim:

1. A ferritic stainless steel comprising, in weight percent, from 0 to less than 0.1 aluminum, from 0 to less than 0.1 silicon, from 21 to 35 chromium, greater than 1 to 2 manganese, from 0.002 to 0.1 carbon, from 0 to 0.04 nitrogen, from 0 to 1 molybdenum, from 0 to 0.5 nickel, from 0 to 0.05 lanthanum, from 0 to 0.1 cerium, from 0 to 0.1 zirconium, from 0 to 0.5 titanium, from 0 to 0.1 tantalum, from 0 to 0.2 niobium, iron and impurities.

2. The ferritic stainless steel of claim 1 wherein the ferritic stainless steel comprises:

from 0 to 0.05 weight percent aluminum, and

from 0 to 0.05 weight percent silicon.

3. The ferritic stainless steel of claim 1 wherein the ferritic stainless steel comprises:

from 0.005 to 0.05 weight percent aluminum, and

from 0.005 to 0.05 weight percent silicon.

4. The ferritic stainless steel of claim 1 wherein the ferritic stainless steel comprises from 1.5 to 2.0 weight percent manganese.

5. The ferritic stainless steel of claim 1 wherein the ferritic stainless steel comprises from 1.6 to 2.0 weight percent manganese.

6. The ferritic stainless steel of claim 1 wherein the ferritic stainless steel comprises, in weight percent, from 0 to 0.05 aluminum, from 0 to 0.05 silicon, from 21 to 24 chromium, greater than 1 to 2 manganese, from 0.002 to 0.1 carbon, from 0 to 0.04 nitrogen, from 0 to 1 molybdenum, from 0 to 0.3 nickel, from 0.02 to 0.04 lanthanum, from 0 to 0.1 zirconium, from 0 to 0.1 titanium, from 0 to 0.1 tantalum, from 0 to 0.1 niobium, cerium, iron and impurities, wherein a sum of the weight percent cerium and the weight percent lanthanum ranges from 0.03 to 0.06.

7. The ferritic stainless steel of claim 6 wherein the ferritic stainless steel comprises:

from 0.005 to 0.05 weight percent aluminum, and

from 0.005 to 0.05 weight percent silicon.

8. The ferritic stainless steel of claim 6 wherein manganese ranges from 1.5 to 2 weight percent.

9. The ferritic stainless steel of claim 6 wherein manganese ranges from 1.6 to 2 weight percent.

10. The ferritic stainless steel of claim 1 wherein the ferritic stainless steel comprises, in weight percent, from 0 to 0.05 aluminum, from 0 to 0.05 silicon, from 23 to 27 chromium, greater than 1 to 2 manganese, from 0.002 to 0.1 carbon, from 0 to 0.04 nitrogen, from 0 to 1 molybdenum, from 0 to 0.3 nickel, from 0 to 0.05 lanthanum, from 0 to 0.1 cerium, from 0 to 0.1 zirconium, from 0 to 0.5 titanium, from 0 to 0.1 tantalum, from 0.05 to 0.2 niobium, iron and impurities.

11. The ferritic stainless steel of claim 10 wherein the ferritic stainless steel comprises:

from 0.005 to 0.05 weight percent aluminum, and

from 0.005 to 0.05 weight percent silicon.

12. The ferritic stainless steel of claim 10 wherein manganese ranges from 1.5 to 2 weight percent.

13. The ferritic stainless steel of claim 10 wherein manganese ranges from 1.6 to 2 weight percent.

14. The ferritic stainless steel of claim 1 wherein the ferritic stainless steel is essentially free of silver, calcium oxide, and titanium.

15. An interconnect comprising a ferritic stainless steel according to claim 1.

16. A ferritic stainless steel comprising, in weight percent, from 0 to 0.05 aluminum, from 0 to 0.05 silicon, from 23 to 27 chromium, greater than 1 to 2 manganese, from

0.002 to 0.1 carbon, from 0 to 0.04 nitrogen, from 0.75 to 1 molybdenum, from 0 to 0.3 nickel, from 0 to 0.05 lanthanum, from 0 to 0.1 cerium, from 0 to 0.05 zirconium, an amount of at least one of titanium, tantalum and niobium, wherein the amounts of titanium, tantalum and niobium satisfy the equation:

0.4 weight percent < [%Nb + %Ti + $^{1}Z_{2}(^{0}ZoTa)$] < 1 weight percent, iron and impurities.

17. The ferritic stainless steel of claim 16 wherein the ferritic stainless steel comprises:

from 0.005 to 0.05 weight percent aluminum, and

from 0.005 to 0.05 weight percent silicon.

18. The ferritic stainless steel of claim 16 wherein manganese ranges from 1.5 to 2 weight percent.

19. The ferritic stainless steel of claim 16 wherein manganese ranges from 1.6 to 2 weight percent.

20. The ferritic stainless steel of claim 16 wherein the ferritic stainless steel comprises no greater than 0.5 weight percent titanium.

21. The ferritic stainless steel of claim 16 wherein the amounts of titanium, tantalum and niobium satisfy the equation:

0.5 weight percent < [%Nb + %Ti + $^{1}Z_{2}(^{0}ZoTa)$] < 1 weight percent.

22. The ferritic stainless steel of claim 16 wherein the ferritic stainless steel is essentially free of silver, calcium oxide, and titanium.

23. An interconnect comprising a ferritic stainless steel according to claim 16.

Claims

1. A ferritic stainless steel consisting of, in weight percent, from 0 to less than 0.1 aluminum, from 21 to 35 chromium, greater than 1 to 2 manganese, from 0.002 to 0.1 carbon, from 0 to 0.04 nitrogen, from 0.75 to 1 molybdenum, from 0 to 0.5 nickel, from 0 to 0.05 lanthanum, from 0 to 0.1 cerium, from 0 to 0.5 titanium, from 0 to 0.1 tantalum, from 0 to 0.2 niobium, iron and impurities,

wherein the ferritic stainless steel is characterized by the formation of a manganese-chromium spinel scale on the surface of the ferritic stainless steel during oxidation.

2. The ferritic stainless steel of claim 1 wherein the aluminum ranges from 0 to 0.05 weight percent.

3. The ferritic stainless steel of claim 1 wherein the aluminum ranges from 0.005 to 0.05 weight percent.

4. The ferritic stainless steel of claim 1 wherein the manganese ranges from 1.5 to 2.0 weight percent manganese.

5. The ferritic stainless steel of claim 1 wherein the manganese ranges from 1.6 to 2.0 weight percent.

6. The ferritic stainless steel of claim 1 wherein the ferritic stainless steel consists of, in weight percent, from 0 to 0.05 aluminum, from 21 to 24 chromium, greater than 1 to 2 manganese, from 0.002 to 0.1 carbon, from 0 to 0.04 nitrogen, from 0.75 to 1 molybdenum, from 0 to 0.3 nickel, from 0.02 to 0.04 lanthanum, from 0 to 0.1 tantalum, from 0 to 0.1 niobium, cerium, iron and impurities, wherein a sum of the weight percent cerium and the weight percent lanthanum ranges from 0.03 to 0.06.

7. The ferritic stainless steel of claim 6 wherein the aluminum ranges from 0.005 to 0.05 weight percent.

8. The ferritic stainless steel of claim 6 wherein manganese ranges from 1.5 to 2 weight percent.

9. The ferritic stainless steel of claim 6 wherein manganese ranges from 1.6 to 2 weight percent.

10. The ferritic stainless steel of claim 1 wherein the ferritic stainless steel consists of, in weight percent, from 0 to 0.05 aluminum, from 23 to 27 chromium, greater than 1 to 2 manganese, from 0.002 to 0.1 carbon, from 0 to 0.04 nitrogen, from 0.75 to 1 molybdenum, from 0 to 0.3 nickel, from 0 to 0.05 lanthanum, from 0 to 0.1 cerium, from 0 to 0.1 tantalum, from 0.05 to 0.2 niobium, iron and impurities.

11 . The ferritic stainless steel of claim 10 wherein the aluminum ranges from 0.005 to 0.05 weight percent.

12. The ferritic stainless steel of claim 10 wherein manganese ranges from 1.5 to 2 weight percent.

13. The ferritic stainless steel of claim 10 wherein manganese ranges from 1.6 to 2 weight percent.

14. The ferritic stainless steel of claim 1 wherein the ferritic stainless steel is essentially free of silver, calcium oxide, and titanium.

15. An interconnect comprising a ferritic stainless steel according to claim 1.

16. A ferritic stainless steel consisting of, in weight percent, from 0 to 0.05 aluminum, from 23 to 27 chromium, greater than 1 to 2 manganese, from 0.002 to 0.1 carbon, from 0 to 0.04 nitrogen, from 0.75 to 1 molybdenum, from 0 to 0.3 nickel, an amount of at least one of titanium, tantalum and niobium, wherein the amounts of titanium, tantalum and niobium satisfy the equation:

0.4 weight percent $\leq$[%Nb + % Ti + ½ (% Ta)] $\trianglelefteq$ weight percent, iron and impurities,

wherein the ferritic stainless steel is characterized by the formation of a manganese-chromium spinel scale on the surface of the ferritic stainless steel during oxidation.

17. The ferritic stainless steel of claim 16 wherein the aluminum ranges from 0.005 to 0.05 weight percent.

18. The ferritic stainless steel of claim 16 wherein manganese ranges from 1.5 to 2 weight percent.

19. The ferritic stainless steel of claim 16 wherein manganese ranges from 1.6 to 2 weight percent.

20. The ferritic stainless steel of claim 16 wherein the titanium ranges from 0 to no greater than 0.5 weight percent.

21. The ferritic stainless steel of claim 16 wherein the amounts of titanium, tantalum and niobium satisfy the equation:

0.5 weight percent $\leq$[%Nb + % Ti + ½ (% Ta)] $\leq$1 weight percent.

22. The ferritic stainless steel of claim 16 wherein the ferritic stainless steel is essentially free of silver, calcium oxide, and titanium.

23. An interconnect comprising a ferritic stainless steel according to claim 16.

24. A ferritic stainless steel consisting of, in weight percent, from 0 to less than 0.1 aluminum, from 0 to less than 0.1 silicon, from 21 to 24 chromium, greater than 1 to 2 manganese, from 0.002 to 0.1 carbon, from 0 to 0.04 nitrogen, from 0 to 1 molybdenum, from 0 to 0.5 nickel, from 0.02 to 0.04 lanthanum, from 0 to 0.1 cerium, from 0 to 0.1 tantalum, iron, and impurities,

wherein the ferritic stainless steel is characterized by the formation of a manganese-chromium spinel scale on the surface of the ferritic stainless steel during oxidation.

25. The ferritic stainless steel of claim 24 wherein the aluminium ranges from 0 to 0.05 weight percent and the silicon ranges from 0 to 0.05 weight percent.

26. The ferritic stainless steel of claim 24 wherein the aluminium ranges from 0.005 to 0.05 weight percent and the silicon ranges from 0.005 to 0.05 weight percent.

27. The ferritic stainless steel of claim 24 wherein the manganese ranges from 1.5 to 2.0 weight percent.

28. The ferritic stainless steel of claim 24 wherein the manganese ranges from 1.6 to 2.0 weight percent.

29. An interconnect comprising a ferritic stainless steel according to claim 24.

30. A ferritic stainless steel consisting of, in weight percent, from 0 to less than 0.1 aluminum, from 21 to 35 chromium, 1.5 to 2 manganese, from 0.002 to 0.1carbon, from 0 to 0.04 nitrogen, from 0.75 to 1 molybdenum, from 0 to 0.5 nickel, from 0 to 0.05 lanthanum, from 0 to 0.1 cerium, from 0 to 0.1 tantalum, from 0 to 0.2 niobium, iron, and impurities.

31. A ferritic stainless steel consisting of, in weight percent, from 0 to less than 0.1 aluminum, from 0 to less than 0.1 silicon, from 21 to 24 chromium, 1.5 to 2 manganese, from 0.002 to 0.1 carbon, from 0 to 0.04 nitrogen, from 0 to 1 molybdenum, from 0 to 0.5 nickel, from 0.02 to 0.04 lanthanum, from 0 to 0.1 cerium, from 0 to 0.1 tantalum, iron, and impurities.

32. A ferritic stainless steel consisting of, in weight percent, from 0 to 0.05 aluminum, from 23 to 27 chromium, 1.5 to 2 manganese, from 0.002 to 0.1 carbon, from 0 to 0.04 nitrogen, from 0.75 to 1 molybdenum, from 0 to 0.3 nickel, iron, impurities, and an amount of at least one of titanium, tantalum and niobium, wherein the amounts of titanium, tantalum, and niobium satisfy the equation:

0.4 weight percent $\leq$[%Nb + % Ti + ½ (% Ta)] $\leq$1 weight percent, iron and impurities.