CLAIMS

1. A heat treatment apparatus 10 comprising:

a fluidised bed furnace 20; and

a removable insert 30 receivable within the furnace 20;

wherein when positioned within the furnace 20 the insert 30 defines a space 40 which accommodates a fluidised bed 50.

2. The apparatus 10 as claimed in Claim 1 wherein, when in use, an article 70 to be heat treated is positioned within the space 40, and the insert 30 is sized such that a predetermined clearance is defined between the article and the insert 30.

3. The apparatus 10 as claimed in Claim 1 or Claim 2 wherein the insert 30 is formed from a thermally insulative material.

4. The apparatus 10 as claimed in any one of Claims 1 to 3 wherein the insert 30 extends around the inner periphery of the furnace 20.

5. The apparatus 10 as claimed in any one of Claims 1 to 4 further comprising a distribution plate 60 having a plurality of apertures, the distribution plate 60 being located in a base portion of the furnace 20 and supporting the insert 30 and the fluidised bed 50.

6. The apparatus 10 as claimed in any one of Claims 1 to 5, further comprising a gas permeable membrane 110 covering the upper surface of the fluidised bed 50.

7. The apparatus 10 as claimed in Claim 6, wherein the membrane 110 is a flexible membrane.

8. The apparatus 10 as claimed in any one of Claims 1 to 7 wherein a thermally insulative layer is applied to a surface of the article 70 which is in contact with the fluidised bed 50.

9. The apparatus 10 as claimed in any one of Claims 1 to 8 wherein a cooling gas flow 100 is directed at a portion of the article 70.

10. The apparatus 10 as claimed in any one of Claims 1 to 9, further comprising an insulative supporting plate 80 located between the article 70 and the base of the furnace 20.

11. The apparatus 10 as claimed in any one of Claims 1 to 10, the fluidised bed 50 comprising a plurality of refractory particles, wherein the furnace 20 further comprises a drain port 90 adapted to allow for the drainage of the particles from the fluidised bed 50.

12. A fluidised bed furnace 20 for the heat treatment of metals or metal articles, wherein the upper surface of the fluidised bed 50 is covered by a gas permeable membrane 110.

13. The furnace 20 as claimed in Claim 12, wherein the membrane 110 is a flexible membrane.

14. A method of using a heat treatment apparatus 10 comprising a fluidised bed furnace 20 and a removable insert 30 receivable within the furnace 20; the method comprising the steps of:

placing an article 70 to be heat treated in the furnace 20;

selecting an insert 30 such that a pre-determined clearance is defined between the article 70 and the insert 30;

placing the insert 30 in the furnace 20;

filling the space 40 defined between the article 70 and the insert 30 with a fluidised bed medium; and

carrying out a pre-defined heat treatment process.

15. The method as claimed in Claim 14 wherein the step of filling the space 40 defined between the article 70 and the insert 30 with a fluidised bed medium, comprises the additional step of:

positioning a gas permeable membrane 110 over the upper surface of the fluidised bed 50.

CLAIMS

1. A heat treatment apparatus comprising:

a fluidised bed furnace; and

a removable insert receivable within the furnace;

wherein when positioned within the furnace the insert defines a space which accommodates a fluidised bed.

2. An apparatus as claimed in Claim 1 further comprising an article to be heat treated, the article being positioned within the space, and the insert being sized such that a predetermined clearance is defined between the article and the insert.

3. An apparatus as claimed in Claim 1 or Claim 2 wherein the insert extends around the inner periphery of the furnace.

4. An apparatus as claimed in any one of Claims 1 to 3 further comprising a distribution plate having a plurality of apertures, the distribution plate being located in a base portion of the furnace and supporting the insert and the fluidised bed.

5. An apparatus as claimed in any one of Claims 1 to 4, further comprising a gas permeable membrane covering the upper surface of the fluidised bed.

6. An apparatus as claimed in Claim 5, wherein the membrane is a flexible membrane.

7. An apparatus as claimed in any one of Claims 2 to 6 further comprising a cooling gas flow supply means adapted to direct a cooling gas flow at a portion of the article.

8. An apparatus as claimed in any one of Claims 1 to 7, further comprising a supporting plate located between the article and the base of the furnace

9. An apparatus as claimed in any one of Claims 1 to 8, the fluidised bed comprising a plurality of refractory particles, wherein the furnace further comprises a drain port adapted to allow for the drainage of the particles from the fluidised bed.

10. A method of using a heat treatment apparatus comprising a fluidised bed furnace and a removable insert receivable within the furnace; the method comprising the steps of:

placing an article to be heat treated in the furnace;

selecting an insert such that a pre-determined clearance is defined between the article and the insert;

placing the insert in the furnace;

filling the space defined between the article and the insert with a fluidised bed medium;

carrying out a pre-defined heat treatment process.

11. A method as claimed in Claim 10 wherein the step of filling the space defined between the article and the insert with a fluidised bed medium, comprises the additional step of:

positioning a gas permeable membrane over the upper surface of the fluidised bed.