We Claim:

1. A hard metal material in the form of a casting comprising greater than 10 and up to 50 volume % particles of a refractory material with particle sizes less than 500 microns dispersed in a host metal,

characterized in that the refractory material consists of

(a) particles of carbides and/or nitrides and/or borides of one of zirconium, hafnium, vanadium, niobium, tantalum, chromium, and molybdenum; and/or

(b) particles of a chemical mixture of carbides and/or nitrides and/or borides of any two or more of titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum, and tungsten,

and wherein the particles are insoluble in the host metal at its casting temperature and the host metal comprises a ferrous alloy (such as a steel, a cast iron), a stainless steel, an austenitic-manganese steel or an iron-based or a nickel-based or a cobalt-based superalloy.

2. The hard metal material casting as claimed in claim 1 wherein the particles of the refractory material are selected from (a) niobium carbide containing refractory particles and (b) particles of a chemical mixture of niobium carbide and titanium carbide.

3. The hard metal material casting as claimed in any one of claims 1 to 2 comprising greater than 15 volume % particles of the refractory material dispersed in the host metal, preferably less than 30 volume % particles of the refractory material dispersed in the host metal, and preferably less than 25 volume % particles of the refractory material dispersed in the host metal.

4. A method of manufacturing a component of a hard metal material comprising:

(a) forming a slurry of a hard metal material comprising greater than 10 and up to ~~5~~-50 volume % particles of a refractory material with particle sizes less than 500 microns dispersed in a liquid host metal in an inert atmosphere, with the refractory material consisting of (a) particles of carbides and/or nitrides and/or borides of one of zirconium,

hafnium, vanadium, niobium, tantalum, chromium, and molybdenum; and/or (b) particles of a chemical mixture of carbides and/or nitrides and/or borides of any two or more of titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum, and tungsten,

and wherein the particles are insoluble in the host metal at its casting temperature and the host metal comprises a ferrous alloy (such as a steel, a cast iron), a stainless steel, an austenitic-manganese steel or an iron-based or a nickel-based or a cobalt-based superalloy, and

(b) pouring the slurry into a mould and forming a casting of the component such as in an inert atmosphere.

5. The method as claimed in claim 4 comprises forming the slurry and thereafter forming the casting of the component in a chamber under vacuum conditions which remove air from the chamber and supplying an inert gas, such as argon, into the chamber.

6. The method as claimed in claim 4 or claim 5 wherein the refractory material is less than 400 microns particle size, and preferably less than 150 microns particle size.

7. The method as claimed in any one of claims 4 to 6 comprises selecting one or more than one of (a) the refractory material to have a smaller thermal contraction than the host metal, (b) the density of the refractory material, compared to the density of the host metal in the liquid state to control the dispersion of the particles of the refractory material in the host metal, and (c) the refractory material to have minimal solid solubility in the liquid host metal.

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