【CLAIMS】

【Claim 1】

A plasma sprayed coating comprising a composite of a magnesium compound and an yttrium compound,

wherein the weight ratio of the yttrium compound to the magnesium compound in the composite is 1:9 to 9:1,

wherein the composite contains a monoclinic yttrium oxide, and

the monoclinic yttrium oxide constitutes the main phase of crystalline yttrium oxide.

【Claim 2】

The plasma sprayed coating of claim 1, wherein the yttrium compound further contains a cubic yttrium oxide.

【Claim 3】

The plasma sprayed coating of claim 1, wherein the composite comprises grains with an EBSD grain size of 250 nm or less.

【Claim 4】

The plasma sprayed coating of claim 1, wherein the composite comprises grains with an EBSD grain size of 100 nm or less.

【Claim 5】

The plasma sprayed coating of claim 1, wherein the composite further contains Al_2O_3.

【Claim 6】

The plasma sprayed coating of claim 1, wherein the yttrium compound includes YF_3.

【Claim 7】

The plasma sprayed coating of claim 1, wherein the yttrium compound includes Y-O-F.

【Claim 8】

A method for manufacturing a plasma sprayed coating, the method comprising:

(a) introducing a feedstock powder containing yttrium and magnesium sources into a plasma stream to melt at least a portion of the feedstock powder; and

(b) exposing a substrate to an atmospheric plasma stream containing the yttrium and magnesium sources to form a plasma sprayed coating containing a composite of a magnesium compound and an yttrium compound,

wherein the weight ratio of magnesium and yttrium, converted to MgO and Y_2O_3, is 1:9 to 9:1,

wherein the composite contains a monoclinic yttrium oxide, and

the monoclinic yttrium oxide constitutes the main phase of crystalline yttrium oxide.

【Claim 9】

The method of claim 8, wherein in step (a), the yttrium and magnesium sources are composed of a mixture of yttrium oxide and magnesium oxide.

【Claim 10】

The method of claim 9, wherein the yttrium and magnesium sources contain cubic yttria.

【Claim 11】

The method of claim 8, wherein the yttrium compound further contains a cubic yttrium oxide.