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CASTING METHOD OF TiAl ALLOY

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- **Patent Assignee**
  IHI
- **Inventor**
  SATO SHIGEMASA
  SEKIGUCHI TATSUYA

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- **Fampat family**

JP2015205325	A	2015-11-19	[JP2015205325]

- **Abstract:**
  (JP2015205325)
  PROBLEM TO BE SOLVED: To provide a casting method of a TiAl alloy, capable of suppressing breaking and crack of a TiAl alloy casting product.SOLUTION: The casting method of the TiAl alloy comprises a casting step (S10) for pouring TiAl alloy molten metal into a casting mold for casting, and a cooling step (S12) for cooling and solidifying the TiAl alloy molten metal casted in the casting mold, in which, in the cooling step (S12), cooling speed of the casting mold surface is set to become larger than 0°C/minute and less than 20°C/minute when the casting mold surface temperature is in a range of 1100-1000°C.

Claims

(JP2015205325)

Claims machine translated from Japanese

1. Being casting method of the TiAl alloy,

The note hot water doing the TiAl alloy *** hot water in the mold, the cast process which casts and,

Cooling the TiAl alloy *** hot water which was cast to the aforementioned mold, the cooling process which it solidifies and,

Having,

In the aforementioned cooling process, cooling rate of the mold surface, mold surface temperature from the 1100.deg.C between to the 1000.deg.C, to be larger than 0.deg.C/amount casting method of the TiAl alloy which features that it makes under 20.deg.C/amount.

2. Being casting method of TiAl alloying the statement in claim 1,

In the aforementioned cooling process, the aforementioned mold surface temperature between to the 1000.deg.C, being true aerial from the 1100.deg.C, casting method of the TiAl alloy which features that it cools the TiAl alloy casting which was cast to the aforementioned mold.

3. Being casting method of TiAl alloying the statement in claim 1,

In the aforementioned cooling process, the aforementioned mold surface temperature from the 1100.deg.C between to the 1000.deg.C, the TiAl alloy casting which was cast to the aforementioned mold, being overturned in the container which was formed with the metallic materials or the inorganic material, casting method of the TiAl alloy which features that it cools.

4. Being casting method of TiAl alloying the statement in claim 1,

In the aforementioned cooling process, the aforementioned mold surface temperature from the 1100.deg.C between to the 1000.deg.C, casting method of the TiAl alloy which features that the TiAl alloy casting which was cast to the aforementioned mold, is cooled inside the furnace.

5. From claim 1 either of 4 being casting method of TiAl alloying the statement in one,

The mold itself which possesses the cavity where the aforementioned mold is formed at the possession bottom, the aforementioned TiAl alloy *** hot water the note hot water is done having,

As for the aforementioned mold itself,

The backup layer where it is provided on cavity side, oxidation cerium, includes at least one of oxidation yttrium and the zirconia, is laminated by resistance reactivity layer and the aforementioned resistance reactivity layer which control the reaction with the aforementioned TiAl alloy *** hot water, is formed with the refractory material and, casting method of the TiAl alloy which features that it has possessed.

CASTING MOLD, PROCESS FOR PRODUCING SAME, AND Ti-Al ALLOY CAST PRODUCT AND PROCESS FOR PRODUCING SAME

WO2015146266

- **Patent Assignee**
  IHI
- **Inventor**
  SATOH SHIGEYUKI
  SEKIGUCHI TATSUYA

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- **Fampat family**

WO2015146266	A1	2015-10-01	[WO2015146266]

- **Abstract:**
  (WO2015146266)
  A casting mold (10) for Ti-Al alloy casting which includes a casting mold main body (14) having a bottom and a cavity (12) into which a Ti-Al alloy melt is poured, the casting mold main body (14) comprising: an unreactive layer (16) which has been disposed on the cavity side and is constituted of a refractory material containing at least one of cerium oxide, yttrium oxide, and zirconium oxide, and which inhibits a reaction with the Ti-Al alloy melt; and a backup layer (18) formed on the unreactive layer (16). The backup layer (18) comprises: a weakening layer (18a) which is constituted of a refractory material comprising 80 -100 mass% silica material that contains 26-34 mass% cristobalite, with the remainder comprising fused silica, and which lowers the strength of the casting mold; and a shape-retention layer (18b) which is constituted of a refractory material and retains the shape of the casting mold.

Claims

(WO2015146266)

Claims machine translated from Japanese

1. Being the mold which casts the TiAl alloy,

The mold itself which possesses the cavity which is formed at the possession bottom, the TiAl alloy *** hot water the note hot water is done having,

As for the aforementioned mold itself,

The resistance reactivity layer where it is provided on cavity side, oxidation cerium, is formed with oxidation yttrium and the refractory material which includes at least one of the zirconia, controls the reaction with the aforementioned TiAl alloy *** hot water and,

The backup layer which is formed on the aforementioned resistance reactivity layer and, possessing,

As for the aforementioned backup layer,

The weak conversion layer where 26 mass % or more 34 mass % it includes the cristobalite below, the silica material where the remainder consists of the melted silica, 80 mass % or more 100 mass % below is formed with the refractory material which is contained, decreases mold strength and,

The automorphic layer which is formed with refractory material, keeps mold form and, the mold which features that it possesses.

2. Being the mold of statement in claim 1,

As for the refractory material which forms the aforementioned weak conversion layer, the aforementioned silica material 90 mass % or more 100 mass % below the mold which features that it contains.

3. Being the mold of statement in claim 2,

As for the refractory material which forms the aforementioned weak conversion layer, the mold which features that it consists of the aforementioned silica material.

4. From claim 1 either of 3 being the mold of statement in one,

As for the aforementioned weak conversion layer, the mold which features that it is formed to just above of the aforementioned resistance reactivity layer.

5. Being production method of the mold which casts the TiAl alloy,

The low type model in order to form the mold itself which possesses the cavity which is formed at the possession bottom, the TiAl alloy *** hot water the note hot water is done the low die forming process which forms and,

In the aforementioned low type model, oxidation cerium, the resistance reactivity slurry which mixes with oxidation yttrium and the refractory material particle and the binder which include at least one of the zirconia coating is done, oxidation cerium, the resistance reactivity stucco material which consists of oxidation yttrium and the refractory material particle which includes at least one of the zirconia the stucco is processed, the resistance reactivity slurry layer formation process which resistance reactivity slurry layer is formed and,

With respect to the aforementioned resistance reactivity slurry layer, the backup slurry layer formation process which forms backup slurry layer and,

Heating the low type model which formed with the aforementioned resistance reactivity slurry layer and the aforementioned backup slurry layer, the deviation from low process which deviation from low it does, the mold compact forms and,

Heating the aforementioned mold compact below the 1100.deg.C above the 1000.deg.C, the calcination process which calcines and,

Having,

As for the aforementioned backup slurry layer formation process,

The melted silica 80 mass % or more 100 mass % below the refractory material particle which is contained and the weak conversion slurry which is mixed with the binder, coating are done, the melted silica 80 mass % or more 100 mass % below the weak conversion stucco material which consists of the refractory material particle which is contained the stucco is processed and weak conversion slurry layer is formed,

The stucco processing the automorphic slurry which mixes with the refractory material particle and the binder and the automorphic stucco material which consists of the refractory material particle, forming automorphic slurry layer, production method of the mold which features that it forms the aforementioned backup slurry layer.

6. Being production method of the mold of statement in claim 5,

In aforementioned backup slurry layer formation process, production method of the mold which features that aforementioned weak conversion slurry layer the melted silica 90 mass % or more 100 mass % below coating does the refractory material particle which is contained and the weak conversion slurry which is mixed with the binder, the melted silica 90 mass % or more 100 mass % below the stucco processes the weak conversion stucco material which consists of the refractory material particle which is contained is formed.

7. Being production method of the mold of statement in claim 6,

In the aforementioned backup slurry layer formation process, the stucco processing the weak conversion stucco material of the refractory material particle where the aforementioned weak conversion slurry layer coating does the refractory material particle which consists of the melted silica and the weak conversion slurry which is mixed with the binder, consists of the melted silica, production method of the mold which features that it is formed.

8. From claim 5 either of 7 being production method of the mold of statement in one,

In the aforementioned backup slurry layer formation process, just above of the aforementioned resistance reactivity slurry layer, production method of the mold which features that the aforementioned weak conversion slurry layer is formed.

9. From claim 1 either of 4 the TiAl alloy casting which features that it is cast with the aforementioned mold of statement to one.

10. Casting method of the TiAl alloy casting which features that from claim 1 either of 4 in one from the 1100.deg.C it heats the aforementioned mold of statement to the 1300.deg.C, the note hot water does the TiAl alloy *** hot water inside the mold and

casts.

[chitanaruminaido] casting and its grain refining method
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- **Patent Assignee**
  IHI
- **Inventor**
  NISHIGORI SADAO
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JP2012097358	A	2012-05-24	[JP2012097358]
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- **Abstract:**
  (JP2012097358)
  PROBLEM TO BE SOLVED: To provide a cast article of titanium aluminide, which has fine crystal grains in the metal structure and is superior in both creep property and fatigue characteristics, and provide a crystal-grain refining method therefor. SOLUTION: The cast article of titanium aluminide including both Fe and V has a chemcal composition of 46 to 50 atom% of Al, 5 atom% or less of both the elements of Fe and V in total (wherein the content of Fe is 17.5-0.3x atom% or less (x:the content of Al)), 0.1 to 0.4 atom% of C, balance Ti and inevitable impurities, the average crystal powder size of the metal structure is 50 to 300 m, and the average powder size of C-group deposetted matter depossitted in the metal structure is 1 m or less. COPYRIGHT: (C)2012,JPO&INPIT

Claims

(JP2012097358)

Claims machine translated from Japanese

1. Contains Fe and V both parties in the [chitanaruminaido] casting which, chemical composition,
Al: 46-50 atmoic %,
Fe and V both elements at gross 5 atmoic % below (however, as for the content of Fe 17.5-0.3x atmoic % below (x: The content of Al)),
C: 0.1-0.4 atmoic %,
Remainder: It is Ti and the inevitable impurity,
Average crystal grain size of metallographic structure 50-300 .micro.m, during metallographic structure the [chitanaruminaido] casting which features that mean diameter of C basic deposit which is precipitated is 1 .micro.m or less.
2. In claim 1 as the [chitanaruminaido] casting of statement after casting the alloy *** hot water of the same chemical composition inside the die, the occasion where that casting body is cooled, in the temperature limits of the 1500-1100.deg.C, grain refining method of the [chitanaruminaido] casting which features that it cools at the cooling rate of 150-250.deg.C/min.