

Patrick Delaborde

De: Raymond Allier
Envoyé: lundi 27 janvier 2014 18:30
À: Paul Morgen
Cc: Patrick Delaborde
Objet: TR: New ti alloy
Pièces jointes: Fe segregation in Ti 10-2-3 alloy .pdf

Catégories: En Copie

Paul,

Voici le 1^{er} retour d'Alec MITCHELL sur l'élaboration du Ti 10.2.3.

Sa première remarque concerne la dimension des lingots à élaborer pour limiter la ségrégation. Je vais reboucler avec Philippe sur ce retour.

Bonne soirée.

Raymond ALLIER.

De : Mitchell, Alec [<mailto:alecm@mail.ubc.ca>]

Envoyé : jeudi 23 janvier 2014 23:23

À : Raymond Allier

Cc : Philippe Heritier

Objet : RE: New ti alloy

Dear Raymond,

10-2-3 is used as a structural alloy and so isn't under the same scrutiny for hard alpha as are the rotating part alloys. The problem with the alloy is that it segregates very severely on solidification (see attached paper) and the increased local iron content leads to the beta fleck defect. All melters have great difficulties to make this alloy, particularly in diameters greater than 500mm. The VAR diameter you propose is right at the edge of "possible" and will probably mean melting in quite short ingots in order to preserve the cooling effect of the base. I think a better route would be to develop a PAR-only strategy since the ingot cooling rates are higher. If this route is not possible (from specifications) then you might consider VAR at a smaller diameter followed by upsetting in order to have enough mechanical working in the alloy at the large diameter of the finished product?

As a further point for consideration, the very low melting rates required for this type of alloy mean that it is possible to use the "drip-short" method of VAR melt control as in the superalloys. (When melting the simpler alloys such as 6/4 the high current conditions mean that there are no drip-shorts and we cannot use this technique for control and have to use only voltage, current and melt-rate as the control parameters). It would be worthwhile to include this possibility in the VAR specification for at least one furnace.

I'd appreciate your thoughts on the above - I'll get back to you with some detail suggestions on your proposed process schedule,

Dr A Mitchell
Professor Emeritus
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From: raymond.allier@eramet-aubertduval.com [raymond.allier@eramet-aubertduval.com]

Sent: Wednesday, January 22, 2014 9:29 AM

To: Mitchell, Alec

Cc: philippe.heritier@eramet-aubertduval.com

Subject: New ti alloy

Dear Professor MITCHELL,

I come back to you in order to have your comments on our first ideas for 10.2.3 production.

In the file enclosed, you will find the process route proposed : could you give up your feedback.

With Henri POISSON, the first question we would like to ask you is : for you, what are the issues with this alloy (from the turnings and scrap preparation to the ingot homogenization)?

In advance, thank you for your advice.

Cordialement

Raymond ALLIER

Chef de Projet Elaboration

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