

Title (en)

Austenitic heat resistant alloy with improved castability and transformation, method of making steel slabs and wires

Title (de)

Austenitische hitzebeständige Legierung mit verbesserter Vergießbarkeit und Transformation, Verfahren zur Herstellung von Brammen und Drähten

Title (fr)

Alliage austénitique pour tenue à chaud à coulabilité et transformation améliorées, procédé de fabrication de billettes et de fils

Publication

EP 1312691 A1 20030521 (FR)

Application

EP 02292531 A 20021015

Priority

FR 0114818 A 20011116

Abstract (en)

An austenitic alloy with improved hot casting and transformation behavior has a defined composition, which also satisfies two relationships between its component elements. <?>An austenitic alloy with improved hot casting and transformation behavior has a defined composition, which also satisfies the two following relationships between its component elements: <?>(a) in relation with the mode of solidification: <?>(b) balance $a = \text{eq Nia} - 0.5 \times \text{eq Cra}$ is less than 3.6 where: <?>(c) $\text{eq Cra} = \text{Cr} + 0.7 \times \text{Si} + 0.2 \times \text{Mn} + 1.37 \times \text{Mo} + 3 \times \text{Ti} + 6 \times \text{Al} = 4 \times \text{V}$ and where: <?>(d) $\text{eq Nia} = \text{Ni} + 22 \times \text{C} + 0.5 \times \text{Cu}$; <?>(e) in relation to the residual ferrite content; <?>(f) balance $b = \text{eq Nib} - 2 \times \text{eq Crb}$ is greater than - 41 where: <?>(g) $\text{eq Crb} = \text{Cr} + 0.7 \times \text{Si} + 1.37 \times \text{Mo} + 3 \times \text{Ti} + 6 \times \text{Al} + 4 \times \text{V}$, and where: <?>(h) $\text{eq Nib} = \text{Ni} + 22 \times \text{C} + 0.5 \times \text{Cu} + 0.5 \times \text{Mn}$. <?>Independent claims are also included for the following: <?>(a) the fabrication of a billet from this austenitic alloy; <?>(b) the fabrication of a wire from this austenitic alloy; <?>(c) the fabrication of bar from this austenitic alloy; <?>(d) an austenitic alloy piece able to be machined or hot or cold shaped or knitted from such a billet, wire or bar. <?>The composition of the austenitic alloy is, by wt: <?>(a) carbon : 0.010 - 0.04%; <?>(b) nitrogen : 0 - 0.01%; <?>(c) silicon less than 2%; <?>(d) nickel : 16 - 19.9%; <?>(e) manganese less than 8%; <?>(f) chromium : 18.1 - 21%; <?>(g) titanium : 1.8 - 3%; <?>(h) molybdenum less than 3%; <?>(i) copper less than 3%; <?>(j) aluminum less than 1.5%; <?>(k) boron less than 0.01%; <?>(l) vanadium less than 2%; <?>(m) sulfur less than 0.2%; <?>(n) phosphorus less than 0.4%; <?>(o) up to 0.5% at least of an element chosen from yttrium, cerium, lanthanum and other rare earth metals; <?>(p) the remainder being iron and production and deoxidization impurities.

Abstract (fr)

Alliage austénitique pour tenue à chaud à coulabilité et transformation améliorées dont la composition comprend, en % en poids : 0,010% < carbone < 0,04%, 0% < azote < 0,01%, silicium < 2%, 16% < nickel < 19,9%, manganèse < 8%, 18,1% < chrome < 21%, 1,8% < titane < 3%, molybdène < 3%, cuivre < 3%, aluminium < 1,5%, bore < 0,01%, vanadium < 2%, soufre < 0,2%, phosphore < 0,04% et éventuellement jusqu'à 0,5% d'au moins un élément choisi parmi l'yttrium, le cérium, le lanthane et les autres terres rares, le reste étant du fer et des impuretés résultants de l'élaboration ou de la désoxydation, ladite composition satisfaisant en outre les deux relations suivantes : en relation avec le mode de solidification : reliquat $a = \text{eq Nia} - 0,5 \times \text{eq Cra} < 3,60$ où, $\text{eq Cra} = \text{Cr} + 0,7 \times \text{Si} + 0,2 \times \text{Mn} + 1,37 \times \text{Mo} + 3 \times \text{Ti} + 6 \times \text{Al} + 4 \times \text{V}$, et où, $\text{eq Nia} = \text{Ni} + 22 \times \text{C} + 0,5 \times \text{Cu}$, en relation avec le taux de ferrite résiduel : reliquat $b = \text{eq Nib} - 2 \times \text{eq Crb} > - 41$ où, $\text{eq Crb} = \text{Cr} + 0,7 \times \text{Si} + 1,37 \times \text{Mo} + 3 \times \text{Ti} + 6 \times \text{Al} + 4 \times \text{V}$, et où, $\text{eq Nib} = \text{Ni} + 22 \times \text{C} + 0,5 \times \text{Cu} + 0,5 \times \text{Mn}$.

IPC 1-7

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