

Title (en)  
Austenitic iron-nickel-chromium-copper alloy

Title (de)  
Austenitische Eisen-Nickel-Chrom-Kupfer-Legierung

Title (fr)  
Alliage austénitique fer-nickel-chrome-cuivre

Publication  
**EP 1975269 A1 20081001 (FR)**

Application  
**EP 07290382 A 20070330**

Priority  
EP 07290382 A 20070330

Abstract (en)

Austenitic alloy of iron-nickel-chromium-copper composition, comprises: nickel (Ni) (= 36%); chromium (Cr) ( $\geq 0.02\%$ ); copper (Cu) ( $\geq 0.1\%$ ); mixture of copper and cobalt (Co) (= 15%); manganese (Mn) (0.02-2%); mixture of aluminum (Al) and titanium (Ti) (0-3%); carbon (C) (0-2%); mixture of vanadium (V) and tungsten (W) (0-6%); mixture of niobium (Nb) and zirconium (Zr) (0-0.5%); molybdenum (Mo) (0-8%); tin (Sn) (= 1%); boron (B) (0-0.006%); mixture of sulfur (S), selenium (Se) and antimony (Sb) (= 0.008%); and mixture of calcium (Ca) and magnesium (Mg) (0-0.020%). Austenitic alloy of iron-nickel-chromium-copper composition, comprises: nickel (Ni) (= 36%); chromium (Cr) ( $\geq 0.02\%$ ); copper (Cu) ( $\geq 0.1\%$ ); mixture of copper and cobalt (Co) (= 15%); manganese (Mn) (0.02-2%); mixture of aluminum (Al) and titanium (Ti) (0-3%); carbon (C) (0-2%); mixture of vanadium (V) and tungsten (W) (0-6%); mixture of niobium (Nb) and zirconium (Zr) (0-0.5%); molybdenum (Mo) (0-8%); tin (Sn) (= 1%); boron (B) (0-0.006%); mixture of sulfur (S), selenium (Se) and antimony (Sb) (= 0.008%); and mixture of calcium (Ca) and magnesium (Mg) (0-0.020%). Where: the rest is iron and the impurities resulting from the elaboration, the percentages in Ni, Cr, Cu and Co alloy satisfying the following conditions: Co is less than Cu; Co is less than 4%, if Cr is greater than 7.5%;  $Ni + 1.2Cr + (Cu/5)$  (I) is greater than 28%; and Cr is 7.5%, if Ni is greater than 32.5%; and the manganese content satisfying the following conditions if  $6Ni - 2.5X + 4(Cu + Co)$  (III) (where X is  $Cr + V + W + \text{silicon (Si)} + Al$ )  $\geq 205$ ,  $Mn = Ni - 27.5 + Cu - Cr$ , if  $180.5 = (III) = 205$ ,  $Mn = 4\%$ , and if  $(III) = 180.5$ ,  $Mn = 2\%$ . Independent claims are included for: (1) an electromagnetic device with self-regulation of temperature comprising the alloy; (2) a device with self-regulation of magnetic flux comprising the alloy; (3) a device with controlled dilation comprising the alloy; (4) current sensors, measurement transformers or magneto-harmonic sensor comprising the alloy; (5) electromagnetic motors and actuators comprising the alloy; (6) stators for horology engines comprising the alloy; (7) inductors or transformers for power electronics comprising the alloy; (8) bimetals comprising the alloy; (9) coil layer of horology engines or high sensitive electromagnetic relay comprising the alloy; and (10) temperature measurement devices or temperature marking devices, without contact, comprising the alloy; and (11) hypertextured substrates for epitaxy comprising the alloy.

Abstract (fr)

L'invention concerne un alliage austénitique fer-nickel-chrome-cuivre dont la composition comprend en % en poids : Ni # 36 % Cr # 0,02 % Cr  $\geq 0,1\%$  Cu + Co # 15 % 0,01 % Mn # 6 % 0,02 % Si # 2 % 0 % Al + Ti # 3 % 0 % C # 2 % 0 % V + W # 6 % 0 % Nb + Zr # 0,5 % 0 % Mo # 8 % Sn # 1 % 0 % B # 0,006 % 0 % S + Se + Sb # 0,008 % 0 % Ca + Mg # 0,020 % le reste étant du fer et des impuretés résultant de l'élaboration, les pourcentages en nickel, chrome, cuivre, cobalt étant tels que l'alliage satisfait en outre les conditions suivantes :  $Co < Cu$   $Co < 4\%$  si  $Cr > 7,5\%$   $Eq \# 1 > 28\%$  avec  $Eq \# 1 = Ni + 1,2 \# Cr + Cu / 5$   $Cr < 7,5\%$  si  $Ni > 32,5\%$ , et la teneur en manganèse respectant en outre les conditions suivantes : - si  $Eq3 \# 205$ , #####Mn # Ni - 27,5 + Cu - Cr - si 180,5 #  $Eq3 \# 205$ , #####Mn # 4% - si  $Eq3 \# 180,5$ , #####Mn # 2% avec  $Eq \# 3 = 6 \# Cr - 2,5 \# X + 4 \# Cu + Co$  et  $X = Cr + Mo + V + W + Si + Al$

IPC 8 full level

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CPC (source: EP KR US)

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