

Title (en)

METHOD FOR PRODUCING HIGH-STRENGTH STEELS HAVING HIGH IMPACT ENERGY ABSORPTION PROPERTIES

Title (de)

VERFAHREN ZUR HERSTELLUNG VON HOCHFESTEN STÄHLEN MIT HOHEN AUFPRALLENERGIE-ABSORPTIONSEIGENSCHAFTEN

Title (fr)

PROCEDE DE FABRICATION D'ACIERS À HAUTE RESISTANCE MÉCANIQUE AYANT UNE HAUTE CAPACITE D'ABSORPTION D'ENERGIE DE CHOCK

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Application

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Abstract (en)

The object of the present invention is to provide high-strength steel sheets exhibiting high impact energy absorption properties, as steel materials, to be used for shaping and working into such parts as front side members of automobiles which absorb impact energy upon collision, as well as a method for their production. The high-strength steel sheets of the invention which exhibit high impact energy absorption properties are high-strength steel sheets with high flow stress during dynamic deformation characterized in that the microstructure of the steel sheets in their final form is a composite microstructure of a mixture of ferrite and/or bainite, either of which is the dominant phase, and a third phase including retained austenite at a volume fraction between 3% and 50%, wherein the average value σ_{dyn} (MPa) of the flow stress in the range of 3 SIMILAR 10% of equivalent strain when deformed in a strain rate range of 5×10^{-2} SIMILAR 5×10^{-3} (1/sec) after pre-deformation of greater than 0% and less than or equal to 10% of equivalent strain, satisfies the inequality: $\sigma_{dyn} \geq 0.766 \times TS + 250$ as expressed in terms of the maximum stress TS (MPa) in the static tensile test as measured in a strain rate range of 5×10^{-4} SIMILAR 5×10^{-3} (1/s) without deformation, and the work hardening coefficient between 1% and 5% of a strain is at least 0.080. <IMAGE>

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Cited by

EP2060646A4; EP1207213A4; EP1391526A3; EP1382702A1; DE102005003551A1; DE102005003551B4; EP2312008A1; EP0974677A4; FR2830260A1; EP1857562A4; EP1398390A1; EP1870482A4; US6692584B2; US9074272B2; US9194015B2; US7553380B2; US7008488B2; WO2005116283A1; WO2011120550A1; EP3390040B2

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