

Title (en)  
METHOD OF PRODUCING COLD-ROLLED STEEL SHEET AS WELL AS COLD-ROLLED STEEL SHEET AND MEMBERS FOR AUTOMOBILE

Title (de)  
VERFAHREN ZUR HERSTELLUNG EINES KALTGEWALZTEN STAHLBLECHS, KALTGEWALZTES STAHLBLECH UND FAHRZEUGTEIL

Title (fr)  
PROCÉDÉ DE PRODUCTION D'UNE TÔLE D'ACIER LAMINÉE À FROID, TÔLE D'ACIER LAMINÉE À FROID, ET ÉLÉMENT VÉHICULE

Publication  
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Application  
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Abstract (en)  
This invention provides a method of producing a cold-rolled steel sheet being excellent in not only the phosphate treatability but also the corrosion resistance after coating under severe corrosion environment such as hot salt water immersion test or composite cycle corrosion test, wherein a continuously annealed steel sheet after cold rolling is pickled with a mixture of nitric acid and hydrochloric acid having a nitric acid concentration of more than 100 g/L but not more than 200 g/L and a ratio R (HCl/HNO<sub>3</sub>) of hydrochloric acid concentration to nitric acid concentration of 0.01-0.25 to remove Si-containing oxide formed on the steel sheet surface by continuous annealing, and a ratio of covering the surface of the steel sheet with an iron-based oxide formed by the pickling is not more than 85% and preferably a maximum thickness of the iron-based oxide existing on the surface of the steel sheet is not more than 200 nm, as well as a cold-rolled steel sheet produced by this method and a member for automobile using the cold-rolled steel sheet.

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Cited by  
EP3604616A4; EP3321394A4; EP2821515A4; EP3399064A4; US11008635B2; EP3190211A4; EP3418417A4; US10174430B2; US11085099B2

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