

Title (en)  
COLD REDUCED NON-AGING DEEP DRAWING STEEL AND METHOD FOR PRODUCING

Publication  
**EP 0510249 A3 19930908 (EN)**

Application  
**EP 91114828 A 19910903**

Priority  
• US 69014291 A 19910423  
• US 72096691 A 19910625

Abstract (en)  
[origin: EP0510249A2] A cold reduced, non-aging, aluminum killed steel characterized by an elongated grain structure and having an rm value at least 1.8 produced from a slab having a reduced hot rolling temperature. A slab consisting essentially of  $\leq 0.08\%$  carbon,  $\leq 0.1\%$  acid sol. aluminum,  $\leq 0.2\%$  manganese, all percentages by weight, the balance iron and unavoidable impurities, is hot rolled to a sheet from a temperature less than 1260 DEG C. Preferably, the slab is continuously cast from a melt consisting essentially of 0.03-0.08% acid sol. aluminum, 0.003-0.007% total nitrogen,  $< 0.20\%$  manganese, wherein % acid sol. aluminum x % total nitrogen is within the range of  $1 \times 10^{-4}$  to  $5 \times 10^{-4}$  and is hot rolled from a temperature of 1093-1175 DEG C. The hot rolled sheet is descaled, cold reduced, batch annealed and temper rolled. Preferably, the cold reduced sheet is annealed in the range of 538-649 DEG C and the temper rolled sheet has a tensile strength of 284.5-313.9 N/mm<sup>2</sup> (29-32 kg/mm<sup>2</sup>), a total elongation of at least 42% and an rm value of at least 2.0.

IPC 1-7  
**C21D 8/04**

IPC 8 full level  
**C21D 8/04** (2006.01)

CPC (source: EP)  
**C21D 8/0426** (2013.01)

Citation (search report)  
• [XD] US 4473411 A 19840925 - HOOK ROLLIN E [US], et al  
• [AD] US 4145235 A 19790320 - GONDO HISASHI, et al  
• [AD] US 4478649 A 19841023 - AKISUE OSAMU [JP], et al  
• [AD] US 4698102 A 19871006 - MARUOKA KUNIAKI [JP], et al  
• [AD] US 4116729 A 19780926 - KATOH HIROSHI, et al  
• [AD] US 4627881 A 19861209 - KAWANO TSUYOSHI [JP], et al  
• [AD] US 3798076 A 19740319 - SUEMUNE K, et al  
• [AD] US 3959029 A 19760525 - MATSUDO KAZUO, et al  
• [A] ISIJ INTERNATIONAL, vol. 30, no. 9, 1990, TOKYO,JP pages 764 - 772 K.USHIODA ET AL.

Designated contracting state (EPC)  
AT BE DE ES FR GB IT NL SE

DOCDB simple family (publication)  
**EP 0510249 A2 19921028; EP 0510249 A3 19930908; EP 0510249 B1 20000308**; AT E190359 T1 20000315; DE 69132028 D1 20000413;  
DE 69132028 T2 20000928; ES 2144396 T3 20000616

DOCDB simple family (application)  
**EP 91114828 A 19910903**; AT 91114828 T 19910903; DE 69132028 T 19910903; ES 91114828 T 19910903