

Title (en)

Steel material having improved fatigue crack driving resistance and manufacturing process therefor

Title (de)

Stahl mit verbesserter Ermüdungsfestigkeit und Verfahren zur Herstellung

Title (fr)

Acier avec une resistance en fatigue ameliorée et methode de production

Publication

EP 1312690 B1 20060809 (EN)

Application

EP 02025246 A 20021112

Priority

- JP 2001349220 A 20011114
- JP 2002134471 A 20020509

Abstract (en)

[origin: EP1312690A1] The present invention provides a structural steel material and a manufacturing process therefor, which makes it possible to perform material design using a quantitative assessment of fatigue resistance in steel materials which undergo cyclic softening. The steel material according to the present invention has a cyclic softening parameter of at least 0.65 and at most 0.95, the cyclic softening parameter being represented by the ratio (σ_{15}/σ_1) of the stress at the maximum strain in the first cycle (σ_1) to that in the 15th cycle (σ_{15}) measured when a waveform of incremental and decremental cyclic loads is applied 15 times with a maximum tensile and compressive strain of ± 0.012 , a frequency of 0.5 Hz, and the number of waves to the maximum strain being 12. The structural steel material comprises C: 0.02-0.20%, Si: at most 0.60%, Mn: 0.50 - 2.0%, Al: 0.003 - 0.10%, and optionally a small amount of one or more elements of Cu, Ni, Cr, Mo, V, Nb, Ti, B, and Ca, and has a value of carbon equivalent, C_{eq} , represented by the following formula of from 0.28 - 0.65: $C_{eq} (\%) = C + Si/24 + Mn/6 + Ni/40 + Cr/5 + Mo/4 + V/14$. <IMAGE>

IPC 8 full level

C22C 38/04 (2006.01); **C21D 8/02** (2006.01); **C22C 38/00** (2006.01); **C22C 38/02** (2006.01); **C22C 38/06** (2006.01); **C22C 38/12** (2006.01); **C22C 38/14** (2006.01); **C22C 38/40** (2006.01); **C22C 38/42** (2006.01); **C22C 38/44** (2006.01); **C22C 38/46** (2006.01); **C22C 38/48** (2006.01); **C22C 38/50** (2006.01); **C22C 38/54** (2006.01)

CPC (source: EP KR)

C21D 8/0263 (2013.01 - EP); **C22C 38/002** (2013.01 - EP); **C22C 38/02** (2013.01 - EP); **C22C 38/04** (2013.01 - EP KR); **C22C 38/06** (2013.01 - EP); **C22C 38/12** (2013.01 - EP); **C22C 38/14** (2013.01 - EP)

Cited by

CN114993832A; RU2630721C1; CN113378385A; RU2633684C1; CN114411059A; RU2510424C1; RU2613269C2; CN102161148A; CN102127698A; WO2011150687A1; WO2012113118A1; WO2012113119A1

Designated contracting state (EPC)

DE FR GB IT SE

DOCDB simple family (publication)

EP 1312690 A1 20030521; **EP 1312690 B1 20060809**; CN 1165633 C 20040908; CN 1418978 A 20030521; DE 60213736 D1 20060921; DE 60213736 T2 20070816; KR 100545599 B1 20060125; KR 20030040150 A 20030522

DOCDB simple family (application)

EP 02025246 A 20021112; CN 02150567 A 20021114; DE 60213736 T 20021112; KR 20020070549 A 20021114