

Title (en)  
THICK STEEL PLATE HAVING EXCELLENT CRYOGENIC TOUGHNESS

Title (de)  
DICKE STAHLPLATTE MIT HERVORRAGENDER KRYOGENER ZÄHIGKEIT

Title (fr)  
PLAQUE D'ACIER ÉPAISSE AYANT UNE EXCELLENTE ENDURANCE CRYOGÉNIQUE

Publication  
**EP 3392361 A4 20190612 (EN)**

Application  
**EP 16875576 A 20161212**

Priority  
• JP 2015247748 A 20151218  
• JP 2016086863 W 20161212

Abstract (en)  
[origin: EP3392361A1] To provide a thick steel plate having excellent cryogenic toughness particularly in the C-direction when the minimum value of absorption energy satisfies 150 J or more, on the assumption that a tensile strength is 690 to 830 MPa, a yield strength is 590 MPa or more, and a brittle fracture rate is 10% or less when a Charpy impact test is performed at -196°C in a Ni steel having a Ni content of 5.50 to 7.50%. Disclosed is a thick steel plate having excellent cryogenic toughness, which satisfies a predetermined composition, wherein a volume fraction  $v$  of the residual austenite phase existing at -196°C is 4.0 to 12%, and a fracture unit configuration parameter  $M$  value represented by the following formula (1) satisfies 2.4 or more when  $t$  is a thickness of the thick steel plate. In the following formula (1),  $DI$  is a value calculated by the following formula (2) and  $[ ]$  represents the content (% by mass) of each element.  $M$  value =  $DI \times v^2 / t$   $DI = 1.16 \times C / 10 \times 0.5 \times 0.7 \times Si + 1 \times 1 + 3.33 \times Mn \times 1 + 0.35 \times Cu \times 1 + 0.36 \times Ni \times 1 + 2.16 \times Cr \times 1 + 3 \times Mo \times 1 + 1.75 \times V \times 1$

IPC 8 full level  
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Citation (search report)  
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