

Title (en)  
THICK STEEL PLATE

Title (de)  
DICKE STAHLPLATTE

Title (fr)  
PLAQUE D'ACIER ÉPAISSE

Publication  
**EP 3447162 A4 20191002 (EN)**

Application  
**EP 17786057 A 20170421**

Priority  
• JP 2016085147 A 20160421  
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• JP 2017016090 W 20170421

Abstract (en)  
[origin: EP3447162A1] A thick steel plate is provided that has a chemical composition comprising, by mass%, C: 0.01-0.20%, Si: 0.10-0.25%, Mn: 1.30-2.50%, P: 0.01% or less, S: 0.0010-0.0100%, Ti: 0.005-0.030%, Al: 0.003% or less, O: 0.0010-0.0050%, N: 0.0100% or less, Cu: 0-0.50%, Ni: 0-1.50%, Cr: 0-0.50%, Mo: 0-0.50%, V: 0-0.10%, Nb: 0-0.05%, and the balance: Fe and impurities, and which contains in the steel a composite inclusion in which MnS is present around a Ti oxide. An area fraction of MnS in a cross-section of the composite inclusion is 10% or more and less than 90%, the proportion which MnS accounts for in the peripheral length of the composite inclusion is 10% or more, and the number density of composite inclusions that have a grain diameter in a range of 0.5-5.0 µm is in a range of 10-100 per mm<sup>2</sup>. The thick steel plate exhibits excellent HAZ low-temperature properties during high heat input welding.

IPC 8 full level  
**C22C 38/00** (2006.01); **C21D 8/02** (2006.01); **C22C 38/02** (2006.01); **C22C 38/04** (2006.01); **C22C 38/06** (2006.01); **C22C 38/08** (2006.01); **C22C 38/14** (2006.01); **C22C 38/16** (2006.01); **C22C 38/18** (2006.01); **C22C 38/58** (2006.01)

CPC (source: EP KR)  
**C21D 8/0226** (2013.01 - EP); **C21D 8/0263** (2013.01 - EP); **C22C 38/001** (2013.01 - EP); **C22C 38/02** (2013.01 - EP KR); **C22C 38/04** (2013.01 - EP KR); **C22C 38/06** (2013.01 - EP); **C22C 38/08** (2013.01 - EP); **C22C 38/14** (2013.01 - EP KR); **C22C 38/16** (2013.01 - EP KR); **C22C 38/18** (2013.01 - EP)

Citation (search report)  
• [X] EP 2400041 A1 20111228 - NIPPON STEEL CORP [JP]  
• [X] JP H0543977 A 19930223 - NIPPON STEEL CORP  
• [X] JP H01191765 A 19890801 - NIPPON STEEL CORP  
• [X] JP 2008163455 A 20080717 - NIPPON STEEL CORP  
• [A] EP 1221493 A1 20020710 - NIPPON STEEL CORP [JP]  
• See references of WO 2017183720A1

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**EP 17786057 A 20170421**; CN 201780024463 A 20170421; JP 2017016090 W 20170421; KR 20187033428 A 20170421