

Title (en)  
MANUFACTURING METHOD FOR HIGH-STRENGTH STAINLESS STEEL SEAMLESS PIPE FOR USE AS OIL WELL PIPING

Title (de)  
HERSTELLUNGSVERFAHREN FÜR EIN NAHTLOSES ROHR AUS HOCHFESTEM ROSTFREIEM STAHL ZUR VERWENDUNG ALS ÖLBOHRROHR

Title (fr)  
PROCÉDÉ DE FABRICATION D'UN TUYAU SANS SOUDURE EN ACIER INOXYDABLE À HAUTE RÉSISTANCE DESTINÉ À ÊTRE UTILISÉ COMME TUYAUTERIE DE PUIITS DE PÉTROLE

Publication  
**EP 2857530 B1 20181212 (EN)**

Application  
**EP 13796392 A 20130530**

Priority  
• JP 2012125126 A 20120531  
• JP 2013003411 W 20130530

Abstract (en)  
[origin: EP2857530A1] Provided is a high-strength stainless steel tube for oil country tubular goods having a wall thickness of more than 25.4 mm and a high strength of a 110 ksi (758 MPa) grade yield stress or more with excellent toughness and excellent corrosion resistance. A steel material having a chemical composition containing, by mass%, C: 0.005% or more and 0.06% or less, Si: 0.05% or more and 0.5% or less, Mn: 0.2% or more and 1.8% or less, Cr: 15.5% or more and 18.0% or less, Ni: 1.5% or more and 5.0% or less, V: 0.02% or more and 0.2% or less, Al: 0.002% or more and 0.05% or less, N: 0.01% or more and 0.15% or less, O: 0.006% or less, and further containing one or more of Mo: 1.0% or more and 3.5% or less, W: 3.0% or less and Cu: 3.5% or less, in which the relational expressions  $Cr+0.65Ni+0.60Mo+0.30W+0.55Cu-20C\geq 19.5$  and  $Cr+Mo+0.50W+0.30Si-43.5C-0.4Mn-Ni-0.3Cu-9N\geq 11.5$  are satisfied, is made into a seamless steel tube by performing heating and hot rolling. The hot rolling is performed under conditions such that the total rolling reduction in a temperature range of 1100°C to 900°C is 30% or more. After the hot rolling has been performed, cooling is performed at a cooling rate equal to or more than an air-cooling rate, and, further, quenching-tempering is performed. With this method, a high-strength and high-toughness seamless steel tube having a strength of 110 ksi (758 MPa) or more and a toughness of 40 J or more in terms of vE- 10 despite having a thick wall and excellent corrosion resistance even in a high-temperature corrosion environment having a temperature of 230°C and containing CO<sub>2</sub> and Cl<sup>-</sup> can be stably manufactured.

IPC 8 full level  
**C21D 8/10** (2006.01); **C21D 9/08** (2006.01); **C22C 38/00** (2006.01); **C22C 38/58** (2006.01)

CPC (source: EP US)  
**C21D 8/10** (2013.01 - EP US); **C21D 8/105** (2013.01 - EP US); **C21D 9/08** (2013.01 - EP US); **C21D 9/085** (2013.01 - EP US); **C22C 38/001** (2013.01 - EP US); **C22C 38/002** (2013.01 - EP US); **C22C 38/02** (2013.01 - EP US); **C22C 38/04** (2013.01 - EP US); **C22C 38/06** (2013.01 - EP US); **C22C 38/42** (2013.01 - EP US); **C22C 38/44** (2013.01 - EP US); **C22C 38/46** (2013.01 - EP US); **C22C 38/48** (2013.01 - EP US); **C22C 38/50** (2013.01 - EP US); **C22C 38/54** (2013.01 - EP US); **C21D 2211/001** (2013.01 - EP US); **C21D 2211/005** (2013.01 - EP US); **C21D 2211/008** (2013.01 - EP US)

Citation (examination)  
EP 1662015 A1 20060531 - JFE STEEL CORP [JP]

Cited by  
EP3333276A4; EP2918697A4; US10151011B2

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)  
**EP 2857530 A1 20150408; EP 2857530 A4 20151104; EP 2857530 B1 20181212**; AU 2013268908 A1 20141120; AU 2013268908 B2 20160128; BR 112014029392 A2 20170627; BR 112014029392 B1 20190924; CA 2872342 A1 20131205; CA 2872342 C 20180717; CN 104379774 A 20150225; CN 104379774 B 20170426; ES 2708275 T3 20190409; IN 2395KON2014 A 20150501; JP 2013249516 A 20131212; JP 5488643 B2 20140514; RU 2584100 C1 20160520; US 2015101711 A1 20150416; WO 2013179667 A1 20131205

DOCDB simple family (application)  
**EP 13796392 A 20130530**; AU 2013268908 A 20130530; BR 112014029392 A 20130530; CA 2872342 A 20130530; CN 201380028317 A 20130530; ES 13796392 T 20130530; IN 2395KON2014 A 20141028; JP 2012125126 A 20120531; JP 2013003411 W 20130530; RU 2014153558 A 20130530; US 201314403731 A 20130530