

Title (en)
Bainitic steels with boron

Title (de)
Bainitstähle mit Bor

Title (fr)
Aciers bainitiques avec bore

Publication
EP 2287346 A1 20110223 (EN)

Application
EP 10166261 A 20100617

Priority
US 48661009 A 20090617

Abstract (en)
Steel compositions contain micro-alloying additions of boron and titanium, with yield strength of at least 100 ksi (690 MPa), excellent toughness and good weldability. Boron additions are used to increase hardenability. Strong nitride formers, such as titanium, may be added to the steel composition in order to prevent boron nitrides from forming. These compositions may be cooled from hot rolling in air or using accelerated cooling. After air cooling, the composition may be quenched or quenched and tempered. The compositions are suitable for high strength line pipes (for example, X100 in API 5L standard) and other applications.

IPC 8 full level
C21D 8/02 (2006.01); **C21D 1/18** (2006.01); **C21D 1/25** (2006.01); **C21D 8/10** (2006.01)

CPC (source: EP US)
C21D 1/18 (2013.01 - EP US); **C21D 1/25** (2013.01 - EP US); **C21D 8/0226** (2013.01 - 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); **C21D 2211/002** (2013.01 - EP US); **C21D 2211/008** (2013.01 - EP US)

Citation (search report)
• [A] US 2009010794 A1 20090108 - TURCONI GUSTAVO LOPEZ [AR], et al
• [A] EP 1008660 A1 20000614 - SUMITOMO METAL IND [JP]
• [A] EP 1914324 A1 20080423 - SUMITOMO METAL IND [JP]
• [A] WO 2009065432 A1 20090528 - TENARIS CONNECTIONS AG [LI], et al
• [A] US 4812182 A 19890314 - FANG HONGSHENG [CN], et al
• [A] HONG-SHENG FANG ET AL.: "The Developing Prospect of Air-cooled Bainitic Steels", INTERNATIONAL JOURNAL OF ISSI, vol. 2, no. 2, 1 February 2005 (2005-02-01), pages 9 - 18, XP002611497
• [A] "Corrosion 2001", part Paper 01077 16 March 2001, NACE INTERNATIONAL, Houston, Texas, article G.L.TURCONI ET AL.: "Improvement of resistance to SSC initiation and propagation of high strength OCTG through microstructure and precipitation control", pages: 1 - 15, XP009141583
• [AP] G. GOMEZ ET AL.: "Air cooled bainitic steels for strong, seamless pipes - Part 1 -alloy design, kinetics and microstructure", MATERIALS SCIENCE AND TECHNOLOGY, vol. 25, no. 12, 1 December 2009 (2009-12-01), pages 1501 - 1507, XP002611498

Cited by
CN111876696A; CN103451550A; NL2032426B1; WO2024008920A1

Designated contracting state (EPC)
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Designated extension state (EPC)
BA ME RS

DOCDB simple family (publication)
US 2010319814 A1 20101223; AR 077129 A1 20110803; BR PI1004267 A2 20120320; BR PI1004267 B1 20201222; EP 2287346 A1 20110223; EP 2287346 B1 20191218; JP 2011006790 A 20110113; JP 5787492 B2 20150930; MX 2010006761 A 20101222

DOCDB simple family (application)
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