



## SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application number:  
EP 16 78 01 04

### Classification of the application (IPC):

C22C 38/00, C22C 38/60, B21B 1/26, C21D 9/46, C22C 38/28, C21D 6/00,  
C21D 8/02, C22C 38/08, C22C 38/12, C22C 38/16, C22C 38/14, C22C 38/32,  
C22C 38/34, C22C 38/02, C22C 38/06, C22C 38/38

### Technical fields searched (IPC):

C22C, C21D

DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
E	EP 3239343 A1 (POSCO [KR]) 01 November 2017 (2017-11-01) * paragraphs [0035], [0038] - [0041], [0049], [0051], [0056]; claims 1,4; tables 1,2 *	1-3, 9, 11, 14-17
X	<b>ZHANG Z T ET AL:</b> "Investigation of the Effect of Alloying Elements and Water Vapor Contents on the Oxidation and Decarburization of Transformation-Induced Plasticity Steels" <i>METALLURGICAL AND MATERIALS TRANSACTIONS B</i> , SPRINGER-VERLAG, NEW YORK, 03 July 2009 (2009-07-03), vol. 40, no. 4, DOI: 10.1007/S11663-009-9255-X, ISSN: 1543-1916, pages 567-584, XP019735138 * pages 567, 568; figures 1, 6; tables 1,2 *	1, 7, 8, 11, 12, 14
X	WO 2015015739 A1 (JFE STEEL CORP [JP]) 05 February 2015 (2015-02-05) * claims 1,4-6,8,13; tables 1-3 *	1-8, 11-13, 15, 17
X	JP 2013060657 A (JFE STEEL CORP) 04 April 2013 (2013-04-04) * paragraphs [0024], [0030] - [0032], [0037]; claims 1,2; tables 1-3 *	1-3, 9, 16, 17
X	EP 2660345 A2 (POSCO [KR]) 06 November 2013 (2013-11-06) * paragraphs [0039], [0040], [0052]; claims 1-3,7,10; tables 1-3 *	1-4, 6, 9, 16, 17
X	US 2011064968 A1 (KIM SUNG-IL [KR] ET AL) 17 March 2011 (2011-03-17) * paragraphs [0030] - [0034], [0036]; claims 1,2,6,8; tables 1,2 *	1-3, 10, 17

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

Place of search The Hague	Date of completion of the search 09 November 2018	Examiner Rausch, Elisabeth
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### CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone	P: intermediate document
Y: particularly relevant if combined with another document of the same category	T: theory or principle underlying the invention
A: technological background	E: earlier patent document, but published on, or after the filing date
O: non-written disclosure	D: document cited in the application
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### LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 8, 12, 13, 15

Hot rolled steel sheet having a microstructure comprising 75% or more ferrite and pearlite and a tensile strength of 800 MPa or less and manufacturing method thereof.

2. claims: 9, 16

Hot rolled steel sheet having a microstructure comprising 75% or more bainite and martensite and a tensile strength of 900 MPa or more and manufacturing method thereof.

3. claims: 10, 17

Hot rolled steel sheet having a microstructure comprising 75% or more bainite and martensite and a tensile strength of 800 MPa or less and manufacturing method thereof.

All further search fees have been paid within the fixed time limit. The present (supplementary) European search report has been drawn up for all claims.

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

Place of search The Hague	Date of completion of the search 09 November 2018	Examiner Rausch, Elisabeth
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X: particularly relevant if taken alone	P: intermediate document
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A: technological background	E: earlier patent document, but published on, or after the filing date
O: non-written disclosure	D: document cited in the application
& : member of the same patent family, corresponding document	L: document cited for other reasons

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## ANNEX TO SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application number:  
EP 16 78 01 04

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on 09-11-2018  
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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 3239343	A1	01-11-2017	CN 107109582 A	29-08-2017
			EP 3239343 A1	01-11-2017
			JP 2018505963 A	01-03-2018
			KR 20160077567 A	04-07-2016
			US 2018002790 A1	04-01-2018
			WO 2016105115 A1	30-06-2016
WO2015015739	A1	05-02-2015	CN 105473749 A	06-04-2016
			EP 2998416 A1	23-03-2016
			JP 5800098 B2	28-10-2015
			JP WO2015015739 A1	02-03-2017
			KR 20160014687 A	11-02-2016
			US 2016186283 A1	30-06-2016
JP 2013060657	A	04-04-2013	JP 6047983 B2	21-12-2016
			JP 2013060657 A	04-04-2013
EP 2660345	A2	06-11-2013	CN 103392022 A	13-11-2013
			EP 2660345 A2	06-11-2013
			JP 5879364 B2	08-03-2016
			JP 2014508854 A	10-04-2014
			KR 20120073407 A	05-07-2012
			US 2013295402 A1	07-11-2013
US 2011064968	A1	17-03-2011	JP 5456026 B2	26-03-2014
			JP 2011523443 A	11-08-2011
			KR 20090124264 A	03-12-2009
			US 2011064968 A1	17-03-2011
			WO 2009145562 A2	03-12-2009