Inv. No. 337-TA-1402

March 3, 2025

Before the Honorable Monica Bhattacharyya, Administrative Law Judge

In The Matter Of

Certain High-strength Aluminum Or Aluminum-alloy Coated Steel, And Automotive Products And Automobiles Containing Same

Complainant's Opening Statement

ArcelorMittal

CDX–0001C.1

Roadmap

1) Technology at issue and ArcelorMittal's Patents
2) Economic and Technical Domestic Industry exists
3) VinFast infringes the Asserted Patents
4) The Asserted Patents are valid
5) ArcelorMittal is entitled to an exclusion order

ArcelorMittal

CDX–0001C.56

The Asserted Patents Are Valid

1. The asserted references were already considered and overcome.
2. VinFast fails to prove that most references are actually *prior* art.
   a. No proof of public availability
   b. Post-dates invention
3. The alleged references fail to invalidate (alone or in combination).
4. VinFast ignores the secondary considerations.

Dr. Dierk Raabe
Technical Expert

CX-0082C (Raabe Rpt.)

CDX–0001C.57

2006 VW Passat Is Not Prior Art

2006 VW Passat 1049

CARFAX Report

CARFAX **Vehicle History Report™**

2006 VOLKSWAGEN PASSAT 2.0T
VIN: WVWAK73C66P041049
SEDAN 4 DR
2.0L I4 F
GASOLINE
FRONT WHEEL DRIVE

- No accidents or damage reported to CARFAX
- **29** Service history records
- At least 1 open recall
- **2** Previous owners
- Types of owners: Personal lease, Personal
- **167,795** Last reported odometer reading

This CARFAX Vehicle History Report is based only on information supplied to CARFAX and available as of 8/20/24 at 5:37:14 PM (CDT). Other information about this vehicle, including problems, may not have been reported to CARFAX. | Use this report as one important tool, along with a vehicle inspection and test drive, to make a better decision about your next used car.

CARFAX Additional History Not all accidents / issues are reported to CARFAX	Owner 1	Owner 2

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8/20/24 5:37:14 PM (CDT)

CX-0082C (Raabe Rpt.) at ¶¶ 121–187, 448–484, 643–662; RX-0715.0001, .0009 (Carfax Rpt.); CX-0084C (Brown Rpt.) ¶¶ 76–78

Patent Office Already Considered the 2006 VW Passat

2006 VW Passat 1049

’227 Patent

Self-study programme 339—Volkswagen Passat, Mar. 2005.

Self-study programme 339, The Passat 2006.

Wikipedia Article on VW Passat, downloaded at https://fr.wikipedia.org/wiki/Volkswagen_Passat, last accessed on Aug. 11, 2016 see machine translation.

Boezewinkel et al.: Tata Steel analysis of Volkwagen Passat. Project 11450, Oct. 7, 2017.

TNOReport 010028844—Analyses on hot-formed coated steel samples, Aug. 20, 2015/Proces-verbaa/ Agin Boeder on sample taking of the Volkswagen Passat, see partial English translation.

10μm

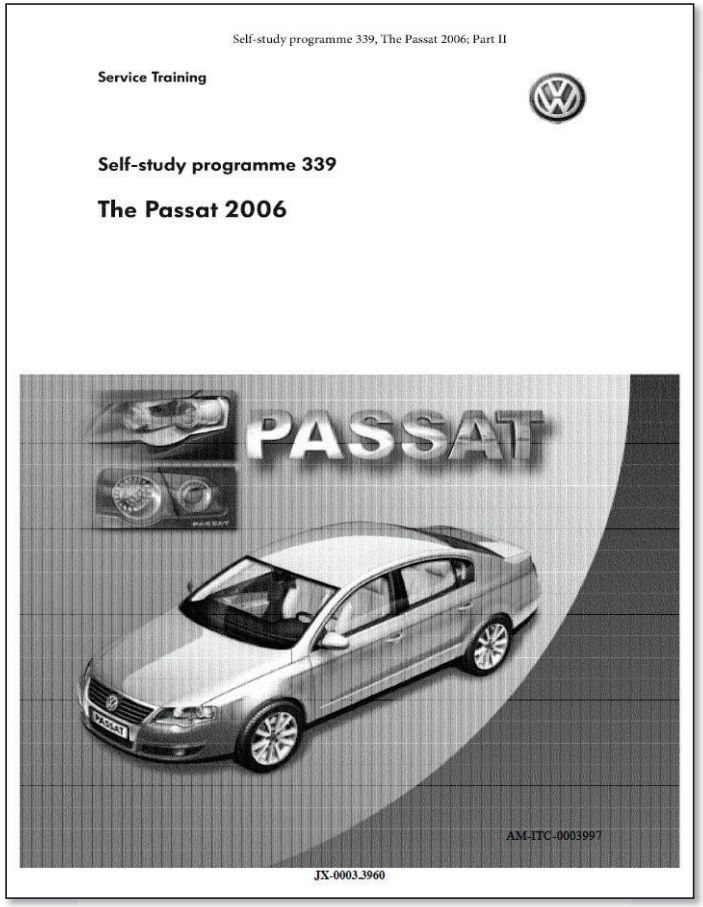
AM-ITC-0000021

JX-0001 (’227 Patent); CX-0082C (Raabe Rpt.) ¶¶ 77–110, 121–187; JX-0003.3960 (self-study); 2328 (Wiki); 1211 (TNOReport); 2020 (Boezewinkel)

CDX–0001C.59

Patent Office Already Considered the 2006 VW Passat

Self–Study Programme 339


Self-study programme 339, The Passat 2006; Part II

Service Training

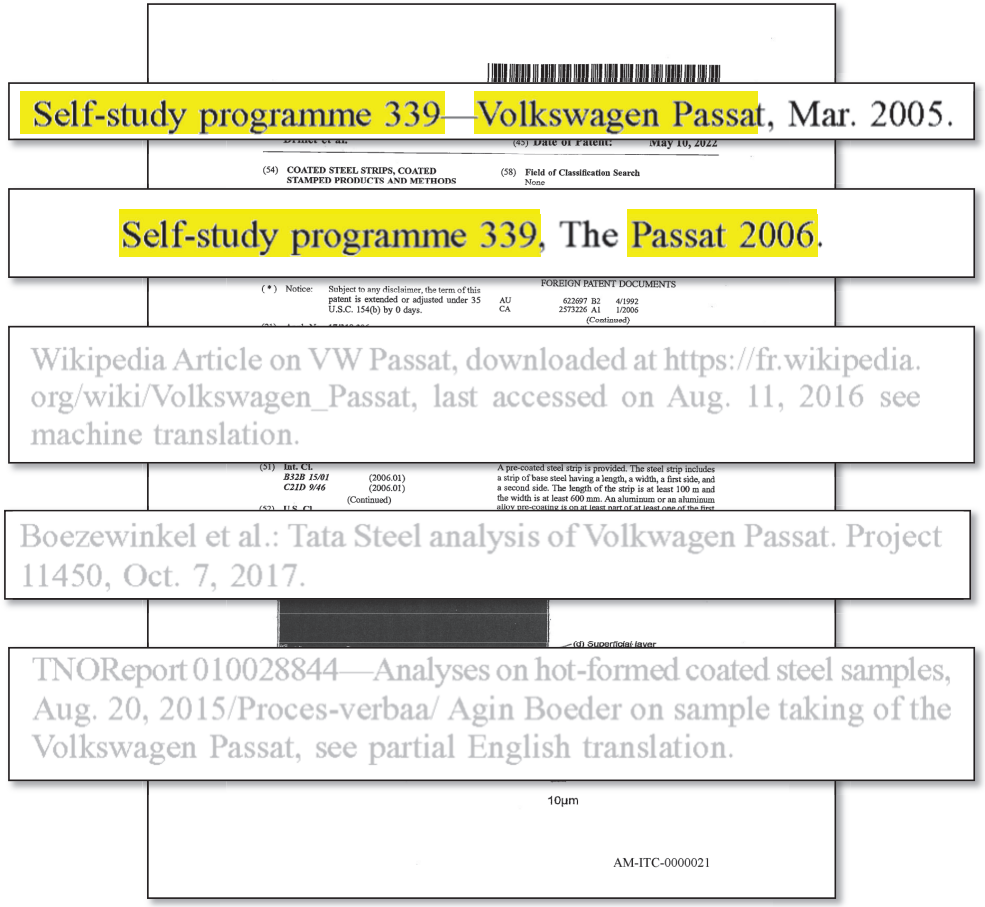
Self-study programme 339

The Passat 2006

AM-ITC-0003997

JX-0003.3960

’227 Patent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Self-study programme 339, The Passat 2006.

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Boezewinkel et al.: Tata Steel analysis of Volkwagen Passat. Project 11450, Oct. 7, 2017.

TNOReport 010028844—Analyses on hot-formed coated steel samples, Aug. 20, 2015/Proces-verbaa/ Agin Boeder on sample taking of the Volkswagen Passat, see partial English translation.

10μm

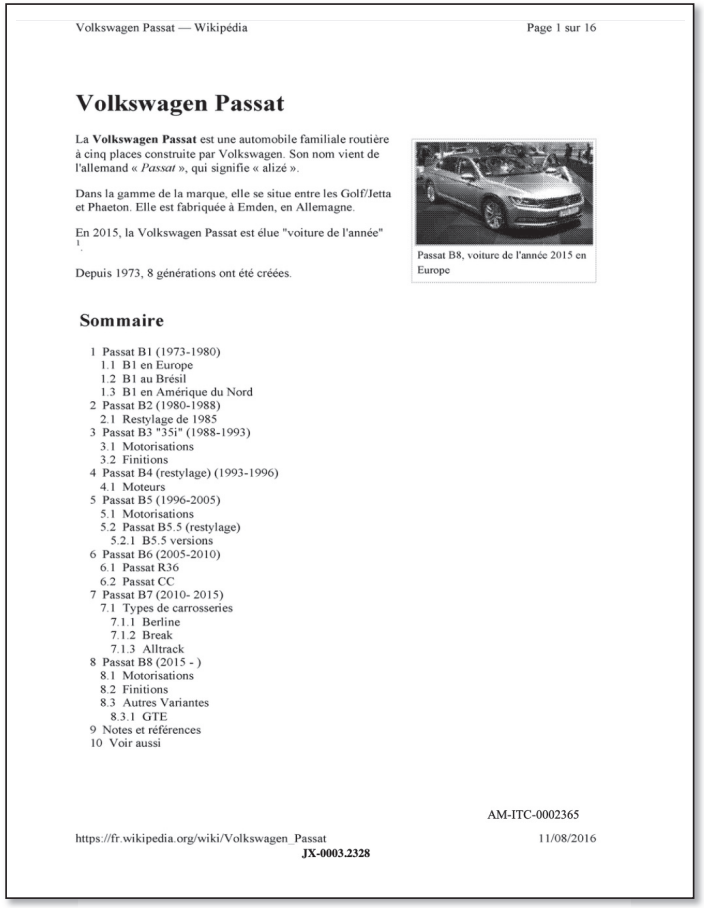
AM-ITC-0000021

JX-0001 (’227 Patent); CX-0082C (Raabe Rpt.) ¶¶ 77–110, 121–187; JX-0003.3960–4035 (self-study)

CDX–0001C.60

Patent Office Already Considered the 2006 VW Passat

Wikipedia Article



Volkswagen Passat — Wikipédia Page 1 sur 16

Volkswagen Passat

La **Volkswagen Passat** est une automobile familiale routière à cinq places construite par Volkswagen. Son nom vient de l'allemand « *Passat* », qui signifie « alizé ».

Dans la gamme de la marque, elle se situe entre les Golf/Jetta et Phaeton. Elle est fabriquée à Emden, en Allemagne.

En 2015, la Volkswagen Passat est élue "voiture de l'année" [1].

Passat B8, voiture de l'année 2015 en Europe

Depuis 1973, 8 générations ont été créées.

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1.3 B1 en Amérique du Nord
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3 Passat B3 "35i" (1988-1993)
3.1 Motorisations
3.2 Finitions
4 Passat B4 (restylage) (1993-1996)
4.1 Moteurs
5 Passat B5 (1996-2005)
5.1 Motorisations
5.2 Passat B5.5 (restylage)
5.2.1 B5.5 versions
6 Passat B6 (2005-2010)
6.1 Passat R36
6.2 Passat CC
7 Passat B7 (2010- 2015)
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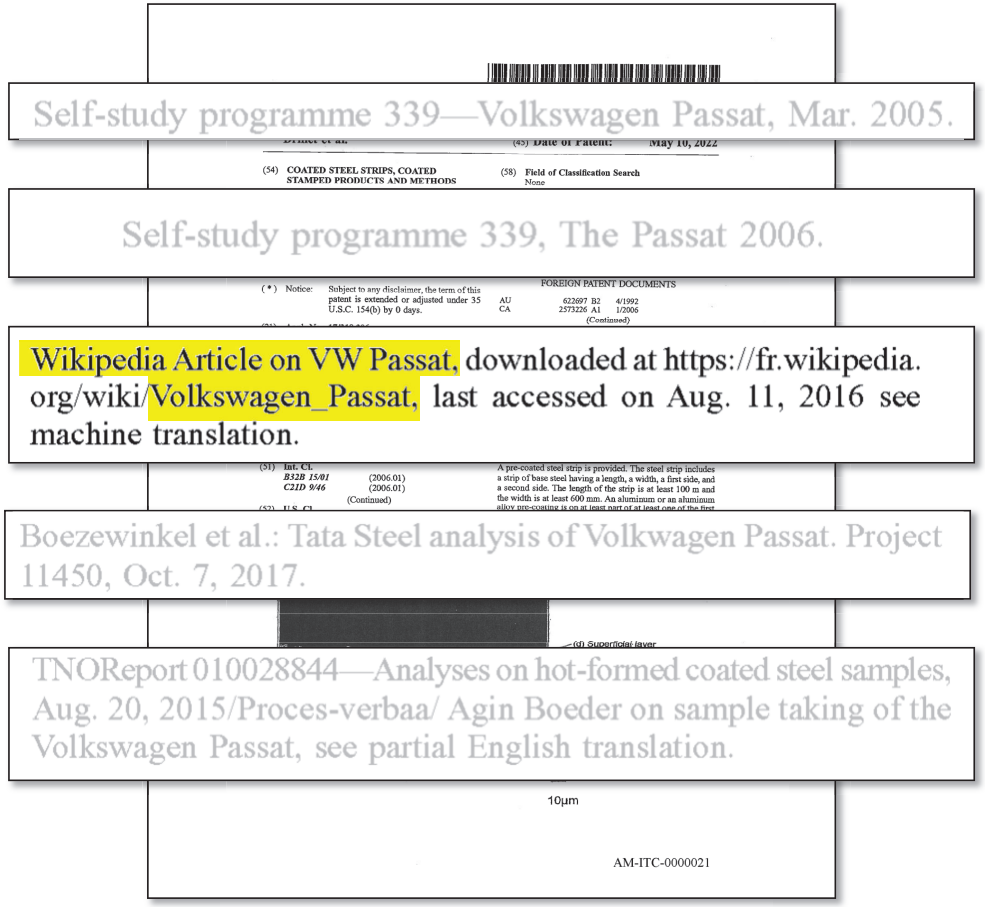
7.1.1 Berline
7.1.2 Break
7.1.3 Alltrack
8 Passat B8 (2015 -)
8.1 Motorisations
8.2 Finitions
8.3 Autres Variantes
8.3.1 GTE
9 Notes et références
10 Voir aussi

AM-ITC-0002365

https://fr.wikipedia.org/wiki/Volkswagen_Passat 11/08/2016

JX-0003.2328

'227 Patent



Self-study programme 339—Volkswagen Passat, Mar. 2005.

(54) COATED STEEL STRIPS, COATED STAMPED PRODUCTS AND METHODS

(58) Field of Classification Search None

Self-study programme 339, The Passat 2006.

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

FOREIGN PATENT DOCUMENTS

AU 622697 B2 4/1992
CA 2573226 A1 1/2006

Wikipedia Article on VW Passat, downloaded at https://fr.wikipedia.org/wiki/Volkswagen_Passat, last accessed on Aug. 11, 2016 see machine translation.

(51) Int. Cl.
B32B 15/01 (2006.01)
C21D 9/46 (2006.01)

A pre-coated steel strip is provided. The steel strip includes a strip of base steel having a length, a width, a first side, and a second side. The length of the strip is at least 100 m and the width is at least 600 mm. An aluminum or an aluminum

Boezewinkel et al.: Tata Steel analysis of Volkwagen Passat. Project 11450, Oct. 7, 2017.

TNOReport 010028844—Analyses on hot-formed coated steel samples, Aug. 20, 2015/Proces-verbaa/ Agin Boeder on sample taking of the Volkswagen Passat, see partial English translation.

10μm

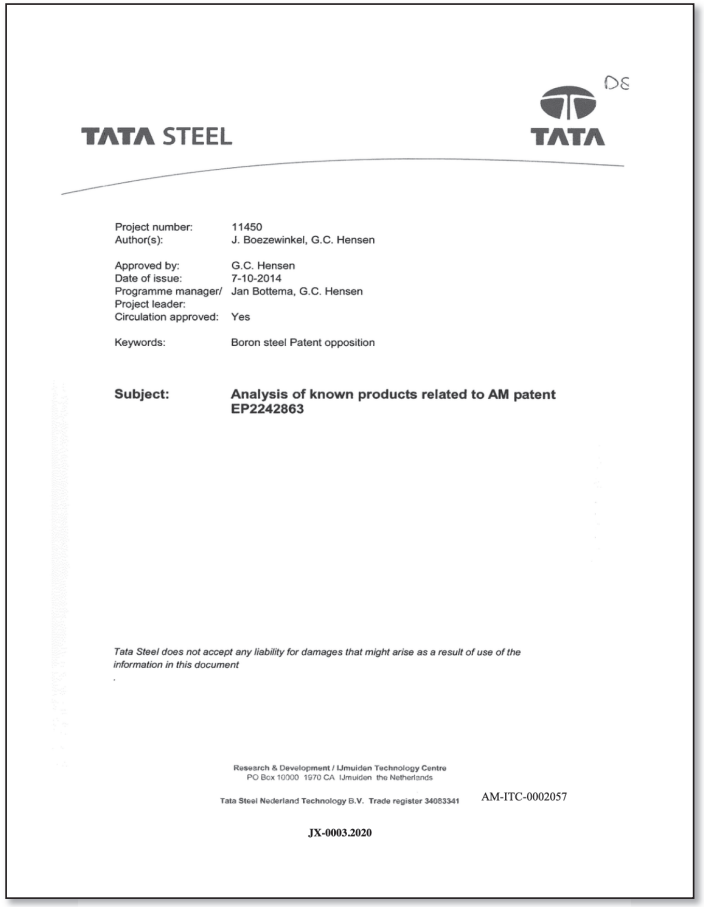
AM-ITC-0000021

JX-0001 ('227 Patent); CX-0082C (Raabe Rpt.) ¶¶ 77–110, 121–187; JX-0003.2328–2362 (Wikipedia article)

CDX–0001C.61

Patent Office Already Considered the 2006 VW Passat

Boezewinkel



TATA STEEL

TATA

Project number: 11450
Author(s): J. Boezewinkel, G.C. Hensen

Approved by: G.C. Hensen
Date of issue: 7-10-2014
Programme manager/ Jan Bottema, G.C. Hensen
Project leader:
Circulation approved: Yes

Keywords: Boron steel Patent opposition

Subject: **Analysis of known products related to AM patent EP2242863**

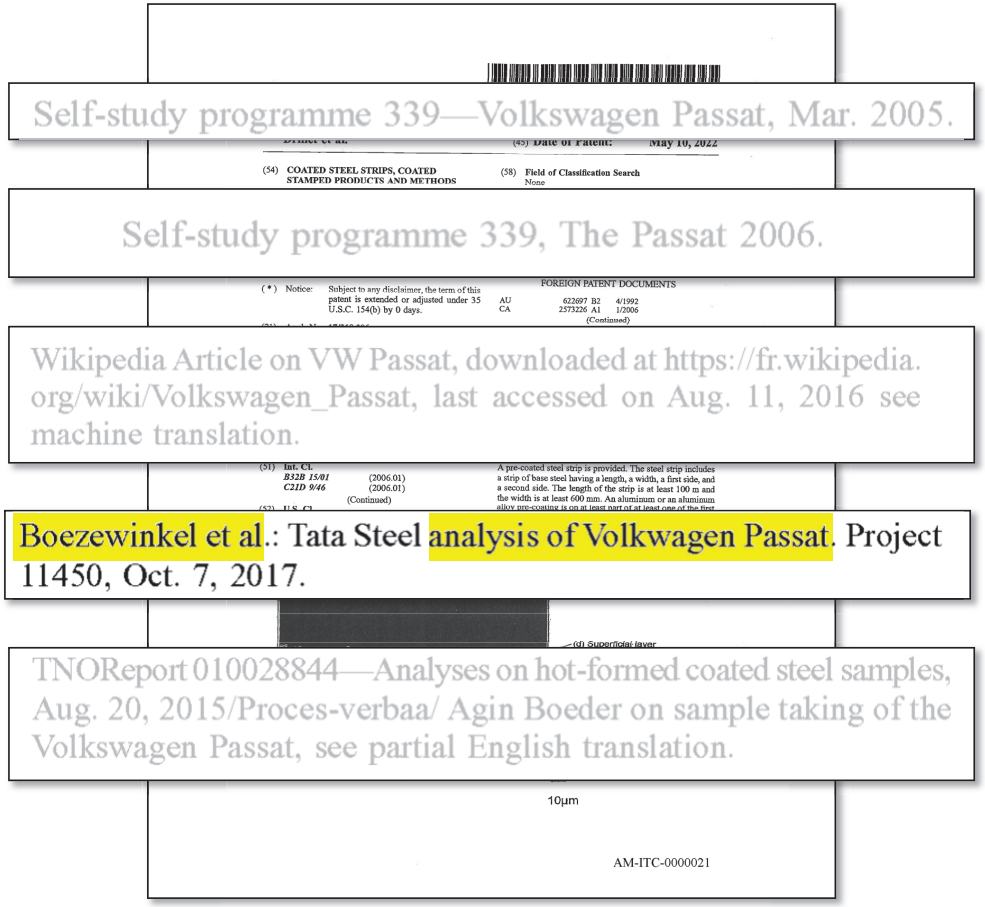
Tata Steel does not accept any liability for damages that might arise as a result of use of the information in this document

Research & Development / IJmuiden Technology Centre
PO Box 10000 1970 CA IJmuiden the Netherlands

Tata Steel Nederland Technology B.V. Trade register 34083341 AM-ITC-0002057

JX-0003.2020

’227 Patent



Self-study programme 339—Volkswagen Passat, Mar. 2005.

(54) COATED STEEL STRIPS, COATED STAMPED PRODUCTS AND METHODS

(58) Field of Classification Search
None

Self-study programme 339, The Passat 2006.

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(Continued)

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(Continued)

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Boezewinkel et al.: Tata Steel analysis of Volkwagen Passat. Project 11450, Oct. 7, 2017.

(d) Superficial layer

TNOReport 010028844—Analyses on hot-formed coated steel samples, Aug. 20, 2015/Proces-verbaa/ Agin Boeder on sample taking of the Volkswagen Passat, see partial English translation.

10μm

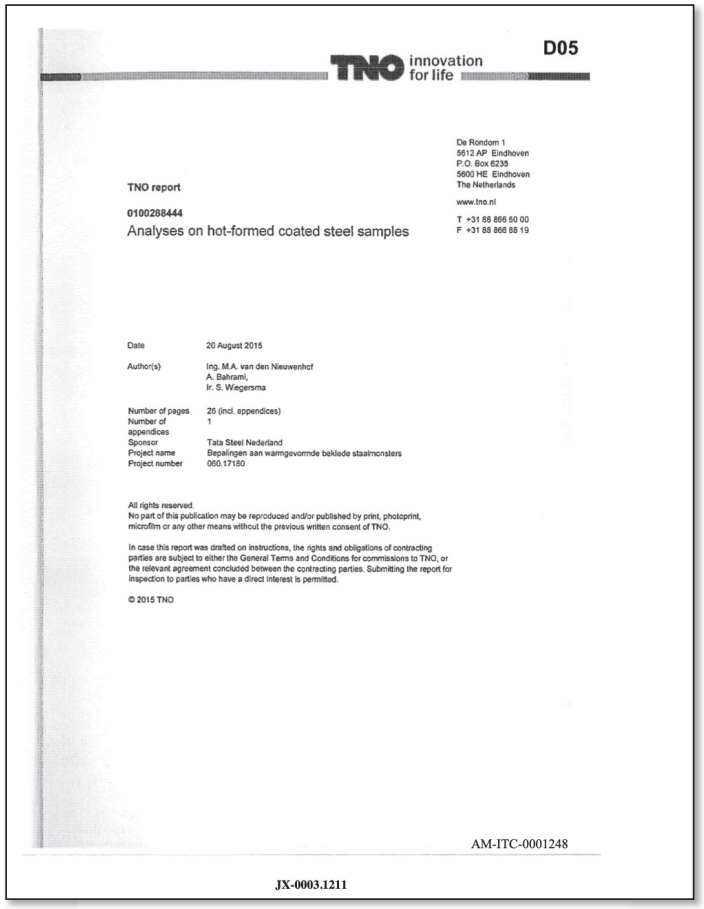
AM-ITC-0000021

JX-0001 (’227 Patent); CX-0082C (Raabe Rpt.) ¶¶ 77–110, 121–187; JX-0003.2020–34 (Boezewinkel)

CDX–0001C.62

Patent Office Already Considered the 2006 VW Passat

TNO Report



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TNO report

0100288444

Analyses on hot-formed coated steel samples

Date	20 August 2015
Author(s)	Ing. M.A. van den Nieuwenhof A. Bahrami, Ir. S. Wegersma
Number of pages	26 (incl. appendices)
Number of appendices	1
Sponsor	Tata Steel Nederland
Project name	Bepalingen aan warmgevormde beklede staalmonsters
Project number	060.17180

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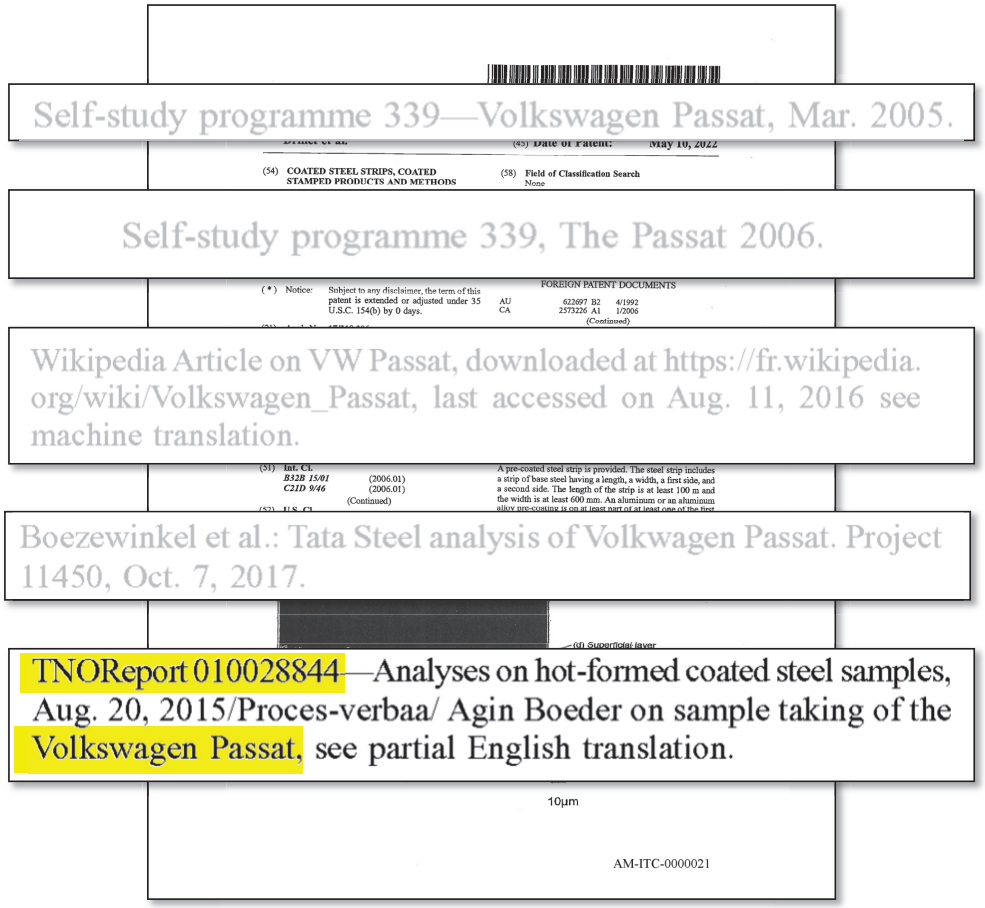
AM-ITC-0001248

JX-0003.1211

’227 Patent



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(58) Field of Classification Search
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Self-study programme 339, The Passat 2006.

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(Continued)

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C21D 9/46 (2006.01)
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10μm

AM-ITC-0000021

JX-0001 (’227 Patent); CX-0082C (Raabe Rpt.) ¶¶ 77–110, 121–187; JX-0003.1211–1236 (TNOReport)

CDX–0001C.63

Patent Office Already Considered Engels

Engels

Inv. No. 337-TA-1402
RX-0063

New Developments in Sheet Metal Forming

Edited by
Mathias Liewald

INSTITUTE FOR METAL FORMING TECHNOLOGY OF THE UNIVERSITÄT STUTTGART

DEUTSCHE GESELLSCHAFT FÜR MATERIALKUNDE E.V.

MAT INFO WERKSTOFF-INFORMATIONSGESELLSCHAFT

POSCO Exhibit 1041-0001
Filed with Petition for IPR of U.S. Patent No. 9,708,683
VINFAST1402-00002279

RX-0063.0001

'227 Patent

US011326227B2

(12) **United States Patent**
Drillet et al.

(10) **Patent No.: US 11,326,227 B2**
(45) **Date of Patent: May 10, 2022**

(54) **COATED STEEL STRIPS, COATED STAMPED PRODUCTS AND METHODS**

(71) Applicant: **ArcelorMittal**, Luxembourg (LU)

(72) Inventors: **Pascal Drillet**, Rozerieulles (FR); **Dominique Spehner**, Balan (FR); **Ronald Kefferstein**, Saint Mitre les Ramparts (FR)

(73) Assignee: **ArcelorMittal**, Luxembourg (LU)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **17/319,306**

(58) **Field of Classification Search**
None
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,240,269 A 3/1966 Thomas
4,257,549 A 3/1981 Bricmont
(Continued)

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AU 622697 B2 4/1992
CA 2573226 A1 1/2006
(Continued)

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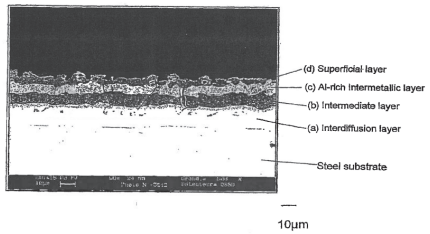
Engels, H. et al., "Controlling and Monitoring of the Hot-Stamping Process of Boron-Alloyed Heat-Treated Steels."—p. 135-50 ("Engels"), published in Liewald, M. (Ed.). "New developments in sheet metal forming": Frankfurt a.M.: MATINFO, Werkstoff-Informationsges (2006).

(2015.01); *Y10T 428/12757* (2015.01)

25 Claims, 4 Drawing Sheets



AM-ITC-0000021

JX-0001 ('227 Patent); RX-0063 (Engels); CX-0082C (Raabe Rpt.) ¶¶ 131–137

CDX–0001C.64

Patent Office Already Considered Cornette

Cornette

D6
Neumann Müller
Oberwalleney & Partner
Patentanwälte

SAE TECHNICAL PAPER SERIES

2001-01-0078

High Strength Steels for Automotive Safety Parts

D. Cornette, T. Hourman, O. Hudin, J. P Laurent and A. Reynaert
Usinor Research

Reprinted From: New Sheet Steel Products and Sheet Metal Stamping (SP–1614)

[redacted]

SAE 2001 World Congress
Detroit, Michigan
March 5-8, 2001

400 Commonwealth Drive, Warrendale, PA 15096-0001 U.S.A. Tel: (724) 776-4841 Fax: (724) 776-5760

AM-ITC-0014498

’227 Patent

US011326227B2

(12) **United States Patent**
Drillet et al.

(10) **Patent No.: US 11,326,227 B2**
(45) **Date of Patent: May 10, 2022**

(54) **COATED STEEL STRIPS, COATED STAMPED PRODUCTS AND METHODS**

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(73) Assignee: **ArcelorMittal**, Luxembourg (LU)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **17/319,306**

(22) Filed: **May 13, 2021**

(65) **Prior Publication Data**

US 2021/0262055 A1 Aug. 26, 2021

(58) **Field of Classification Search**
None
See application file for complete search history.

(56) **References Cited**

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4,257,549 A 3/1981 Bricmont
(Continued)

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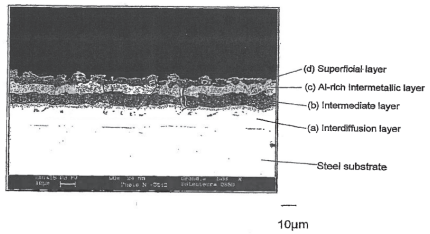
Cornette et al., "High Strength Steels for Automotive Safety Parts" SAE Technical Paper Series 2001-01-0078, Mar. 2001, ISSN: 0148-7191.

CPC *C21D 9/46* (2013.01); *B32B 15/012* (2013.01); *C23C 2/12* (2013.01); *C23C 2/26* (2013.01); *C23C 2/40* (2013.01); *Y10T 428/12389* (2015.01); *Y10T 428/12396* (2015.01); *Y10T 428/12757* (2015.01)

or second sides of the strip of base steel. A thickness t_c of the pre-coating is from 20 to 35 micrometers at every location on at least one of the first or second sides. Processes, coated stamped products and land motor vehicles are also provided.

25 Claims, 4 Drawing Sheets



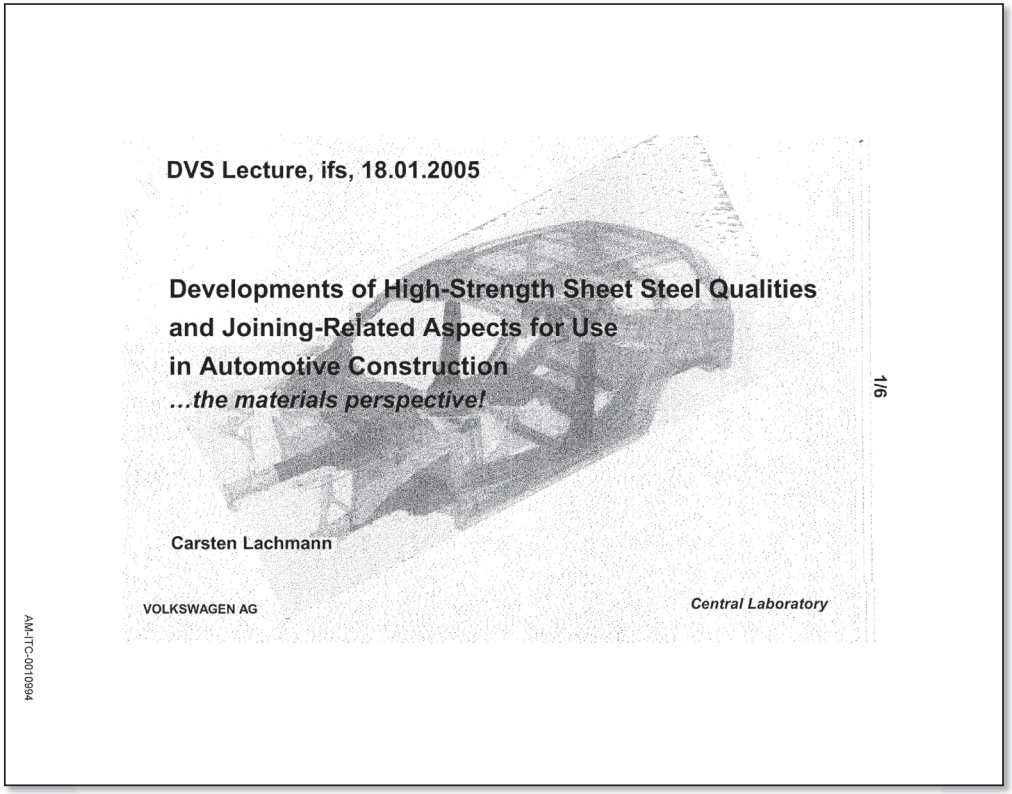
AM-ITC-0000021

JX-0001 (’227 Patent); RX-0019 (Cornette); CX-0082C (Raabe Rpt.) ¶¶138–148

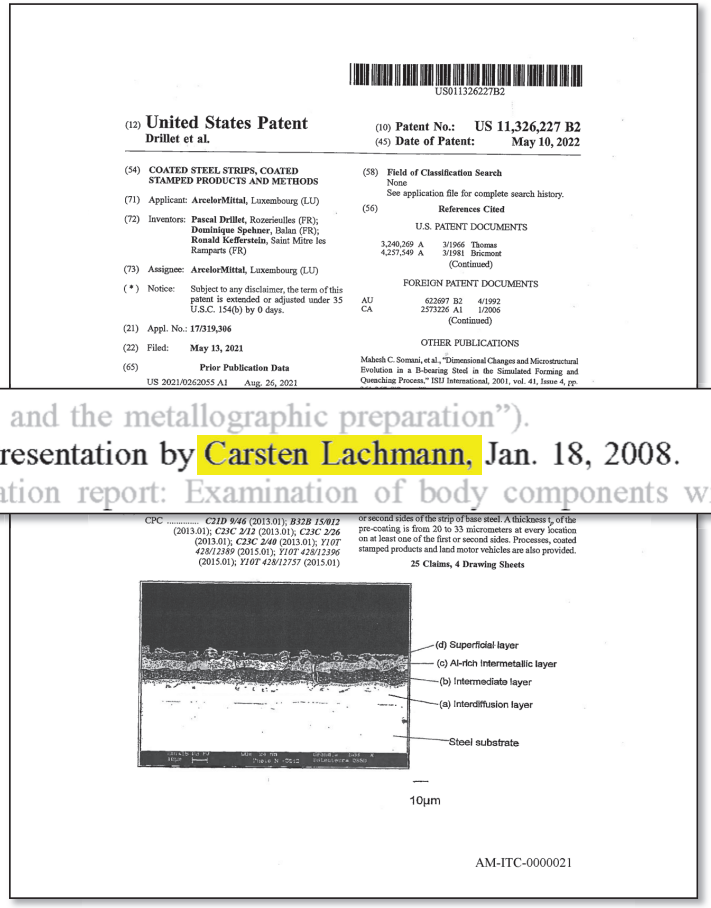
CDX–0001C.65

Patent Office Already Considered Lachmann

Lachmann



’227 Patent

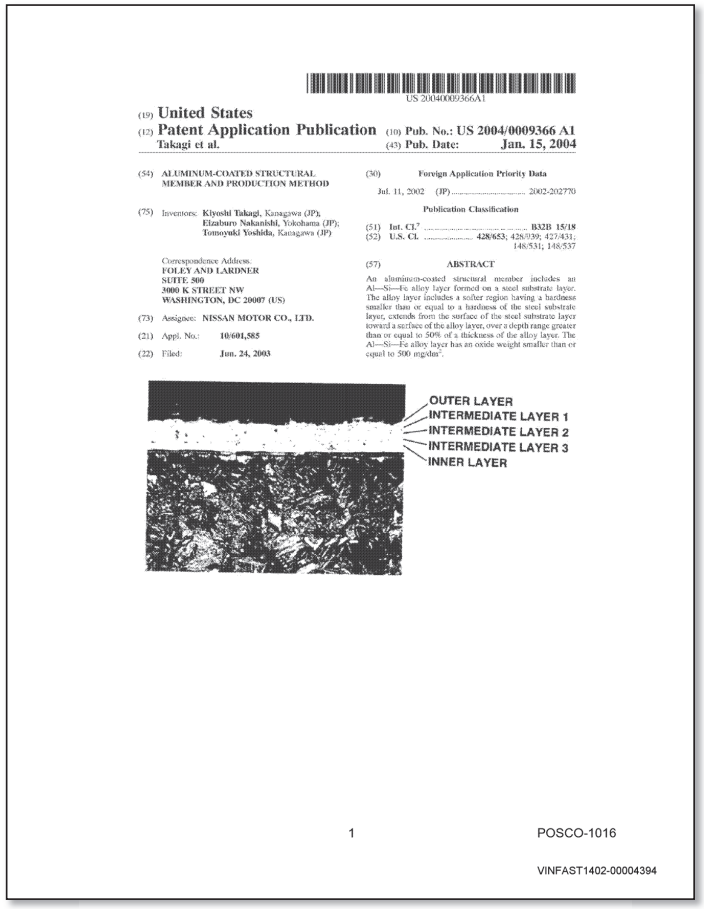


JX-0001 (’227 Patent); RX-0005 (Lachmann (Ger.)); RX-0062 (Lachmann (Eng.)) CX-0082C (Raabe Rpt.) ¶¶ 185–187

CDX–0001C.66

Patent Office Already Considered Takagi

Takagi



US 20040009366A1

(19) United States
(12) Patent Application Publication
Takagi et al.

(10) Pub. No.: US 2004/0009366 A1
(43) Pub. Date: Jan. 15, 2004

(54) ALUMINUM-COATED STRUCTURAL MEMBER AND PRODUCTION METHOD

(75) Inventors: Kiyoshi Takagi, Kanagawa (JP); Eizaburo Sakanishi, Yokohama (JP); Tomoyuki Yoshida, Kanagawa (JP)

Correspondence Address:
FOLEY AND LARDNER
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007 (US)

(73) Assignee: NISSAN MOTOR CO., LTD.

(21) Appl. No.: 10/601,585

(22) Filed: Jun. 24, 2003

(30) Foreign Application Priority Data

Jul. 11, 2002 (JP) 2002-202770

Publication Classification

(51) Int. Cl.[7] B32B 15/18
(52) U.S. Cl. 428/653; 428/939; 427/431; 148/531; 148/537

(57) ABSTRACT

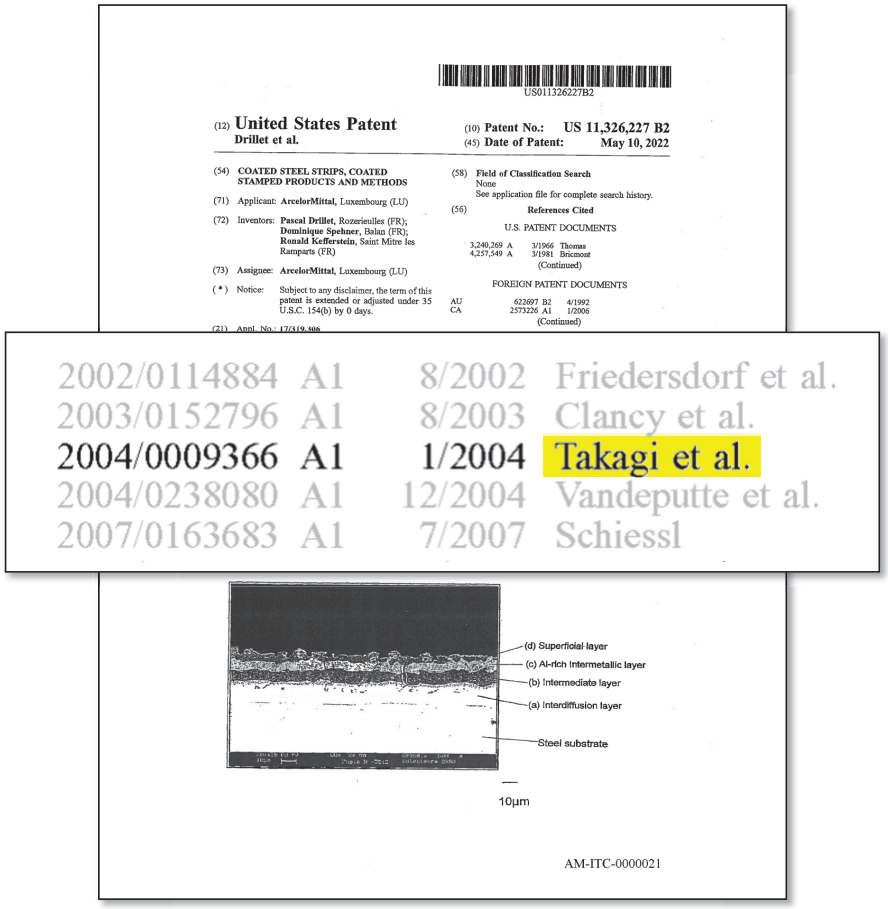
An aluminum-coated structural member includes an Al—Si—Fe alloy layer formed on a steel substrate layer. The alloy layer includes a softer region having a hardness smaller than or equal to a hardness of the steel substrate layer, extends from the surface of the steel substrate layer toward a surface of the alloy layer, over a depth range greater than or equal to 50% of a thickness of the alloy layer. The Al—Si—Fe alloy layer has an oxide weight smaller than or equal to 500 mg/dm².

OUTER LAYER
INTERMEDIATE LAYER 1
INTERMEDIATE LAYER 2
INTERMEDIATE LAYER 3
INNER LAYER

1 POSCO-1016

VINFAST1402-00004394

’227 Patent



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(73) Assignee: ArcelorMittal, Luxembourg (LU)

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(21) Appl. No.: 17/319,398

(58) Field of Classification Search
None
See application file for complete search history.

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(d) Superficial layer
(c) Al-rich Intermetallic layer
(b) Intermediate layer
(a) Interdiffusion layer
Steel substrate
10μm

AM-ITC-0000021

JX-0001 (’227 Patent); RX-0104 (Takagi); CX-0082C (Raabe Rpt.) ¶¶ 160–163

CDX–0001C.67

Patent Office Already Considered Suehiro II

Suehiro II

Inv. No. 337-TA-1402
RX-0022

D14
Neumann Müller
Oberwalleney & Partner
Patentanwälte

NIPPON STEEL TECHNICAL REPORT No. 88 JULY 2003

UDC 669 . 718 . 5 : 669 . 14 . 018 . 295 - 415

Properties of Aluminum-coated Steels for Hot-forming

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Kazuhisa KUSUMI*1 Masahiro OHGAMI*1
Toshihiro MIYAKOSHI*2

Abstract

Production of parts with high strength by means of hot-forming process has been receiving considerable attention lately. Application of aluminized steel with good hardenability for this process has been investigated. Tensile strength over than 1,500MPa was obtained with steel containing around 0.2mass% C. Surface coated layer changed from Al-10% Si to Fe-Al(-Si) phases through the hot-forming process. The steel with Fe-Al(-Si) surface layer showed good paintability even without phosphatized treatment. After painting, they showed good corrosion resistance in JASO-CCT as galvanized steel did. The steel showed good spot weldability due to the stable surface layer at high temperature. (*license product within the frame of global strategic alliance with Arcelor (USIBOR1500))*

1. Introduction

High-strength steel sheets are used more and more for automobile components in recent years to reduce the weight of an automobile to improve environmental problems and collision safety. Many car components and structural members can be made significantly lighter by using high-strength steel sheets and reducing their thicknesses. With this as a background, the strength of the steel sheets used therefor has increased from 440- or 590-MPa class to 780-MPa class. Generally speaking, as the strength of a steel sheet increases, its formability deteriorates, and to overcome this problem, various types of high-strength steel sheet products with controlled microstructures have been developed[1]. In spite of these efforts, however, press forming complicated shapes is difficult when the strength of a steel sheet is as high as approximately 1,500 MPa.

In Europe, a forming method called die quenching, hot forming, hot stamping or hot pressing is employed for fabricating automobile structural members having a strength of 1,500 MPa or so[2]. By this method, the strength of a steel sheet is increased through quenching after heating it to a temperature in the austenite temperature range, say, around 900°C, while forming dies are maintained at room temperature. Techniques similar to this are being studied in Japan; similar processes have been studied or put into actual practice using steel sheets without surface treatment[3, 4]. In Europe, Arcelor has developed and commercially launched an aluminized steel sheet product called USIBOR 1500 for that application. It has excellent hot-pressing properties and corrosion resistance qualities[5, 6]. Based on a global strategic alliance with Arcelor, Nippon Steel Corporation has entered into a license agreement regarding USIBOR 1500 and studied the production technologies and properties of the product. This paper reports the results of the company's studies of the properties and characteristics that are required of aluminized steel sheet products for hot forming application.

2. Hot Forming Process

The hot forming method is already a practical reality; the process is outlined in **Fig. 1**. In this method it is necessary to heat a steel sheet to a temperature in the austenite temperature range, equal to or higher than the A_{c3} temperature: for example, steel containing about 0.2 mass % C must be heated to 850°C or higher. Heated steel sheet is extracted from a heating furnace, transferred to a pressing machine, formed into a prescribed shape using dies maintained at room temperature, and thus quenched. At the forming work, the press machine is retained at the lower dead point until the entire steel sheet is quenched sufficiently.

*1 Yawata R&D Lab. *2 Yawata Works

AM-ITC-0014691

RX-0022.0001

’227 Patent

US011326227B2

(12) **United States Patent**
Drillet et al.

(10) **Patent No.: US 11,326,227 B2**
(45) **Date of Patent: May 10, 2022**

(54) **COATED STEEL STRIPS, COATED STAMPED PRODUCTS AND METHODS**

(71) Applicant: **ArcelorMittal**, Luxembourg (LU)

(72) Inventors: **Pascal Drillet**, Rozerieulles (FR); **Dominique Spehner**, Balan (FR); **Ronald Kefferstein**, Saint Mitre les Ramparts (FR)

(73) Assignee: **ArcelorMittal**, Luxembourg (LU)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **17/319,306**

(22) Filed: **May 13, 2021**

(65) **Prior Publication Data**
US 2021/0262055 A1 Aug. 26, 2021

(52) **U.S. Cl.**
CPC *C21D 9/46* (2013.01); *B32B 15/012* (2013.01); *C23C 2/12* (2013.01); *C23C 2/26* (2013.01); *C23C 2/40* (2013.01); *Y10T 428/12389* (2015.01); *Y10T 428/12396* (2015.01); *Y10T 428/12757* (2015.01)

(58) **Field of Classification Search**
None
See application file for complete search history.

(56) **References Cited**

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(Continued)

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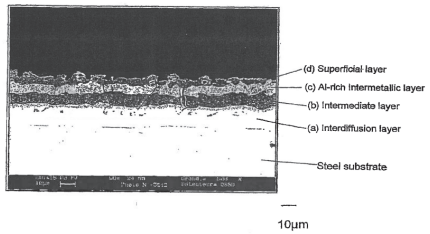
Suehiro, Masayoshi et al., "Properties of Aluminium-coated Steels for Hot-forming" Nippon Steel Technical Report No. 88, Jul. 2003.

alloy pre-coating is on at least part of at least one of the first or second sides of the strip of base steel. A thickness t_c of the pre-coating is from 20 to 35 micrometers at every location on at least one of the first or second sides. Processes, coated stamped products and land motor vehicles are also provided.

25 Claims, 4 Drawing Sheets



AM-ITC-0000021

JX-0001 (’227 Patent); RX-0022 (Suehiro II); CX-0082C (Raabe Rpt.) ¶¶ 182–184

CDX–0001C.68

Patent Office Already Considered GMW14400

GMW14400

GM	WORLDWIDE ENGINEERING STANDARDS	Material Specification Metals	GMW14400

Low Carbon, Heat-Treatable Boron Steel – Uncoated or Aluminized Pre-Coated

1 Scope

This specification covers the requirements for low carbon, heat-treatable boron steel used in the manufacture of structural parts requiring heat treatments to achieve high strength. Press-hardened steel can be pre-formed and subsequently hot-stamped and die quenched, but post-forming should not be the scope for this type of steel. Typical applications include door impact beams, bumper impact beams, and reinforcements for impact structures.

1.1 Material Description. The particular application shall determine the pre- or post- forming operations to produce the finished product.

1.1.1 Resistance Welded Mechanical Tubing. Tubes supplied to this specification are roll formed from steel strip to the desired shape and dimension, electrical resistance welded into a tube, and then heat treated to achieve the final mechanical property requirements.

1.1.2 Induction Heat Treated Steel. Part sections formed with this operation and supplied under this standard shall be made by stamping a coil blank in the as-rolled condition. The raw stamping can be selectively coil induction hardened to achieve the required strength requirements. Aluminized, pre-coated products are not to be used in these applications.

1.1.3 Hot-Stamped/Die-Quenched Steel.

1.1.3.1 Uncoated Products. Part sections formed with this operation and supplied under this standard shall be made by austenitizing a pre cut blank or pre-stamped part, hot stamping the heated blank or pre-stamped part, and rapid cooling (quenching) the stamped part in the die. The cooled part may be subsequently shot blasted to remove oxide from the surface. The microstructure of the finished parts shall consist of martensite and bainite.

1.1.3.2 Pre-Coated Products. Part sections formed with this operation and supplied under this standard shall be made by austenitizing a pre cut blank, hot stamping the heated blank and rapid cooling (quenching) the stamped part in the die or via water quenching. Parts shall not be pre-stamped prior to the hot stamping operation, but slight roll-forming operations may be allowable if the coating is not damaged. Shot blasting the cooled part is not permitted for pre-coated parts due to damage to the coating. The microstructure of the finished parts shall consist of martensite and bainite.

1.2 Material Identification. The GMW base metal specification number defines the material designation, steel product type, grade, and finish type. The steel product type is "CR" for cold rolled products, or "HR" for hot rolled products. The steel grades will correspond to the chemical and mechanical requirements as shown in Tables 1 through 4. The finish type, an alpha character, will be designated with the finish U (unexposed). The above descriptive items are used together to form the coding system. Examples of the coding system for engineering part drawings, electronic math data files, and/or manufacturing engineering documents are shown in paragraph 8.

1.2.1 Material Identification.

GM WORLDWIDE	NORTH AMERICA	EUROPE	LATIN AMERICA	ASIA PACIFIC
GMW14400M-ST-T HT1475T/1170Y MS	GM4396M Type 1 (tubes)			
GMW14400M-ST-S HT1475T/1170Y MS	GMN7486			
GMW14400M-ST-S HS1300T/950Y MS	GM6429M			

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Order Number: W22117464
Sold to:BYDONGWOON YOON [3636101000011] - BHYOON@CNSPAT.COM,
Not for Resale,2020-04-27 23:52:13 UTC

VINFAST1402-00002701

'227 Patent

US011326227B2

(12) **United States Patent**
Drillet et al.

(10) **Patent No.: US 11,326,227 B2**
(45) **Date of Patent: May 10, 2022**

(54) **COATED STEEL STRIPS, COATED STAMPED PRODUCTS AND METHODS**

(71) Applicant: **ArcelorMittal**, Luxembourg (LU)

(72) Inventors: **Pascal Drillet**, Rozerieulles (FR); **Dominique Spehner**, Balan (FR); **Ronald Kefferstein**, Saint Mitre les Ramparts (FR)

(73) Assignee: **ArcelorMittal**, Luxembourg (LU)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(58) **Field of Classification Search**
None
See application file for complete search history.

(56) **References Cited**

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CA 2573226 A1 1/2006
(Continued)

Low Carbon, Heat-Treatable Boron Steel—Uncoated or Aluminized PreCoated, GM Worldwide Engineering Standards, GMW14400.

(Continued)

(51) **Int. Cl.**
B32B 15/01 (2006.01)
C21D 9/46 (2006.01)
(Continued)

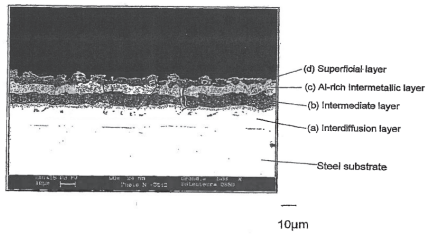
(52) **U.S. Cl.**
CPC ***C21D 9/46*** (2013.01); ***B32B 15/012*** (2013.01); ***C23C 2/12*** (2013.01); ***C23C 2/26*** (2013.01); ***C23C 2/40*** (2013.01); ***Y10T 428/12389*** (2015.01); ***Y10T 428/12396*** (2015.01); ***Y10T 428/12757*** (2015.01)

Kappel, LLC

(57) **ABSTRACT**

A pre-coated steel strip is provided. The steel strip includes a strip of base steel having a length, a width, a first side, and a second side. The length of the strip is at least 100 m and the width is at least 600 mm. An aluminum or an aluminum alloy pre-coating is on at least part of at least one of the first or second sides of the strip of base steel. A thickness t_c of the pre-coating is from 20 to 35 micrometers at every location on at least one of the first or second sides. Processes, coated stamped products and land motor vehicles are also provided.

25 Claims, 4 Drawing Sheets



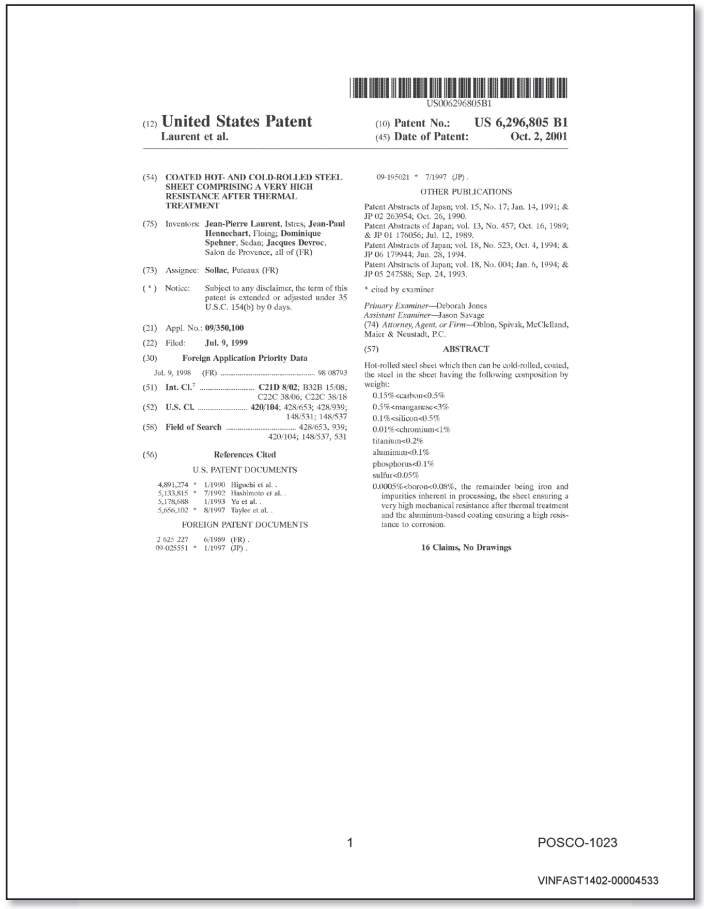
AM-ITC-0000021

JX-0001 ('227 Patent); RX-0067 (GMW14400); CX-0082C (Raabe Rpt.) ¶¶ 171–175

CDX–0001C.69

Patent Office Already Considered Laurent

Laurent



US006296805B1

(12) **United States Patent**
Laurent et al.

(10) **Patent No.: US 6,296,805 B1**
(45) **Date of Patent: Oct. 2, 2001**

(54) **COATED HOT- AND COLD-ROLLED STEEL SHEET COMPRISING A VERY HIGH RESISTANCE AFTER THERMAL TREATMENT**

(75) Inventors: **Jean-Pierre Laurent**, Istres; **Jean-Paul Hennechart**, Floing; **Dominique Spehner**, Sedan; **Jacques Devroc**, Salon de Provence, all of (FR)

(73) Assignee: **Sollac**, Puteaux (FR)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/350,100**

(22) Filed: **Jul. 9, 1999**

(30) **Foreign Application Priority Data**

Jul. 9, 1998 (FR) 98 08793

(51) **Int. Cl.**[7] **C21D 8/02**; B32B 15/08; C22C 38/06; C22C 38/18

(52) **U.S. Cl.** **420/104**; 428/653; 428/939; 148/531; 148/537

(58) **Field of Search** 428/653, 939; 420/104; 148/537, 531

(56) **References Cited**

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Primary Examiner—Deborah Jones
Assistant Examiner—Jason Savage
(74) *Attorney, Agent, or Firm*—Ohlon, Spivak, McClelland, Maier & Neustadt, P.C.

(57) **ABSTRACT**

Hot-rolled steel sheet which then can be cold-rolled, coated, the steel in the sheet having the following composition by weight:

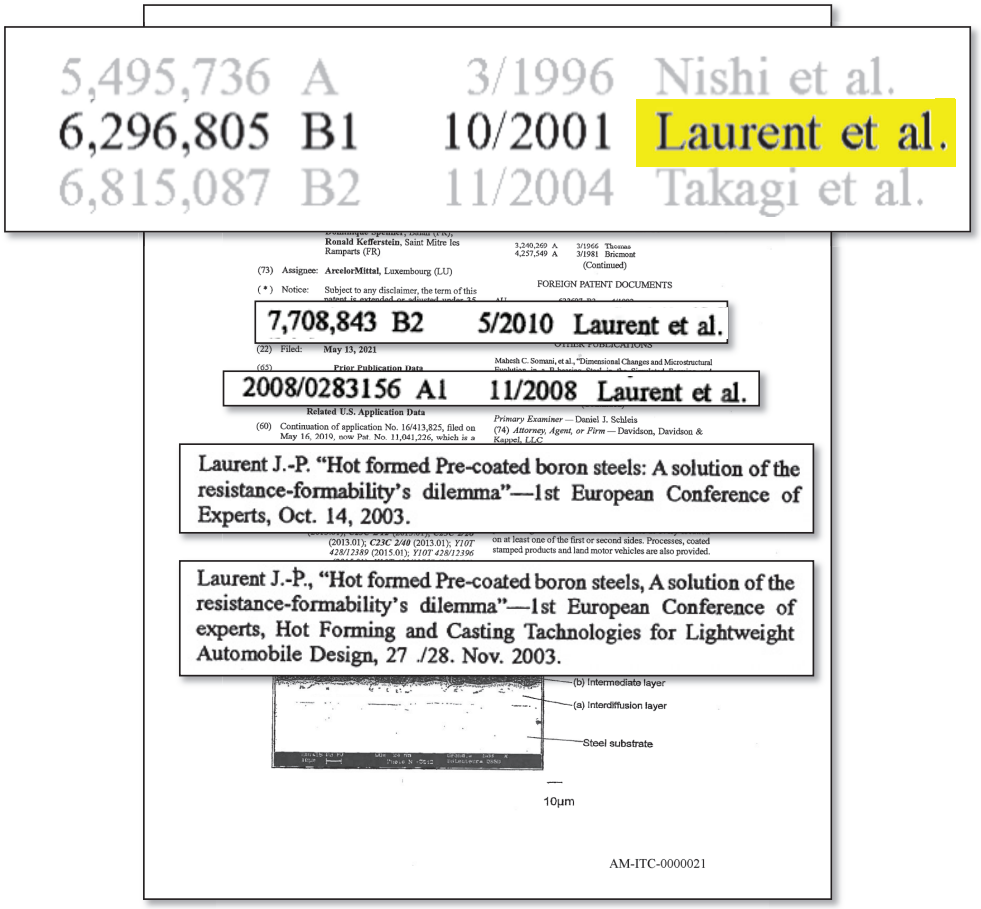
0.15%<carbon<0.5%
0.5%<manganese<3%
0.1%<silicon<0.5%
0.01%<chromium<1%
titanium<0.2%
aluminum<0.1%
phosphorus<0.1%
sulfur<0.05%
0.0005%<boron<0.08%, the remainder being iron and impurities inherent in processing, the sheet ensuring a very high mechanical resistance after thermal treatment and the aluminum-based coating ensuring a high resistance to corrosion.

16 Claims, No Drawings

1 POSCO-1023

VINFAST1402-00004533

’227 Patent



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Ronald Kefferstein, Saint Mitre les Remparts (FR)

(73) Assignee: **ArcelorMittal**, Luxembourg (LU)

(*) Notice: Subject to any disclaimer, the term of this

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4,257,549 A 3/1981 Bricmont
(Continued)

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7,708,843 B2 5/2010 Laurent et al.

(22) Filed: May 13, 2021

(65) Prior Publication Data

2008/0283156 A1 11/2008 Laurent et al.

Related U.S. Application Data

(60) Continuation of application No. 16/413,825, filed on May 16, 2019, now Pat. No. 11,041,226, which is a

Primary Examiner — Daniel J. Schleis
(74) *Attorney, Agent, or Firm* — Davidson, Davidson & Kappel, LLC

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(b) Intermediate layer
(a) Interdiffusion layer
Steel substrate
10μm

AM-ITC-0000021

JX-0001 (’227 Patent); RX-0109 (Laurent ’805); CX-0082C (Raabe Rpt.) ¶¶ 157–159

CDX–0001C.70

Patent Office Already Considered Vaissiere

Vaissiere

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SAE TECHNICAL PAPER SERIES

2002-01-2048

Development of Pre-Coated Boron Steel for Applications on PSA Peugeot Citroën and RENAULT Bodies in White

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RENAULT S.A.

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USINOR - CRPC

A. Reinhardt
PSA Peugeot Citroën

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POSCO Exhibit 1033-0001
Filed with Petition for IPR of U.S. Patent No. 9,708,683
VINFAST1402-00003251

'227 Patent

US011326227B2

(12) **United States Patent**
Drillet et al.

(10) **Patent No.: US 11,326,227 B2**
(45) **Date of Patent: May 10, 2022**

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(73) Assignee: **ArcelorMittal**, Luxembourg (LU)

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(21) Appl. No.: **17/319,306**

(22) Filed: **May 13, 2021**

(58) **Field of Classification Search**
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See application file for complete search history.

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(2013.01); *C23C 2/40* (2013.01); *Y10T 428/12389* (2015.01); *Y10T 428/12396* (2015.01); *Y10T 428/12757* (2015.01)

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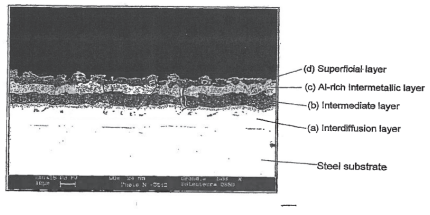

AM-ITC-0000021

JX-0001 ('227 Patent); RX-0081 (Vaissiere); CX-0082 (Raabe Rpt.) ¶¶ 149–156

CDX–0001C.71