



Marine &amp; Offshore

Certificate number: SMS.W.I./5390/A.0



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## RECOGNITION FOR BV MODE I SCHEME

**DK Corporation**  
Pohang - KOREA (REPUBLIC OF)

**Summary of the range of the recognition which is detailed in the subsequent page(s):**

1. Hot Rolled Plates in Stainless Steel Grades 304, 304L, 304N1, ASTM 304L, 316L, 316LN and ASTM 316L
2. Hot Rolled Plates in Duplex Stainless Steel Grades UNS S31803, UNS S32205 (ASTM A240) and SUS329J3L (JIS G4304)

*This certificate is issued to attest that Bureau Veritas Marine & Offshore has performed, at the above company's request and in compliance with the requirements of NR320, a satisfactory assessment of the quality management system related to the range of the recognition.*

**This certificate will expire on: 10 Jan 2025**

For Bureau Veritas Marine & Offshore,  
At BV PUSAN, on 01 Mar 2021,  
Won-Jun JANG



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site [www.veristar.com](http://www.veristar.com). Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

The electronic version is available at: <http://www.veristarm.com/veristarmb/jsp/viewPublicPdfRecognition.jsp?id=1dohmcec1x>

BV Mod. Ad.E 696 June 2017

This certificate consists of 2 page(s)

## **THE SCHEDULE OF RECOGNITION**

### **1. RANGE OF THE RECOGNITION**

The products listed in the table below are to be certified individually or per batch with a certificate of conformity endorsed by Bureau Veritas Marine & Offshore.

App. number	Validity date	Item designation	Trade name
07459/E0 BV	09 Aug 2022	STAINLESS STEEL ROLLED PRODUCTS - 9013I	Hot rolled plates in stainless steel grades 304, 304L, 304N1, ASTM 304L, 316L, 316LN and ASTM 316L.
08046/E0 BV	31 Aug 2025	STAINLESS STEEL ROLLED PRODUCTS - 9013I	Hot rolled plates in duplex stainless steel grades UNS S31803, UNS S32205 (ASTM A 240) and SUS329J3L (JIS G 4304).

### **2. LIMITATIONS**

The certificates listed in the range of recognition are to be valid, as applicable.

Bureau Veritas Marine & Offshore is to be informed immediately of any modification to quality management system in order to agree on appropriate actions.

DK Corporation has to manufacture, examine and test the products as per the quality plan agreed with Bureau Veritas Marine & Offshore.

DK Corporation has to submit the product certificates of conformity for endorsement by Bureau Veritas Marine & Offshore as agreed with Bureau Veritas Marine & Offshore.

DK Corporation has to mark the products as agreed with Bureau Veritas Marine & Offshore.

DK Corporation has to apply for the periodical audits as agreed with Bureau Veritas Marine & Offshore.

### **3. PERIMETER OF CERTIFICATION**

Quality system of following site(s) has been assessed:

DK Corporation - Pohang - KOREA (REPUBLIC OF)

### **4. REMARKS**

4.1 The periodical audits are to be carried out within  $\pm 3$  months of the anniversary date, 10th January, annually.

4.2 No steel making.

4.3 Heat treatment operations including solution treatment (annealing), with spray water quenching as cooling method and Finishing operations at DK Corporation.

\*\*\* END OF CERTIFICATE \*\*\*



Marine &amp; Offshore

Certificate number: 07459/F0 BV

File number: MAT 5390/01

Product code: 9013I

*This certificate is not valid when presented without the full attached schedule composed of 7 sections*

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## APPROVAL CERTIFICATE for MATERIALS

*This certificate is issued to*

**DK Corporation**

Pohang - KOREA (REPUBLIC OF)

*for the type of product*

### STAINLESS STEEL ROLLED PRODUCTS

Hot rolled plates in stainless steel grades 304, 304L, 304N1, ASTM 304L, 316L, 316LN, ASTM 316L, 321 and ASTM 321.

#### Requirements:

Bureau Veritas Rules on Materials and Welding for the Classification of Marine Units

*This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.*

**This certificate will expire on: 20 Jun 2027**

**For Bureau Veritas Marine & Offshore,**

At BV PUSAN, on 20 Jun 2022,

Chang-Uk HONG

***This certificate was created electronically and is valid without signature***



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site [www.veristar.com](http://www.veristar.com). Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

The electronic version is available at: <https://www.veristarm.com/veristarm/b/jsp/viewPublicPdfTypepec.jsp?id=xozoztwoah>

BV Mod. Ad.E 1533 June 2017

This certificate consists of 3 page(s)

## THE SCHEDULE OF APPROVAL

### 1. PRODUCT DESCRIPTION :

Hot rolled plates.

Steel grade	Heat treatment	Range of thickness
304/304L/ 304N1/ ASTM 304L	Solution annealing followed by spray water quenching	From 8mm up to 80mm
316L/316LN/ASTM 316L	Solution annealing followed by spray water quenching	From 8mm up to 80mm
321/ASTM 321	Solution annealing followed by spray water quenching	From 8mm up to 90mm

- No Steelmaking.
- Heat treatment operations including solution treatment (annealing) at 1040°C about, with spray water quenching as cooling method and finishing operations (pickling) at DK Corporation.

### 2. DOCUMENTS AND DRAWINGS :

- "General Information for Manufacturing Process" Rev.01 dated 01/08/2017 issued by DK Corporation.
- PT procedure ref. No. BG-NDEP-PT-ASME-001 dated 20/12/2021.
- UT procedure ref. No. BG-NDEP-UT-DKC-RS-021 dated 01/12/2021.
- Chemical composition specification on ladle issued by DK Corporation.

Ladle analysis for each grade	C	Si	Mn	P	S	Cr	Mo	Ni
<b>304</b>	< 0.08%	< 0.75%	< 2.0%	< 0.045%	< 0.03%	18 to 20%	-	8 to 10.5%
<b>304L</b>	< 0.03%	< 1.0%	< 2.0%	< 0.040%	< 0.03%	17 to 19%	-	9 to 12%
<b>304N1</b>	< 0.08%	< 1.0%	< 2.5%	< 0.045%	< 0.03%	18 to 20%	-	7 to 10.5%
<b>ASTM 304L</b>	< 0.03%	< 0.75%	< 2.0%	< 0.045%	< 0.03%	17.5 to 19.5%	-	8 to 12%
<b>316L</b>	< 0.03%	< 1.0%	< 2.0%	< 0.040%	< 0.03%	16 to 18.5%	2 to 3%	10 to 14%
<b>316LN (1)</b>	< 0.03%	< 1.0%	< 2.0%	< 0.040%	< 0.03%	16 to 18.5%	2 to 3%	10 to 14%
<b>ASTM 316L</b>	< 0.03%	< 0.75%	< 2.0%	< 0.045%	< 0.03%	16 to 18%	2 to 3 %	10 to 14%
<b>321 (2)</b>	< 0.08%	< 1.0%	< 2.0%	< 0.045%	< 0.03%	17 to 19%	-	9 to 13%
<b>ASTM 321 (3)</b>	< 0.08%	< 0.75%	< 2.0%	< 0.045%	< 0.03%	17 to 19%	-	9 to 12%

(1) N content (wt%) : 0.14% min. - 0.22%max.

(2) Ti content (wt%) : 5xC min - 0.80%max

(3) Ti content (wt%) : 5x(C+N) min - 0.70%max

- Mechanical properties specification issued by DK Corporation.

Mechanical properties for each grade	Yield stress N/mm <sup>2</sup>	Tensile strength N/mm <sup>2</sup>	Elongation %	Charpy V-notch (J) transverse testing Minimum average at -196°C
<b>304</b>	> 210	> 530	> 40	27
<b>304L</b>	> 175	470 to 670	> 45	27
<b>304N1</b>	> 280	> 560	> 35	27
<b>ASTM 304L</b>	> 170	≥485	> 40	27
<b>316L</b>	> 195	490 to 690	> 40	27
<b>316LN</b>	> 300	≥590	> 45	27

ASTM 316L	> 170	≥485	> 40	27
321	> 205	500 – 700	> 40	27
ASTM 321	> 205	≥515	> 40	27

**3. TEST REPORTS :**

As per reports issued by DK Corporation: Reports dated November 1997 and May 1998; "Test report for BV type approval" dated 14 July 2014, "Test report for BV extension approval" dated 21 April 2022.

**4. APPLICATION / LIMITATION :**

As rolled plates delivered by POSCO Steel Works at Pohang Works or Nippon Steel & Sumikin Stainless Steel Corporation at Yawata works .

As per Bureau Veritas Rules for Classification, products to be used for the construction of cargo tanks, storage tanks, including liquefied gases and pressure vessels for chemicals.

**5. PRODUCTION SURVEY REQUIREMENTS :**

5.1-The steel plates are to be supplied by DK Corporation in compliance with the type and the requirements described in this certificate.

5.2-This type of product is within the category IBV of Bureau Veritas Rule Note NR320.

5.3-BV product certificate is required.

**6. MARKING OF PRODUCT :**

As per Bureau Veritas Rules for Classification.

**7. OTHERS :**

This certificate replaces approvals from No.07459/A0 BV to No.07459/E0 BV.

\*\*\* END OF CERTIFICATE \*\*\*



Marine &amp; Offshore

Certificate number: 08046/E0 BV

File number: MAT 5390/03

Product code: 9013I

*This certificate is not valid when presented without the full attached schedule composed of 7 sections*

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## APPROVAL CERTIFICATE for MATERIALS

*This certificate is issued to*

**DK Corporation**

Pohang - KOREA (REPUBLIC OF)

*for the type of product*

### STAINLESS STEEL ROLLED PRODUCTS

Hot rolled plates in duplex stainless steel grades UNS S31803, UNS S32205 (ASTM A 240) and SUS329J3L (JIS G 4304).

#### Requirements:

Bureau Veritas Rules on Materials and Welding for the Classification of Marine Units

*This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.*

*This certificate is a renewal of certificate N° 08046/D0 BV expiring on 31/08/2020*

**This certificate will expire on: 31 Aug 2025**

**For Bureau Veritas Marine & Offshore,**

At BV PUSAN, on 28 May 2020,

Chang-Uk HONG



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

## **THE SCHEDULE OF APPROVAL**

### **1. PRODUCT DESCRIPTION :**

Hot rolled plates in duplex stainless steel.

Steel grade	Heat treatment	Range of thickness
UNS S31803	Solution annealing followed by spray water quenching	Up to 50mm
UNS S32205 (ASTM A240)	Solution annealing followed by spray water quenching	Up to 50mm
SUS 329J3L (JIS G4304)	Solution annealing followed by spray water quenching	Up to 50mm

Solution treated (annealing) at 1120°C, with spray water quenching as cooling method, in DK Corporation Works - Finishing operations (cutting and pickling) in DK Corporation Works.

### **2. DOCUMENTS AND DRAWINGS :**

As per documentation submitted by DK Corporation :

Chemical Composition	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	N %
UNS S31803	< 0.03	< 1.00	< 2.00	< 0.030	< 0.020	21.0- 23.0	4.50 - 6.50	2.50 - 3.50	0.08 - 0.20
UNS S32205	< 0.03	< 1.00	< 2.00	< 0.030	< 0.020	22.0- 23.0	4.50 - 6.50	3.00 - 3.50	0.14 - 0.20
SUS329J3L	< 0.03	< 1.00	< 2.00	< 0.040	< 0.030	21.0- 24.0	4.50 - 6.50	2.50 - 3.50	0.08 - 0.20

Mechanical Characteristics	Yield Strength min. N/mm <sup>2</sup>	Tensile Strength min. N/mm <sup>2</sup>	Elongation %	Charpy V-notch average min. at +20°C (J)
UNS S31803	450	620	25	72
UNS S32205	450	620	25	72
SUS 329J3L	450	620	25	72

### **3. TEST REPORTS :**

"Test Report" issued by DK Corporation and dated July 1999.

### **4. APPLICATION / LIMITATION :**

As per Bureau Veritas Rules for Classification. Steel making, casting and rolling of slabs are carried out by POSCO Pohang works.

### **5. PRODUCTION SURVEY REQUIREMENTS :**

5.1 - The stainless steel plates are to be supplied by DK Corporation in compliance with the type and the requirements described in this certificate.

5.2 - This type of product is within the category IBV of Bureau Veritas Rule Note NR320.

5.3 - BV product certificate is required.

### **6. MARKING OF PRODUCT :**

As per Bureau Veritas Rules for Classification.

### **7. OTHERS :**

This certificate replaces approvals from No.08046/A0 BV to No.08046/D0 BV.

**\*\*\* END OF CERTIFICATE \*\*\***