

Marine Design Appraisal Document

Date
02 August 2004

Quote this reference on all future communications
KPA/JHL/D04/O-55938

SAMSUNG, HULL NO. 1535 CONTROL AIR DRYER

1. The Documents listed in the **Appendix** have been examined for compliance with Lloyd's Register's Rules and Regulations for the Classification of Ships - Part 5, Chapters 10 & 11, and are assigned an appraisal status as indicated, subject to the following comments.

<u>Comments</u>	<u>Action</u>
1.1 Material of pressure parts is to be to Lloyd's Register tests and requirements, and material welded to pressure parts is to be of a weldable quality with a maximum carbon content of 0.23%.	AQS
1.2 All doubler pads are to have well-rounded corners and tell tale holes as per paragraph 5.10.14.5.1 of the Rules.	AQS
1.3 Attachment of flanges, branches and pads are to be as per Part 5, Chapter 10, Fig.10.14.3 & 4 of the Rules.	AQS
1.4 The thickness of the nozzle pipes is to be increased to sch. 80 to comply with Pt5, Ch11, 7.1 of the Rules.	AQS
1.5 Hydraulic test for the whole system is to be carried out and the system is to be demonstrated to the attending surveyors' satisfaction	AQS
1.6 Heat treatment & routine tests are to be to the attending surveyors satisfaction in accordance with the pressure vessel Class listed below (Part 5, Chapter 17 refers).	AQS



J.H. Lee
 Engineer Surveyor
 Korea Plan Approval Services, Pusan

Tel.: +82 51 640 5031
 Fax: +82 51 637 4114
 Email: jang-ho.lee@lr.org

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

Appendix to Design Appraisal Document

Date	Quote this reference on all future communications
02 August 2004	KPA/JHL/D04/O-55938

1. The documents listed below have been examined.

<u>Dwg.</u>	<u>Rev</u>	<u>Title</u>	<u>Status</u>	<u>Date</u>
KHDM-3700-PI-004	1	Process & Instrument Drawing	AQ	2 Aug. 2004
KHDM-3700-FD-008	1	Fabrication Detail Drawing	AQ	2 Aug. 2004

Appraisal Status Key

- AQ = Approved subject to the matters raised that require resolution - and provided the arrangements are to the surveyor's satisfaction
- AQS = Details to be submitted by the client to the local surveyor's Office responsible for surveying the building and the arrangements verified in accordance with the Rule/Regulations requirements by the surveyor.

2. This Design Appraisal Document(DAD) supersedes and cancels our DAD ref. no. KPA85227 issue 2 dated 1 Apr. 2004.
3. The following Design Information has been considered together with the submitted documents in the appraisal.

DESIGN INFORMATION

Title	Control Air Dryer
Class	2/2
Design Pressure (bar)	14.7
Design Temp. (deg.C)	50
Test Pressure (bar)	22.05

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

Heatless Type Control Air Dryer

Page 1 of 1

CERTIFIED COPYProject: Samsun Heavy Ind. Co.,Ltd.
Hull No. H-1535

Client: Kyung Nam Dryer Co.,Ltd.

Office: Seoul

Clients Order Number: -

Date: 17 December 2004

Order Status: Completed.

Inspection Dates

First: 30 December 2004

Final: 17 December 2004


This certificate is issued to the messrs., Kyung Nam Dryer Co.,Ltd. to certify that the undersigned Surveyor to this Society did attend at their Koyang works on the above dates for the purpose of examining and witnessing hydro tests for the undermentioned two(2) sets of Heatless Type Control Air Dryer stated to be intended for ship No.H-1535 being built by Samsung Heavy Ind. Co.,Ltd. Korea.

Particulars of Heatless Type Control Air Dryer - Two(2) Sets.

Model No.	: KHDM-3700.
Serial No.	: 050101-A/B.
Process	: Compressed Air.
Capacity	: 3415Nm ³ /Hr(outlet flow).
Design Press. /Temp.	: 15 Kg/cm ² /50°C.
Operating Press./Temp	: 13 Kg/cm ² /Max.50°C.
Purge Air Pressure	: 3.5 Kg/cm ² .
Normal Purge	: 285 Nm ³ /Hr.
Outlet Due Point	: -40°C at ATM.Pressure.
Main Supply & Control Power	: 240V, 1 Phase, 50Hz.
1 Cycle	: 50 Minutes.
Dryer Type	: Desiccant(Activated Alumina),1000Kgs/2 Tower.

The Blowers were found to have been constructed in accordance with approved manufacturer's drawing No. KHDM-3700-GA-005/PI-004/EW-007/CB-006/FD-008,Rev.1 visually examined and hydro tests were witnessed and all found satisfactory.

For identification purpose, these Blowers were stamped on metal identification plates :-

LR SEO 0451263-1/2 

Lloyd's Register Asia

Seon H. Choi
Surveyor to Lloyd's Register Asia

A member of the Lloyd's Register Group



Marine Design Appraisal Document

Lloyd's Register Asia
Busan Design Support Office
22nd Floor, Allianz Life Insurance Bldg.,
#862-1, Beomcheon 1-dong, Busanjin-gu,
Busan 614-724
Republic of Korea

Date
26 March 2013

Please quote the document number on all future communications

HYUNDAI HEAVY INDUSTRIES CO., LTD.
IMO NOS. 9637492 9655444
YARD NOS. 2558 2566
KYUNG NAM DRYER, CONTROL AIR DRYERS

1. The Documents listed in the **Appendix** have been examined for compliance with Lloyd's Register's Rules and Regulations for the Classification of Ships (July 2011) - Part 5, Chapters 10 & 11, and are assigned an appraisal status as indicated, subject to the following comments.

1.1	Comments	Action
1.1.1	Materials are to be in accordance with the requirements of an acceptable national or international specification.	AQS
1.1.2	Hydraulic tests are to be to the attending surveyor's satisfaction.	AQS
1.1.3	Mountings such as valves, gauges, etc. are to be subjected to a hydraulic test of twice the approved design pressure.	AQS
1.1.4	All valves are to be LR approved type.	AQS

J. Y. Ha / Surveyor
Engineering Group
Busan Design Support Office
Lloyd's Register ASIA
Tel.: +82 51 640 5076
Email: jong-yong.ha@lr.org

J. H. Lee / Senior Surveyor
Engineering Group
Busan Design Support Office
Lloyd's Register ASIA
Tel.: +82 51 640 5031
Email: jang-ho.lee@lr.org

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

Lloyd's Register Asia
Is a subsidiary of Lloyd's Register Group Limited

Lloyd's Register, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register Group'. The Lloyd's Register Group assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register Group entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Lloyd's Register Asia
Busan Design Support Office
22nd Floor, Allianz Life Insurance Bldg.,
#862-1, Beomcheon 1-dong, Busanjin-gu,
Busan 614-724
Republic of Korea

Date
26 March 2013

Please quote the document number on all future communications

APPENDIX

1. The documents listed below have been examined.

Document No.	Rev.	Title	Status	Date
KHDM700-CO-001	0	Desiccant (Heatless) Type Control Air Dryer (Model no.: KHDM-350)	AQ	26 Mar. 2013
KHDM350-CO-001	0	Desiccant (Heatless) Type Control Air Dryer (Model no.: KHDM-700)	AQ	26 Mar. 2013

2. The following Design Information has been considered together with the submitted documents in the appraisal.

Design Information

Air Dryer Title	Control Air Dryer (Model No.: KHDM-350)	Control Air Dryer (Model No.: KHDM-700)
Working Pressure (bar G.)	7	7
Design Pressure (bar G.)	9	9
Design Temp. (°C)	100	100
Test Pressure (bar G.)	13.5	13.5
Class	3	3

Appraisal Status & Action Key

- AQ = Approved subject to the matters raised that require resolution - and provided the arrangements are to the surveyor's satisfaction.
- AQS = Details to be submitted by the client to the local surveyor's Office responsible for surveying the building and the arrangements verified in accordance with the Rule/Regulations requirements by the surveyor.

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

Lloyd's Register Asia
Is a subsidiary of Lloyd's Register Group Limited

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.



Certificate for Air Receivers

Office

Seoul Port

Manufacturer

Kyung Nam Dryer Co., Ltd.

Client

As above

Built under licence from (if applicable)

N/A

Designer

Kyung Nam Dryer Co., Ltd.

First date of inspection

08-04-13

Date

10 April 2013

Work's order number

-

Intended service

PRESSURE VESSEL FOR CONTROL AIR DRYER

Intended for

HHI : H. 2558

Final date of inspection

08-04-13

This certificate is issued to the above Client to certify that the air receiver described herein, has been surveyed during manufacture by the undersigned Surveyor.

The air receiver has been constructed and tested in accordance with the relevant classification Rules and Regulations. The materials used have been approved, and the workmanship and results of weld tests (where required by the Rules) found satisfactory.

On completion the air receiver was tested by hydraulic pressure with satisfactory results.

Details

Identification number

6 Pcs of Chamber (Model : KHDM-350) : 130208-A/B, 130209-A/B, 130210-A/B and 2 Pcs of Chamber (Model : KHDM-700) : 130211-A/B

Plan number

KHDM350-CO-001 (KHDM-350), KHDM700-CO-001 (KHDM-700)

Date plans approved

26-03-13

Place plan approval

BDSO (Busan Design Support Office), BDS/ENG/212446

Capacity (m³)

KHDM-350 : 0.074 M3, KHDM-700 : 0.155 M3

Approved design pressure (bar)

9.0

Hydraulic test pressure

13.5 Bar

Date of hydraulic test

09 April 2013

Shell thickness (mm)

9.3 / 12.7

Class (if welded)

3

Welding firm (Class 1 only)

-

Identification Marks

Identification number (including office contraction code)

LR SEO 1350365

D.P. (bar)

9.0

T.P. (bar)

13.5

Initials

LCH

Date

09-04-13

C. H. Lee

Surveyor to Lloyd's Register Asia

A subsidiary of Lloyd's Register Group Limited

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.



Marine Design Appraisal Document

Lloyd's Register Asia
Busan Design Support Office
22nd Floor, Allianz Life Insurance Bldg.,
#862-1, Beomcheon 1-dong, Busanjin-gu,
Busan 614-724
Republic of Korea

Date
26 March 2013

Please quote the document number on all future communications

HYUNDAI HEAVY INDUSTRIES CO., LTD.
IMO NOS. 9637492 9655444
YARD NOS. 2558 2566
KYUNG NAM DRYER, CONTROL AIR DRYERS

1. The Documents listed in the **Appendix** have been examined for compliance with Lloyd's Register's Rules and Regulations for the Classification of Ships (July 2011) - Part 5, Chapters 10 & 11, and are assigned an appraisal status as indicated, subject to the following comments.

1.1	Comments	Action
1.1.1	Materials are to be in accordance with the requirements of an acceptable national or international specification.	AQS
1.1.2	Hydraulic tests are to be to the attending surveyor's satisfaction.	AQS
1.1.3	Mountings such as valves, gauges, etc. are to be subjected to a hydraulic test of twice the approved design pressure.	AQS
1.1.4	All valves are to be LR approved type.	AQS

J. Y. Ha / Surveyor
Engineering Group
Busan Design Support Office
Lloyd's Register ASIA
Tel.: +82 51 640 5076
Email: jong-yong.ha@lr.org

J. H. Lee / Senior Surveyor
Engineering Group
Busan Design Support Office
Lloyd's Register ASIA
Tel.: +82 51 640 5031
Email: jang-ho.lee@lr.org

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

Lloyd's Register Asia
Is a subsidiary of Lloyd's Register Group Limited

Lloyd's Register, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register Group'. The Lloyd's Register Group assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register Group entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Lloyd's Register Asia
Busan Design Support Office
22nd Floor, Allianz Life Insurance Bldg.,
#862-1, Beomcheon 1-dong, Busanjin-gu,
Busan 614-724
Republic of Korea

Date
26 March 2013

Please quote the document number on all future communications

APPENDIX

1. The documents listed below have been examined.

Document No.	Rev.	Title	Status	Date
KHDM700-CO-001	0	Desiccant (Heatless) Type Control Air Dryer (Model no.: KHDM-350)	AQ	26 Mar. 2013
KHDM350-CO-001	0	Desiccant (Heatless) Type Control Air Dryer (Model no.: KHDM-700)	AQ	26 Mar. 2013

2. The following Design Information has been considered together with the submitted documents in the appraisal.

Design Information

Air Dryer Title	Control Air Dryer (Model No.: KHDM-350)	Control Air Dryer (Model No.: KHDM-700)
Working Pressure (bar G.)	7	7
Design Pressure (bar G.)	9	9
Design Temp. (°C)	100	100
Test Pressure (bar G.)	13.5	13.5
Class	3	3

Appraisal Status & Action Key

- AQ = Approved subject to the matters raised that require resolution - and provided the arrangements are to the surveyor's satisfaction.
- AQS = Details to be submitted by the client to the local surveyor's Office responsible for surveying the building and the arrangements verified in accordance with the Rule/Regulations requirements by the surveyor.

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

Lloyd's Register Asia
Is a subsidiary of Lloyd's Register Group Limited

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.



Certificate for Air Receivers

Office

Seoul Port

Manufacturer

Kyung Nam Dryer Co., Ltd.

Client

As above

Built under licence from (if applicable)

N/A

Designer

Kyung Nam Dryer Co., Ltd.

First date of inspection

07 February 2014

Date

07 February 2014

Work's order number

2U566N6841

Intended service

PRESSURE VESSEL FOR CONTROL AIR DRYER

Intended for

HHI : H. 2566

Final date of inspection

07 February 2014

This certificate is issued to the above Client to certify that the air receiver described herein, has been surveyed during manufacture by the undersigned Surveyor.

The air receiver has been constructed and tested in accordance with the relevant classification Rules and Regulations. The materials used have been approved, and the workmanship and results of weld tests (where required by the Rules) found satisfactory.

On completion the air receiver was tested by hydraulic pressure with satisfactory results.

Details

Identification number

6 Pcs of Chamber (Model : KHDM-350) : 131210-A/B, 131211-A/B, 131212-A/B and 2 Pcs of Chamber (Model : KHDM-700) : 131213-A/B

Plan number

KHDM350-CO-001 (KHDM-350), KHDM700-CO-001 (KHDM-700)

Date plans approved

26-03-13

Place plan approval

BDSO (Busan Design Support Office), BDS/ENG/212446 dated 26 Mar 2013.

Capacity (m³)

KHDM-350 : 0.070 M3, KHDM-700 : 0.164 M3

Approved design pressure (bar)

9.0

Hydraulic test pressure

13.5 Bar

Date of hydraulic test

07 February 2014

Shell thickness (mm)

9.3 / 12.7

Class (if welded)

3

Welding firm (Class 1 only)

-

Identification Marks

Identification number (including office contraction code)

LR SEO 1450120

D.P. (bar)

9.0

Initials

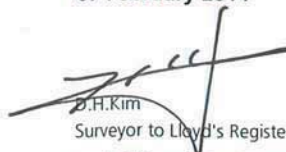
DHK

T.P. (bar)

13.5

Date

07 February 2014


B.H. Kim
Surveyor to Lloyd's Register Asia

A subsidiary of Lloyd's Register Group Limited

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.