

## Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the LR Type Approval System.

This certificate is issued to:

PRODUCER	Hy-Lok Corporation
PLACE OF PRODUCTION	1467-1, Songjeong-dong, Gangseo-gu, Busan, 618-817 Korea
DESCRIPTION	115 Series Ball Valves
TYPE	DIN 2353 Light Series Tube (L) Basic Part, No. : BVDT-6L, -8L, -10L, -12L, -15L, -18L, -22L, -28L, -35L DIN 2353 Heavy Series Tube (S) Basic Part, No. : BVDT-8S, -10S, -12S, -14S, -16S, -20S, -25S, -30S, -38S Femal DIN/ISO 228/BSP Basic Part, No. : BVDF-2G, -4G, -6G, -8G, -12G, -16G, -20G Femal NPT (ANSI/ASME B1.20.1) Basic Part, No. : BVDF-4N, -6N, -8N, -12N, -16N, -20N [Remarks] <i>Fire safety Design Code added '-FS' after the basic part number. (ex.: BVDF-16N-FS)</i>
APPLICATION	Hydraulic Fluids, compressed air, lubricants and fuel oil systems [Remarks] <i>Only 'Fire Safety' type can be used in spaces where leakage of failure caused by fire could result in fire spread, flooding or the loss of an essential services in accordance with Part 5, Chapter 12, Section 6.1.3 of the Rules.</i>
Certificate No.	12/10009
Issue Date	23 February 2012
Expiry Date	22 February 2017
Sheet	1 of 2

  
N. Nagamune  
Yokohama Design Support Office  
Lloyd's Register

Lloyd's Register, registered office:  
71 Fenchurch Street, London EC3M 4BS

**STANDARD/  
DESIGN CODE**

LR Rules and Regulations for the Classification of Ships, Part 5, Chapter 12 (July 2011)  
DIN 2353:1991 "German Industrial Standardization"  
API 607: 2005 (ISO 10497-5:2004) "Fire Test for Soft-Seated Quarter-Turn Valves"

**RATINGS**

DIN 2353 Light Series Tube (L)	Nominal size range (DN) : 4~25 Pressure range : 315 bar ~ 160 bar
DIN 2353 Heavy Series Tube (S)	Nominal size range (DN) : 4~25 Pressure range : 500 bar ~ 315 bar
Femal DIN/ISO 228/BSP	Nominal size range (DN) : 6~25 Pressure range : 500 bar ~ 315 bar
Femal NPT (ANSI/ ASME B1.20.1)	Nominal size range (DN) : 6~25 Pressure range : 500 bar ~ 315 bar
Temperature rating	
Seal material	NBR (Buna N) : -23°C ~ 121°C Viton : -23°C ~ 200°C EPDM : -46°C ~ 149°C
Ball seats material	POM-MoS <sub>2</sub> : -30°C ~ 100°C PTFE : -54°C ~ 65°C
Body material	SS316 : ASTM A479/SS316, DIN 17440/1.4571 Carbon Steel : ASTM A108/12L14, DIN 1651 9SMn28K

**OTHER CONDITIONS**

Valves are to be tested in accordance with recognised standards, but to not less than 1.5 times the design pressure in accordance with Part 5, Chapter 12, Section 8.1.7 of the Rules.

*"This Certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register of any modification or changes to the equipment in order to obtain a valid certificate."*

*The Design Appraisal Document No. 11/10098 and its supplementary Type Approval Terms and Conditions form part of this Certificate.*

Certificate No.	12/10009
Issue Date	23 February 2012
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Lloyd's Register

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# Marine Design Appraisal Document

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Date  
23 February 2012

Quote this reference on all future communications  
YDS/T/NNA/114226 (M12-03)

## THE LR TYPE APPROVAL SYSTEM, 2002.

Issued to: HY-LOK CORPORATION  
for: 115 SERIES BALL VALVES  
TYPE APPROVAL CERTIFICATE No. 12/10009

The undernoted documents have been reviewed for compliance with the requirements of the LR Type Approval System, 2002 and this Design Appraisal Document forms part of the Certificate.

### APPROVAL DOCUMENTATION

Request for Marine Services Form dated 04 March 2011.

'Approval Services – Request for Quotation' form dated 04 March 2011

Doc. No. 115BV-DP (Rev. 1) 'Design Plan' dated 18 August 2008

Doc. No. 115BV-DS (Rev.1) 'Design Specification Data Sheet' dated 25 August 2008

Doc. No. 115BV-IRC (Rev.1) 'Design Input Review Check List' dated 28 August 2008

Doc. No. 115BV-DR (Rev.1) 'Design Calculation Sheet' dated 22 September 2008

Doc. No. 115BV-CVS (Rev.1) 'Calculation Verify Sheet' dated 25 September 2008

Doc. No. 115BV-VCH (Rev.1) 'Design Verification Check List' dated 29 September 2008

Catalog No. H-115BV dated June 2003

Doc. No. 115BV-DWG (Rev.1) 'Drawing of 115 Series Ball Valve' accompanied with the following Drawings:-

<u>Dwg. No.</u>	<u>Rev.</u>	<u>Title</u>	<u>Date</u>
2008K24J01	0	Ball Valve Body for Fire Safety	24/11/2008
2008K24J02	0	Ball Valve Body	24/11/2008
2008K24J03	0	End Connector for Fire Safety	24/11/2008
2008K24J04	0	End Connector for Fire Safety	24/11/2008
2008K24J05	0	End Connector	24/11/2008
2008K24J06	0	End Connector	24/11/2008
2008K24J07	0	Stem	24/11/2008
2008K24J08	0	Ball	24/11/2008
2008K24J09	0	Stopper	24/11/2008
2008K24J10	0	Stop Ring	24/11/2008
2008K24J11	0	Inner Washer	24/11/2008
2008K24J12	0	Handle	24/11/2008

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

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<u>Dwg. No.</u>	<u>Rev.</u>	<u>Title</u>	<u>Date</u>
2008K24J13	0	Washer	24/11/2008
2008K24J14	0	Upper Washer	24/11/2008
2008K24J15	0	Pin	24/11/2008
2008K24J16	0	Seat	24/11/2008
2008K24J17	0	Seat for Fire Safety	24/11/2008

### **TEST REPORTS**

Report No. TR-LR-HYROK115-111215 'Test Report for LR Type Approval' dated 15 December 2011 witnessed by Busan Port Surveyor

Doc. No. FSTR-12A13-01 'Fire Safety Test Report' dated 13 January 2012 witnessed by Busan Port Surveyor

Doc. No. 115BV-VLD (Rev.1) 'Design Validation' attached with the test reports of Shell test, Leakage test, Pressure test and Fire safety test

Lloyd's Register Busan Port Surveillance Report dated 13 January 2012

### **Supplementary Type Approval Terms and Conditions**

*Type Approval certifies that a representative sample of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein. It does not mean or imply approval for any other use, nor approval of any product(s) designed or manufactured otherwise than in strict conformity with the said representative sample.*

*Type Approval is based on the understanding that the manufacturer's recommendations and instructions and any relevant requirements of the Rules and Regulations are complied with.*

*Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations.*

*Lloyd's Register reserves the right to cancel or withdraw this Type Approval Certificate in accordance with the LR Type Approval System Procedure.*



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

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Part 1A  
 Subject: Valves  
 Product: Ball Valves (Part 1A)

Producer / Licence No.		Description of Product			Cert. No.
Type	Details of Approval	Application	Remarks		
115 Series Ball Valves	<p>Body material            SS316 : ASTM A479/SS316, DIN 17440/1.4571            Carbon Steel : ASTM A108/12L14, DIN 1651 9SMn28K</p> <p>DIN 2353 Light Series Tube (L)            Basic Part, No. :            BVDT-6L, -8L, -10L, -12L, -15L, -18L, -22L, -28L, -35L</p> <p>DIN 2353 Heavy Series Tube (S)            Basic Part, No. :            BVDT-8S, -10S, -12S, -14S, -16S, -20S, -25S, -30S, -38S</p> <p>Femal DIN/ISO 228/BSP            Basic Part, No. :            BVDF-2G, -4G, -6G, -8G, -12G, -16G, -20G</p> <p>Femal NPT (ANSI/ ASME B1.20.1)            Basic Part, No. :            BVDF-4N, -6N, -8N, -12N, -16N, -20N</p> <p>[Remarks]  <i>Fire safety Design Code added '-FS' after the basic part number.</i>  <i>(ex.: BVDF-16N-FS)</i></p> <p>Nominal size range (DN): 4 ~ 25            Pressure range: 500 ~ 160</p> <p>Temperature rating            Seal material            NBR (Buna N) : -23°C ~ 121°C            Viton : -23°C ~ 200°C            EPDM : -46°C ~ 149°C</p> <p>Ball seats material            POM-MoS<sub>2</sub> : -30°C ~ 100°C            PTFE : -54°C ~ 65°C</p>	<p>Hydraulic Fluids, compressed air, lubricants and fuel oil systems</p> <p>[Remarks]  <i>Only 'Fire Safety' type can be used in spaces where leakage of failure caused by fire could result in fire spread, flooding or the loss of an essential services in accordance with Part 5, Chapter 12, Section 6.1.3 of the Rules.</i></p>	<p>Expires: 22 February 2017</p> <p>See the certificate for other conditions.</p>	12/10009	

*[Signature]*  
 23/02/2012