DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **P-14518**

This is to certify that the
Ball Valve

with type designation(s)
115 Series

Manufactured by
Hy-Lok Corporation (Kangseo Factory)
Pusan, **Republic of Korea**

is found to comply with
Det Norske Veritas' Rules for Classification of Ships
Det Norske Veritas' Standards for Certification 2.9 No. 5-794.40

Application
The valves may be used in the following systems: Compressed air and water based hydraulic fluids. The valves with DIN 2353 tube connection and a part number ending with -FS may also be used in the following systems: Petroleum based hydraulic fluids, lubricating oil and fuel oil systems.

Temperature range:	**See certificate**
Max. working press.:	**500 bar, see certificate**
Sizes:	**DN: 4 to 25**

This Certificate is valid until **2017-06-30**.

Issued at **Høvik** on **2013-07-12**

DNV local station: **Pusan**

Approval Engineer: **Mohsen Mohebbi**

for **Det Norske Veritas AS**

Digitally Signed By: Ragavendhra Rao, Vishnumurthi
Location: DNV Høvik, Norway
Signing Date: 12.07.2013

On behalf of - Marianne Spæren Marveng
Head of Section

Product description

Ball valves with female threaded or tube ends. Fire safety valves are marked with FS after the basic part no. I.e.: BVDT-16S-FS.

Pressure ratings:

Type	Basic part No.	DN	PB (bar)
DIN 2353 Light Series Tube (L)			
	BVDT – 6L	4	315
	BVDT – 8L	6	315
	BVDT – 10L	6	315
	BVDT – 12L	10	315
	BVDT – 15L	13	315
	BVDT – 18L	13	315
	BVDT – 22L	20	160
	BVDT – 28L	25	160
	BVDT – 35L	25	160
DIN 2353 Heavy Series Tube (S)			
	BVDT – 8S	4	500
	BVDT – 10S	6	500
	BVDT – 12S	8	500
	BVDT – 14S	10	500
	BVDT – 16S	13	400
	BVDT – 20S	13	400
	BVDT – 25S	20	315
	BVDT – 30S	25	315
	BVDT – 38S	25	315
Female DIN/ISO 228/BSP			
	BVDF -2G	6	500
	BVDF -4G	6	500
	BVDF -6G	10	500
	BVDF -8G	13	500
	BVDF -12G	20	315
	BVDF -16G	25	315
	BVDF -20G	25	315
Female NPT (ANSI/ASME B1.20.1)			
	BVDF-4N	6	500
	BVDF-6N	10	500
	BVDF-8N	13	500
	BVDF-12N	20	315
	BVDF-16N	25	315
	BVDF-20N	25	315

Temperature ratings:

Seals

Material	Temperature rating
NBR (Buna N)	-23°C to 121°C
Viton	-23°C to 200°C
EPDM	-46°C to 149°C

Ball seats

Material	Temperature rating
POM – MoS_2	-30°C to 100°C
PTFE	-54°C to 65°C

Body material:

SS316: ASTM A479/SS316, DIN 17440/1.4571
Carbon steel: ASTM A108/12L14, DIN 1651/9SMn28K

Application/Limitation

Valves where sealing is done only by threads shall not be used for flammable fluids.
Max. pressure is to be de-rated dependant on temperature(See following table).

	Temperature (ºC)				
	20	**50**	**100**	**150**	**200**
Carbon steel	1.00	1.00	1.00	0.89	0.81
Stainless steel	1.00	0.95	0.85	0.77	0.71

Valves with EPDM seals shall not be used for hydrocarbon applications
The approval does not cover systems with oxygen.
The approval does not include any operating gear for remote control of the valves.

Each valve is to be subjected to a hydrostatic pressure test at minimum 1.5 times the design pressure:
Holding time : 2 minutes for all sizes
Acceptance criterion: No leakage is permitted.

Each valve assembly shall be subjected to a hydrostatic seat leakage test. The test pressure shall at least be equal to the maximum design pressure. The test shall be performed with closed valve with the other end open to atmosphere:
Holding time : 5 minutes for all sizes
Acceptable criterion: Drop tight

Each valve is to be certified by Det Norske Veritas when required by Det Norske Veritas Rules, or by the Purchaser.

Type Approval documentation

Design plan document no.: 115BV-DP, Rev.1
Design specification data sheet, document no.: 115BV-DS, Rev.1
Design input review checklist, document no.: 115BV-IRC, Rev. 1
Drawing overview with attached drawings, document no.: 115BV-DWG, Rev.1
Design calculation sheet, document no.: 115BV-DR, Rev.1
Design calculation verification sheet, document no.: 115BV-CVS, Rev.1
Design verification checklist, document no.: 115BV-VCH, Rev. 1
Test report, document no.: 04T-H115BV
Fire test report, document no.: FSTR-081107-01
ASME Quality system certificate

Tests carried out

Fire test (Valve BVDF-16N-FS)

Marking of product

For traceability to this type approval, each valve is at least to be marked with:

- Manufacturer's name or trade mark
- Type designation
- Size
- Max design pressure or pressure class

Certificate Retention Survey

For retention of the Type Approval, a DNV Surveyor shall perform a survey - before the expiry date of this certificate - to verify that the conditions for the type approval are complied with.

END OF CERTIFICATE