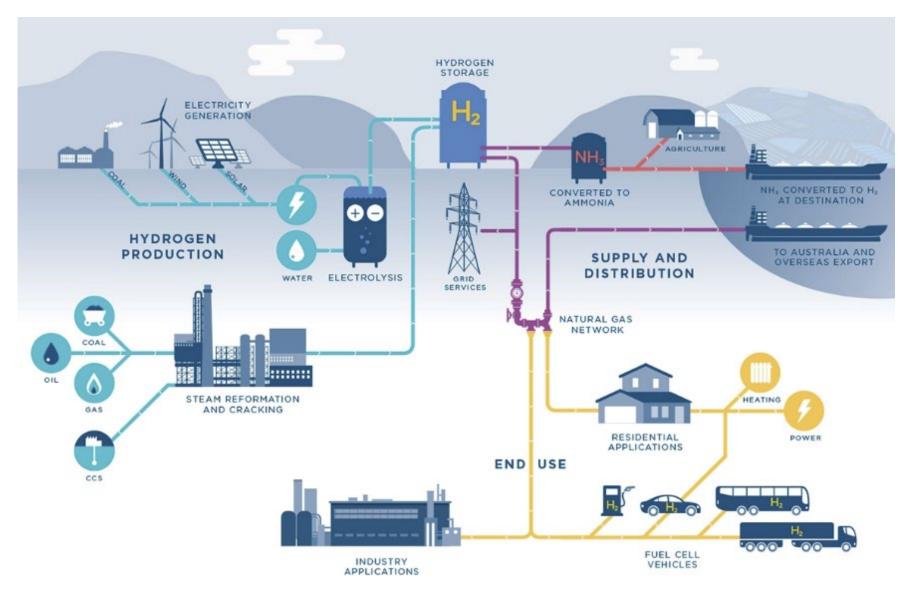
HYDROGEN SOLUTION PROVIDER – HY-LOK CORPORTION





At a glance





43
Years of experience



493
employees



Serving customers in more than

+100



Annual Sales

\$140

Mil

Hy-Lok organization offers additional growth potential in Hydrogen industries

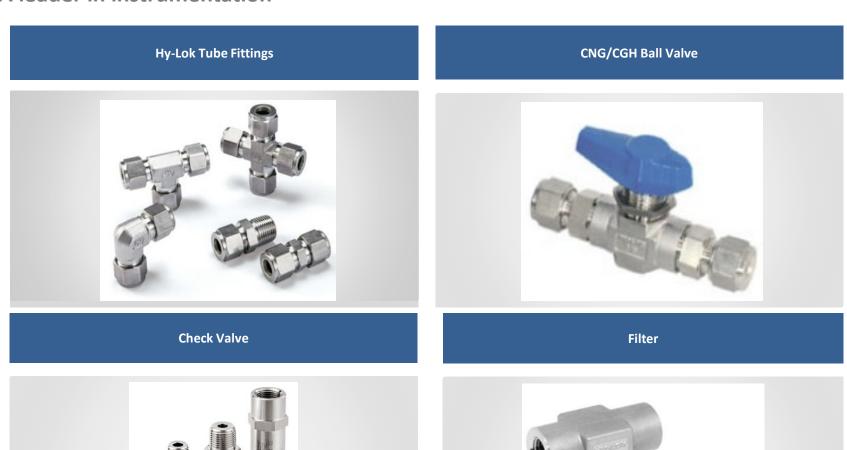


			Task Force Team			
Sales / PM	R&D	Production	Logistic	Procurement	OC	HSE
- Check the client needs / Demand - Customer Satisfaction - As PM	Review KPC/SR - Engineering - APQP - Control Plan - Process Flow Diagram - Pre-Process Capability Report - Work Procedure / Instruction - Reliable Test - 4M Design Change Procedure - MSA Management - Manage the Lab - Manage KPI	- PFMEA - Measurement and Report - Tool Management - Make production Line - MSA Management - Manage the cycle time - Verrification for 1st Part - Prevention action Plan - Production Schedue Management - Manage the traceability - Manage the sub-vendor - Sub-vendor Verification and Audit - Audit the process in sub-vendor - Manage KPI	- Packing Procedure - Monitoring assembly - MSA Management - Traceability - Make prevention action plan - Pool Proof system - Manage KPI	- Manage the subvendor - Material Management - Change Procedure - Audit IATF 16949 for sub-vendor - Inspection Agreement with subvendor - Manage KPI - Traceability	- Make Quality Manual - Visual & Dimensional Check Sheet/MTR - Inspection Agreement, standard, Certificate - Inspection and Testing - Manage NCR - Audit worker / QC - Audit quality / production system - Product verification - MSA Management - External Lab management - Control Plan for the quality management - Make PSA - 8D Report - Manage KPI	- MSDS Report - Prevention Action Plan - Repair & Maintenance - Record the equipment failure - Water Quality - Energy consumption & A Pollution management
Mr SM Choi Career : 10Years	Mr JH Lee Career : 20Years	Mr KY Kim Career : 15Years	Mr SW Nam Career : 20Years	Mr Y Hwang Career : 13Years	Mr JT Kim Career : 13Years	Mr SG Kim Career : 15Years

Product portfolio at a glance for Hydrogen



A leader in instrumentation

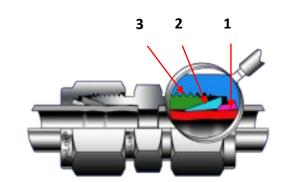




Tube Fitting

Hy-Lok® Key Design Benefits

- 1. The Back Ferrule provides a strong mechanical and anti-vibration hold on the tube
- 2. Pressure Seal by Front Ferrule on the Tube and Body
- 3. Fine Pitch, Silver Plated Nut, Threads ensure no galling



Scope Fitting

Series: Hy-Lok Tube Fitting (Two Ferrule Construction)

Material : Stainless Steel S316/316L

EDPM O-ring for SAE/MS Male Connector Fitting

■ Pressure: 35Mpa (1/4" 6mm to 5/8" 16mm)

70Mpa (1/4" & 6mm)

■ Temperature Range: -40deg C to +85deg C

■ Size certified: 1/4" ~ 5/8" (6mm ~ 16mm)

■ EC 79 Certified Approval Number:

35Mpa: e4*79/2009*406/2010*00069*00

70Mpa: e4*79/2009*406/2010*00074*00









CNG Series Ball Valve

CNG® Key Design Benefits

- 1. Live Loaded Type for long cycle life and High Pressure
- 2. Quick ¼" turn on-off control of the flow the vehicle tank to engine
- 3. Either certified by ECE R110

Scope of Ball Valve

Series: CNG1B (Orifice 6.2mm) / CNG2B (Orifice 9.2mm)

• Material : Stainless Steel S316/316L

EDPM / PEEK

Pressure: 35Mpa (8M, 10M, 12M, 16M & ¾"-16UNF Connection)

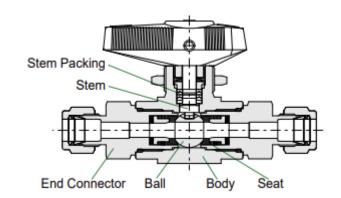
■ Temperature Range: -40deg C to +85deg C

Size certified : 8mm ~ 16mm (Two Ferrule End)

■ EC 79 Certified Approval Number :

35Mpa: e4*79/2009*406/2010*00070*00





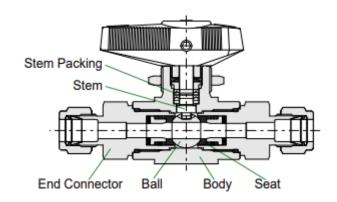




CGH Series Ball Valve

CGH® Key Design Benefits

- 1. Two Sealing Construction on End connector
- 2. Quick ¼" turn on-off control of the flow the vehicle tank to engine



Scope of Ball Valve

• Series: CGH2B Series (6m: Orifice 4.8mm / 8m, 10m, 12m: Orifice 6.4mm)

■ Material : Stainless Steel S316/316L

EDPM / PEEK

Pressure : 35Mpa (6M, 8M, 10M & 12M)

■ Temperature Range: -40deg C to +85deg C

Size certified : 6mm ~ 12mm (Two Ferrule End)

■ EC 79 Certified Approval Number:

35Mpa: e4*79/2009*406/2010*00078*00



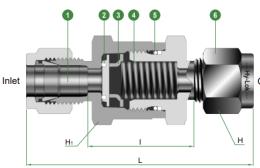




CVH Series Check Valve

CVH® Key Design Benefits

- 1. Integrated Poppet with O-ring for excellent leak tight
- 2. Prevent Non-return for the fluid from Outlet to Inlet



- · is max. flow design for min. pressure drop. include flow dia from 4.8mm to 15.0mm
- - · provides leak tight shut-off with elastomer seal
- 3 Poppet Stopper
 - · provides minimizes spring stress.
- · are available for the cracking pressure in the range from 1/3psig to 25psig
- O-ring and Back Up Rings
 - are halves for ensures closure to the rated pressure

Scope of Check Valve

Series : CVH Series

Material : Stainless Steel S316/316L

EDPM / PTFE

■ Pressure: 35Mpa

■ Temperature Range: -40deg C to +85deg C

■ Size certified: ¼" 6mmOD ~ ½" 12mm OD

1/4" Female NPT

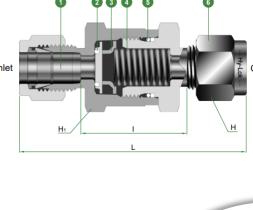
1/4", 3/8" & 1/2" Male NPT

■ EC 79 Certified Approval Number:

35Mpa: e4*79/2009*406/2010*00072*00









FT Series Filter

FT® Key Design Benefits

- 1. Easy replacement of filter elements
- 2. Available bypass design

Scope of Ball Valve

Series : FT Series

■ Material : Stainless Steel S316/316L

EDPM / PTFE

■ Pressure: 35Mpa

■ Temperature Range : -40deg C to +85deg C

■ Size certified: ¼" 6mmOD ~ ½" 12mm OD

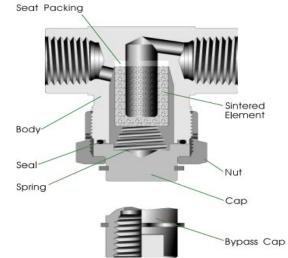
½" Female NPT

1/4" Male NPT

■ EC 79 Certified Approval Number:

35Mpa: e4*79/2009*406/2010*00072*00

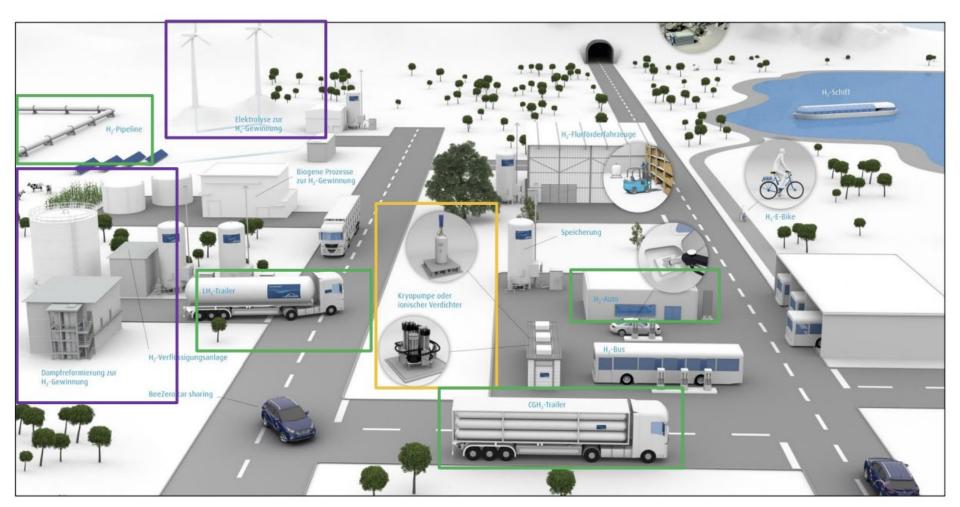






Hydrogen Target industries





H2 production

- renewable production...
- conventional production

H2 distribution

- pipeline
- trailer transport
- · on-site production

H2 fueling

- liquid hydrogen
- gaseous hydrogen

Other

- liquification
- storage
- · project execution
- service & maintenance

Hydrogen Application









<Hydrogen Reformer >

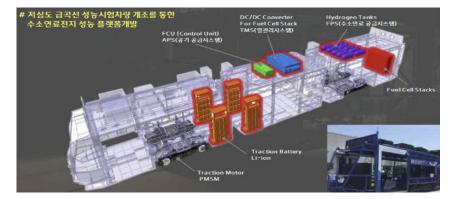
<Hydrogen Station>

<Hydrogen Dispenser>





<Hydrogen Truck >





<Hydrogen Train>

Hydrogen Supply Record



1. MOBILITY

	PROJECT	End User	Serial of	Total Amount	Remark
			Production		
MOBILITY	XCIENT TRUCK	HKMC	2022 ~ 2025	3.5Million	1550ea contracted
	HYDROGEN BUS	KAMAZ	~ 2023	1.8Million	1000ea to be anti
					cipated
	HYDROGEN VAN STEP0		2022 ~ 2023	EUR 10,000	300ea contracted
	HYDROGEN VAN STEP1	HYVIA	2023 ~ 2025	EUR 300,000	4000ea, to be con
					tracted
	HYDROGEN VAN XDD		2025 ~ 2030		400,00ea being in
					work
	HYDROGEN VAN HK0	STELLANTIS	2023		Not started
STROAGE	HYDROGEN TRAILER	GAUSSIN	2023		Prototype done
	HYDROGEN ECO STORAGE SYS	ZF-FAURECIA	2023	EUR 1,500	Prototype done
	TEM				

<u>2. TRAIN</u>

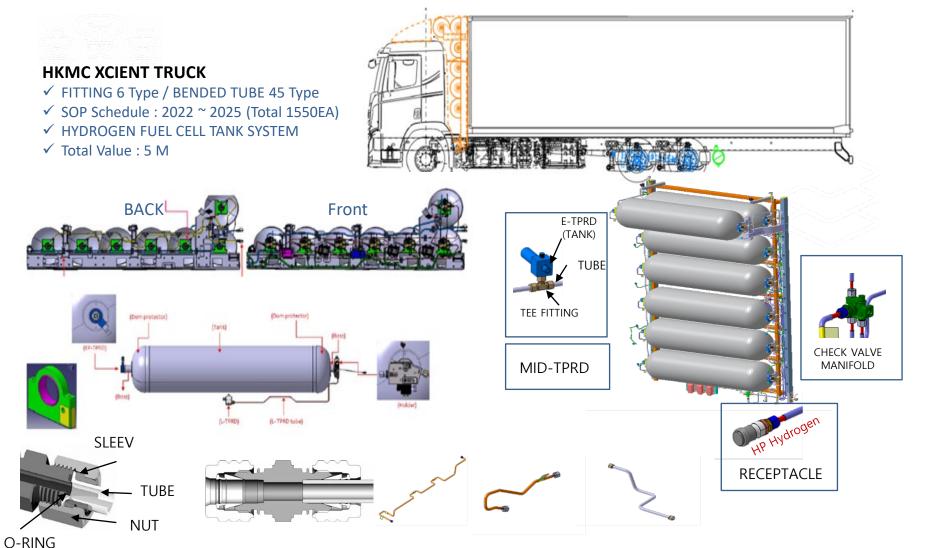
	PROJECT	End User	Serial of	Total Amount	Remark
			Production		
TRAIN	CORADIA ILINT	ALSTOM	2020 ~ 2022	EUR 200,000	84ea
	TALGO HYDROGEN TRAIN	TALGO	~ 2023		Prototype being
					in process

<u>3. PLANT</u>

	PROJECT	End User		Total Amount	Remark
			uction		
PLANT	Hydrogen Production Plant	GKN	300 (Plant)		MADER

Hydrogen Supply Record – Hydrogen Truck





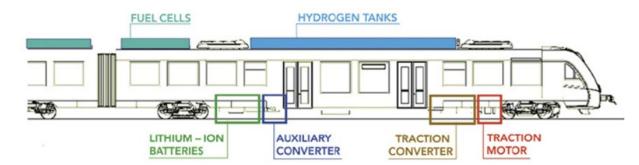
- ✓ HY-LOK can supply O-ring Face Seal Fitting (HP), Bended Tube (HP/MP), Two Ferrule Fitting (MP) and Receptacle
- ✓ O-ring Face Seal Fitting (EC79 Certified), Bended Tube (NO EC79 Item), Two Ferrule Fitting (EC79 Being in Process) and Receptacle (EC79 Certified)

Hydrogen Supply Record – Hydrogen Train



ALSOM'S CORADIA ILINT

- ✓ CNG Valve 2 type / Tube Fittings 19 type
- ✓ SOP Schedule: 202- ~ 2022 (Total 84EA)
- ✓ HYDROGEN FUEL CELL TANK SYSTEM
- ✓ Total Value : EUR 200,000





Roof Mounted Fuel Cell





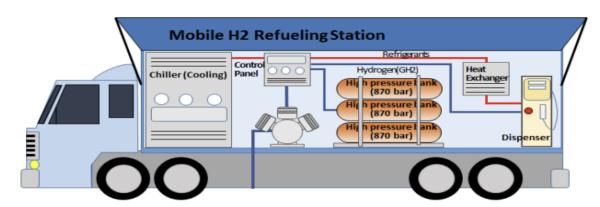
[✓] CNG Ball Valve and Various Tube Fitting are installed between hydrogen tank and fuel cell system.

Supply Record – Mobile Refueling Station



CARBUROS METALICOS

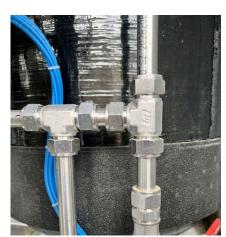
- √ Various Tube Fittings supplied
- ✓ HYDROGEN FUEL CELL REFUELING SYSTEM
- ✓ Total Value : EUR 10,000 per 1ea











√ Tee Connector has been installed between Hydrogen Tank and Dispenser



EC79 Test Detail



NO.	Spec. No.		TYPE OF TEST	Test Conditions		
5.1	Annex 8 Part B1		Hydrogen Compatibility Test	- Number of material samples to be tested: 3 - ISO 11114-1 or ISO/DIS 11114-4		
5.2	MATERIAL			- Number of material samples to be tested: 3 - ASTM D572 - Uses Aggravated conditions conforming to Para.2.4.5.1 / 2.0MPa for 96hours		
5.3		Annex 8 Part B3	Ozone Compatibility Test	 Number of material samples to be tested: 3 ISO 1431/1 Ozone Exposure for 120 hours at 40°C Increase the coefficient of Expansion up to 20% - Verification of Cracking 		
5.4		Annex 8 Part B4	Corrosion Resistance Test	- Number of material samples to be tested: 3 - ISO 9227 – Salt Spray for 144hours - ISO 6957 – Ammonia for 24hours		
5.5		Annex 8 Part B5 Endurance Test		- Number of material samples to be tested: 3 - Fluid: Gas(Air, Nitrogen, Hydrogen) 1) 96%: 20°C±5°C (10±2 Sec) N/W-0.5 2) 2%: Minimum Temp. for 2hours (In/External Leak Test) 3) 2%: Maximum Temp. for 2hours (In/External Leak Test) x 1.25 Time		
5.6	PRODUCT	Annex 8 Part B6	Hydraulic Pressure Cycle Test	- Number of material samples to be tested: 3 - Filling Cycles(5,000x3Time),Duty Cycles(50,000x3Time) - Pressure:20 Bar(2.0MPa) ~ 438 Bar(N/Wx1.25Time)		
5.7		Annex 8 Part B7 Internal Leakage Test		Internal Leakage Test	- Number of material samples to be tested: 3 - Fluids: H2, Allowable Leakage:10cm³/hour(0.16cm³/min) for 3min. 1) Ambient:20°C±5°C (N/Wx0.02Time) 2) Low-Temp. :-40°C, 2hours (N/Wx0.02Time) 3) High-Temp. :120°C, 2hours (N/Wx0.02Timex1.25Timex1.37Time)	
5.8		Annex 8 Part B8	External Leakage Test	- Number of material samples to be tested: 3 - Fluids: H2, Allowable Leakage: 10cm³/hour(0.16cm³/min) for 3min. 1) Ambient: 20°C±5°C (N/Wx0.02Time-7Bar) 2) Low-Temp. :-40°C, 2hours (N/Wx0.02Time-7Bar) 3) High-Temp. :120°C, 2hours (N/Wx0.02Timex1.25Timex1.37Time)		

EC79 Certificate





L-2938 Luxembourg





snch L-5201 Sandweiler





Sandweiler, le 21 novembre 2014





SOCIÉTÉ NATIONALE DE CERTIFICATION ET D'HOMOLOGATION

Registre de Commerce: B 27180

L-5201 Sandweiler

Référence: e13*79/2009*406/2010*0004*01

- Rapport technique

Fiche de renseignements du constructeur

Sandweiler, le 24 janvier 2013

Référence: e13*79/2009*406/2010*0005*01

- Rapport technique

Fiche de renseignements du constructeur

Référence: e13*79/2009*406/2010*0002*00

- Rapport technique

- Fiche de renseignements du constructeur Sandweiler, le 17 octobre 2012

CERTIFICAT DE RECEPTION CE PAR TYPE

EC TYPE-APPROVAL CERTIFICATE

Communication concernant: Communication concerning

EC type approval extension de la réception CE par type (1) extension of EC type-approval (refus de la réception-CE par type (1) - retrait de la réception CE par type (1)

d'un type de composant hydrogène en rapport avec le règlement (CE) n° 79/2009, tel que mis en œuvre par le règlement (UE) n° 406(2010.

of a type of hydrogen component with regard to Regulation (EC) No 79/2009, as implemented by Regulation (EU) No 406/2010.

Numéro de réception CE par type: EC type-approval number:

Raison de l'extension:

e13*79/2009*406/2010*0004*01

see: Annex 0 of technical report N° TS-79/2009-001/13

SECTION I SECTION I

CGH2HR-OF-4

Marque (nom commercial du fabricant):

Hy-Lok Corporation

Type:

Variante(s)/version(s): not applicable CERTIFICAT DE RECEPTION CE PAR TYPE EC TYPE-APPROVAL CERTIFICATE

Communication concernant: Communication concerning

EC type-approval (- extension de la réception CE par type (1) extension of EC type-approval (1

refus de la réception-CE par type - retrait de la réception CE par type (1) withdrawal et EC type approval (1)

d'un type de composant hydrogène en rapport avec le règlement (CE) n° 79/2009, tel que mis en œuvre par le règlement (UE) n° 406/2010. of a type of hydrogen component with regard to Regulation (EC) No 79/2009, as implemented by Regulation (EU) No 406/2010.

Numéro de réception CE par type:

Raison de l'extension:

Reason for extension

e13*79/2009*406/2010*0005*01

see Annex 0 of technical report N° 82-79/2009-001/14

SECTION I SECTION I

Marque (nom commercial du fabricant): Make (trade name of manufacturer).

Type:

0.2.

Variante(s)/version(s): Variant(s)/version(s):

Hy-Lok Corporation

CGH2-OFX

see table 1 of information document

CERTIFICAT DE RECEPTION CE PAR TYPE EC TYPE-APPROVAL CERTIFICATE

Communication concernant: Communication concerning

certificat de réception CE par type (1) EC type-approval (

extension de la réception CE par type (1) refus de la réception CE par type (1) refusal of EC type approval

- retrait de la réception-CE par type

d'un type de composant hydrogène en rapport avec le règlement (CE) n° 79/2009, tel que mis en œuvre par le réglement (UE) n° 406/2010.

of a type of hydrogen component with regard to Regulation (EC) No 79/2009, as implemented
by Regulation (EU) No 406/2010.

Numéro de réception CE par type:

EC type-approval number:

e13*79/2009*406/2010*0002*00

Raison de l'extension:

not applicable Reason for extension:

SECTION I

Marque (nom commercial du fabricant): Make (trade name of manufacturer)

Hy-Lok Corporation

0.2.

CGH2HC-OFM-4T6U

Variante(s)/version(s):

not applicable

<O-ring Face Seal Receptacle >

<O-ring Face Seal Fitting>

<O-ring Face Seal Check Valve>

EC79 Certificate





Division Valuele Regulation & Admission



Division Vehicle Regulation & Admission



Division Vehicle Regulation & Admission

THE NETHERLANDS (NEDERLAND)



EC TYPE-APPROVAL CERTIFICATE

Communication concerning:

- EC type-approval (1)
- ion of EC type appro

of a type of hydrogen component

with regard to Regulation (EC) number 79/2009, as implemented by Regulation (EU) number 406/2010.

EC type-approval number

e4*79/2009*406/2010*00069*00

Reason for extension

: N.A.

SECTION I

Make (trade name of manufacturer) : Hy-lok Corporation 0.2 : Tube Fittings C-series 35 MPa

Means of identification of type, if marked on the component

CAM CXA CRTM CBTM CFC CPC CR CBTF CSBT CSRT CPA CAF CLA CMC CLF CLMA

P.O. Box 777 Tel. + 31 79 345 83 02 2700 AT Zoetermo The Netherlands www.nbw.nl

E-mail typeapproval/grdw.nl

Type-approval Department



THE NETHERLANDS (NEDERLAND)



EC TYPE-APPROVAL CERTIFICATE

Communication concerning:

- EC type-approval (1)

on of EC type-appr refusal of EC type-approval (withdrawal of EC type approval (1) of a type of hydrogen component

with regard to Regulation (EC) number 79/2009, as implemented by Regulation (EU) number 406/2010.

EC type-approval number

e4*79/2009*406/2010*00074*00

Reason for extension : N.A.

Tel. + 31 79 345 83 02

www.ntw.ni

E-mail typosperoval sinds at

SECTION I

0.1. Make (trade name of mamifacturer) Hy-lok Tube Fittings 70 MPa

0.2. Туре

P.O. Box 777

2700 AT Zoetermo

Hydrogen-component 79.2009-406.2010 v1.00

The Netherlands

CUA-4 CLA-4 CTA-4 CUA-6M **CLA6M** CTA6M

CMC4-4N CFC4-4N CXA-4 CXA6M CMC6M-4N CFC6M-4N

CAM4-4N CAM4-4U-HV CR4-4 CAM6M-4N CAM6M-4U-HV

CSC4-4U-HV CPC-4 CCA-4 CSC4-6U-HV CPC-6M CCA-6M CSC6M-4U-HV

CSC6M-6U-HV

RDW

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CPA-4 CAF4-4N

CAF6M-4N Type-approval Department

THE NETHERLANDS (NEDERLAND)



EC TYPE-APPROVAL CERTIFICATE

Communication concerning:

- EC type-approval (1)

- extension of EC type-approval (1)
- refusal of EC type-approval (1)
- withdrawal of EC type approval (1)

of a type of hydrogen component

with regard to Regulation (EC) number 79/2009, as implemented by Regulation (EU) number 406/2010.

EC type-approval number

: e4*79/2009*406/2010*00071*00

Reason for extension

: N.A.

SECTION I

Make (trade name of manufacturer) : Filter FT Series 35 MPa

0.2. FTH-XX-YY-EP FTM-4N-YY-EP

Means of identification of type, if 0.3. marked on the component : See 0.2. Type

0.3.1. Location of that marking : Body of the components(see drawings)

Name and address of manufacturer Hy-Lok Corporation 97, Noksansandan 27-ro, Gangseo-gu

46751 Busan Korea, Republic of

In the case of components and separate technical units, location and method of affixing of the EC approval mark

Name(s) and address(es) of assembly plant(s)

Hy-Lok Corporation 97, Noksansandan 27-ro, Gangseo-gu 46751 Busan

Korea, Republic of

Type-approval Department

Tel. + 31 79 345 83 02 2700 AT Zoeterno E-mail typeapproval@rdw.ni The Netherlands www.nfw.nl Hydrogen-component 79,2009-406,2010 v1.00

Page I of 4

EC79 Certificate





Division Vehicle Regulation & Admission



Division Vehicle Regulation & Admission



Division Vehicle Regulation & Admission

THE NETHERLANDS (NEDERLAND)



EC TYPE-APPROVAL CERTIFICATE

Communication concerning:

- EC type-approval (1)

- extension of EC type-approval - refusal of EC type-approval (1)

of a type of hydrogen component

- withdrawal of EC type approval (1)

with regard to Regulation (EC) number 79/2009, as implemented by Regulation (EU) number 406/2010.

EC type-approval number

e4*79/2009*406/2010*00070*00

Reason for extension

: NA SECTION I

Make (trade name of manufacturer) Hy-lok Ball Valves VCNG

0.2. VCNG1B-H-8M-EP VCNG1B-H-10M-EP VCNG1B-H-12M-EP

VCNG2B-H-16M-EP VCNG2B-F-8U-EP

Means of identification of type, if marked on the component See 0.2. Type

Body of the components(see drawings) Location of that marking

Name and address of manufacturer Hy-Lok Corporation

97, Noksansandan 27-ro, Gangseo-gu 46751 Busan

Korea, Republic of

In the case of components and separate technical units, location and method of affixing of the EC approval mark

Tel. + 31 79 345 83 02

www.nfw.nl

H-mail typesperoval kirdw.ni

P.O. Bev 777

2700 AT Zoetermeer

Hydrogen-component 79,2009-406,2010 v1.00

The Netherlands



P.O. Bey 777

2300 AT Zoetermee

The Netherlands

Type-approval Department

Page I of 4



THE NETHERLANDS (NEDERLAND)



EC TYPE-APPROVAL CERTIFICATE

Communication concerning:

- EC type-approval (1)

extension of EC type-approval - refusal of EC type-approval (1) - withdrawal of EC type approval (1) of a type of hydrogen component

with regard to Regulation (EC) number 79/2009, as implemented by Regulation (EU) number 406/2010.

EC type-approval number e4*79/2009*406/2010*00078*00

Reason for extension : N.A.

SECTION I

0.1. Make (trade name of mamufacturer) : Hy-lok Ball Valves VCGH

0.2. VCGH2B-H-6M VCGH2B-H-8M

VCGH2B-H-10M VCGH2B-H-12M

0.3. Means of identification of type, if marked on the component

: See 0.2. Type

Location of that marking : Body of the components(see drawings) 0.3.1.

Hy-Lok Corporation 97, Noksansandan 27-ro, Gangseo-gu Name and address of manufacturer

46751 Busan Korea, Republic of

In the case of components and separate technical units, location and method of affixing of the EC approval mark

Tel. + 31 79 345 83 02

www.nów.ni

E-mail typesperoval sindw.nl

Type-approval Department

P.O. Bex 777

2700 AT Zoetermee

The Netherlands

THE NETHERLANDS (NEDERLAND)



EC TYPE-APPROVAL CERTIFICATE

Communication concerning:

- EC type-approval (1)

- extension of EC type-app refusal of EC type-approval of a type of hydrogen component

with regard to Regulation (EC) number 79/2009, as implemented by Regulation (EU) number 406/2010.

EC type-approval number : e4*79/2009*406/2010*00072*00

Reason for extension : N.A.

SECTION I

: Check valves 35 MPa Make (trade name of manufacturer)

0.2 Type CVH1-H4T-YY-EP

CVH1-H6M-YY-EP CVH2-H6T-YY-EP

CVH2-H8T-YY-EP CVH2-H8M-YY-EP CVH2-H10M-YY-EP CVH2-H12M-YY-EP CVH1-F4N-YY-EP CVH1-M4N-YY-EP

CVH2-M6N-YY-EP CVH2-M8N-YY-EP Means of identification of type, if

marked on the component : See 0.2. Type Location of that marking Body of the components(see drawings)

Name and address of manufacturer Hy-Lok Corporation

97. Noksansandan 27-ro. Gangseo-gu

46751 Busan Korea, Republic of

Type-approval Department

Page I of 4

<CGH Series Ball Valve >

<CVH Series Check Valve >

Tel. + 31 79 345 83 02

www.nbw.nl

E-mail typeapproval (2ndw si

<CNG Series Ball Valve >

Hy-Lok at a glance



Headquarter



Busan, South Korea (25,445 m²)

Sinpyeong Factory



Busan, South Korea (11,150 m²)

Forging Factory



Gimhae, South Korea (13,223 m²)

- Fittings
- Instrument Valves
- Pipeline Ball Valves
- Double Block & Bleed Valves
- Cryogenic Valves

- Sampling System
- Instrument Package System
- Air Manifolds

Forged Material

Hy-Lok global set up



- Servicing close to customers
- Providing a wide range of service solutions
- Operating globally
- More than 100 global service networks



Hy-Lok long term business advantages





Professional

- ✓ Over 40 years skilled employees
- ✓ Introducing state-ofthe-art machines
- ✓ Global set up to customers



Experienced

- ✓ Diverse oil & gas projects performance
- ✓ Approved vendor by oil major companies
- ✓ Qualified supplier in energy industries



Interactive

- ✓ Fast reaction in term of customer's needs
- ✓ Quick technical supports & service



Organized

- ✓ Accurate and delicate facilities
- ✓ Ensured solid logistic system
- ✓ Continuous improvement of procedure

Thank You

- SM CHOI

