DNV·GL

Certificate No:
TAP0000005

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Bulk Loading Hoses with Permanently Fitted Couplings

with type designation(s)
Dolphinflex Chemical Red, Dolphinflex Chemical Green, Dolphinflex Oil blue, Dolphinflex Submersible White

Issued to
Sangbong Corporation
Gyeonggi-do, Republic of Korea

is found to comply with
Det Norske Veritas' Standards for Certification 2.9 No. 5-791.70
Det Norske Veritas' Rules for Classification of Ships Pt.5, Ch.4 "Chemical Carriers"

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Type:	Temperature range:	Max. working press.:	Sizes:
Dolphinflex Chemical Red	**-30°C to 80°C**	**dependent on size**	**1" to 12"**
Dolphinflex Chemical Green	**-30°C to 80°C**	**dependent on size**	**1" to 12"**
Dolphinflex Oil blue	**-30°C to 80°C**	**dependent on size**	**1" to 12"**
Dolphinflex Submersible White	**-30°C to 80°C**	**dependent on size**	**1" to 12"**

This Certificate is valid until **2019-12-15**.

Issued at **Høvik** on **2015-12-16**

for **DNV GL**

DNV GL local station: **Seoul**

Approval Engineer: **Adel Samiei**

On behalf of Marianne Spæren Marveng
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

© DNV GL 2014. DNV GL and the Horizon Graphic are trademarks of DNV GL AS.

Job Id: **262.1-010318-1**
Certificate No: **TAP0000005**

Product description

Four types of bulk loading flexible hoses with permanently fitted couplings designed according to EN13765: 2010

Hoses manufactured by Dolphinflex:

Type	Chemical Red	Chemical Green	Oil Blue	Submersible White
Inner Wire	Stainless Steel 316	Stainless Steel 316	Galvanized Steel / Stainless Steel 316	Stainless Steel 316
Lining	P.T.F.E. or E.C.T.F.E.	Poly-propylene fabrics and films	Poly-propylene fabrics and films	Poly-propylene fabrics or P.T.F.E.
Inner Layer	Poly-propylene fabrics and films	Poly-propylene fabrics and films	Poly-propylene fabrics and films	Poly-propylene fabrics and films
Outer Cover	Polyester PVC coated Red	Polyester PVC coated Green	Polyester PVC coated Blue	Poly-propylene fabrics
Outer Wire	Stainless Steel 316	Stainless Steel 316	Galvanized Steel / Stainless Steel 316	Stainless Steel 316

Couplings manufactured by Dolphinflex:
Male thread nipple, Male or female quick coupling, Ferrule, Turn back, Slip-on flange, Welding neck flange.

Application/Limitation

This certificate is valid for the specific assembly of hose and coupling type as specified, assembled and delivered by the holder (named as manufacturer) of this certificate.

hose assemblies with below design data:

Hose Part no.	Hose size (inch)	Internal diameter (mm)	Chemical red / Green / Oil Blue / Submersible White	
			Bending radius (mm)	Maximum working pressure (bar)
SB01	1	25	125	10,5
SB02	1,5	38	150	10,5
SB03	2	50	200	10,5
SB04	2,5	65	200	10,5
SB05	3	80	300	14
SB06	4	100	400	14
SB07	6	150	575	14
SB08	8	200	800	14
SB09	10	250	1000	10,5
SB10	12	300	1200	10,5

The hose assemblies covered by this type approval may be assembled and delivered by other than the certificate holder under the following conditions:

- The assembler is authorized by a written authorization from a certificate holder. The certificate holder shall keep record of all assembler authorizations.
- Hose assemblies are in accordance with an assembly procedure issued by the certificate holder and the assembler has proved their qualifications by burst testing of a selection of hose/coupling combinations.
- One sample of each hose type is to be burst tested and the testing is to be witnessed by DNV GL.

Hose assemblies delivered from an authorized assembler shall in addition to the pressure test report with reference to the type approval certificate be delivered with a copy of the written authorization stamped by DNV GL.

All hose assemblies delivered under the DNV GL type approval scheme shall be subject to a pressure test at 1.5 times the maximum working pressure and shall be delivered with the pressure test report with reference to the type approval certificate.

In addition to proof pressure, Change in length test, twist test and electrical resistance test have to be done on each hose assemblies. (Ref. EN 13765:2010 – Annex K.)

Hose assemblies are not fire tested; therefore they are not to be used when fire resistant components are required.

Batch tests for hoses and hose assemblies shall be done in accordance with EN 13765:2010 – Annex L.

Type Approval documentation

Tests carried out

Change in length Test, Proof pressure test, Cold flexibility test, Oil resistance test (for Oil blue type), Vacuum test, impulse test, 200 pressure cycle test, Burst pressure test, Electric conductivity test, End load test, Twist Test.

Marking of product

For traceability to this Type Approval, the products are at least to be marked at both ends with:

- Manufacturer's name or trade mark
- Type designation
- Maximum working pressure
- Size
- The last test date of the hose assembly
- Quarter and year of the hose assembly manufacture

Periodical assessment

For retention of the Type Approval, DNV GL Surveyor shall perform a periodical assessment every second year, to verify that the conditions for the type approval are complied with and to witness the following tests on a selection of sizes:

- Dimensional check
- Change in length
- Burst test

The tests are to be performed with the type of couplings fitted that are Type Approved with the hoses. Also Batch test reports are to be reviewed.