

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings**

with type designation(s)

Cobalt Blue FLEXI 1RB, Cobalt Blue FLEXI 2RB

Issued to

**Cobalt Blue Ltd.
Piraeus, Greece**

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018****DNV GL class programme DNVGL-CP-0183 – Type approval – Flexible hoses****Application :****Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.**

Type:	Temperature range:	Max. working press.:	Sizes:
Cobalt Blue FLEXI 1RB	-40°C to +100°C	160 bar(g)	1/2"
Cobalt Blue FLEXI 2RB	-40°C to +100°C	225 bar(g)	1/4"

Issued at **Høvik** on **2020-11-09**This Certificate is valid until **2025-11-08**.for **DNV GL**DNV GL local station: **Piraeus**Approval Engineer: **Maheshraja Venkatesan**

**Zeinab Sharifi
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

Flexible rubber hoses Cobalt Blue FLEXI 1RB and 2RB with permanently attached couplings constructed according to EN 853 type 1SN for use in CO₂ applications: -

- Tube : oil resistant synthetic rubber
- Reinforcement : one high tensile steel braid
- Cover : abrasion, ozone and hydrocarbon resistant synthetic rubber

Material of construction for couplings: carbon steel material grade 11SMnPb37

Manufacturing location(s): -

- Couplings : Cobalt Blue Ltd., Piraeus, Greece

Assembling location: -

- Cobalt Blue Ltd., Piraeus, Greece

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 covered by this certificate are approved to be used in:

- petroleum based hydraulic fluids
- CO₂ applications

Hose assemblies covered by this certificate are not allowed to be used in systems related to DNV GL classed drilling units (applications covered by DNVGL-OS-E101).

Pressure ratings & ferrule designations:

Size (Inside diameter)			Item code	Maximum working pressure (bar)	End fittings designation	
DN	Dash	in			Ferrule designation	Insert designation
06	-4	¼	Flexi 2RB	225	RUFE02	UNPI01CB
12	-8	½	Flexi 1RB	160	RUFE01	NKMA01CB/ KAMA01CB/ UNMA01CB

Flexible hoses are only to be used in short lengths where it is necessary due to vibrations or flexible mounting of the machinery. The hoses shall not replace/be used where permanent piping is possible/required.

The hose assemblies must only be fitted in places where they are always accessible. Flexible hoses of these types are not to be used on boiler fronts.

The outer end of the pipe coupling (performing the connection to the fixed piping) is not covered by this certificate and shall follow the below requirements:

- Flanged ends shall be according to a recognized standard
- Slip-on threaded joints having pipe threads where pressure-tight joints are made on the threads with parallel or tapered threads, shall comply with requirements of a recognized standard. Limitations stated in DNVGL-RU-SHIP Pt.4 Ch.6 Sec.9 [5.2.6] to be followed.
- If these outer ends are going to be part of a mechanical joint as covered by Table 10 DNVGL-RU-SHIP Pt.4 Ch.6 Sec.9, then they shall be separately type approved.

Hose assemblies covered by this certificate shall not be used in system subject to pressure below atmospheric or vacuum condition.

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The cover of hoses for gaseous applications shall be pin pricked.

Production testing

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

Type Approval documentation

Tests carried out

Dimensional check, change in length, vacuum, abrasion resistance, burst pressure, proof pressure, impulse test, oil resistance test, ozone resistance test, cold flexibility test, cover adhesion test, fire test

Marking of product

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

- hose manufacturer's name or trademark;
- date of manufacture (month/year);
- designation type reference;
- nominal diameter;
- pressure rating;
- temperature rating.



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Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.