DNV·GL

Certificate No:
TAP0000028

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings

with type designation(s)
GMV

Issued to
Gates Corporation
Englewood CO, United States

is found to comply with
Det Norske Veritas' Rules for Classification of Ships Pt.4, Ch.6 "Piping Systems"
Det Norske Veritas' Standards for Certification 2.9 No. 5-791.70

Application :

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

Temperature range:	**-40°C to 135°C**
Max. working press.:	**3.9 bar to 24.1 bar (Dependent on the size)**
Sizes:	**3/4" to 4"**

This Certificate is valid until **2019-08-06**.

Issued at **Høvik** on **2015-08-07**

for **DNV GL**

DNV GL local station: **Long Beach**

Approval Engineer: **Adel Samiei**

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.

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Product description

- Hose assembly type GMV with permanently fitted couplings types GL, G & GSP. Hose and couplings are made by Gates Corporation. Hose assemblies shall be supplied with HeatGuard fire sleeves.

- Design:
  - Tube: Nitrile - NBR
  - Reinforcement: 2 layer textile braid with helical spiral wire (sizes -12 to -20)
    2 layer helical braid with helical spiral wire (sizes -24 to -64)
  - Cover: Neoprene

- Couplings:
  - Type GL Sizes ¾" to 4"
  - Type G Sizes ¾" to 1 ¼"
  - Type GSP Sizes 1 ½" and 2"

Application/Limitation

- Hose assemblies are approved to be used in low pressure and vacuum applications with petroleum base and water base hydraulic fluids within a temperature range of -40°C to 135°C. Operating temperatures in excess of 135°C with petroleum base hydraulic fluid may materially reduce the life of the hose assembly.

- Maximum allowable working pressure and bending radius shall be as below:

Size	Nominal diameter	Maximum working pressure	Bending radius
-12	¾"	24.1 bar / 350 psi	64 mm
-16	1"	20.7 bar / 300 psi	76 mm
-20	1 ¼"	17.2 bar / 250 psi	102 mm
-24	1 ½"	11.2 bar / 162 psi	127 mm
-32	2"	7.7 bar / 112 psi	152 mm
-36	2 ¼"	6.1 bar / 88 psi	178 mm
-40	2 ½"	4.7 bar / 68 psi	178 mm
-48	3"	4.3 bar / 62 psi	229 mm
-56	3 ½"	3.9 bar / 56 psi	254 mm
-64	4"	3.9 bar / 56 psi	305 mm

- 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.

- Hose assemblies with couplings made of carbon steel are not to be used at temperatures below -10°C unless the material is normalized.

- 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.

- 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 DNVGL.

- All hose assemblies delivered under the DNV 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.
- The hose assemblies must only be fitted in places where they are always accessible.
- The hose assemblies are to be mounted in accordance with the manufacturer's instructions.
- The hoses shall not be installed in systems subject to pressure below atmospheric or pressure pulsation.

Type Approval documentation
Tests carried out

Burst pressure, vacuum, fire, Ozone resistance, Oil resistance, cover adhesion dimensional check & cold flexibility tests

Marking of product

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

- Manufacturer's name or trade mark
- Type designation
- Maximum working pressure
- Size
- Additional marking at manufacturer's option

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
- Leakage test
- Burst test

The tests are to be performed with the type of couplings fitted that are Type Approved with the hoses.

END OF CERTIFICATE