

TYPE APPROVAL CERTIFICATE

This is to certify:

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

with type designation(s)
EFG3K, EFG4K, EFG5K, EFG6K, M3K, M4K, M5K, M6K, G1, G2, Megaflex CM2T, M2T

Issued to
Gates UK Ltd
St. Neots, Cambridgeshire, United Kingdom

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:
EFG3K	-40°C to +121°C	210 bar	-20 to -32
EFG4K	-40°C to +121°C	280 bar	-6 to -20
EFG5K	-40°C to +121°C	350 bar	-6 to -32
EFG6K	-40°C to +121°C	420 bar	-6 to -32
M3K	-40°C to +100°C	225 bar	-4 to -16
M4K	-40°C to +100°C	280 bar	-4 to -16
M5K	-40°C to +100°C	350 bar	-4 to -8
M6K	-40°C to +100°C	420 bar	-4
G1	-40°C to +100°C	41 to 225 bar	-4 to -32
G2	-40°C to +100°C	80 to 400 bar	-4 to -32
Megaflex CM2T	-40°C to +100°C	165 to 400 bar	-4 to -16
M2T	-40°C to +100°C	103 to 420 bar	-4 to -32

Issued at **Høvik** on **2019-03-15**

for **DNV GL**

This Certificate is valid until **2023-06-30**.

DNV GL local station: **Newcastle-upon-Tyne**

Approval Engineer: **Adel Samiei**

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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.



Job Id: **262.1-016887-8**
 Certificate No: **TAP000003S**
 Revision No: **3**

Product description

11 types of flexible hoses of non-metallic materials with permanently fitted couplings

Hose designation	EFG3K	EFG4K	EFG5K	EFG6K	M3K	M4K	M2T
Tube	NBR						
Reinforcement Wires	four wires	four (six for ≥ -20) wires			1 or 2 braids	2 braids	
Cover	CR				NBR/PVC		

Hose designation	M5K	M6K	G1	G2	Megaflex CM2T
Tube	NBR				
Reinforcement Wires	2 braids	1 braid	2 braids		2 braids
Cover	NBR/PVC				SBR-based

Coupling designations are to be according to the below tables (for each assembling location):

- Gates (U.K.) Ltd., St. Neots, Cambridgeshire, United Kingdom

Size		EFG3K	EFG4K	EFG5K	EFG6K	M3K	M4K	M5K	M6K	G1	G2	CM2T	M2T
Dash	DN												
-4	6	-	-	-	-	G	G	G	G	G	G	G	G/B-SS
-5	8	-	-	-	-	G	G	G	-	G	G	G	G/B-SS
-6	10	-	GS	GS	GS	G	G/GS	G	-	G	G	G	G/B-SS
-8	12	-	GS	GS	GS	G	G/GS	G	-	G	G	G	G/B-SS
-10	16	-	GS	GS	GS	G	G/GS	-	-	G	G	G	G/B-SS
-12	19	-	GS	GS	GS	G	G/GS	-	-	G	G	G	G/B-SS
-16	25	-	GS	GS	GS	G	GS	-	-	G	G	G	G/B-SS
-20	31	GS	GS	GS	GSM	-	-	-	-	G	G	-	G
-24	38	GSP	-	GSM	GSM	-	-	-	-	GSP	GSP	-	GSP
-32	51	GSP	-	GSM	GSM	-	-	-	-	GSP	GSP	-	GSP

- Gates Fluid Power Technologies (Changzhou) Co. Limited, Changzhou, China

Size		EFG3K	EFG4K	EFG5K	EFG6K	M3K	M4K	M5K	M6K	G1	G2	M2T
Dash	DN											
-4	6	-	-	-	-	G	G	G	G	G	G	G
-5	8	-	-	-	-	G	G	G	-	G	G	G
-6	10	-	GS	GS	GS	G	G	G	-	G	G	G
-8	12	-	GS	GS	GS	G	G	G	-	G	G	G
-10	16	-	GS	GS	GS	G	G	-	-	G	G	G
-12	19	-	GS	GS	GS	G	G	-	-	G	G	G
-16	25	-	GS	GS	GS	G	-	-	-	G	G	G
-20	31	GS	GS	GS	GSM	-	-	-	-	G	G	G
-24	38	GSP	-	-	GSM	-	-	-	-	GSP	GSP	-
-32	51	GSP	-	-	-	-	-	-	-	GSP	GSP	-

Rubber hose manufacturers:

- 1) Gates Corporation, 1450 Montana Road, Iola Kansas 66749, USA
- 2) Gates India Private Limited, Ambala-Chandigarh Highway, PO Lalru 140501, Punjab, India
- 3) Gates Mexico COHISA, Calle 6 S/N, Parque Industrial Atlacomumco, Atlacomumo Estado De Mexico, 50450, Mexico
- 4) Gates Fluid Power Technologies (Changzhou) Co. Limited, 11 Kohler Road, National Hi-Tech District, 213022 Changzhou, China
- 5) Gates Hortum Sanayi Ve Ticaret Ltd. Sti., Adliye Mahallesi 1520. Sokak No.18, 54580 Arifiye Sakarya Turkey, (Only CM2T hoses)

End fittings manufacturers:

- 1) Gates Karvina Fluid Power Plant, Karvina, Czech Republic.
- 2) Gates Corp, Versailles, MO, USA
- 3) Gates India Private Limited, Punjab, India
- 4) Gates Fluid Power Technologies (Changzhou) Co., Ltd., Changzhou, China

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Application/Limitation

This certificate is valid for the specific assembly of hose and coupling type as specified, assembled and delivered by below assembling locations:

- Gates (U.K.) Limited, 5 Alpha Drive, Eaton Socon, St. Neots, Cambridgeshire, United Kingdom
- Gates Fluid Power Technologies (Changzhou) Co. Limited, 11 Kohler Road, National Hi-Tech District, 213022 Changzhou, China

Hose assemblies covered by this certificate may be used for: Fuel oil, lubricating oil, hydraulic oil, fresh water and compressed air systems in maximum working pressure (in bar) as per the below table:

Size		EFG3K	EFG4K	EFG5K	EFG6K	M3K	M4K	M5K	M6K	G1	G2	CM2T	M2T
Dash	DN												
-4	6	-	-	-	-	225	280	350	420	225	400	400	420
-5	8	-	-	-	-	225	280	350	-	215	350	350	380
-6	10	-	280	350	420	225	280	350	-	179	330	330	350
-8	12	-	280	350	420	225	280	350	-	160	280	275	296
-10	16	-	280	350	420	225	280	-	-	131	250	250	262
-12	19	-	280	350	420	225	280	-	-	105	214	215	241
-16	25	-	280	350	420	225	280	-	-	90	165	165	172
-20	31	210	280	350	420	-	-	-	-	63	125	-	159
-24	38	210	-	350	420	-	-	-	-	50	90	-	140
-32	51	210	-	350	420	-	-	-	-	41	80	-	103

Temperature range:

Hose types	EFG3K, EFG4K, EFG5K, EFG6K	M3K, M4K, M5K, M6K, G1, G2, CM2T, M2T
Petroleum based hydraulic fluids	-40°C to +121°C	-40°C to +100°C
Water based hydraulic fluids and Air	-40°C to +85°C	-40°C to +70°C
Fresh Water	0°C to +85°C	0°C to +70°C

Each hose assembly is before delivery to be hydraulic pressure tested to 1.5 times the maximum working pressure and delivered with a test report with reference to this certificate.

The hoses shall not to be used where fixed piping is possible/required and must only be fitted in places where they are always accessible.

Flexible hoses of these types are not to be used on boiler fronts.

Flexible hoses covered by this certificate shall not be installed in systems subject to pressure below atmospheric or vacuum conditions.

It must be possible to shut off from the system all flexible hoses used in systems for compressed air, lubrication oil, fuel oil and petroleum base hydraulic oil.

The cover on hoses for gaseous applications shall be pinpricked.

Type Approval documentation

- Gates Hydraulics Catalogue (35093 1/2015)
- Dimensional check test, leakage, burst pressure test, cold flexibility test, cover adhesion test, ozone resistance, oil resistance, impulse test reports from each rubber hose manufacturing location
- Fire test reports:
 - CM2T: WTD71 test reports numbers 31/07, 32/07, 33/07, 34/07, 35/07, 36/07, 004/11. (DN10 to DN25)
 - EFG3K: WTD71 test reports number 101/10 (DN 31 – coupling GS)
 - EFG4K: WTD71 test reports number 33/10 (DN19 – coupling GS)
 - EFG5K: Southwest research institute test report numbers 01.16918.01.802b and 01.16918.01.802d[1] (DN38 and DN51 with GSM couplings)

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EFG6K: WTD71 test reports number 37/10 and Southwest research institute test report number 01.16918.01.806a (DN10 GS coupling and DN51 GSM coupling)

G1: WTD71 test reports numbers 64/00, 73/00, 68/00, 08/11, 15/08, 14/08 and Southwest research institute test report number 01.20535.001h (DN10 to DN25 – G couplings)

G2: WTD71 test reports numbers 63/00, 69/00, 72/00, 02/11, 18/08 and Southwest research institute test report number 01.20535.01.001i (DN10 to DN25 – G couplings)

M3K: WTD71 test reports numbers 61/00, 67/00, 71/00, 07/11 and Southwest research institute test report numbers 01.019577.01.802f, 01.20535.01.001c, 01.20535.01.001j and 01.20535.01.001x (DN10 to DN25 – G couplings)

M4K: WTD71 test reports numbers 90/00, 70/00, 05/11 and Southwest research institute test report numbers 01.20535.01.001d and 01.20535.01.001dd (DN10 to DN16 – G couplings)

M5K: WTD71 test reports number 62/00 (DN10 – G couplings)

- Document named Submission For DNV Type Approval Flexible Hose of Non-Metallic Material with Permanently Fitted Couplings M2T dated 2014-10-22 containing manufacturer catalogue, coupling drawings, dimensional check test, oil resistance test and impulse test reports
- Oil resistance test report dated 2015-02-19
- Burst and change in length test dated 2015-02-18 witnessed by DNV GL surveyor
- Impulse test report dated 2015-02-18
- Cold flexibility test report dated 2015-02-18 witnessed by DNV GL surveyor
- Cover adhesion test report dated 2015-02-18 witnessed by DNV GL surveyor
- Ozone resistance test report dated 2015-02-18 witnessed by DNV GL local surveyor
- Fire test report 01.16919.01.102 dated 2012-03-22 for 4M 2T, 8M2T & 16M2T with couplings types G & SS done by Southwest research institute.
- Fire test report 01.20535.01.001y dated 2014-08-27 for 32M2T with couplings types G & SS done by Southwest research institute.
- Fire test reports witnessed by DNV GL dated 2019-01-09 and 2019-02-19
- Renewal burst pressure test reports dated 2018-12-19 & 2019-12-17

Tests carried out

Dimensional check, Impulse, Ozone resistance, Abrasion resistance, Cold bend, Adhesion, Change in length, Oil resistance, Burst, Fire Resistant.

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.

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.