

TYPE APPROVAL CERTIFICATE

Certificate No:
TAP00000B1
Revision No:
1

This is to certify:

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

with type designation(s)

GATES hoses with DICSA stainless steel permanently fitted couplings - G1, G2, M3K, M4K, M5K, M6K, EFG3K, EFG4K, EFG5K, EFG6K, M2T, MXT, PRO1T, PRO2T

Issued to

DISTRIBUIDORA INTERNACIONAL CARMEN, S.A.U. (DICSA)
Zaragoza, Spain

is found to comply with

DNV rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV-OS-D101 – Marine and machinery systems and equipment, Edition July 2021
DNV class programme DNV-CP-0183 – Type approval – Flexible non-metallic hoses

Application :

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

Type:	Temperature range:	Max. working press.:	Sizes:
G1	-40°C to +100°C	40 to 225 bar	DN6 to DN51
G2	-40°C to +100°C	80 to 400 bar	DN6 to DN51
M3K	-40°C to +100°C	210 bar	DN6 to DN25
M4K	-40°C to +100°C	280 bar	DN6 to DN25
M5K	-40°C to +100°C	350 bar	DN6 to DN12
M6K	-40°C to +100°C	420 bar	DN6
EFG3K	-40°C to +121°C	210 bar	DN31 to DN51
EFG4K	-40°C to +121°C	280 bar	DN16 to DN31
EFG5K	-40°C to +121°C	350 bar	DN12 to DN51
EFG6K	-40°C to +121°C	420 bar	DN10 to DN51
M2T	-40°C to +100°C	see page 4	DN6 to DN51
MXT	-40°C to +100°C	see page 4	DN6 to DN25
PRO1T	-40°C to +100°C	see page 4	DN6 to DN25
PRO2T	-40°C to +100°C	see page 4	DN6 to DN25

Issued at **Høvik** on **2021-11-29**

for **DNV**

This Certificate is valid until **2026-11-20**.

DNV local station: **Barcelona FIS**

Approval Engineer: **Maheshraja Venkatesan**

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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 AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") 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

14 different types of non-metallic hoses with permanently fitted couplings:

1. **G1:** 1-Wire Braid Hose

Tube: Black, oil resistant, synthetic rubber (Nitrile - Type C)

Reinforcement: One braid of high-tensile steel wire

Cover: Black, oil and abrasion resistant, synthetic rubber (Nitrile/PVC – Type C2)

End fittings (Ferrule): ZPF2212

2. **G2:** 2-Wire Braid Hose

Tube: Black, oil resistant, synthetic rubber (Nitrile - Type C)

Reinforcement: Two braids of high-tensile steel wire

Cover: Black, oil and abrasion resistant, synthetic rubber (Modified Nitrile -Type C2)

End fittings (Ferrule): ZPF2212 (DN6, 10, 12, 16, 19, 25) – ZAC68010 (DN31, 38, 51)

3. **M3K:** Mega3000® Hose

Tube: Black, oil resistant, synthetic rubber (Nitrile - Type C)

Reinforcement: Braided, high-tensile steel wire. -4, -5, -6 and -8 sizes are one braid; -10, -12 and -16 sizes are two braid.

Cover: Black, oil, abrasion and weather resistant, synthetic rubber (Nitrile/PVC - Type C2), with color coded layline. Also available with unique abrasion resistant MegaTuff® or XtraTuff™ cover

End fittings (Ferrule): ZSC2112 (DN6, 10, 12) – ZPF2212 (DN16, 19, 25)

4. **M4K:** Mega4000™ Hose

Tube: Black, oil resistant, synthetic rubber (Nitrile - Type C)

Reinforcement: Two braids of high-tensile steel wire

Cover: Black, oil, abrasion and weather resistant, synthetic rubber (Modified Nitrile - Type C2), with color coded layline.

Also available with unique abrasion resistant MegaTuff® or XtraTuff™ cover

End fittings (Ferrule): ZPF2212

5. **M5K:** Mega5000™ Hose

Tube: Black, oil resistant, synthetic rubber (Nitrile - Type C)

Reinforcement: Two braids of high-tensile steel wire

Cover: Black, oil, abrasion and weather resistant, synthetic rubber (Nitrile/PVC - Type C2) (4, 5, 6), Polychloroprene - Type A (8) with color coded layline. Also available with unique abrasion resistant MegaTuff® or XtraTuff™ cover

End fittings (Ferrule): ZPF2212

6. **M6K:** Mega6000™ Hose

Tube: Black, oil resistant, synthetic rubber (Nitrile - Type C)

Reinforcement: Two braids of high-tensile steel wire

Cover: Black, oil, abrasion and weather resistant, synthetic rubber (Nitrile/PVC - Type C2), with color coded layline. Also available with unique abrasion resistant MegaTuff® or XtraTuff™ cover.

End fittings (Ferrule): ZPF2212

7. **EFG3K:** Spiral Wire Hose

Tube: Black, oil resistant, synthetic rubber (Nitrile - Type C)

Reinforcement: Four alternating layers of spiraled, high-tensile steel wire

Cover: Black, oil resistant, synthetic rubber (Polychloroprene - Type A), with color coded layline. Also available with unique abrasion resistant MegaTuff® or XtraTuff™ cover.

End fittings (Ferrule): ZPF1224

8. **EFG4K:** Spiral Wire Hose

Tube: Black, oil resistant, synthetic rubber (Nitrile - Type C)

Reinforcement: Four alternating layers of spiraled, high-tensile steel wire

Cover: Black, oil resistant, synthetic rubber (Polychloroprene - Type A), with color coded layline. Also available with unique abrasion resistant MegaTuff® or XtraTuff™ cover

End fittings (Ferrule): ZPF1224 (DN16, 19) – ZAC68010 (DN25, 31)

9. **EFG5K:** Spiral Wire Hose

Tube: Black, oil resistant, synthetic rubber (Nitrile - Type C)

Reinforcement: Four (six for -20, -24 and -32) alternating layers of spiraled, high-tensile steel

Cover: Black, oil resistant, synthetic rubber (Polychloroprene - Type A), with color coded layline. Also available with unique abrasion resistant MegaTuff® or XtraTuff™ cover.

End fittings (Ferrule): ZAC68010 (DN12, 16) - Z6101 (DN19, 25) – Z6101 (DN31, 38, 51)

10. EFG6K Spiral Wire Hose

Tube: Black, oil resistant, synthetic rubber (Nitrile - Type C)
 Reinforcement: Four (six for -20, -24 and -32) alternating layers of spiraled, high-tensile steel
 Cover: Black, oil resistant, synthetic rubber (Polychloroprene - Type A). Color coded layline. Also available with unique abrasion resistant MegaTuff® or XtraTuff™ cover.
 End fittings (Ferrule): ZPF1224 (DN10, 12, 16) - ZA6101 (DN19, 25) – Z6101 (DN31, 38, 51)
 Fittings material: AISI 316L

11. M2T MegaFlex hose constructed as per EN 857 type 2SC

Tube: NBR(Nitrile) based
 Reinforcement: two braids of high tensile steel wire
 Cover: NBR(Nitrile) based. Black, oil, abrasion and weather resistant
 End fittings (Ferrule): ZPF2212

12. MXT constructed as per EN 857 type 2SC

Tube: NBR(Nitrile) based
 Reinforcement: two braids of high tensile steel wire
 Cover: NBR(Nitrile) based
 End fittings (Ferrule): ZPF2212

13. PRO1T constructed as per EN 857 type 1SC

Tube: NBR(Nitrile) based
 Reinforcement: one braid of high tensile steel wire
 Cover: NBR(Nitrile) based
 End fittings (Ferrule): ZSC2112

14. PRO2T constructed as per EN 857 type 2SC

Tube: NBR(Nitrile) based
 Reinforcement: two braids of high tensile steel wire
 Cover: NBR(Nitrile) based
 End fittings (Ferrule): ZPF2212

Manufacturing locations

Hoses : Gates (U.K.) Limited, 5 Alpha Drive, Eaton Socon, St. Neots, Cambridgeshire, UK
 Fittings : Distribuidora Internacional Carmen, S.A.U. (DICSA), Zaragoza, Spain.

Assembling location

Distribuidora Internacional Carmen, S.A.U. (DICSA), Zaragoza, Spain.

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 type approval certificate are approved for use with petroleum base and water base hydraulic fluids within a temperature range as specified below:

Hose type	Minimum temperature	Maximum temperature
G1, G2, M2T, MXT, M3K, M4K, M5K, M6K, PRO1T, PRO2T	-40°C	+100°C
EFG3K, EFG4K, EFG5K, EFG6K	-40°C	+121°C

Also, the hose assemblies covered by this certificate are approved to be used in fresh water and compressed air within temperature range of 0°C to +70°C.

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.

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

Maximum working pressure of each hose type/size (in bar):

Hose Type	DN6	DN8	DN10	DN12	DN16	DN19	DN25	DN31	DN38	DN51
	-4	-5	-6	-8	-10	-12	-16	-20	-24	-32
G1	225	-	180	160	130	105	88	63	50	40
G2	400	-	330	275	250	215	165	125	90	80
M3K	210	-	210	210	210	210	210	-	-	-
M4K	280	-	280	280	280	280	280	-	-	-
M5K	350	-	350	350	-	-	-	-	-	-
M6K	420	-	-	-	-	-	-	-	-	-
EFG3K	-	-	-	-	-	-	-	210	210	210
EFG4K	-	-	-	-	280	280	280	280	-	-
EFG5K	-	-	-	350	350	350	350	350	350	350
EFG6K	-	-	420	420	420	420	420	420	420	420
M2T	420	380	350	296	262	241	172	159	140	103
MXT	400	350	330	275	250	215	165	-	-	-
PRO1T	225	215	180	160	130	105	88	-	-	-
PRO2T	400	350	330	275	250	215	165	-	-	-

All hose assemblies delivered under this type approval certificate shall be in compliance with an assembly procedure issued by the certificate holder.

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 DNV-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 DNV-RU-SHIP Pt.4 Ch.6 Sec.9, then they shall be separately type approved.

Type Approval documentation

Gates catalogue for flexible hoses

Gate's letter dated 2015-05-18

Dicsa technical specification for fittings dated March 2016.

Fittings drawings:

ZCS2112: 0400, 0500, 0600, 0800_1, 1000, 1200, 1600

ZPF2212: 0400_12, 0500_6, 0600_5, 0800_7, 1000_5, 1200_7, 1600_5, 2000_5, 2400_3, 3200_V5

ZPF1224: 0006_3, 0400_3, 0800_3, 1000_4, 1200_V1, 1600_3, 2000_3, 2400_V1, 3200_3

ZA61010: 1200_V2, 1600_1, 2000_1, 2400_1, 3200

ZAC68010: 0800, 1000, 1200_1, 1600_1, 2000, 2400_2, 3200

Burst test reports:

- IPP150409/1,2,3 dated 2015-04-09 (G1)
- IPP150409/4,5 dated 2015-04-09 & IPP160302/1 dated 2016-03-02 (G2)
- IPP150410/5,6 dated 2015-04-10 (M4K)
- IPP150410/4,7 dated 2015-04-10 (M3K)
- IPP150410/8 dated 2015-04-10 (M6K)
- IPP150410/7 dated 2015-04-10 (M5K)
- IPP150410/9 dated 2015-04-10 (G3K)
- IPP150410/10 dated 2015-04-10 & IPP160302/2 dated 2016-03-02 (G4K)
- IPP160302/3,4 dated 2016-03-02 & IPP150410/14 dated 2015-04-10 (G5K)
- IPP150410/15,16,17 dated 2015-04-10 (G6K)
- IPP150410/1,2 dated 2015-04-10 (CM2T)
- IPP21112/7,8,9 dated 2021-11-02 (M2T)
- IPP21112/1,2,3 dated 2021-11-02 (MXT)
- IPP21112/1,2,3 dated 2021-11-02 (PRO1T)
- IPP21112/10,11,12 dated 2021-11-02 (PRO2T)
- Renewal (2021) reports: IPP21112/13,14,15,16,17,18,19,20 dated 2021-11-02
- Renewal (2021) reports: IPP21113/1,2,3,4,5,6,7,8,9,10 dated 2021-11-02

Impulse test reports:

- EI20141111/1 dated 2014-11-11 (CM2T – ¾") - EI20141116/2 (CM2T – 3/8 dated 2014-11-06)
- EI20141116/1 dated 2014-11-06 (EFG3K 1 1/2")

- EI20141219/1 dated 2014-12-19 (EFG4K – ¾") EI20141128/1 (EFG4K – 1 ¼ dated 2014-11-28)
- EI201524/1 dated 2015-04-01 (EFG5K – ¾") EI2015119/1 (EFG5K – ½ dated 2015-01-19) EI2015323/1 (EFG5K – 1 1/2" dated 2015-03-23)
- EI201541/1 dated 2015-04-01 (EFG6K – ¾") EI201523/1 (EFG6K – 3/8 dated 2015-02-03) EI201533/1 (EFG6K – 1 ½ dated 2015-03-03)
- EI2014107/1 dated 2014-10-07 (G1 – ¾") EI20141020/1 (G1 – 3/8 dated 2014-10-20) EI20141020/1 (G1 – 1 ¼ dated 2014-10-20)
- EI20141015/1 dated 2014-10-15 (G2 – ¾") EI20141023/1 (G2 – 3/8 dated 2014-10-23) EI2016210/1 (G2 – 1 ½ dated 2016-02-10)
- EI2015316/1 dated 2015-03-16 (M3K – ¾") EI201519/1 (M3K – 3/8 dated 2015-01-09)
- EI2014122/1 dated 2014-12-02 (M4K – 3/8") EI20141124/1 (M4K – 3/8 dated 2014-11-24)
- EI2015427/1 dated 2015-04 (M5K – 1/4")
- EI2014122/1 dated 2014-12-02 (M6K – 1/4")
- (Type PRO1T) EI2021730/1 dated 30/07/21 EI202185/1 dated 05/08/21 EI20211014/1 dated 14/10/21 EI2021830/1 dated 30/08/21 EI2021101/1 dated 01/10/21
- (Type MXT) EI202192/2 dated 02/09/21, EI20191126/1 dated 26/11/19, EI20191128/2 dated 28/11/19
- (Type M2T) EI20191122/2 dated 02/12/19, EI20191112/2 dated 12/11/19, EI20191115/1 dated 15/11/19, EI202199/1 dated 09/09/21, EI2021924/3 dated 24/09/21, EI20191128/1 dated 28/11/19
- (Type PRO2T) EI202182/1 dated 02/08/21, EI2021812/1 dated 12/08/21, EI20211019/1 dated 19/10/21, EI2021824/1 dated 24/08/21, EI2021101/1 dated 01/10/21

Fire test reports: (LAPI)

- 2063.0IS0110/14 & 2064.0IS0110/14 (CM2T:DN10, DN19) & 939.0IS0110/16 (CM2T:DN25)
- 890.0IS0110/15 (EFG3K: DN38) & 1591&1592.0IS0110/16 (EFG3K: DN31, DN51)
- 090.0IS0110/16 (EFG5K: DN12) 455.0IS0110/15 (EFG5K: DN19) 891.0IS0110/15 (EFG5K: DN38)
- 456.0IS0110/15 (EFG6K: DN10) 614.0IS0110/15 (EFG6K: DN19) 1153.0IS0110/15 (EFG6K: DN38)
- 1830.0IS0110/14 (G1: DN10) 038.0IS0110/15 (G1: DN19) 1832.0IS0110/14 (G1: DN38)
- 1833.0IS0110/14 (G2: DN10) 1921.0IS0110/15 (G2: DN19) 091.0IS0110/16 (G2: DN38)
- 225.0IS0110/15 (EFG4K: DN19) 256.0IS0110/16 (EFG4K: DN31) 942.0IS0110/16 (EFG4K: DN16)
- 228.0IS0110/15 (M3K: DN10) 1924.0IS0110/15 (M3K:DN19) 943.0IS0110/16 (M3K:DN25)
- 040.0IS0110/15 (M4K: DN10) 229.0IS0110/15 (M4K:DN19) 944.0IS0110/16 (M4K:DN25)
- 042.0IS0110/15 (M5K: DN10) 945&946.0IS0110/16 (M5K: DN6, DN12)
- 043.0IS0110/15 (M6K: DN6)
- Type M2T: 1548/21, 1549/21, 1550/21 dated 22/10/2021
- Type MXT: 1551/21, 1552/21, 1553/21 dated 22/10/2021
- Type PRO1T: 1554/21, 1555/21, 1556/21 dated 22/10/2021
- Type PRO2T: 1557/21, 1558/21, 1559/21 dated 22/10/2021

Gate's test reports on rubber hoses

DNV Authorization letter dated 24-Sep 2021 from Gates (U.K.) Limited with reference to Type Approval certificates TAP000003S Rev.4 and TAP00001Y4

Catalogues:

- PRO1T & PRO2T Hydraulic hose E2/50179 dated 05/2019
- Datasheet Hydraulic hose MXT™
- Datasheet Hydraulic hose M2T®

Tests carried out

Dimensional check, Change-in-length, burst, cover adhesion, oil resistance, cold flexibility, ozone resistance, impulse, leakage, fire tests

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.



Job Id: **262.1-018123-2**
Certificate No: **TAP00000B1**
Revision No: **1**

Periodical assessment

For retention of the Type Approval, a DNV 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 DNV-CP-0338.