DNV·GL

Certificate No:
TAK00001WM

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Synthetic Fibre Ropes

with type designation(s)
Toro™ 12 Strand,
Toro™ 12x12

Issued to
Cortland Company, Inc.
Stafford, TX, USA

is found to comply with
DNV GL class programme DNVGL-CP-0100 – Type approval – Synthetic fibre ropes for towing, mooring and anchoring

Application :

Mooring and Towing of Ships and HSLCs.

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

Issued at **Høvik** on **2020-06-24**
This Certificate is valid until **2025-06-23**.
DNV GL local station: **Houston**

Approval Engineer: **Gisle Hersvik**

for **DNV GL**

Martin Strande
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.

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Product description

Toro™ 12 Strand and **Toro™ 12x12** Braided Fibre Ropes.

- Fibre material: High Tenacity HMPE
- Elongation at break: 3 – 4%
- Specific gravity: 0,98 (floats in seawater)

ROPE CHARACTERISTICS				
Toro™ 12 Strand				
Nominal Diameter,		**Nominal Linear Mass,**	**Minimum Tensile Strength,**	
			-spliced rope	**-unspliced rope**
inch	**mm**	**kg/100m**	**MT (tonnes)**	**MT (tonnes)**
3/8	9	5.3	7.94	8.8
7/16	11	7.1	10.0	11.1
1/2	12	9.1	13.8	15.4
9/16	14	11.3	16.6	18.4
5/8	16	14.1	21.7	24.1
3/4	18	20.1	28.0	31.1
13/16	20	23.5	33.6	37.3
7/8	22	27.5	38.2	42.5
1	24	35.3	47.6	52.9
1-1/8	28	40.0	55.1	61.3
1-1/4	30	45.1	62.1	69.0
1-5/16	32	55.4	71.2	79.1
1-3/8	34	61.2	80.0	88.9
1-1/2	36	80.1	97.5	108.3

Tensile Strengths are determined in accordance with Cordage Institute CI 1500-02, Test Methods for Fiber Ropes.
Fibre ropes are to be delivered with a linear mass within ± 5 % of the nominal linear mass given in the table.

ROPE CHARACTERISTICS				
Toro™ 12x12				
Nominal Diameter,		**Nominal Linear Mass,**	**Minimum Tensile Strength,**	
			-spliced rope	**-unspliced rope**
inch	**mm**	**kg/100m**	**MT (tonnes)**	**MT (tonnes)**
1-5/8	40	92.2	111	123
1-3/4	44	107.6	129	143
2	48	141.3	168	186
2-1/8	52	162.0	192	214
2-1/4	56	180.5	213	237
2-1/2	60	220.2	258	287
2-5/8	64	243.8	286	318
2-3/4	68	271.5	317	352
3	72	320.6	371	413
3-1/8	76	347.0	402	447
3-1/4	80	377.4	436	484
3-1/2	84	432.7	497	552

3-5/8	88	467.6	537	597
3-3/4	92	504.1	577	641
4	96	570.8	651	723

Tensile strengths are determined in accordance with Cordage Institute 1500-02, Test Methods for Fiber Ropes and ISO 2307.

Fibre ropes are to be delivered with a linear mass within ± 5 % of the nominal linear mass given in the table.

Application/Limitation

The approval covers ropes with diameter from 9 mm to and including 96 mm.

Scope of assessment is limited to evaluation of net mass per metre and static strength.

Type Approval documentation

Tests carried out

Type Testing carried out according to **Type Approval documentation**.

Marking of product

Product shall be marked with *manufacturer's name*: **Cortland Company, TX, USA**, *type designation, weight* and *length*.

The marking is to be carried out in such a way that it is visible, legible and indelible. The marking of product is to enable traceability to the DNV GL Type Approval Certificate.

Periodical assessment

The scope of the Periodical Assessment is to verify that the conditions stipulated for the Type Approval is complied with and that no alterations are made to the product design or choice of materials.

Periodical assessments (for Certificate Retention and Certificate Renewal) shall be performed according to DNVGL-CP-0338.

This certificate is only valid if required Periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in https://approvalfinder.dnvgl.com

END OF CERTIFICATE