

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Synthetic Fibre Ropes

with type designation(s)
**TUFFLEX PLUS 8 and TUFFLEX PLUS 12 Mooring Lines,
TUFFLEX PLUS 8 and TUFFLEX PLUS 12 Mooring Tails**

Issued to

Tufropes Private Limited
Silvassa, Dadra & Nagar Haveli, India

is found to comply with

DNV class programme DNV-CP-0100 – Type approval – Synthetic fibre ropes for towing, mooring and anchoring
ISO 10556:2009 "Fibre ropes of polyester/polyolefin dual fibres"
OCIMF Mooring Equipment Guidelines (MEG4), Fourth Edition 2018 [test requirements]
OCIMF Guidelines for the Purchasing and Testing of SPM Hawsers (2000)

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.

Issued at **Hamburg** on **2023-04-28**

This Certificate is valid until **2028-04-27**.

DNV local unit: **India CMC MES**

for **DNV**

Approval Engineer: **Gisle Hersvik**

Thorsten Lohmann
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

TUFFLEX PLUS 8: 8-strand plaited synthetic rope
TUFFLEX PLUS 12: 12-strand braided synthetic rope

- Fibre material: Polyolefin fibres & Polyester yarn
- Specific gravity: 0.98 (floats in sea water)
- Elongation at break: 18 % $\pm$ 3 %
- With or without marine finish.
- UV-stabilized.
- Single construction: Polyolefin & Polyester yarn.

Compliance with OCIMF Mooring Equipment Guidelines (MEG4)

Mooring Line Base Design Certificate – for TUFFLEX PLUS 32 mm and 104 mm

Ref No.: **TF/MEG4/MLBDC/TF PLUS/23/001** Issue date: **2023-03-01**

Mooring Line Certificate will be issued with reference to mooring line base design certificate.

Mooring Tail Base Design Certificate – for TUFFLEX PLUS 32 mm and 104 mm

Ref No.: **TF/MEG4/MTBDC/TF PLUS/23/002** Issue date: **2023-03-01**

Mooring Tail Certificate will be issued with reference to mooring tail base design certificate.

The rope Manufacturer has performed the full test scenario as per OCIMF MEG4.

Compliance with OCIMF 2000, Guidelines for the Purchasing and Testing of SPM Hawsers

Tested: Size 6 (48 mm) and Size 13 (104 mm)

Rope Characteristics

The Rope characteristics are tabulated on the next page observing the following:

Fibre ropes are to be delivered with a linear mass $\pm 5\%$ of the nominal linear mass given in the table.

Linear Density are tabulated on the following pages.

The breaking load values are given for dry and wet, un-spliced and spliced mooring ropes. The LDBF/TDBF (Line Tail Design Break Force) is the value stated for the spliced rope.

TUFFLEX PLUS 8-strand and TUFFLEX PLUS 12-strand:

Ref. Number / Size		Linear Density - rope	Mass - rope	Breaking Load [Ton]	
Diameter [mm]	Cir. [Inch]	[kg/m]	[kg/ 220m]	Un-spliced	Spliced [LDBF/TDBF]
32	4	0.680	149.00	26.30	23.70
34	4-1/4	0.740	163.00	29.60	26.60
36	4-1/2	0.800	176.00	33.00	29.70
38	4-3/4	0.890	196.00	37.70	33.90
40	5	0.980	216.00	42.90	38.60
42	5-1/4	1.080	238.00	47.20	42.50
44	5-1/2	1.190	262.00	51.80	46.60
46	5-3/4	1.300	286.00	56.80	51.10
48	6	1.410	310.00	62.00	55.80
50	6-1/4	1.530	337.00	67.60	60.80
52	6-1/2	1.660	365.00	73.40	66.10
54	6-3/4	1.790	393.00	78.91	71.00
56	7	1.920	422.00	84.60	76.10
58	7-1/4	2.060	453.00	87.40	78.70
60	7-1/2	2.210	486.00	95.80	86.20
62	7-3/4	2.350	518.00	101.70	91.50
64	8	2.510	552.00	107.80	97.00
66	8-1/4	2.670	587.00	114.80	103.30
68	8-1/2	2.830	623.00	122.10	109.90
70	8-3/4	3.000	661.00	129.60	116.60
72	9	3.180	700.00	137.40	123.70
74	9-1/4	3.360	739.00	144.70	130.20
76	9-1/2	3.540	779.00	152.10	136.90
78	9-3/4	3.730	820.00	159.70	143.70
80	10	3.920	862.00	167.40	150.70
82	10-1/4	4.120	906.00	174.20	156.80
84	10-1/2	4.320	951.00	181.20	163.10
86	10-3/4	4.540	998.00	188.00	169.20
88	11	4.750	1045.00	195.00	175.50
90	11-1/4	4.970	1093.00	203.50	183.20
92	11-1/2	5.190	1142.00	212.20	191.00
94	11-3/4	5.420	1192.00	221.00	199.00
96	12	5.650	1243.00	230.00	207.00
98	12-1/4	5.890	1295.00	239.70	215.70
100	12-1/2	6.130	1349.00	249.60	224.60
102	12-3/4	6.380	1403.00	259.70	233.70
104	13	6.630	1459.00	270.00	243.00

Application/Limitation

The approval range covers ropes with diameter from 32 mm to and including 104 mm.

The OCIMF MEG4 approval range covers ropes with diameter from 32 mm to and including 104 mm.

The OCIMF 2000 approval range covers ropes with diameter from 32 mm to and including 104 mm.

Place of Manufacture

Tufropes Private Limited, Survey No.: - 328/1/1/1, Tipco Road, Masat, Silvassa, Dadra & Nagar Haveli and Daman Div. 396230, India

Type Approval documentation

Tests carried out

Type Testing carried out in accordance with **Type Approval documentation**, and according to:

- OCIMF's Mooring Equipment Guidelines (MEG4) [requirements to testing].
- OCIMF 2000, Guidelines for the Purchasing and Testing of SPM Hawsers (1st Edition 2000) [testing].
- DNV-CP-0100.

The fibre ropes are manufactured in accordance with:

- ISO 10556:2009 "Fire ropes of polyester/polyolefin dual fibres"
- IS 14928: Textiles - Composite Synthetic Fibre Ropes

Marking of product

Product shall be marked with *manufacturer's name, place of production and type designation, diameter, product code and strength*.

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 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 / Certificate Renewal) shall be performed according to DNV-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.dnv.com>

END OF CERTIFICATE