Certificate no.:
TAK00002F1

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Synthetic Fibre Ropes

with type designation(s)
YSM-GRAND 8 [YSM and Partners],
YSM-GRAND 12 [YSM and Partners]

issued to

Responsive Industries Limited.

Palghar, Maharashtra, 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]

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 **2024-10-08**
This Certificate is valid until **2029-10-07**.
DNV local unit: **India CMC MES**

for **DNV**

Approval Engineer: **Gisle Hersvik**

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

YSM-GRAND 8: 8-strand plaited / braided synthetic fibre rope
YSM-GRAND 12: 12-strand plaited / braided synthetic fibre rope

-Fibre material: Polyester/Polyolefin dual fibres (mixed 60% PP and 40% PES)
-Specific gravity: 0.98 (floats in seawater)

Compliance with OCIMF Mooring Equipment Guidelines (MEG4)

Mooring Line Base Design Certificate - For YSM-GRAND 38 mm and 112 mm
Ref. No.: RIL/MEG4-YSM-GRAND/LBDC/24/001 **[Issue date: 2024-10-01]**
Mooring Line Certificates will be issued with reference to Mooring Line Base Design Certificate.

Responsive Industries Limited has performed the full test scenario as per OCIMF MEG4.

Rope Characteristics

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

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

All MBL values are given for the un-spliced ropes.
All LDBF (Line Design Break Force) values are given for the spliced ropes.

YSM-GRAND 8 and **YSM-GRAND 12**: 8- and 12-strand plaited / braided synthetic fibre ropes

Diameter [mm]	Linear Density -Rope [g/m]	Mass -Rope [kg/220 mtrs]	MBL [kN]	MBL [kgf]	LDBF [kN]	LDBF [kgf]
			Un-Spliced	Un-Spliced	Spliced	Spliced
38	737	162.25	289	29469	260.10	26523
40	875	192.50	335	34160	301.50	30744
44	1040	228.80	400	40788	360.00	36709
48	1200	264.00	465	47416	418.50	42675
49	1252	275.55	484.7	49425	436.23	44483
50	1305	287.10	504.5	51444	454.00	46295
51	1357	298.65	524.2	53453	471.80	48110
52	1410	310.20	544	55472	489.60	49925
53	1450	319.00	563.0	57410	506.70	51669
54	1490	327.80	582.0	59347	523.80	53412
55	1530	336.60	601.0	61285	540.90	55156
56	1570	345.40	620	63222	558.00	56900
57	1635	359.70	642.5	65516	578.25	58965
58	1700	374.00	665.0	67811	598.50	61030
59	1765	388.30	687.5	70105	618.75	63095
60	1830	402.60	710	72399	639.00	65159
61	1887	415.25	732.5	74694	659.25	67224
62	1945	427.90	755.0	76988	679.50	69289
63	2002	440.55	777.5	79283	699.75	71354
64	2060	453.20	800	81577	720.00	73419
68	2320	510.40	900	91774	810.00	82597
72	2580	567.60	1000	101971	900.00	91774
76	2830	622.60	1098	111964	988.20	100768
80	3190	701.80	1225	124915	1102.50	112423
84	3495	768.90	1338.0	136438	1204.20	122794
88	3800	836.00	1451	147960	1305.90	133164
92	4135	909.70	1578.5	160962	1420.65	144866
96	4470	983.40	1706	173963	1535.40	156567
100	4860	1069.20	1825	186098	1642.50	167488
104	5250	1155.00	1944	198232	1749.60	178409
112	6968	1533.00	2263	230761	2036.70	207685
116	6984	1536.50	2420.0	246771	2178.0	222094
120	7000	1540.00	2578.43	262926	2320.58	236633

The data in the table is provided by Responsive Industries Limited.

Application/Limitation

The approval range covers ropes with diameter from 38 mm to and including 120 mm.

The OCIMF MEG4 approval range covers ropes with diameter from 38 mm to and including 112 mm.

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].
- ISO 10556: 2009, Fibre ropes of polyester/polyolefin dual fibres.
- DNV-CP-0100.

The fibre ropes are manufactured in accordance with:
- Product Specification (YSM-GRAND), Form No. RIL/OCIMF/YG-001.

Marking of product

Product shall be marked with *manufacturer's name*: **Responsive Industries Limited, India**, *type designation*: YSM-GRAND and *diameter*.

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