



Certificate no.:
TAS00004A9

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Winch - General Application

with type designation(s)
9.2m, 10.4m, 11.4m, 12.4m, Spreader beam

issued to

M-REEL AS
Tananger, Rogaland, Norway

is found to comply with
DNV standard DNV-ST-0378 – Offshore and platform lifting appliances

Application:

Installation, transportation and storage reel for reeled products

Issued at **Høvik** on **2024-05-21**

This Certificate is valid until **2029-05-20**.

for **DNV**

DNV local unit: **West Norway CMC**

Approval Engineer: **Florian Teica**

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.



Form code: TA 251

Revision: 2023-09

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Design codes/standards used as reference

1. DNV-RP-0232 *Pipeline and cable laying equipment*, October 2021
2. DNV-ST-N001 *Marine operations and marine warranty*, September 2021 – for onshore in-air lifting

Product description

Equipment designation: Modular reel
Category: Storage equipment

Design temperature: -10deg C

The operational limitations defined below have been provided by M-Reel AS, data procedures adopted for estimating which have not formed part of this review. It is the end user's responsibility to ensure that these are never exceeded during service.

In-air lifting

Spreader beam Safe Working Load (SWL): 550 tonnes

Dynamic amplification factor (DAF): 1.10 (Onshore/inshore)

Lifting arrangement:

- as per drawing no mr3001-11 Rev 0 (with regards to dedicated spreader beam and sling angles)
- in case of non-symmetrical loading on the reel drum, the lifting gear and sling set shall be chosen such that the Centre of gravity (COG) of the lifted equipment is aligned with the Centre of lift (COL), ref doc no CAS 3001-01-SRW-002 Rev 0
- maximum rigging Self-weight (e.g. spreader bar, shackles, slings, etc): 4185 kg

It is the end user's responsibility to ensure that suitably sized loose gear is selected for in-air lifting and that the Centre of gravity of the loaded reel is aligned with the Centre of lift.

Payload

- Offshore storage or use: 400 tonnes or up to 80.81 tonnes/m on drum and up to 200 tonnes on flange
- When the drum is partitioned, the maximum load / meter on the drum shall not exceed the values stated above

Environmental conditions

		Operational		Transit/survival	
		On underrollers	In Reel Drive System	In cradle, no seafastening	In cradle, with seafastening
Vessel accelerations	Vertical (in addition to gravity)	±0 g	±0.1 g	±0.1 g	±0.27 g
	Longitudinal*	0.035 g	0.1 g	0.1 g	0.48 g
	Transverse*	0.08 g	0.34 g	0.17 g	0.48 g
Wind speed (at reel location)		N/A		36 m/s	

*) relative to vessel axis

Operational limitations

Reel type	9.2m Reel	10.4m Reel	11.4m Reel	12.4m Reel
Flange outer diameter	9.2m	10.4m	11.4m	12.4
Maximum Drum diameter	From 4m to 7m		From 5m to 7m	
Self-weight	Up to 61.5 tonnes	Up to 68.1 tonnes	Up to 80.3 tonnes	Up to 87.2 tonnes

Drum diameter		4m	5m	6m	7m
Product stack outer diameter	9.2m Reel	Up to 9.0m			
	10.4m Reel	Up to 9.5m			
	11.4m Reel	N/A	Up to 10.5m		
	12.4m Reel	N/A	Up to 11.5m		
MOLL (backtension)*		0.7 x product diameter [mm] or up to 100kN		0.8 x product diameter [mm] or up to 100kN	
Maximum torque at centre of drum		20.4 Tm	25.5 Tm	30.6 Tm	35.7 Tm

*) The MOLL (Maximum Operational Line Load, ref DNV-RP-0232 sec 1.6.2) shall be linearly reduced from the drum surface to outer layers to a value which shall maintain the actual torque at the drum centre below the values stated above

Application/Limitation

1. Although this structure has been reviewed using the strength requirements for winches, with reference to DNV-ST-0378 5.2.2, it is noted that the item is not to be used as a winch. In particular the reeling and unreeling of the product is done as a well-controlled, low risk operation. Flange height clearance and number of layers have therefore not been restricted.
2. The approval is based on the following boundary conditions during offshore use:
 - The reel will be resting on appropriately sized cradles supporting the reel flange on a minimum contact arc or 60 degrees, ref drg no mr3001-10 Rev 1;
 - The seafastening layout shall be as per 4374-022 - SF01 Rev.2:
 - o Location and number of lashings; MSL as per 4374-022 - SF01 Rev.2 (MSL Maximum securing load, ref CSS Code Annex 13 sec 4.2)
 - o Lashing angle (from vertical)
 - o The transport cradles shall provide lateral support, ref drg no mr3001-10 Rev 1
 - o D-rings and lashing capacities (MBL, minimum breaking loads) shall be as per CSS Code Annex 13 Table 1
3. The Type Approval is not covering:
 - D-rings; these shall be provided with Manufacturer PC
 - Lateral supports/restraints and lashings; actual seafastening adequacy with regards to strength and location (see also §2 above) shall be evaluated prior to each mobilization by the end user
 - The support cradles
 - The drive systems (under-roller and RDS)
 - Loose gear items (e.g. slings, shackles, links, etc)
 - Deck strength (reel cradle support structure)
 - Corrosion in marine environment
4. The reel flange rim shall be inspected for integrity/deformations prior to each operation when the reel is operated on underrollers.



Job ID: **262.1-041651-1**
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Type Approval documentation

Marking of product

Each reel shall be fitted with a plaque stating the following:

- the Maximum gross weight (MGW = self-weight + payload for offshore use)
- manufacturer's name
- Type Approval holder's name

Each D-ring shall be marked with the corresponding MSL (Maximum Securing Load) for in plane and out-of-plane capacities as per 4374-022 - SF01 Rev.2.

Each Spreader beam shall be marked as per DNV-ST-0378 sec 14.

Certification

This Type Approval covers design(s) only. i.e. the Type Approval is not valid for the final product, but may be used as basis for obtaining a product certificate.

If a DNV Product Certificate is required, the following shall apply:

- The manufacturing survey shall be followed-up by a DNV Surveyor
- Assembling of the reel at final installation to be carried out by qualified personnel following M-Reel AS' assembling procedure.
- Disassembly of the reel to be carried out by qualified personnel following M-Reel AS' assembling procedure
- Each spreader beam shall be subject to load testing as per DNV-ST-0378 sec 14.

Manufacturing location(s)

1. 10708281
2. 10741707
3. 10224167

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.

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