

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Winch - General Application**with type designation(s)
114-54-49

Issued to

FLEXI FRANCE SAS
Le Trait, France

is found to comply with

DNV GL standard DNVGL-ST-0378 – Standard for offshore and platform lifting appliances**Application :****Installation and storage reel for flexible and umbilical pipe**Issued at **Høvik** on **2019-12-17**This Certificate is valid until **2024-12-16**.DNV GL local station: **France CMC**for **DNV GL**Approval Engineer: **Florian Teica**

Aldo Matteucci
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.



Design codes/standards used as reference

1. DNVGL-RP-0232 *Pipeline and cable laying equipment*, September 2018
2. DNVGL-ST-N001 *Marine operations and marine warranty*, September 2018 – for onshore and inshore in-air lifting

Product description

Category: Storage equipment

Self-weight: 57.2 tonnes

Drum outer diameter: 5.40 m

Reel outer diameter: 11.40 m

Payload

- Onshore storage/use: 600 tonnes or up to 122.2 tonnes/m
- Onshore/inshore lifting: 340 tonnes or up to 69.3 tonnes/m
- Offshore storage/use: 340 tonnes or up to 69.3 tonnes/m
- When the drum is partitioned, the maximum load / meter on the drum shall not exceed the values stated above

Minimum/maximum product diameter, number of layers, line tension (MOLL)

Number of layer		1	2	3	4	5 & +*
Line diameter		MOLL [Te]	MOLL [Te]	MOLL [Te]	MOLL [Te]	MOLL [Te]
OD [mm]	50	2.5	1.4	1.2	1.0	0.8
	75	3.8	2.1	1.7	1.5	1.3
	100	5.0	2.9	2.3	1.9	1.7
	125	6.3	3.6	2.9	2.4	2.1
	150	7.5	4.3	3.5	2.9	2.5
	175	8.8	5.0	4.0	3.4	2.9
	200	10.0	5.7	4.6	3.9	3.3
	225	11.3	6.4	5.2	4.4	3.8
	250	12.5	7.1	5.8	4.8	4.2
	275	13.8	7.9	6.3	5.3	4.6
	300	15.0	8.6	6.9	5.8	5.0
	325	16.3	9.3	7.5	6.3	5.4
	350	17.5	10.0	8.1	6.8	5.8
	375	18.8	10.7	8.7	7.3	6.3
	400	20.0	11.4	9.2	7.7	6.7
	425	21.3	12.1	9.8	8.2	7.1
	450	22.5	12.9	10.4	8.7	7.5
	475	23.8	13.6	11.0	9.2	7.9
	500	25.0	14.3	11.5	9.7	8.3
	525	26.3	15.0	12.1	10.2	8.8
	550	27.5	15.7	12.7	10.6	9.2
	575	28.8	16.4	13.3	11.1	9.6
	600	30.0	17.1	13.8	11.6	10.0

*) maximum number of layers without the product exceeding the reel flange outer radius.

Environmental conditions

Vessel accelerations	Vertical (in addition to gravity)	Operational	Transit/survival
	Longitudinal*	0.25 g	0.5 g
	Transverse*	0.25 g	0.5 g
Wind speed (at reel location)		20 m/s	51.5 m/s

*) relative to vessel axis

Design temperature: -20deg C

In-air lifting

Dynamic amplification factor (DAF)

- Onshore: 1.05
- Inshore: 1.1

Lifting arrangement:

- as per drawing no CN000-333-592 Rev 15 and OBIM-00000400-001 Rev 0 (with regards to sling location and angles)
- reel may be lifted with/without onshore/offshore storage cradles
- 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)

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.

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

Application/Limitation

1. Although this structure has been reviewed using the strength requirements for winches, with reference to DNVGL-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 reel structure has been assessed for the following conditions, ref doc no NDC-MGC-2019-013 Rev 1:
 - Onshore storage on factory and offshore cradles, payload up to 600 tonnes
 - Onshore spooling on under-roller system, payload up to 340 tonnes
 - Onshore and inshore in-air lifting, payload up to 340 tonnes
 - Offshore transport and storage on offshore cradles, payload up to 340 tonnes
 - Offshore operation (spooling/unspooling) on Reel drive system (RDS), payload up to 340 tonnes
3. The approval is based on the following boundary conditions during offshore use:
 - The reel will be resting on appropriately sized offshore cradles supporting the reel flange on a minimum contact arc of 110 deg
 - The offshore cradles supports (vessel deck structure) shall be located as per doc no IREE-S0114054-001 Rev 1
 - The seafastening layout shall be as per drg no IREE-S01140554-001 Rev 1 with regards to:
 - o Location and number of lashings; the lashings shall be pre-tensioned according to the D-ring MSL (Maximum securing load, ref CSS Code Annex 13 sec 4.2)
 - o Lashing angle (from vertical)
 - o Location and number of lateral supports/restraints; these shall be executed such that they are able to support the flange in both tension and compression
 - o D-rings and lashing capacities (MBL) shall be as per CSS Code Annex 13 Table 1

4. 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 §3 above) shall be evaluated prior to each mobilization
 - The support cradles (offshore and factory)
 - The drive systems (under-roller and RDS)
 - Loose gear items (e.g. slings, shackles, links, spreader beam/frame, etc) and the reel carrier associated with in-air lifting operations
 - Deck strength (reel cradle support structure)
 - Corrosion in marine environment

Type Approval documentation

Marking of product

Each reel shall be marked with the Maximum gross weight (MGW = self-weight + payload for onshore/offshore use)

Each D-ring shall be marked with the corresponding MSL (Maximum Securing Load)

Certification

If a DNVGL Product Certificate is required, the manufacturing survey shall be followed-up by a DNVGL Surveyor.

Periodical assessment

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

End of certificate