Main changes in NR432

The main changes in Bureau Veritas Rules NR432 - Fibres Ropes for Offshore Services - December 2024 editionwith respect to the previous edition (NI432 R02– December 2018) are as follows.

Rules history

December 2024 edition Entry into force December 1st, 2024 Contents	December 2024 edition Entry into force December 1st, 2018 Contents
Fibre Ropes for Offshore Services [NR 432 DT R03 December 2024]	Certification of Fibre Ropes for Deepwater Offshore Services [NI 432 DT R02 E December 2018]

Overview

General update :

- Text is adapted for Marine Renewable Energies applications in shallow and intermediate water depths
- Specific requirements for polyamide ropes are provided
- Design and operating criteria are further developed in a new section 7, taking into account the cases where pre-stretching at installation / re-tensioning in operation is not possible or planed.
- App 2 now provides guidelines for the load-elongation modelling of fibre ropes, for different materials (polyester, HMPE, polyamide) and different conditions (long-term, early-life, no re-tensioning).

The organisation of the document is modified according to the following correspondence table:

Fibre Ropes for Offshore Services [NR 432 DT R03 May 2024]	Certification of Fibre Ropes for Deepwater Offshore Services [NI 432 DT R02 E December 2018]
Section 1 General	Section 1 General
Section 2 Certification scheme	Section 2 Certification scheme
Section 3 Fibre material	Section 3 Qualification of fibre material
Section 4 Rope design and manufacturing	Section 4 Rope design and manufacturing
Section 5 Quality control activities	Section 5 Quality control activities
Section 6 Rope prototype testing	Section 6 Rope prototype testing
Section 7 Ropes for station-keeping : design and operating criteria	Appendix 1 Ropes for station-keeping : design and operating criteria
Appendix 1 Rope testing	Appendix 3 Rope testing
Appendix 2 Guidance on load-elongation properties of fibre ropes	-------
Appendix 3 Templates for data sheet	Appendix 2 Templates for data sheet

Table 1 : Correspondence table

Section 1 – General

Topic	Description	Reference
Scope and application	Redefinition of scope and application of the Rule Note	[1.1] and [1.2]
Certification conditions	Certification conditions moved from Section 1 to Section 2	[1]
Definitions	Addition of several definitions	[1.3]
References	References updated	[1.4]
Sub-sea lowering lines	Removal of the sub-sea lowering lines from the Rule Note	-

Section 2 – Certification scheme

Topic	Description	Reference
Certification conditions	Certification conditions moved from Section 1 to Section 2	[1]
Process of certification	Description of certification process in line with NR320	[2.1]

Section 3 – Fibre material

Topic	Description	Reference
Fibre material	Inclusion of new material : polyamide	-
Marine grade fibre	Rewording of the definition of marine grade fibre	[1.3.2]
Hydrolysis	Inclusion of a new requirement related to the hydrolysis properties of aramid and polyarylate fibres	[1.3.4]

Section 4 – Rope design and manufacturing

Topic	Description	Reference
Rope design	Update and development of the requirements related to rope design for shallow water applications and for polyamide	[1]
Splices	The requirement related to splice arrangement has been detailed	[2.2.3]
T0	Definition of T0 updated and adapted to the different materials	[2.3.2]

Section 5 – Quality control activities

Topic	Description	Reference
General	Re-wording	[1]

Section 6 – Rope prototype testing

Topic	Description	Reference
General	*Global rewording of the section for compliance with "Rule Note" wording, with some notes included in the main text*	-
Load-elongation measurements	*New requirements related to polyamide and to stationkeeping systems without re-tensioning means*	*[3]*
Creep	*Definition of creep is included*	*[4.1]*
Cyclic loading endurance	*Addition of a note to make the requested load range for cyclic endurance testing explicit*	*[5.1]*
Particle ingress protection	*Inclusion of a new requirement related to the qualification of particle ingress protection for shallow / intermediate water depths applications*	*[5.3]*
Sub-sea lowering lines	*Deletion of requirements for sub-sea lowering lines*	-

Section 7 – Ropes for stationkeeping : Design and operating criteria

Topic	Description	Reference
Design and operating criteria	*Design and operating criteria extracted from previous App1 and developed in a dedicated section*	-
Arrangement of stationkeeping systems in deepwaters	*Update and re-wording of the requirements related to the arrangement of stationkeeping systems in deepwaters*	*[2]*
Arrangement of stationkeeping systems in intermediate / shallow waters	*New requirements for the arrangement of stationkeeping systems in intermediate / shallow waters*	*[3]*
Design criteria	*Update of the requirements related to the increase in safety factors to be considered in a mooring analysis including fibre rope segments*	*[4.1.2]*
Endurance under cyclic loading	*Update of the requirements for the evaluation of the fatigue life of fibre ropes to adapt it to all materials*	*[4.3.1]*
Installation	*Update of the requirements related to rope pre-stretching before installation, and rope re-tensionning after installation*	*[5.1.4]*
Operations	- *Title of sub-article changed from "re-tensioning" to "operations"* - *Update of the requirements related to re-tensioning means*	*[5.2]*
Inspection of rope	*Wording : "inserts" changed to "short rope segments"*	*[5.3]*

Appendix 1 – Rope testing

Topic	Description	Reference
Rope testing	*Moved from Appendix 3 to Appendix 1*	-
General update	*Update and rewording of the text to adapt it to "Rule Note" format*	-
Sample condition	*Introduction of a table to clarify the requested sample conditions for each material (including polyamide) and each test*	*[2.2.2]*
Stiffness tests - polyamide	*Addition of a new requirement providing requirements for the stiffness tests of polyamide ropes*	*[4.1.2]*
Recording	*Introduction of the formula for the calculation of the quasi-static stiffness*	*[4.5]*

Appendix 2 – Guidance on load-elongation properties of fibre ropes

Topic	Description	Reference
Load-elongation properties	*Extracted from previous Appendix 1, rearranged and developed in a dedicated Appendix 2*	-
Mechanical model	*Definition of the applicable model for each material considered*	*[1.6]*
Line length	*Guidance on line length definition is provided*	*[1.7]*
Bibliography	*Reference to publications is moved from [6] to [1.8] and title is changed from "Reference documents" to "Bibliography"*	*[1.8]*
Quasi-static characteristics - polyester	*Quasi-static characteristics of polyester ropes are provided for different conditions of the system:* - *Long-term* - *Early life* - *Long-term without re-tensioning*	*[2.3]*
Numerical data	*Numerical data are provided for the application of the models described in [2.3] and [3], for polyester and high modulus materials*	*[4]*
Polyamide	*Inclusion of a specific article for the load-elongation modelling of nylon ropes*	*[5]*

Appendix 3 – Templates for data sheet

Topic	Description	Reference
Templates for data sheet	*Templates moved from App 2 to App 3*	-
Coating	*Introduction of a "coating" part in the "Rope design" data sheet*	*Tab 2*