

Mooring tail base design certificate

This form demonstrates that the product has been manufactured, tested and documented following the guidelines in appendix B of the *Mooring Equipment Guidelines, Fourth Edition*. The base design performance indicators should be reviewed with reference to *Guidance on performance indicator interpretation* table below.

Certification does not indicate approval or certification by OCIMF.

General information

Issue date:	Expiry date:
Line manufacturer:	Independent inspection agency:
Line design designation:	Material type and grade:
Line construction:	Jacketed? Yes No
Design range:	Rotating? Yes No

Base design performance indicators

Performance Indicators	Smallest Diameter		Largest Diameter		
	Design:	Measured:	Design:	Measured:	
Diameter					
Tail Design Break Force (TDBF)					
Tail Linear Density (TLD)					
Load Bearing Linear Density (LBLD)					
Tail Tenacity (TT)					
Splice type					
Maximum Line Tenacity (MLT)					
Dynamic Stiffness (Ksh, Kex)	Sheltered (Ksh):	Tension-tension endurance (CTF)	CTF 50%:		
	Exposed (Kex):		CTF 20%:		
			% TDBF: 10	% TDBF: 20	% TDBF: 30 % TDBF: 40 % TDBF: 50
Average Immediate Strain* (e)					

Name and address of manufacturing facility:

Independent inspector: Completion date:

Address of independent inspector:

Base design sample testing information

Name and address of test facility:

Independent inspector: Completion date:

Address of independent inspector:

Base design sample and product documentation reviewed

Independent inspector:	Date of review:
Prototype manufacturing report:	Manufacturer's discard and inspection criteria:
Prototype ITP:	Splicing instructions:
Prototype test report:	Procedures for testing and inspection of retired mooring tails:
Design specification:	Determination of performance indicators:

Equivalent documents from other type approval programmes (list)

STAMP OF INDEPENDENT
INSPECTOR

Guidance on performance indicator interpretation for mooring tails

Name	Indicator	Unit of Measurement	Description	Guidance to the Line Selector
Tail Design Break Force	TDBF	t	The tensile force that can be sustained by a product sample without rupture when tested with terminations and in laboratory conditions. TDBF is a rating assigned by the manufacturer, NSBF is the result of an individual test.	Tested NSBF values are normally greater than the TDBF and the TDBF is normally between 125% and 130% of the ship design MBL. A greater TDBF or NSBF for a given diameter or LBLD does not necessarily indicate a superior product. For tail designs of the same material and size, NSBF should be compared using both TT and TDBF but need not be identical. The force at which a tail breaks in service may be lower than the TDBF, due to the influence of geometry (D/d), temperature, loading rates and amplitudes and internal and external wear over time.
New Straight Break Force	NSBF	lb		
Tail Linear Density	TLD	kg/m	The linear mass of the tail (TLD) or the load bearing structure (LBLD) measured at reference tension.	A higher LBLD results in reduced material stress for a fixed TDBF. Linear Density includes the mass of any coatings applied directly to the load bearing structure as well as the linear mass of the material itself. LBLD is only comparable when the load bearing material is of the same type. For jacketed lines, TLD is greater than LBLD and includes material mass of jackets which is non-load bearing. A higher LBLD may also cause the tail to become stiffer.
Load Bearing Linear Density	LBLD	lb/ft		
Tail Tenacity	TT	t/kg/m lb/lb/ft	Load bearing material stress at break.	TT represents material stress at the TDBF. For a given line size and material type, a line of lower TT offers increased resistance to the majority of fatigue and wear modes. TT of lines of different materials should not be compared. The maximum tenacity is defined as the tenacity of the smallest size in the design range.

Name	Indicator	Unit of Measurement	Description	Guidance to the Line Selector
Sheltered Stiffness	Ksh	x TDBF	The resistance of the tail to elongation when cycled in the stated load ranges, around the stated mean load and at the stated frequency.	Ksh and Kex indicate the effective stiffness of a tail in motion driven environments. The stated values correspond to the tested mean loads and load ranges only. The effective stiffness of a tail is influenced by mean load, load range and load rate as well as tail length, construction and fabrication. Grommet tails have two times the stiffness of a single leg tail of the same diameter. The effect of reduced stiffness is to decrease peak loads induced by motion driven environments. However, reduced stiffness may also cause greater ship offsets for force based environmental loads (e.g. wind/current loads). It is recommended that values of tail stiffness are used in mooring analysis which correspond with known environmental conditions. Both Ksh/Kex and immediate strain (e) values should be closely matched when tails are replaced.
Exposed Stiffness	Kex			
Tension-tension Endurance – Cycles to Failure	CTF	Cycles to failure	The number of cycles that would cause a tail to fail when cycled continuously between reference tension and the stated loads (%TDBF) in new (eye and eye) configuration and when tested in laboratory conditions.	A higher CTF indicates a higher resistance to tension-tension fatigue. The CTF values should be used for comparative and selection purposes. Laboratory tests do not fully reflect the compound nature of tension-tension fatigue, or the risks to reliability posed by other hazards (e.g. mechanical damage). The interpolation or extrapolation of tail CTF values to determine a discard point is not recommended.
Average Immediate Strain	e	% elongation at stated % of TDBF	The percentage elongation of the mooring line when exposed to a stated percentage of TDBF.	Elongation is affected by material content, material type, tail structure and fabrication. Grommet tails will elongate approximately 50% less than an eye and eye tail of the same size when exposed to the same load. Both immediate strain and static/dynamic stiffness should be incorporated into mooring analysis and closely matched when tails are replaced.