

# Safe Mooring – regulatory updates and recommendations

for bulk carriers in operation

DNV Maritime  
12 May 2025

Prepared for  **INTERCARGO**  
INTERNATIONAL ASSOCIATION  
OF DRY CARGO SHIPOWNERS

# Updated regulations



- By resolution MSC.474(102), the Maritime Safety Committee adopted amendments to SOLAS regulation II-1/3-8, including new requirements for

Guidance on shipboard towing  
and mooring equipment  
(MSC.1/Circ.1175/Rev.1)  
Revised

Guidelines on the design of  
mooring arrangements and the  
selection of appropriate mooring  
equipment and fittings  
(MSC.1/ Circ.1619)  
New

Guidelines for inspection and  
maintenance of mooring  
equipment including lines  
(MSC.1/ Circ.1620)  
New

- Which will enter into force on 1<sup>st</sup> Jan 2024.
- The new requirements will apply to new cargo and passenger ships constructed on or after 1 January 2024.
- **The maintenance and inspection requirements apply retroactively to all ships.**
- DNV has prepared an explanation site on the regulations and interpretations on newbuildings as well as ships in operation. <https://www.dnv.com/maritime/insights/topics/safe-mooring/>

# Frequently asked questions

Question from owners and operators	Answer / recommendation
<b>1. What to do for compliance?</b>	Establish a regime and keep record ready for inspection
<b>2. Any documentation need to be submitted to Class for approval?</b>	No approval is required, unless a change is made to the fittings.
<b>3. Do I need to establish <math>MBL_{SD}</math> ?</b>	For bulk carriers you should. The Ship Design MBL ( $SDMBL/MBL_{SD}$ ) may be defined with due consideration to EN number, SWL of fittings, brake capacity of winches, strength of existing lines and any operational concerns.
<b>4. What shall be done if the vessel uses lines with MBL higher than Ship Design MBL?</b>	No requirement for immediate replacement but suggest to plan for it.
<b>5. Why my vessels has no SWL information for my fittings? Not physically marked on deck, no info on the mooring arrangement drawing either?</b>	This is a typical challenge for vessels built before 2007 as it was not mandatory at that time. No regulatory issue if continue operation as is, but recommend to perform a technical review and identify any risks associated.

# Common challenges

Establish suitable SDMBL and manage risks identified from the original design

- Define Ship Design MBL with due considerations to EN number, SWL of fittings, brake capacity of winches, strength of existing lines and any operational concern. When necessary, mooring analysis (direct mooring load calculation) can be considered.
- Some examples from previous work for bulk carries

Vessel	SWL of fittings	Winches	Mooring line	Services provided by DNV Safe Mooring team	Result summary
Vessel 1 180 000 DWT Built in 2014	83t chocks 64t roller fairleads	Max brake 48t	Synthetic rope, MBL 105t	MBLsd definition, System verification	MBLsd established as 72t following EN number, 64t rollers need to be protected by correct winch rendering. Challenging winch brake capacity due to lower capacity.
Vessel 2 84 000 DWT Built in 2013	63t-64t	Undivided drum, max brake 60t	Synthetic rope MBL 80t	Same as above	MBLsd established as 63t, following the EN number and SWL of fittings. Challenging winch due to undivided drum.
Vessel 3 62 000 DWT built in 2011	46t / 64t chock 73-88t bollard 42t roller	Max brake 36t	Synthetic rope MBL 96t	EN number review, Mooring analysis MBLsd definition, System verification	Difficult to define according to EN number. Concluded to MBLsd 42t as per mooring analysis.

# Common challenges

## Change of rope standards

- Previous standard
  - MBL - Minimum Breaking Load
- MEG4 standard
  - LDBF – Line Design Breaking Force
  - TDBF – Tail Design Breaking Force
  - WLL – Work Load Limit

<b><u>CERTIFICATE OF CONFORMITY</u></b> (Certificate in Acc. to EN 10204 type 3.1)	
SUPPLIED TO	:
CUSTOMER ORDER NO.	:
PRODUCT	:
QUANTITY	: 2 x 220mtrs 2mtr protected eye each end
DIAMETER	: 26-32mm
CONSTRUCTION	: 12 Strand covered with Tipto® jacket
MINIMUM BREAK STRENGTH	: 62.4 tonnes
LANKHORST UK REFERENCE	: 8320/14 ✓
PRODUCT IDENTIFICATION CODE	: 24557/24558
STANDARD	: Ropes are produced according OCIMF Guidelines.  05/12/2014

Customer:		Vessel:	
Order No:		Shipping Ma	

We hereby certify that the rope as listed below supplied to your firm has been manufactured in order to meet the requirements of ISO 9554:2010 and OCIMF Mooring Equipment Guidelines:4<sup>th</sup> Edition 2018. All ropes have been inspected visually during the manufacturing process and before delivery. Sampling tests have being carried out according to the company's quality system in force and meet the requirements of MEG4 regulations.

**Mooring Line Certificate**

**Line supply information**

Ship design MBL t : NSBF (if tested) t :  
Diameter mm : 32mm Length m : 220  
Jacketed (Y/N) : YES Splice type & design :  
Material type and grade : UHMPE  
Manufacturer's part code and unique line identifier :  
Line design designation (product name) :  
Line construction : 12 Strand (12 x 1 Braided)  
Rotating (Y/N) : NO

**Performance indicators**

Line Design Breaking Force (LDBF) t : 62,4 tons/ 612 kN  
Line Linear Density (LLD) Kg/m : 0,772  
Load Bearing Linear Density (LB LD) Kg/m : 0,435  
Line Tenacity (LT) Kg/m : 143,45  
Angled Breaking Force (ABF) % Avg NSBF : D/d ratio 5 = 80% D/d ratio 10= 90%  
Angled Endurance (AE) % Avg NSBF : D/d ratio 5 = N/A D/d ratio 10= N/A  
Breaking Elongation :  
Temperature (T) % BF at 20 dgr Celsius ( ) : -20C=111% 0C= 109% 20C= 100% 40C= 92% 60C= 80C= 78%  
Axial compression Resistance (ACR) 90% Avg NSBF : N/A  
Average Immediate Strain (e) : %LBDF 10= 0,3% %LBDF 20= 0,6% %LBDF 30= 0,8% %LBDF 40= 1,1% %LBDF 50= 1,4%

# Common challenges

## Undivided drum



- Quick estimate – when drum diameter is 460mm and mooring rope is 64mm, the table shows the reduction of brake holding

Layers of rope on drum	Effective operational brake	Percentage of SDMBL (63Te)	Recommended Percentage of SDMBL by MEG4
1	100% of Max. BHC	70%	Recommended 60%, Minimum 50%
2	81% of Max. BHC	56%	Recommended 60%, Minimum 50%
3	67% of Max. BHC	47%	Recommended 60%, Minimum 50%
4	58% of Max. BHC	40%	Recommended 60%, Minimum 50%
5	51% of Max. BHC	35%	Recommended 60%, Minimum 50%

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