

## Selecting the right mooring ropes

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### Why you not should look at nominal diameter but instead to LDBF

Typically, mooring ropes are chosen by nominal diameter — but is that really correct? The actual measured diameter often differs, and ropes of similar size can vary in strength and performance. To prevent mishaps, OCIMF and IMO recommend selecting mooring ropes based on Line Design Breaking Force (LDBF) rather than diameter.

### Various factors influence the measured diameter of a rope

Construction	Load
Material	Elongation
Design	

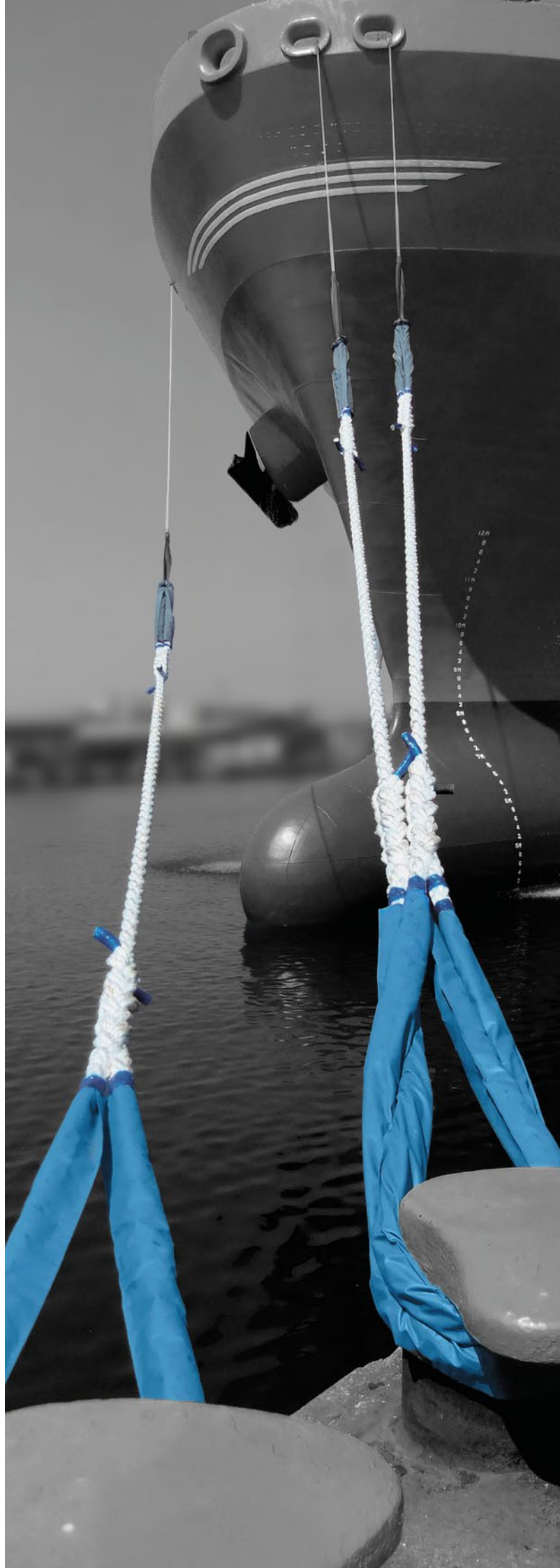
Choosing the right mooring ropes isn't simple — tides, swell, and wind all affect the required strength to ensure crew safety and meet international standards.

Ropes with the same nominal diameter can differ greatly in Line Design Breaking Force (LDBF) and performance, so diameter alone is unreliable.

To select suitable ropes, calculate the needed LDBF and share detailed vessel information, including:

- Ship type and size
- Winch design and layout
- Trading areas
- Mooring analysis results
- Potential berth arrangements

In short: choose by strength, not size — and share details to get it right.



## What is line design breaking force (LDBF)?

Line Design Breaking Force (LDBF) is the minimum strength at which a new, dry, and spliced mooring rope will break when tested according to OCIMF MEG 4 guidelines or IMO MSC.1/Circ.1619 and IMO MSC.1/Circ.1620.

To ensure that a mooring rope is sufficiently strong, the guidelines recommend that the rope's LDBF should be between 100% and 105% of the vessel's Ship Design Minimum Breaking Load (SDMBL).

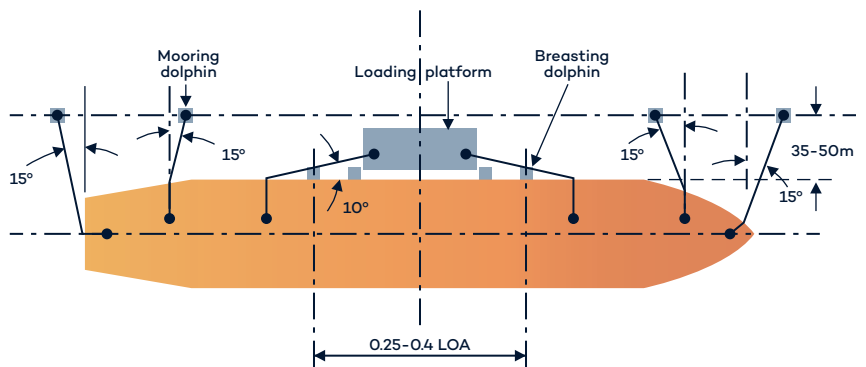
Selecting an LDBF that is too low can lead to unexpected line failures and create life-threatening situations for the crew. Choosing a mooring rope with an excessively high LDBF can cause severe damage to mooring equipment and endanger the crew as well.

## How to calculate the LDBF for your vessel?

Before selecting the type of mooring ropes for your vessel, you first need to know which Line Design Breaking Force (LDBF) is required.

According to MEG 4 and IMO regulations, the LDBF must be between 100% and 105% of the vessel's SDMBL. To calculate the LDBF of the mooring ropes, the following formula can be used:

$$\text{LDBF} = \text{SDMBL} \times 1,05$$



LDBF = Line Design Breaking Force  
SDMBL = Ship Design Minimum Break Force

EXAMPLE

A Bulk carrier has a SDMBL of 56 tons (576,6 kN)

In this case the needed LDBF will be:

LDBF = 56-58,8 T (549,36 kN-576,83 kN) (100%-105% of vessels SDMBL)

## Select the mooring rope

After the LDBF is calculated, you need to decide which type of mooring ropes you want to use. Does your vessel require 6-8 or 12-strand mooring ropes? What kind of fibers do you prefer, and does the mooring rope need SNAP BACK LIMITER (SBL) technology? For our example, we chose our AMBER MIX S mooring ropes.

Diameter (mm)	Diameter (inch)	Circ (inch)	Lenght* (mtr)	Weight (kg)	LDBF (From) (t)	LDBF (Till) (t)	LDBF (From) (kN)	LDBF (Till) (kN)
34	1.3/8	4.1/4	220	129	20,3	24,6	199	242
38	1.1/2	4.3/4	220	161	24,7	30,7	243	301
40	1.5/8	5	220	165	28,1	34,0	275	334
44	1.3/4	5.1/2	220	195	34,1	40,4	334	397
48	1.7/8	6	220	226	40,5	46,7	398	457
50	2	6.1/4	220	247	46,8	50,9	458	499
52	2.1/8	6.1/2	220	269	51,0	54,3	500	532
56	2.1/4	7	220	309	54,4	62,7	533	615
60	2.1/2	7-1/2	220	350	62,8	71,4	616	700