

# Mooring equipment should not look like this

A guide for ship staff completing mooring system inspections.



## **Stopper line frayed/unravelled and weak**

Failure of the stopper line whilst under tension may result in unexpected loads acting on the mooring line while it is being manually belayed and endanger the crew who are either holding the stopper line or handling the mooring line.



## **Mooring line surface showing evidence of heat damage**

Heat damage can be caused through friction or direct contact with external heat sources.

Generally caused by surging, and affected lines will show glossy or glazed areas on the line surface.

A heat-damaged line is generally more seriously weakened than commonly believed.



## **Pinching damage**

Results in pulled or cut yarns, which directly affects the strength of the mooring line.



#### **Cut strand on a braided nylon line**

Like cut yarns, cut strands have a direct though more serious effect on the line's strength.



#### **Mooring lines stained with grease**

Contact with chemicals may cause deterioration of the line.

When it is likely that a line will get in contact with grease from winches, roller fairleads and so on, select lines with good chemical resistance.

If a line passes along/over/around greased fittings and equipment, those involved in maintenance/greasing should be instructed to remove excess grease/oil.



#### **Mooring lines stained with paint**

Contact with chemicals such as paint may cause degradation and should be avoided.

Contact with paint can cause the line to harden, which affects its grip on the drum end.



#### **Mooring line stained with fuel oil**

Oil and petroleum products generally do not affect synthetic fibres, but should be avoided and may cause pollution when lines have absorbed oil and are then dropped into the sea.

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### **Buried turns**

Improper reeling or spooling (without the right pretensioning) causes the tensioned part of the mooring line on the dedicated winch to become buried underneath the underlying turns.

If not noticed in time, buried mooring lines may be dangerous for the linesmen as the line initially pays out when slacking away for letting go, but when wound/spooled back onto the drum, it will continue to turn in the slacking away direction if the line has not been freed in time.



### **Improperly spliced wire mooring line**

Splicing generally reduces the strength of the wire by 10%. Ensure that the correct method of splicing is used (contact the manufacturers).

Good practice requires a number of five full and preferably two additional half tucks in a wire.



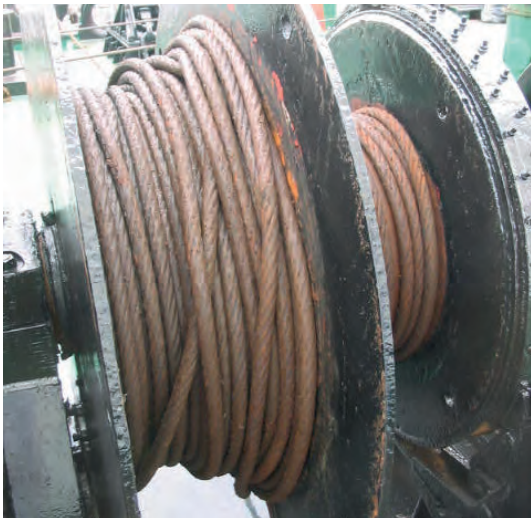
Synthetic mooring line heaved tight on the storage section of a split-drum type winch.



### **Fairlead rollers being “strangled” in order to improve the incoming angle on the winch drum**

Strangling the roller causes the mooring line to chafe.

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### **Improper spooling of wire line**

Wire mooring line irregularly/unevenly spooled onto the winch drum.

Note crossed wires in underlying layers which are severely damaged or crushed by upper layers of the wire.



### **Abrasion damage to mooring lines from frozen fairleads**

Chafing between a mooring line and other equipment such as cocks and fairleads causes surface abrasion.

Rust or evidence of wear may be an indication that the rollers do not rotate freely.



### **Mooring wire and lines through same Panama lead**

Friction or chafing between mooring lines and mooring wire causes damage from surface abrasion and contamination of the line.

The lubricated mooring wire leaves grease deposits on the panama lead and stains mooring lines with grease residues.

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### **Kinks**

Kinks cause permanent distortion of the strands and seriously affect the line's strength.

Kinked lines should be removed from service until they have been examined and properly repaired. Despite being repaired, this line has been weakened.

Expect kinks to cause about 30% reduction in strength. A kinked line means poor contact between line and drum end surfaces and may cause the mooring line to slip.

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### **Chain stopper for stoppering mooring lines**

Fibre line stoppers should be used for stoppering fibre mooring lines.

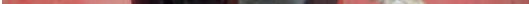
Using chain for stoppering might cause crushing and pinching damage to yarns and strands when tension comes on the chain stopper.

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### **Mooring line chafing against winch structure**

Lines not paid out properly may rub on the ship's structure (winch frames, platforms, etc.) involving a considerable risk of damage through chafing, abrasion or cutting.





**Excessive clearance between roller and pedestal table, two lines acting on the same roller**

This indicates that the roller pin is worn, meaning it will have lost part of its original strength and may fly back when under tension.

Allowing two lines on the same roller is very bad practice as it may result in overloading the roller/pedestal fairlead and chafing between the two mooring lines.



**Chafing damage to line due to rust**

Rusty, knife-edge flakes on the storage drum cause chafing damage and accelerated wear on the mooring line due to contact during operation or as a result of vibration.

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# Unsafe or damaged equipment



## **Extreme wear and grooving on rollers**

Grooving over part of the surface of the roller indicates that the roller is frozen and that the line/wire is always chafing against the roller in the same area.

Grooving or corrosion and scale accelerates damage to the mooring lines/wires.

Generally, and when under tension, lines/wires will tend to settle in the groove which will cause further/accelerated wear to the grooved surface.

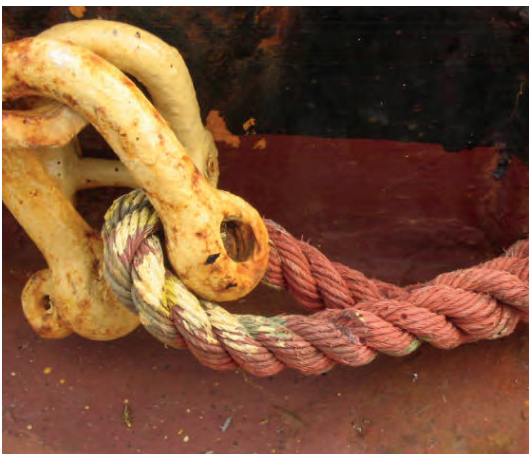
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## **Extreme grooving in button type roller fairlead**

The depth and size of the groove indicate that it has previously been used for wire lines, which might cause bird caging or corkscrewing when new wires are installed.

If the fairlead is subsequently used for lines with a different diameter, the sharp edges of the groove will damage the line through abrasion and chafing.



Eye screw pin of D-shackle for connecting the line stopper to the stoppering eye/lug not properly fitted.

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