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# NATURAL FIBRE ROPES AND ROPE LADDERS[1]

## 1. GENERAL

Due to its strength, superior grip, good abrasion resistance and low stretch qualities, manila is the rope of choice for lifeboat and life raft embarkation ladders, pilot ladders, manropes and Jacobs ladders.

## 2. PROPERTIES, STOWAGE AND CARE

The natural fibre rope is susceptible to damage and loss of strength due to a number of factors if it is not stowed and handled carefully.

- Abrasion or cuts may occur during routine handling. Bulwarks, fish plates, deck edges, decks and any other surfaces which may come into contact with the ladder should therefore be smooth and free from obstructions or defects which may chafe or cut the rope.
- Natural fibres are susceptible to dry rot and mildew, therefore the rope is normally treated with chemical preservatives in the factory to provide resistance to such problems. However, rope ladders should not be stowed when wet as the preservatives may become less effective over time.
- Rope ladders should not be stored together with chemicals, acids, detergents or paint as these products and their fumes may cause the fibres to deteriorate quickly.
- Rope ladders should not be dragged over decks which need cleaning. Abrasive material such as cargo particles or blasting grit may penetrate the strands, and contact with hydraulic oil or fuel residues may also cause damage.
- If a rope ladder is dirty, it should be washed with fresh water. Soap or detergent should not be used as these products may affect the natural oils and chemical preservatives in the rope. High pressure water guns should also be avoided as these may force dirt or grit into the fibres.
- The ladder should be allowed to dry naturally prior to storage. Once dry, the ladder should be shaken to remove any particles that may still remain.
- Ideally, rope ladders should be stored in a cool, dry, well ventilated compartment and be stowed on wooden gratings which allows maximum exposure to the air. If kinks are present, these should be removed beforehand.
- In sub-zero temperatures they should be thawed thoroughly before use as frozen rope fibres are more susceptible to breakage.
- In order to protect rope ladders stored outside from the effects of rot, mildew, chemicals, acids and detergents, they should be stowed on a suitable grating. The height of the grating should be such that the ladder will not come into contact with free water on deck.

[1] W 20 / 2020 (Entire Chapter Added)

- Natural fibre rope is also susceptible to actinic degradation due to ultraviolet radiation, particularly in tropical areas. Rope ladders stored outside should therefore be covered when not in use to protect them from the effects of sunlight. Coverings will also protect ladders from precipitation and frost.
- The shipboard ends of rope embarkation ladders stored outside on gratings are often shackled to padeyes, and it is not uncommon to find the rope between the grating and the padeyes uncovered and in contact with the deck. This may result in accelerated deterioration in the vicinity of the eye thimbles due to prolonged exposure to sunlight and water which may contain chemicals. Protecting the rope between the grating and the padeyes should not be over-looked when stowing and covering a rope ladder.

## 3. INSPECTION AND MAINTENANCE

The following points should be borne in mind while inspecting the ladders:

- Although the surface of the rope may appear to be in satisfactory condition, natural fibre rope may self-abrade from the inside. Therefore the lay should be opened at regular intervals along the ladder to check for signs of wear, broken fibres, powdering, dry rot or mildew.
- The presence of dark mould spots or a grey powdery substance within the lay of the rope may be an indication of rot or mildew, particularly if accompanied by a musty odour. Once mildew has taken hold it is very difficult to eradicate.
- A rope which is stained or has surface fibres which can be rubbed off easily may have been attacked by chemicals. Dark brown spots on the outside may indicate that the rope has been in contact with acid or acid fumes.
- If the fibres on the surface appear to be weak or frayed and can be picked away with a fingernail, the rope may be suffering from actinic degradation due to exposure to sunlight.

The inspection of ladders should also cover the fixtures and fittings:

- Spliced tail strands and rope ends should be either whipped or taped to prevent them from unravelling. Any splices with loose tucks should be tightened or renewed.
- Steps and chocks should be inspected for damage including cracks, wear, splits, sharp edges and splinters. Checks should be made to ensure that any slip resistant material applied to the steps is still effective. All steps should be horizontal and none should be painted, either partially or completely, as this may mask the presence of flaws.
- Natural fibre seizings may be affected by rot, mildew, chemicals, acids, detergents, paint and sunlight in the same way as the rope itself. Their condition should be checked to confirm they have not degraded, even when tarred marlin has been used. Seizings should be intact and tight, holding the wooden chocks or rungs securely in place.
- Shackles securing ladders to padeyes on deck should be inspected to ensure that they are not corroded beyond acceptable limits. Ideally, stainless steel shackles should be used.

Shackle pins should be screwed firmly into the shackle body and moused. Shackle bolt nuts should be tight and secured with a stainless steel split pin.

- Shackles should have the certificate and painted yellow with a red pin.
- Padeyes, handhold stanchions and its securing arrangement should be inspected for damage and corrosion, and welds checked for excessive wear down and cracks.

### 3.1. Embarkation ladder[2]

Embarkation ladder to be replaced at interval of 5 years or upon degradation whichever is earlier.

Refer to Mespas[3] for maintenance of embarkation ladders.

## 4. REPLACEMENT CRITERIA

Any damage to or degradation of a natural fibre rope, rope ladder should be evaluated. If deemed necessary, or if any doubt exists, rope, ladder should be removed from service and repaired as applicable or replaced. Factors which may result in such action may include:

- Fraying, abrasion, cuts or signs of excessive wear
- Deterioration (particularly if long fibres pulled from the rope lack strength and break easily)
- Damage caused by chemicals, detergent or paint
- Powdering between strands
- Discolouration (other than benign stains)
- Rot or mildew
- Variations in diameter size
- Exposure to overloading or shock loads
- Kinks which are difficult to remove

If small sections of rope are found to be damaged or weakened, the entire length should be replaced completely. It is not acceptable to crop out the affected areas and reconnect the rope regardless of the method used (eg splicing, joining shackles, knots).

Steps, rungs or chocks which are cracked, worn, split, splintered or painted should be replaced, as should any worn or missing anti-slip material. New chocks should always be secured with fresh seizings. Any seizings found to be in poor condition should be changed.

[2] W 45 / 2023
[3] W 03 / 2024

If it is necessary to replace a rope ladder completely, the old one should be adequately marked or tagged to prevent the possibility of inadvertent use and disposed ashore at first opportunity.

Shackles should be replaced if wear or corrosion has reduced the diameter of the crown or pin by more than 10%.

Pad eyes found to be worn beyond Classification Society limits should be renewed. Any cracked welds should be ground out and repaired by a suitably qualified welder.

Pad eyes are to be visually inspected for any crack and reduction of its diameter due to corrosion.