

Technical eNewsletter

Damaged wire insulation in fluorescent tube lighting fixtures

On a number of vessels, it has recently been observed that the wire insulation inside fluorescent light fittings is damaged. The damage has been found on the external cable connected to the lighting fixture when the wire insulation of such cable is exposed to direct UV light inside the lighting housing.

The insulation has either melted or become brittle and fallen off the wires. The reported damage has been related to cables from different cable manufacturers and for various types of light fittings. The immediate consequence may be an electric shock while changing tubes, an electric short circuit and/or the start of a fire.

According to rules for electrical systems, electrical equipment shall be constructed of durable non-hygroscopic materials which are not subject to deterioration in the atmosphere to which the equipment is likely to be exposed.

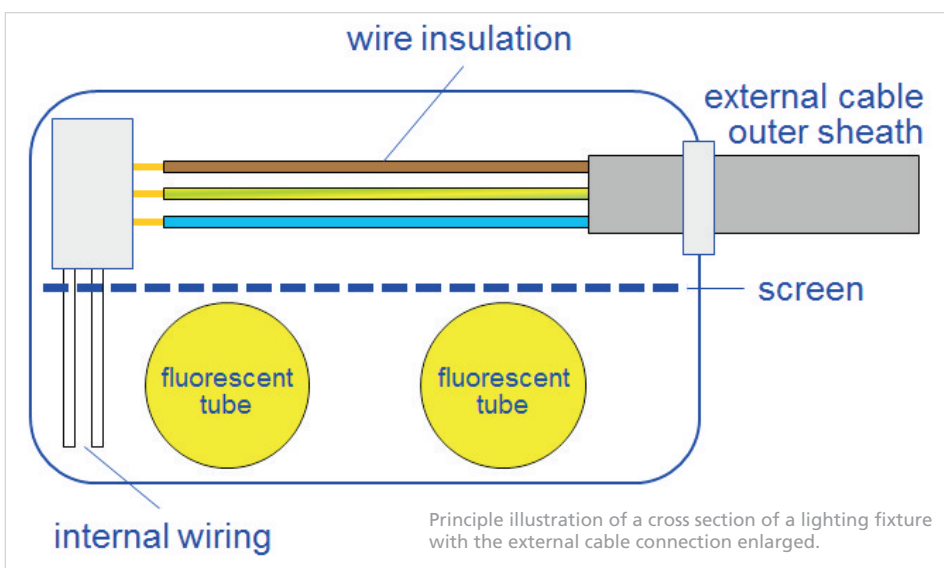
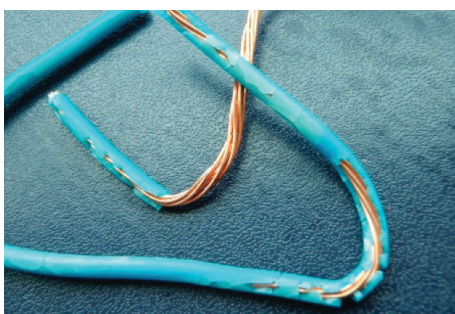
The outer sheath of the external cables is normally UV light resistant. However international standards do not require UV light resistant wire insulation since these are not normally exposed to UV light.

When installing the external cable in the lighting fixture terminal, the external cable sheath is dismantled, exposing the wire insulation. If the UV light from the fluorescent lighting is close by and the insulation is exposed to it for a lengthy period, the insulation seems to deteriorate.

Any of the following three measures should prevent the aforementioned damage to the wire insulation.

1. The fluorescent lighting fixture includes a gear tray/reflector/screen which effectively prevents (separates) the wire insulation from being exposed to the UV light.
2. The external cable used, and especially the inside wire insulation, is confirmed to be UV light resistant.
3. The external cable sheath is dismantled to expose the inside wire insulation, and this is then covered by UV light resistant heat-shrinkable tubing.

To ensure the safe electrical installation of fluorescent lighting fixtures on ships and offshore installations, the following is recommended:



For newbuildings:

- Verify that the fluorescent lighting fixture includes a reflector/screen which effectively prevents the wire insulation from being exposed to the UV light which is present.
- Where the insulation is exposed to UV light, either the insulation of the external cable has to be UV light resistant or UV light resistant heat-shrinkable tubing has to be mounted.

For vessels in operation:

- Spot check of the condition of external cables entering light fixtures where the wire insulation might be exposed to UV light.
- For cables with damaged insulation, heat-shrinkable tubing need to be fitted in order to ensure proper insulation

DNV is presently reviewing international standards and classification requirements to ensure that a sufficient level of details in this context is stipulated and practised. If the standards are found inadequate, DNV will pursue this in relevant international organisations.

For more information, please contact

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