

Are you magnetically testing your crane ropes?

MRT is becoming widely accepted as the only effective way to inspect the inside of a rope whilst it is still in service, says **Barrie Mordue**, Director at Tensology.

Magnetic Rope Testing (MRT) is currently a hot topic of conversation in the lifting industry, mainly because of recent changes to the relevant standards and guidance documents as well as a number of high profile rope failures. There are many good reasons to use MRT to help establish the condition of a rope and in many cases the benefits outweigh the cost of carrying out the test. There is also the question of whether enough is being done during a thorough examination to comply with the law, particularly if MRT is not being used.

Why MRT?

A large number of crane and lifting ropes, under normal operating conditions, will tend to deteriorate internally without any visible external indication. If you take the example of multi-strand crane ropes, the contra-layer rope construction provides the desired rotation resistant properties, however this rope construction also leads to high internal contact pressures which negatively impact the safe working life of the rope. Single layer ropes can also suffer internally with both inter-strand and strand-core contact causing internal deterioration. Even plasticated ropes,



crane ropes need Periodic Thorough Examination by a Competent Person. As a crane hoist rope is considered as a consumable item, the rope will need replacing at some point before it becomes unsafe. Deciding when to safely retire a rope from service is the primary responsibility of the Rope Examiner. A number of standards and guidance documents are available to aid the rope examiner with this task.

The crane rope inspection and discard standard "ISO 4309:2017 - Cranes - Wire

rejection criteria for wire ropes and also recognises differences in equipment types and levels of competence and training for MRT equipment operators.

Whilst the Periodic Thorough Examination of crane and hoisting ropes is a legal requirement in the European Union under LOLER, the adherence to ISO 4309, the IMCA guidelines or other standards is not. Essentially, a rope can be Thoroughly Examined and discard decisions made using whichever standard the Competent Person deems appropriate and the legal requirement under LOLER would have been met. There are however, other legal responsibilities to consider in the workplace and if a rope fails following Thorough Examination and all reasonable measures have not been taken to identify damage or deterioration, the duty holder may not be deemed to have done enough to comply with the law.

Cost consideration

Awareness of changes to the rope inspection and discard standards is increasing and MRT is becoming widely accepted as the only effective way to inspect the inside of a rope whilst it is still in service. Whilst the crane owner or duty holder may not be fully conversant with the latest editions of all the relevant standards relating to his equipment, the competent person needs to be. The competent person should be able to identify if a rope inspection would benefit from MRT and the decision whether or not to include MRT then belongs to the duty holder.

Cost is often cited as the reason MRT is not carried out, however the cost of not carrying out MRT is often overlooked. If MRT is the only effective way of identifying certain types of deterioration, then in many circumstances there is a higher risk of rope failure if MRT is not employed. The true cost can therefore be seen as the cost of prevention + cost of failure. When deciding whether or not MRT should be carried out, the true cost should be used and measured against the risk that the rope fails.

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where the internal contact pressure is reduced can be affected, particularly if moisture is trapped inside the rope underneath the plastic.

External deterioration can also be difficult to detect during a visual inspection. In order to visually inspect the full circumference of a long length of rope whilst the rope is running is difficult and time consuming. When you factor in the presence of external lubricant/wire rope dressing then the effectiveness of many external visual inspections is questionable.

Legal requirements

To comply with the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER),

ropes – Care and maintenance, inspection and discard" was developed and published to provide the rope examiner with a means of safe and consistent decision making in relation to the removal from service of crane ropes. ISO 4309 was revised in 2017 to include MRT.

In addition to the introduction of MRT into ISO 4309, in October 2018, the International Marine Contractors Association (IMCA) also published their latest guidance on Magnetic Rope Testing "IMCA LR 004, IMCA HSSE 023, IMCA M 197 Rev. 1 Guidance on Examination of Steel Wire Rope Through Magnetic Rope Testing (MRT)". The IMCA guidance document, aimed primarily at the offshore lifting sector, includes MRT