

INTERNATIONAL

FEBRUARY 2014
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A KHL Group publication

cranes

AND SPECIALIZED TRANSPORT

ConExpo
**SHOW
GUIDE**

**Repair and
refurbishment**

Industrial lifting

**On site in Dubai,
Germany, Vietnam**

**Product news:
Palfinger, Krøll**

Truck cranes



ON THE COVER



The new 130 US ton capacity Tadano Mantis GTC-1200 telescopic crawler crane. For more on this and other ConExpo launches see the show guide starting on page 18.

SUBSCRIPTIONS

International Cranes and Specialized Transport is a monthly publication with a worldwide circulation. The annual airmail subscription rate is £195, US\$310, €235. *International Cranes and Specialized Transport* is published on the 15th of each month.

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KHL also publishes *American Cranes & Transport*, *Cranes and Project Transport Turkey*, *International Construction*, *Demolition & Recycling International*, *Construction Europe*, *International Rental News*, *Access International*, *Access, Lift & Handlers* and *International Construction Turkey*. Call +44 1892 784088 for details.

International Cranes and Specialized Transport (USPS 017 158) is published monthly by KHL Group and distributed in the US by DSW, 75 Aberdeen Road, Emigsville, PA 17318-0437. Periodicals postage paid at Emigsville, PA. Postmaster: Send address changes to *International Cranes and Specialized Transport*, c/o PO Box 437, Emigsville, PA 17318-0437.



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Published by



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KHL Group 2014
ISSN: 1747-700X

Printed by: Garnett Dickinson Print, UK



The paper in this magazine originates from timber that is sourced from sustainable forests, managed to strict environmental, social, and economic standards. The manufacturing mill has both FSC & PEFC certification, and also ISO9001 and ISO14001 accreditation.

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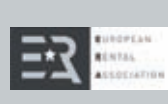
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MEMBER OF



Divided opinion

ROBERT TRAXL, head of research and development at Teufelberger, a manufacturer of wire and synthetic fibre rope, explains issues surrounding the new standard:
EN 13001-3-2 Cranes – General design – Part 3-2: Limit states and proof of competence of rope reeving components for selecting the correct rope

Although the document *CEN TS 13001-3-2* has been in circulation since 2004, the method for the selection of wire ropes has still not been fully put into practice. The determination of the theoretical life time of a rope under single layer spooling conditions is extremely difficult. Determining the lifetime of a rope for multi-layer spooling is almost impossible. This is because too many factors, such as the number of layers, number of wraps, pre-tension of the rope during installation, spooling in upper or lower layers and the lifting or lowering the load, influences

the life of a rope.

At the University of Stuttgart in Germany, tests with different rotation-resistant wire ropes in multi-layer spooling arrangements were carried out. As the results differed extremely, no results for the calculation of the theoretical life-time could be published. With rotation-resistant (non-rotating) ropes no tests at all have been carried out. This particular standard creates new combinations of working conditions on, for example, the d/d (drum diameter/rope diameter) ratio, with regard to line pull. The mode of failure of wire ropes selected according to these

new working conditions, however, is unproven.

Unsafe situation

Experiences have shown that the behaviour of wire ropes to show external wire breaks can change dramatically if small d/d ratios in combination with high line pulls are used individually or in combination. Hence, in such cases, the use of discard criteria according to *ISO 4309* may not be applicable and a dangerous situation may occur. Up until now the material in the standards relies on proven engineering practice and established criteria of wire ropes, which can easily be used by inspectors in the field. The updated *EN 13001-3.2* is based on a theoretical approach to determining the life of a wire rope used on cranes, but it is yet to be verified.

Around the world *ISO 4308* and *ISO 8087* are recognised by crane designers and end users as the standards by which the selection of wire ropes is made. Following many international meetings a revision of these

two standards in the form of *ISO 16625* was agreed. This document, *ISO/FDIS 16625* at this stage, has now been submitted to ISO Central Secretariat for formal approval. *ISO/FDIS 16625* reflects the different working conditions of the different types of cranes and, in particular, the practical experiences made by crane and wire rope manufacturers in the past years and decades. The design of a reeving system and the discard criteria of wire ropes necessarily belong together: see *ISO 4308* and *ISO 4309*, *DIN 15020 Part 1* and *DIN 15020 Part 2*. The replacement of the *ISO 4308* standard (*ISO/FDIS 16625*) maintains this relationship and no additional or competing standard is necessary.

These are the key reasons why we strongly believe that *EN 13001-3-2* doesn't represent the best available knowledge at the time. The whole European wire rope industry has raised its concerns in many inquiries but these comments have not been considered sufficiently so far. ■

“The updated EN 13001-3.2 is based on a theoretical approach to determining the life of a wire rope used on cranes, but it is yet to be verified”

ROBERT TRAXL, head of research and development wire rope at Teufelberger