

## Warning

Wire rope will fail if worn-out, shock loaded, overloaded, misused, damaged, improperly maintained or abused.

- Always inspect wire rope for wear, damage or abuse before use
- Never use wire rope which is worn-out, damaged or abused
- Never overload or shock load a wire rope
- Inform yourself: Read and understand the guidance on product safety given in this catalogue; also read and understand the machinery manufacturer's handbook
- Refer to applicable directives, regulations, standards and codes concerning inspection, examination and rope removal criteria

Protect yourself and others - failure of wire rope may cause serious injury or death!

## Warning

CAUTIONARY NOTICE – RESTRICTIONS ON THE USE OF LARGE DIAMETER ROTATION-RESISTANT ROPES.

All wire ropes are prone to damage if they are not properly supported when used at high loads. Larger rotation-resistant ropes are particularly susceptible to this form of abuse, due to their rigid construction and the relatively fine wire sizes involved in their manufacture/construction. Instances have been recorded of ropes being heavily worked over plain drums and failing "prematurely", despite the nominal tension being in the region of half the breaking strength of the rope.

The best way of preventing difficulties of this sort is to avoid conditions that are likely to generate damagingly high contact stresses. A simple method of assessing the severity of the contact conditions is to firstly calculate the tread pressure based on the projected nominal area and then apply a factor (of say 10\*) to allow for the highly localised and intermittent nature of the actual wire contacts, as indicated below :-

Type of contact	Close-fitting U-groove	Oversize U-groove	Plain drum
Level of support	Good	Fair	Poor
Tread path width	100% of rope dia.	50% of rope dia.	20% of rope dia.
Tread pressure =	2T/Dd	4T/Dd	10T/Dd
Contact stress =	20T/Dd	40T/Dd	100T/Dd

**Note: Contact stresses which exceed 10% of the tensile strength grade of the outer wires should be considered a cause for concern, especially if the rope is operating at a low factor of safety.**

[\* - This is because the true contact area is very much less than the projected nominal area.]

*Worked example:*

*Consider case of a 50mm rotation-resistant rope (MBF=2100kN) operating at a 3:1 factor of safety.*

*Then, for the Contact stress < 200 Mpa say, the following minimum bending diameters are indicated :-*

<i>Close-fitting groove</i>	<i>- 1400mm</i>
<i>Oversize U-groove</i>	<i>- 2800mm</i>
<i>Plain drum</i>	<i>- 7000mm</i>

