



## Rotation Resistant Ropes

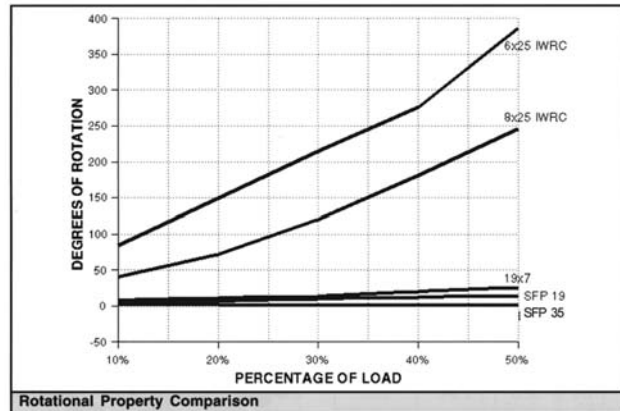
In certain instances the use of rotation-resistant wire rope is necessary to provide rotational stability to the lifted load. In general, the use of these wire ropes is limited to those situations where it is impractical to:

- Use a tag line
- Relocate rope dead end
- Increase sheave sizes
- Eliminate “odd-part” reeving
- Significantly reduce rope loading and rope fall length

Rotation-resistant wire ropes have less of a tendency to unlay when loaded than do conventional wire ropes. This results in improved rotational stability to the lifted load. Rotation-resistant wire ropes are designed in such a way that the rotational force of the outer strands

is partially counteracted by the rotational force of the inner strands or core when the rope is subjected to a load.

The chart compares the rotational properties of rotation-resistant ropes with a standard 6x25 wire rope. The rotation-resistant ropes far surpass the rotational stability of a conventional 6x25 IWRC wire rope on both short and long falls.



## SAFETY DESIGN FACTORS

ASME B30.5 specifies that rotation-resistant ropes have a safety design factor of five or greater. The required strength design factor of rotation-resistant rope becomes very important from the standpoint of maintaining the inherent low rotation of the rope and eliminating any tendency to overload the inner core, thereby causing a reduction in rope strength.

## HANDLING & INSTALLATION

Precautions should be followed when using rotation-resistant wire rope. The rope ends must be properly seized and secured (refer to “Handling and Installation: Seizing Wire Rope”) and cut with a saw or impact hammer to prevent unlaying of the strands.

Attachment of end fittings must be done with care to prevent kinking or unlaying of rope, which harms the balance of the rope.

**Operation of rotation-resistant wire ropes (excluding SFP 35™) with a swivel is generally not recommended.** The use of a swivel allows the inner core to twist tighter, resulting in a significant reduction in rope strength, possibly leading to premature rope failure. A swivel may be used as a temporary device only during the initial installation period to help eliminate any installation-induced twisting or cabling.

**The swivel must be removed from the reeving after the rope installation is completed and before the crane begins operation.**

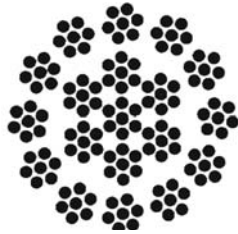
Due to the opposite lay direction of the inner core and outer strand layers in rotation-resistant ropes, care should be taken to avoid shock loading. Shock loading will result in distortion of the rope structure, causing bird-caging, core protrusion, etc. Due to the potential for complete rope failure, shock-loaded wire ropes must be immediately removed from service.



**Caution**

The rated strengths of the 19x7 and 8x19 class wire ropes are less than wire ropes in the 6x19 and 6x36 classes. Larger sheaves are required in order to achieve comparable fatigue life. For further information on proper sheave sizes, contact your ALP Sales Representative.

**19 x 7 Rotation-Resistant**



**Strands:** 19  
**Wires Per Strand:** 7  
**Core:** WSC  
**Standard Grade(s):** EIPS  
**Lay:** Regular  
**Finish:** Bright

**19x7 is recommended for hoisting unguided loads with a single-part line.**

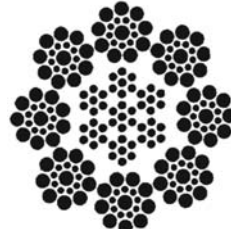
The rotation-resistant properties of this rope are secured by two layers of strands. The inner strands are left lay, while the 12 outer strands are right lay, which enables one layer to counteract the other layer's rotation.

The rotation-resistant characteristics of the 19x7 wire ropes are superior to those of the 8x19 Class wire ropes.

Rope Diameter		Approx. Weight (lbs/ft)	Nominal Strength (tons*)
(in.)	(mm)		
3/16	4.8	0.064	1.57
1/4	6.5	0.113	2.77
5/16	8.0	0.177	4.30
3/8	9.5	0.250	6.15
7/16	11.0	0.350	8.33
1/2	13.0	0.450	10.80
9/16	14.5	0.580	13.60
5/8	16.0	0.710	16.80
3/4	19.0	1.020	24.00
7/8	22.0	1.390	32.50
1	26.0	1.820	42.20
1-1/8	29.0	2.300	53.10
1-1/4	32.0	2.840	65.10
1-3/8	35.0	3.430	78.40
1-1/2	38.0	4.080	92.80

\* Tons of 2,000 lbs.

**8 x 19 Rotation-Resistant**



**Wires Per Strand:** 19  
**Core:** IWRC  
**Standard Grade(s):** EIPS  
**Lay:** Regular  
**Finish:** Bright

**8x19 is recommended for hoisting unguided loads with a single-part or multi-part line.**

The eight outer strands are manufactured in right lay, with the inner strands being left lay.

These ropes are slightly stronger and significantly more rugged than the 19x7 construction. However, the rotation-resistant properties of the 8x19 rotation-resistant ropes are much less than those of the 19x7 construction.

These ropes are manufactured in right regular lay in the 8x19 Seale and 8x25 Filler Wire constructions.

Rope Diameter		Approx. Weight (lbs/ft)	Nominal Strength (tons*)
(in.)	(mm)		
1/2	13.0	0.47	11.7
9/16	14.5	0.60	14.7
5/8	16.0	0.73	18.1
3/4	19.0	1.06	25.9
7/8	22.0	1.44	35.0
1	26.0	1.88	45.5
1-1/8	29.0	2.39	57.3
1-1/4	32.0	2.94	70.5
1-3/8	35.0	3.56	84.9
1-1/2	38.0	4.24	100.0

\* Tons of 2,000 lbs.