



# Product

## BULLETIN

Wire Rope Corporation of America

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### CHARACTERISTICS OF FLEX-X<sup>®</sup> 35 RESULT IN SUPERIOR PERFORMANCE

Flex-X<sup>®</sup> 35, the newest member of the Flex-X family of crane ropes, provides the user unique characteristics as a hoist rope. The following information outlines the operating characteristics and discusses why Flex-X 35 is the rope of choice in many applications.

#### 1. Rotation Resistance (Non-Rotating)

The balanced design of Flex-X 35 results in minimal torque under load, providing superior rotation resistance. Under a normal working load range, Flex-X 35 has virtually no tendency to rotate, making it ideal for both single-part and multi-part hoist systems where rotation resistance is required. Due to its superior rotation resistant properties, **Flex-X 35 may be used with a swivel.**

#### 2. Strength

The design and manufacturing process of Flex-X 35 provides a rope with one of the highest strength-to-diameter ratios. The standard "ASME B30.5 Mobile and Locomotive Cranes" requires a design factor of 3.5 for 6-strand hoist ropes and a design factor of 5.0 for rotation resistant ropes. Therefore, most rotation resistant ropes result in lower lifting capacities compared to 6-strand hoist ropes. However, the Minimum Breaking Force (MBF) of Flex-X 35 is approximately 45% higher than 6-strand XIP ropes of the same diameter. **Even with the 5.0 design factor, the higher MBF of Flex-X 35 results in lifting capacities equal to or greater than 6-strand XIP ropes utilizing a 3.5 design factor. Other ropes of similar construction and grade do not provide this benefit.**

In the chart on the next page, we have indicated the diameters and strengths of Flex-X 35 that are commonly used. Two columns have been added – one to show the required MBF at a design factor of 5 that gives the same lifting capacity as a 6-strand XIP rope at a design factor of 3.5, and the other to show the ASTM A1023 35x7 2160 Grade Compacted Strand MBFs. Flex-X 35 has significantly higher minimum breaking force than both of these columns.

<b>FLEX-X 35</b>				
<b>Diameter (mm)</b>	<b>Flex-X 35 Minimum Breaking Force in Tons</b>	<b>35x7 Minimum Breaking Force required @ Design Factor=5 to equal 6 Strand XIP @ Design Factor=3.5</b>	<b>ASTM A1023 Minimum Breaking Force in Tons</b>	<b>Approx. Weight Per Foot, Pounds</b>
13	20.4	19.86	18.21	0.60
*16	30.6	29.86	28.21	0.90
18	38.5	37.57	34.62	1.2
*19	42.9	41.86	38.67	1.3
22	57.2	55.86	52.38	1.7
*25.4	75.8	73.86	70.00	2.2
*26	79.3	77.43	74.19	2.3
*28	91.6	89.43	85.21	2.7
*30	105	102.14	-	3.1
32	119	115.71	110.16	3.5

\*Standard inventory items

### 3. Resistance to Wear and Fatigue over Sheaves

The multi-strand design of Flex-X 35 combined with compacted strands and lang lay construction helps to maximize resistance to wear by greatly increasing wire and strand surface areas that contact sheaves and drums. Internally, the enhanced surfaces of the compacted strands help minimize strand-to-strand nicking between strand layers that occurs in other rotation resistant ropes. This feature results in greater resistance to fatigue.

### 4. Resistance to Crushing and Abrasion on Drums

The characteristics of Flex-X 35 enhance its performance in multiple-layer spooling as well. The lang lay design coupled with the special Flex-X features provides excellent resistance to abrasion that occurs at kickover areas in drum spooling. The rope construction combined with the compacted strand design of Flex-X 35 results in a rope cross-section of very high density. This feature provides increased resistance to crushing.

## **Flex-X Family**

Flex-X 35 provides superior service in many hoisting applications, particularly those involving long falls, single-part systems or swivels. Flex-X 19 provides less resistance to rotation and should not be used with a swivel, but works well in many other applications as a hoist rope. Flex-X 9 is the premium boom hoist available on the market, while Flex-X 6 provides added service life for main hoists compared to standard 6-strand ropes.