

ROPES
DESIGNED
EXCLUSIVELY
FOR
DRAGLINES

POWER  **MAX**TM
with PowerSteel® Technology



NEW **POWERMAX™** DRAGLINE
HOIST AND DRAG ROPES –

From the creator of
TUF-MAX™ shovel ropes.

POWERMAX™
with PowerSteel® Technology

PowerSteel®
TECHNOLOGY

PowerSteel Technology:
What is it?

- State-of-the-art steel wire technology developed by WRCA's metallurgical research team.
- Utilization of field engineering expertise to determine exact requirements.
- Enhanced plastics engineering by the founder of impregnated ropes.
- Innovative rope design by the industry's leading engineers.
- Tightly controlled production methods to assure highest performance.
- Highest quality standards in the world.

And this combination is available only through WRCA.

 **WRCA®**

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CERTIFIED
ISO 9001:2000

TESTED, TOUGH & TRUESM

PERFORMANCE for the long haul.



POWER MAX[™]
with PowerSteel[®] Technology

A NEW STANDARD
IN DRAGLINE ROPE
DESIGN AND
CONSTRUCTION



INTRODUCING POWERMAX –

Dragline hoist
and drag ropes
that work harder,
longer.



Surface mining puts enormous demands – and takes an extraordinary toll – on operating wire ropes and machinery. **PowerMax** was conceived, designed and manufactured to deliver the *power* demanded by the industry and *maximize* the service life of drag ropes and hoist ropes.

PowerMax[™] is an 8-strand wire rope created to provide operating characteristics essential to drag and hoist ropes. Proprietary **WRCA** metallurgy was utilized in developing special rod chemistry requirements to provide optimum wire characteristics for mining ropes.

With eight outer strands, **PowerMax** is more fatigue resistant than 6-strand ropes of the same diameter, plus, its greater surface area puts more steel in touch with contact surfaces reducing wear and abrasion.

Just as importantly, no drag or hoist rope available is subjected to more rigorous standards of manufacturing than **PowerMax**. **PowerMax** is a product of **PowerSteel[®] Technology**, a **WRCA** exclusive. The technology combines all aspects of rope manufacturing in one cohesive process that assures a product that's second to none.

Using **PowerSteel Technology**, in-house metallurgical and engineering teams developed and designed **PowerMax** specifically for surface mining applications. The industry's highest manufacturing standards,

continuous tracking and testing, and the use of enhanced plastics in core impregnation give **PowerMax** a clear-cut edge in drag rope and hoist rope performance.

- EXCLUSIVE DESIGN
- PROPRIETARY METALLURGY
- IMPROVED PERFORMANCE
- WORLD'S TOUGHEST PRODUCTION STANDARDS
- **GUARANTEED**

Beyond **PowerMax's** superior performance, **WRCA** offers valuable advice to maximize your service life with the most experienced and knowledgeable technical staff in the industry. Let our engineers assist you in determining the optimum resocket and end-for-end schedule for your ropes. Phone them at **816.236.5054**.

HOW TO OPTIMIZE THE SERVICE LIFE OF **POWERMAX** ROPES –

Here are practices for dragline hoist and drag ropes that can save you money.



To maximize the service life of **POWERMAX** ropes on draglines, proper maintenance and operating procedures are important especially when used as drag ropes.

RESOCKET ROPES REGULARLY

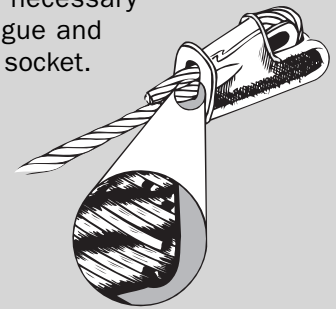
It is important to have an established **resocketing program** that is adhered to on a consistent basis. Too often a drag rope failure occurs because the rope was not resocketed in time causing it to be prematurely removed from service.

Regular resockets are necessary because of the metal fatigue and wear that occurs near the socket.

Resocketing also moves the wear points of the ropes through the fairlead sheaves helping to distribute wear over a greater length of rope.

A typical resocket program requires the ropes to be resocketed at intervals no greater than 20% of the expected service life.

Hoist ropes typically are resocketed two to three times during their service life, and they should never be run more than 50% of the expected service life before being resocketed.



Resocket at around every 20 percent of a drag rope's expected service life.

TURN DRAG ROPES END FOR END

Drag rope wear normally occurs in the area that operates through the fairleads and contacts the overburden. This usually affects about one-third to one-half of the rope's overall length. The best drag rope life is attained by **turning the ropes end-for-end** after 35%-45% of the expected service life. To maximize service life it is important to turn the drag ropes end-for-end before too many wire breaks occur in the area running through the fairleads.

GUARD AGAINST “MARTENSITE” —

The #1 Cause of Premature Wire Breaks

Wire ropes are made of high carbon steel wires that have been cold drawn producing very ductile fatigue resistant properties as well as very high strength.

Martensite is a very hard, non-ductile phase of steel that can be formed along the rope's surface if friction and heat occur from fairlead sheaves spinning against the rope.



Wire section shown at high magnification: cracks begin to develop in the martensitic layer.



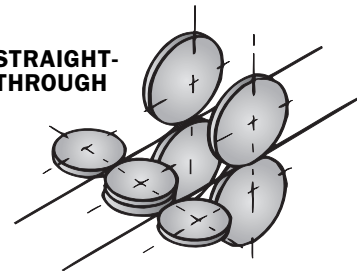
Cracks will propagate through the wire and result in breaks.

wire resulting in complete wire breaks as the rope continues to operate.

LUBRICATE ROPES OFTEN

Regular lubrication is crucial to reduce friction between the rope's components as well as the friction between rope and sheaves or drums. Wire ropes are thoroughly lubricated at the factory, but rope service life is increased with **field lubrication**. For hoist and drag ropes, automatic drip or spray systems used to apply lubricant at preselected intervals have been found to be effective methods of keeping the ropes well lubricated to help maximize rope life.

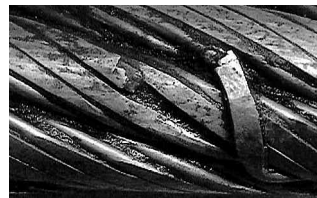
STRAIGHT-THROUGH



Controlling fairlead sheave overspin is key to minimizing the chances of developing martensite. Every dragline operator should be conscious of this condition.

TRIM BROKEN WIRES

If damage or other conditions lead to a small number of broken wires early in a rope's life, the best practice is to use a wire cutter or bolt cutter to **trim**



Always trim broken wires to prevent any damage to adjacent wires.

bolt cutter to **trim broken wires**. If left untrimmed, broken wires can lay across adjacent unbroken wires. When this section of rope runs through a sheave, the broken wires will be pressed into the wires it lays over, nicking them and leading to a nest of broken wires and reduced rope life.

Unique design, superior materials and state-of-the-art manufacturing techniques give this new rope the power to handle the high capacity demands of surface mining and provide greater service life resulting in fewer rope changes and lower maintenance costs. **PowerMax** drag and hoist ropes increase performance and lower costs. That's performance... *and it's guaranteed.*

