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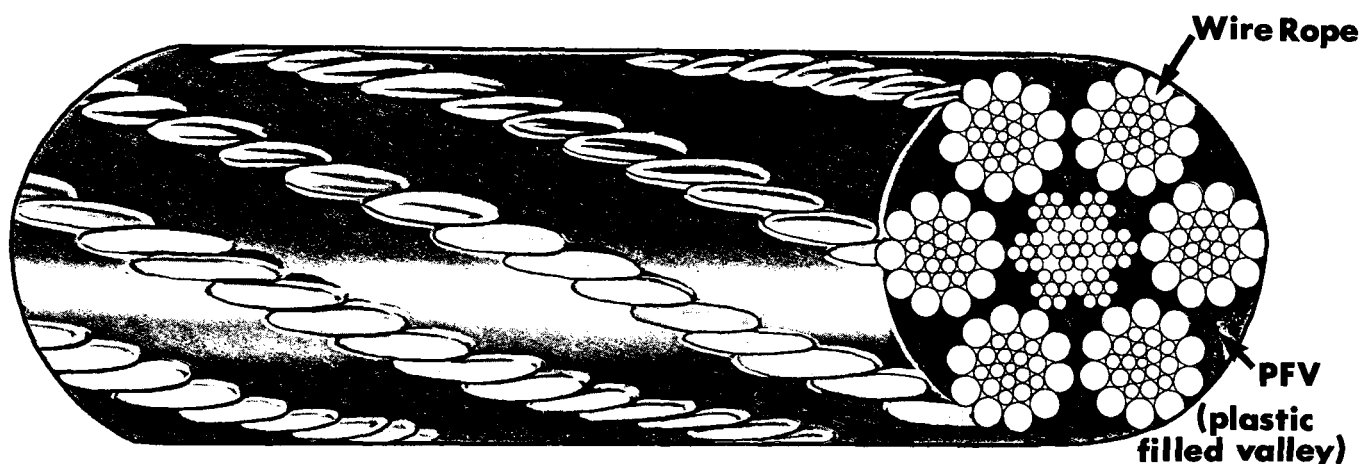
PFV WIRE ROPE

A Report by Bruce Shearer, Waipa Logging Division, NZFS

INTRODUCTION

Wire rope is used extensively in the logging industry, but few technological advances in its construction have been made over recent years. A relatively new development, originating in the U.K. and now manufactured also in the U.S.A., is PFV (Plastic Filled Valley) wire rope.

PFV rope has bright, orange-coloured, thermo-plastic infused around the component strands and fills the valleys of the rope. The manufacturers claim that the plastic reduces wire contact, provides greater wear area, locks in lubrication, and inhibits internal corrosion. The rope diameter is not increased.



THE TRIAL

Waipa Logging Division, Kaingaroa Forest, recently received 100 metres of PFV rope for the purpose of trial and evaluation. The 19 mm diameter, 6 x 19, (9/9/1), IWRC rope, manufactured by MacWhyte Wire Rope Co., U.S.A., was imported into New Zealand by the agents, Titan Plant Services Ltd., of Lower Hutt.

The initial sample only permitted the Waipa Logging Division to carry out a limited evaluation in three different applications:

- 30 metres as a skidder winch rope
- 30 metres as a crane loader's closing rope
- 40 metres as hauler and tractor strops

SKIDDER WINCH ROPE

A 30 metre long winch rope was placed on a Clark Ranger 666B. It contained a pressed-on Talurit clamped eye, and a poured winch rope ferrule.

This winch rope was put into service in May 1981, but the clamped eye only lasted for five drags before it pulled loose. The failure occurred where the steel rings of the strops slid over the Talurit clamp as the winch eye passed over the skidder's fairlead roller. The outer plastic covering was not removed when the clamp was pressed on.

This was subsequently repaired by splicing a new eye into the winch rope end. The splicer had to first cut away the outer plastic covering before splicing. The internal strand was left plastic coated, which did not cause any problems when splicing. Overall, no problems were encountered when splicing this rope.

Before pouring the white metal into the ferrules, all outer covering and internal valley plastic had to be removed first. No melting of the thermo-plastic was evident around the ends of the ferrule when the white metal was poured into them. All ferrules were lagged before pouring of the white metal.

Five steel-ringed log strops were attached to the winch rope. The action of these sliding up and down the rope pulled away the outer plastic covering, and at times the inner-strand valley plastic for the first three metres along the rope.

The PFV winch rope was in continuous use for 84 working days and required two further spliced eyes during this time.

It has been established that the conventional wire rope used in this type of operation usually lasts between 30 to 40 working days.

CRANE ROPE

A 30 metre length of PFV rope, used as a closing clam rope, was fitted onto a NCK crane loader.

No problems were encountered when fitting the rope into the rope drum or the clam wedge sockets. The rope was easily bent into place, and the outer plastic covering did not cause the wedges to slide out.

One operational problem experienced by the crane operator was that he could not tell when the outside steel strands around the clam wedge were breaking, because of the outside plastic covering. It is necessary for the crane operator to check the loader ropes regularly for signs of strand breakage, especially the clam wedge sockets, which are generally the first to show signs of wear and fatigue. The clam closing rope wedge must be inspected, as the wedge socket is offset and therefore the rope does not have a direct pull to the sheaves.

On conventional wire ropes a small length is pulled out and the broken strand section cut out. The crane operator had to therefore cut a small section of the PFV rope as a safety precaution, not knowing if the steel strands had started to fracture or break. (This could have been overcome by cutting away the first 300 mm of the outside plastic coating, thereby exposing the steel strands for regular inspection). No damage to the steel strands occurred in this section of the rope. Strands started to break and the plastic covering

pulled away along several sections of the rope where it had been making contact with the hollow sections of the crane's boom.

The outer plastic covering was also severely broken away along the sections of rope which were constantly being pulled through both of the clam sheaves.

The PFV rope was in constant use for approximately 30 working days before it finally parted, due to severe crushing on the drum. A standard rope would last approximately 15-20 working days in similar applications.

HAULER AND TRACTOR STROPS

The 40 metres of PFV rope available for strops were made into 6 metre hauler strops and 3.6 metre tractor strops.

The tractor strops contained a steel ring clamped into the eye and also fitted with ferrules and chokers. The PFV tractor strops lasted approximately two to three weeks longer than the conventional steep rope strops, with the majority of the PFV rope strops breaking at the Talurit clamped eye.

Two hauler strops lasted only three days when they were unfortunately burnt as a result of being caught on the fall block, when a short lead line was fitted from the fall block to the butt rigging.

Two other PFV hauler strops were fitted onto the butt rigging along with two conventional strops. The PFV strops lasted 10 working days, during which time three new conventional strops were required.

The PFV rope is highly visible due to its bright colour, and is easily handled with the outer plastic covering. Loggers handling the rope did not have to contend with oil and grease of a new rope, or have sprags caught in clothing and hands.

The rope was easily spliced, although it took longer when making up the winch ropes and strops, due to the removal of the outer plastic coating before splicing, plus removing the internal valley coatings when fitting the rope ferrules.

A disadvantage of the strops commented on by both hauler and tractor breaker-outs, was that it tended to be too stiff when placing the stops under logs. Instead of curling back up on the other side of the log, the rope tended to lay flat on the ground. Consequently the breaker-outs had to climb over the log to retrieve the ferrule end.

As previously mentioned, the crane operator had difficulty in determining when to renew the clam wedge section, although this problem could have been solved by cutting away the first 300 mm of the outer plastic covering, enabling a clear view of the steel strands.

Two tractor strops were taken into Cookes Consolidated Services Ltd. in Rotorua, to assess if clamped ferrules could have been fitted. This was not achieved, due mainly to the outer plastic covering and the internal valley coating. Consequently they were unable to compress the strands small enough to allow the clamped ferrule to be fitted.

After two to three weeks it was found that both the hauler and tractor strops showed severe wear along the outer plastic coating, as a result of the chokers sliding action up and down the rope. The outer covering peeled back completely jamming the chokers.

CONCLUSION

The small sample of PFV rope made available for the trial limited the applications in which it could be used. The overall impression was that it was of valuable assistance in certain applications.

Generally, it was not suitable for hauler and tractor strops due to the jamming affect of the outer plastic coating within the chokers.

Its use on crane loaders would be of immense value, especially in the application of boom luffing ropes, although further extensive trials would be required.

The most suitable application envisaged would be in hauler operations, as tail, main, and skyline ropes, with the PFV coating saving major wear and tear in extremely rough terrain. Also, due to its bright colour, it would be easily seen during use.

Waipa Logging Division are attempting to purchase a further 1200 metres of PFV rope for evaluating as hauler ropes. A comparative trial with standard wire rope in similar applications is seen as a useful test.

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