

Comparison of Polypropylene Exportguard to Wood Lagging

INTRODUCTION

Manufacturing plants producing cable for communication and power transmission applications commonly use wood lagging on their reels to protect high value cable products. Wood lagging is any type of wood product fastened to the edges of flanges of reels, intended to protect the high value product on the reel. Export shipments of high value cable products are the most common application for wood lagging.

Most shipping departments would prefer not to use wood lagging for several reasons, including high material cost, high labor requirements, worker discontent and safety concerns. We'll review some of these challenges in relationship to alternate materials and methods.

The most common alternatives to wood lagging are a variety of plastic products to be discussed in this document. A summary of one large company's cost study is also included.

CONCLUSIONS

The general experience of large communication and power cable manufacturers shows a significant reduction in labor and material cost when using a heavy-duty plastic reel wrap. Many benefits are realized when choosing plastic materials, some that can be quantified, and some that are less measurable but equally important.

The study by one large US manufacturer suggests several benefits:

1. Material cost savings -- 63% reduction in material costs generating a savings of about \$170,000 per year.
2. Labor savings – Expected labor reduction of 45%, with annualized savings of \$9,500.
3. Safety improved by eliminating use of dangerous pneumatic nail guns and steel banding, which were replaced by tape and/or nylon strapping.
4. Safety improved at receiving locations when unpacking the reels. Cutting the steel strapping used with wood lagging is inherently hazardous, with nylon banding presenting little or no hazard.
5. Removing wood lagging requires prying the nails out of the flanges, with the nails remaining in the wooden lagging material creating a safety hazard during disposal.

Observations at many other manufacturing facilities are consistent with these results. It is reasonable to assume cost savings of 40 – 60% can be realized when converting to any type of plastic wrapping material. It is also safe to assume that worker injuries and compensation insurance claims can be reduced by switching away from wood lagging.

Two other benefits realized by many wire and cable manufacturers when using plastic wraps are recyclability and labeling.

1. The plastic wraps are fully recyclable, even with foam laminated to the substrates. Most recycling centers accept either the PP or the PE substrates.
2. Printed film can be laminated to the plastic substrates, with or without foam, giving easy options for handling instructions or brand identification.

ALTERNATIVES TO WOOD LAGGING

Alternative materials include:

1. Heavy duty plastic corrugated materials
2. Combinations of plastic and foam, with 1/8", 3/16" or 1/4" foam laminated to the substrate
3. Single face plastic corrugated
4. A system generally referred to as "tabbed lagging"

A short discussion of each alternative follows.



(Image 1) Wood lagging using 2x4 lumber (Image 2) Wood lagging using thin plywood sheets (Image 3) Plastic reel wrap – many varieties

EXPORTGUARD - Heavy duty plastic corrugated material is the most common alternative to wood lagging. This polypropylene material has a basis weight of 275 pounds per thousand square feet (275# msf). It has score lines across the traverse allowing the material to wrap easily and neatly around a reel. Typically supplied cut to exact width to fill out the traverse of the reel, it is supplied in rolls 75 – 300 feet long, based on the requirements of the shipping department. Poly tape and nylon strapping are used to hold the wrap in position for over the road shipping on flatbed trailers or in enclosed trucks.



(Image 4) 275# PP – heat scored on reel

(Image 5) 275#PP with foam

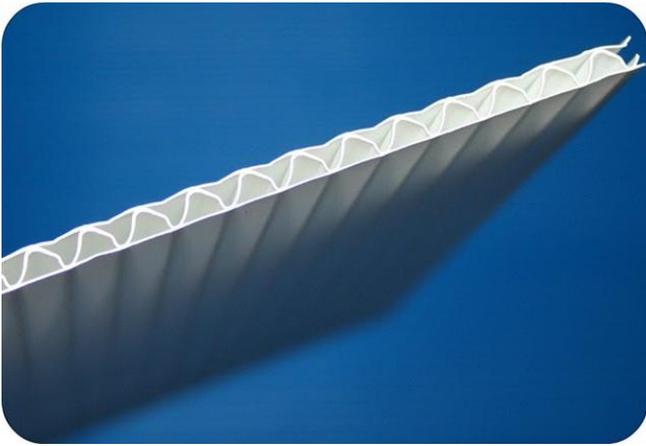
Heat cored 275# Exportguard

sealing against flanges

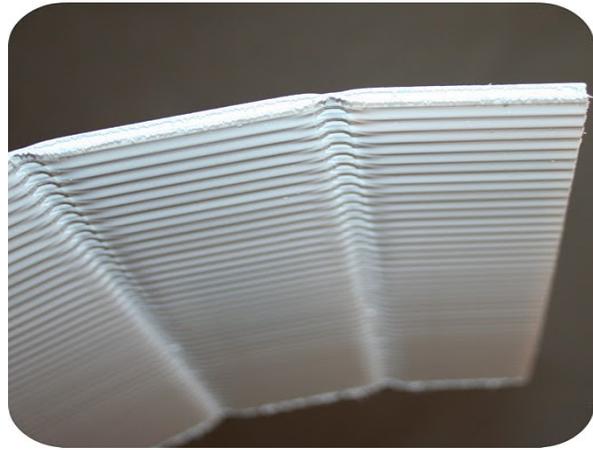
Closed cell polyethylene foam can be added to Exportguard to provide maximum impact protection. Adding foam to the plastic substrate provides excellent impact and puncture resistance. The foam is often sized about 2" wider than the plastic corrugated. When applied between the flanges the overhang of the foam makes contact with the flanges of the reel, forming a weather resistant seal providing further protection for high value wire or cable.

CABLEGUARD - Medium weight plastic corrugated is available in two distinct styles, with very similar performance characteristics.

1. Heat Scored Cableguard polypropylene is 4mm in cross section with heat scores every 2 ½ inches. The flutes run the circumference of the reel and the score lines are oriented across the traverse of the reel. This allows for easy wrapping of reels.
2. Tri-ply polyethylene, also 4mm in cross section, is comprised of three layers plastic sheeting with a corrugated configuration similar to fiber corrugated board found in common corrugated boxes. The flutes are oriented across the traverse allowing the material to curve around the circumference of the reel.



160# PE tri-ply



160# PP heat scored

Cableguard, the most extensively used reel wrap, is not often used alone as a direct replacement for wood lagging. It is mostly used to protect reels for less demanding transportation, in particular for domestic shipments.

CABLEGUARD WITH FOAM - Medium weight plastic corrugated with polyethylene foam laminated to one side is also a common replacement for wood lagging. The basis weight of this material is typically 160# msf, with polyethylene foam laminated to it for added impact protection. The flexible plastic roll stock is laminated with polyethylene foam in thicknesses of 1/8", 3/16" or ¼". This combination of plastic corrugated and foam is applied between the flanges of reels. It is held in place by a combination of tape and nylon banding. This material offers excellent impact resistance due to the combination of a structured plastic corrugated substrate mated to the cushioning property of the foam. The performance characteristics of this option are considered similar to heavy duty plastic materials without foam.



160# PP heat scored with foam sealing against flanges

As with the heavy duty plastic corrugated with foam, the foam is often sized about 2" wider than the plastic corrugated, providing a weather resistant seal against the inside of the flanges. This feature is particularly important when protection from weather is a factor.

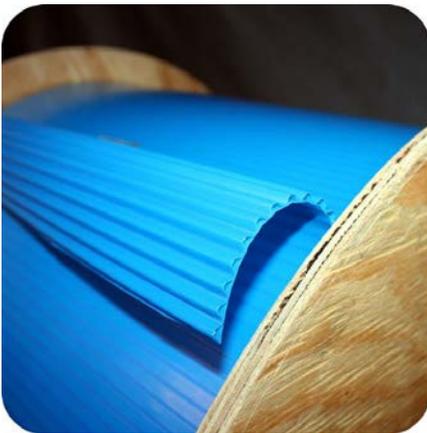
TABBED LAGGING is a variation of heat scored PP reel wraps. It is available in a range of weights, but most commonly 160# msf. This option can provide the highest level of protection of all plastic options.

Tabbed lagging is available in sheets sized to specific reel dimensions. It is applied to the edges of reel flanges, with extended tabs that wrap onto the sides of the flanges that are then stapled in place. This configuration creates a void between the protective wrap and the cable being protected. It is more costly than other wraps as the sheets need to be die cut to exact width and length to wrap each reel size.



Reels with tabbed lagging

SINGLE FACE PLASTIC CORRUGATED is a polyethylene substrate often used in less demanding situations. It provides good impact protection, and is suitable for many reel wrapping situations. It is not the material of choice for more demanding situations requiring high levels of impact protection. Consequently it is not often chosen as a direct alternative to wood lagging.



Single face polyethylene wrap