Rapid-Lagg™ Rubber Pulley Lagging

In applications where rubber lagging is best suited, Rapid-Lagg™ is made from exceptionally high wear resistant rubber. Using a blend of synthetic and natural rubber, Richwood achieves the best in abrasion resistance and gripping strength. These qualities are key to long life rubber lagging that provides unsurpassed performance year after year.

The Rapid-Lagg™ modified diamond design provides superior traction and superior wear life when compared with other diamond profile designs. This design coupled with our industry leading specifications of tensile and elongation results in many cost savings benefits. The Rapid-Lagg™ is also available in a bar profile design, which works exceptionally well in applications where pulley's are likely to experience material build-up. You can rely on Richwood Rapid-Lagg™ to reduce belt and pulley wear as well as belt slippage.

COMBI-LAGG® CERAMIC PULLEY LAGGING

STRIP PULLEY LAGGING DEVELOPMENT PROGRAM

The lagging or covering of the surface of steel faced pulleys, particularly drive units, provides a number of maintenance and conveyor performance benefits.

- Increase in the co-efficient of friction between the steel drum and the conveyor belt cover increasing drive traction, particularly in wet conditions.
- Prevention of build-up of conveyed material fines and water on the pulley face.
- Increased drive traction can eliminate the danger of over tensioning to avoid slip.
- Improved belt tracking and noise reduction.
- Reduction of wear to both the expensive drive pulley and conveyor cover.

Reduction in corrosive effect due to the nature of conveyed materials or environmental conditions.

A number of lagging products have been developed over the years, and rubber has long proven the most efficient and cost effective. The two most common methods employ either the use of steam cure rubber, which is applied to the drum in an uncured state and cured in an autoclave, or pre-cured rubber sheet, which is applied to the pulley or drum using a cold cement bonding system. The pre-cured lagging system, while more costly than the steam cure process, has clearly proven the improved service life and economic benefit of the system. It is not uncommon for pre-cured drive lagging to perform successfully for up to five years or more.

One major advantage in the use of pre-cured rubber is in the ability to apply the rubber lagging in place, without the removal of the conveyor belt and drive systems, saving considerable down time, loss of production, and maintenance costs. The disadvantage in carrying out the application of lagging in place in conventional sheet form is in gaining suitable access for men and materials.

Combi-Lagg® and Rapid-Lagg Pulley Lagging

Product Description/Selection Criteria

We manufacture two types of Richwood strip lagging systems:

Combi-Lagg® Ceramic and Rapid-Lagg™ Rubber Strip Pulley Lagging

The elimination of slippage is of prime concern for conveyor operations. The ceramic/rubber combination is intended for use with conveyor drive systems to eliminate slippage problems due to wet fines build-up and extreme adverse operating conditions.

In relation to alternative lagging systems the cost of installation is higher. However, the initial cost is insignificant compared with the long-term benefits.

Details of the ceramic lagging standard segments are illustrated in the chart provided, and will allow the lagging of up to 90° face width pulleys. Non-standard size requirements can be met on request.

Richwood Rapid-Lagg™ Rubber Strip Lagging

Rapid-Lagg™ rubber strip lagging is intended for applications where rubber, not ceramic, lagging is needed.

The rubber strip is available in kit form for all standard pulley dimensions. The performance characteristics in the selected formulation are equal or superior to other pre-cured high quality lagging materials, with the added advantage of no material waste. In addition, the strip system using a cold bonding cement permits easy application to the pulley without removal from the structure.

Redi-Lagg-R™ Rubber Lagging and Redi-Lagg-C™ Ceramic Lagging for Weld-On Applications

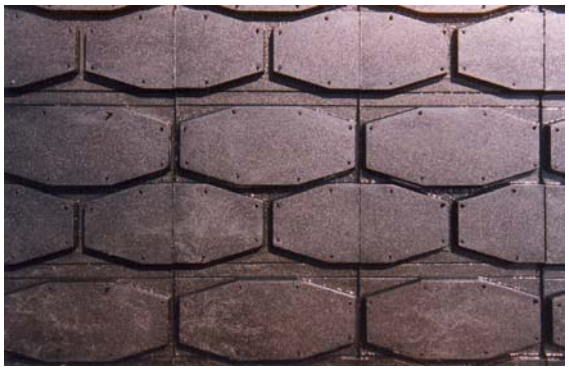
Redi-Lagg-R™ weld-on rubber lagging is available in 72” lengths and in thicknesses from ½” to ¾”.

Redi-Lagg-R’s aggressive tread patterns and high quality rubber compounds offer superior belt gripping power and longer service life.

Redi-Lagg-C™ weld-on ceramic lagging is made with the same industry leading technology used in our Combi-Lagg® Ceramic Pulley Lagging. Redi-Lagg-C weld-on ceramic lagging will last 4 to 8 times longer than rubber lagging products.

Ceramic Pulley Lagging Technical Data

Parameters	*Richwood Combi-Lagg®*
Thickness Overall	.625"
Tile Thickness Overall	.300"
Tile Base Thickness	.250"
Tile Stub Height	.050"
Rubber Thickness Beneath Tile	.325"
Total Square Inches of Tile Bonded to Rubber - Per Square Foot	120 Sq. In.
Portion of Tile Bonded to Rubber	2.0 Sq. In.
Tile Length and Width	1" x 1"
Number of Stubs Per Tile	13
Size of Stubs	.135" x .210" Oval
Tiles Per Square Foot	60
Gripping Surface Per Square Foot (Stub Surface)	22.08 Sq. In.
Rubber Shore A Durometer	61
Rubber Tensile Strength	3,600 psi
Rubber Elongation Percent	600%
Factory Prepared Bonding Surface	Yes
Overall Strip Dimensions	12" x Pulley Face
Number of Strips Required for 30" Diameter Pulley	8 @ Pulley Face Width
Friction Value	.4 to .6 depending on application
Maximum Operating Temperature	180° F



Rapid-Lagg™ Modified Diamond Profile Pulley Lagging

Richwood Rapid-Lagg™ Diamond Profile Rubber Pulley Lagging is available in 1/2", 5/8" and 1" thicknesses. The Rapid- Lagg™ modified diamond design provides superior traction and superior wear life when compared with other diamond profile designs. Rapid-Lagg™ may be ordered in full length strips or cut to length strips as specified.

Rapid-Lagg™ Modified Diamond Profile Strips

Part Number	*Thickness*	*Width*	*Length*
LPRRL-118-1/2	½”	12"	118"
LPRRL-118	5/8”	12"	118"
LPRRL-118-3/4	¾”	12”	118”
LPRRL-118-1	1"	12"	118"

Pulley Lagging
Physical Properties

60 Durometer

Elastomer	SBR
Tensile Strength	3600 psi
Elongation	600%
Modulus	1258 @ 300%
Color	Black
Shore Hardness A	60 ± 5
Specific Gravity	1.125

40 Durometer

Elastomer	NR
Tensile Strength	2300 psi
Elongation	650%
Modulus	262 @ 300%
Color	Green
Shore Hardness A	40 ± 5
Specific Gravity	1.14

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Combi-Bond™ Cold Bond Cement

Combi-Bond™ Cement for applying ceramic elements can be calculated as follows:

Allow .8 liter/quart of cement for each 10 square feet of lagging. The surface of the rubber and the surface of the pulley will each require 2 coats of cement. The .8 liter/quart can will provide enough cement to cover 10 square feet x 4 coats of cement.

Combi-Bond™ Cement can be ordered in .8 liter/quart kit. (All Combi-Bond™ Cement Kits include necessary hardener.)

Combi-Bond™ is supplied in containers with screw on caps for easy resealing.

Application and Preparation Procedure
Combi-Lagg® and Rapid-Lagg™ Pulley Lagging

The key to a successful bonding process is in the preparation of the surfaces to be coated.

The following steps are necessary to achieve optimum results when bonding rubber to metal with Richwood adhesive bonding systems.

SURFACE PREPARATION - METAL

- Remove all weld splatter, sharp edges, or irregularities by grinding.
- Blast cleaning the surface to NACE I. While metal blast class 2.5 is the preferred method, grinding using a 16 grit disc at 4000 rpm will achieve an acceptable surface texture. (See attached blast specs.)
- Remove all traces of dust and blast media residue by brushing or vacuuming. Take care to avoid contaminating the surface after cleaning.
- Prime the surface immediately after blasting with metal primer. Apply evenly using a brush or roller, taking care to avoid runs or puddles.
- The primed surface must be allowed to dry thoroughly. Approximately one hour at 70°F prior to applying the bonding adhesive.

RUBBER PREPARATION

Combi-Lagg® and Rapid-Lagg™ Conveyor Pulley Lagging is supplied buffed, primed and sealed in a plastic sleeve for protections. In the event it is necessary to prepare the surface of the rubber, the following procedure is recommended:

- Buff the surface of the rubber with a slow speed (2400-2800 rpm) sander/polisher using a 16-24 grit disc, stiff wire brush, or rubber hog. Keep the tool moving and with light pressure to obtain a uniform buffed surface. High speed tools and excessive heat build-up will result in a scorching, or melting, of the rubber surface and possible bond failure.
- Brush off the surface of the buffed rubber with a clean brush.

ADHESIVE PREPARATION

- Mix the adhesive/hardener together. Mix one 40 gram bottle of hardener per 0.8 liter of Combi-Bond™ Adhesive. A thorough mix is required by stirring, not shaking.

ADHESIVE APPLICATION

- Two coats of adhesive/hardener mixture must be applied to each surface. Combi-Lagg® and Rapid-Lagg™ pulley lagging us supplied buffed, primed and sealed in a sleeve. The first coat has been applied.

- Apply the first uniform coat of adhesive to the primed metal surface and allow to dry, one hour minimum.

- Once the adhesive is dry, apply a second coat to both surfaces (metal and rubber). When the surfaces dry to a tack, normally this takes about 8-12 minutes, the two surfaces can be bonded together. To insure proper adhesive perform this step in one strip at a time.

BONDING

- Press the rubber onto the steel surface and roll, or stitch, with a 1/4" roller (a 2" roller can be used in the case of Rapid-Lagg™). Apply pressure during this operation to ensure maximum surface contact paying particular attention to the joints and edges. A rubber mallet can be used lightly to assist in the bonding process, however, care should be taken to avoid excessive deformation of the rubber. If the coated surfaces become too dry, apply an additional coat of cement as detailed above.

- A filler rubber strip between the joints of the lagging can be used to assist in sealing the joint against moisture and material fines, if required. The filler rubber strip is essential when lagging a crown faced pulley to ensure a uniform result.

  NOTE: Primed surfaces should be bonded as soon as possible and not left exposed to adverse environmental conditions. It is recommended that surfaces primed with adhesive/hardener mixture should be applied within 24 hours. Metal surfaces primed with an approved metal primer can be held for as long as seven days when properly stored away from direct sunlight in a dry and clean environment.

TYPICAL BONDING MISTAKES

- Bonding when the adhesive is too ***wet***. Test the coated surface with the back of the finger. It should feel tacky, but not leave a residue on your finger. If the surfaces are bonded too wet the cement will cure, but the initial bonding strength will be poor.

- Bonding when adhesive is too ***dry***. The bond will be poor and spotty. Re-coat and carry out the recommended procedure.

- Bonding with inadequate pressure. Sufficient pressure should be applied to ensure maximum surface contact. The addition of continuous weight or pressure is advantageous in cases where insufficient pressure can be applied by hand. In such cases the items may be left to stand under pressure, if necessary, overnight.

APPLICATION LIMITATIONS USING CHEMICAL ADHESIVES

- Normally the use of cold vulcanizing or chemical adhesive systems is not recommended when the surface temperature of the substrate is 40° F or below, 110° F and above, or the relative humidity exceeds 85%.

- When bonding or applying rubber to metal, a dew point chart in determining the suitability for coatings is used. Generally, the surface temperature of the metal substrate should be 5° F higher than the dew point.

- Adequate ventilation must be provided when using primers and adhesives in a confined space. The applicator must ensure that the necessary safety precautions as advised by the manufacturer are followed at all times.

- The drying times of the adhesives will vary depending on the environmental conditions. Drying times stated in the application procedures are based on results achieved at room temperature, i.e. ± 70° F.

- With cold bonding adhesives and primers, the adhesion properties will increase over time. Normally, when using a metal primer together with an adhesive/hardener solution the pulley can be put into service after 8 hours. When bonding is carried out without the use of a metal primer (i.e. where a prime coat of adhesive/hardener is used in place of the primer) the pulley should stand for approximately 24 hours prior to use.

- Storage of rubber products:

    - Store all rubber products in a clean, dry place and away from direct sunlight.

    - Recommended storage temperature, 20°C or 70°F.

    - Keep away from oils and greases.

ADHESIVES

Metal Primer
Cement and Hardener

RECOMMENDED TOOLS

1" Round Application Brush
Razor Knife - Retractable
6" Rubber Knife
Rubber Mallet
Roller Stitchers - 1/4" - 2"
7" Sander/Polisher 2400/2800 rpm
16 - 24 Grit Discs for Above
Square
Spirit Level
Tape Measure
3" Paint Brush
Paint Roller with High Quality Nap Cover and Tray

APPLICATION PROCEDURE

- Measure the diameter and face width of the pulley, select the number of required lagging strips.
- Blast or grind pulley face to obtain a clean surface, NACE 1, Class 2.5
- Clean pulley face: brush, vacuum or solvent wash.
- Immediately after surface preparation, prime the pulley face with metal primer, minimum dry time 1 hour.
- Trim ends of rubber strips leaving provision for 2" overhang on both ends of pulley face.
- Apply one coat of adhesive/hardener to the pulley face, allow to dry 1 hour.
- Establish a start line across the pulley face using a square, level and straight edge. Once this is complete, clamp the straight edge securely to the pulley.
- Apply the second coat of adhesive/hardener to both the pulley face and the rubber, let dry to a tack.
- Fit first strip squarely across the pulley face using the straight edge as a guide.
- Press lagging strip firmly onto the pulley, taking care to avoid air entrapment.
- Using a roller stitcher, stitch the strip onto the pulley paying particular attention to the edges.
- Once this is completed, lightly tap the surface of the strip using a rubber mallet to obtain total surface contact.
- Each subsequent strip is applied in a similar manner.
- Complete the lagging process until two or three strips remain. At this point for Combi-Lagg® Ceramic Pulley Lagging, apply the half strip enclosed in your kit if a half strip was provided. Then measure the remaining space and cut the last 1 or 2 whole strips accordingly to ensure a close fit.
- Trim the excess rubber from the edges of the pulley around the circumference using a 6" rubber knife and bevel the rubber at an angle of approximately 45°.

NOTE: When lagging a crown faced pulley, filler rubber strips will be required to ensure a close fit between the edges of the strips in the center of the pulley face.

Combi-Lagg® Pulley Lagging

How to Specify Blasting

Your coating supplier will always designate the degree of surface preparation required for his materials. The three basic standards used to describe surface preparation are: Steel Structures Painting Council (SSPC) "Surface Preparation Specifications," the National Association of Corrosion Engineers Standards (N.A.C.E.) and the Swedish Pictorial Standards. Basically their definitions are:

SSPC	SWEDISH*	NACE	DESCRIPTION
SP 1, Solvent Cleaning	N/A	N/A	Removal of oil, grease, dirt, soil and contaminants by cleaning with solvent, vapor, alkali, emulsion or steam.
SP 2, Hand Tool Cleaning	St 2	N/A	Removal of loose rust, loose mill scale and loose paint by hand chipping, scraping, sanding and wire brushing.
SP 3, Power Tool Cleaning	St 3	N/A	Removal of loose rust, loose mill scale, and loose paint by power tool chipping, descaling, sanding, wire brushing and grinding.
SP 5, White Metal Blast Cleaning	Sa 3	1	Removal of all visible rust, mill scale, paint and foreign matter by blast cleaning.
SP 6, Commercial Blast Cleaning	Sa 2	3	Blast cleaning until at least two-thirds of each square inch is free of all visible residues.
SP 7, Brush-Off Blast Cleaning	Sa 1	4	Blast cleaning of all except tightly adhered residues of mill scale, rust, and coatings.
SP 8, Pickling			Complete removal of rust and mill scale by acid pickling, duplex pickling, or electrolytic pickling.
SP 10, Near White Blast Cleaning	Sa 2-1/2	2	Blast cleaning until at least 95% of each square inch is free of all visible rust, mill scale, paint and foreign matter.
SP 11-87T, Power Tool Cleaning to Bare Metal	N/A	N/A	Removal of all visible rust, mill scale, paint, and foreign matter using power tools and producing a minimum profile of 1 mil.

*Also SSPC-Vis 1 Standard

Combi-Lagg® Pulley Lagging

Abrasive/Profile Comparative Chart

The following chart should be used for approximating the abrasive size required to obtain a specified anchor pattern. The standard metal used to obtain these results was hot rolled steel with tightly adhering mill scale. The resulting depth of anchor pattern will vary with the method used for measuring depths as well as any one of numerous other variables (type and hardness of steel, thickness of mill scale, degree of cleaning specified, etc.) This information can be used for centrifugal wheel as well as pressure blasting. Pressure blasting should be done using 90-100 psi nozzel pressure. The depth of anchor pattern used in this chart is an average and not a minimum or maximum depth obtainable. Consult local abrasive suppliers for specific technical data.

1 Mil Profile

30/60 Mesh Silica Sand
G-80 Steel Grit
S-110 Steel Shot*
80 Mesh Garnet
100 Aluminum Oxide
Clemtex #4
Black Beauty 3060

1.5 Mil Profile

16/35 Mesh Silica Sand
G-50 Steel Grit
S-170 Steel Shot*
36 Mesh Garnet
50 Grit Aluminum Oxide
Clemtex #3
Black Beauty 3060

2 Mil Profile

16/35 Mesh Silica Sand
G-40 Steel Grit
S-230 Steel Shot*
36 Mesh Garnet
36 Grit Aluminum Oxide
Clemtex #3
Black Beauty 2040

2.5 Mil Profile

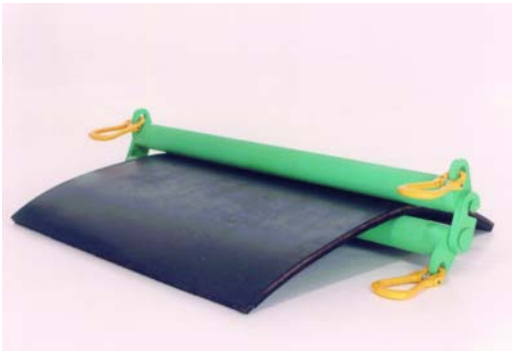
8/35 Mesh Silica Sand
G-40 Steel Grit
S-280 Steel Shot*
16 Mesh Garnet
24 Grit Aluminum Oxide
Clemtex #2
Black Beauty 2040

3-4 Mil Profile

8/20 Mesh Silica Sand
G-25 Steel Grit
S-330 or 390 Steel Shot*
16 Mesh Garnet
16 Grit Aluminum Oxide
Clemtex #2
Black Beauty 1240

- Steel shot alone will not give a good angular anchor pattern and should be used in combination with steel grit for best results.

Quick-Grip™ Belt Clamp



SERIES L
24" TO 42"

Richwood Series L Quick-Grips™ are manufactured with 3" O.D. tubing for belt widths from 24" through 42". Series L 24" to 42" clamps are supplied with open hook end plates that will work on belts up to 3/4" thick.

Series L clamps are supplied with cable slings attached to the cam portion of the clamp. The recommended working load limit of each sling is 4,120 pounds vertical, based on a 4 to 1 safety factor. The total capacity of the clamp half assembly is rated at 8,000 pounds working load when properly applied.

Series L 24" to 42" clamps are supplied with open hook end plates that will work on belts up to 3/4" thick.

Series L clamps are supplied with cable slings attached to the cam portion of the clamp. The recommended working load limit of each sling is 4,120 pounds vertical, based on a 4 to 1 safety factor. The total capacity of the clamp half assembly is rated at 8,000 pounds working load when properly applied.

Belt Width	Model #	Weight Per Clamp Half	Clamp Tube O.D.	Clamp Half Working Load Rating
24"	QC24-3	62#	3"	8,000 lbs
30"	QC30-3	68#	3"	8,000 lbs
36"	QC36-3	74#	3"	8,000 lbs
42"	QC42-3	80#	3"	8,000 lbs

Do not exceed maximum working load rating.

SERIES M
42" TO 54"

Richwood Series M Quick-Grips™ are manufactured with 4" O.D. tubing available for belt widths of 42", 48" and 54". For heavy-duty applications our Series H clamp is available for belts 48" through 72". Series M clamps for 42" to 54" belt widths are supplied with high tensile steel open hook end plates that will work on belts up to 1" thick.

Series M clamps for 42" to 54" belt widths are supplied with high tensile steel open hook end plates that will work on belts up to 1" thick.

Series M clamps are also supplied with grade 80 alloy steel master links attached to the cam portion of the clamp. The recommended working load limit of each master link is 7,100 pounds, based on a 4 to 1 safety factor. The total capacity of each clamp half assembly is rated at 14,000 pounds working load when the load is applied evenly at both ends of the clamp.

Belt Width	Model #	Weight Per Clamp Half	Clamp Tube O.D.	Clamp Half Maximum Working Load Rating
42"	QC42-4	105#	4"	14,000 lbs
48"	QC48-4	115#	4"	14,000 lbs
54"	QC54-4	125#	4"	14,000 lbs

Do not exceed maximum working load rating.

SERIES H
48" TO 72"

Richwood Series H Quick-Grips™ clamps are also supplied with grade 80 alloy steel master links attached to the cam portion of the clamp. The recommended working load limit of each link is 18,000 pounds, based on a 4 to 1 safety factor. The total capacity of each clamp half assembly is rated at 26,000 pounds maximum working load when the load is applied evenly at both ends of the clamp.

The Quick-Grips shown below are our Series H clamps with 6" O.D. tubing for belt widths from 48" through 72".

Series H 48" to 72" clamps are supplied with high tensile steel open hook end plates that will work on belts up to 1-1/2" thick.

Series H clamps are also supplied with grade 80 alloy steel master links attached to the cam portion of the clamp. The recommended working load limit of each link is 18,000 pounds, based on a 4 to 1 safety factor. The total capacity of each clamp half assembly is rated at 26,000 pounds maximum working load when the load is applied evenly at both ends of the clamp.

Belt Width	Model #	Weight Per Clamp Half	Clamp Tube O.D.	Clamp Half Maximum Working Load Rating
48"	QC48-6	233#	6"	26,000 lbs
54"	QC54-6	240#	6"	26,000 lbs
60"	QC60-6	255#	6"	26,000 lbs
72"	QC72-6	285#	6"	26,000 lbs

Do not exceed maximum working load rating.