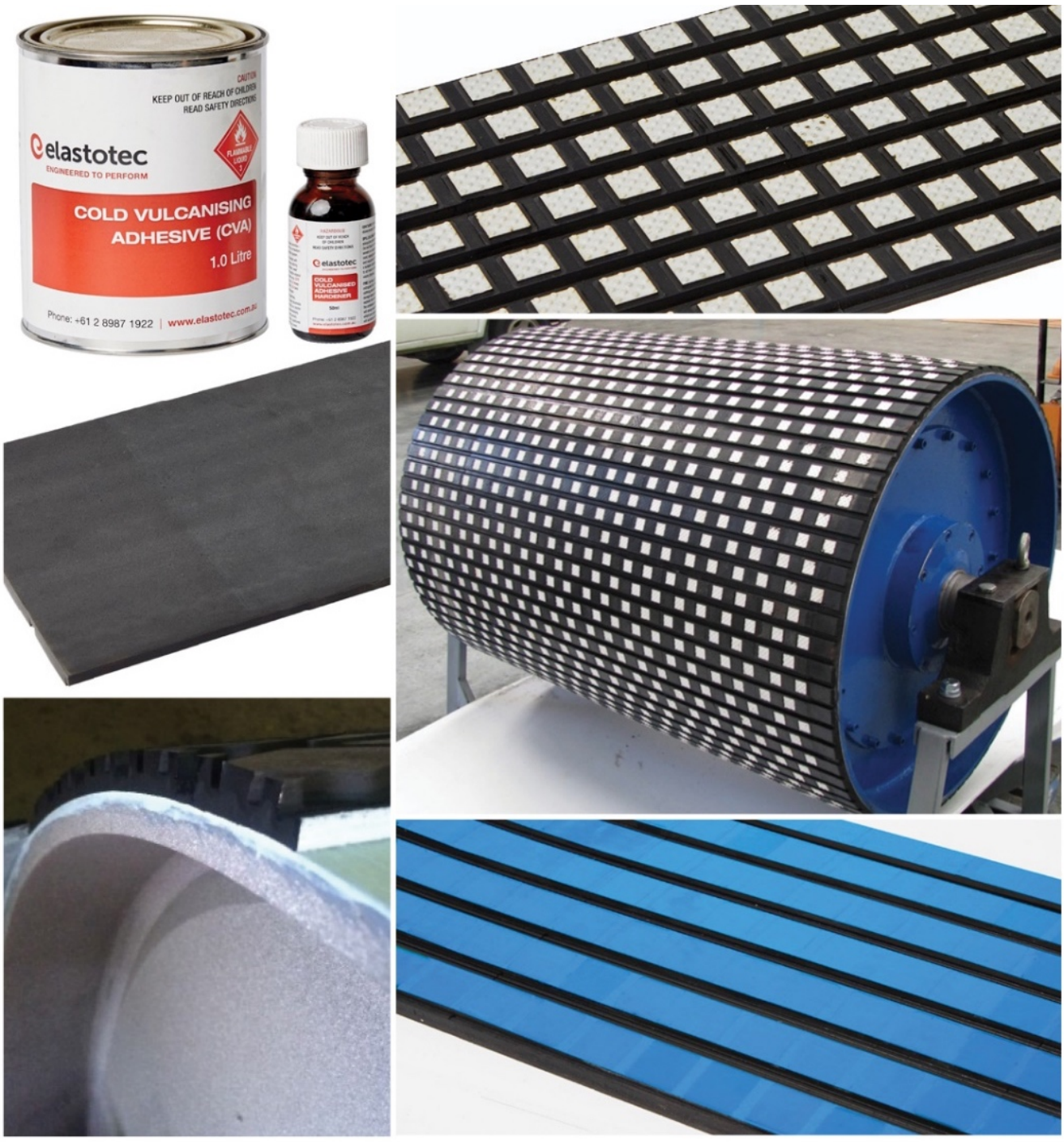
Cold Bonded Lagging Application Procedure



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Cold Bonded Lagging Application Procedure

WORK INSTRUCTION

ORIGINATED BY: David Molesworth	**DATE ORIGINATED:** 13/01/2012	**REVISION:** Version 6
REVIEWED BY: Cameron Dodd	**DATE REVIEWED:** 25/08/2021	**NEXT REVIEW:** 25/08/2022
PPE REQUIRED:	Latex gloves, safety shoes, respirator, safety glasses	
BASIC LABOUR COMPETENCY STANDARDS:	Experience lagging pulleys	

1. Application conditions – Safety requirements – Required tools and equipment

NOTE:

LAGGING CONDITIONS

Max humidity 80%

Temperature 10ºC (50ºF) minimum

Temperature 40ºC (104ºF) maximum

Substrate temperature >+5ºC (9ºF) above the dew point

ADVANTAGES OF THE ELASTOTEC COLD BONDED APPLICATION PROCEDURE

- Matched bonding system to provide consistent rubber tear adhesion
- Elastotec Metal Primer 2205, Elastotec Cold Bonding Adhesive or Conti Secur BFA Cold Bonding Adhesive, Elastotec CN Bonding Layer
- Compression lagging method provides high sealing pressure at joins and allows straight and crowned pulleys to be done using the one procedure
- Lagging design available with thicker edge strip for improved joint sealing
- Pneumatic hammers provide increased application pressure and increased adhesion through better surface contact
- Detailed application method to maximise adhesion strength
- **Only available through Approved Applicators that have been trained and certified by Elastotec**

SAFETY REQUIREMENTS


Approved safety glasses


Approved hand gloves


Approved safety boots


Approved respirator


Approved hearing protection

REQUIRED TOOLS & EQUIPMENT

- ☐ NBR Latex gloves
- ☐ Chalk Line
- ☐ Straight Edge and Set Square
- ☐ Stanley Knife
- ☐ Curing Tape
- ☐ Temperature and Dew Point Gauge
- ☐ Paint Roller
- ☐ Pneumatic Hammer
- ☐ Paint Tray
- ☐ Paint Brushes
- ☐ Stop Watch
- ☐ Paint Pen
- ☐ Stitching Wheel
- ☐ Rubber Mallet

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WORK HEALTH & SAFETY ISSUES

STEPS	SEQUENCE	POTENTIAL HAZARDS	RECOMMENDED SAFE JOB PROCEDURES	HAZARD RATING
1.	Mount pulley to stand using mandrel	Crush injury from pulley turning	Ensure a suitable stand and mandrel are used for the pulley weight and size	3
2.	Sandblast pulley	Handling crush injury	Ensure pulley is secured at all times	3
3.	Apply metal primer	Solvent fumes & chemical exposure	Gloves and respirator	4
4.	Apply adhesive	Solvent fumes & chemical exposure	Gloves and respirator	4
5.	Apply lagging	Use of hammer, crush injury	Two hands on hammer	4
6.	Trim lagging	Cut injury	Work Instruction WI-0033 Use of Knives	4

RISK ASSESSMENT TOOL (MATRIX)	CONSEQUENCES			
Likelihood	Major (eg, Death / Disability)	Serious (eg, Serious injury / Lost Time)	Minor (eg, First Aid Injury)	Insignificant (eg, incident but no injury)
Very Likely (and will almost certainly happen)	1 Extreme	2 High	2 High	3 Medium
Likely (and will probably happen at sometime)	2 High	2 High	3 Medium	3 Medium
Unlikely (but could happen at sometime)	2 High	3 Medium	3 Medium	4 Low
Very unlikely (and Might happen only rarely)	3 Medium	3 Medium	4 Low	4 Low

SUMMARY

A method of applying cold bonded strip lagging to conveyor pulleys that is suitable for both straight and crowned pulleys.

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2. Preparation

- Start a new CBL Checklist and complete customer information, Product Checks and Tools Sections.
- Separate rollers and trays for primer and adhesive
- Check the label on the cold bond lagging
- Check the adhesive is within its shelf life.
- Check that the strip size and lagging type is correct for the customer order/pulley. Match the strips to the pulley by checking the diameter of the pulley and if it is a crowned pulley.
- Take lagging strips out of the packaging, stack on a clean surface with the bonding layer facing up. Mark out the centre of each strip with a paint marker on the visual face of the lagging.
- Check the qty of strips required by following the formula below
- (Pulley diameter mm x 3.14) / Strip width (250mm) and round up.
- Check that if the pulley to be lagged is a crowned pulley. If it is, please refer to the Crown pulley lagging module.
- Check pulley surface temperature is > 5ºC above the Dew Point and record on check list.

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3. Pulley shell metal preparation

METAL PREPARATION

Adhesion to metal surfaces is dependent on having surface preparation that allows the bonding system to obtain a strong chemical and physical attachment. Metal surfaces are blasted to increase surface area with a surface profile of greater than 50µm (2000µin) giving a good base for adhesion. Measure surface profile using Testex Tape and micrometre, or digital surface profile tester. Record results on the CB Checklist. Repeat as per Appendix 2 for the test pieces.

TESTEX TAPE

SURFACE PROFILE TESTER

Bonding at the primer/metal interface is by chemical adsorption of the primer onto the steel surface. Shot blasting of the steel pulley shell improves adhesion by the following mechanisms:

- Removal of surface contaminants such as rust, scale and dirt
- Increase of the shell surface area aids the physical attachment of the primer to the steel.
- Producing a +ve charge over the steel surface (see diagram below)

Cold Bonded Lagging Application Procedure

There is some evidence to show that steel shot produces a greater +ve charge on the pulley shell than other blasting media such as garnet and silica.

Metal primers are designed with polymers that contain –OH groups that will be electrically attracted to the +ve charged pulley shell. The –OH groups in the metal primer also act a site for the adhesive top coat to bond to the metal primer

METAL PREPARATION FACTORS THAT CAN ENHANCE ADHESION:

- Clean dry surface free from contamination
- Surface roughness >=50µm (2000µin)
- Surface with +ve electrical charge from shot blasting

METAL PREPARATION FACTORS THAT CAN CAUSE PROBLEMS WITH ADHESION:

- Dirty or oily blasting media or compressed air
- Wet blasting media/compressed air (water contains -OH groups that will deactivate a +ve charged steel surface
- Non-steel blasting media
- Old media with a reduced particle size that does not produce the required 50µm (2000µin) or greater surface roughness
- Application of solvent-based metal primers in high humidity can cause moisture to condense on the surface (check work surface temperature is >+5ºC (9ºF) above the dew point)
- Storage of pulleys coated with metal primer in high humidity (>70%RH) conditions can result in the moisture in the air reacting with the metal primer and reducing subsequent adhesion levels with the adhesive topcoat when it is applied.

RECOMMENDATIONS FOR PULLEY SHELL SURFACE PREPARATION

1. Use steel blasting shot – must be clean and dry
2. Compressed air for blasting must be dry – compressed air dryer required
3. No oil in compressed air for blasting – oil traps clear and working
4. Surface roughness >=50µm (2000µin) after blasting – measure and record

   If steel blasting is not available, surface grinding can be used as long as surface roughness is >=50µm (2000µin)
5. Apply either Elastotec 2205 or Chemlok 205 metal primer within 1 hour of blasting/grinding. Ensure shell surface temperature is >+5ºC (9ºF) above the dew point. If necessary use heat lamps to achieve this in high humidity conditions
6. In high humidity conditions (>70%RH) after application of metal primer apply adhesive topcoat within 24hours to prevent deactivation of metal primer.

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4. Primer application

PRIMER APPLICATION (PULLEY SURFACE ONLY)

Apply one coat of Elastotec 2205 or Chemlok 205 Metal Primer to the pulley surface within 1 hour of blasting/grinding using either a paint roller or paintbrush. Allow drying completely (minimum 30 minutes, however, overnight is preferable as this ensures all solvent is removed from the primer). Ensure metal primer coat is even with no drips/tears. Touch up after drying if required. Repeat as per Appendix 2 for the test pieces.

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5. Adhesive application

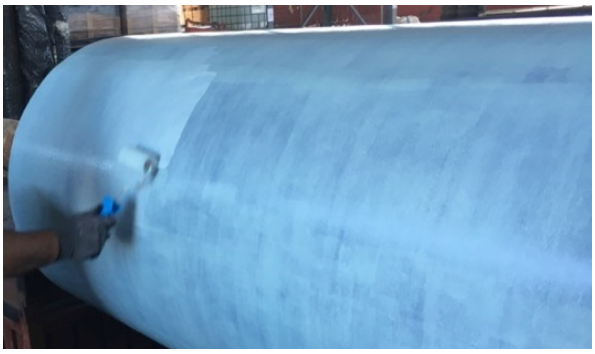
ADHESIVE APPLICATION (PULLEY SURFACE AND RUBBER SURFACE)

Elasstotec Cold bond Adhesive or Conti Secur BFA Cold Bond Adhesive

Open the glue tin, mix thoroughly to check for settlements. Pour the contents of the hardener bottle into the can of adhesive and stir with a paddle or mixing stick until fully mixed. This will take 3-5 minutes. Ensure that mixing includes any material that has settled on the bottom of the adhesive can.

PULLEY

Measure and record the air temperature and dew point to ensure it is >+5ºC (9ºF) separation before continuing. Apply one coat of Cold Bonding Adhesive with a clean paint roller and allow drying completely (minimum 30 minutes). A roller is used to avoid any damage to the metal primer coat or subsequent coats. Repeat as per Appendix 2 for the test pieces.



RUBBER

Measure and record the air temperature and dew point to ensure it is >+5ºC (9ºF) separation before continuing. Apply one coat of Cold Bonding Adhesive with a clean paintbrush to the back and sides of all of the strips. This should be done with a vigorous rubbing action to ensure complete coverage and good surface contact. Allow drying completely (minimum 30 min). Repeat for the test piece.

6. Pulley and strips marking

LAGGING APPLICATION START

Mark a line across the pulley face that is parallel to the pulley shaft centerline with a Stanley Knife, string line or laser line. Mark a centre point on this line.

Mark the centre section of the strips that will be aligned to the pulley centre mark.

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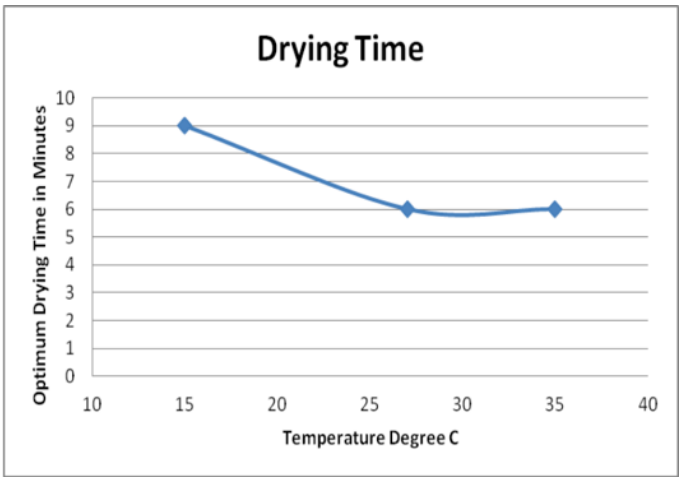
7. First strip application

PULLEY AND RUBBER

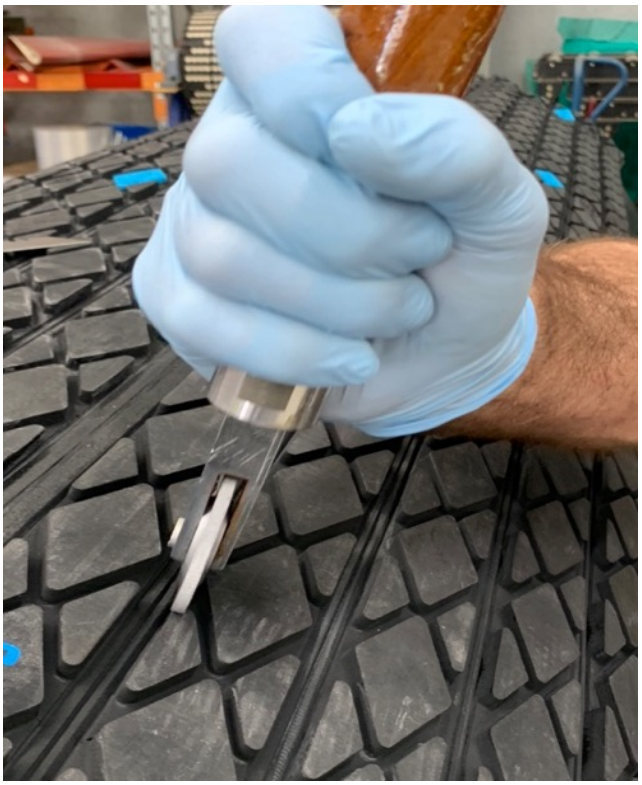
Measure and record the air temperature and dew point to ensure it is >+5ºC (9ºF) separation before continuing. Compare the air temperature to the above drying time chart for optimal application and record the start time on the checklist. Apply a second coat of Cold Bonding Adhesive with a paint roller to the back and sides of one strip and an area of the pulley face equivalent to one strip adjacent to the marked line. This coat should not be thick. It is to be a light, even coat that is enough to tackify the surface. Start the timer as soon as the coat is finished being applied and record this time on the checklist. When using Conti Secur BFA Glue, use graph on this work instruction.



Lay a sheet of silicon release liner approximately 10mm (0.39in) below the centerline. This will allow easier placement of the lagging strip in the next step.

Once the drying time has been reached, immediately line up the centre of the strip and one edge along the centerline using the silicon release liner as a resting place off of the pulley face. Move across the pulley face pressing the lagging edge onto the surface so that it lines up exactly with the centerline. This application is easiest if the strip is positioned with a second operator and the strip is handled with clean gloves.

Stitch the longitudinal sipe along the centerline from the centre to the edge of the pulley. Repeat for the other side of the strip then remove the silcon release liner from under the lagging strip. This process is then repeated on the middle sipe, followed by the bottom sipe then the in-between sipes. This helps to keep the strip straight throughout the application.



Cold Bonded Lagging Application Procedure

Starting at the top row of the first strip and in the centre of the pulley, use a rubber mallet to hammer across the pulley to one edge, then to the other edge. For rubber lagging hit each diamond twice and for ceramic lagging, hit each tile twice. This is to allow the air to escape, prevent pockets of trapped air and to ensure good contact between the lagging and pulley shell. Repeat the process for the subsequent rows on the lagging, until the strip is completed.

IF doing a rubber CBL application, stitch each diagonal rows/sipes after completion of hammering down the strip.

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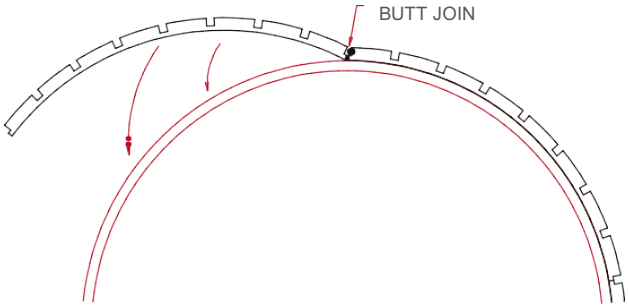
Cold Bonded Lagging Application Procedure

8. Subsequent strip application

For applying the subsequent strips there are two methods that can be used:

BUTT JOIN

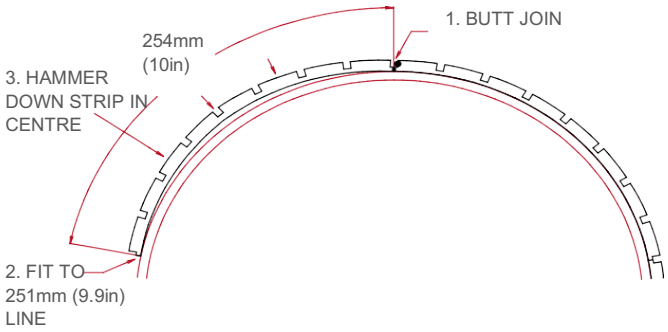
– this is the quickest method but must be done carefully to ensure there is no gap between adjacent strips as any gap allows water to reach the pulley shell and cause corrosion. The use of Sikaflex or similar sealants at the join between strips is not recommended and is not required when the workmanship is good. The Butt Join method is only suitable for straight pulleys.



COMPRESSION JOIN

– this method takes a little longer but has several advantages:

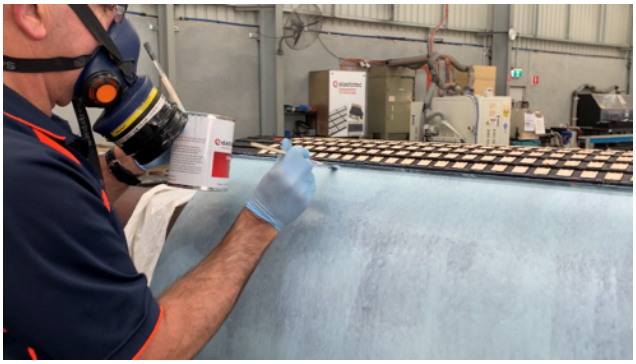
- Can be used for both straight and crowned pulleys
- Provides a high sealing force between strips that minimise the chance of water ingress through the join
- Compensates for small differences in the width of the final strip that has to be fitted to the pulley



BUTT JOIN

PULLEY AND RUBBER

Measure and record the air temperature and dew point to ensure it is >+5ºC (9ºF) separation before continuing. Compare the air temperature to the above drying time chart for optimal application and record the start time on the checklist. Apply a second coat of Cold Bonding Adhesive with a paint roller to the back and sides of one strip, an area of the pulley face equivalent to one strip adjacent to the marked line and the sipe of the previous strip. This coat should not be thick. It is to be a light, even coat that is enough to tackify the surface. Start the timer as soon as the coat is finished being applied and record this time on the checklist..



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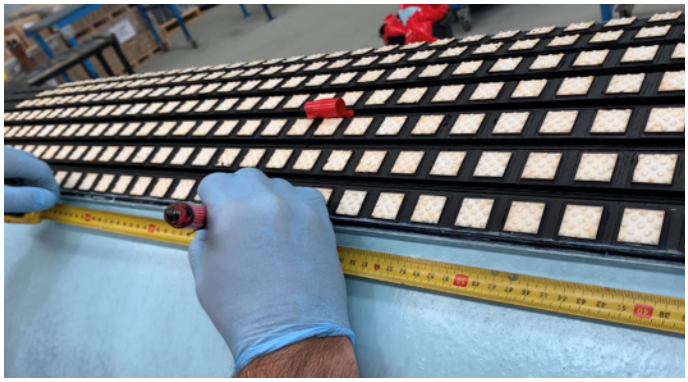
Cold Bonded Lagging Application Procedure

Lay a sheet of silicon release liner approximately 10mm (0.39in) below the previous strip. This will allow easier placement of the lagging strip in the next step.



Once the drying time has been reached, immediately line up the centre of the strip and one edge along the centerline using the silicon release liner as a resting place off the pulley face. Ensure that the diamonds for rubber lagging and the tiles for ceramic lagging line up. Move across the pulley face pressing the lagging edge into the edge of the previous strip. This application is easiest if the strip is positioned with a second operator and the strip is handled with clean gloves.

Stitch the longitudinal sipe along the join, ensuring good contact between the two strips and no gaps occur. Remove the silcon release liner from under the lagging strip. This process is then repeated on the middle sipe, followed by the bottom sipe then the in-between sipes. This helps to keep the strip straight throughout the application.

Starting at the top row of the first strip and in the centre of the pulley, use a rubber mallet to hammer across the pulley to one edge, then to the other edge. For rubber lagging hit each diamond twice and for ceramic lagging, hit each tile twice. This is to allow the air to escape, prevent pockets of trapped air and to ensure good contact between the lagging and pulley shell. Repeat the process for the subsequent rows on the lagging, until the strip is completed.

IF doing a rubber CBL application, stitch each diagonal rows/sipes after completion of hammering down the strip.

Once the stitching and hammering as been completed on the strip to remove any air underneath, use a pneumatic hammer over the whole surface of the strip twice. This step is used to ensure good contact over the entire lagging area. Record the finish time for the strip on the checklist.

Repeat this process for the remaining strips to go around the pulley until 2/3rds of the pulley has been covered.

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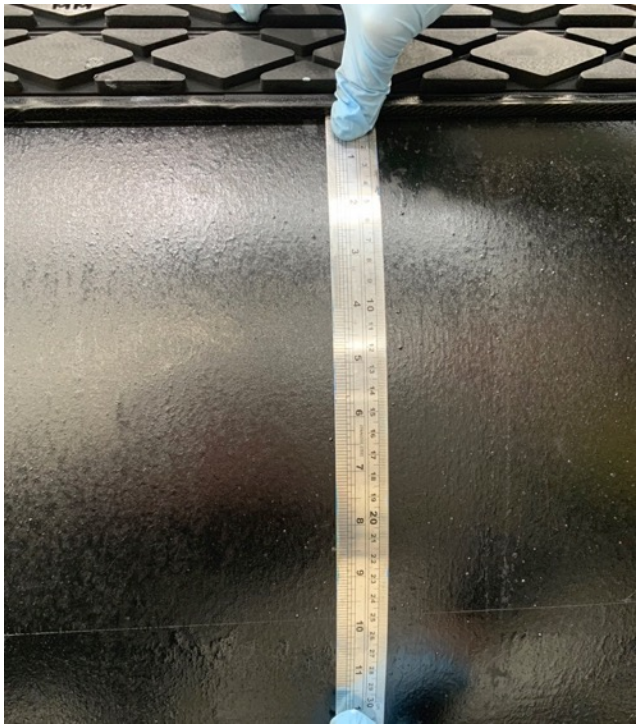
COMPRESSION JOIN

Mark a second line across the pulley face at a distance of 247mm (9.7in) from the edge of the first strip. The centerline should be above the strip that is already on the pulley. This can be done using a section of the lagging approximately 50mm (~2in) wide that has been cut from the end of a piece of lagging or a flexible ruler. Take this section and trim the sipe from one edge to give a length of 247mm (9.7in). This makes the section approximately 247mm (9.7in) long as the lagging is supplied is 250mm (9.8in) across the strip.



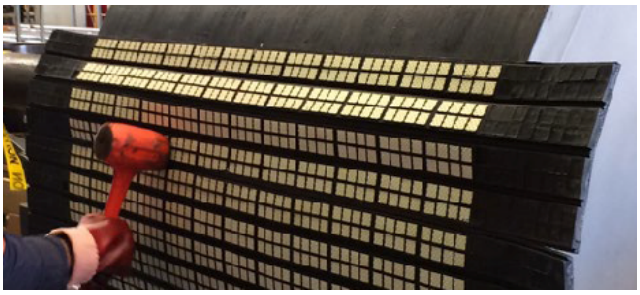
Check the temperature to determine the adhesive drying time and record this time on the checklist.

PULLEY AND RUBBER

Measure and record the air temperature and dew point to ensure it is >+5ºC (9ºF) separation before continuing. Compare the air temperature to the above drying time chart for optimal application and record the start time on the checklist. Apply a second coat of Cold Bonding Adhesive with a paint roller to the back and sides of the next strip, the area of the pulley between the previous strip and the 247mm (9.7in) compression line and to the sipe of the previous strip. This coat should not be thick. It is to be a light, even coat that is enough to tackify the surface. Start the timer as soon as the coat is finished being applied and record this time on the checklist.

Lay a sheet of silicon release liner approximately 10mm (0.39in) below the previous strip. This will allow easier placement of the lagging strip in the next step.

Once the drying time has been reached, immediately line up the centre of the strip and one edge along the centerline using the silicon release liner as a resting place off of the pulley face. Fit the second strip to the pulley face with the top edge pressed carefully along the new centerline. Press the opposite edge into place in contact with the edge of the previous strip. Due to the second centerline being located 247mm (9.7in) from the first strip and the lagging is 250mm (9.8in) wide, the second lagging strip will pucker and will bow out away from the pulley.



IMPORTANT:

First, hammer the edge that was placed along the string line down. Then hammer the opposite edge down (adjacent to the previously installed strip). This locks the two edges in place and prevents them from moving. Finally, hammer the centre sections of the strip down starting in the middle of the pulley and working out towards the edge. This allows the air to be excluded and prevent the formation of bubbles or air pockets.

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Stitch the longitudinal sipes along both joins ensuring good contact between the two strips and no gaps occur. This process is then repeated on the middle sipe, followed by the bottom sipe then the in-between sipes. This helps to keep the strip straight throughout the application.

Starting at the top row of the first strip and in the centre of the pulley, use a rubber mallet to hammer across the pulley to one edge, then to the other edge. For rubber lagging hit each diamond twice and for ceramic lagging, hit each tile twice. This is to allow the air to escape, prevent pockets of trapped air and to ensure good contact between the lagging and pulley shell. Repeat the process for the subsequent rows on the lagging, until the strip is completed.

IF doing a rubber CBL application, stitch each diagonal rows/sipes after completion of hammering down the strip.

Repeat this process for the remaining strips to go around the pulley until 2/3rds of the pulley has been covered.

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9. Lagging application finish

LAGGING APPLICATION FINISH

When the last 2/3rds of the pulley shell are ready to be lagged it is important to determine the best size for cutting the remaining strips. The aim is to achieve the following:

- A neat fit of the last lagging strip with no gap
- Strips cut along the sipes
- Minimum strip width of 150mm (5.9in)

Using 50mm (~2in) wide segments cut from the end of the lagging strips; line up the remaining gap left to complete the pulley. Trim these segments to size so that you can fit them to the remaining surface to be lagged and check at both ends and the middle for consistency. Where possible, trimming of these remaining segments should be evenly distributed to ensure best bonding surface coverage.

Trim the strip widths for the last 2-3 strips using the 50mm (~2in) wide segments that have been checked for the correct size as measuring tools. Note that the cut edge of these strips is to be coated with 2 coats of Cold Bonding Adhesive before installation for best bonding to occur.

PULLEY AND RUBBER

Measure and record the air temperature and dew point to ensure it is >+5ºC (9ºF) separation before continuing. Compare the air temperature to the above drying time chart for optimal application and record the start time on the checklist. Apply a second coat of Cold Bonding Adhesive with a paint roller to the back and sides of one strip, an area of the pulley face equivalent to one strip adjacent to the marked line and the sipes of the previous strip. This coat should not be thick. It is to be a light, even coat that is enough to tackify the surface. Start the timer as soon as the coat is finished being applied and record this time on the checklist.

Lay a sheet of silicon release liner approximately 10mm (0.39in) below the previous strip. This will allow easier placement of the lagging strip in the next step.

Hammer the surface of the strips to ensure good contact between adhesive layers on the pulley shell and the lagging. Use a stitching wheel on all the recessed cutting sipes.

Once the stitching and hammering has been completed on the strip to remove any air underneath, use a pneumatic hammer over the whole surface of the strip twice. This step is used to ensure good contact over the entire lagging area. Record the finish time for the strip on the checklist.

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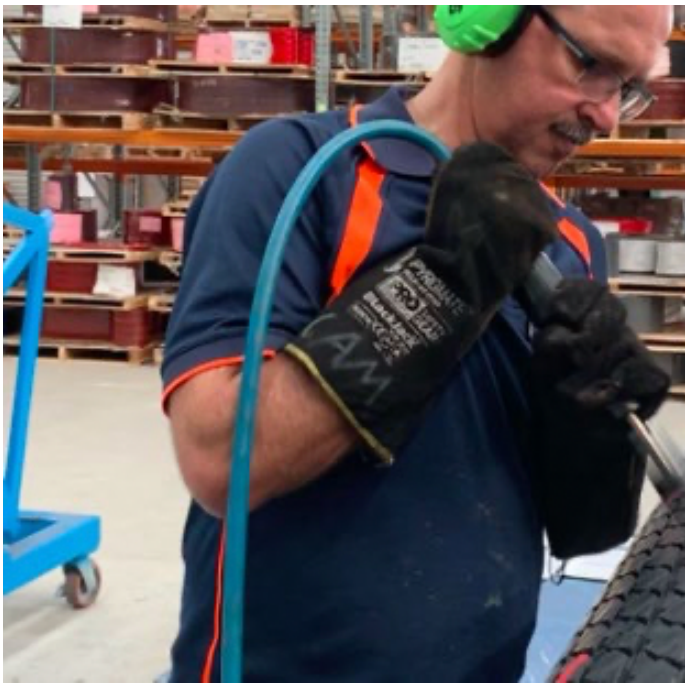

Complete test pieces before proceeding. Measure and record the air temperature and dew point to ensure it is >+5ºC (9ºF) separation before continuing. Compare the air temperature to the above drying time chart for optimal application and record the start time on the checklist. Apply a second coat of Cold Bonding Adhesive with a paint roller to the back of the test piece rubber and the steel test piece. This coat should not be thick. It is to be a light, even coat that is enough to tackify the surface. Start the timer as soon as the coat is finished being applied and record this time on the checklist. Ensure samples are thoroughly stitched, hammered and pneumatically hammered for best results. Record the finish time for the test piece on the checklist.

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10. Finishing

Using a new, sharp knife, trim and buff the ends of the lagging strips to be flush with the edges of the pulley.

11. Adhesion test

Allow at least 48 hours before completing the adhesion testing.

To complete the testing, clamp down the sample using the through-holes and apply a load to the tail end of the sample. This is a 90degree pull test. Measure and record the force at which the lagging separates from the steel test piece.

From the results achieved, calculate the final bond strength results in the form of N/mm (Newtons per millimetre). To do this, convert the force recorded to Newtons and divide by the steel test piece width (25mm (1in) per the earlier drawing). For the bond strength result to be a pass, it should be a minimum of 12N/mm.

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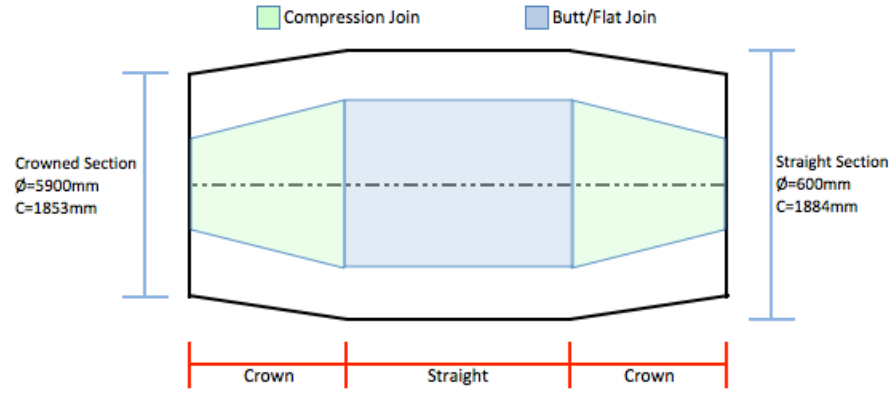
Appendix 1

Application of Hot Vulcanised Lagging to Crowned Pulleys



BASED ON THE ABOVE EXAMPLE

- Calculate pulley circumference at the centre (straight section is 1884mm (74.2in)) and at the narrower ends (crowned is 1853mm (73in)) [difference of 31mm (1.2in)].
- Calculate the number of strips required on a strip width of 254mm (10in) at the centre (1884 / 254 = 7.4 strips) [74.2 / 10 = 7.4 strips]
- Across the 7.4 strips, it is 4.2mm (0.2in) per strip. Cut 25mm (1in) off the end of two strips. Leave one as 254mm (10in) wide and cut the other to 250mm (9.8in) wide.
- Mark a centerline across the pulley face for the width of the straight section.
- Using the 254mm (10in) wide offcut, mark a line across the straight section at this width below the centreline. For the pulley ends, mark using the 250mm (9.8in) wide section.
- Using a straight edge, mark a line from the narrower ends to the start of the straight section.
- Apply the first lagging strip placing the top edge along the marked line. Hammer the edge down approximately 50mm (2in) wide.
- Press the bottom lagging edge along the bottom marked line. Hammer the edge down approximately 50mm (2in) wide.
- Hammer the strip down along the centreline, approximately 50mm (2in) wide. The lagging will pucker at the ends.
- Working from the pulley centre, hammer the remaining lagging down and firmly stitch all sipes and recesses.
- For the next strip mark, a line at 254 (10in) for the straight section and at 250mm (9.8in) for the pulley ends. Repeat the strip application as before.
- Repeat steps 7 – 11 until 2/3rds complete, and then follow Lagging Application Finish steps outlined earlier.

Appendix 2

Completed CBL Application Checklist Example

CBL Application Checklist elastotec

Customer Sample		Date	25/9/19	Operator	J.Smith
Lagging to be Used Matches Pulley ID/WO			Ok	WO/PO#	ID7988
Product Checks					
Pulley and Test Pieces Sandblasted		Spec.	Left End	Centre	Right End
Surface Profile Measurement #1		>= 50um	92	86	83
Surface Profile Measurement #2		>= 50um	88	91	85
Surface Profile Measurement #3		>= 50um	83	83	70
Surface Profile Measurement #4		>= 50um	85	87	83
CBL Test Pieces Measurement		>= 50um	79	68	65
Cold Bonding Adhesive is in Date and of a Liquid Consistancy (No Lumps)		Ok			
Lagging Strips are in Date and at Room Temperature - No Condensation		Ok			
Tools					
Paint Rollers and Trays are Clean and No Excess Blobs of Paint		Ok			
Paint Brushes, Trays and Gloves		Ok		Work Piece Temp.	Dew Point Temp.
OH&S Equipment - PPE		Ok			
Application - Chemlok 205		Drying	Time	(C)	(C)
1 Coat Chemlok 205 to Pulley Face and **Test Pieces**		30 min (minimum)	8:00am	24.2C	15.8C
Application - CB Adhesive (Elastotec or ContiSecure)					
1st Coat Cold Bonding Adhesive to Pulley Face, Strips and **Test Pieces**		30 min (minimum)	10:00am	25.2C	15.8C
Application of CBL Strips		Start	Finish	Work Piece Temp. (C)	Dew Point Temp. (C)
Application of Lagging Strip - Strip#1		11:15am	11:30am	25.8C	15.4C
Strip#2		11:30am	11:45am	26.1C	15.6C
Strip#3		11:45am	12:00pm	26.1C	15.7C
Strip#4		12:00pm	12:15pm	26.7C	16.1C
Strip#5		12:15pm	12:30pm	26.7C	14.9C
Strip#6		12:30pm	1:00pm	27.8C	15.2C
Strip#7		1:00pm	1:45pm	27.8C	15.4C
Strip#8		1:45pm	2:00pm	28C	15.4C
Strip#9					
Strip#10					
Strip#11					
Strip#12					
Strip#13					
Strip#14					
Strip#15					
Strip#16					
Strip#17					
Strip#18					

2021-08-25 Version 6

ABN: 28 006 489 238

Issue: KDOC00135
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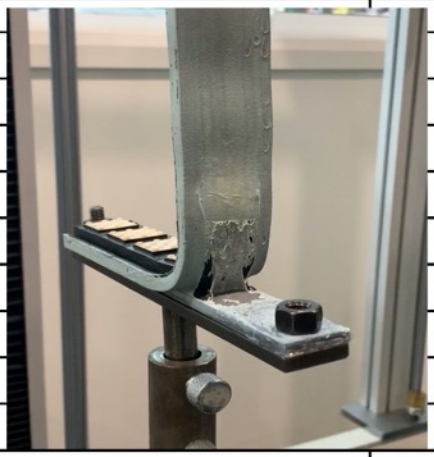
Cold Bonded Lagging Application Procedure

	Start	Finish	Work Piece Temp. (C)	Dew Point Temp. (C)
Strip#19				
Strip#20				
Strip#21				
Strip#22				
Strip#23				
Strip#24				
Strip#25				
Application of Lagging to CBL Test Pieces	2:05pm	2:20pm	27.6C	15.1C
Pnuematic Hammer Complete Pulley Face	2:25pm	2:45pm		
Final Inspection				
Lagging Adhesion (N/mm)	12.14	13.46		
Failure Mode - % Rubber Tear	85%RT	50%RT		
Joins	Ok			
Trim Ends and Buff	Ok			
Pack up				
Check Adhesive and Chemlok Tins are Sealed and Stored Properly	Ok			
Clean Brushes and Dispose of Used Trays	Ok			
Clean Bench Spaces and Empty Bins	Ok			
Reporting/Sign Off				
Operator Sign Off	J.Smith			
Supervisor Sign Off	S, John			
Notes				
Attach Photo of Joins, Pulley Shell Edge and Adhesion Test Results After Completion of Application				



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Appendix 3

Completed CBL Application Test Report Example

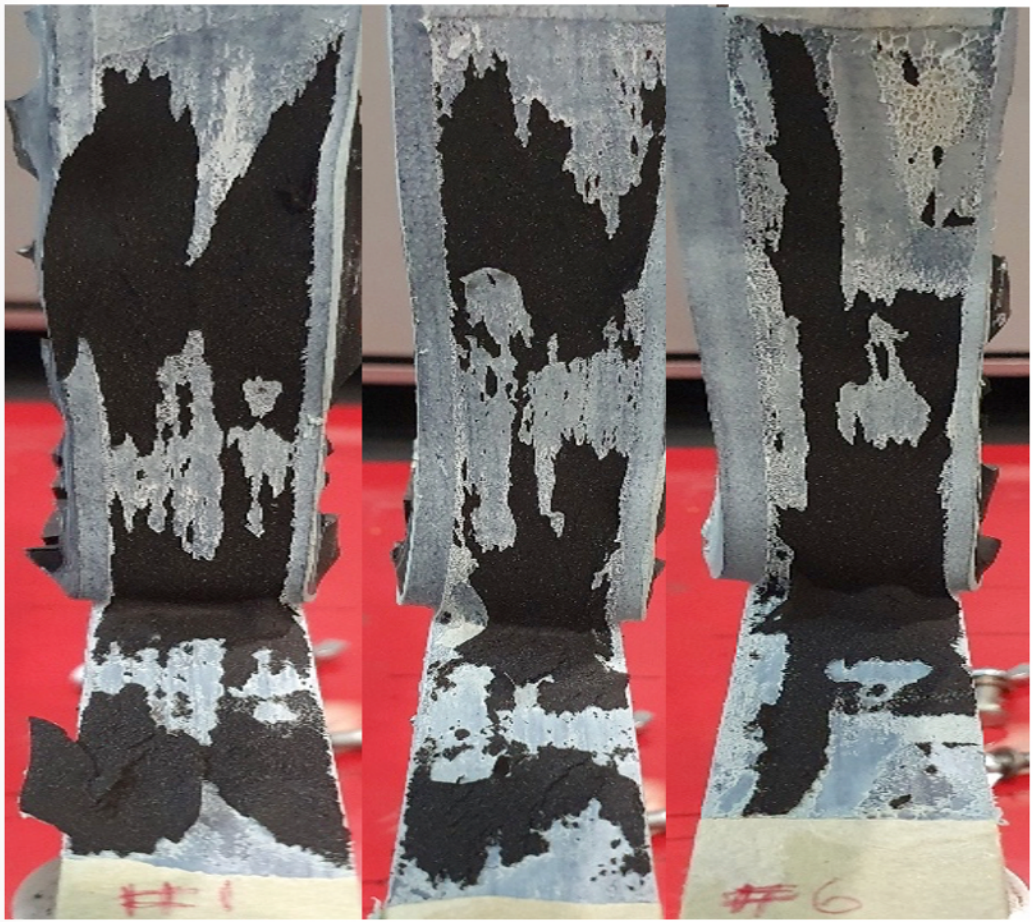
elastotec
ENGINEERED TO PERFORM

Report Date
23/6/21
Prepared By
J.Smith

Cold Bond Application

Peel Test		Results		
Sample I.D.	**Width (mm)**	**N**	**N/mm**	**Mode of Failure**
1	25.0	420.5	*16.8*	70% Rubber Tear
2		463.1	*18.5*	75% Rubber Tear
3		360.3	*14.4*	50% Rubber Tear

16.6

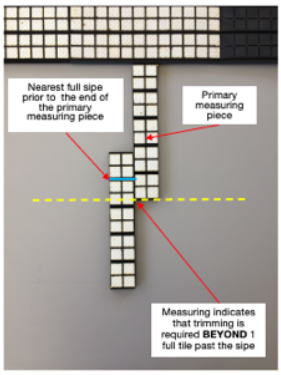


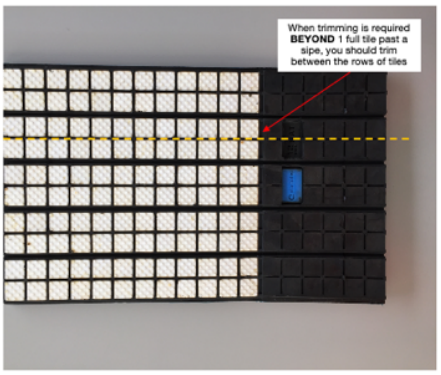
Appendix 4

Trimming of 80% Full Ceramic Lagging Strips

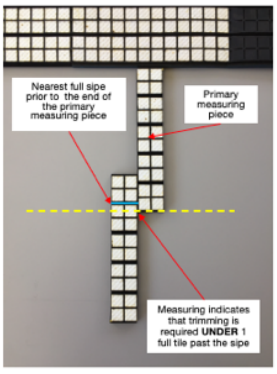
To ensure that all lagging strips will fit neatly on the pulley, it is important to start measuring checks when the last 2/3rds of the pulley are ready to be lagged (E.g., if there are 9 strips of lagging required to lag the whole pulley, then measuring checks should start after the 3rd strip of lagging has been applied). Due to having less sipes and being a more rigid product, 80% Full Ceramic Lagging requires some additional considerations when trimming to ensure all strips fit correctly and a good seal is achieved between each strip of lagging. 80% Full Ceramic Lagging has 6 sipes, 1 on each edge and 4 within the lagging strip, and when trimming 80% Full Ceramic Lagging it is also possible to trim between the rows of tiles if necessary as well as along the sipes. This is to reduce the number of strips that require trimming so there are as many edge sipes used as possible. Note that any cut edges must be coated with 2 coats of Cold Bond Adhesive before installation for best bonding to occur, and the minimum strip width is 150mm so any trimming should not create a strip under that width.

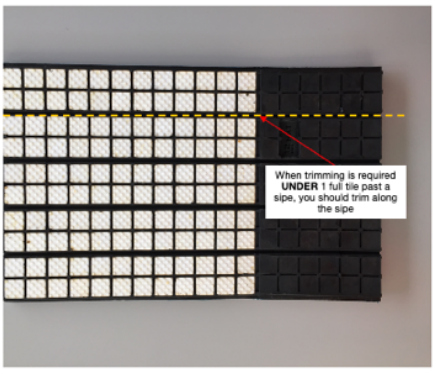
Scenario 1: Trimming between rows of tiles should only be done when measuring indicates that overlap is occurring **BEYOND** 1 full tile past a sipe as shown below:





Scenario 2: Trimming along a sipe (either an edge sipe or a sipe within the lagging strip) is done when measuring indicates that overlap is occurring **UNDER** 1 full tile past a sipe as shown below:





Additional trimming of edge sipes may also be required to get a neat fit of all remaining strips. It is recommended that measuring using offcut pieces continues after each strip is installed until the last strip is applied.

IMPORTANT:

You should only trim any strip of lagging once so there is always one full edge sipe still intact. **You should never join two cut/trimmed surfaces against each other, a cut/trimmed section must always be installed against a lagging strip with a full edge sipe.** When measure checking using offcut pieces, you should always measure in 3 sections along the face width after each strip of lagging has been applied to ensure that the spacing remains the same across the full length of the pulley.