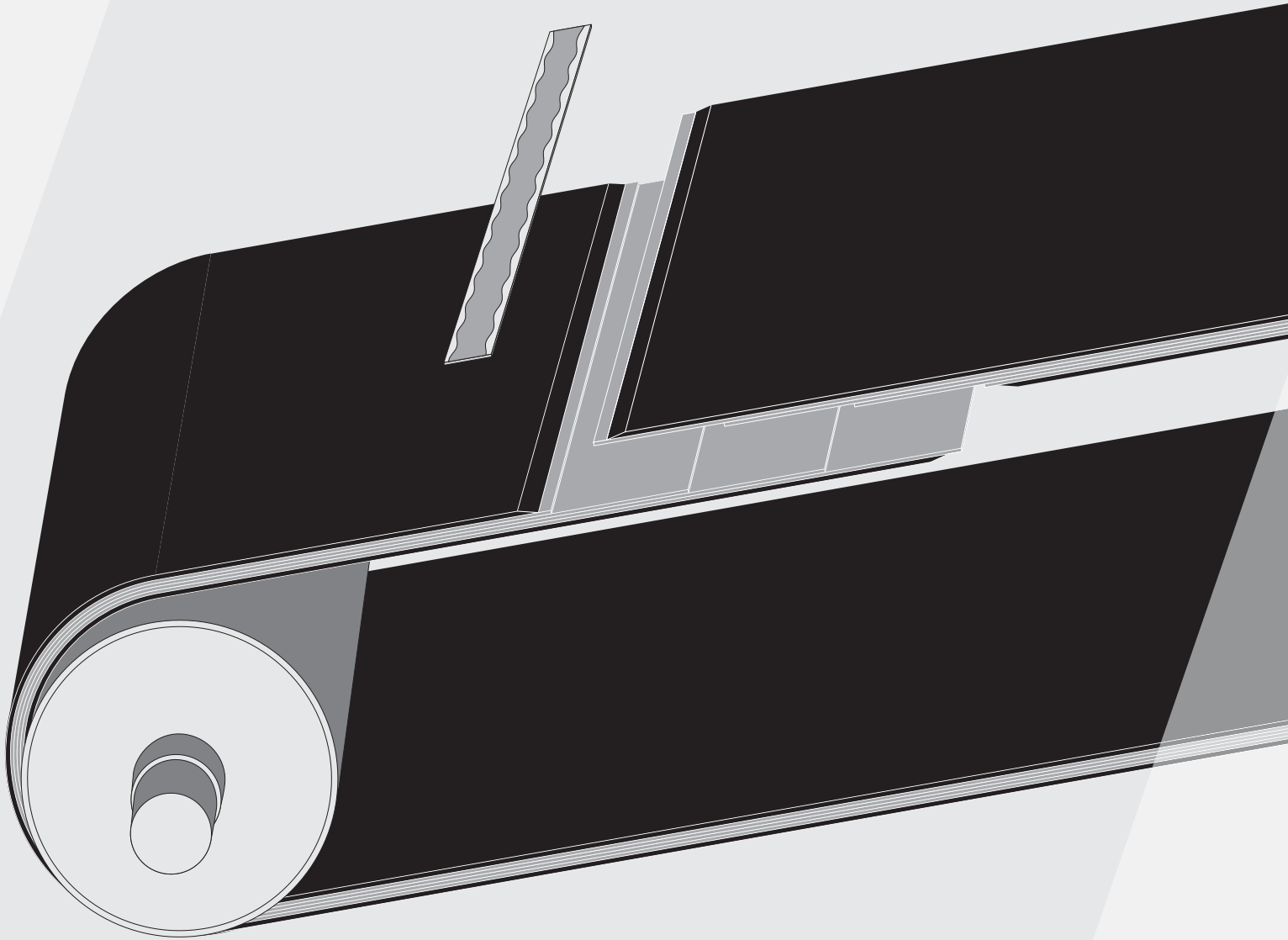




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SPLICING MANUAL

Cold Splicing of Rubber Conveyor Belts with Fabric Plies

Content

Contents

General Recommendations	2
Storage of splicing products	2
Precautions	2
Application Range of Cold Splices	2
Standard and "V"-quality conveyor belts	2
Splicing methods	2
Place / site	2
Conditions for Cold Splicing	3
Working place	3
Conveyor belt	3
Ambient conditions	3
Tools and Equipment	3
Products for Cold Splicing of Standard and "V"-Quality Conveyor Belts	3
Systems and Dimensions of Cold Splices	4
Splicing methods	4
Selection of step direction	4
Splice runs against conveying direction	4
Splice runs in conveying direction	4
Selection of step length	5
Mono-ply belts – up to 1/500	5
Two-ply and multi-ply belts	6
Splicing Process	8
General preparation	8
Preparation of the lower part of the belt	9
Preparation of the upper part of the belt	12
Joining of the splice	13
Filling and covering the joint gap	15

General Recommendations

Storage of splicing products

Splicing products should be stored in a dry and dark place at a temperature between 59°F and 79°F (DIN 7716).

Please observe expiry date on box!

Precautions

Observe safety instructions on the containers!

Application Range of Cold Splices

Standard and "V"-quality conveyor belts

Cold endless splicing of mono- and multi-ply conveyor belts with textile carcass (DIN 22102) and covers made of the following polymers:

- Natural rubber NR*
- Styrene butadiene rubber SBR*
- Isoprene rubber IR*
- Butadiene rubber BR*
- Chloroprene rubber CR*
- or a mixture of above polymers, e.g. NR/SBR*

In case of doubt consult belt manufacturer about rubber quality.

For splicing of other belt types please contact your local REMA TIP TOP specialist.

Splicing methods

- rectangular or
- bias (0.3 x belt width)

Place / Site

- in a vulcanizing shop or
- on site

Note:

Our recommendations are the result of field tests and long experience.

In view of different materials and working conditions beyond our control it is generally recommended to make tests locally.

A liability or responsibility can be extracted in no case from these recommendations.

Conditions for Cold Splicing

Working place

In order to ensure quality and durability of a cold splice a clean working place and proper usage of the splicing products are essential.

Conveyor belt

The conveyor belt must be clean and dry.

If necessary clean the belt as follows:

- Scrape off water-soluble contamination (e.g. salt, fertilizer) and rinse with water.
- Remove oil and grease with REMA TIP TOP Cleaning Fluid.

Dry the belt with REMA TIP TOP Drying Hood or Air Dryer.*

Ambient conditions

The ambient temperature and the temperature of the splicing products should be between +50°F and +113°F.

Humidity influences such as condensation water (below dew point) must be absolutely avoided.

If necessary

- erect a tent to protect working area from strong sunlight, rain and wind;
- warm up splice area with a drying hood or a hot air dryer.*

* Note:

Electrical appliances must not be left unattended (risk of fire!) or exposed to humidity.

Tools and Equipment

- Belt tensioners
- Chain or cable winch
- Screw clamps
- Measuring tape
- Metal ruler
- Flat angle
- Marking crayon (white)
- Plumb line
- 6" knife
- Don Carlos knife
- Off-set knife
- Ply knife
- Ply lifter
- Whetstone
- Scissors
- Pincers
- Grip tongs
- Hand brush
- Cement brush
- Stitcher
- Double acting roller
- Cable drum
- Safety goggles
- Drying hood
- Buffing motor (with flexible shaft and wire brushes)

Products for Cold Splicing of Standard and "V"-Quality Conveyor Belts

SC 2000 Black

U.S. Part #	Product #	Size
101 000 041	SC2000B	Pint / 1/2 kg
101 000 042	SC2000B 1KG	Quart / 1 kg
101 000 043	SC2000BG	Gallon / 5 kg
101 000 053	SC2000B-DRUM	Drum / 290 kg

UT-R 20 HARDENER (Non-Flammable)

Use with SC 2000 Black Cement Only

U.S. Part #	Product #	Size
UTR20/20G	525 1030	20 g
UTR20/40G	525 1046	40 g

#13 Cleaning Solvent (Non-Flammable)

Use with SC 2000 Black Cement Only

U.S. Part #	Product #	Size
101 000 059	13-QT	Quart / 32 fl. oz.
101 000 060	13-G	Gallon / 1 US gal.
101 000 058	13-DRUM	Drum / 54 U.S. gal.

SC 4000 Black

U.S. Part #	Product #	Size
101 000 045	SC4000B-PINT	Pint / 0.33 kg
101 000 046	SC4000-QT	Quart / 660 g
101 000 047	SC4000-GAL	Gallon / 3.3 kg
101 000 052	SC4000-DRUM	Drum / 190 kg

E-40 HARDENER (Flammable)

Use with Standard Conveyor Belts and SC 4000 Black Cement Only

U.S. Part #	Product #	Size
E40/15G	525 1139	15 g
E40/30G	525 1146	30 g

R-50 CLEANING SOLVENT (Flammable)

Use with SC 4000 Black Cement Only

U.S. Part #	Product #	Size
101 000 061	R-50-QT	Quart / 32 fl. oz.
101 000 062	R-50-GAL	Gallon / 1 gal.
101 000 050	R-50-DRUM	Drum / 54 US gal.

Filler Rubber with CN Bonding Layer on Both Sides (TT440)

U.S. Part #	Product #	Size
303 (1.5mm)	5285363	1/16" x 20" x 33'
305 (3mm)	5285899	1/8" x 29" x 33'
306 (3mm)	5285428	1/8" x 58" x 33'
309 (6mm)	5285916	1/4" x 29" x 33'
310 (6mm)	5285882	1/4" x 58" x 33'

Belt Repair and Cover Strip

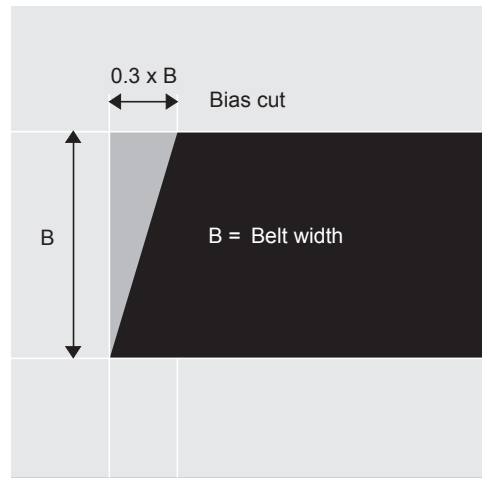
U.S. Part #	Product #	Size
CN66 (splice cover strip)	5316800	4" x 33'

Systems and Dimensions of Cold Splices

Splicing methods

- Overlap splice (mono- and two-ply belts)
- Step splice (multi-ply belts)

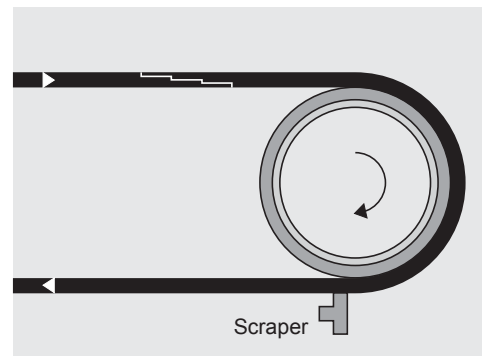
A bias cut ($0.3 \times$ belt width) positively influences the durability of a splice



Selection of step direction

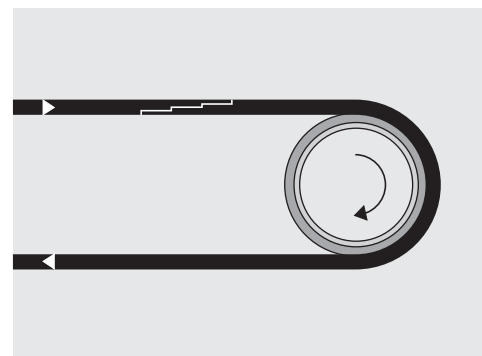
Splice runs against conveying direction

This method is recommended because it is favorable even in case of aggressive scrapers.



Splice runs in conveying direction

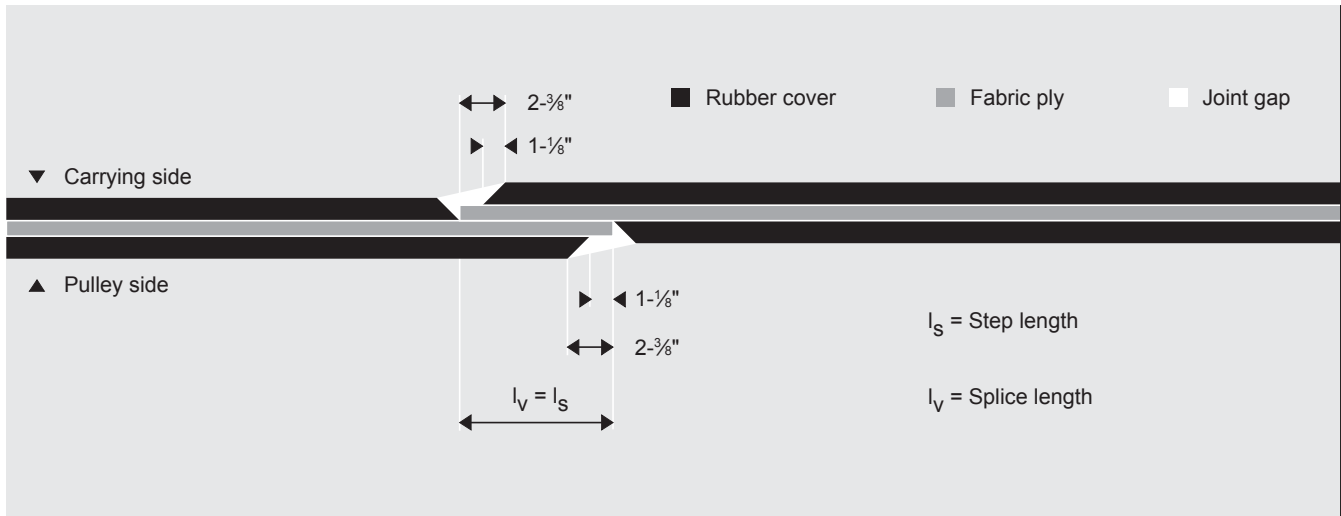
Alternative method for slider bed conveyors.



Systems and Dimensions of Cold Splices

Selection of step length

Mono-ply belts – up to 1/500



Overlap splice

Belt type	Step length l_s in inches	Splice length l_v in inches	Number of steps
1/200	9- ⁷ / ₈	9- ⁷ / ₈	1
1/250	9- ⁷ / ₈	9- ⁷ / ₈	
1/315	11- ³ / ₄	11- ³ / ₄	
1/400	11- ³ / ₄	11- ³ / ₄	
1/500	13- ³ / ₄	13- ³ / ₄	

Systems and Dimensions of Cold Splices

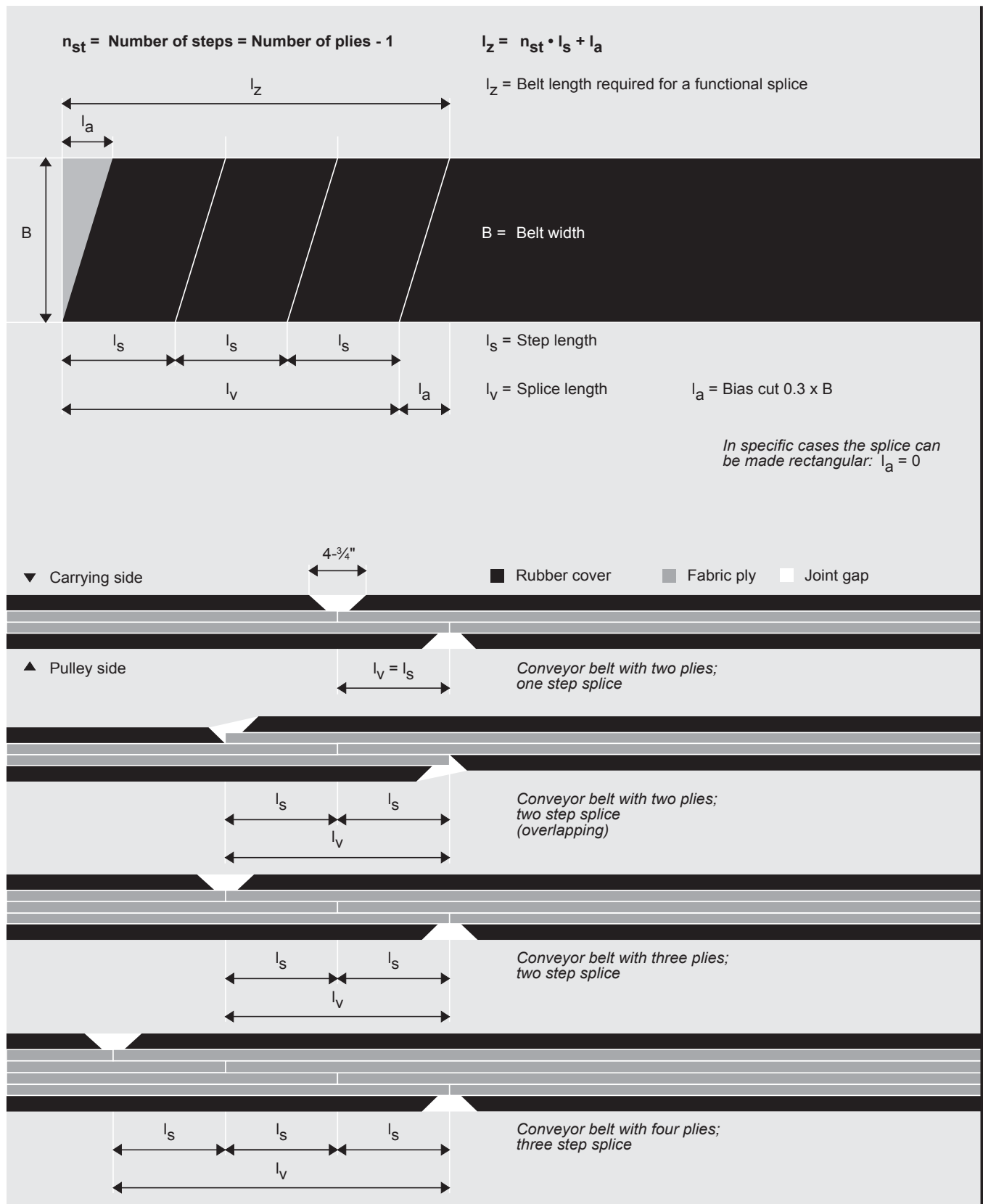
Selection of step length

Two-ply and multi-ply belts

Belt type	Step length l_s in inches	Splice length l_v in inches	Number of steps
2/220*	8	12	1 or 2
2/250*	10	14	
2/300*	8	20	
2/400*	15	19	
2/500*	18	22	
3/330	8	20	2
3/375	10	24	
3/600	15	34	
4/400	8	28	3
4/800	15	49	
5/750	12	52	4
5/1000	15	64	
5/1250	18	76	
5/1500	20	84	

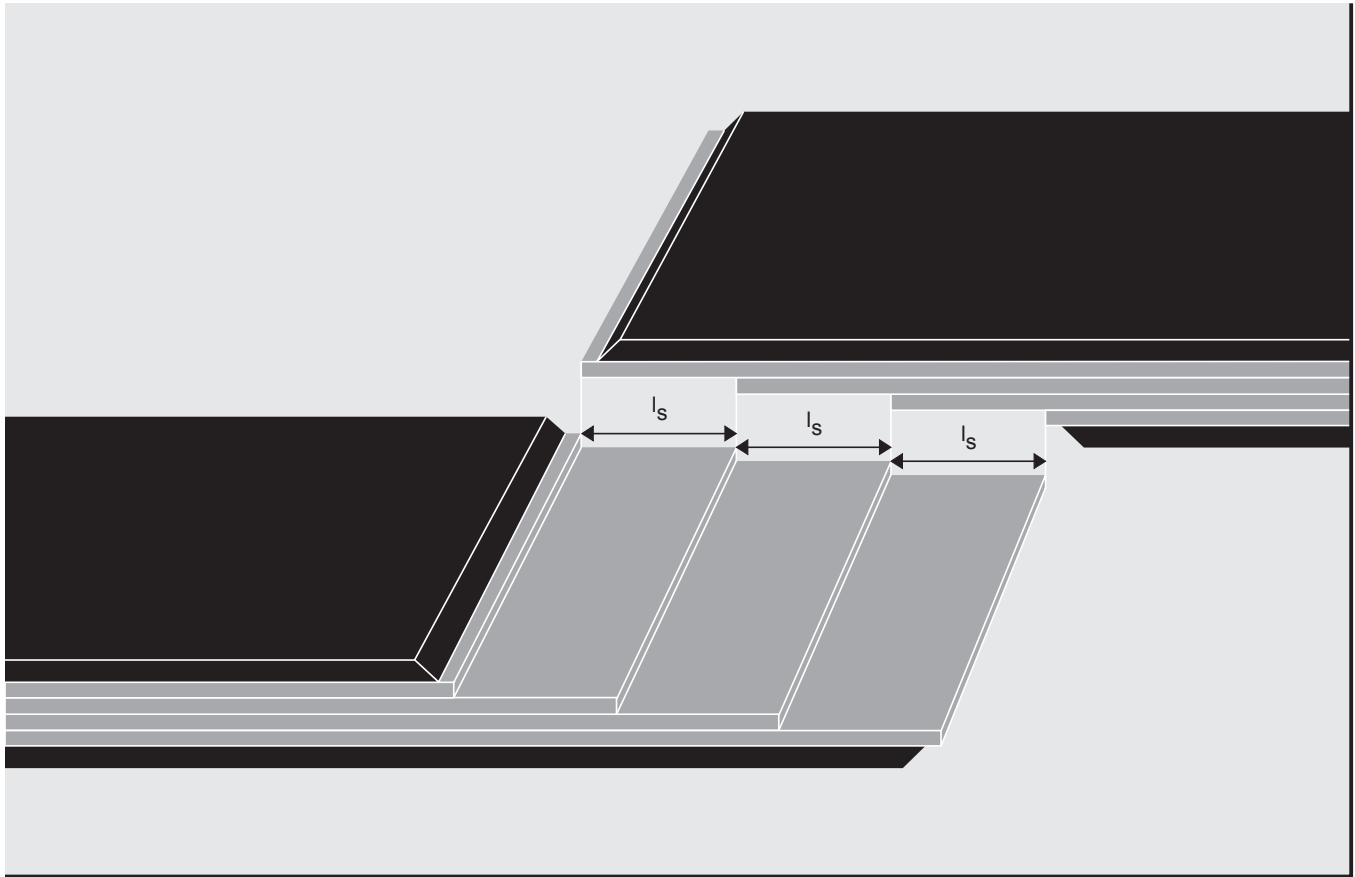
* These belt types can be spliced with both one step and / or two steps.

Systems and Dimensions of Cold Splices



Step splices

Splicing Process

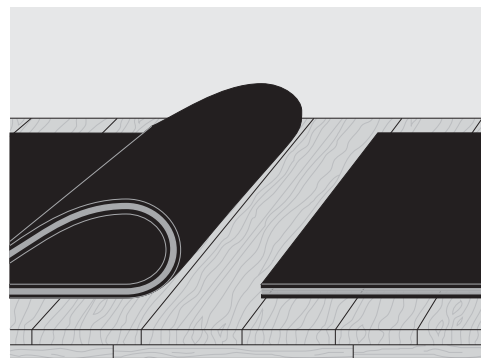


Overlap and step splice

General preparation

Provide tools, equipment and splicing products.

If a new belt is installed place a working table / platform on head or tail of the conveyor or in the conveyor construction (remove carrying idlers if necessary) in such a way that the belt lies on it even and straight without tension.



The working table / platform should be made of even and straight wooden boards, planks or beams.

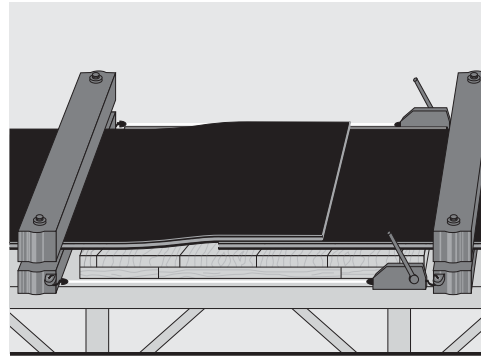
Splicing Process

The free belt ends (heads) should be secured with belt tensioners.

The belt ends must be pulled together until the belt is tensioned.

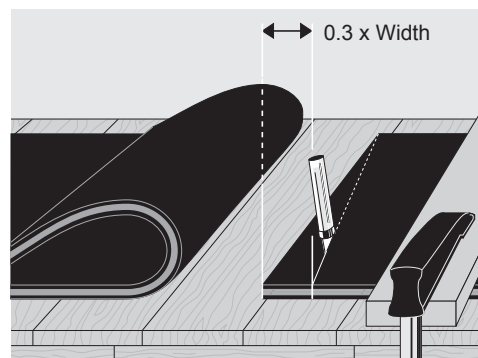
Furthermore, the belt ends must be exactly aligned and positioned so that they overlap minimum by splice length plus bias (lz).

The belt should be fixed / secured in this position.



Preparation of the lower part of the belt

1. Fold back upper belt part and make a bias cut on the lower part.

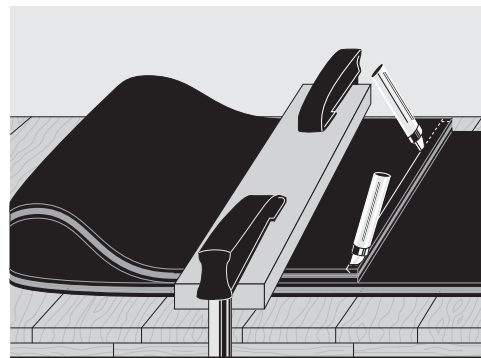


2. Fold back lower part and draw a line parallel to the bias cut on the pulley side, at $1\frac{1}{8}$ " from the belt end.

Also mark rubber edges which should be preserved.

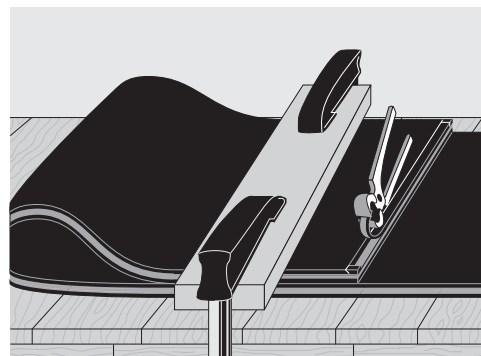
Cut belt cover along the line with a Don Carlos knife held at an angle of approx. 45° .

Cut belt cover along the marked rubber edges with the Don Carlos knife held vertically without damaging the top ply.



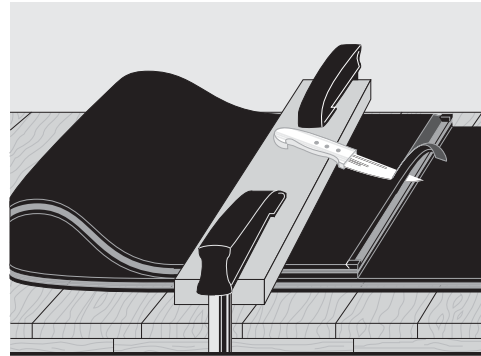
3. Strip rubber cover with pincers.

Cut rubber edges even with the upper fabric ply.

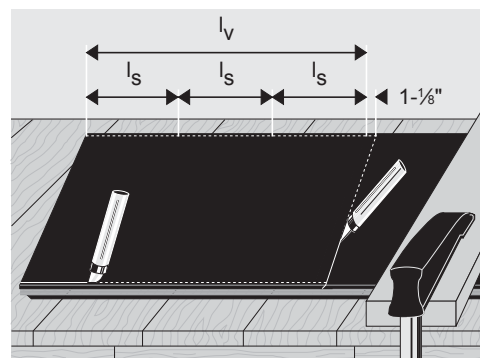


Splicing Process

4. Bevel rubber cover $1\text{-}\frac{1}{8}$ " parallel to the removed strip using a 6" knife.



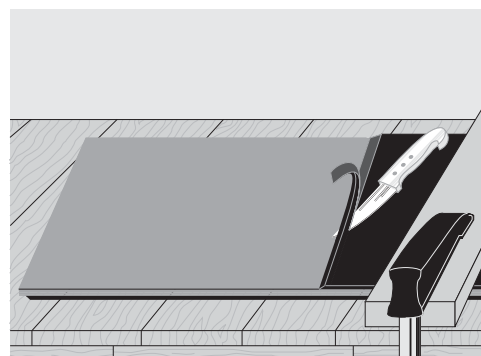
5. Fold back lower part again and mark splice length (l_v acc. to chart), step length (l_s) and rubber edges.
Draw another line $1\text{-}\frac{1}{8}$ " parallel to the splice length line.
Cut rubber cover along this line with a Don Carlos knife held at an angle of approx. 45° .
Also cut rubber edges with the Don Carlos knife held vertically without damaging the fabric plies



6. Cut rubber cover in narrow strips (approx. $\frac{3}{4}$ " – $1\text{-}\frac{1}{8}$ " wide) and pull off with pincers or grip tongs.
Cut rubber edges of the belt flush with off-set knife.

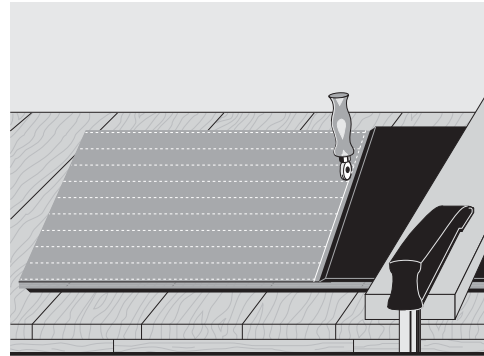


7. Bevel belt cover $1\text{-}\frac{1}{8}$ " wide with a 6" knife.



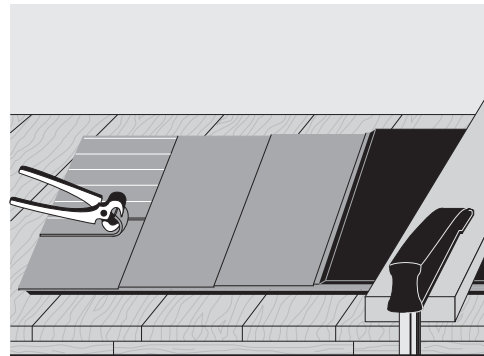
Splicing Process

8. Cut upper fabric ply $1\frac{1}{8}$ " from the rubber cover with a ply knife and pull off with pincers.



9. Mark the subsequent fabric plies according to the step length (ls), cut and pull off.

The last fabric ply must be retained.

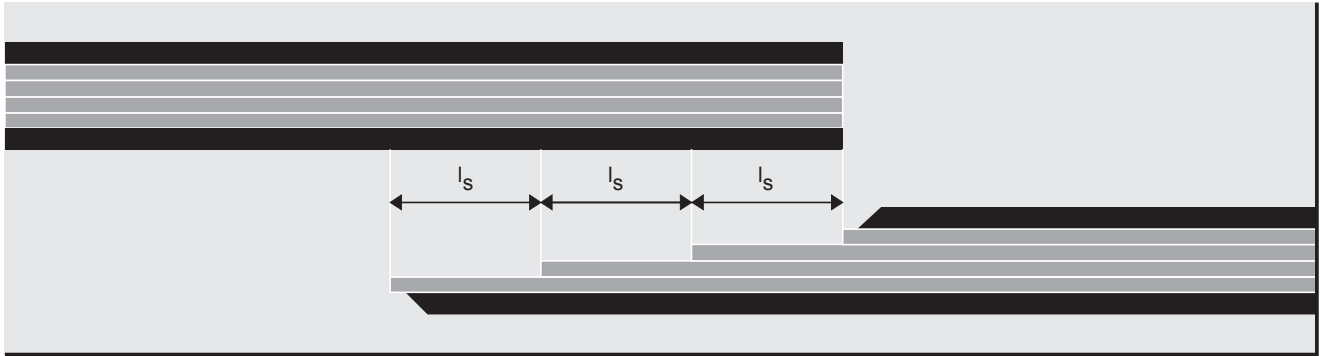


10. Cut the rubber edges of the belt flush with each fabric ply.

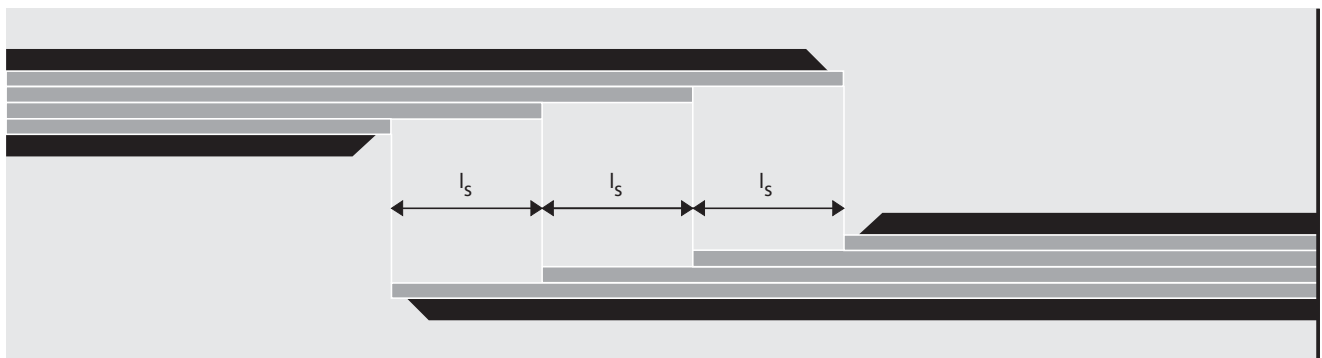
Splicing Process

Preparation of the upper part of the belt

1. Superimpose the belt ends ensuring correct alignment. Secure both parts to avoid dislocation (e.g. with clamps).
Transfer the edge of the top fabric ply of the lower part to the upper part – for the bias cut.
Exactly transfer fabric steps of lower part to upper part. Marking should be made with a marking crayon or by cutting small notches at both edges of the belt.



2. Carry out bias cut on upper part.
3. Draw a line on the carrying side 1-1/8" from bias cut.
Mark rubber edges also.
Cut the rubber cover along the 1-1/8" line with a Don Carlos knife held at an angle of approx. 45°.
Do not damage top fabric ply!
Also cut the marked rubber edges with the Don Carlos knife held vertically.
Pull off rubber cover with pincers and cut rubber edges flush.
Bevel rubber cover 1-1/8" parallel to the removed strip using a 6" knife.
4. Proceed on the pulley side as instructed for the carrying side of the lower part of the belt (step down fabric plies, cut rubber edges flush, bevel rubber cover).
5. Control:
Join both belt ends and check if the joints and the fabric steps are matching exactly to each other.
Rectify if necessary.
Moreover, it must be ensured that the edges of both belt ends are correctly aligned.



Splicing Process

Joining of the splice

1. Carefully buff bevelled edges of the rubber covers and the surface of the rubber edges with a buffing tool (e.g. rotating wire brush).

Buff intermediate rubber and buff even any high spots.

When buffing avoid shiny spots and scorching of the rubber.

Break edge of fabric steps without damaging the fabric ply (e.g. protect with a thin tin plate).

Remove buffing dust with a clean, dry brush.

2. Thoroughly mix cement with hardener.

Important:

This mixture must be used within 2 hours (potlife).

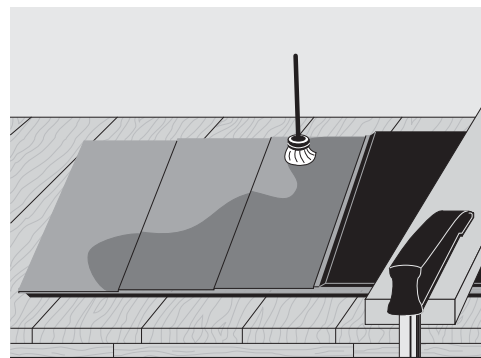
Observe working and safety instructions!

3. Coat the whole splicing area and the joint gaps of both belt ends with cement / hardener mixture (use a brush with short bristles).

Allow first coat to dry completely (min. 30 minutes).

The second coat must be allowed to dry only until it is still slightly tacky (check with back of finger).

In case of overdrying apply another coat.



For fabric with coarse surface structure see below.

Fabric plies with coarse surface texture:

In such cases 3 coats of cement / hardener mixture have to be applied.

Alternatively and in order to increase the initial bonding strength, it is recommended to use the CN Bonding Rubber 0.5 mm (528 5208) as follows:

- Apply a coat of cement / hardener mixture to the whole splice area and the joint gaps of both belt ends and allow to dry completely (min. 30 minutes).
- Then apply another coat of cement / hardener mixture to the lower belt end and one coat to the exposed side of the CN bonding rubber and allow to dry until these coats are still slightly tacky (check with back of finger).
- Apply the CN bonding rubber with the coated side onto the lower belt end and stitch on from the centre outwards without trapping air. Remove protective foil from the CN bonding rubber.
- Apply another coat of cement / hardener mixture to the upper belt end and one coat to the CN bonding rubber and allow to dry until these coats are still slightly tacky (check with back of finger).
- In case of overdrying apply another coat of cement / hardener mixture.

Splicing Process

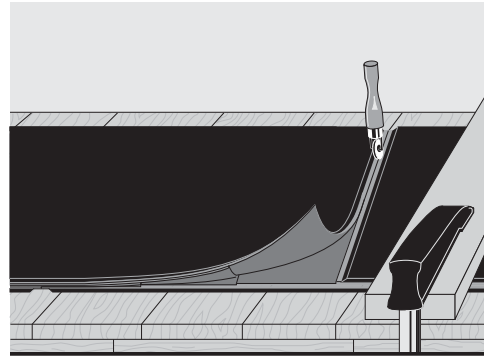
4. Align and superimpose lower part and upper part of the belt without trapping air.

Splice areas must match to each other exactly.

Never overlap fabric ply edges.

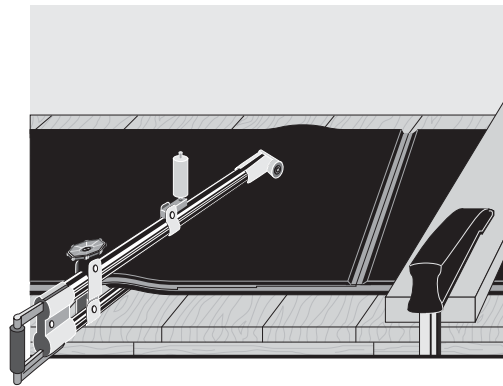
Stitch on or press on complete splice area from center outwards.

Stich on the edges and joint gaps with a narrow stitcher ($\frac{1}{8}$ ").



5. Then stitch on the splice area using the double acting roller with its pressure screw tightened lightly at first.

Repeat this operation several times with the pressure screw fully tightened.



Splicing Process

Filling and covering the joint gaps

1. Coat once the joint gaps with cement / hardener mixture and allow to dry completely (min. 30 minutes).

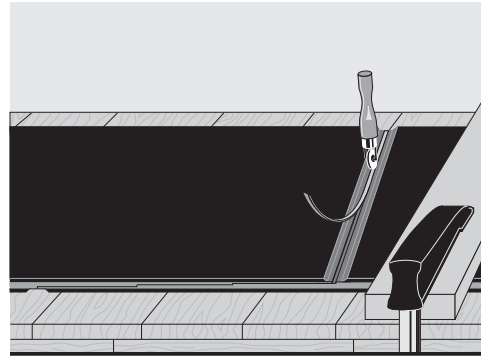
2. If necessary fill any gaps in the joint area with CN filler rubber.

Cut to size suitable pieces of filler rubber and coat joint gaps and filler rubber with cement / hardener mixture.

Allow this coat to dry until it is still slightly tacky (check with back of finger).

Apply filler rubber and stitch on.

In case of thick rubber covers laminate filler rubber until max. 2 mm below belt surface to ensure that the cover strip (1.5 mm thick) is approx. 0.5 mm below belt surface.



3. Coat the joint gap with cement / hardener mixture.

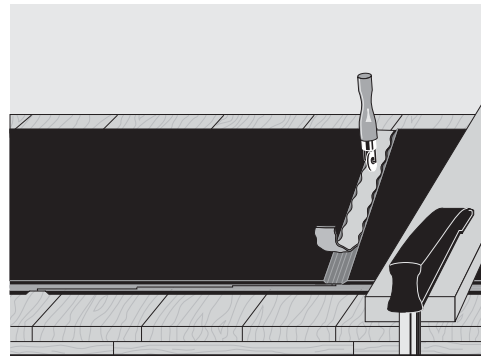
Remove protective foil on cover strip.

Coat the bonding layer of the cover strip with cement / hardener mixture.

Allow these coats to dry until they are still slightly tacky (check with back of finger).

Apply cover strip without trapping air.

First stitch on lightly with the wide stitcher and then firmly with the narrow stitcher from the centre outwards.



4. Repeat above operation for second splice gap.

REMA TIP TOP Product & Solutions

CONVEYING SOLUTIONS

Pulley Lagging

- PERFORMANCE GRIP 70
- REMAGRIP
- REMAGRIP Ceramic Lagging
- UNIGRIP
- UNILAG
- T-REX

Belt Cleaners

- REMACLEAN - T-Bar Scrapers
- REMACLEAN - Green Combi
- REMACLEAN - Grey Combi
- REMACLEAN - Cleaning Brush

Skirting

- REMASKIRT
- Combi-Skirt
- T-REX
- UNISKIRT

Repair Products

- Repair Patches
- Repair Strips
- REMA GOO
- RG 7000
- T-2 Repair System

Other

- Conveyor Belting
- REMACLEAT
- Edge Wall
- Impact Slider Bed Bars
- REMAMILL
- REMASCREEN

Rollers & Pulleys

- REMASLEEVE
- REMAROLL
- REMATRACK

WEAR & CORROSION PROTECTION

Wear Protection Lining

- REMA Performance Line
- REMALINE
- REMASTAR
- UNILINE
- REMATHAN
- T-REX

Rubber Linings

- CHEMOLINE
- CHEMONIT

Heavy Wear Protection

- REMALOX
- REMALOX HD
- KG Bars
- ZP Profile Bars
- REMA WEAR Repair

Anticaking

- REMAFLOX
- REMALEN
- REMASLIDE

Corrosion Coatings & Linings

- COROFLAKE
- COROGARD
- COROFLOOR
- TOPLINE
- RCC LININGS
- COROFLEX

Material Handling Hose

- Fixed Flange
- Split or Swivel Flange
- Cut End Hose

ADHESIVES & SOLUTIONS

Cements & Adhesives

- SC 2000 Black / White
- SC 4000 Black / White
- BC 3004 Blue Cement
- PC-4 Plastic Cement

Solutions

- PR 200 Metal Primer
- #13 Cleaning Solvent
- R50 Cleaning Solvent
- TIP TOP Hand Cleaner
- A&B Vulc Compound

Splice Kits

- Hot Splice Kits
- MSHA Splice Kits
- WK Press and Splice Material
- Filler Rubber
- CN Bonding Rubber

TOOLS & REPAIR

Tools

- Rubber Cut Saw
- Extruder Gun
- Vulcanizing Presses
- Combi Stripper
- Grooving Tool

Other

- REMAWRAP Pipe Repair
- OTR Tire Patches



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