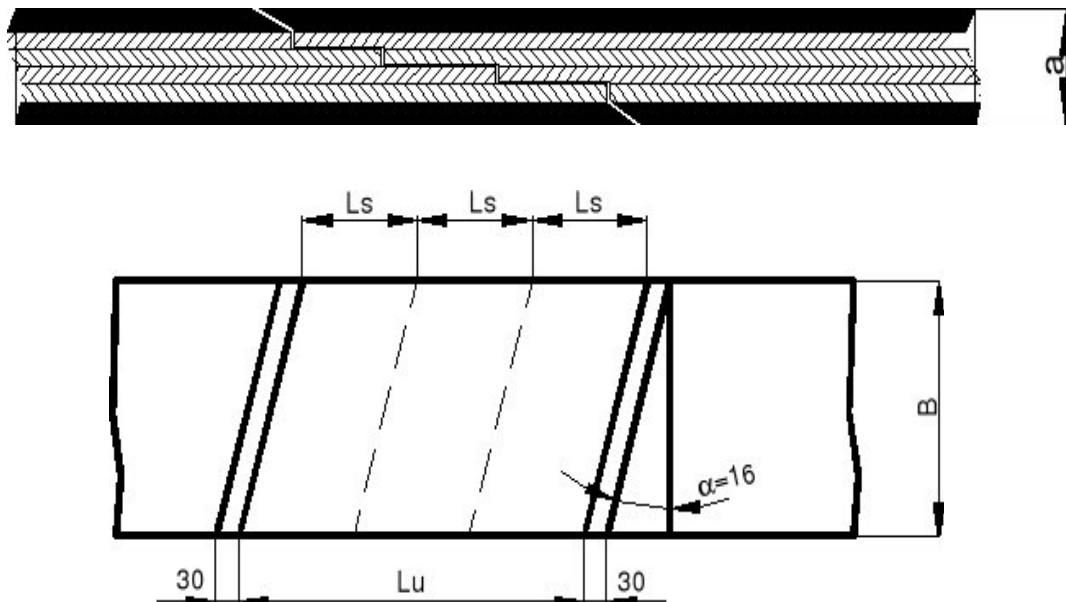


**UPUTSTVO ZA PRIPREMU I LEPLJENJE TRANSPORTNE TRAKE  
LEPILOM ELANIT SC 162**

## Spajanje gumeno-tekstilnih transportnih traka

Gumeno-tekstilna transportna traka je osnovni element transportnog sistema. Za dobro funkcionisanje transportnog sistema potrebno je obezbediti određene uslove. Jedan od najvažnijih je pravilno spajanje transportne trake. Na sl.1 je prikazana skica sastava na gumeno-tekstilnoj transportnoj traci:



Slika 1

Transportna traka je izložena složenim silama naprezanja (smicanje, istezanje, savijanje...) u toku rada. Urađeni spoj sva ta naprezanja može izdržati pod uslovom da se sve operacije pripreme i lepljenja trake urade pravilno.

**- Izrada sastava**

Da bi sastav bio kvalitetan neophodno je uraditi sledeće operacije:

- odrediti dužinu spoja
- ne sme se oštetiti osnova platna
- brušenje treba izvršiti tako da kontaktne površine budu ravne (skida se gumeni sloj do platna ali tako da ne dode do oštećenja platna. Na taj način se obezbeđuje da lepilo prodre u strukturu platna i povećava adhezijska sila između kontaktnih površina).
- Izvršiti kontrolu uklapanja gornjeg i donjeg dela trake
- Površine koje se lepe moraju biti čiste i suve
- Priprema, nanošenje i sušenje lepila moraju biti urađeni prema uputstvu za upotrebu lepila

## Dužina spoja

Dužina spoja se određuje zavisno od prekidne jačine i broja platna u transportnoj traci.

Broj stepenika se određuje po obrascu:

$$N = n - 1$$

N – broj stepenika

n – broj uložaka

Ukupna dužina preklopa trake se određuje po obrascu:

$$L = 0,3B + nls + lk$$

0,3 B – dužina dodatka za kosinu

n – broj stepenika

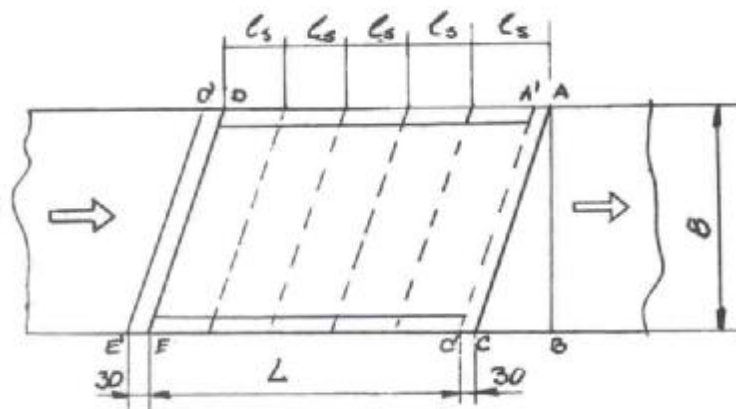
ls – dužina stepenika

lk – širina završnih kosina

## -Izrada spoja

Traka se postavlja tako da gornji deo trake pokazuje smer kretanja trake, odnosno gornji deo trake se uvek kreće prema pogonskoj stanici.

## - Obeležavanje donjeg dela trake (slika 2 )



Slika 2

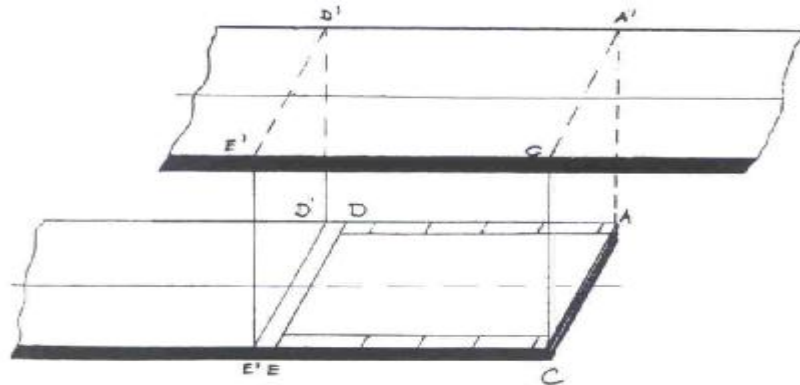
Na kraju trake označiti tačke A, B, i C. Dužina BC iznosi 0,3B (B – širina trake). Spojiti tačke A i C i po liniji AC preseći traku. Zatim obeležiti ukupnu dužinu spoja (tačke D i E).

Tačkama , A',C', D' i E' obeležiti širinu kosina paralelno sa kosim rezom. Posle toga je potrebno obeležiti sve stepenice na spoju i zaseći sve obeležene tačke na rubovima trake.

Na kraju je potrebno obeležiti sredinu trake na dužini od 4-5 m jer širine gornjeg i donjeg dela trake nisu iste.

### - Obeležavanje gornjeg dela trake

Preklopiti gornji preko donjeg dela trake i obeležiti sredinu trake na gornjem delu (slika3)



Slika 3

Sa obeleženog donjeg dela trake preneti sve mere na gornji deo.

### - Otvaranje spoja

Obeležiti liniju celom dužinom spoja duž ivice trake sa obe strane za širinu zaštitnih gumenih ivica. Duž te linije zaseći gumu i jedno platno. Nož držati pod uglom od  $45^\circ$  prema ivici trake.

Otvaranje sastava počinje iz tačke D i E. Kod prvog stepenika se skida gumena obloga sa jednim platnom uz pomoć stolarskih klešta, noža, žabastih klešta ili električnog vitla. Kod pripreme svakog sledećeg stepenika se skida po jedno platno. Presecanje platna treba izvršiti pažljivo da ne bi došlo do oštećenja ili presecanja platna koje ostaje na traci. Posle pripreme svih stepenika prelazi se na obradu zaštitnih ivica gornje i donje završne kosine uz korišćenje noža od 150 mm. Sve operacije pri otvaranju spoja su iste i za gornji i za donji deo trake.

### - Brušenje sastava

Brušenje sastava se vrši rotirajućom okruglom žičanom četkom. Brušenjem se skida guma koja je ostala na platnu prilikom otvaranja. Platno se u toku brušenja ne sme oštetiti ili pregreјati.

Brušenje se vrši niz osnovu da se ne bi oštetila osnova. Takođe je potrebno izvršiti i brušenje zaštitnih ivica trake kao i obe kosine. Ostaci posle brušenja se otklanjaju četkom.

### - Kontrola spoja

Kontrola se vrši preklapanjem gornjeg preko donjeg dela trake i proverom da li su stepenice na pravom mestu na oba dela trake. Sredine traka se takođe moraju poklapati. Ako je traka pravilno pripremljena potrebno je nožem obeležiti četiri kontrolne tačke po širini trake na početku i završetku spoja, kao i dve kontrolne tačke po kosini spoja iznad gornje kosine.

### - Sušenje

Sušenje trake je neophodno u slučaju da je oštećena zaštitna bočna guma na traci tako da se vide platna da bi se odstranila vlaga iz platna. Za sušenje trake se koriste haube. Sadržaj vlage u platnu ne sme biti veći od 20%. Temperatura platna ne sme prelaziti  $110^\circ\text{C}$ .



### - Čišćenje nosećeg platna na sastavu

Pre nanošenja lepila potrebno je izvršiti čišćenje ostatka pri brušenju četkom upotrebom sredstava za čišćenje Čistilo SC. Čišćenje se vrši od sredine prema krajevima trake.

### - Priprema lepila

Lepilu se pre upotrebe dodaje 5% Utvrđivača SC i dobro promeša drvenim ili metalnim štapićem ili se zatvorena dozna mučka oko 5 min. Ovako pripremljeno lepilo upotrebljivo je 2 h.

### - Nanošenje lepila

Na gumu i tkaninu treba naneti tri sloja pripremljenog lepila. Prvi sloj se suši 10 min. Drugi sloj se suši oko 30 min. Treći sloj treba sušiti do stepena kada je "lepljiv na dodir" (15-20 min). U slučaju da se treći sloj presuši neophodno je naneti još jedan sloj. Kod lepljenja gume na metal, lepilo se nanosi u dva sloja preko prajmera za metal (Prajmer SC) na metalu i na gumi. Prvi sloj se suši 30 min, a drugi sloj od 10 do 20 min. Slepiti površine i snažno ih pritisnuti presom ili valjcima. Za valjkaste površine se preporučuje gumeni čekić minimalne težine 0,5 kg kojim se gumena površina "izudara" od sredine ka krajevima tako da se otisci čekića preklapaju kako ne bi došlo do blokiranja vazduha. Radni uslovi: temperatura okoline od 20-30°C, temperatura lepila 20-30°C.

### -Centriranje

Pre spajanja trake se vrši centriranje uz korišćenje pocinkovanih cevi od 12 mm koje moraju biti duže 300 mm od širine trake. Cevi se koriste da ne bi došlo do slepljivanja premazanih površina pre nego što se izvrši kontrola. Centriranje se vrši preklapanjem gornjeg preko donjeg dela trake proverom kontrolnih tačaka. Sve kontrolne tačke na oba dela trake se moraju preklapati.

### - Spajanje gornjeg i donjeg dela trake

Spajanje se vrši tako što se najpre izvrši lepljenje gornje završne kosine korišćenjem ručnog valjka. Posle toga se lepi svaki sledeći stepenik. Lepljenje se vrši od sredine trake prema bočnim ivicama da ne bi ostao blokiran vazduh u sastavu, uz stalnu proveru preklapanja kontrolnih tačaka. Spajanje se završava lepljenjem donje završne kosine.

### - Rolovanje sastava

Zalepljene površine se roluju dvostrukim rolačem četiri puta. Posebno treba obratiti pažnju na ivice trake i završne kosine. Rolovanje se vrši od sredine prema ivici trake bez ostavljanja prostora koji nije rolovan. Prvi put se rolovanje vrši uz lagani pritisak, da bi se za svako sledeće rolovanje pritisak povećavao pomoću zavrtnja na dvostrukom rolaču. Kod trećeg rolovanja pritisak bi trebalo da bude oko 70 kp/cm<sup>2</sup>.

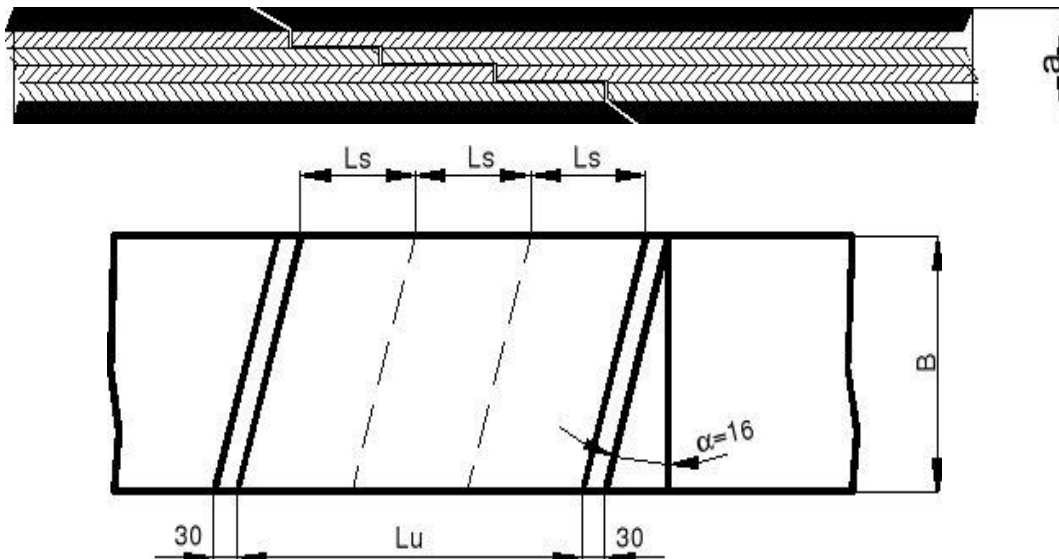
### - Završna obrada sastava

Završna obrada ivica traka vrši se odsecanjem viška trake, tako da se gornji i donji deo trake preklapaju. Obrada završne gornje kosine vrši se odsecanjem viška gumene obloge, tako da površina gornje kosine bude u istoj ravni sa površinom trake. Nakon 1 h traka se još jednom izroluje i može da se pusti u pogon!

## Instruction for preparation and bonding of the conveyor belt with ELANIT SC 162 adhesive

### Bonding of rubber- textile conveyor belts

Rubber-textile conveyor belt is the basic element of the transportation system. For good functioning of the transportation system, adequate conditions need to be provided. One of the most important is proper bonding of the conveyor belt. In picture one, we have shown the sketch of the rubber-textile conveyor belt composition:



Picture 1

Conveyor belt is exposed to complex tension forces (shearing, stretching, bending...) during work. Bond must be strong enough to withstand all that forces, but only if the preparation, applying of the adhesive and bonding is done properly.

### - Making of the composition

In order to make quality composition, it is necessary to proceed following operations:

- Determine the length of the composition
- Surface of the textile mustn't be damaged
- Grinding should be done carefully, so the both surfaces are smooth (take of the rubber part up to textile, so the textile is not damaged. In that way you ensure the adhesive penetrates into textile structure, and increases adhesion force between contact surfaces).
- Do the control of upper and lower part of the belt fitting
- Surfaces must be dry and clean Preparation, applying, and drying of the adhesive must be done according to the Instruction for u

### Length of the composition

Length of the composition is determined by strength and number of textiles in conveyor belt.

Number of steps is calculated according to this formula:

$$N = n - 1$$

N – no. of steps

n – no. of pads

Total length of the belt folding is calculated according to this formula:

$$L = 0,3B + nls + lk$$

0.3 B – length of extras for steep

n – no. of stairs

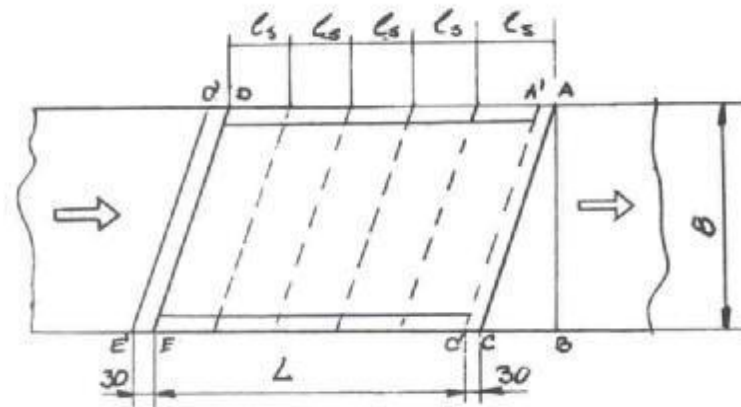
ls – length of stairs

lk – width of ending parts

#### -Making of bond

Put the upper part of the belt to a moving direction, or towards the operating station.

#### - Marking of the lower part of the conveyor belt (picture 2)



Picture 2

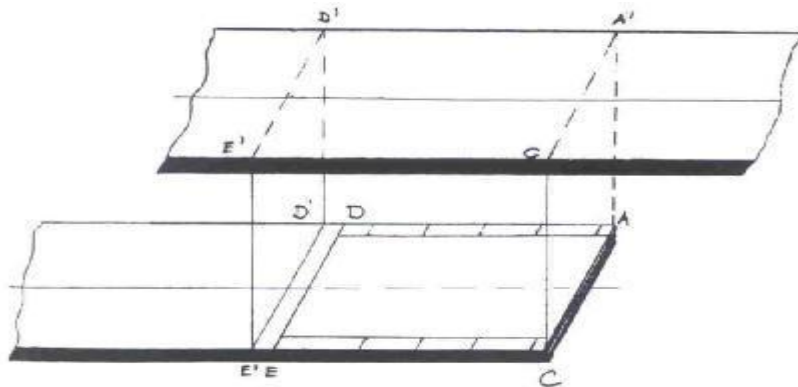
At the end of the belt mark dots A, B, and C. Length BC is 0.3B (B – width of the belt). Connect dots A and C and cut the belt over line AC. Then, mark the total length of the bond (dots D and E).

Mark with dots, A', C', D' and E' width of slopes, parallel to slope cut. Then mark all stairs on the bonds, cut all the dots marked on the edges of the belt.

At the end, mark the middle of the belt at the length of 4-5 m because widths of upper and lower parts are not the same.

### - Marking of the lower part of the conveyor belt

Fold the upper over lower part of the belt and mark the middle of the belt on upper part (picture 3)



Picture 3

Transfer all the measures marked on lower part on upper part.

### - Opening the bond

Mark the line on the whole length along the edge of the belt, on both sides, width of protective rubber gloves. Cut the rubber along that line and one piece of textile. Hold the knife in the angle of 45° towards the edge of the belt.

Opening of the bond starts from dots D and E. At the first stair, you take of the rubber cover with one textile part using carpentry pliers, knife, or electrical screwdriver. When preparing each stair, take of one textile. Cutting of the textile should be done carefully, in order not to damage or cut of the textile that stays on the conveyor belt. After preparation of all stairs, do the processing of protective edges upper and lower slope using knife of 150 mm. All operation with opening the bond are the same for lower and upper part of the conveyor belt.

### - Grinding of the composition

Grinding of the composition is done by rotating round wire brush. By grinding, you take of the rubber left on the textile during opening. Textile shouldn't be damaged or overheated. It is also necessary to do the grinding of the edges as well as both slopes. Remains after the grinding should be removed with brush.

### - Bond control

Control is done by folding upper over lower part of the belt and check if the stairs are on the right place of the both parts of the conveyor belt. The middles of the belts must also overlap. If the belt is properly prepared, mark four control dots with knife, at the beginning, and end of the bond, as well as two control dots above upper slope.

### - Drying

Drying of the belt is necessary in case that the protective rubber is damaged, so that the textile is visible. For drying of the conveyor we use hot hoods. Moisture content mustn't be more than 20%. Temperature shouldn't be over 110°C.

**- Cleaning of the supporting textile on the composition**

Before applying the adhesive, it is necessary to clean the remains from grinding using Cleaner SC. Cleaning should be done from the middle to the ends of the conveyor.

**- Preparation of the adhesive**

Before using, 5% of the Hardener SC is added and mix well with wooden or metal stick, or shake in the closed package for 5 min. Such prepared adhesive is usable for 2 h.

**- Applying of the adhesive**

Three layers of the adhesive should be applied on rubber and textile. First layer dries for 10 min. Second layer dries for 30 min. Third layer should be dried until it is sticky to touch (15-20 min). In case the third layer is over dry, apply another layer. When bonding rubber to metal, adhesive should be applied in two layers over primer for metal (Primer SC) on metal and rubber. First layer dries for 30 min. Second layer dries for 10-20 min. Bond the surfaces, and press them with press or rollers. For roll surfaces we recommend rubber hammer of the minimal weight 0.5 kg, hit the surface from the middle to endings. Overlap the hits of the hammer in order not to block the air. Working conditions:: room temperature 20-30°C, adhesive temperature 20-30°C.

**-Centering**

Centering should be done before bonding, using 12 mm galvanized pipes that must be longer 300 mm than width of the conveyor. Pipes are used to prevent bonding of the surface before the control. Centering is done by folding upper over lower part of the conveyor checking control dots. All control dots on both parts must match.

**- Bonding of upper and lower part of the conveyor belt**

When bonding, first bond the upper ending slope using manual roller. After that, bond each stair, one by one. Bonding is done from the middle towards the edges to prevent air blocking. Constant checking of control dots is necessary. Bonding is finished with lower ending slope.

**- Rolling of the composition**

Bonded surfaces should be rolled with double roller four times. Pay attention to edges of the conveyor belt, and ending slopes. Rolling is done from the middle towards the edges, without leaving any space. First rolling is done with small pressure Next time increase the pressure, with screw bolt on double roller. With third rolling, pressure should be about 70 kp/ cm<sup>2</sup>.

**- Final finishing of the composition**

Final finishing is done by cutting the rest of the belt, so the upper and lower parts overlap. Finishing of the upper slope is done by cutting the rest of the rubber surface, so the surface of the upper slope is in the same level with conveyor belt surface. After one hour, when the conveyor belt is rolled once again, it can be put in operation!