



**DALMIA CEMENT (B) LIMITED - ARIYALUR**  
**MECHANICAL DEPARTMENT**



Issue No. 01	Rev. No: 03	Effective Date: 20.04.2018	SOP/MECH/41
Issued By: M.R		Approved By: HOD-Mechanical.	
BELT REPLACEMENT			

**SOP**

**Scope** : This SOP is applicable to Safe working for BELT REPLACEMENT

**Responsibility** : Section Engineer – Mech

**Accountability** : Section Engineer – Mech

**PPE:**

1. Helmet,
2. Safety shoe,
3. Hand Gloves
4. Safety goggles.
5. Nose mask.

**Tools:**

1. Chain block – 3nos
2. Wire rope sling – 6nos
3. D shackle – 4nos.
4. Buffing machine
5. Hot joint machine
6. Pull lift
7. Splicing pincer
8. Hot air blower
9. Mechanical clamps – 3sets
10. Wire brush

**Hazards:**

**Risks associated**

Body injury

Cut injury

**Mitigating Measures**

Safe and health tools and tackles

Safe and health tools and tackles

**Training needs:**

1. Emergency preparedness
2. Pneumatic wrench
3. Dismantling & Assembly procedure



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**Procedure:**

1. Use Proper PPE & tools
2. Take work permit from safety dept as per the work condition.
3. Check the tools working condition before start up the job.
4. Make the one side splicing of belt. (if required)
5. Take the position of belt roll on top of the conveyor with proper direction of joint.
6. Take the LOTO & after that Clamp the new belt with old belt.
7. Clear the LOTO of belt conveyor and take local operation with mushroom lock ,By On - Off take the position of the belt at joint location
- 8 . Take the LOTO of belt conveyor and lift take up with required length of belt With help of clamp lock the belt both carrying and return side
9. Belt joining position area idler and frame has to be remove
10. According to the belt grade/temperature/material handling to choose the belt joint type

**IF COLD JOINT - PROCEDURE**

- According to belt width splicing to be done
- Clean, Grinding the belt
- Over lap the both splicing end and check it
- After remove the over lap,Apply the belt joint solution for entire width
- After 10-15 min to check dryness the belt joint solution
- Over lap the belt and slow hammering has to be done



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- After 3 hrs curing time to remove the belt clamp at both carrying and return side

**IF HOT JOINT - PRECEDURE**

- UHR Belt joint both the end to be positioned and clamped
- Both the end splicing has to be done like that 250mm long in 3 step and In both of the end top and bottom 30mm long channel splicing has to be done.Grinding has to be done
- After splicing both end with steps has to be overlapped with 10mm
- After overlap , both splicing end has to be locked,
- Splicing area has to be cleaned with petrol.
- UHR Rubber solution has to be applied 2 coat on splicing area. Blower has to be applied
- UHR 710 T60 Skin compound has to be applied on splicing area.
- C2 for cover compound has to be applied on end channel.
- Both the end matching has to be done.
- Hot vulcanizing hydraulic machine has to be fixed.
- Switch on power and temp 40deg, oil pressure 100bar heating has to be done.
- Oil 180bar pressure, 150 deg temp has to be reached.
- Oil 300bar pressure, 155 deg temperature has to maintained in one hour.
- After one hour heating , stop the heating and maintain the pressure 300 bar
- Cooling has to be done and temperature has to be reached below 55deg.
- Hot vulcanizing hydraulic machine has to be dismantled.



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- Belt joint has to be checked for operation
- 11. Fix all the idler and frame.
- 12. Down the take up and required length
- 13. Remove the all tools and tackles from belt
- 14. Clear the LOTO, take local operation
- 15. By on- off condition remove the old belt with help of hydra
- 16. Take the no load trail and adjust the Belt if required
- 17. Remove the man and tools from work place
- 18. Close the Work permit and give clearance for operation

**Emergency / Emergency Shut OFF:**

1. If any injury takes place, provide First aid and inform to the Safety department or Call Emergency number 3108/9865152222

**Records/Annexure:**

1. Refer Line clearance in Process department.
2. JSA is enclosed below.

**JOB SAFETY ANALYSIS :( JSA)**



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<b>Job Safety Analysis</b>	Job: Belt replacement	Date: <b>01/09/2014</b>	Analysis by: Section Engineer	Analysis by: Section
Title of employee doing job: Site incharge	Supervisor: Section Engineer	Department: Mech	Section: LS CRUSHER	Approved by: HOD-Mechanical.
Req'd/recommended PPE: Safety Helmet, Safety shoe, Hand Gloves, Safety goggles. Nose mask.				
Sequence of Basic Job Steps	Potential Hazards	Recommended Safe Job Procedure	What Could Go Wrong	Corrective Action
Make the one side splicing	Body injury	Use proper tools for splicing the belt	Pull lift may slip and hit hands while splicing. pincher may slip / cut during load	Check the condition of the Pull lift / pincher and Dshackle
Rolling the new belt	Hand injury	Use trained persons to roll the belt	Fingers may caught inbetween the belt	Create awareness for persons
Lifting the belt to top of the old belt	Body injury	Use certified lifting tools / cranes only.	Lifting sling may damage	Check the condition of the sling, chainblock / crane load and swing angle and certification to use.
Take the position of belt roll on top of the conveyor with proper direction of joint.	Body injury	Use recommended tools only to avoid unsafe operation .	Hand or finger may caught in between	Check the condition of handgloves

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Clamp the new belt with old belt	Body injury	Use proper regulators and flashback arrestors only to ensure safe operation .	Hose burn, torch melting	Check the condition of regulators and flashback arrestors
	Burn injury	Use proper handgloves	Hand gloves may be in damage condition	Check the condition of handgloves
Positioning the belt	Hand injury or cut	Don't touch the belt while on/off time	Hand or fingure may caught in between	Operating person should ensure nobody was near to the belt
Remove the old belt	Cut injury	Use good knife to cut the belt.	Knife may be in damage condition	Check the condition of Knife
			It may scratch/ cut the fingure of the handling person/ other persons nearby	Operating person should ensure nobody was near to the old belt cutting area
Take the Line clearence	Body injury	Use work permit system.	Drive may run	Check the lockout & tagout system
Lifting the take up	Hand injury	Use good Chainblocks/slugs/ Dshackle to lift the take up.	Chainblocks/slugs/Dshackle may be in damage condition	Check the condition of lifting tools
	Fall down	Use proper mechanical safety belt.	Persons may slip down from the platform	Check safety belt and its condition
Remove the frame and idlers from joint area	Body injury	Use proper spanners only to avoid slip / shear of bolt and nut during removing.	Spanners may slip and hit hands while removing. bolt may shear / cut during load	Check the condition of the bolt / nut and spanner
Other end Splicing the belt	Body injury	Use proper tools for splicing the belt	Pull lift may slip and hit hands while splicing. pincher may slip / cut during load	Check the condition of the Pull lift / pincher and Dshackle
Clean, Grind & clean & join the belt joint	Body injury	Use certified buffing machines only to avoid unsafe operation.	Buffing disc may cut and hit hands while cleaning.	Check the condition of the buffing wheel / handle.
	Eye injury & Dust	Use safety goggles, nose mask and earplug	PPE may be damage condition	Check the condition of PPE
Cold joint	Hand injury	Use certified rollers to ensure safe operation	Hand or fingure may caught in between	Operating person should ensure nobody was near to rolling area



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Hot joint	Hand injury	Use good lifting clamps to position the machine	Clamps may be in damage condition	Check the condition of lifting clamps
	Electric shock	Use certified hot vulcanising machine only.	Powercable damage	Check the condition of the cable and certification to use.
	Burn injury	Use proper handgloves	Hand gloves may be in damage condition	Check the condition of handgloves
Fix the frame and idlers of joint area	Body injury	Use proper spanners only to avoid slip / shear of bolt and nut during fixing.	Spanners may slip and hit hands while opening. bolt may shear / cut during load	Check the condition of the bolt / nut and spanner
Removing the clamp	Body injury	Use proper spanners only to avoid slip / shear of bolt and nut during opening.	Spanners may slip and hit hands while opening. bolt may shear / cut during load	Check the condition of the bolt / nut and spanner
Releasing the take up	Hand injury	Use good Chainblocks/slides/Dshackle to down the take up.	Chainblocks/slides/Dshackle may be in damage condition	Check the condition of lifting tools
	Fall down	Use proper mechanical safety belt.	Persons may slip down from the platform	Check safety belt and its condition

SL No	Activity			Isolation Matrix for Utility & General Equipment.						
				Isolation Type						
				Electrical Energy				Other Energy		
6	Conveyor Belt Replacement	Name and Tag for the Equipment	Drive for the Equipment	Feeding Equipment.	Discharge equipment	Belt locking at both sides of the joint				