Glass Processing Technology
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Lecture - 66
Internal Process Loss

Now, let us understand lamination department rejections. Now, again simple two reasons, machines, simple two reasons, machine is not behaving properly or operator does not have the skill, and hence there are problems in processed glass.

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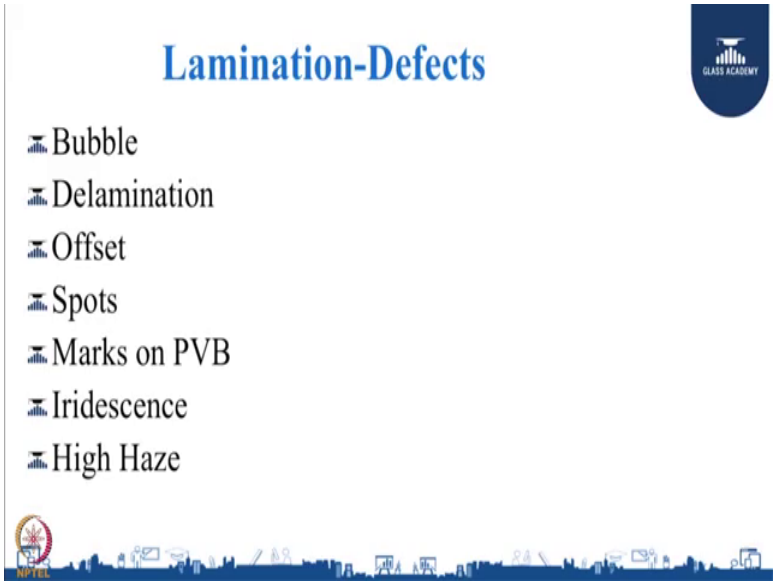

Now, what are the defects we observe? Bubbles, delamination, offset, spots, marks on PVB, iridescence, high haze.

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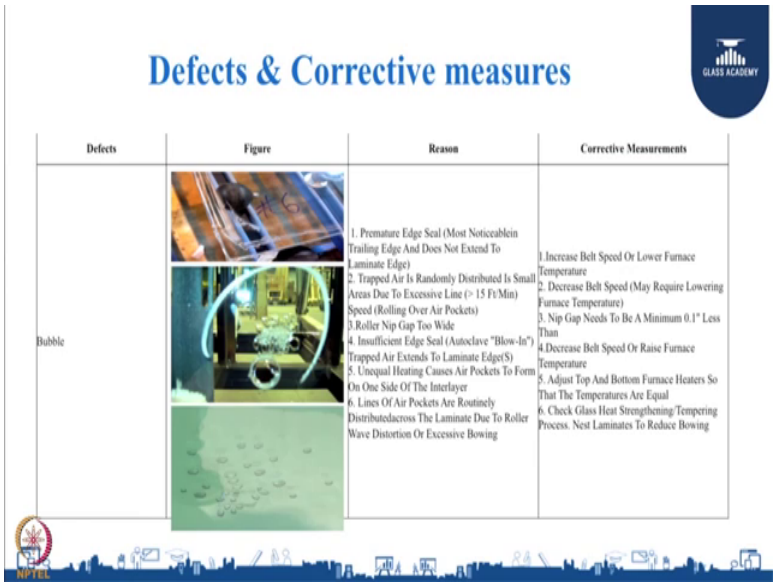

Now, we see defect as a bubbles in the glass. Premature edge seal most noticeable in trailing edge and does not extend to laminate edge. Trapped air is randomly distributed in small areas due to excessive line speed. Roller nip gap two wide. Insufficient edge seal trap air extends to laminate edges. Unequal heating causes air pockets to form on one side of the inter layer. Line of air pockets are routinely distributed across the laminate due to roller wave distortion of excessive bowing.

Corrective measures are very simple increase belt speed or lower furnace temperature. Decrease belt speed may require lowering furnace temperature. Nip gap needs to be a minimum 0.1 inches less than whatever. Decrease belt speed or raise furnace temperature. Adjust top and bottom furnace heater, so that the temperature are equal. Check glass heat strengthening tempering process, nest laminate to reduce bowing.

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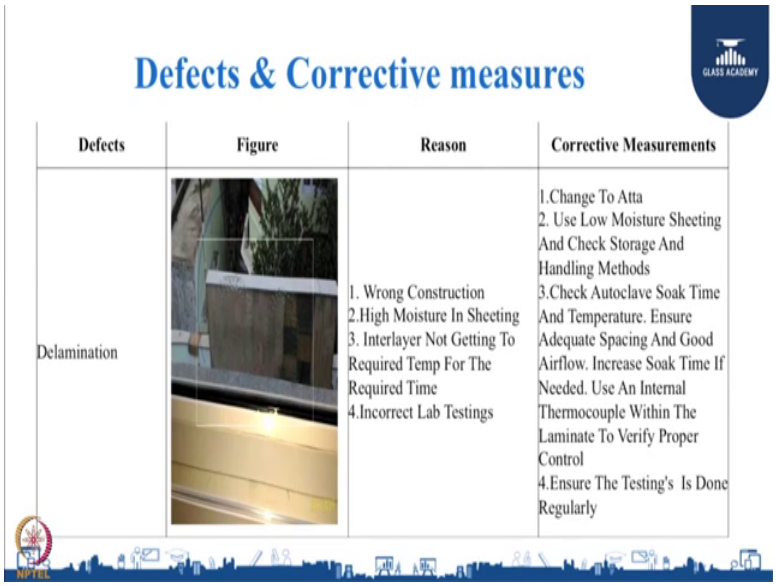

Delamination, reasons are very simple, wrong construction of glass, high moisture in setting, inter layer not getting to required temperature for the required time, incorrect lab testing. Change to Atta, use low moisture sheeting and check storage and handling method. Check autoclave soak time and temperature. Ensure adequate spacing and good air flow increase soak time if needed. Use an internal thermo couple within the laminate to verify proper control. Ensure the testing is done regularly.

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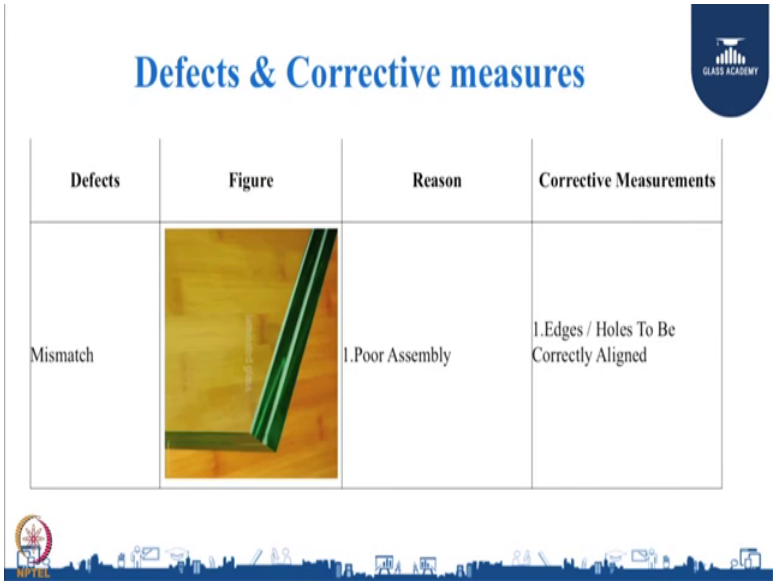

Mismatch, the reason is very simple, poor assembling. When two glasses are not properly assembled then mismatch will happen. Correction corrective actions are edges and hole to be correctly aligned, a simple method you can avoid mismatch.

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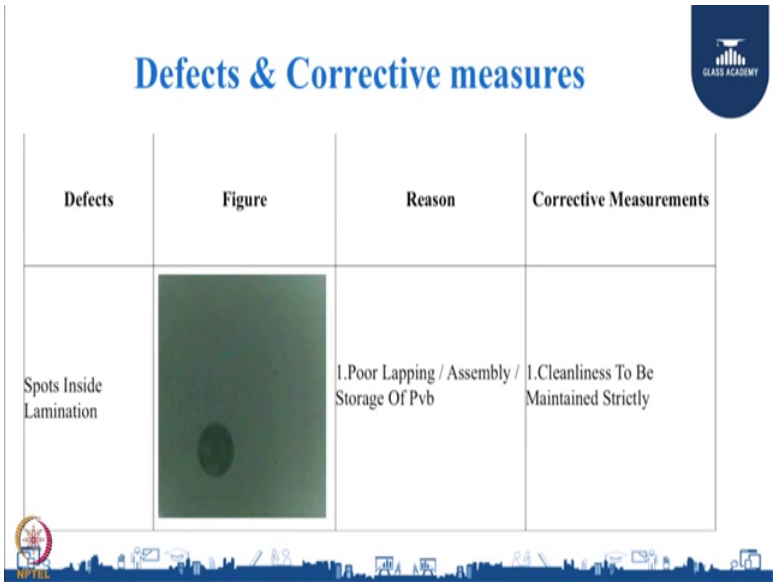

Spot inside lamination, reason is very simple, poor lapping assembly storage of PVB. Corrective action is cleanliness to be maintained strictly so a very simple reason.

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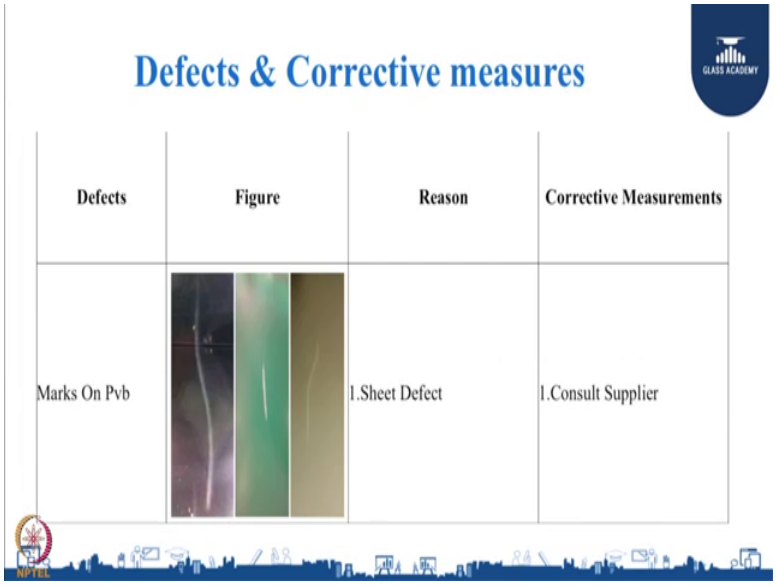

Marks on PVB, sheet may be defective, and you must consult supplier.

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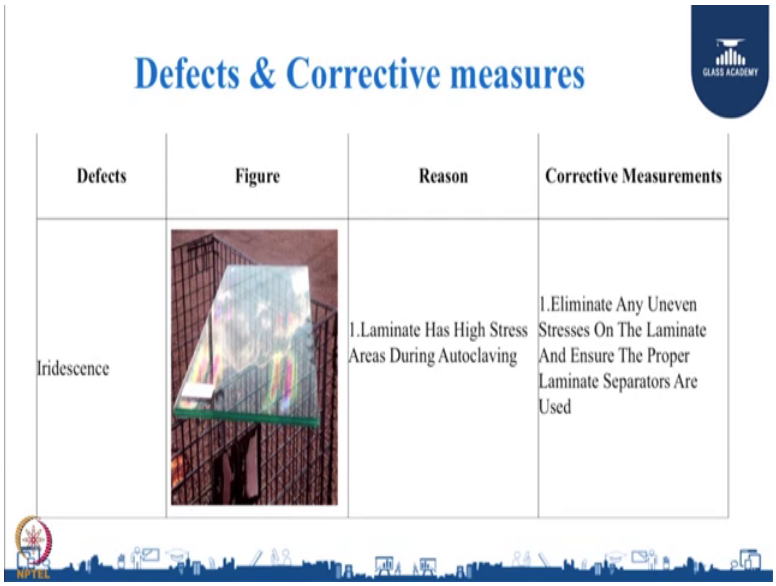

Iridescence, reason is laminate high glass stress area during autoclaving. Eliminate any uneven stress on the laminate and ensure the proper laminate separators are used.

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It is a general check list you must have to avoid lint, black spot, mismatch, slip, inter layer dirt, interlayer shortage bubbles. Quality of water to be checked; dust free glass after wash, lame room lake room should be always dust free, humidity should be maintained in 22 to 25 degree. Room temperature should be 20 to 25 Celsius; PVB to be

cut 3 to 4 mm excess then glass size. Use cap and apron while laying the PVB, edges to be cleaned after auto glave.

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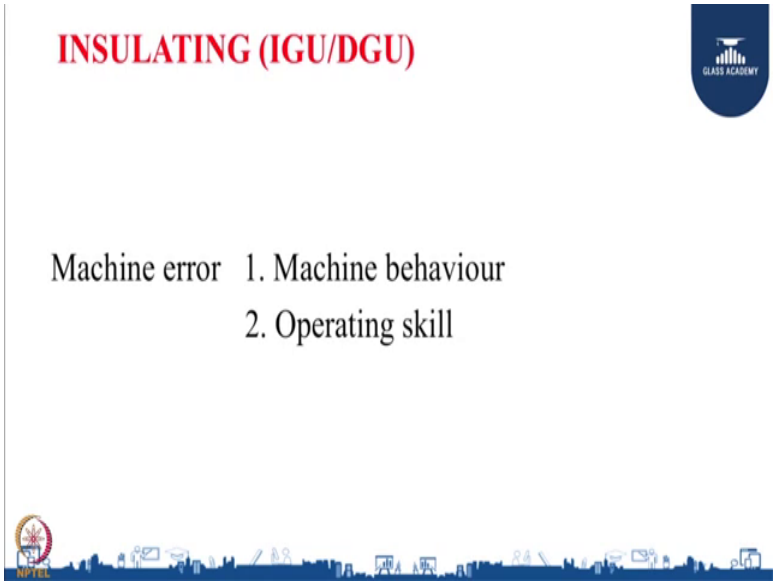

Now, let us discuss insulating that is IGU or DGU. Again reason is very simple machine behavior or operating skill is lacking.

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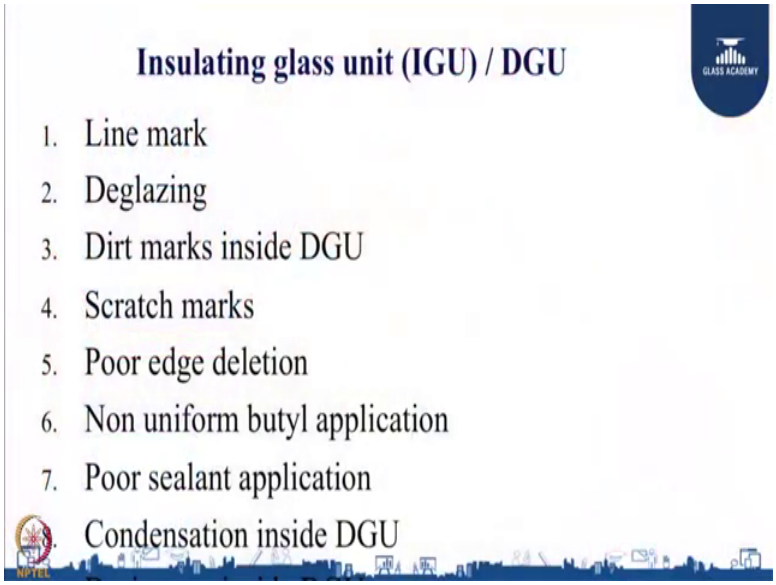

Now, what all the problems we observe in insulating glass unit. Line mark, deglazing, dirt marks inside DGU, scratches, poor edge deletion, non uniform butyl application,

poor sealant application, condensation inside DGU, these are the eight majorly observed problem in DGU.

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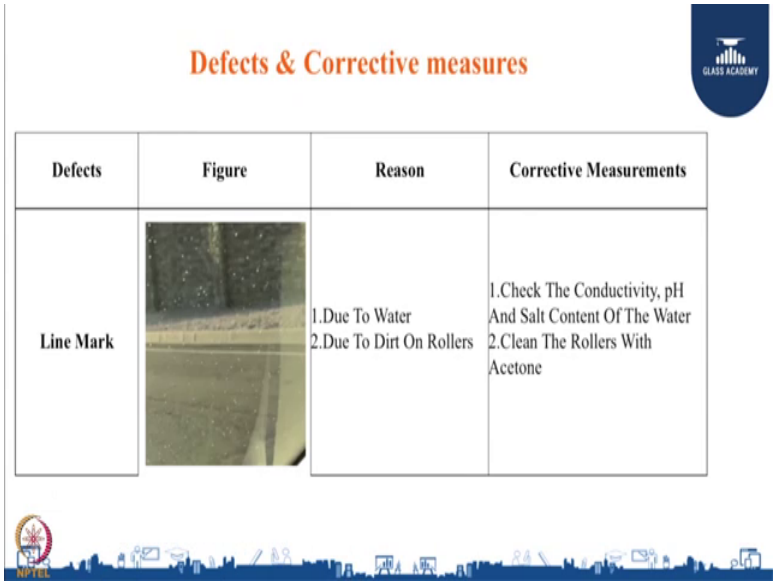

Now, let us understand one by one. Line mark, reason is very simple, quality of water or due to dirt on rollers. Corrective measure is check the conductivity, pH and salt content of the water; clean the rollers with acetone and you can avoid line mark.

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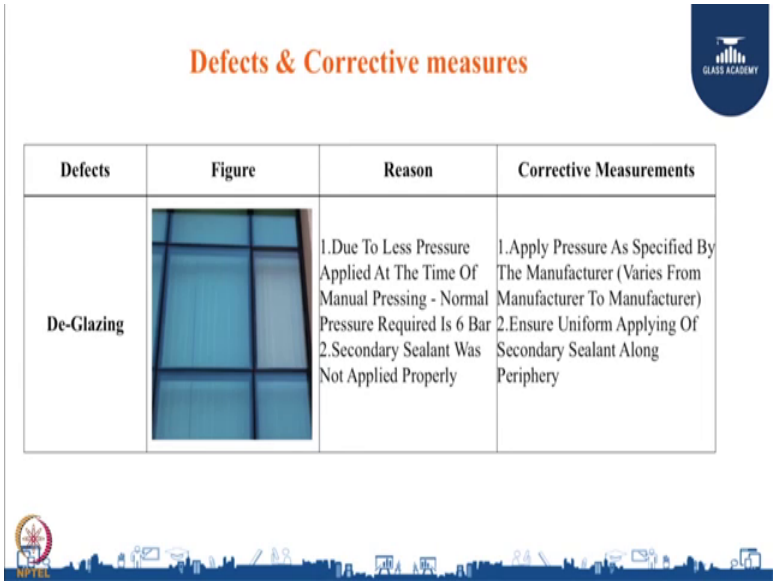

De-glazing, reason is due to less pressure applied at the time of manual pressing because normal pressure required is 6 bar, another is secondary sealant was not applied properly.

Corrective measure is apply pressure as specified by the manufacturer. Ensure uniform applying of secondary sealant along periphery area, and you can avoid de-glazing.

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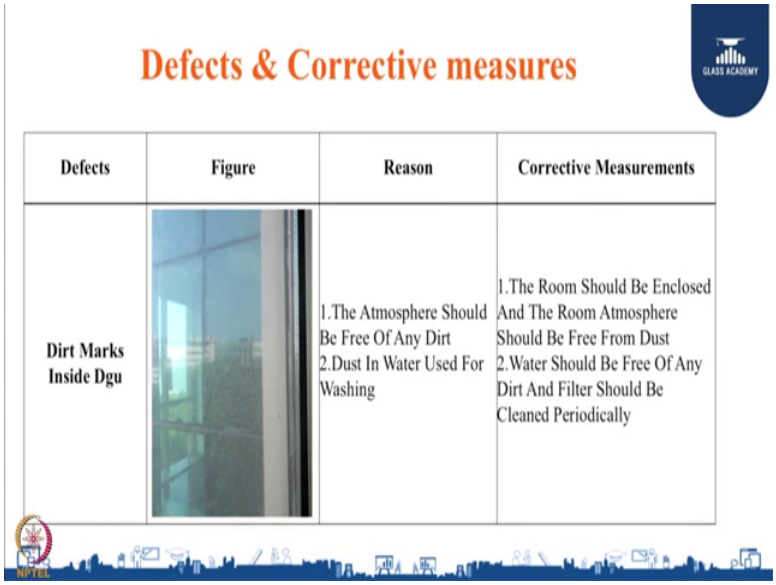

Dirt marks in repeat dirt marks inside unit, double glazing unit. Reason is the atmosphere should be free of any dirt, dust in water used for washing. Corrective measure is the room should be enclosed and the room atmosphere should be free from dust. Second is water should be free of any dirt and filter should be cleaned periodically.

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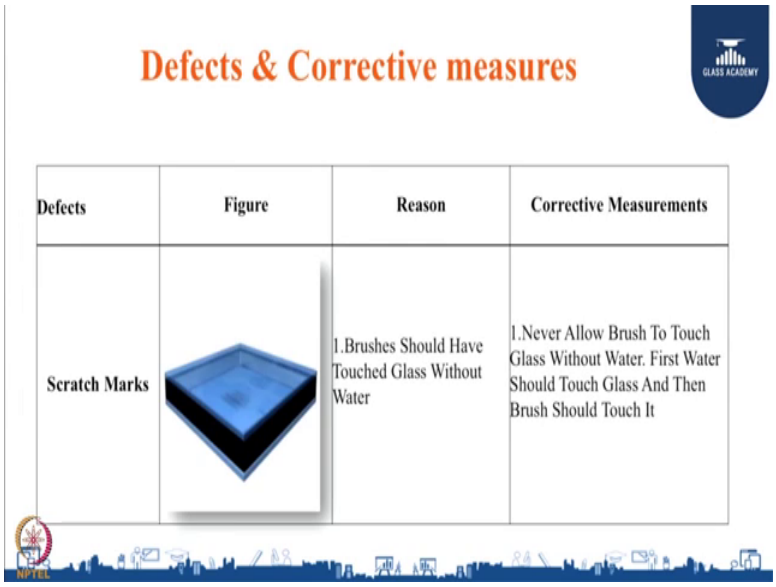

Scratch markers, scratch marks, reason could be brushes should have touched glass without water. Corrective action is never allow brush to touch glass without water. First water should touch glass and then brush should touch the glass and you can avoid scratch marks.

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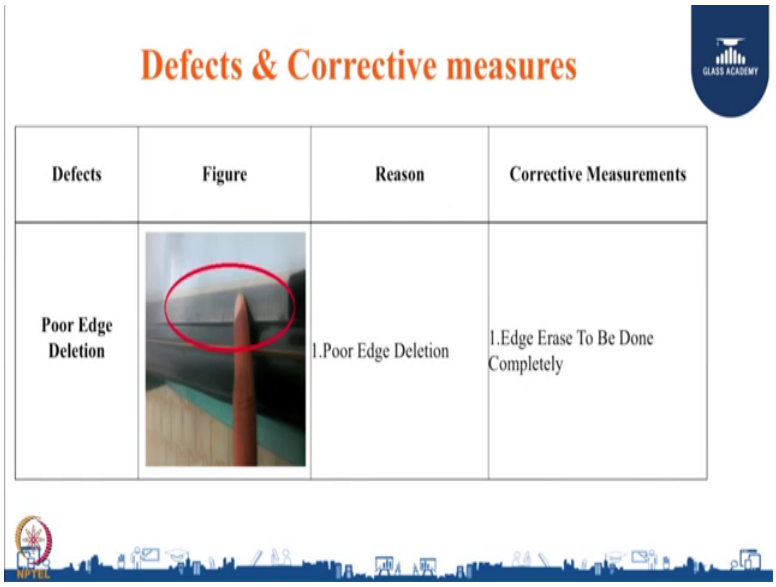

Poor edge deletion, while deleting the coating at the edge, it has been not done properly. Corrective measure is take proper care while erasing coating at the edge.

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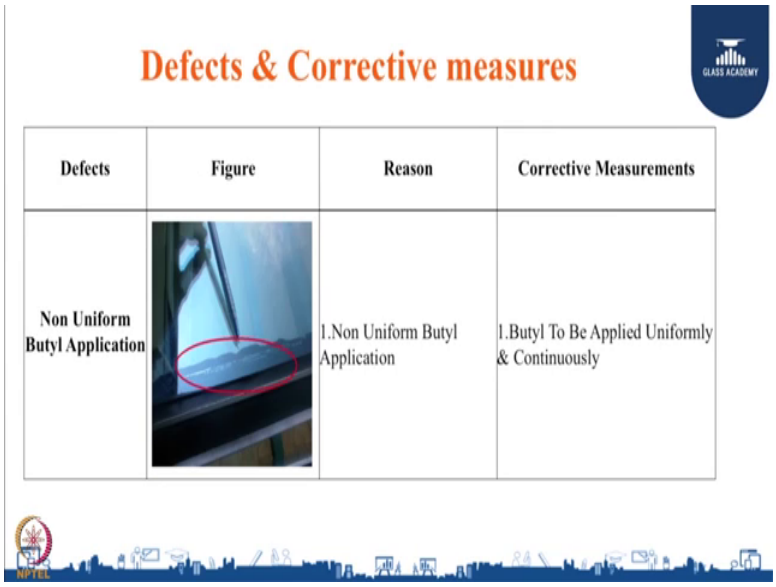

Non uniform butyl application, the reason is person is not checked properly. And the corrective measure is butyl to be applied uniformly and continuously, and you can avoid non uniformity of butyl.

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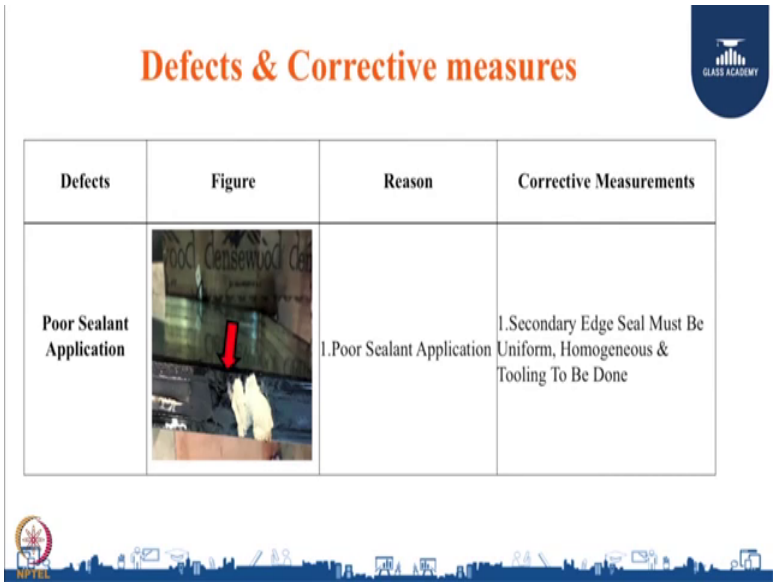

Poor sealant application, reason is simple, negligence. Corrective action is secondary edge seal must be uniform, homogenous and tooling to be done.

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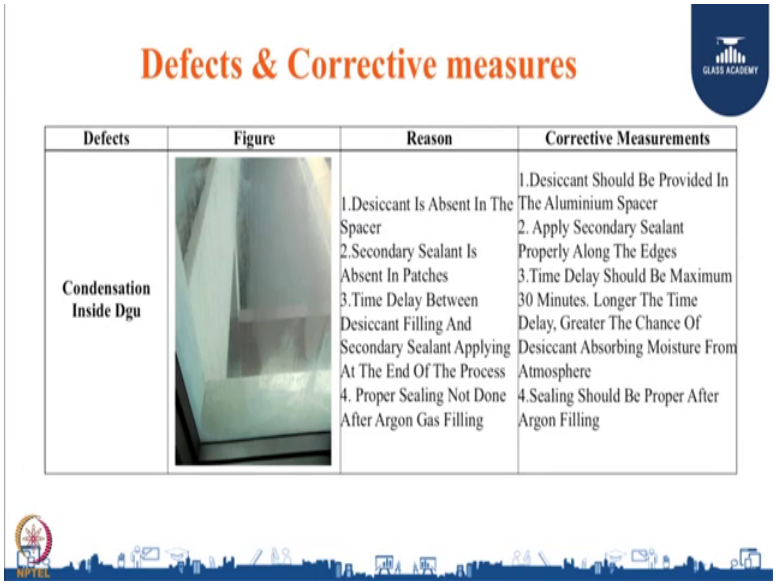

Condensation in inside DGU, desiccant is absent in the spacer, secondary sealant is absent in the patches, time delay between desiccant filling and secondary sealant

applying at the end of the process, proper sealing not done after argon gas filling. Corrective action is desiccant should be provided in the aluminium spacer apply secondary sealant properly along the edges, time delay should be maximum 30 minutes. Longer the time delay greater the chance of desiccant absorbing moisture from atmosphere. Sealing should be proper after argon filling. Desiccant inside edges reason is avoid punching directly, corrective action is during air gas filling make sure punched air is less than desiccant dia.

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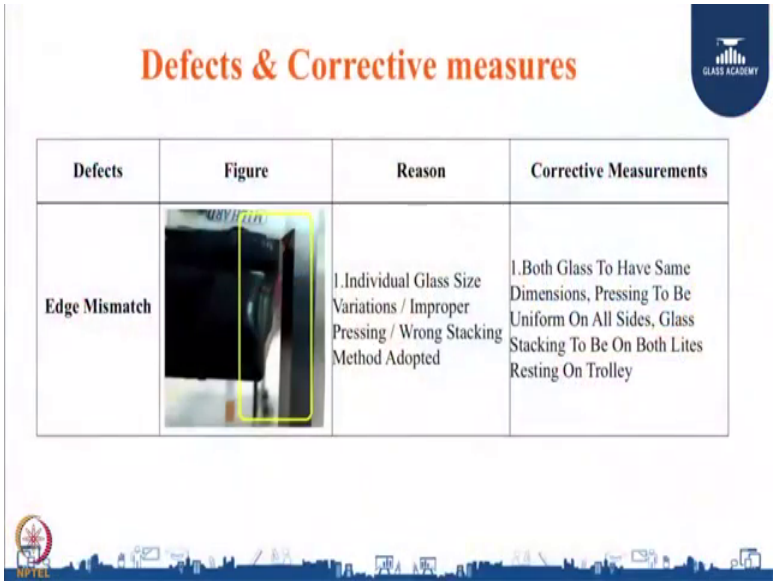

Edge mismatch, individual glass size variation, improper pressing, wrong stacking. Corrective action is both glasses to have same dimension, pressing to be uniform on all sides, glass stacking to be on both lites resting on trolleys.

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A small sop can be made for checking before doing the processing. Quality of water to be checked; dust free glass after wash; butyl to be uniform in the spacer; check the position of coater glass; dust free glass before pressing silicon is applied uniformly; ensure proper drying of silicon; clean the glass before dispatch. These are the few measures and corrective actions if you take you can avoid internal rejections and breakages. Handling is a major issue and one need a proper training to handle the glass. And another area is operating skill which is again a cause for rejections. So, glass handling as well as operating skill both are very important to avoid rejections in processing industry.

Thank you.

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