

Glass Processing Technology
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Lecture - 47
Insulating Glass Unit (Process and Lab Tests)

This is a double glazing unit, where we are going to join the two glasses with the airspace. By doing this we are getting insulation: insulation with respect to heat, insulation with respect to light, insulation with respect to sound thereby giving energy saving aspects also to the glass. So, what the process goes?

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First we are loading the glass if it is a low e product we will be doing edge deletion. The purpose of edge deletion is the entry to protect the glass coatings from external environment. Now, the glass is loaded into the table.

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You see how the glass is taking. So, everywhere we have glass handlers and glass section cups.

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So, the glass has been kept on the edge deletion table.

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Now, it is going to (Refer Time: 02:00) everywhere it is sensor; if this glass goes that glass comes.

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Now, he is loading the partner glass.

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Now, if you see the first glass is going inside the washing. Now you see the glass is coming, now this is going for edge deletion. The purpose of doing edge deletion is to protect the coating surface from external environment. So, thereby there is no oxidation in the field later on stages; you see here as all the four sides the coating is getting removed. The amount of coating getting removed is known as a bite.

The calculation of bite is done based on three factor basically, first one is ripple load acting on the glass, self weight or dead load acting on the glass and thermal dilatation.

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That is why you see here the setting of the edge deletion has been done.

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Now, this is how the glass will look after the edge deletion, this is how the glass will look after the edge deletion. So, edge is getting removed. So, it is looking like clear glass. So, that there is no reaction with the external environment. All four sides you can see the edge is deleted coating.

Next is the glass is going into washing section; next is the glass is going into washing section take the take you; take from here from here you cannot take try. I think they are not going to remove you take from here, that is the partner glass they are not going to remove.

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Now, the glass is getting washed in the washing machine once the glass is edge (Refer Time: 09:19) erased (Refer Time: 10:19).

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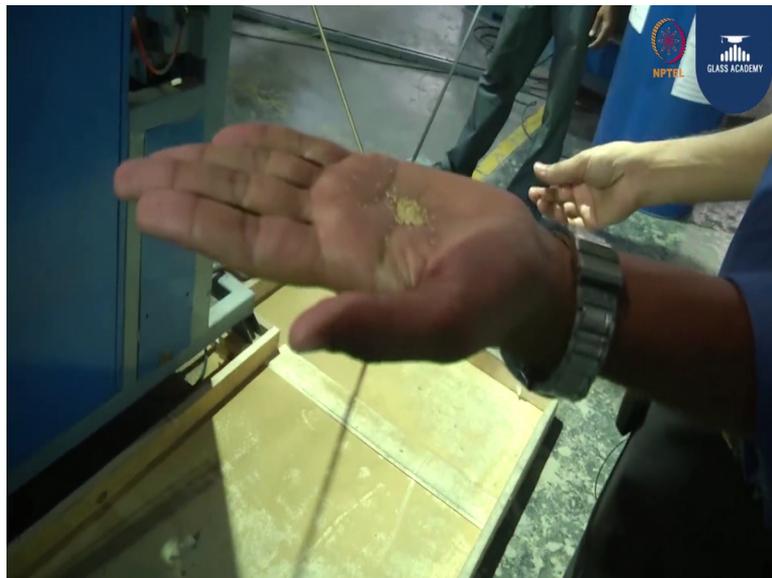
Once the glass washing is done, it is come into assembly section; it is come into assembly section desiccant filling. Show video.

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This is this is known as aluminium frame, where they are going to fill inside this spacer with desiccant; the desiccants will look like this.

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The desiccants will look like this these are small granules, which will absorb the moisture once the DGU is assembled. Now, you see now inside the frame he is filling with desiccants.

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First they are going to drill the frame, then we are going to keep desiccants.

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You see. So, for this edge they have drilled here, for this edge they have drilled here. Now they are going to fill with butyl now in the similar way they are going to do other side also done. Completed.

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Already they have filled with desiccant these are all this is known as bendable spacer and it is a black spacer. You can see a colour; it is the black spacer and the desiccants if at all any condensation through these holes the desiccants are going to absorb the moisture. If you see there are holes in the spacer, there are holes in the spacer and through these holes. (Refer Time: 12:46) If you see there are holes on the spacer, and through these holes. The desiccants are going to absorb the moisture is a known as a 12 mm black anodize the spacer, butyl application slow-slow remove.

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Now, they are going to apply primary sealant to the spacer this is known as polyisobutylene.

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So, this is working at 135 degrees temperature, melting point and now he is applying butyl to the frame.

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You can see butyl is coming out from here through the extruder, you can see on the spacer. Now butyl is applied. So, like this they are going to apply the butyl on all four sides of the frame, and we need to make sure that a minimum of 2.7 gram is applied on each surface of the butyl frame.

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Now, this is the place, where they are going to hang these spacers.

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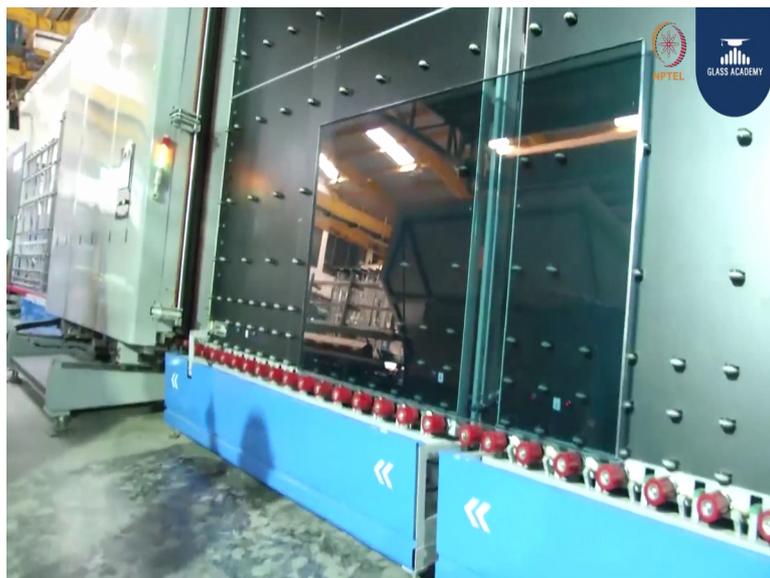
Now, they are going to do assembly; you can see here now the frame applied with the butyl they are going to stick to the glass.

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Wherever they have done edge deletion in that area, they are going to apply this spacer.

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Now, this is going for the pressing section, already the one glass is one partner glass is inside the press machine, now they are going to send the second glass also.

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Now, it is going for pressing.

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Now, it is going for pressing, already came this is how the glass will look.

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You need to be fast it will come fastly. [FL] In the meantime, we will take this spacer bending come (Refer Time: 17:29) [FL].

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Now, this is the spacer rack. So, this is the spacer rack where they are going to place the spacer.

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And this is the spacer bending machine; spacer bending machine now you can see these are spacer bending machine, where the glass is spacer is going to be get bend.

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This is the connector where they are going to join the spacer endings.

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Now, you see the spacer is getting bend with this spacer bending machine, and wherever there is a joint with the help of this connector, they are going to join the two spacer joints [FL].

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Now, he is going to join the two spacers.

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This is how it is going to look; this is the bendable spacer machine we call. Now that goes for desiccant filling next butyl application next assembly next pressing come; this joint now.

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This is how the glass will look; now the first glass is coming.

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Now, it is getting served in the press machine, the second glass is going to enter the second glass is going to enter there they are going to do assembly, that is the framework they are going to apply.

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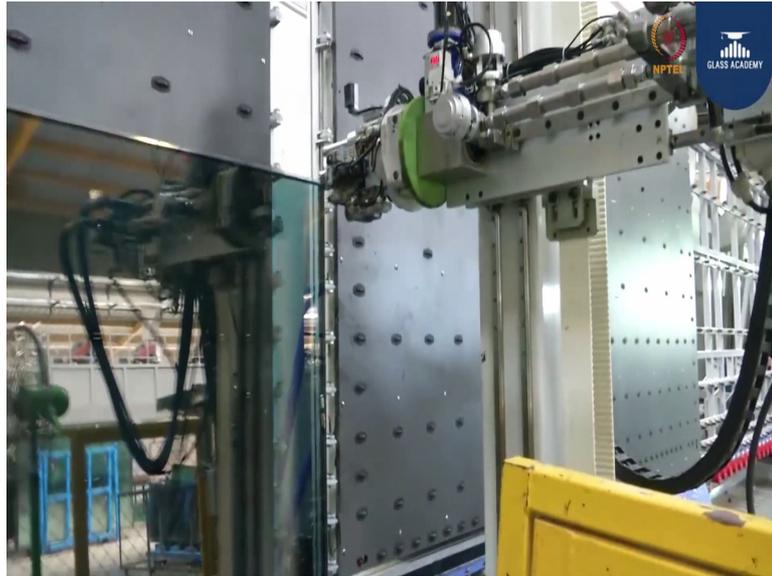
Now, you can see he is applying the spacer frame to the glass, now the partner glass is coming for assembly and pressing.

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This is how a glass is going to look after pressing.

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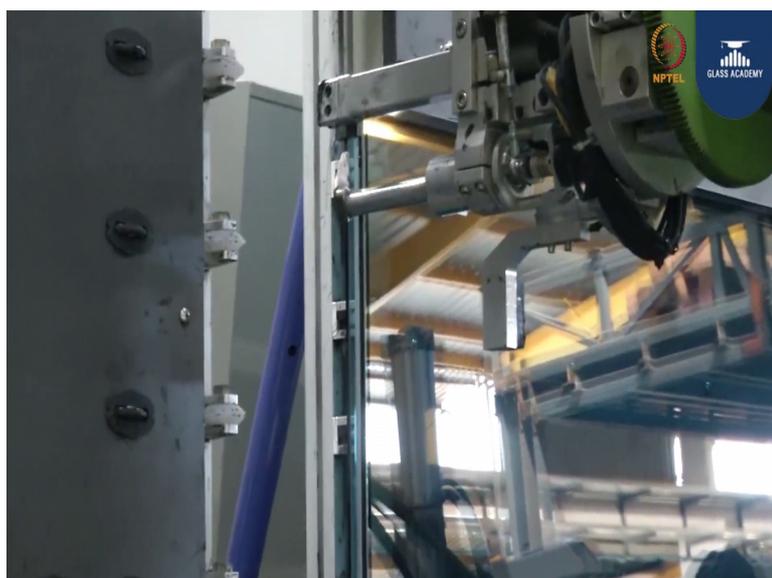
Now, it is going for secondary sealing.

Here or next.

Here this section come, come.

Now, it is going for secondary sealing, now with the help of robot it is getting filled. So, the secondary sealing is done here with the help of robot, that is the silicone two pot silicone we are using.

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The silicone will give structural strengthened glass. It will bind the mechanical properties

of the glass, it will give structural strength, with respect to wind load, dead load and thermal dilatation.

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So, once the pasting is done tooling edges tooling will be done; next it goes for curing. This is how a DGU glass will look alike after the process.

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Now, once if you see the silicone is a rubber material, which requires a curing. So, now, it goes first side, side keep side.

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Now, once the pasting is done, it is ready for curing. It requires minimum 3 and half to 4 hours for curing and in order to acquire the adhesion, it requires 24 hours of time. Now, he is doing the tooling work.

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Now, the glass is going for curing.

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He is doing the corner tooling work paper, butterfly pot life first; come now these glasses are ready for curing.

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It requires minimum 3 and half to 4 hours for curing, and once the curing is done it requires bonding. Bonding will be done with respect to glass and frame after 24 hours. So, before dispatch we need to make sure along with the curing adhesion is also there.