Glass Processing Technology
Prof. Ramesh Kumar Chouhan
Department of Civil Engineering
Indian Institute of Technology, Madras

Lecture - 64
Internal Process Loss

Hello everyone I am Ramesh Kumar Chouhan from Fuso Glass India Private Limited, we have 3 plants, one in Chennai, Hyderabad and third in Mumbai. Well, friends today I will be discussing on Internal Process Loss.

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The biggest challenge in processing industry is processing loss, which we need to understand, what is processing loss? Rejections or breakages while processing glass well, how do you control or address this challenge, understand first what are the reasons of rejections are breakages while processing the glass.

There are majorly 3 reasons, one is human error, second machine error and third is raw material quality. Now friends let us understand one by one, human error one is negligence and second is it could be lack of skill. Machine error it could be machine behavior or it depends on operating skills; raw material, before processing the glass and after processing the glass.

Now let us discuss first human error as I said negligence and second is lack of skill. The major problem in the glass industry is rejection due to chip. Now why does it happen? And how do we avoid this? We must use tools as per the thickness of glass.

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In point number one; you can see the different tools available over there where in you have to select the tool as per the glass thickness. Second glass should not collide with each other. Now, if you look at in photo number 2 you can see here the 2 glass when its collides a small chip occurs over there and that it becomes their problem in quality; customer will not accept if glass is having any chip at the corner. So, you have to be very careful while handling the glass, 2 glasses should not collide on the table because it will create chip.

Third rubber pad on trolley should be in good condition, if you observe in this trolley there are rubber pads. Now, after a rigorous use of this trolleys rubbers gets damaged and then glass can touch the iron plate of the trolley. So, you should be very careful while unloading the glass on the trolley.

Fourth is glass should not touch the metal frame of trolley, exactly what I have been telling is while unloading the glass you should be very careful that glass should not touch any iron part. Because, the glass is very soft and if you touch the iron steel or something it is bound to create a chip and that will not be acceptable under a quality norms.

Fifth while loading glass on trolley stacking should be proper, what does it mean, when you are loading the glass it has to be loaded accordingly and keeping the space in between the glass and without touching the glass you have to load the glass. Point number 6, use separators in between the glass, when you are stacking the glass on the trolley the corner side of the glass it should have a separator. So, that chip will not happen and glass can be kept on the trolley properly.

7, load glass only as per capacity of trolley; now this is again a very important factor because there is a trolley and you are bound to put all the glasses available on the trolley forgetting that the strength of trolley can take only 1 ton or one and half ton. So, you should be very careful while unloading the glass on the trolley and glass should be loaded only as per the capacity of trolley.

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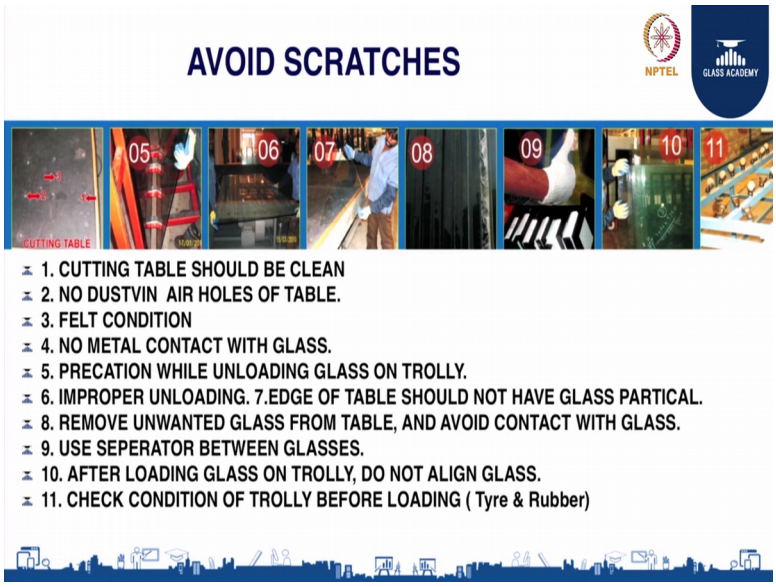

The second major issue is scratches, how do we avoid the scratches? Now, the very first point is that always cutting table should be clean neat and clean, you should clean air holes and there should not be any dust in the holes. I will show you this is the table and there are certain holes; if you can look at over here these are the holes, these holes will have certain dust inside. So, you have to blow the dust out and then make sure that the table is clean so, that glass does not attract to any scratches. Felt condition, the condition of felt it should not be toned out or damaged in damaged condition, it should have a total clean and felt should be good of good quality.

Fourth point is no metal contact with the glass, when you unload the glass you should be very careful that it does not touch any iron particle or iron part on the table, you should be careful while unloading the glass of the trolley. Because, as I earlier said that rubbers on the trolley should be of good quality and while unloading the glass it should not touch the iron part of the trolley.

Now the sixth point is improper unloading, now you can see in the photo that always loading should be in a proper condition. If you must check that you know glasses while unloading the glass the sizes of glasses matters, you should not unload the glass if behind small size of glasses are there. So, first you should load always bigger glass and then small sizes. 7 th Edge of the table should not have glass particles; now this very important any small particle at the edge, while unloading the glass if it touches the glass it will create scratches. So, you have to be very careful.

8 point remove unwanted glass from table and avoid contact with glass, now you know small-small glasses lying here and here and there on the table you should remove immediately and it should not have a contact with the glass it should avoid contact with the glass. 9 use separator between the glass as I earlier said after loading you must use separators in between the glass.

Point 10 after loading glass on trolley do not align the glass, what happens is to just to align we push the glass that should be avoided because, if we push the glass after putting on the trolley it will create scratches on the glass. Last, but very important check condition of trolley before loading, quality of trolley, what weight it can take and quality of rubber.

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Another aspect is finger marks, now in coater glass it is very important to avoid finger marks on the glass, you must always use proper gloves to handle the glass. Do not use auto loader to pick the glass from coating side, whenever you lift the glass make sure that coating side is behind. So, that it will not form any kind of marks on the glass. Do not use your finger to lift low E glass from coating side always you must lift the glass from below that is from clear glass side. Always keep coating side up on the table.

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Now, conveyor marks, no dust should be there on the rollers, extra care while unloading, improper loading and unloading can create marks, glass should not touch at the edge you have to be very very careful. Now coming to the machine operator, now again 2 reasons one is the, it could be that machine is not behaving properly or operators are lacking skill to operate.

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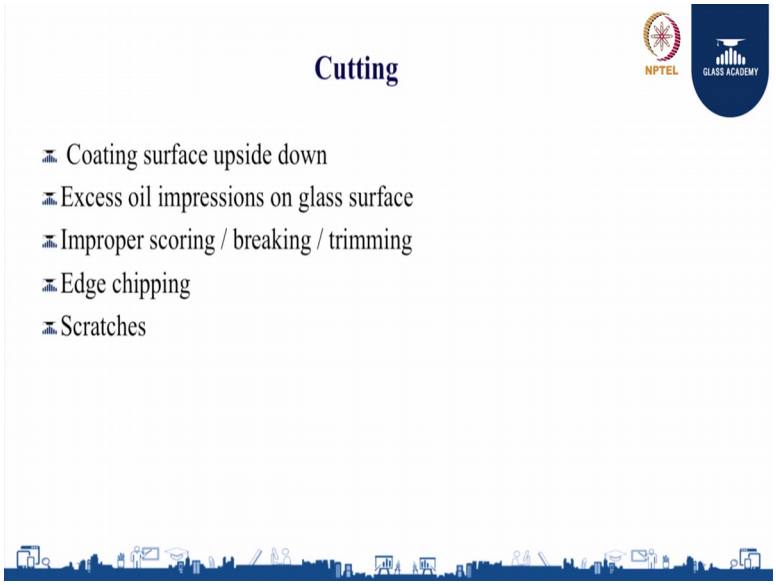

When you are cutting the glass coating surface should be always upside down, excess oil impression on glass surface should be avoided, while breaking and trimming the glass scoring has to be taken care, it has to be properly scored while cutting the glass that chipping can form. So, you have to be very careful and of course, scratches as we have discussed in earlier scratches slides. In cutting department the first error could be a dimension error and this could lead to a customer dissatisfaction.

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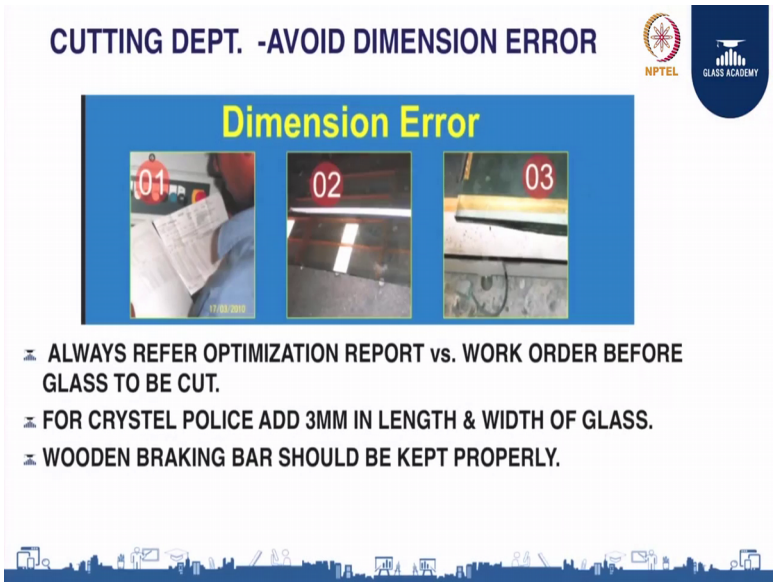

Always refer optimization report versus work order before glass to be cut, for crystal police at 3 mm in length and width of glass, wooden breaking bar should be kept properly. Now these are the 3 reasons if we can address this 3 reason we can avoid dimension errors.

Diagonal error, breaking bar should be kept in center of glass while breaking the glass, check glass diagonal by using try square as explained in photo 2, measure glass diagonally by tape and make sure that there is no diagonal error.

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As just discussed coating surface down side, reason coating surface identification error why this happens because, before cutting the glass you do not identify which side is a glass is having coating and corrective measure is always coating side must be on top unless specified. Oil impression on glass surface, now excess oil spillage, you have to be very careful while applying oil on the glass improper scoring, breaking, trimming reason is again improper breaking. You have to be very careful scoring, breaking should be uniform with appropriate tool and this is how you can avoid major defects in the glass.

Edge chipping reason is again improper breaking, handling, stacking corrective action is proper breaking tool to be used and glass surface to be protected. Scratches glass debris on cutting bed, now this one is major reason for having scratches on the glass. So, we must avoid any particle on the bed before cutting the glass. Now, let us discuss on grinding, what kind of defects generally we see: size, diagonal error, scratches, edge chipping, uneven arries, water marks. These are the basic mistakes we find in grinding.

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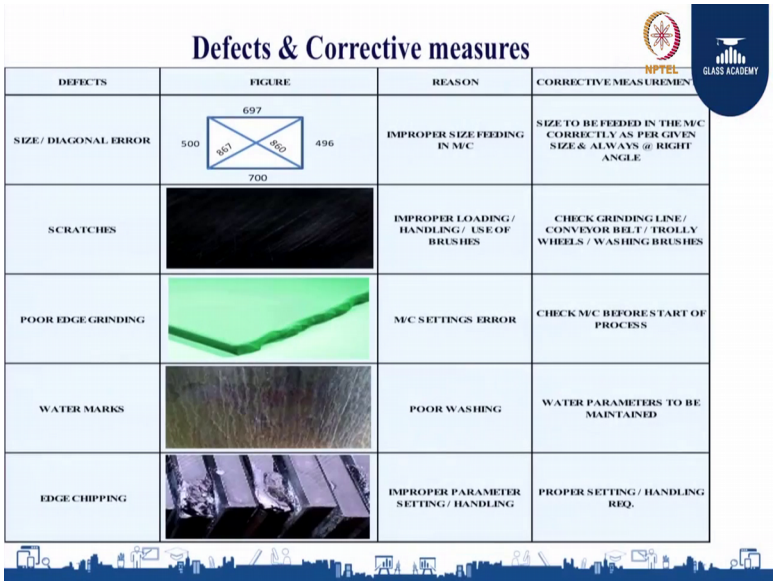

Now, in grinding area how do we avoid defects and what are the corrective measures we should take. Diagonal error it is because of improper size feeding in machine. So, what we have to do, we will have to make sure that sizes feeded in machine are as per the work order. Scratches, improper loading, handling and use of brushes while washing the glass. Need to check grinding line conveyor belt, trolley wheels and washing brushes.

Poor edge grinding this is again a machine setting problem. What we have to do is we have to make sure to set the machine properly.

Water marks this is because of poor water quality, to avoid water marks water parameters to be maintained are to be checked properly before washing. Edge chipping, improper parameter setting in the machine or handling; so, what we have to do is proper setting and we have to take care of handling, this is how we can avoid mistakes in grinding department. In washing against scratch and water marks, as I told water marks because of poor washing or water quality, what has to be done water parameter to be monitored it has to be between 6 to 8 PH, conductivity from 0 to 20 and TDS from 0 to 20.

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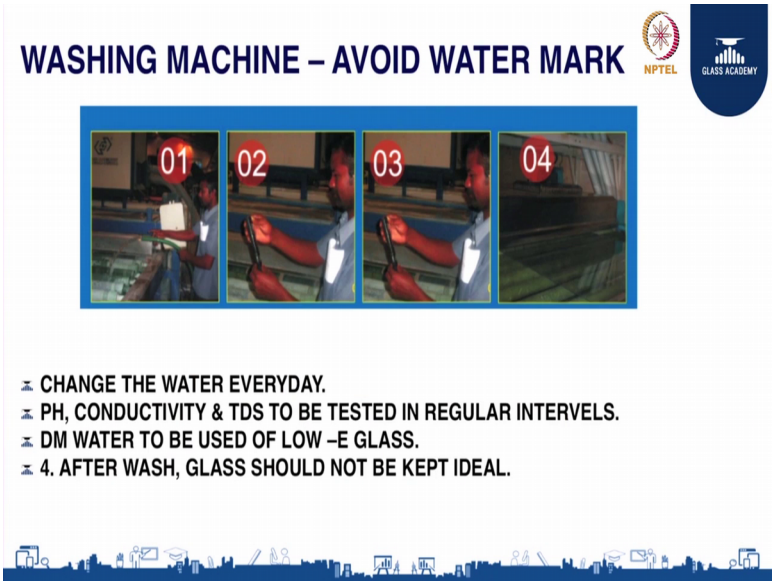

In washing machine there is an everyday water has to be checked, PH conductivity, TDS to be tested in regular intervals, DM water to be used on low E glass, after wash glass should not be kept ideal. It has to go to the next department, because if you keep it ideal chances are there that dust will form on the glass and it can spoil the glass and it will create defects in glass. Hence, the quality of glass will deteriorate.

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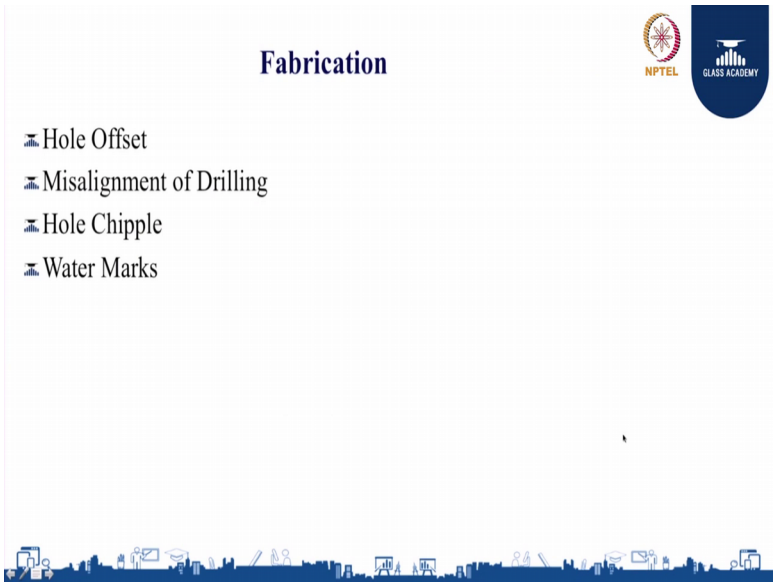

Fabrication, now in fabrication reasons are hole offset, misalignment of drilling, hole chipple, water marks. Misalignment of hole while drilling, the reason is uneven pressure at the time of drilling. Corrective action is alignment of drill bits and table should be proper. Hole chipple, poor drill bits you must check the quality of drill bit before you drill the glass. Hole crack this is again poor pressure application on the glass, hole dia edge, hole distance, glass thickness all this parameter need to be checked carefully before drilling the glass.

Water marks, drilling done for prolong period of time, water parameters in drilling to be maintained. Hole mismatch, incorrect edge distance or hole dia, now this needs a skill proper edge distance hole dia to be maintained. So, you need a little training before you get into drilling of the holes, major lesson to be learnt from for drilling machine is check the dimension of glass before drilling.

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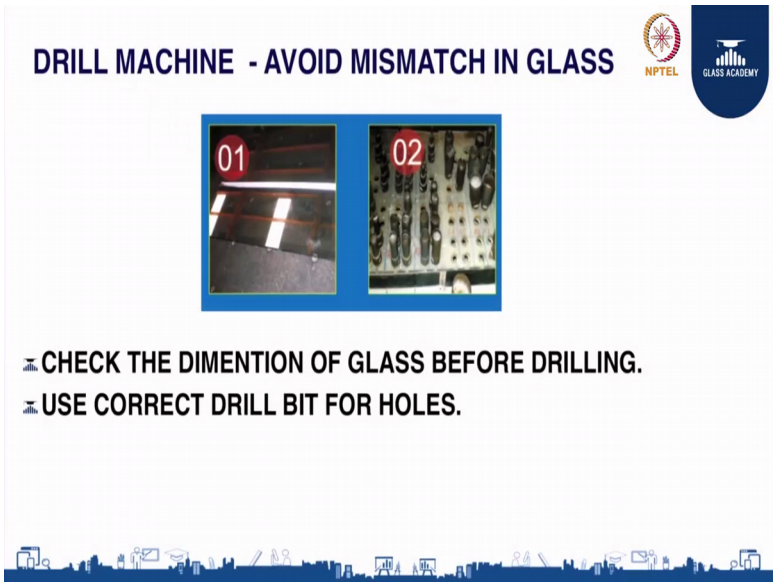

Use correct drill bit for holes.