Glass Processing Technology
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Lecture - 13
Serviceability Sales and Production Planning in Solutions Business

Good morning and welcome to the session on Sales and Production Planning in terms of servicing the customers from our solutions business.

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So, before I get into the overall session, I will just give you a brief overview on what do we take in this session, what are going to be the coverage points and what are all going to be are learning at the end of this session.

So, the first one is what is done? We just see, what are the types of value addition we do in glass, how is it done? The flow of material and the information part which is very important and the real role of planning in terms of these various stages and finally, the key performance indicators and how we evaluate the entire process of planning.

So, students before we talk on planning, we need to understand planning. Planning has two categories; sales and production planning. So, when we talk about sales, the segment of business is as such you will be getting inputs from your customer in terms of confirmed orders which has to be broken into various delivery schedules. So, this

delivery schedule, the confirm specifications, the confirm sizes, the confirm recommends, all put together in terms of various collated formats will form the final summary of what the sales requirement is at project level which is at customer level.

So, this requirement is then compiled and then, based upon the allocation and availability of resources, it is getting inputs are in terms of a production plan getting executor and then finally, once again service back to the customer in terms of a delivery. So, this process is what we call in terms of serviceability of customer in our solutions in glass processing industry. So, as said to you I just take you into the various stages and the first point will be what is done which is nothing, but the types of value addition of glass.

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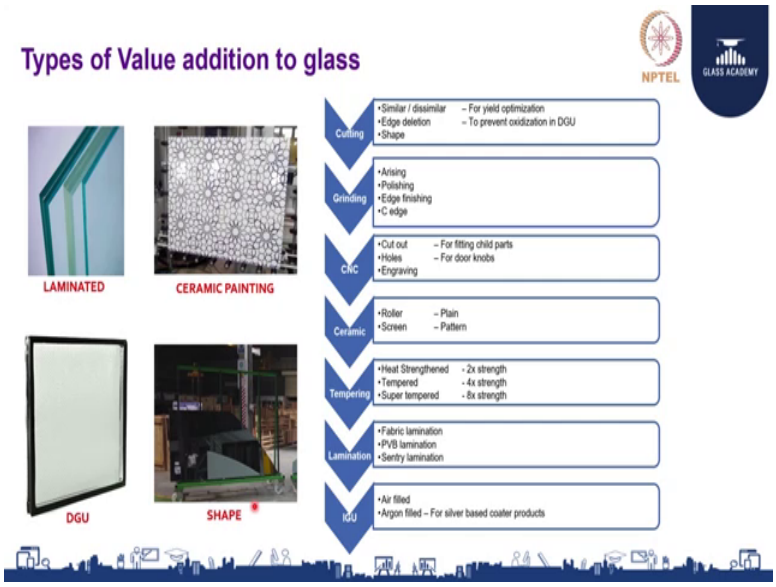

So, here I am just trying to give you a brief pictures in terms of what are all the value additions you can add in glass. As you can see here the first one you can do a laminator glass, a colourful design subject on the glass which is called a ceramic painting, then the DGU which you would have seen at and then, various shapes also can be cut in the glass. So, for all this what are all the types of process and what are all the sub-divisions of that process in terms of various terminologies, I will just give you a brief update, so that you are clear as we go into the various concepts of planning on how do we plan and deliver this part of the customer nearest concern. So, when you take the first one, the first operation in glass is cutting.

So, in cutting I would have given you 3 steps; one we talk about similar and dissimilar. What is similar and dissimilar? Similar and dissimilar are nothing, but the symmetrical cutting and the asymmetrical cutting part. Why do you do it? You do it in terms of better combinations for optimizing and maximizing your yield. The second one as the edge deletion part, which for the silvered coater glasses, you need to do this as a special process during cutting so that you are able to prevent the oxidization during your IGU steps.

So, this is also being done under cutting and the shapes is nothing, but complex profiles, where you inputted into a machine and then, you cut it into the desired profile. So, all these three comes under cutting and the next step would be the grinding operation. In grinding, you have I would have mentioned four stages, where these are 4 different types; one would be the arising, the second would be the clear polishing, the third would be the edge finishing and fourth would be C-edge. So, based upon the different customer requirements, different customer critical to quality parameters, you perform either of these.

And then, you move into the CNC where you have been knowing which is needed for making cut-outs in the glass which is needed for making holes and any engraving you need to do on the glass in terms of writing something or mentioning some quotes, you can also do an engraving which can be done, which can be performed in the CNC machines and after this operation, you have various stages. It depends upon what the actual customer needs.

For example, if you see here we talk about the ceramic painting. In ceramic painting, you have different types where you call the roller plain and the screen pattern types. So, with these two, these are the two types where you can do a ceramic painting on the glass and after this you want to get into a tempering, where to strengthen the glass you have three different categories. One you call the heat strengthen which is 2 times in terms of strength it tempering which is 4 times in terms of strength and super temper, where it is almost 8 times the strength. So, based upon once again the customer critical parameters, you perform either one of these and after tempering you have two more stages where you called the lamination and DGU. So, this is what I was calling as the laminator glass where you have two different glasses where you bind it in terms of a fabric lamination or

PVB lamination or a central lamination, this type of lamination once again is being decided by the customer in terms of his requirement.

Then, the last step in terms of the overall process would be IGU which is integrating the glass and here you have two types where it is an air filled or an argon filled. Argon filled is basically used for silver based coater products. So, these are the 7 types of basic process. Now, you had different types of value addition to the glass making it more better, making it more stronger, making it more richer in terms of looks and deliver it as per the customer critical requirement is a concern.

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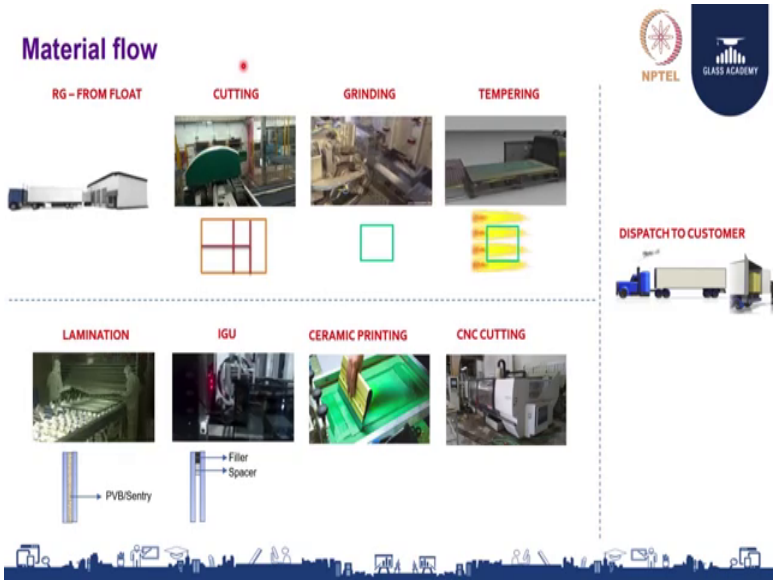

So, before we get in to the planning, having understood the process in terms of what are all process if we do one glass industry, in terms of adding value addition because first and foremost important to understand how does the material flow. So, material flow forms of first important part in the overall glass industry is processing. So, I am just explaining you. You will be seeing it on the screen that a schematic sketch. In terms of various process and a coordination of the various process as an input and the next as part of an output in such a way, how do we meet to the despatch to the customer.

So, here we see you have a raw glass from float happening which is nothing, but you buy glass from a float industry and then, you perform the cutting operation. As I said to you, here you can perform symmetrical cutting as well as asymmetrical cutting and get it based upon even shapes which is decided by the customer and then, you do a grinding

and then, after grinding you do a tempering. So, when you go for tempering, there are two more stages before tempering which can be added based upon the customer requirement. One you want to add a printing on the glass which I showed you in terms of the various designs. After grinding you add the ceramic printing and then, you can go for tempering or even after adding ceramic printing, you want to add some ores or you want to take some cut-outs, you do CNC cutting and then, you get into the tempering.

So, these two processes, the ceramic printing and CNC cutting is an additional value addition in terms of the process based upon the customer requirement on how we actually wants. If it is going to be only a plane glass where it does not have any printing nor holes nor cut outs, then it goes into the tempering for which it gets strengthen and then, after strengthening it can be despatched to customer.

If you want access or he wants it as a lamination, then you send this glass to the lamination plant or the lamination machines where you bind the glass with respect to a fabric or a centring and if that is enough, this can be despatched to the customer or if after tempering you want to do only IGU operation, you can send the glass in temper to IGU where the 2 glasses are being integrator and then, it can be despatched to the customer. That is also an operation where you can laminate two different glasses and then, bind it together in terms of an IGU machine. So, even after lamination, two different panels can be integrator through IGU and can be despatched to the customer.

So, students understand this is overall flow cycle and the material flows, right from procumbent, from the float industry, then to the cutting and then, to the grinding and after grinding based upon the value addition between printing or CNC cutting, it gets into the tempering and after tempering, it decides based upon lamination or IGU and then, it follows this flow and then, get despatched to the customer. So, this material flow should remember only one basic thing that is, when is the customer requirement to be despatched and based upon you need to plan all resources, all schedules in such a way I am able to make a flow straight to despatch to the customer.

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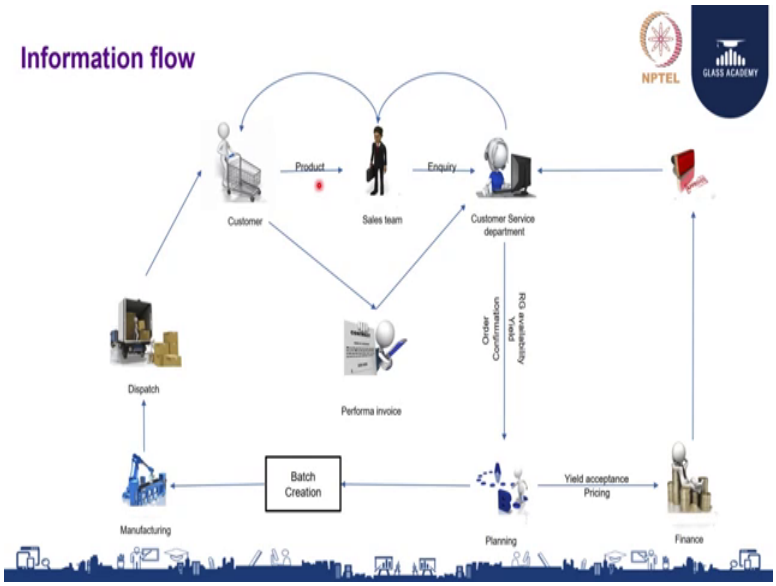

So, after seeing the material flow, I will just take you through a small schematic sketch explaining the information flow, because in production planning and sales or we say the sales in production planning, material flow is one point which we take care. The information flow is very important because that is where you add all the critical parameters into the specification less by the manufacturing to ensure it is being accomplished. So, here I will just explain you the overall information flow of the process. You have the customer. Who is the customer? The customer is the person who actually buys glass from your industry which is the glass industry and we have a sales team. It was nothing, but the sales engineer whom the customer contacts.

The sales guy or the sales team places an enquiry to the customer service department, the customer service department immediately after receiving the enquiry quickly checks with the planning team whether the raw glass is available, what kind of yield you will be able to deliver for this requirement. So, the planning team gives their input in terms of the yield acceptance and what should be the necessary inputs for the pricing consideration to the finance team and once the finance is in terms of all the overall pricing and yield part, it gives an approval to proceed.

So, the approval flows back directly to the customer service team and from customer service team to the sales team and then, back to the customer. So, in this first loop you are able to see a clear process where the customer at inception of his requirement contact

the sales guy through the customer service touches the planning team and with various inputs, from planning team gets a pass through finance.

For further order placement from the sales team to the customer, so this is one cycle. So, once this process completes and the customer is really happy in terms of the pricing in terms of the schedule on when what date he will be able to get it. He immediately release a performa invoice and this goes to the customer service department and once again this being a performa invoice, the customer service comes to the planning as part of the order creation by the first step in planning would be the batch creation stage and after batch creation stage, it flows into the manufacturing process and from manufacturing process getting dispatched and from despatch, it reaches the customer.

So, if you see this overall process, you need to understand the planning plays a central role in terms of understanding the customer requirement, understanding the manufacturing resource availability, understanding the current schedules of the customer and then, understanding what is going to be the overall yield of your process and with all these inputs gives back and forth information to the customer service team and also, to the sales team. In such a way, the orders are taken or being routed through the right process in terms of meeting the right delivery as expected by the customer.

So, if you see in this process, I would be explaining the importance of planning in terms of the batch creation stage, as part of coordination with the manufacturing and the customer segment and apart from this I would also take you in through into the various KPIs of planning and the process in which it executes on a month, in meeting the overall requirements of the customer for that month.

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So, as I said to you once the glass PIS being received, it is being initiated to the planning for further process into the manufacturing and delivery to the customer. In this stage, the first stage is batch creation. What do you mean by batch creation?

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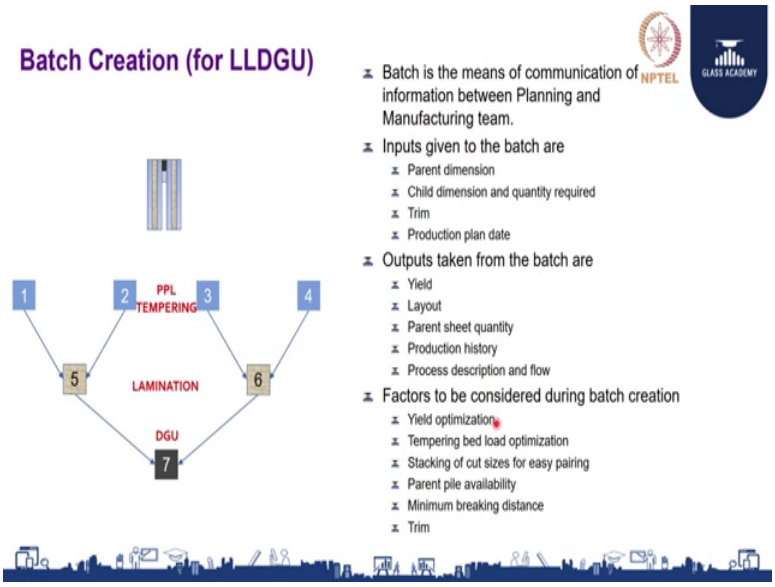

So, I will just explain you with shortly on batch. Batch is nothing, but a means of communication and information between the planning and the manufacturing team. It is a very important information, communication of information between the planning and the manufacturing team. Why? Before I ask you why, let us understand what are all the

inputs to be given in this batch. You have the parent dimensions, which is nothing, but the bigger glass from which you cut the accessories needed by the customer. The accessories needed by the customer is nothing, but the child dimension, ok. He also decide what should be the trim allowance to be left and what is the production plan date, for that cutting or for that operation in the various operations which you saw in the overall processing and what you take as outputs.

From the batch, the outputs are nothing, but yield the layout of the cutting the parent sheet. How much parent sheets will get consumed, what is a production history, the process description on the flow and what are all the factors should be considered during batch creation. The first factor will be the yield optimization. Students please remember yield is the basic parameter in planning and in manufacturing which helps you to save glass, reduce cost as committed to your customer. And hence, this becomes your first important factor to be considered before selection of any of the parent, but tempering lower optimization, this stacking of cut sizes for easy pairing the parent pile availability, the minimum breaking distance and the trim ok.

So, I will just take you into some more details in terms of the factors. As I told you yield is nothing, but what is the overall geometry of the glass, how much glass you are going to waste so, this is called the yield, ok. So, if you ask me in short, the net glass durably total glass you have to see the yield. The tempering better ore optimization is nothing, but given a processing time what is the maximum extent of usage in the tempering bed. That is the lower optimization of this, then after your tempering how do you prefer the stacking of cut sizes for easy pairing, because it depends upon each stages on what do you want, then whether your raw glass is available.

So, when it has be more what is the breaking distance in the tempering and then, what should be also the trim to be considered to the overall batch. So, here in the side I have given you a small schematic sketch which will explain you the batch creation of a complex product where I call it as a laminated DGU.

So, guys, students please understand what laminated DGU is. Laminated DGU is nothing, but you have two laminated panels and with these two laminated panels, you integrate them to a double glazing unit. So, to do that let us understand this batch creation how it happens. So, I will just take you into the previous steps to explain this

schematic sketch of this. So, as I said DGU is nothing, but a double laminated glass DGU. So, please understand that.

So, the first step is what? So, when I talk about laminated glass, you can see the coloured blue 1 2 3 4, ok. So, 1 and 2 are nothing, but the first 2 glasses. 3 and 4 are nothing, but the second 2 glasses. So, I would have indicated a colour of blue here and same number is also being indicated as blue which gives you a clear understanding that these two are one laminated unit and 3 and 4 are the second laminated unit, and since you are going to follow the next process of tempering, I have indicated that both the glasses are being first tempered.

So, what happens here you first cut it, you second grind it and then, you temper all these four glasses and then what do you do? You laminate 1 and 2 glass; you laminate 3 and 4 glass, ok. So, what happens you get 5th unit which is nothing, but this single point and then, the 6th in the sense when this single point and after lamination, you just apply a DGU, I would have shown you this DGU in terms of a dark colour here in this glass between the two units. So, this is a very complex process explaining the overall batch creation of a LLDGU.

Let us take this offshore to understand for example what it is going to be for a simple tempering glass. So, what should be the batch creation for a simple tempering glass? Simple tempering glass, the batch creation should be for a cutting grinding and then, only for a tempering, that is all the batch. So, if I am going to do a lamination without tempering, then you will do a batch creation for cutting tempering and then, for lamination.

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