Glass Processing Technology
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Lecture - 34
Insulating Glass Unit

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Now, let us see the troubleshooting and the EN standard for IG unit standards.

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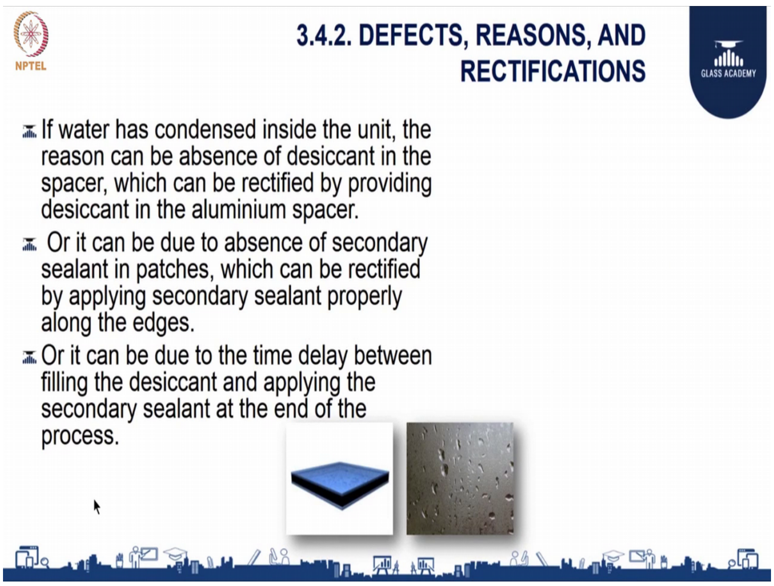

The major defects which is observed is condensation. If water has condensed inside the unit the reason can be absence of desiccant in the spacer, which can be rectified by providing desiccant in the aluminium spacer. It can be also due to the absence of secondary sealant in patches, or you have some bubbles which forms in between the secondary sealant which can be rectified by application of secondary sealant properly along the edges. And also it can be due the time delay between the filling the desiccant and the applying the secondary sealant at the edge, at the end of the process.

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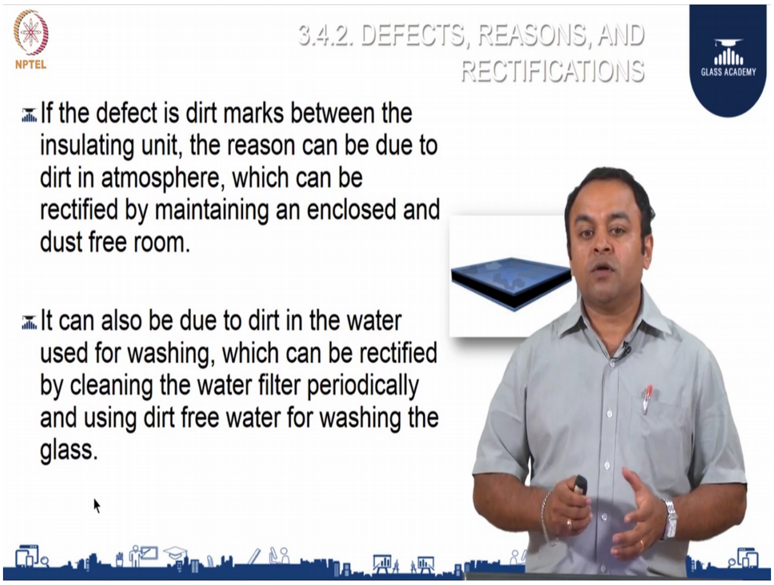

If the defect is a dirt marks between the insulated glass and the reason can be due to the dirt in atmosphere, which can be rectified by maintaining an enclosed and dust free room. It can be also due to the dirt in the water used for washing, which can be rectified by cleaning the water filter periodically and using the dirt free water for washing the glass.

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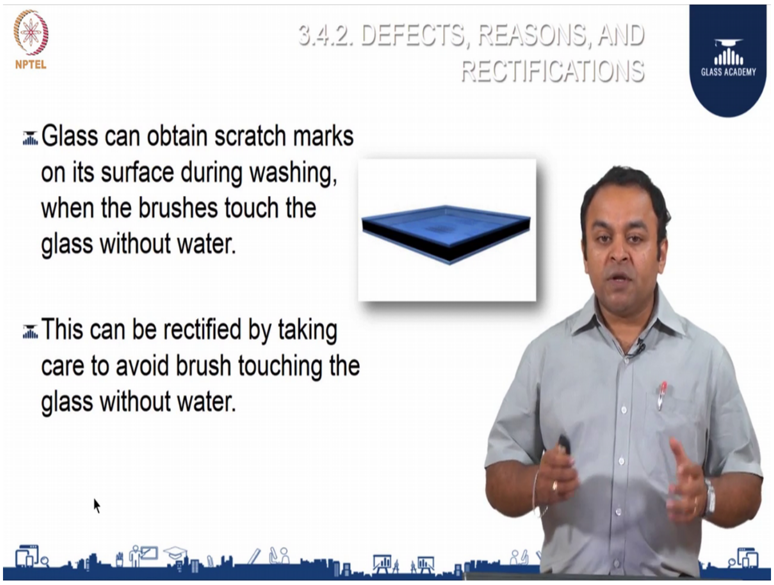

Glass can obtain glass scratches on the glass surface during washing when the brushes touch the glass without water. Please ensure proper water inside the washing, and do not use without having any water inside. This can be rectified by taking care to avoid brush touching the glass without water.

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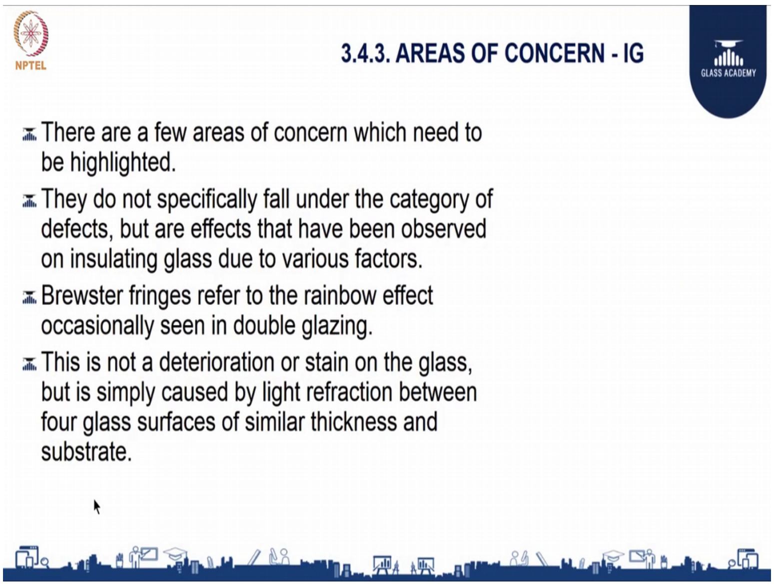

There are few areas of concern which needs to be highlighted. We have the Brewster fringes refer to the rainbow effect occasionally seen in the double glazed unit. This is not a deterioration or the strain of the glass, but it is simple cross by the light reflection between 4 glasses surface or similar thickness and substrate.

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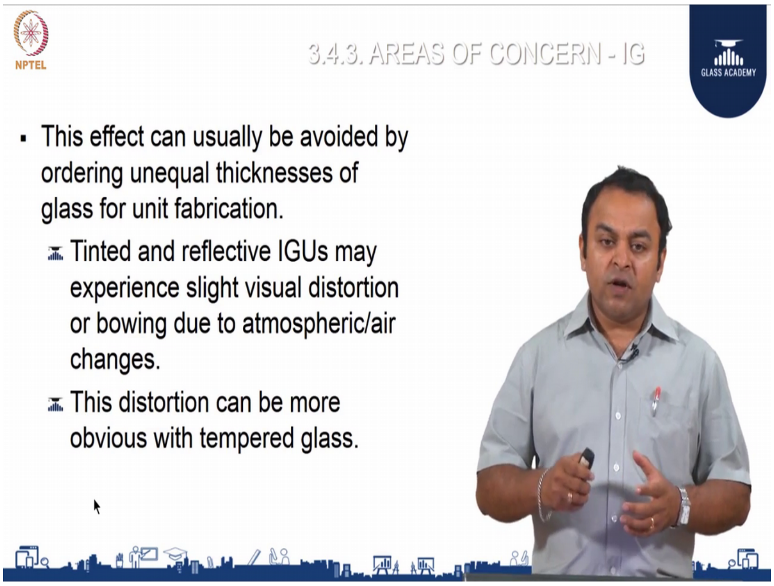

Tinted and reflective IGUs may experience slight visual distortion of bowing due to the atmospheric or air changes. This distortion can be more obvious with tempered glass.

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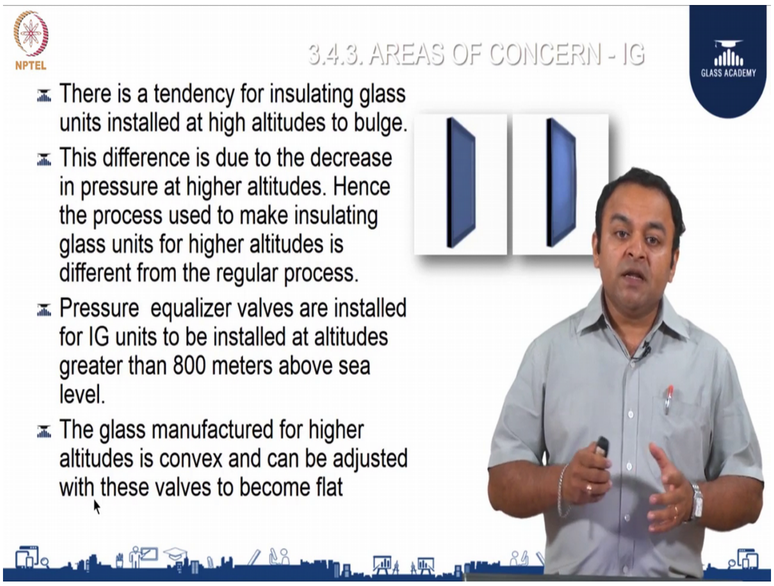

There is a tendency for insulated glass unit at high altitudes to bulge, the difference is due to the decrease in pressure at higher altitudes. Hence the process used to make the insulated glass unit at higher altitude is slightly different.

You have something called the pressure equalization walls which is fixed to the IGU. These are installed for the IGU unit to be sent which is more than 800 meters from the sea level. The glass manufactured for high altitudes is always convex and can be adjusted with these valves to become flat at the installation site.

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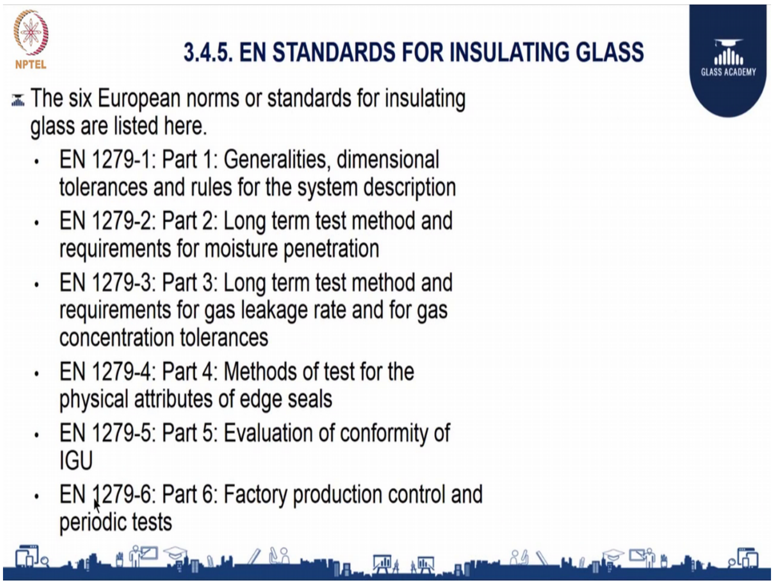

The European standard for insulated glass is EN 1 2 7 9 it has got 6 parts and the table shows the different parts of EN standards.

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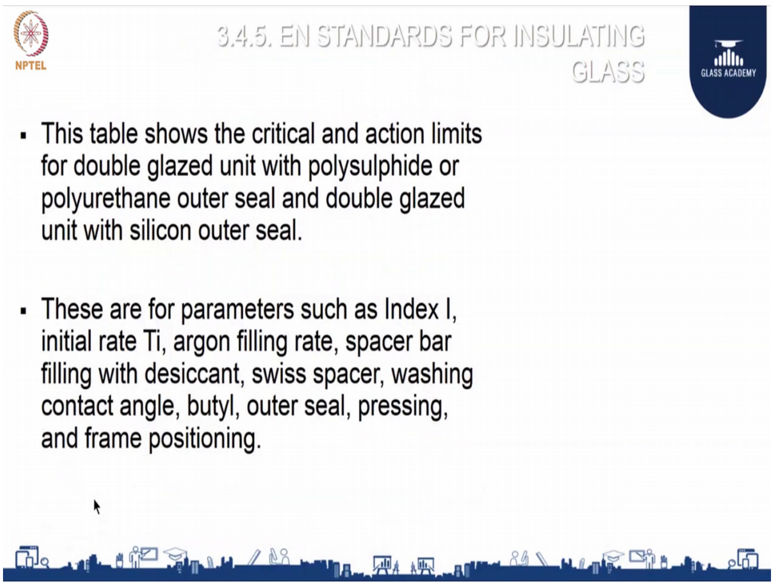

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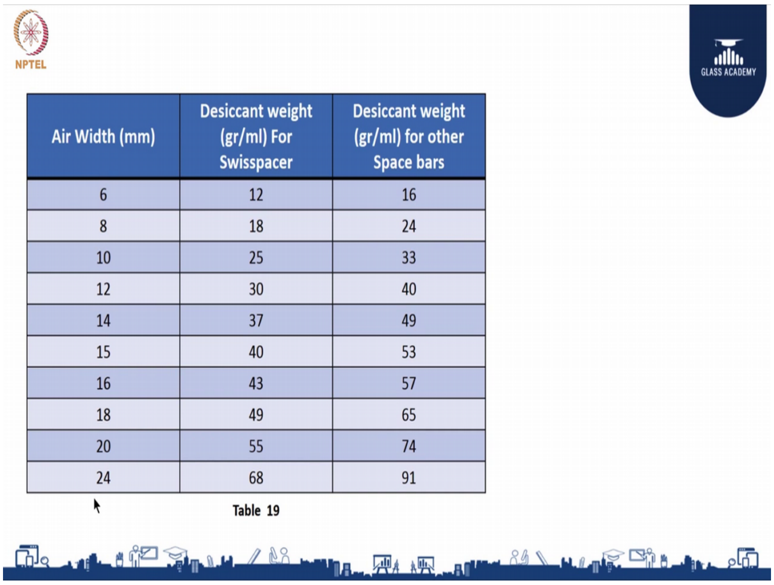

Air Width (mm)	Desiccant weight (gr/ml) For Swisspacer	Desiccant weight (gr/ml) for other Space bars
6	12	16
8	18	24
10	25	33
12	30	40
14	37	49
15	40	53
16	43	57
18	49	65
20	55	74
24	68	91

Table 19

Now comes the how much desiccant to be filled in a alumina spacer based on the air gap, you have for the Swiss spacer as well as for the normal annual spacer. There is a table which shows how much minimum of desiccant to be filled.

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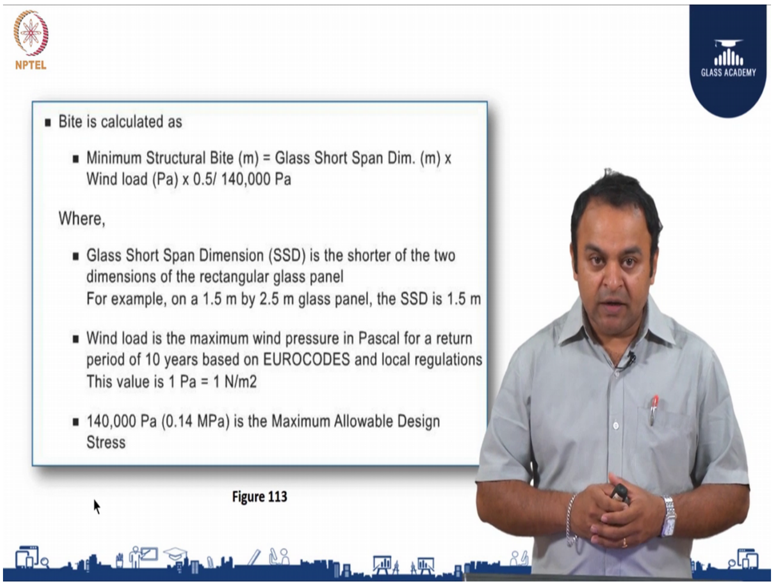

Figure 113

Bite is calculated by that there is a formula for the bite which is like the glass short span dimension always in meters, multiplied by the wind load in Pascal multiplied by 0.5. That divided by the maximum allowable design stress which is like 140000 Pascal’s of 0.14 mega Pascal’s.

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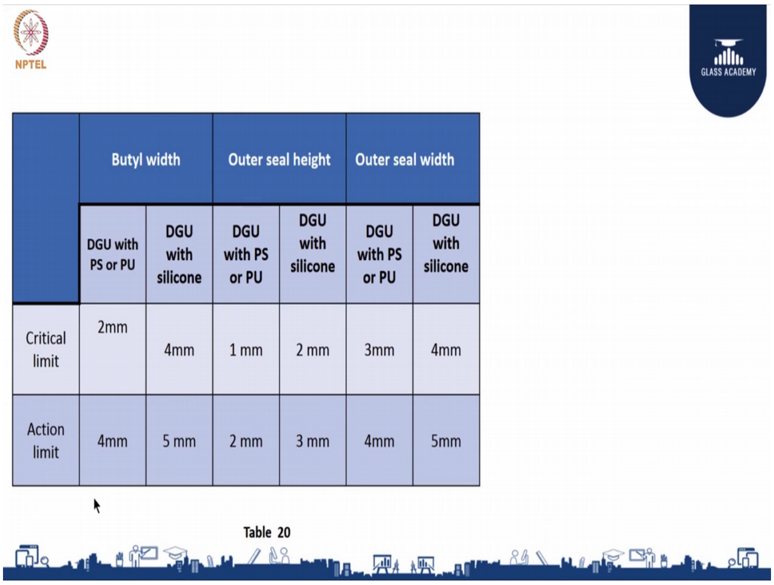

	Butyl width		Outer seal height		Outer seal width	
	DGU with PS or PU	DGU with silicone	DGU with PS or PU	DGU with silicone	DGU with PS or PU	DGU with silicone
Critical limit	2mm	4mm	1 mm	2 mm	3mm	4mm
Action limit	4mm	5 mm	2 mm	3 mm	4mm	5mm

And you always have a butyl width the outer seal height and outer seal width, which is there for the edge of the sealant as well as for polyurethane and poly sulphide.

There is a small table which gives the action and the critical limit.

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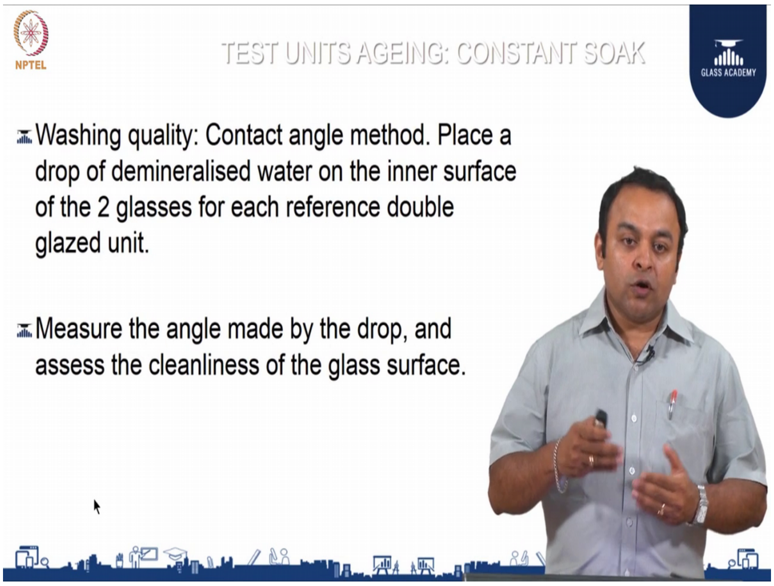

Now, the washing quality which was highlighted earlier, we have a contact angle method place of place a drop of demineralised water on the inner surface of the 2 glass for each of this reference double glazed unit. Measure the angle made by the drop and assess the clean enough of the glass surface.

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If the angle is more than 90 degree the glass is said to be very, very dirty. If it is up to 925 degrees even it is dirty, if it is less than 25 degree the glass is said to be clean.

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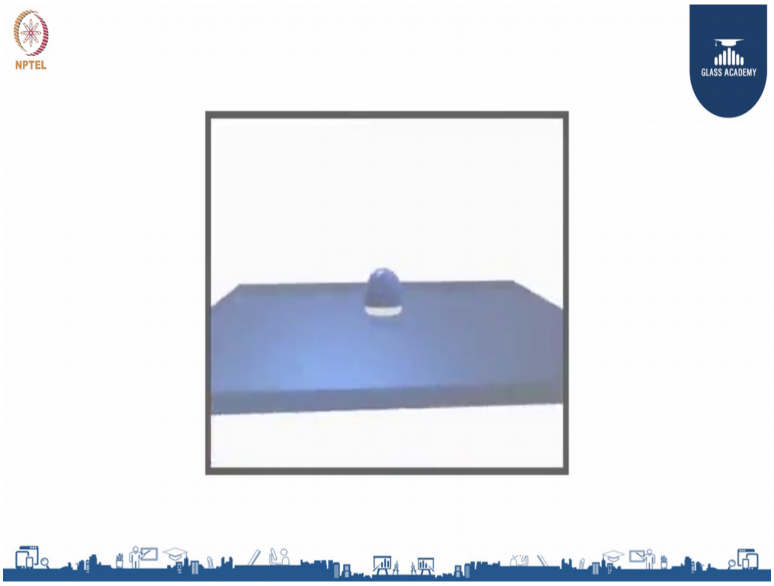

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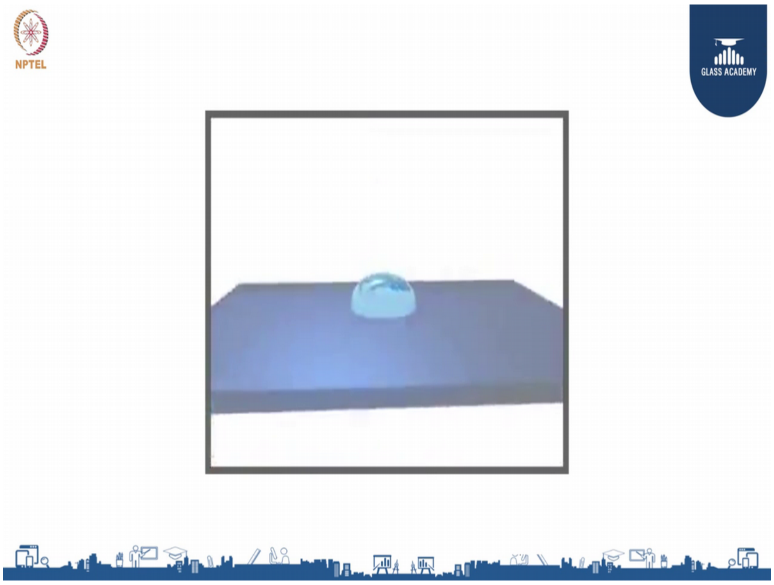

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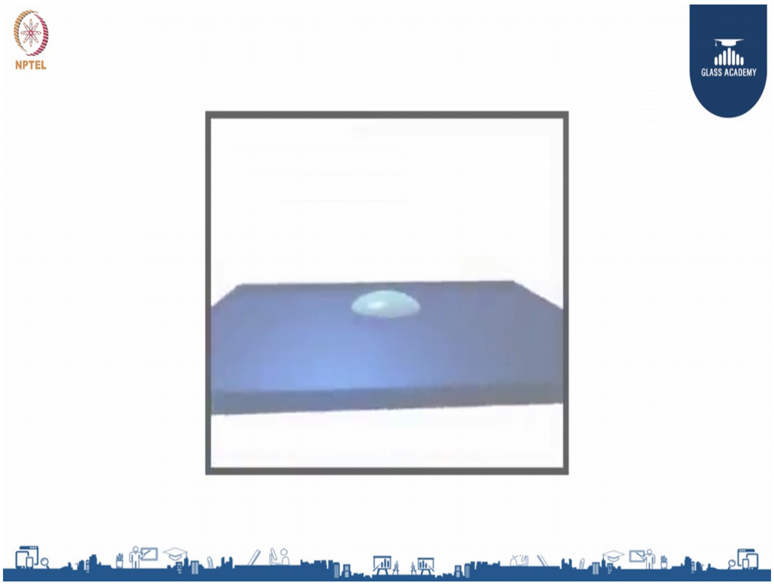

Thank you.