

Bubbles Solutions of Laminated Glass with EVA Interlayer Film By Peter Lin

++What People May Think, When They Face Bubbles

When some customers processing laminated glass with EVA INTERLAYER FILM, bubbles appear inside the laminated glass, People would always think in these ways:

1-The EVA INTERLAYER FILM I ordered last time, didn't have bubbles problem, why this time the bubbles is coming out, that's definitely the reason of the quality of EVA INTERLAYER FILM.

2-Some customers face this situation. Maybe they don't use EVA INTERLAYER FILM very much, so they don't finish the one roll of EVA INTERLAYER FILM in a short period. They used two thirds of the roll of EVA INTERLAYER FILM, and after several weeks, they go back to use the left part of the roll. But this time the bubbles are coming out, they are very confused. How come the same roll of EVA INTERLAYER FILM has different quality?

3-Some customer may just change the new EVA INTERLAYER FILM supplier and the bubbles comes out. Even their new supplier tell them it's all about the processing , they would not believe him, they would think it's of course the problem of the quality of your



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EVA INTERLAYER FILM, because the EVA INTERLAYER FILM of my old supplier don't have this bubbles problem.

++General Reasons for Bubbles

Many Laminated glass producers have misconception of the reasons of the bubbles problems.

Here is the real why:

1-First situation: the temperature is too high, maybe more than 160 C degree, which will cause the EVA and other compound to break down and create gas. In this way, it's just reducing your temperature, and everything would be fine.

2-Second situation: the temperature in the oven is not average, which means some part of the glass, is hotter than others. So some part of the EVA INTERLAYER FILM will melt and finish the cross-link reaction while other parts of EVA INTERLAYER FILM is still not melted, which will interrupt the vacuuming and cause the bubbles. For this situation, we suggest you modified the lamination machine.

3-Third situation: The oil of the vacuum pump needs to be renewed. The vacuum pump is old or the vacuum ability is not good enough. If the vacuum machine is old, renew it. If the



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vacuum ability is not powerful enough, try to buy a new one.

4-Four situation: the air moisture is high. The moisture in the air in your region is changed, which will easily cause the EVA INTERLAYER FILM wet when it exposes in the air.

Moisture in the EVA INTERLAYER FILM would cause the bubbles. Although the EVA INTERLAYER FILM is less sensitive to moisture compared to PVB FILM. But if the moisture of EVA INTERLAYER FILM is too high, the bubbles will also come out.

Some customer open the packaged of one roll of EVA INTERLAYER FILM, and don't use it up at one time. And the left part of the EVA INTERLAYER FILM will absorb the moisture in the air and cause the bubbles.

5-Five Situation: Different EVA INTERLAYER FILM supplier has different formula for EVA INTERLAYER FILM, so if you change the EVA INTERLAYER FILM supplier, you need to adjusting the processing parameters of time and temperature setting according to the supplier's EVA INTERLAYER FILM property.

++Micro Reasons for Bubbles:



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1-The plainness of the tempered glass is bad.

--As you known, tempered glass is less plain than the flat glass. So you should choose a company that produce better tempered glass.

-- Since the tempered glass's plainness is worse than flat glass, you should use thicker EVA INTERLAYER FILM for the tempered glass. Generally speaking, the tempered glass should be laminated with at least 0.76 mm thickness EVA INTERLAYER FILM.

--Laminate less layers 'pre- laminated glass' in a silicone bag at a time. If you laminate too many layers 'pre-laminated glass' in a silicone bag at one time, the vacuuming would not work perfect and cause the bubbles.

--If you laminated small pieces 'pre-laminated glasses' at the same time, put the 'pre - laminated glasses' on the Teflon mesh , which will help vacuum, and the Teflon mesh should cover the vacuum hole to make sure the vacuum hole is not sealed by the silicone bag itself.

2-Check if the silicon bag is leaking.



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--Averagely speaking, a silicone bag can be used for 2 or more years. But check the silicone bag if your laminated glasses have bubbles.

--Check if the sealing buckle of the edge of the silicon bag is sealed perfectly when processing laminated glass with EVA INTERLAYER FILM.

3-It's too early to pull the laminating glass out of the oven,

The temperature of laminated glass is still very high and the EVA INTERLAYER FILM is still melting and reacting. When the laminated glass is getting cold, the melted EVA INTERLAYER FILM is contracting, and the EVA INTERLAYER FILM can't fully fill the gap between two glasses, so bubbles come out in edges.

4-It's too early to stop the vacuuming.

And the cross link reaction of the EVA INTERLAYER FILM is not totally finished and stable. And also the silicone bag would suck same air back in to the bag, which cause the bubbles. So generally speaking, don't stop vacuuming until the temperature of the laminated glass is lower than 45 degrees or close to your room temperature.



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Notes: Always remember you put the Teflon mesh on the vacuuming hole to make sure the vacuuming is not stopped by the laminated glass upon the hole.

++Case Study: Bubbles of Laminated Glass with EVA INTERLAYER FILM



We have seen a situation in this way: Bubbles comes out in the Laminated Glass. And we checks all the details of vacuuming and vacuuming is definitely no problem.

But the bubbles still comes out in the laminated glass. And the bubbles are regular and in lines.

Finally we realized that the bubble lines are right upon the heating pipes.

So we reduced the temperatures and did the test. Then no bubbles comes out, but some part of laminated glass is not very transparent.



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So we know the reason:

Because the heating pipes are under silicon bag, when laminating glass, the part of laminated glass right upon the heating pipes are in higher temperature. And the temperature inside the oven is not in average.

Remember that when the temperature is too high, the copolymer and compound will be breaking up and produce gas which would cause bubbles inside laminated glass.

So It's better if you can talk to the EVA Glass Lamination Oven producer to modify the oven.

If you need any other information, please feel free to contact us.

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1-Super clear eva glass interlayer film, for both indoor and outdoor laminated glass application;

Super Clear EVA Film for Massive Lamination



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EVAFORCE SUPER+

*Super Clear EVA Film for Massive Lamination

*Massive, Largest sold quantity in all EVA films

*Great performance with affordable price

*Aim for architectural safety laminated glass

*Applied both indoor and outdoor

*Replacing PVB Film

Super Clear EVA Film for Tempered Curved Glazing

EVAFORCE EXTREME

*Super Clear EVA Film for Tempered Curved Glazing

*Less overflowing during vacuuming heating

*Strengthened safety mechanical properties

*Recommended for extreme environments, safety tempered glazing or curved glass laminating

*Applied both Indoor and Outdoor

*Replacing PVB Film

Super Clear EVA Film for Graphic Insertions



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EVAFORCE LOW80-120

***Super Clear EVA Film for Graphic Insertions**

***Laminating both at 80° C and at 130° C**

***Protect the insertions from above 100° C**

2-White eva glass interlayer film, for both indoor and outdoor laminated glass application;

***Milky White/White Opaque EVA Film**

0% Visible Light Transmittance

***Sandblasting White/White Translucent EVA Film**

65% Visible Light Transmittance

***Super Milky White/Super White Opaque EVA Film**

0% Visible Light Transmittance

3-Thermal cutter for trimming laminated glass edges overflowed remains;

4-Green tape for fixing laminated glass, high temperature resistance;

