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GLASS WASHING: 5 WAYS TO TELL IF GLASS IS CLEAN

TIPS FOR OPERATING AND MAINTAINING YOUR GLASS WASHER

Many processes in glass fabricating start with glass washing and it is critical that the washer is performing optimally in order to insure proper adhesion strength of spacers, laminate, coatings etc downstream. It is important that you know what your glass washer is capable of so you have a benchmark for evaluating the results during production. Consult with your Billco Solutions Rep on the capabilities and expectations for your specific washer.

*The inspection methods mentioned in this document are intended to bring awareness to the availability and existence of recommended methods and are not intended to be a step by step guide on implementing the methods.

Here are 5 common methods to tell if glass is clean by checking the surface energy and macroscopic particulate counts on the glass surface prior to Insulating Glass and Laminating processes.



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1. VISUAL INSPECTION

For post washer inspection, the human eye and visual inspection is the quickest way to determine washer performance. This can be done two ways.

Back Illumination (Transmission) – The operator illuminates the glass from below and observes from above. This can be done inline or offline. When performed offline, it is advisable to observe the glass against a dark and uniform color background.



Front Illumination (Reflection) – The operator illuminates the glass from above and observes the glass from the same side with the light angled towards the eye/camera.





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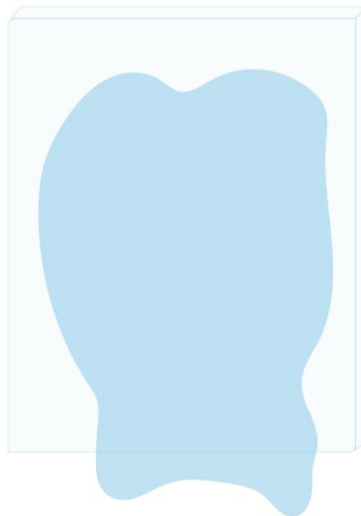


2. WATER-BREAK TEST

The Water-Break Test is good at detecting molecular films on a surface that may not be visible to the human eye over a large coverage area. It works well for glass lites that can be handled manually.

To perform the test, submerge a glass lite vertically in a tank of de-ionized water that is free of additives and withdraw it vertically while observing the sheeting of the water over time.

This test is subjective and should be executed and observed multiple times under different conditions before implementing into a process verification procedure. It is advisable to reference the ASTM standards for analyzing results.





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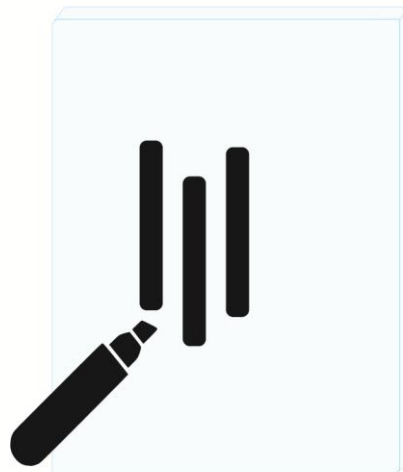


3. DYNE TESTING

Dyne Testing is good for quantifying the energy of the glass surface.

When the Dyne level test fluid is applied to the glass surface, the liquid will either form a continuous film on the surface or pull back into small droplets. The exact surface energy (Dyne level) can be determined by applying a range of increasing or decreasing values of Dyne test fluid.

Ask your Billco Service technician for procedure documentation.





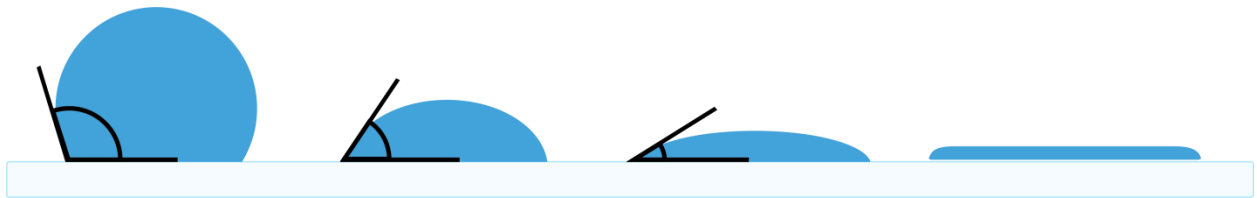
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4. CONTACT ANGLE TEST

Helps determine and quantify the surface energy, or wetting tension of the glass surface. Both manual and automated measurement methods are available. Although precise, this test only measures the surface energy on a small area of the glass surface.

Note: The surface energy of cleaned raw glass and coated glass may be different. Consider the differences when testing.



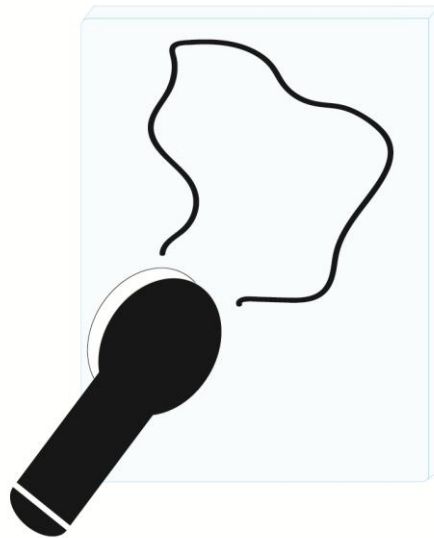


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5. STEAM / FOG TEST

This is a large-area verification based on glass surface energy and water fluid tension. Optimally, the glass surface is expected to be uniform over the entire glass lite. Any changes in surface energy will generate patterns in the steam across the glass. Variations can cause the water droplets to bead differently due to residues (large area surface contaminate coverage) and particulates (can be deposited by air post dry.)



If you have completed the above and are still experiencing issues, please contact the Billco Service Department at 724.452.7390 or service@billco-mfg.com.