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Hanwha Azdel Condensed Troubleshooting Guide

Materials for the Future
Hanwha Azdel

Troubleshooting suggestions

1. Rotate the board to see if defect follows orientation.

2. Verify part Thickness:
   a) How thick is the molded part to the print specification?
   b) Can the molded part thickness be increased or decreased?
3. Fabric Specification.
   a) What is the elongation of the fabric, is it within specification?
   b) Can the elongation be increased?
4. Side wiper blades on mold.
   a) Position of wiper blade?
   b) Can they be adjusted?
   c) Make adjustment upward to take tension off fabric.
5. Fabric Grippers/carrier into press.
   a) Can the grippers be programmed to drop cloth onto the board after the heating cycle?
   b) Adjust grippers to release fabric either when mold starts to close or just before top mold makes contact with fabric.
6. Increase board temperature.
   a) Can the overall temperature of the board be increased?
   b) Start by adding 50-68F to the top and bottom of the heating elements.
   c) If the bottom heat starts to cause corrugation or ripples in the board only add heat to the upper elements and take away from lower oven.

Continue on next page

Troubleshooting suggestions

7. Position of lower mold to heated material from oven.
   a) When the press closes is the heated substrate pooling in the bottom of the mold?
   b) Can the press be adjusted so the material does not pool in the lower mold?
   c) Adjust the closing heights to where the material just touches the bottom mold. You want the upper mold to push the material into the bottom mold.
8. Sheet line, position of sheet to rail.
   1. Is the sheet line below the rail?
   2. Is the sheet line even with the rail?
   3. If the sheet line is below the rail or even with the rail, raising the lower part of the press upward in increments of 25mm to 50mm may help with the reduction of the lifting.

Problem Trouble Shooting

Wrinkles

- Conduct a free loft inspection of the board to verify amount of shrinkage compared to original sheet size. A free loft is when you put the board through the heating cycle, and let it freeze off over the mold (approximately 3 minutes) This will also determine if optimal loft has been reached. Is the material falling short of the clamps and/or front rear shut off of tool?
- If clamps are on the front and rear of tool, are they grabbing the material through mold close?
- Is the tool clamp functioning, and traveling as it should?
- If wiper blades are in use, adjust wiper blades downward to assist in eliminating the wrinkles, or continue to lower all the way until there is too much fabric tension, then back off until excessive tension is gone. If fabric tension is not an issue, then lower the wiper blades to the lowest position. If lowered all the way, additional travel may be required, which could mean the making of new blades with additional travel.

Standard Reactions

Wrinkles

- Platen position can affect wrinkles. If you have dual moving platens, you may have to mold below the sheetline. Start lowering both platens below sheet line in increments of 1 inch (25mm). Look for any changes to wrinkles as you lower the platens.
- Too cold of a mold can contribute to wrinkles and/or tearing. Typical mold temperature is 80F up to 140F. With 80F being most common. Temperature is based on mold design and equipment being used. Not all customers run the exact same temperatures.
- What is the temperature of the board as it exist the oven and what is it at mold close? Typical temperature for board at oven exit is 400F-420F. Typical board temp at mold close is 380F-390F. Although this is not the case for every customer and/or program.
- What is molded thickness? Some geometries (outside/inside radii) may require molded thickness of 1mm. This is the thickness of the board with the fabric and foam removed. Only measure the Azdel after molding. If buildup is required, the use of aluminum tape is common.

Standard Reactions

Wrinkles

- If the sheet is exhibiting ripples when exiting oven, this is a sign the board temperature is too hot. As long as you maintain the proper loft and surface (top sheet) temperatures 380F-400F you can adjust the lower heaters to reduce or eliminate the ripples. If the process allows zone adjustment, making adjustments to the center zones only is recommended and transfer some of that heat to the outer edges of top and bottom heaters.

- When the molds are closing does the outer edges of the sheet wrap over the A & C pillars (front and rear of mold) ? If so does it appear that the middle part of the sheet is scalloping or creating a half moon. What we mean by this if you look across the mold in CD direction is the center of the board even with the outer edges. If not this means your sheet line is too high in the press and the material is pooling in the lower mold.

Standard Reactions

Fabric delamination from the Azdel

- Verify film temperature at mold close. Typical temperature for board at oven exit is 400F-420F. Typical board temp at mold close is 380F-390F. Temperatures may need to be elevated or decreased dependent on transfer time from oven exit to mold close. We like to see a 10 second or less transfer time from oven exit to mold close. 1Verify the correct film was applied to the board as well as orientation. Is it upside down?
- Verify oven performance. Are actual temperatures the same as the oven set-point. If not, maintenance will need to troubleshoot root cause. If you don't have a line scanner, Azdel TDE's have a MOLE unit or you can purchase heat tape.
- Are the platens moving as they should? Any additional delay can affect adhesion. Suggested core board temp at mold close is 380F-390F (193C-199C). Although this is not the case for every customer and/or program. Temperatures may need to be elevated or decreased dependent on transfer time from oven exit to mold close. We like to see an 8 second or less transfer time from oven exit to mold close.
- Verify if the mold/tooling is not pulling the fabric during mold open.

Standard Reactions

Fabric delamination from the Azdel

- Is the construction of the fabric correct? has it been changed? does it meet original specifications?

- If your oven has an exhaust, is it open/closed as it should be? Look for any obstructions of air flow.

- Is the adhesive being used the correct GSM, do you need a heavier weight and/or type?

- Is the part at the correct or optimum molded thickness?

- Is the fabric delaminating happening in the same spot?

•Rotate the board 180 degrees, does defect follow the board?

Standard Reactions

Free loft

- The amount of loft is based on the type of Azdel being used, is it Superlite or an XLT product? Each of our product does loft, but its based on the grade of Azdel being used. Contact your Azdel representative for loft values if needed.

- Loft is based on how much time and heat/energy is being applied to the Azdel. Not all customers equipment is the same so it's difficult to dictate what your soak time and oven setting should be. Approximately 55 seconds is a common soak. Typical core temperature for board at oven exit is 400F-420F. Typical board temp at mold close is 380F-390F.

Standard Reactions

Warp or deformation

- Too much tension on the fabric. Back off on mechanism applying tension, until the warp or deformation is eliminated.

- Make sure material is reaching optimal molding temperatures. Typical core temperature for board at oven exit is F-400F-420F. Suggested board temp at mold close is 380F-390F.

- The molded part should be 212F or cooler at mold open. If not deformation, and/or cover stock delamination can occur.

- Look at elongation values of the fabric. Does it meet the elongation specification?

- Verify the mold is getting proper cooling. Verify set-point to tooling actual. Is mold watered correctly?