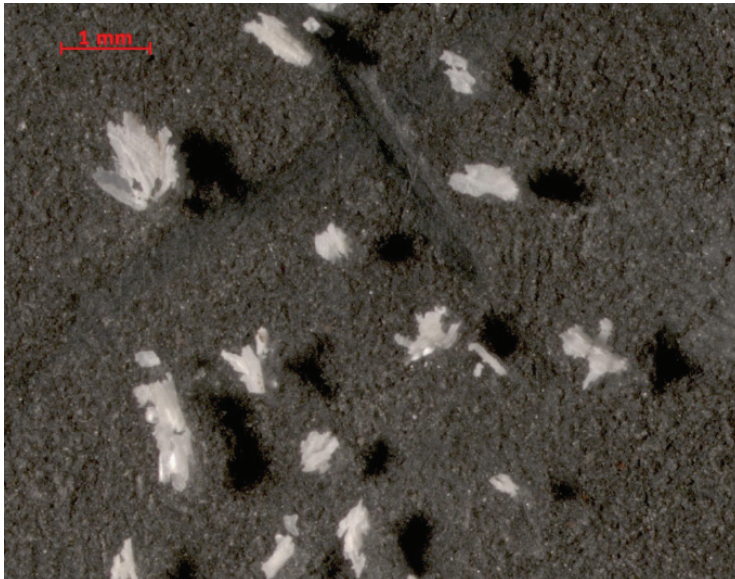

Problem:

Vent Deposits

Vent deposits are thermal decomposition byproducts that build up in the mold vents. This build-up of residue, often referred to as “plate-out,” eventually can lead to clogged vents.



Vent deposits

TECH TIPS

Your Vydine[®] technical services team offers step-by-step troubleshooting tips to help locate and solve problems that may occur during injection molding in order for you to get production back up and running.

Problem:

Vent Deposits

Root causes

Several factors can cause vent deposits:

- *Molding conditions:* Excessive melt temperatures, injection pressure, residence times and injection velocity can cause the material to degrade and generate volatiles that condense in the mold vents.
- *Material formulation:* Certain materials contain thermally sensitive additives such as lubricants, stabilizers, modifiers and flame retardants which decompose under adverse molding conditions.
- *Wet resin:* Excess moisture off-gasses and creates more volatiles that need to be vented out. This adds to the oligomers, lubricants and other additives that are normally vented out, prematurely filling the vents.
- *Inadequate venting:* The venting system is not adequate for the air and volatiles to be removed each shot.

How to troubleshoot

Evaluate the molding process

- Good venting is critical for allowing air to escape the mold design as the molten polymer flows into the sprue, runner, gate and cavity. Each time the polymer is melted it gives off oligomers, lubricants and air that need to be vented out. Excessive shear rates will also create oligomers, all of which need to be removed. All of these volatiles must pass through the vents with vent deposits occurring as these hot gases condense on the colder mold surface. There must be adequate venting area to remove these volatiles.
- Excessive vent deposits will eventually close the vents off and cause burn marks, short shots, poor surface quality and/or weak weld lines. If you encounter these types of part defects, consider the following:
 - Decrease the injection speed to allow the hot air and gases in front of the molten polymer to escape the cavity.
 - Make sure melt temperature settings are within the recommended range, as this can lead to excessive polymer degradation.
 - Avoid excessive residence time. When using Vydyne® material, two to five shots per barrel are recommended. Using more than five shots can degrade the material. In this case, reduce barrel temperatures until melt temperature is within the manufacturers' recommended temperature range.

Evaluate the mold design

- There are many factors from a mold design perspective that can cause vent deposits.
- Vents should be located at end of fill, weld lines, and the bottom of ribs, bosses, other geometry, etc. They should be placed every two inches along the parting line to provide adequate volatile removal.
- Evaluate the gate and runner size to make sure it is appropriate for the part volume.

Evaluate the material

- If the resin is too wet, consider the recommended drying conditions. Wet resin may cause excess steam, which can transport lower molecular species from the polymer melt into a vapor phase that condenses in the vents. Drying is recommended for 4 hours at 170°F (77°C).

About Ascend

Ascend Performance Materials is the world's largest fully integrated producer of nylon 6,6 resin. We manufacture and reliably supply world-class plastics, fibers and chemicals that are used in thousands of everyday applications such as car parts, electronics and cable ties.

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