

Profile die for PVC and HIPS

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For most profile shapes, it is reported that the same die can be used for PVC, as well as HIPS. However, when extruding a profile shape for siding applications with 6 to 8 inches flat in the center and curved edges for structural strength, the HIPS shows waves on the flat sections, whereas, PVC would stay perfectly straight.

These waves can be three dimensional, forming bumps and sink holes along the panel, which is an indication of too much flow in the center part. The reason for this can be explained with the difference in rheology between both resins:

HIPS is more shear thinning than PVC, which means that, in areas of high shear rates (such as the flat-sheet part), the viscosity of HIPS drops more than for PVC. This will allow more flow since, as a result of lower viscosity, the pressure gradient is less.

What does this mean for the operator in charge of producing quality products?

1. A change in processing conditions, such as barrel temperature or screw speed does not solve the die flow problem.
2. It takes a different die, or die with an adjustable middle section, to improve the quality for HIPS panels. If anyone of our members has an easier solution to this, we would like to hear it and report in our next newsletter.

- H.H. Mack

See also:

- [Extrusion dies](#)
- [Shear rate and what it means](#)
- [Profile extruder specifications](#)
- [Using shape factors for extrusion die design](#)

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