

Vent Flow

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Vent flow (Consultants' Corner)

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Vent Flow is usually blamed on the screw design, but, more often than not, it is due to a bad vent diverter design. The function of the decompression area, or vent section of the screw, is simply to generate a partially filled channel with no pressure. The vent diverters function is to accept the moving bank of polymer in the screw channel as it passes the opening and roll it back into the screw. If you have vent flow, you can do either of two simple tests that will usually answer which component is to blame for vent flow. First, remove the diverter, rotate the screw slowly, and observe the degree of fill in the channel. If the channel is 1/3 or less filled, the problem is almost certainly the diverter. An alternative test is to run for a few minutes at open discharge at your normal screw speed. If vent flow begins, it is likely a diverter problem as the screw is operating against no discharge pressure.

Diverter design is a bit of an art form and a number of different shapes are proven to work well. However, it requires an understanding of the dynamics of the moving polymer in the barrel as it passes the vent hole to successfully design vent diverters. Even which side of the barrel the vent hole is located has an affect. Barrels vented on the left, looking downstream, are easier to vent than those on the right side. Top vents work best, but have the disadvantages of poor accessibility and vent flow spilling over the barrel.

There are other factors that can cause vent flow, as well as screw or diverter design. Some of these are polymer foaming, screw/barrel wear, improper vent location, excessive pressure, etc. Only a competent extrusion professional can handle them all, but try diverter design first as it is the most likely cause.

- Jim Frankland, New Castle Industries

See also:

- [Twin screw extruder design and operating characteristics](#)
- [Vent flow in twin screw extruders](#)

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