

# Vent Flow in Twin Screw Extruders

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In devolatilizing twin screw extruders, vent flow can be caused by several different mechanisms. Here are examples of the most common causes and what to do to correct the problem. First, vent flow can come from a downstream backup where a high head pressure and low polymer viscosity fills the screw and backs polymer up into the vent. Correct this by either reducing the head pressure, lowering exit temperature if possible to increase polymer viscosity or adding a barrel and a longer screw length from the vent to the head.

Second, vapors flashing from a upstream pressure letdown screw element close to the vent can entrain polymer and cause vent flow. Move the pressure letdown step further upstream about 2.5 diameters to reduce this problem or, if possible, use less vacuum. Third, entraining polymer particles and vent flow can result from too much of a vapor load. A shift in some of the vapor load to a second vent can help this problem. Also, mechanical vent staffers might be used.

Fourth, a low viscosity polymer might adhere to metal walls of the vent and ride up the vent. Vent inserts would be useful here or long lead screws. Fifth, if too much vapor is taken off of a low solids polymer solution or a low viscosity polymer, foaming can occur. Less vacuum must be used to lower the vent velocity and reduce the foaming or a vent staffer could be used. The sixth and last case is where unmelted or solid polymer particles are disengaged and pulled out the vent. A screw change to more intensive mixing or a longer melting zone is needed here to completely heat up and melt the polymer before the vent.

- Carl Hagberg, NFM/Welding Engineers

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