

More on Polymer Filtration

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This note is written to suggest that the mass of polymer which will result in pluggage of a unit area of filter is a measurable quantity which would be useful in specifying polymer quality and in providing a basis for sizing filters.

It is generally assumed in filtering polymer that flow paths through the filter media are closed when a gel or foreign particle becomes lodged in the flow path. The validity of this assumption can be checked by plotting, at a consistent polymer rate, the reciprocal of the pressure drop through the filter media versus the quantity filtered. Expressed in another way, one would expect the pressure drop through the media to approximately double when half of the flow paths are plugged.

Twice the amount of polymer, which corresponds to the doubling of the pressure drop through a clean media, is the maximum amount of polymer that can normally be filtered. It is a useful measure of the quality of the polymer with respect to gels and foreign material. One can call this a plug-gage value for the polymer, with units of mass/area. This pluggage value should be determined as a quality control test and performed by either, or both, the supplier of resin and the resin user.

If the polymer user knows the quality of the filter required for his product, then tests on a small sample of media can be used to determine the size of filter required for a given polymer or, conversely, whether a polymer can be used with a given size of filter. The same test can also be applied to measure the cleanliness and the gel content of rework.

Films are produced commercially in thicknesses that are about the same as the pore size of a fine polymer filter, i.e., 12 microns. For these and thinner films, it may be necessary for the polymer manufacturer to control his process with respect to gel content and foreign material.

- Dr. Kenneth L. Knox

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