

# On-line quality analysis

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A new on-line quality analyzer now being offered for sale by Flow Vision, Inc. has been invented for studying the polymer melt as it comes off the extruder screw. An optical method is used to observe how homogeneous the melt stream actually is. Initially, we hoped to be able to see voids (see Figure 1) and gel particles. These were easily observed but we were startled to see a great deal more than just these two items.

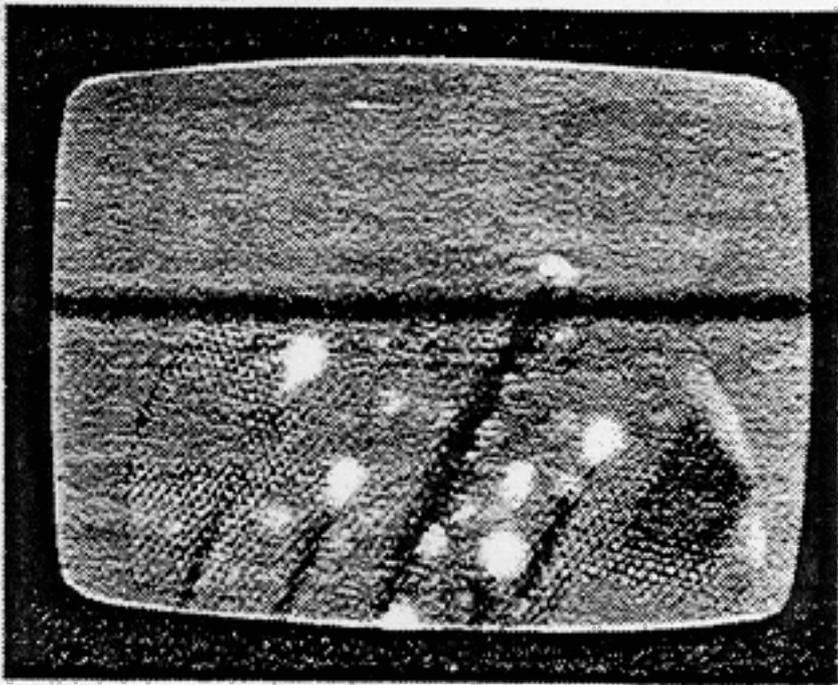


Figure 1

Figure 1

We have seen the following types of events:

1. Incompatible melts — LDPE with PS
2. Unmelted polymer
3. Glass fibers
4. Calcium carbonate filler
5. Filler agglomerates
6. Carbon particles sloughing off screw
7. Gel particles forming in the melt stream

Because we see so much, we expect that we will be able to analyze for the quality of different screw designs by means of this instrument. Currently we are using a simple metering screw which allows all these materials to come through unscathed. This is fine for identifying different types of materials but removing such items by proper design of screws is expected to be a real step ahead in the science of extrusion.

The first unit was installed late in December 1984 and is now being used to analyze a large polyethylene reactor system. This system is expected to give a real view of what is occurring in the reactor; this should result in much better reaction control.

In a few isolated instances we have observed waves moving across the viewing screen consistent with the revolutions of the screw. These waves appear to be velocity profiles; why we are able to see these is not clear at this time.

- Dr. David W. Riley

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- Gels

- Sources of gels
- Polymer filtration
- PVC gels
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