pelletron
Discover Bulkmatology™
The Nature of Bulk Material Handling

Nypro
Oregon

Do you ever get Black Spec contamination on clear parts?

Well we sure did! So we have found a way to eliminate it from the material. Here is some history. We mold clear medical parts in acrylic and crystal styrene. We constantly were fighting black spec contamination in both materials. The styrene was the worst due to excessive fines on the pellets. We knew why the fines were so bad, it was due to the 4 or 5 times the material was being conveyed after manufacture. First it is palletized, then bulked into holding silos, then to rail cars, next to bulk trucks, then into gaylords and finally into our hoppers. All this movement created a lot of fines.

While the fines were a problem with styrene, acrylic didn't seem to have the same kind of issues. In this case the specs seemed to be more contamination related. Yes, we used Gaylord covers, but they were not solving the problem. So we began to look for ways that contamination could be occurring.

One of the first things we noticed was that more often than not the covers on our Gaylords were being sucked into the Gaylord from the vacuum tube.

So the material handlers had to constantly keep pulling them back up on top of the Gaylords. They also had to reach into the Gaylords to move material down toward the vacuum tube so it could suck the material up into the hopper. Now we run a lot of black materials in our plant, many with glass or carbon fillers. Dust from regrind and general handling does get into the air. When a Gaylord cover is in place it prevents that dust from getting into the material, but every time it falls into the Gaylord or the material handler removes it to move the material toward the end of the vacuum tube that dust falls into the clear material. It doesn't matter how careful you are, it is going to happen.

On our crystal styrene job we usually run two machines and on the acrylic job we are usually running four machines. So for each machine we had one Gaylord for each. This compounded the opportunities for problems and also added additional work for the material handling staff.

Solutions:

The first thing we did was to add plastic tarp holders to two sides of each Gaylord cover. We then bought fairly light duty bungee cord by the roll with plastic clips that fit on the ends. We can now slide the bungees through the pallet and clip the cords onto the covers, thus preventing the covers from being sucked into the Gaylord. (Make sure you don't make them too tight or you may create a hazard when releasing one side)

Next we reran our material vacuum lines to allow us to run multiple machines from a single Gaylord. This reduced the handling required for each machine and we added a Gaylord tipper with a vibrator so that the Gaylord would be nearly empty before ever having to be opened

All that being done, we felt we had eliminated the potential for foreign particles from being able to enter the Gaylords. ***But we still had to deal with the fines.***

So we purchased a Pelletron P5 DeDuster™, (500 lbs/hr).

This device not only vacuums off fines, but it also uses anti-static disruption to help release the fines from the pellets due to static electricity. We mounted it on top of the drying hopper. It instantly stopped the burning of the fines in the styrene and we were able to stop the black spec problems that occurred in almost every shot. But an interesting thing happened as we began to check the fines that were being pulled off; we saw that there were still foreign specs in the fines.

P-5 Mini-DeDuster™ Assembly Mounted on dryer. Includes inlet hopper and inlet flow control slide

So we reasoned that even though we had severely reduced and significantly improved the occurrence of black specs that could get into a Gaylord, we had not totally prevented them.

What we learned was that if they did get into our clear material, we could still keep them from getting into our parts with the use of the DeDuster™. So, we added another P-1 mini-DeDuster™, (100#/hr capacity) to the molders for the acrylic jobs.

P-1 Mini-DeDuster Assembly

To date, our Black Spec problem has been virtually eliminated from the material.

We must still be diligent in our control and use of hot runner systems so as to not introduce black specs from the mold, but the use of the following has greatly decreased our scrap and increased our yields while running clear materials.

1. Reduced number of Gaylords,
2. Gaylord covers,
3. Gaylord tipper,
4. Tarp Holders & Bungees, and
5. Pelletron DeDuster™,

(Submitted by Richard Graf, The Nypro Oregon Team. June, 2001)