

CONTAMINATION

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by MIDWEST TUNGSTEN SERVICE

WAX is a cause of adhesion failure on edges or corners. The wax comes from waxed paper used in packaging parts or from wax-lined cartons. As a part is taken from the carton, the edge scrapes off the wax from the paper. Washing with solvents usually just floats the wax to another area.

DRY SPRAY or overspray is paint mist that has dried and drifted away. It looks like grains of very fine sand. Dry spray settles on the top of duct work, air lines, blowers, etc. When a draft is induced by the opening of a door or turning on a blower, this fine powder is recirculated. Stand to one side of a sunbeam coming through the window in the spray room and watch. The best way to fight this is to clean the room each week. That is, clean the tops of pipes, etc. A coated or water-wash booth and proper airflow will help containment. The use of proper spray technique and proper equipment setup will minimize the amount of overspray generated.

AIR LINES. . . Filters for the air lines should be at the nozzle end of the line. Filters near the compressor are usually inadequate. An antistatic gun without a filter will most likely end up producing an oily part. Oil spots are circular areas with poor adhesion and sometimes discoloration. The pattern will often be a large spot surrounded by smaller satellite areas. Rejections will be sporadic. Moisture can effectively be removed near the compressor by using a refrigerated dryer.

ROUGH AREAS or spotty areas can be the result of solvent etch. The clue to this will be that all the parts of the run will have the same appearance. Check our Tips called [Solvent Chart](#).

FINE SHORT LINES or “fines” look like a piece of hair in a clear plastic. Here the solvent (particularly hot solvent) has caused a strain in the molded part to show up. It will always be in the same area and on many parts.

CONTAMINATION does not necessarily mean rejection. Sometimes it is not worth mentioning.

We know a black wrinkle finish will tolerate all kinds of surface blemishes, things that would put a second surface decorator out of business. Where do you draw the line? Second surface and metallized parts must be free of any contaminates. On a first surface coating, as the color changes from a white to a dark shade the problem lessens. A smooth, white TV bezel will show minor imperfections immediately. A brown one will not show them as obviously. A matte, black one, under the same circumstances, will pass inspection. This explains why some jobs run into trouble when the substrate color or finish is changed.

PIN HOLES that look like fish-eyes (visibly different from other types of pinholes) are caused by silicones used as lubricants or mold releases. Even silicone lubricant sprays used in a different area of the factory can migrate to your parts. This contamination cannot be removed by elbow grease or solvents. We question silicone mold releases that claim they can be painted over. (Now we will be sued.) There is a fish-eye solution that can be used with some coatings to overcome the fish-eye problem.

ZINC STEARATE is an alternate mold release, but here the problem is buildup. When a coating does not adhere to a sharp edge of part, you can suspect that an excess of release has been worked into a crevice of the mold cavity and is now too thick on the part. It can be wiped away with the careful selection of solvents. Best bet, try reworking the mold and don't use release agents.

Yes, we know we are oversimplifying this. If you want to go into the subject, call us. We will help you or put you in touch with someone who can.

PULP DUST from those corrugated cartons is a big source of dirt and one that is often condoned. Pulp dust looks like a light, fine sawdust and is often in the cardboard trays that are used as temporary storage for parts.

THE SECONDARY CRISIS. . . That is what we call contamination in the finishing department. Everyone with experience in finishing plastics knows about the items we mention in this bulletin and most everyone reading the bulletin will have rejects coming up in the near future. Unnecessary rejects. . . Why? Well, there is almost always a bigger crisis in the shop as well. Something happens and cartons have to be unloaded in the finishing room. There is no place else and the job has to go out. So, the matter of "pulp" dust is not as important as getting the job out and the rejects will have to be tolerated. Just make sure on the next job, where there is no crisis, the cartons are not again unloaded in the finishing room.

SOLVENT TRAILS. . . Modern lacquer formulas have more than one resin in them. One will be called a film former. It will form a quick drying layer on the top of the paint film. One solvent out of the two or more that are used in a lacquer will have a slower evaporation rate. If the film is forming and a slow solvent is still coming out, then it will leave a pinhole or a trail in the film former. A solvent trail can also look like a piece of lint in the film. If you have both pin holes and spirals trails, suspect solvents. Adjust, and if the trails are gone too, good. If only the pin holes are gone, then check for dirt or lint as well.

TUMBLING COMPOUNDS that are used to clean thermosetting plastics are a major source of contamination. In many cases, fruit pits or nut shells are used as the compound and the extraction from them will coat and polish the part during the tumbling, giving a pleasing gloss and the appearance of cleanliness. However, adhesion problems may result later.

THINK FIRST... Determine the cause of rejection. Some shops lump all rejects from finishing together, under the claim it is the paint, or it is dirt. It may well be that there is more than one cause for the rejects in that shop. Those reject parts tell a story that is worth hearing. You can usually look closely at a part and determine the cause of rejection. A good magnifying glass should be on hand when looking at rejects. A powerful lamp helps, too.

TARNISH that shows up later, on metallic finishes, can be the result of fingerprints. The acid from perspiration will leave a residue on the part that will cause the metallic particles to tarnish after an

extremely short duration. It is unfortunate that the run is usually completed before this contamination shows up.

SOFT PLASTICS or flexible plastics such as butyrate, vinyl, etc. have plasticizers in them. When the wrong plasticizer is used or an improper coating is used, the plasticizer can migrate to the surface at a later date. The results of this contamination can show up in several ways, the part surface can become sticky, vacuum chambers can slow down, coatings can discolor, metal coatings may tarnish, or small blisters can develop. The best thing to do with a flexible plastic is to check with your paint supplier. He will probably give you a barrier basecoating to seal in the plasticizer.

STATIC ELECTRICITY contributes to contamination and is a major problem if you are going to coat a clear part. Some people call static electricity "contact electricity." Plastics are poor conductors of electricity and when two surfaces are brought into contact, if one or both of them are plastic, some of the electrons will intermingle with the contact surface. When the surfaces are separated, some of the electrons will be trapped. One surface will be negatively charged. It is now out of balance and will gather any floating dust particles, etc., to satisfy the negative charge and become neutral.

ANTI-STATICS. . . There are several ways to de-staticize a surface. The two most popular are the use of a liquid antistatic solution and the use of ionized air. Each system has advantages and disadvantages. An antistatic solution has to be only a monomolecular film to be effective and it is little more permanent than ionized air. But from a decorator's point of view it should not be applied until after the last decorating operation. The film can be a contaminate, especially if too heavy.

Compressed air, properly ionized, can be sprayed on the part to neutralize it. The ionization will remove the charge that holds the dust on the part and the forced air will easily blow it away. This leaves an uncontaminated part. Blasts of ionized air should clean the part immediately before the decorating operation.

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