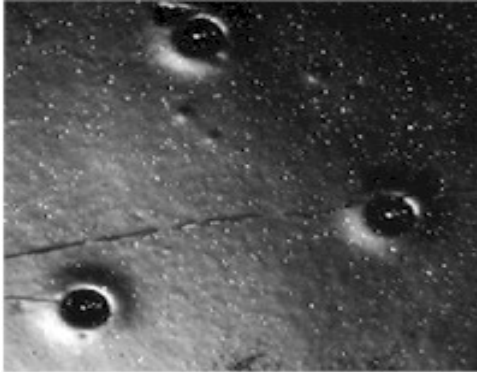


COMMON PAINT DEFECTS, THEIR CAUSES, AND LINETEC'S METHOD OF PREVENTION

POPS



DESCRIPTION:

- Small swelled areas like a pimple or blister
- Broken edge craters if the blisters have burst.
- Pinpoint holes in finish.

CAUSES:

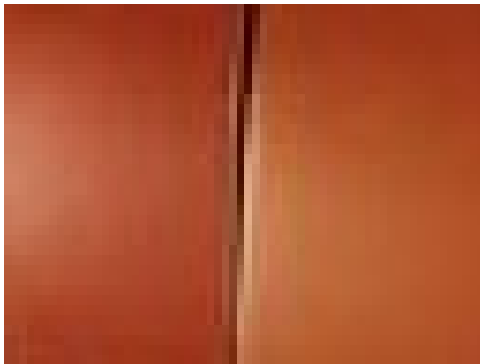
- Excessive film build traps solvents which are released during flash or bake
- Insufficient flash off time before baking.

LINETEC PREVENTIVE

MEASURES:

- Controlled application through SOPs and automated equipment prevents excessive film build
- Adequate flash off time
- Multi-zone oven controls promote gentle temperature ramping

COLOR INCONSISTENCY



DESCRIPTION:

- Inconsistent color from part-to-part or job-to-job

CAUSES:

- Batch-to-batch paint variation
- Poor agitation
- Over-baking / burnt

LINETEC PREVENTIVE

MEASURES:

- In-house color lab w/state-of-the-art equipment:
 - all incoming paint inspected for color match
 - all in-house blend paints inspected for color match
- In-process paint agitated for consistency
- Oven operation and controls to prevent over-baking / burning

METALLIC INCONSISTENCY / MOTTLING



DESCRIPTION:

- Inconsistent flake orientation causing color variation, particularly when viewed at different angles.

CAUSES:

- Oil canning of substrate surface (slight convex or concave distortion)
- Batch-to-batch paint variation
- Insufficient agitation of paint
- Inconsistent applications technique
- Variations in paint film thickness
- Part design may necessitate hand spray (returns, framing, recessed areas)

LINETEC PREVENTIVE

MEASURES:

- Communication with customer
 - oil canning potential
 - effect of part design on painting requirements
- In-house color lab w/state-of-the-art equipment:
 - all incoming paint inspected for color match
 - all in-house blend paints inspected for color match
- In-process paint agitated for consistency
- Controlled application through SOPs and automated equipment ensures consistent finish and paint film thickness

ADHESION FAILURE



DESCRIPTION:

- Flaking or peeling paint between the top-coat and primer, or top-coat and substrate material.

CAUSES:

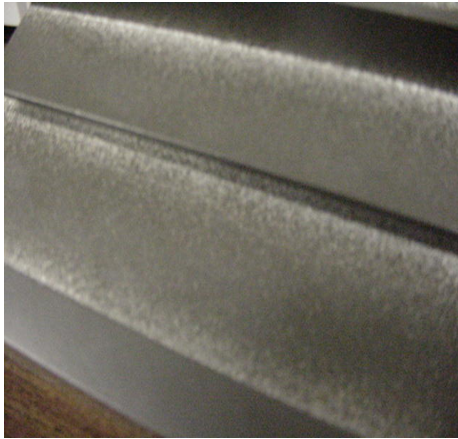
- Improper surface preparation
- Painting over oil, grease or other contaminants
- Improper paint cure

LINETEC PREVENTIVE

MEASURES:

- Chemical Pretreatment System
 - Dedicated Chemical Technician on each shift
 - 5-stage in-line system
 - Electronic interlocking to prevent pretreatment failures
 - Strong participation from chemical supplier
 - Test samples submitted monthly for analysis & coating weight verification
- Oven operation and controls to prevent under-curing

LIGHT COVERAGE



DESCRIPTION:

- Paint fails to fully hide the substrate surface to which it is applied

CAUSES:

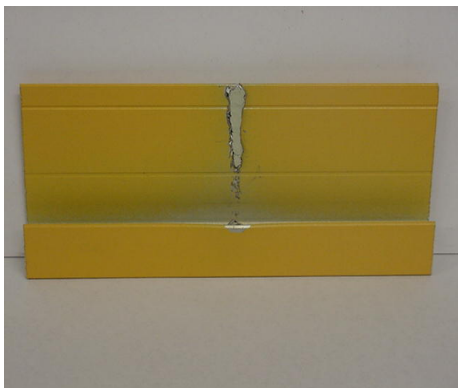
- Inadequate film build
- Faraday cage effect

LINETEC PREVENTIVE

MEASURES:

- Understand customer requirements
 - exposed areas, unexposed areas, general expectations
- Apply basecoat with automated equipment on complex dies
- Hand spray recessed areas to ensure coverage

RACK MARKS



DESCRIPTION:

- Unpainted or light coverage areas on a part due to rack location or contact with part

CAUSES:

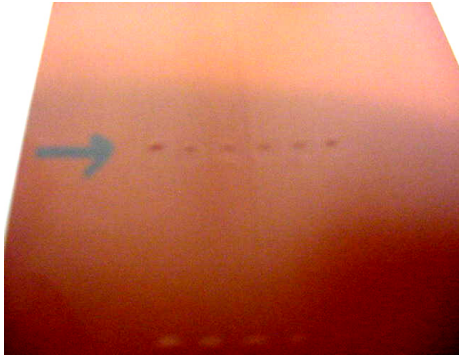
- Rack in direct contact with part prevents paint coverage
- Rack close, but not touching parts, “blocks” paint and creates light coverage in area behind the rack
- Excessive paint build-up on rack can soften in the oven causing the part resting on it to “sink in” creating a blotchy build-up when removed

LINETEC PREVENTIVE

MEASURES:

- Understand customer requirements and expectations
- Innovative rack designs minimize rack contact and interference
- Utilize “racking recipes” to ensure consistent racking of each die
- Rack maintenance schedule ensures that clean racks with minimal build-up are used

WET MIL MARKS



DESCRIPTION:

- Small indentations on exposed surface, approx. 1 ½” total width

CAUSES:

- These marks are the necessary result of taking “wet mil” measurements.
- Wet mil measurements are used to determine the wet film thickness of an applied coating. In turn, this is used to estimate the resulting dry mils. This testing is done in an effort to ensure adequate wet mil coverage to yield the required dry film thickness.

LINETEC PREVENTIVE

MEASURES:

- Controlled application through SOPs and automated equipment ensures consistent paint film thickness, thus reducing the required frequency of wet mil testing
- After taking a wet mil reading, a hand-spray sweep is performed to cover/minimize the mark
- Utilizing a newer style wet mil gauge with smaller profile designed to minimize the surface disruption