

COATING WORLD®

SPECIAL REPORT ON NONSTICK COATINGS AND HOUSEWARES FOR RETAILERS

Protecting Your Private Label's Bottom Line: How Free Product Testing From Whitford Works

Are you sure that the nonstick products on your selling floor will perform as expected when the consumer takes it home? The application of nonstick coatings may not be rocket science, yet it is remarkable how many mistakes can be made (and are) made in the application process.

When a problem occurs, it almost always manifests itself in the finished coating: blisters, coating peeling or flaking off, variations in color of the coating, low gloss, tiny bubbles (called "fish eyes"), nubby appearance ("orange peel"), etc. This inevitably leads to the conclusion, "There is something wrong with the coating!"

To the consumer, this means there's something wrong with the product, too, which can lead to returns that affect your bottom line.

Enter the QCP

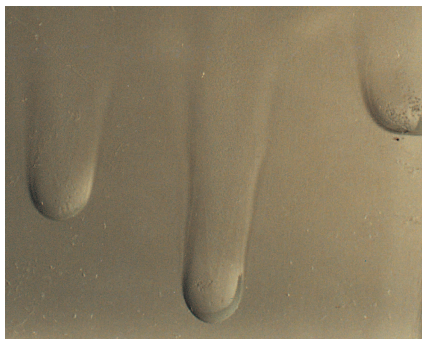
Almost always, the problem lies in the coating application rather than the coating itself. That's why Whitford established the Quality Cooperative Program (QCP). The primary purpose of Whitford's QCP is to achieve and maintain the highest quality possible by preventing problems from occurring before a product hits the selling floor.

Although it is not a final quality check, the QCP establishes certain quality standards that must be met by those who apply Whitford coatings. It also delineates three specific testing procedures that must be carried out on random samples of all coated products to make sure these high application standards are maintained.

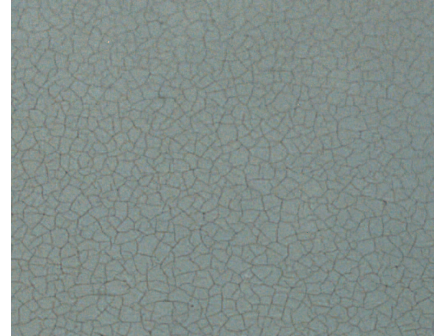
It begins with your insisting that samples of your private-label products, coated with Whitford coatings, are sent



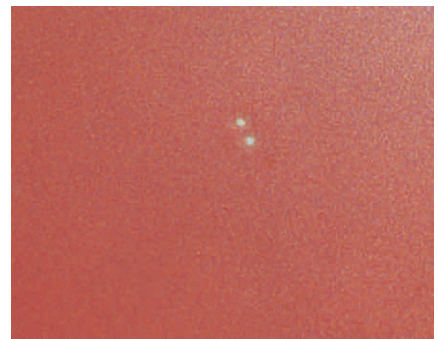
A severe case of coating failure due to improper cure time and temperature.



Sagging, caused by low viscosity or the coating is applied too thickly.



"Mud-cracking" caused by the application of too much coating.



"Fish eyes", small holes caused by contaminants (such as fingerprints) on the surface.

to the nearest Whitford laboratory on a routine basis for testing.

3 tests to avoid failure and costly returns

So don't wait for the consumer to tell you that your product has disappointed them to the point of wanting

their money back. When a Whitford laboratory performs three basic quality tests, problems like chipping and peeling, cracking, and poor nonstick performance can be detected before they become customer returns. Below is a chart that describes three common coating problems, what they look like,

Characteristic	Potential problem	Test method
Coating chips, peels, flakes or scrapes off	Coating does not adhere properly	Crosshatch/Boil Test (Whitford test method 132D)
Blisters, "mud cracks" in coating, rapid wear	Improper amount of coating applied	Film Thickness Test (Whitford test method 114A)
Coating does not perform to expectations, food sticks	Coating may have been cured (baked) too long, not long enough	Completeness of Cure Test (Whitford test method 115A)

and the key tests that can be done to identify them:

The test methods described are basic tests that identify the most common coating problems.

The Cross Hatch and Boil Test determines whether proper adhesion has been achieved, not only to the substrate, but also between coats.

The Film Thickness Test measures the thickness of the dry film to determine whether the proper amount of coating was applied.

The Completeness of Cure Test, used primarily on one-coat nonsticks, verifies the cure by measuring the coating's resistance to a tough solvent, methyl ethyl ketone. A coating's reaction to an MEK rub will reveal temperature and time discrepancies that can cause a coating to underperform.

The QCP doesn't stop here

If the samples you send pass these three basic tests, you will receive a written report confirming the results.

If there is a problem that requires attention, you will receive a report indicating what is wrong and what should be done to correct it.

Should these tests indicate a more complicated problem, we inform you of the more complex situation, then subject the samples to one or more additional quality tests to define the problem and recommend a specific solution.

We can perform a variety of tests that measure characteristics such as gloss, opacity, hardness, adhesion, flexibility, impact, drawability, abrasion, mar resistance, etc. Whitford will also work directly with your manufacturer (or coating applicator) to make sure that the proper course of action is communicated clearly and that any questions are answered.

With Whitford facilities in ten countries and a worldwide network of technicians, we are in a position to provide help wherever you (or your suppliers) may be.

Other tests and what they reveal


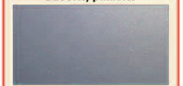











Years of experience in research and development have led Whitford technicians to develop certain test procedures and even design special test equipment in order to determine characteristics which were previously not testable. The chart below explains some of these methods and how they can prevent problems by simulating common nonstick abuse by the average consumer (copies are available for anyone who would like one).

For a full list of these tests and more information about how they are performed, please visit our website at whitfordww.com and click on the "Info for Retailers" section. You'll find a wealth of helpful information.

Want to join?

If you'd like to join the QCP — and take advantage of Whitford's free testing program — please go to whitfordww.com. We're here to help, whether you join the QCP or not.

Solving Common Coating Problems

<p>Using this chart</p> <p>Whitford Worldwide has been solving coating problems for customers since our founding in 1969. One fact has stood out among our areas of product development: a coating fails, the customer sees it, and the coating is at fault — but the application process.</p> <p>There are too many variables in applying coatings that can lead to failure. The chances of this threat are 1) to take action, 2) to realize what can go wrong and how to fix it right.</p> <p>Following are the most common complaints we hear from customers about their work. Each complaint is outlined in three parts:</p> <ol style="list-style-type: none"> 1. Appearance: what the problem looks like. 2. Possible causes of the problem. 3. Suggested solutions. <p>If the applicant can identify, call Whitford Worldwide (see below) and we'll do our best to solve it for you.</p> <p>Whitford Worldwide</p>	<p>Blisters</p>  <p>Appearance Small blister-like bumps on coated surface.</p> <p>Probable cause 1. Coating has been applied too thickly. 2. Excessive evaporation of solvents using a solvent that is too volatile, or increasing part temperature too rapidly.</p> <p>Suggested solution 1. Remove coating and reapply a thinner coat. 2. Reduce coating thickness, then recast and cure. 3. Add small amount of slow evaporating solvent.</p>	<p>Bubbles, pinholes</p>  <p>Appearance Many small pinholes scattered in the coating.</p> <p>Probable cause 1. Excessive agitation, causing coating to foam, trapping gas in it bubbles. 2. Excessive pumping or a forcing pump. 3. Rapid evaporation of solvents.</p> <p>Suggested solution 1. Reduce agitation and/or slow curing process. 2. Add slow-evaporating solvent. 3. Warm parts more gradually, heat briefly before curing.</p>	<p>Cobwebbing</p>  <p>Appearance Small strands of cured material on surface.</p> <p>Probable cause Fast coating is drying as it's applied before it reaches the surface to be coated.</p> <p>Suggested solution 1. Reduce the air pressure in the delivery system to prevent premature drying. 2. Change to a solvent that dries more slowly. 3. Reduce viscosity.</p>	<p>Dry spray</p>  <p>Appearance A rough, mottled surface with orange peel.</p> <p>Probable cause The coating is drying too much before as it is propelled toward the surface by the spray gun.</p> <p>Suggested solution 1. Move the spray gun closer to the surface, reduce the velocity of the spray, or increase the ratio of coating to air in the spray. 2. Change to a solvent that dries more slowly.</p>
<p>Eruptions in die-cast parts</p>  <p>Appearance Occasional, random eruptions in small part marks.</p> <p>Probable cause Microscopic contaminants in the metal. The air expands during cooling, creating eruptions and leaving a hole in a small eruption or a crater.</p> <p>Suggested solution 1. Place eruptions prior to coating and clean the parts to a temperature above the cure temperature. If the die is cleaner, all parts cast there cool and cure. If blisters still appear, advise your customer. 2. Select coating with least cure temperature.</p>	<p>Fish eyes</p>  <p>Appearance Round, crater-like marks on the substrate.</p> <p>Probable cause Contaminants that prevent coating from wetting out the substrate (such as grease from equipment or oil in the compressed air).</p> <p>Suggested solution 1. Remove the offending coating and surface preparation prior to coating. 2. Proceed to assure surface is free from contamination. 3. Check for possibility of silicone contamination. 4. Insufficient adhesion of substrate prep.</p>	<p>Hazing, low gloss</p>  <p>Appearance Dull, low reflective finish on coating.</p> <p>Probable cause 1. Film of material with the PPH that rises to the surface (does not burn off completely). Low cure temperatures. 2. Presence of moisture (humidity) during coating, leaving a rough, irregular surface.</p> <p>Suggested solution 1. Place eruptions prior to coating. 2. Increase curing temperature. 3. Over baking. Low film thickness or rough substrate. 4. Repeat coating with correct PPH. Preheating cure lamp time may eliminate hazing. Check cure, substrate. 5. Check water traps for moisture. Check DPT.</p>	<p>Mud cracking</p>  <p>Appearance Thousands of tiny cracks or cracks in the coating surface resembling dried mud.</p> <p>Probable cause 1. The coating has been applied too thickly. There is no condition most often occurs in automotive coatings. 2. Coating finished too quickly or too high a temperature.</p> <p>Suggested solution 1. Reduce the applied coating. 2. Apply a thinner coat. 3. Check firing process (see Product Data Sheet).</p>	<p>Orange peel</p>  <p>Appearance Rustleed coating surface resembling skin of an orange.</p> <p>Probable cause 1. High viscosity of the coating material. 2. High temperature curing cycle used too fast.</p> <p>Suggested solution 1. Decrease the viscosity and level of solids. 2. Reduce the temperature of the part.</p>
<p>Over spray cratering</p>  <p>Appearance Small particles of coating that cause a surface not to adhere to the substrate. Craters form on areas not intended for coating.</p> <p>Probable cause Too much over spray in application.</p> <p>Suggested solution 1. Move the spray gun closer to the surface, reduce the velocity of the spray, or increase the ratio of coating to air in the spray. 2. Mask part to avoid spraying reaching other surfaces. 3. Increase or exhaust around parts to remove spray.</p>	<p>Particulate contamination</p>  <p>Appearance Hard bits (particulate) on surface of coated parts.</p> <p>Probable cause 1. Dried coating mixed with dirt being back into coating. 2. Airborne particles from air blowing over the oven.</p> <p>Suggested solution 1. Filter coating air entering oven. 2. Keep spray area clean and free of dust. 3. Vacuum particulate matter from oven.</p>	<p>Peeling, flaking</p>  <p>Appearance Sections of coating that have separated from the substrate.</p> <p>Probable cause 1. Contamination. 2. Inadequate curing. 3. Improper cure.</p> <p>Suggested solution 1. Improve process of coating, substrate to assure no trapped air or previous coating remains. 2. Mix according to Product Data Sheet. 3. Check curing procedure with Product Data Sheet.</p>	<p>Sagging</p>  <p>Appearance Coating that runs before curing, leaving raised ridges.</p> <p>Probable cause 1. Low viscosity of coating. 2. Inadequate curing. 3. Coating is applied too thickly.</p> <p>Suggested solution 1. Avoid reducing viscosity or use solvent with higher evaporative rate (see Product Data Sheet). 2. Apply thinner coats. 3. Apply to preheated parts.</p>	<p>How to contact Whitford</p> <p>Whitford Worldwide works manufacturing facilities in 6 countries. Has Whitford sales offices in 5 more countries. See chart below in an additional 25.</p> <p>Whitford Worldwide makes the largest, most complete line of fluoropolymer coatings in the world.</p> <p>Asia-Pacific</p> <p>Whitford 180-1900 Seawall Commercial Bldg. #200, Long Beach, CA 90801 Tel: +1 562 433 3800 Fax: +1 562 433 3801</p> <p>Europe</p> <p>Whitford Division: Coating Sales Dept. Bentley, Cheshire, MK12 0JL England Tel: +44 (0) 1853 573000 Fax: +44 (0) 1853 573010</p> <p>North America</p> <p>Whitford Corporation 180-1900 Seawall Commercial Bldg. #200, Long Beach, CA 90801 Tel: +1 (562) 433 3800 Fax: +1 (562) 433 3801</p> <p>South America</p> <p>Whitford Comercio e Industria S.A. Av. Brasil, 1000 - Sala 100 Rio de Janeiro, RJ - Brasil Tel: +55 (21) 2500 0000 Fax: +55 (21) 2500 0001</p> <p>Whitford Worldwide</p>

Whitford provides its customers with a wealth of helpful information, including the wall chart, "Solving Common Coating Problems". Printed in eight languages, this chart is hanging on the walls of coating applicators around the world and is used to help solve problems when and where they occur.

For even more detailed information on coatings and their uses, ask us for a copy of "The Whitford Engineering Design Guide", the most comprehensive treatise on coatings and how to manage them we have ever seen.