



September 12, 2002

Dan Risley  
Executive Director  
Society of Collision Repair Specialists  
P. O. Box 2548  
Tri-Cities, WA 99302-2548

Dear Dan:

In response to your recent letter regarding the use of flex additive in refinishing a flexible substrate, I can provide you the following information that should clarify the issue. This information is taken directly from our Technical Reference Manual which is available to everyone via the web or in hard copy.

The attached pages show the refinishing procedures for both **new OEM and aftermarket replacement plastic parts** and **repairing/refinishing existing OEM plastic parts. In all cases the attached charts indicate the use of Elast-O-Actif, a flex additive, in the topcoat.**

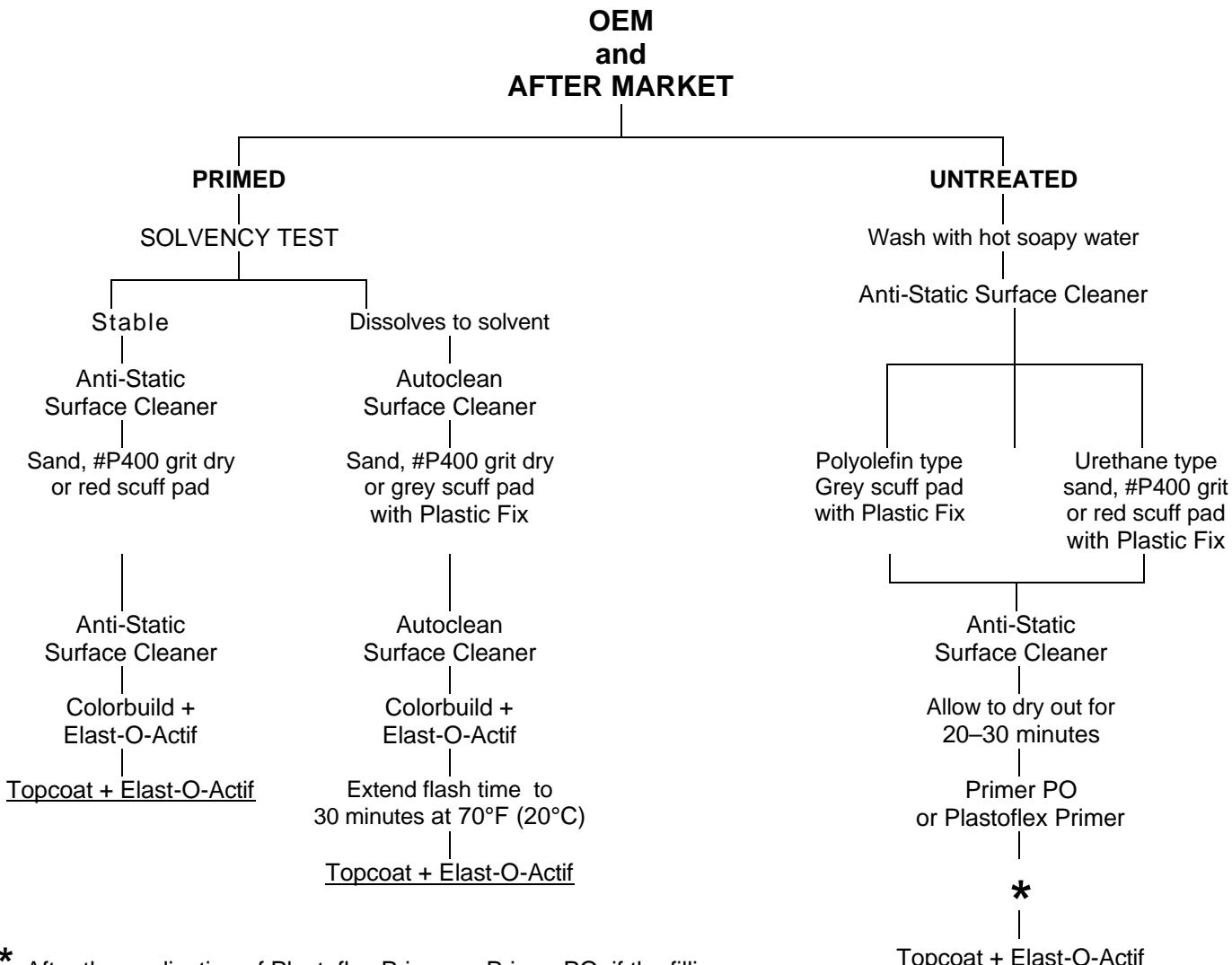
I hope this statement will clarify this issue. Additional refinish information is available in the Technical Reference Manual. We strongly urge everyone to utilize this important manual in matters relating to all refinishing procedures using Akzo Nobel products.

Regards,

Tom Moreland  
National Accounts

Attachments

## FINISHING OF NEW REPLACEMENT PLASTIC PARTS

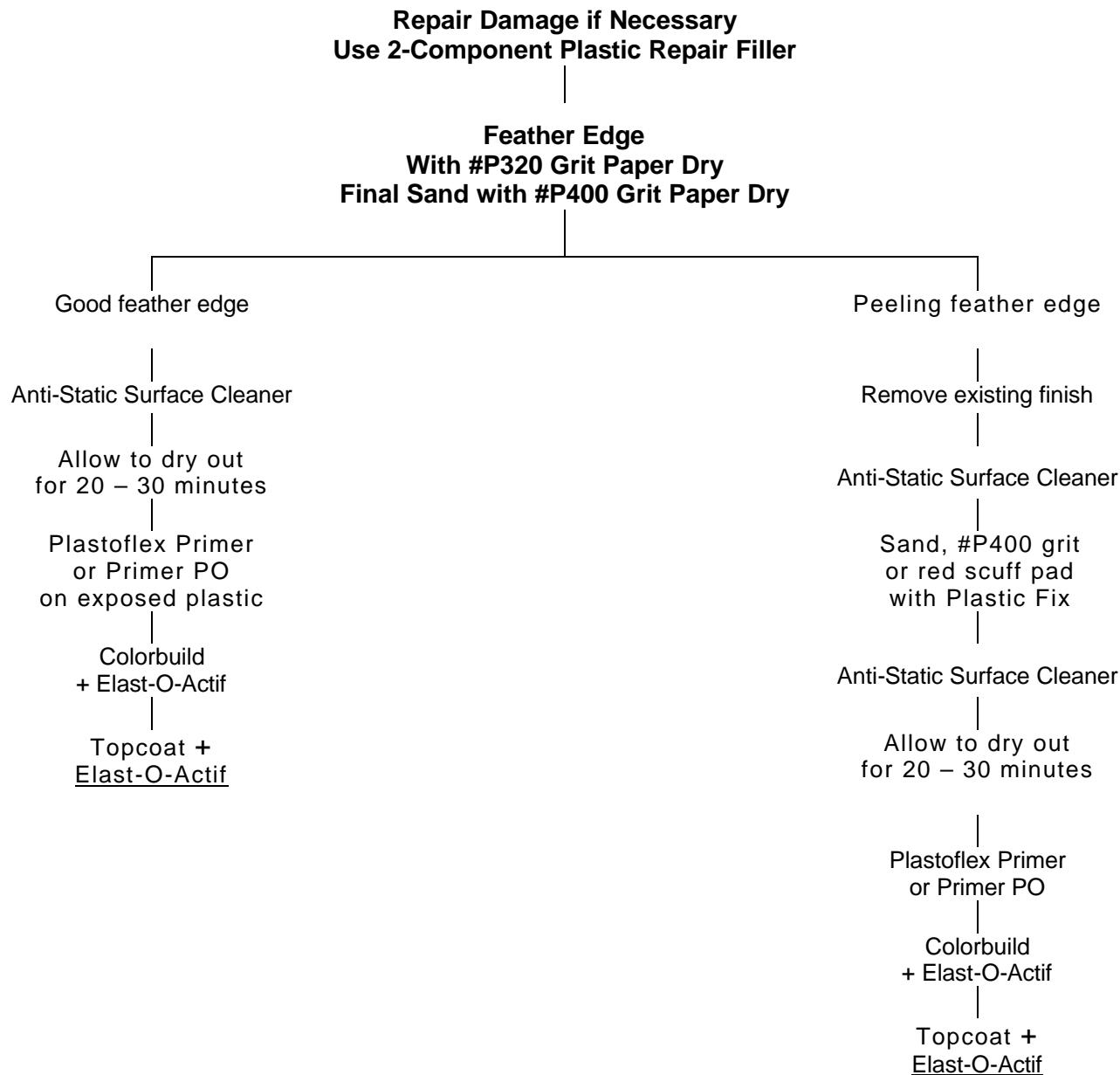


\* After the application of Plastoflex Primer or Primer PO, if the filling qualities of Colorbuild are required, proceed. Remember, Elast-O-Actif should be added to Colorbuild for flexible parts.

## TEST METHODS FOR PLASTICS IDENTIFICATION

### (PREPARATION AND PAINT SYSTEMS)

#### REPAIRING EXISTING OEM PLASTIC PARTS



Having decided on the type of repair system for the plastic part worked on, apply the necessary products to complete the job.

December 11, 1997

Mr. Steve Pisano  
BASF Corp.  
403 Castleton Circle  
Tallahassee, FL 32312

Dear Steve,

As we discussed this morning, both R-M and Glasurit are still recommending the use of flex additive (Glasurit Elastifier Additive 521-111, or R-M 891, HF08 or DF25) in our undercoats and clearcoats when applied over flexible parts. The correct application procedure can be found in either the current Glasurit Technical Manual in Section B, System 10 "Plastics Painting System", Diamont Technical Reference Manual in the section "Flexible Parts", or HS SOLO Technical Reference Manual in the section on HF08.

Many elastifiers currently on the market are based on plasticizers to provide flexibility. The problem with using plasticizer is its tendency to migrate out of the film over time. As a result, the coating loses whatever flexibility the plasticizer imparted and will eventually fail and either crack or lose adhesion. For this reason, the Glasurit and R-M materials utilize reactive polymers to provide flexibility. The result is that the polymer reacts with the system and becomes part of the polymeric matrix of the cured film. Since the materials being used in the additives are more linear than primer and clearcoat resins, the result is a reduced crosslink density and permanent flexibility of the coating.

Additional information regarding the use of Glasurit and R-M products can be found in the respective Technical Manual under the individual product data sheets.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Brian P. Koevenig  
Lab Supervisor, Technical Services



## DuPont Performance Coatings

September 17, 2002  
Mr. Dan Risley  
Executive Director  
Society of Collision Repair Specialists  
Re: Flex Adds in Clearcoats

Dan,

This letter represents the DuPont Performance Coatings (DPC) position on the use of the subject products in clearcoats.

An increasing number of repairs deal with plastic parts. Plastic parts are generally low on the vehicle and are subject to abuse such as rock chips, road hazards and curbside impacts. The critical way in which plastics differ from metals is their ability to “give” and return to their original shape after impact. Flex agents contribute “give” qualities similar to that of plastic. Putting a flex agent in a refinish coating best duplicates the OEM’s use of flexibilized coatings over flexible parts.

The recommended processes for repairing a cleaned flexible substrate requires the addition of flex agent in the filler, sealer, and clearcoat if conventional refinish repair products are being used. Only specialized products for flexible repair such as 2340S™ Flexible Adhesion Sealer do not require an additive.

Flex agents which react into the coating such as 2350S™ Flexible Additive are more permanent and supply longer term performance than simple slow drying solvents referred to as “plasticizers” that will migrate from the film over a period of time.

Following correct procedures is critical to minimize warranty claims and customer dissatisfaction with flexible parts repairs. The GM-4901 manual of approved refinish systems is a document that clearly illustrates the need for the use of flex additives to meet OEM approval requirements. The OEM manufacturers make significant investment in defining the refinish qualities that minimize risk of warranty claims and maximize customer satisfaction. DuPont Performance Coatings recommends that aftermarket repairs be made in accordance with the appropriate OEM recommendations.

# PPG Automotive Refinish

PPG Industries, Inc.  
19899 Progress Drive  
Strongsville, OHIO USA  
Telephone (440) 572-6983  
Fax (440) 572-6110  
[rboston@ppg.com](mailto:rboston@ppg.com)  
[ppg.com](http://ppg.com)

**Russell Boston**  
Director of Training

October 11, 2002

Mr. Dan Risley  
Executive Director- SCRS  
P.O. Box 2548  
Tri-Cities, Washington 99302-2548

Dear Mr. Risley,

This letter is in response to your association's inquiry about the addition of flex additive to the PPG brand products (PPG and Nexa Autocolor). After extensive testing and exhaustive conversations, the recommendations for the brands are as follows:

### Nexa Autocolor

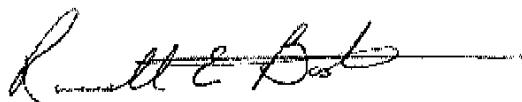
Flex additive is recommended during all applications over flexible parts. Flex additive should be added to the primer, topcoat (excluding basecoat), and clearcoat. Technicians should refer to the applicable product data sheets for the intended product of use, because not every product may require flexing in all situations.

### PPG

#### Deltron and Global

A number of product technologies with differing mechanical properties are used in these ranges. As a general guideline flex additives should be used in these products when flexible parts are repaired off the car. Flex additive should be added to the primer, topcoat (excluding basecoat), and clearcoat. Some product combinations are not recommended over flexible substrates, others do not require modification. In all cases technicians should refer to the applicable product data sheet for the intended product of use.

Sincerely,



Russell Boston  
Director of Training  
PPG Industries, Inc.

CC. Iain Harvey, George Eisenmann, Don Askew, Gregg Whitmer

## Sherwin-Williams: “Flex Additive” as a Not-Included Operation/Material

For many years “Flex Additive” has been recognized as an additional operation and/or material necessary when refinishing flexible parts such as bumper covers. When billed as an additional line item, and deemed appropriate, reimbursement is usual and customary.

As paint technology has evolved, the need for an additional flexible additive has changed. Some paint manufacturers have minimized or eliminated the need for “flex additive” in the clearcoat portion of a basecoat/clearcoat system. As an example, Sherwin-Williams has eliminated the use of V6-V299 Multi-Flex in their latest clearcoat offerings. Previous versions of clearcoat still require the use of flexible additive.

It is important to note that although the use of “flex additive” has been eliminated, a new recommendation has emerged. Sherwin-Williams **specifically requires** the addition of urethane hardener to the basecoat portion of the system to maintain the necessary flexibility and durability of the system when refinishing flexible parts. In essence, the urethane hardener replaces the flex additive as a “Not-Included Operation/Material”.

Because of this change in technology, it may be appropriate to change the syntax or wording for this operation/material. A more appropriate choice may be, “Additional Materials Necessary to Refinish Flexible Parts”. In the end, it’s all semantics. Regardless of technology, refinishers are required to perform an additional labor operation and utilize an additional material when refinishing flexible parts, as compared with non-flexible parts.

In addition, many bumper covers are now being provided in bare (raw) plastic. That is, without a primer coating. These raw plastic parts require substantial additional preparation (cleaning) steps and additional materials, such as plastic adhesion promoters, to prepare them for refinishing. Information providers, such as Mitchell and ADP have stated that their refinish times assume “primed” parts and anything else would require additional time and/or materials to bring them up to the “primed” status.

# Plastic System Refinishing Recommendations



The following pages, minus notations, appear in the Sherwin-Williams Technical Training Manual.

When refinishing raw plastic parts, in comparison to metal parts, the additional labor and/or materials necessary are:

- Test Plastic Material for Sandability
- Clean with SC155 Plastic Surface Cleaner
- Clean with SC159 Plastic Cleaner/Anti-Stat
- Apply UPO-7226/7227 Plastic Adhesion Promoter
- Add 1-2 oz of Hardener to 1 Quart of RTS Basecoat

When refinishing primer plastic parts, in comparison to metal parts, the additional labor and/or materials necessary are:

- Clean with SC155 Plastic Surface Cleaner
- Clean with SC159 Plastic Cleaner/Anti-Stat
- Apply UPO-7226/7227 Plastic Adhesion Promoter or flexed S56/S57/S58 or S59 Color Seal, flexed S61 Transparent Adhesion Promoter, S65 Basecoat  
Transparent 2K Adhesion Promoter or PSE-4600/4601  
4.6 Epoxy.
- Add 1-2 oz of Hardener to 1 Quart of RTS Basecoat

## Notes

# 3 Easy Steps

## Plastic System Refinishing Recommendations Unprimed (Bare) Plastic



### Sanding of Plastic Substrates

Prior to following these plastic system recommendations, it is important to check the plastic substrate for sandability. Sand a small area using P500-P600 grit sandpaper on the backside of the plastic substrate that will not be visible. If the plastic substrate powders, the part must be sanded thoroughly followed by the outlined "3 Easy Steps". If the part does not powder, but rather gums up, follow the "3 Easy Steps" listed below, eliminating the sanding process.

### Step 1: SC155 Low VOC Plastic Surface Cleaner

Soap and water cleaning is the first step in refinishing bare plastic substrates, as recommended by most OE manufacturers. SC155 Low VOC Plastic Surface Cleaner is a soap and water based cleaner specifically developed to remove water borne contaminants as well as mold release agents on the surface of the plastic substrate.

- Clean all surfaces thoroughly with SC155 Low VOC Plastic Surface Cleaner and a white nylon scuffing pad. Clean both the areas to be painted as well as those that will not receive material. This is to insure that the surfaces to be painted are free of contaminants, and that contaminants can not be transferred back to these surfaces through handling the part.
- After cleaning all surfaces, rinse thoroughly, insuring no residue is left behind. Dry with a clean cloth.

### Step 2: SC159 Plastic Cleaner / Anti-static

SC159 Plastic Cleaner / Anti-static is a solvent based cleaner specifically formulated to remove solvent borne contaminants, while deep cleaning the plastic substrate to remove impregnated mold release agents. SC159 also removes static build up before painting.

### Notes

#### Material Cost:

None

#### Additional Materials Needed:

P500-P600 Sandpaper

#### Labor Time Involved:

Unknown, based on material

Testing Only = 3 minutes

Testing & Sanding = 15

#### Material Cost:

SC155 Plastic Surface Cleaner \$14.62 / Qt.

#### Amount Used:

Unknown, based on part size

average 4 oz. = \$1.83

#### Additional Materials Needed:

White Scuff Pad  
Clean Disposable Rags

#### Labor Time Involved:

Unknown, based on part size and complexity  
average 5 minutes

This item listed on  
following page

# 3 Easy Steps

## Plastic System Refinishing Recommendations (cont.)



### Step 2: SC159 Plastic Cleaner / Anti-static (cont.)

- Thoroughly clean the plastic substrate with SC159 Plastic Cleaner / Anti-static and a white nylon scuffing pad.
- Dry excess material with a clean cloth.
- Apply a second application of SC159, following this same procedure.
- Tack surface to be painted with a clean tack cloth.

### Step 3: UPO Plastic Primer

UPO Plastic Adhesion Promoters are available in Clear (UPO-7226) and Dark Gray (UPO-7227). UPO Plastic Adhesion Promoters are designed specifically for application over bare plastic substrates to improve adhesion of the topcoat system. UPO-7226 and UPO-7227 are available in ready-to-spray quarts and aerosol packaging.

- Apply 1 wet coat of UPO Plastic Adhesion Promoter to bare plastic substrate to be refinished, achieving no more than .2-.4 mils of dry film thickness.
- Allow to dry hand slick, before following with application of either a primer/sealer, basecoat/clearcoat, or single-stage topcoat system.

Although the “3 Easy Steps” should be sufficient for most plastic substrates, refer to the following page for some suggestions on refinishing difficult plastic substrates.

### Notes

#### Material Cost:

SC159 Plastic Cleaner / Anti-Stat \$22.78 / Gl.

#### Amount Used:

Unknown, based of part size

average 4 oz. = \$0.71  
X 2 applications = \$1.42

#### Additional Materials Needed:

White Scuff Pad  
Clean Disposable Rags

#### Labor Time Involved:

Unknown, based on part size and complexity  
average 8 minutes

#### Material Cost:

UPO-7226/7227 Plastic Adhesion Promoter \$48.86 / Qt.

#### Amount Used:

Unknown, based of part size  
average 6 oz. = \$9.16

#### Labor Time Involved:

Unknown, based on part size and complexity  
average 10 minutes

# Plastic Refinishing

## Technique Tips For

### Maximum Performance on Bare Plastics



- When cleaning a part, always clean all sides, including the back, to avoid transferring contaminants to the outside during handling or set-up.
- Gray, and especially Red, scuff pads have been shown to severely scratch some bare plastic parts to the point of telescoping sand scratches in the final finish. The white scuff pad eliminates this problem, while providing adequate cleaning of the surface. Pay special attention to cleaning all edges, grooves and feature lines.
- USP-90 Scuffing Gel can be used to enhance the effectiveness of the white scuff pad.
- Tempering of bare plastic parts is optional, but may be beneficial when topcoat adhesion is compromised by imbedded mold release agents.
- If a part primed with UPO-7226/7227 sets overnight, use only clean water to wash any dust off prior to refinishing with hardened basecoat and clearcoat. Do not use wax and grease removers.
- When refinishing with basecoat/clearcoat hardener must be used in the basecoat color at the ratio of 16:16:1. (UH-60, UH-70, UH-80, or UH904 hardener may be used)
- No flex additive is required in the following clearcoats: CC-635, CC-637, CC-639, or CC930.

#### Notes

**Material Cost:**  
USP90 Prep Scuffing Gel  
\$9.50 / Each

**Amount Used:**  
Unknown

**Tempering:**  
Bake part at 140° F. for  
45 minutes. Immediately  
clean.

**Material Cost:**  
UH80 Urethane Hardener  
\$78.33 / Qt.

**Amount Used:**  
1 oz per Ready-to-Spray  
Quart of Basecoat  
\$2.45  
GM Recommendation is  
2 oz per Ready-to-Spray  
Quart of Basecoat  
\$4.90

**Labor Time Involved:**  
Unknown, based on part  
size and complexity  
average 10 minutes

# Refinishing Plastic Parts

## Primed Plastic



### Primed Plastic Parts:

Check primed parts for solubility by pressing a solvent saturated towel on the surface (small area) on a feature line, where the primer is thinnest and hold for 30 seconds.

#### If the primer is soluble:

- Step 1 Remove the primer.
- Step 2 Follow recommendations listed on previous page for Un-Primed (Bare) Plastic.

Exceptions: If lifting occurs while doing the solubility check, it may be necessary to refer to "Saturn Priming Recommendations" #1969, which deals with sensitive O.E.M. primers.

#### If the primer is insoluble:

- Step 1 Clean part on all sides with SC155 Low VOC Surface Cleaner.
- Step 2 Scuff sand using a gray scuff pad and USP-90 Liquid Scuffing Agent giving special attention to small grooves and depressions.
- Step 3 Thoroughly rinse off the scuffing agent with clean water and completely dry the surface.
- Step 4 Reclean the surface with SC159 Plastic Cleaner / Anti-stat.
- Step 5 Apply flexed S56/S57/S58 or S59 Color Seal, flexed S61 Transparent Adhesion Promoter, S65 Basecoat Transparent 2K Adhesion Promoter or PSE-4600/4601 4.6 Epoxy.
- Step 6 Apply basecoat with hardener (1oz per sprayable quart of UH-60/UH-70/UH-80/UH904).
- Step 7 Apply clearcoat as recommended. No flex additive is required in the following clearcoats: CC-635, CC-637, CC-639, or CC930.

### Notes

# Refinishing Plastic Parts

## Original Finish Plastic



### Original Finish Plastic Parts (in sound condition)

- |        | Notes   |
|--------|---|
| Step 1 | Clean part with SC155 Low V.O.C. Surface Cleaner.   |
| Step 2 | Scuff sand using a gray scuff pad and USP-90 Liquid Scuffing Agent giving special attention to small grooves and depressions.   |
| Step 3 | Thoroughly rinse off the scuffing agent with clean water and completely dry the surface.  |
| Step 4 | Reclean the surface with SC159 Plastic Cleaner / Anti-stat.   |
| Step 5 | Apply flexed S56/S57/S58 or S59 Color Seal, flexed S61 Transparent Adhesion Promoter, S65 Basecoat Transparent 2K Adhesion Promoter or PSE-4600/4601 4.6 Epoxy. If filling is required, apply flexed P47 mixed 8:4:1:6 with V6-V299 flexible additive. Any bare plastic exposed during sanding or repair will require application of UPO-7226/7227. |
| Step 6 | Apply basecoat with hardener (1oz per sprayable quart of UH-60/UH-70/UH-80/UH904).  |
| Step 7 | Apply clearcoat as recommended. No flex additive is required in the following clearcoats: CC-635, CC-637, CC-639, or CC930.   |

These pages are for a quick reference only. Refer to specific Technical Data Sheets for complete product and application recommendations. See Material Safety Data Sheets and labels for complete safety information. (Rev. 020320)

# SC155

## Low VOC Plastic Surface Cleaner

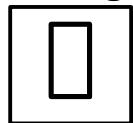


### Product Description

SC155 Low VOC Plastic Surface Cleaner is a low VOC soap and water based surface cleaner specifically developed to remove water borne surface contaminants as well as mold release agents on the surface of plastic substrates. It is specifically designed to work in conjunction with the Sherwin Williams Plastic Refinishing System to insure a quality repair when refinishing plastic parts.

### Notes

### Mixing



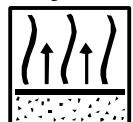
Use at package consistency.

### Application



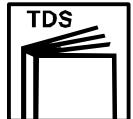
Clean all surfaces thoroughly with SC155 and a white nylon scuffing pad. After cleaning all surfaces, rinse thoroughly, insuring no residue is left behind, and dry with a clean cloth.

### Drytime



Drytime will vary depending on temperature and humidity. Make sure surface is completely dry before continuing.

### Notes



- Refer to Sherwin Williams Plastic Refinishing System recommendations for complete guidelines and companion products.
- SC155 comes packaged with a hand-sprayer for application convenience.

These pages are for a quick reference only. Refer to specific Technical Data Sheets for complete product and application recommendations. See Material Safety Data Sheets and labels for complete safety information. (Rev. 000105)

# SC159

## Plastic Cleaner / Anti-Static

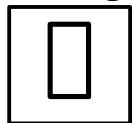


### Product Description

SC159 Plastic Cleaner / Anti-Static is a solvent based cleaner specifically formulated to remove solvent borne contaminants, while deep cleaning the plastic substrate to remove impregnated mold release agents. SC159 also removes static build up before painting. It is specifically designed to work in conjunction with the Sherwin Williams Plastic Refinishing System to insure a quality repair when refinishing plastic parts.

### Notes

### Mixing



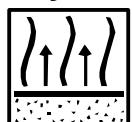
Use at package consistency.

### Application



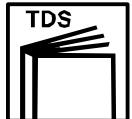
Thoroughly clean the plastic substrate with SC159 and a white nylon scuffing pad. Dry excess material with a clean cloth. Follow this step with a second application of SC159, and again wipe dry.

### Drytime



Drytime will vary depending on temperature and humidity. Make sure surface is completely dry before continuing.

### Notes



- Refer to Sherwin Williams Plastic Refinishing System recommendations for complete guidelines and companion products.

These pages are for a quick reference only. Refer to specific Technical Data Sheets for complete product and application recommendations. See Material Safety Data Sheets and labels for complete safety information. (Rev. 010301)

# UPO-7226 Clear

# UPO-7227 Dark Gray

## Plastic Adhesion Promoters

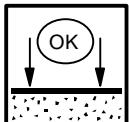


### Product Description

Plastic adhesion promoters UPO-7226 and UPO-7227 are single-component, non-sanding, fast-drying adhesion promoters designed to provide maximum adhesion over plastic parts, both interior and exterior.

### Notes

### Suitable Substrates



- Rigid Plastic Parts (Interior & Exterior)
- Semi-Rigid Plastic Parts (Interior & Exterior)
- Thermoplastic Bumper Covers
- Exterior Grade Thermoplastic Polyolefin - TPO

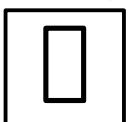
### Surface Preparation



A clean substrate is essential to product performance. It must be clean and free of mold release agent. Wash entire area with SC155 using a white nylon scuff pad, paying close attention to recessed areas. After cleaning, rinse thoroughly with clean water and dry with a clean cloth. Solvent clean with SC159 and a white nylon scuff pad. Dry excess material and apply a second application of SC159, and dry with a clean cloth.

**Note:** Check solvent resistance of factory primer using lacquer thinner. If soluble, remove existing primer and follow the step above.

### Mixing



Stir or shake UPO-7226 / UPO-7227 thoroughly before spraying. UPO-7226 / UPO-7227 are packaged ready to spray. No mixing is required.

### Application



Spray at 8-9psi at the cap for HVLP or 35-45psi for conventional guns. Apply 1 medium coat and allow to dry 10 minutes before recoating. Recommended dry film thickness is .2-.4 mils.

**Do not exceed 0.4 mils of dry film thickness.**

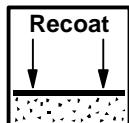
# **UPO-7226 Clear**

# **UPO-7227 Dark Gray**

## **Plastic Adhesion Promoters (cont.)**



### **Recoat**

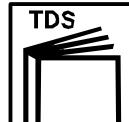


Allow UPO-7226/7227 to dry a minimum of 10 min before recoating with any of the following products:

Ultra-Fill II Primer Surfacer	Ultra-Fill II Primer Sealer
Color-Prime Tintable Primer	Ultra 7000 BC/CC System
Ultra One Stage S/S	Ultra One Stage Turbo S/S
Ultra Interior System	Ultra Plus Acrylic Urethane
2K S65 Basecoat Transparent	

### **Notes**

### **Notes**



- UPO-7226 / UPO-7227 is not recommended for vinyl plastics like upholstery or for polycarbonate (Lexan®) because the solvent in the product will weaken the plastic.
- Make sure UPO-7226 / UPO-7227 is dry before applying topcoat. Spraying over wet UPO-7226 / UPO-7227 will nullify the advantages of its use.
- UPO-7226 / UPO-7227 can be taped for two-tone in 10-20 minutes.
- UPO-7226 / UPO-7227 are also available in aerosol containers for more convenient application to small parts or sand throughs.
- Do not agitate UPO-7226 / UPO-7227 on a mixing machine or stir with a metal mixing stick. Damage to the can liner may result in causing seediness or adhesion issues. The recommended method of agitation is a mechanical paint shaker.
- If a part primed with UPO-7226 / UPO-7227 sets overnight, use only clean water to wash any dust off prior to refinishing with hardened basecoat and clearcoat. Do not use wax and grease removers.

These pages are for a quick reference only. Refer to specific Technical Data Sheets for complete product and application recommendations. See Material Safety Data Sheets and labels for complete safety information. (Rev. 020402)

# V6-V299

## Multi-Flex

### Urethane Flexible Additive

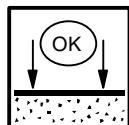


#### Product Description

V6-V299 Multi-Flex Urethane Flexible Additive is designed to increase the flexibility of many Sherwin Williams undercoats and topcoats. It is easy to use and can be applied over a wide variety of semi-rigid and flexible plastic parts.

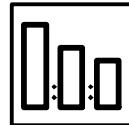
#### Notes

#### Suitable Substrates



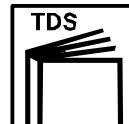
V6-V299, when mixed with a suitable Sherwin Williams product, may be applied over a wide variety of semi-rigid and flexible plastic parts to increase the flexibility of the finish. Some plastics such as polypropylene and polyethylene require the use of UPO-7226 or UPO-7227 Plastic Adhesion Promoter to maximize adhesion of the finish prior to applying a flexibilized coating.

#### Mixing



Refer to detailed mixing recommendations listed below. Multi-Flex Flexible Additive should only be added to pre-thinned material and used within two hours of mixing. Use beyond two hours decreases flexibility and increases drytime. Excessive amounts of Multi-Flex will slow dry times proportionately.

#### Notes



Prolonged exposure to cold temperatures may cause a rise in viscosity. If this happens, bring material to room temperature, shake well, and use.

These pages are for a quick reference only. Refer to specific Technical Data Sheets for complete product and application recommendations. See Material Safety Data Sheets and labels for complete safety information.