

**3M Aerospace**  
**3M™ Surface Pre-Treatment AC-131**



# The Sustainable Solution

**High-performance surface pre-treatment  
for modern coating systems**

- Total cost reduction
- Significant water reduction
- Water-based and non-chromate



# Effective, Efficient & Environmentally Responsible



Today's coating systems have high performance requirements for surface preparation. While traditional processes may provide acceptable surfaces, they can also produce significant amounts of hazardous waste. Now, 3M offers a more sustainable solution for modern coating systems.

## 3M™ Surface Pre-Treatment AC-131

3M Surface Pre-Treatment AC-131 is a high-performance non-chromate coating for use on aluminum, nickel, stainless steel, magnesium and titanium. It is designed for parts finished with epoxy-based or polyurethane-based coatings.

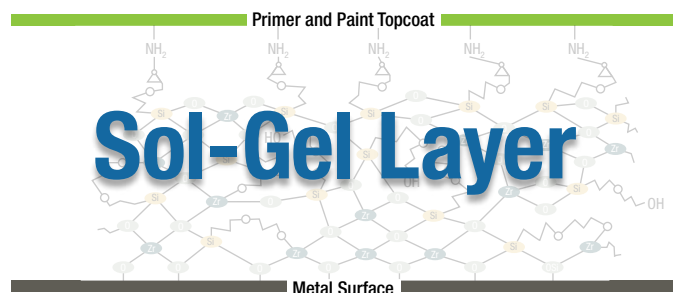
### An environmentally responsible alternative

3M AC-131 pre-treatment offers significant water reduction and a total cost reduction compared to conventional processes. And it is both water-based and non-chromate, making 3M AC-131 an environmentally responsible alternative to traditional conversion coatings.

- Eliminates chromates from surface treatment process
- Compliant with SCAQMD Rule 1124
- Proven to significantly reduce rivet rash
- Process time savings over conventional conversion coating applications
- Reduces water use – no rinsing required

## How it works

3M AC-131 is a solution gelation, or sol-gel, system engineered to improve adhesion between the metal surface and the coating system.



## Typical Physical Properties

**Note:** The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Color	Light blue or clear
Induction Time	30 minutes
Pot Life	24 hours after mixing

## Standard Package Sizes and Coverage

Kit Designation	Coverage, ft <sup>2</sup> (m <sup>2</sup> )
50 mL	16 (1.5)
100 mL	32 (3)
Pint	150 (13.9)
Quart	300 (27.9)
1 Gallon	1,200 (111.5)
5 Gallon	6,000 (557.5)

## Available Product Configurations

AC-131 BB	Blue, 2 part system
AC-131 CB	Clear, 2-part system

## Testing

Coating systems using 3M AC-131 pre-treatment have been tested and qualified by many OEM and industry organizations. The following tests have yielded excellent results:

- Condensing Humidity
- Rain Erosion
- 3000 hour salt spray
- Filiform Corrosion
- Wet and Dry Scribe Adhesion
- Paint Softening
- Acrylic Cracking
- Hydrogen Embrittlement

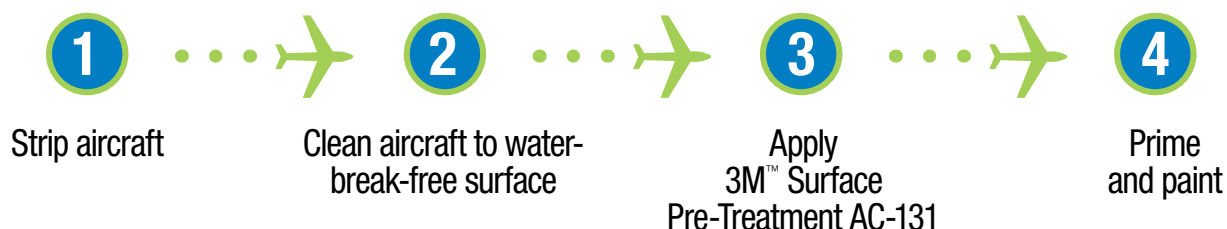
## Health and Safety

3M AC-131 pre-treatment is safe to use and apply when recommended precautions are followed. Before using this product, read and understand the Safety Data Sheet (SDS), which provides information on health, physical and environmental hazards, handling precautions and first aid recommendations. A product SDS is available on request.

## Application Process

Figure 1 shows the general surface preparation process incorporating 3M AC-131 pre-treatment. This product is designed for application on metal components that have been cleaned to a water-break-free surface. Chemical etching and deoxidizing are generally not required; refer to the Surface Preparation section of the Application Guidelines for details.

**Figure 1.** Surface treatment process using 3M AC-131



# Application Guidelines

The following process is commonly used for paint applications on aluminum (sheet, plate, cone), stainless steel and titanium to promote adhesion.

## Materials

- 3M™ Surface Pre-Treatment AC-131 BB or CB
- Wipers, cheesecloth, gauze or clean cotton rags
- Etch Cleaner/Brightener, as applicable
- Alkaline cleaner, as applicable
- Solvents, in order of preference: IPA; acetone; methyl ethyl ketone (MEK); methyl propyl ketone (MPK); a blend of MEK and MPK
- Tack cloth, Chemical Cloth C-60
- 3M™ Doodlebug™ White Cleaning Pad 8440
- Aluminum oxide abrasive paper, cloth, wet or dry type, #100 grit or finer
- Silicon carbide abrasive discs, #100 grit and finer (for titanium and stainless steel only)
- Abrasive pads: Scotch-Brite™ General Purpose Hand Pad 7447 aluminum oxide abrasive, #100 grit or finer

Grade of Abrasive Pad	Approximate Equivalent Grit
Very Fine	240-400
Fine	150-240
Medium	100-150

## Definitions

The following definitions apply to terms that are uncommon or have special meanings as used in these guidelines:

**Water-Break-Free Surface:** A surface that maintains a continuous water film for a period of at least 30 seconds after having been spray- or immersion-rinsed in clean water at a temperature below 100°F (38°C).

**Mist Apply:** Use the minimum amount of 3M AC-131 solution required to wet out the entire surface (as opposed to flooding or spray drenching). This will minimize the amount of excess material that will run off the part and possibly accumulate during this application.

**Ambient Conditions:** The shop conditions meeting the requirements listed under the Facilities Control section of these guidelines.

**Induction Time:** The period of time that freshly mixed 3M AC-131 solution must sit to initiate the polymerization reaction prior to application. The induction time for 3M AC-131 is 30 minutes (minimum). Do not treat the part with the solution before the elapsed induction time is complete.

**Pot-Life:** The limited time period, after all of the 3M AC-131 components have been mixed and the induction time completed, within which the coating material must be used. The pot life for 3M AC-131 pre-treatment is 24 hours. Do not treat the part with the solution after the pot-life has expired.

**Dry to Paint Time:** As soon as the 3M AC-131 coated surface appears dry, but no sooner than 15 minutes from time of 3M AC-131 application (at ambient conditions). This is applicable for areas that can be painted without requiring further operations (i.e., masking/marking/tacking, etc.).

**Dry to Mask/Mark/Tack Time:** As soon as the 3M AC-131 coated surface appears dry, but no sooner than 60 minutes from time of 3M AC-131 application (at ambient conditions).

## Manufacturing Control

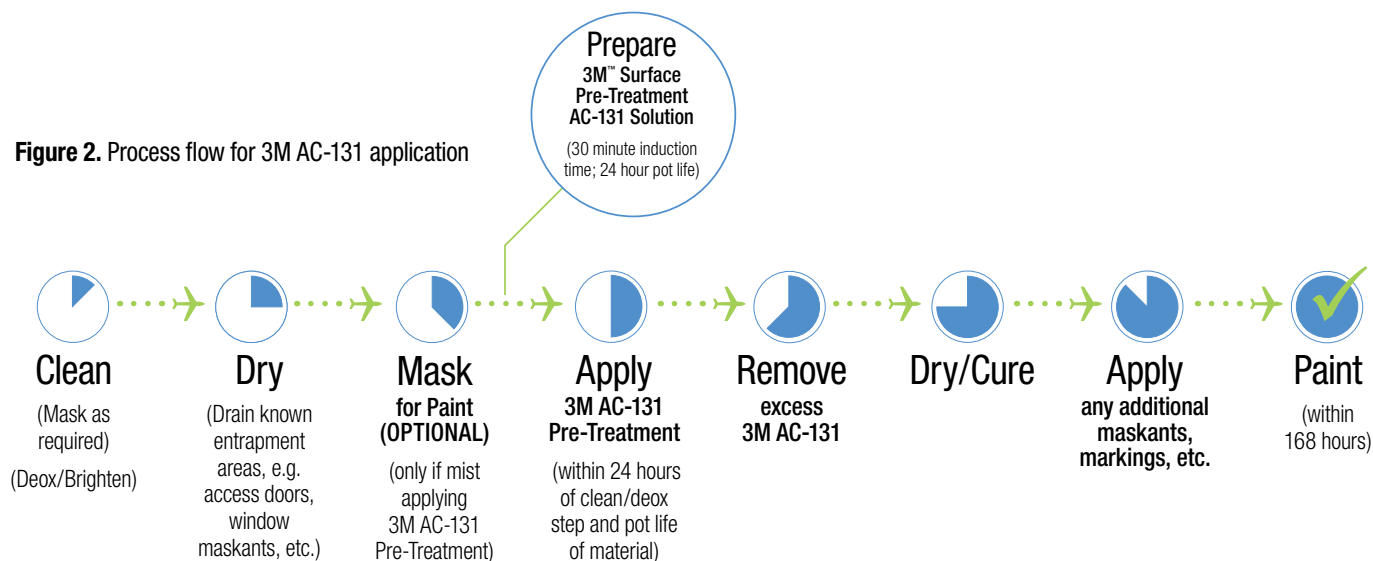
**Warning:** This process involves the use of chemical substances that are hazardous. Please refer to the product SDS and employer's safety instructions. For disposition of hazardous waste materials, consult site environmental engineers for proper disposal methods.

**Note:** Consult local air quality regulations that may regulate solvent use.

## General Processing Notes for 3M Surface Pre-Treatment AC-131

- Hardware to be processed should be racked or handled with minimal contact area and protected from oil, grease and fingerprints. Parts that have been contaminated during handling and transport should be aqueous cleaned with a detergent cleaner or solvent cleaned before storing.

**Figure 2.** Process flow for 3M AC-131 application



- Orient parts for processing to maximize drainage and minimize contact points during cleaning, surface preparation and 3M AC-131 application.
- Spray equipment for applying 3M AC-131 solution is not controlled. Examples of acceptable equipment include HVLP guns, air-assisted airless sprayers, and hand-pumped sprayers.
- 3M AC-131 pre-treatment is a dry-in-place coating. Do not rinse off.
- Process parts in accordance with the flow chart depicted in Figure 2.

## Facilities Control

- Air used for drying, air-water rinsing, and blow-off should be treated and filtered so that it is free of moisture, oil, and solid particles.
- Application should be conducted in an area with adequate ventilation. See product SDS for details.
- Recommended temperatures for application and cure are 57°F to 87°F. Relative humidity should not exceed 85 percent.
- Fresh water input for rinsing of the part prior to 3M AC-131 application should not exceed 200 ppm total solids, and must meet one of the following additional criteria:
  - pH 5 to 9, chloride 6 ppm maximum; or
  - Deionized with conductivity no greater than 25 microsiemens/cm.

## Surface Preparation

3M AC-131 pre-treatment may be applied after cleaning to a water-break-free surface, which can usually be achieved with solvent or aqueous alkaline cleaning. An additional deoxidizing step is optional.

1. As necessary, apply maskant to protect any adjacent surfaces, including entrapment areas, that should not be exposed to cleaning fluids.
2. As required, remove any existing coatings using approved procedures. Take care to minimize roughening or scoring of the underlying metallic surface.
3. Thoroughly clean the substrate to be coated using solvent and/or an aqueous alkaline cleaner in accordance with the following steps.

## Solvent Clean

- a. Solvent clean (see Materials) any grease-contaminated surfaces as needed. While the surface is still wet with solvent, scrub with a very fine abrasive pad, white cleaning pad or clean wiper, as needed.
- b. Rinse thoroughly with water following solvent cleaning.
- c. Check for water-break-free surfaces (see Definitions). If surfaces are not water-break-free, repeat solvent cleaning process or proceed to Alkaline Clean. If surfaces are water-break-free, mix and apply 3M AC-131 within 24 hours.
- d. Allow surfaces to dry before applying 3M AC-131. Open and drain any known water entrapment area such as access doors, masked windows, etc. Blow out any entrapped water as required.



## Alkaline Clean

- a. Dilute cleaner per manufacturer's recommendations.
  - b. Clean substrates thoroughly using abrasive pads or white cleaning pads (see Materials). Do not allow alkaline cleaner to dry on the surface.
  - c. Rinse with enough water to completely remove all alkaline cleaner and abrasive residue from parts, paying particular attention to joints and fastener areas.
  - d. Check for complete rinsing using pH paper with a pH range of 4.5 to 9. The pH of rinse water on the surface should be the same as that of the tap water used for rinsing; if not, continue rinsing until the pH is the same as the tap water.
  - e. Check for water-break-free surfaces (see Definitions). If surfaces are not water-break-free, repeat alkaline cleaning process or proceed to Manual Deoxidation. If surfaces are water-break-free, mix and apply 3M AC-131 within 24 hours.
  - f. Allow surface to dry before applying 3M AC-131. Open and drain any known water entrapment area such as access doors, masked windows, etc. Blow out any entrapped water as required.
2. Rinse with enough water to remove all residues.
  3. Check for water-break-free surfaces (see Definitions). If surfaces are not water-break-free, repeat cleaning and/or deoxidation steps as necessary. If surfaces are water-break-free, mix and apply 3M AC-131 within 24 hours.
  4. Allow surfaces to dry before applying 3M AC-131. Open and drain any known water entrapment area such as access doors, masked windows, etc. Blow out any entrapped water as required.

## Mixing of 3M Surface Pre-Treatment AC-131

Prepare 3M AC-131 solution in accordance with mixing procedures supplied with each kit. Mix thoroughly and allow 30 minutes for solutions to react. Apply 3M AC-131 using one of the methods detailed below.

## Spray Application

1. Mask aircraft for final painting.
2. Ensure temperature of the substrate to be coated and surrounding area (paint hangar) is between 57°F and 87°F.
3. Spray 3M AC-131 using clean application equipment (see Manufacturing Control for recommendations) ONLY AFTER THE 30 MINUTE INDUCTION TIME IS COMPLETE. Do not apply the AC-131 solution after the maximum 24 hour pot life has expired.
4. Apply 3M AC-131 in a misting application from the top down. Wet surface with a single pass, taking care to minimize overlaps. The spray equipment should be adjusted so that one pass of the gun applies a light wet coat on the surface. Runs are an indication that the application is too heavy and that equipment or technique should be adjusted.

## Manual Deoxidation (Optional)

1. Aluminum Surfaces: Power wet-abrade or hand abrade to an overall abraded finish using abrasive pads or paper (see Materials) and water. Titanium and Stainless Steel Surfaces: Abrade surfaces using progressively finer silicon carbide or abrasive pads (see Materials), finishing with #220 grit or finer.

5. If water-breaks occur on the surface during the application of 3M AC-131, surfaces should be reworked using abrasive pads. Solvent wipe area to remove abrasive debris and re-apply 3M AC-131.
6. Allow aircraft to drain for 10 minutes.
7. Check belly drip edges, fastener holes, lap joints and other areas where 3M AC-131 solution may collect. Use filtered compressed air to blow off any excess solution while leaving a wet film behind. Minimize splattering of this excess solution onto adjoining part surfaces. Alternatively, excess 3M AC-131 solution may be gently blotted/wiped off of the surface using a clean wiper or 3M™ Doodlebug™ White Cleaning Pad (see Materials). Do not dry off areas of the part that are able to freely drain. Areas to be subsequently painted where excess 3M AC-131 solution has puddled/collected and dried must have the dried coating removed and reapplied.

## Brush Application

Apply fresh 3M AC-131 by brushing with a clean natural bristle brush or swabbing with a clean wiper, cheesecloth or gauze. Do not scrub with a brush or applicator. Apply the minimum amount of solution required to achieve complete coverage of the surface to be treated. Brushes or wipers should not leave streaks on the surface.

Allow coated part to drain for 3 to 10 minutes. If any surplus 3M AC-131 has pooled or collected in crevices, pockets or other collection areas, including drip edges or fastener holes, use the same methods described under Spray Application to remove excess solution.

## Dry/Cure of 3M Surface Pre-Treatment AC-131

Minimize or avoid contact with coated surfaces while drying. Exact drying times will vary depending on part configuration and ambient conditions.

1. Areas that require no further masking/marking/tacking, etc., may be painted as soon as the surface appears dry but no sooner than 15 minutes, at ambient conditions, from the time of application of 3M AC-131.
2. Areas that require further masking/pencil marking/tacking, etc., must be allowed to dry for a minimum of 60 minutes, at ambient conditions.
3. Surfaces coated with 3M AC-131 and stored at ambient conditions must be coated with organic finish within 168 hours (7 days) of treatment. Avoid contamination of 3M AC-131 coated surfaces during this interval.

**Note:** If elevated temperature processes are required following application of 3M AC-131, coated surfaces must be allowed to dry at ambient temperature for a minimum of 30 minutes. Surfaces coated with 3M AC-131 may be heated to a maximum of 120°F for no more than 8 hours. Surfaces exposed to elevated temperatures must be coated with organic finish within 16 hours. Avoid contamination of 3M AC-131 coated surfaces during this interval.

## Storage

Materials included in this document that are considered to be time and temperature sensitive should be stored in accordance with manufacturer's instructions and in accordance with local requirements from time of receipt through use.

For BMS10-128 and AMS3175, the shelf life of 3M™ Surface Pre-Treatment 3M AC-131 BB and CB is 12 months from the date of package when stored in the original unopened containers between 40°F and 100°F.

## For Additional Information

In the U.S., call toll free 1-800-235-2376, or fax 1-800-435-3082 or 651-737-2171. For U.S. Military, call 1-866-556-5714. If you are outside of the U.S., please contact your nearest 3M office or one of the following branches:

<b>Australia</b> +61-2-949-89333	<b>Austria</b> +43-01-86686-274	<b>Brazil</b> +55-19-3838-7876	<b>Canada</b> 800-410-6880 ext. 6018
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<b>Switzerland</b> +41-01-724-9114	<b>Taiwan</b> +88-62-2704-9011	<b>Thailand</b> +66-2260-8577	<b>United Kingdom</b> +44-845-873-4169

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### 3M Aerospace and Commercial Transportation Division

3M Center, Building 223-1N-14  
St. Paul, MN 55144-1000  
1-800-235-2376  
www.3M.com/aerospace

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