BONDERITE®

Surface Treatment

AEROSPACE PRODUCT SELECTOR GUIDE

Henkel

Henkel Adhesive Technologies

Surface Treatment

Surface Treatment

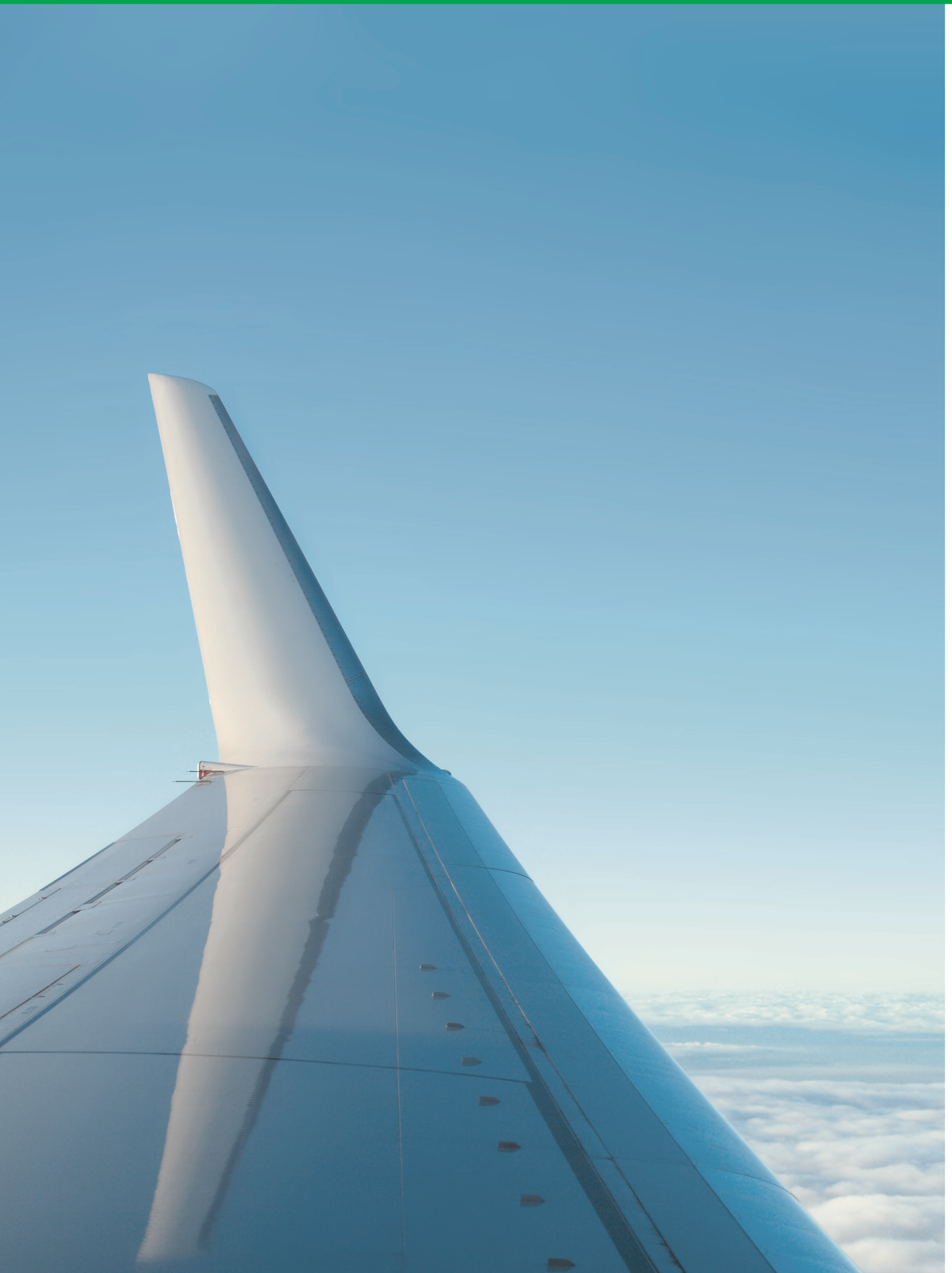
BONDERITE – delivering value and total surface treatment solutions for all your aircraft and engine requirements

Choose from our broad surface treatment portfolio

Aircraft structures, parts and engines require high-quality surface treatment solutions to ensure a safe and reliable fleet for airline operators. Henkel, as a proven surface treatment solutions supplier, provides a broad portfolio of products throughout the aerospace supply chain. It includes cleaners, paint strippers, conversion coatings and engine overhaul products. As a leader in sustainability best practices, Henkel offers environmentally advantaged product options for the aerospace industry's leading platforms.

Benefit from our industry proven expertise

BONDERITE products come along with Henkel's many years of proven aerospace industry experience and know-how. Take advantage and benefit from Henkel's leading products and expertise for your aerospace-grade surface treatment needs.



Covering the entire metal pretreatment process:

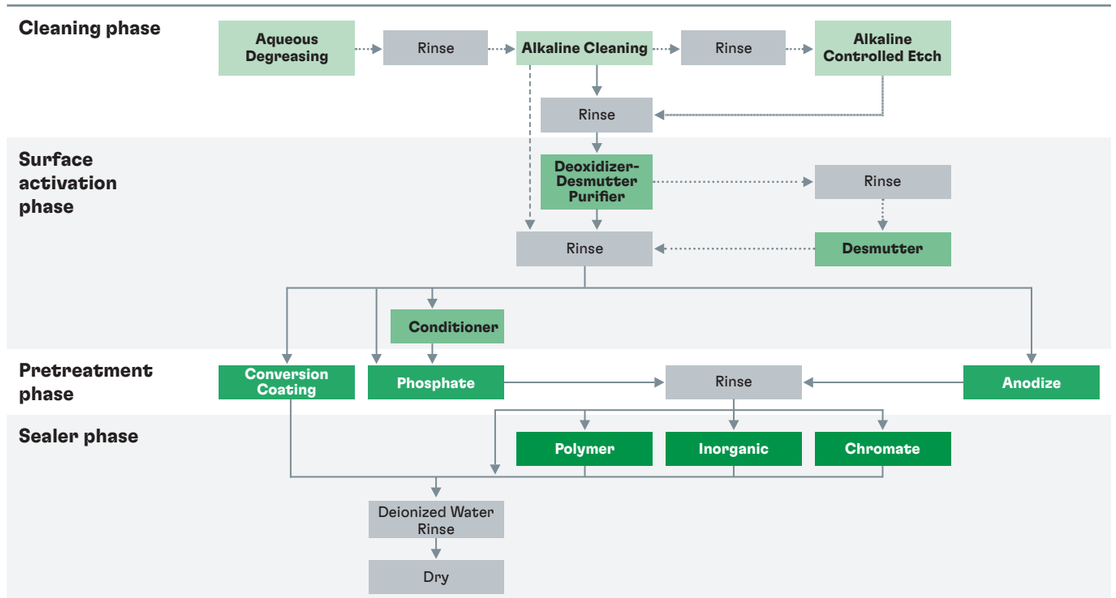
BONDERITE metal pretreatment solutions

Metal Pretreatment: Essential for the longevity of your airframe and aerospace parts

Before bonding, sealing or painting, aircraft parts require a consistent metal pretreated surface that fulfills all of your process requirements. This includes all stages of metal pretreatment from cleaning and degreasing to conversion coating.

From cleaners to conversion coatings: BONDERITE covers it all

With more than seven decades of metal pretreatment experience, Henkel's BONDERITE solutions cover all steps of the surface treatment process: Cleaners and alkaline etchants for the cleaning phase, deoxidizers and desmutting products for the activation phase and conversion coatings for the surface treatment phase. On the following pages, we will introduce you step-by-step to Henkel's aerospace-grade product offerings.



Metal surface treatment typical process

In a class of its own:

BONDERITE cleaning products

for all your aircraft and component cleaning requirements

No aircraft preparation without cleaning ...

A clean surface is essential for all aircraft applications, as it improves the corrosion performance and optimizes contact bonding and sealing of parts. Henkel's broad portfolio of leading BONDERITE cleaning products provides value and dependability for all our customers' needs.

Based on our long history in supplying the aerospace industry, Henkel provides proven solutions for all your cleaning requirements, accompanied by world-class technical expertise and numerous training modules.

... and no cleaning without BONDERITE.

Henkel's BONDERITE range meets many leading OEM process requirements, with aqueous and solvent-based cleaners to remove dirt, grime or impurities from a surface and to deliver optimal performance every time. With BONDERITE, you will always find the appropriate solution to remove surface contaminants like dirt and grease.

Why choose BONDERITE cleaners?

- Easy to maintain bath solutions
- Aerospace grade solutions with OEM qualifications
- Complete surface treatment product portfolio
- Long bath life

BONDERITE cleaning products:

Facts at a glance

Key factors to consider when choosing the right BONDERITE cleaner

- All products must meet OEM process specification requirements, as metal parts and gasket seals can be attacked and destroyed by cleaning chemicals
- Optimal cleaning solution for your process requirements
- Ensure a clean and "water-break"-free surface
- Soil types (Organic or Inorganic)
  - Rust preventives
  - Lubricants
  - Oils
  - Polishing or buffing compounds
  - Inks
  - Oxides
  - Dirt, grease and grime

Cleaners classification

Alkaline Etch (pH > 12)

- Slight to heavy attack of aluminum or metal removal
- Cleaning is enhanced through the evolution of hydrogen gas
- Provides change to the metal appearance

Alkaline Non-Etch Cleaner (pH > 10)

- Inhibited solutions

Neutral, Low Alkaline Non-Etch Cleaner (pH 7 – 10)

- Non-inhibited alkaline solutions
- No adverse effects if allowed to dry on aluminum

Acid (pH < 7)

- Acids chemically break down soils
- Bath can produce surface attack
- Surface attack is controlled by product concentration, temperature and contact time

Solvent

- Safe to use on a wide array of metals
- Good vapor degreaser
- Ideal wiping cleaner
- May attack painted or plastic surfaces

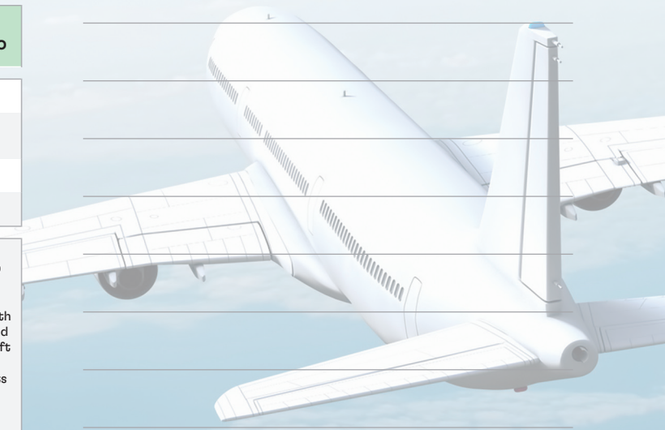
Metal Pretreatment: Cleaners

Applications	Immersion for Parts	•	•	•	•		•	•	•	•	
	Spray / Brush		•							•	•
	Spray Recirculate								•		
	Wipe									•	•
Substrate	Aluminum	•	•	•	•		•		•		•
	Magnesium			•	•		•	•	•		•
	Magnesium – Die Cast				•						•
	Mild Steel										•
	Stainless Steel		•	•	•		•	•	•		•
	Titanium	•	•	•	•		•	•	•		•
	Ferrous		•	•	•		•	•	•	•	•
	Nonferrous				•					•	•
Product Characteristics	Consistency	Liquid	Powder	Liquid	Powder		Liquid	Powder	Liquid	Liquid	Liquid
	Form	Concentrated	Concentrated	Concentrated	Concentrated		Concentrated	Concentrated	Concentrated	Concentrated	Ready to use
	Chemistry	Alkaline, Water-Based	Alkaline, Water-Based	Alkaline, Water-Based	Alkaline, Water-Based		Alkaline, Water-Based	Alkaline, Water-Based	Alkaline, Water-Based	Acidic	Neutral
Process (Immersion)	Time (Minutes)	3 – 15 Minutes	3 – 15 Minutes	Varies as Needed	3 – 15 Minutes		3 – 10 Minutes	Varies as Needed	3 – 15 Minutes	3 – 10 Minutes	
	Temperature °F / °C	130 – 180°F 54 – 82°C	120 – 140°F 49 – 60°C	131 – 158°F 55 – 70°C	130 – 180°F 54 – 82°C		120 – 130°F 49 – 54°C	180°F (min.) 82°C (min.)	100 – 140°F 38 – 60°C	Ambient / 140°F (max.) 60°C (max.)	
	Mix Ratio (Product : Water)	4 y – 10% v / v	5 – 8 oz. / gal.	10 – 20% v / v	5 – 12 oz. / gal.		5 – 8% v / v	5 – 12 oz. / gal.	5% – 25% v / v	25 – 50% by volume / 5 – 10% by volume	
Process (Spray)	Time (Minutes)	–	1 – 3 Minutes	–	–		–	–	1 – 3 Minutes	–	–
	Temperature °F / °C	–	120 – 140°F 49 – 60°C	–	–		–	–	120 – 140°F 49 – 60°C	–	–
	Mix Ratio (Product : Water)	–	1 – 4 oz. / gal.	–	–		–	–	3% – 10% v / v	–	–
Products	New Product Name	**BONDERITE C-AK 298™ AERO**	**BONDERITE C-AK 4215™ NC-LT AERO**	**BONDERITE C-AK 6849™ AERO**	**BONDERITE C-AK 909™ AERO**		**BONDERITE C-AK ALTREX® 24™ AERO**	**BONDERITE C-AK C NVT AERO**	**BONDERITE C-AK LS NP-LT AERO**	**BONDERITE C-IC 4409™ AERO**	**BONDERITE C-AK DW 805 AERO**
Regional Availability & Packaging	Asia Pacific	–	Drum, Pail	Drum	Drum		Pail	–	Pail	Drum, Pail	Drum, Pail
	Europe / Middle East / Africa	–	Pail	Drum, Pail	Pail		–	–	Drum, Pail	Drum, Pail, Tote	–
	Latin America	Drum	Drum, Pail	Drum	Drum		Drum	Drum	–	Drum	–
	North America	Bottle, Drum, Pail, Tote	Bottle, Drum, Pail	Bottle, Bulk, Drum, Tote	Drum		Drum, Pail, Tote	Can, Drum	Drum, Pail	Drum, Pail	–
Description		**BONDERITE C-AK 298™ AERO** is a liquid, non-silicated, immersion cleaner for aluminum and its alloys. It is formulated for use in anodizing and conversion coating lines. It is free rinsing and will remove a variety of soils including oils, greases, inks and wax-based markings.	**BONDERITE C-AK 4215™ NC-LT AERO** is a white granular mix developed for cleaning ferrous and nonferrous alloys by spray, immersion and ultrasonic methods at low temperatures. It is ideal for cleaning fuel and hydraulic components, and for cleaning metals prior to metal bonding.	**BONDERITE C-AK 6849™ AERO** is a clear aqueous alkaline degreaser formulated to remove shop soils, marking inks, Cosmoline brand rust preventive, grease and lube oils from ferrous and nonferrous alloys. It offers both exceptional effectiveness and tank life. It replaces solvent-type vapor degreasing fluids with an effective aqueous cleaner. The costs and hazards normally associated with chlorinated solvent cleaning are thereby greatly reduced.	**BONDERITE C-AK 909™ AERO** is a medium-duty, caustic-free immersion cleaner that provides excellent wetting, emulsifying and dispersing properties which are effective in the removal of a wide variety of soils on ferrous and nonferrous metals. In addition, it is safe on steel, aluminum, brass and zinc die castings.		**BONDERITE C-AK ALTREX® 24™ AERO** is an inhibited, non-etching, concentrated liquid alkaline cleaner for cleaning aluminum and its alloys. The product is an effective remover of most soils found on aluminum and other metals. It can be used in a variety of cleaning operations.	**BONDERITE C-AK C NVT AERO** is a heavy-duty, alkaline cleaner for immersion and barrel cleaning operations. It is particularly suited to plating, porcelain enameling and other critical finishing operations which require the utmost in cleanliness. In addition, it has tremendous soil tolerance, and cleans and rinses well even under the heavy soil loads of barrel washing of screw and header machine products.	**BONDERITE C-AK LS NP-LT AERO** is a straw-colored liquid developed to remove shop soil, lube oils, light drawing oils and drawing waxes from ferrous, aluminum, copper and titanium alloys. In addition, it is also suitable for cleaning most magnesium alloys, zinc and cadmium. The product is ideal for precleaning metals prior to phosphating and painting.	**BONDERITE C-IC 4409™ AERO** is a clear, colorless liquid acid cleaner and deoxidizer designed for use on ferrous and nonferrous alloys by immersion, spray, and hand wipe methods. It is not intended for use on magnesium alloys and high strength steels.	**BONDERITE C-AK DW 805™ AERO** is a ready-to-use product that requires no additional water rinsing. It can be applied by spray or damp cloth, it cleans gently and leaves a protected, high gloss surfaces. Protect and maintain surfaces in one application, while leaving a high-gloss surface shine. Long-term protection against harsh environments such as corrosion, UV-rays and oxidation. it conforms to BSS7432, AIMS09-00-002, AMS 1650C and AMS1526C.

Metal Pretreatment: Cleaners

Applications	Immersion for Parts	·	·	·	·		·		
	Spray / Brush	·		·	·			·	·
	Spray Recirculate								
	Wipe								
Substrate	Aluminum	·	·	·	·			·	·
	Magnesium	·		·					·
	Magnesium – Die Cast								
	Mild Steel				·				
	Stainless Steel	·	·	·	·				·
	Titanium	·	·	·	·				·
	Ferrous	·	·	·			·		·
	Nonferrous	·	·	·			·		·
Product Characteristics	Consistency	Liquid	Liquid	Liquid	Powder		Liquid	Liquid	Liquid
	Form	Concentrated	Concentrated	Concentrated	Concentrated		Ready-to-Use	Concentrated	Concentrated
	Chemistry	Alkaline, Water-Based	Alkaline, Water-Based	Alkaline, Water-Based	Alkaline, Water-Based		Solvent	Alkaline, Water-Based	Alkaline, Water-Based
Process (Immersion)	Time (Minutes)	5 – 15 Minutes	–	5 – 15 Minutes	3 – 15 Minutes		Until wax is completely softened & dissolved	–	-
	Temperature °F / °C	130 – 170°F 65 – 80°C	–	130 – 170°F 65 – 80°C	120 – 140°F 49 – 60°C		50 – 68°F 10 – 20°C	–	-
	Mix Ratio (Product : Water)	3 – 20% by value	–	3 – 20% by value	5 – 8 oz. / gal.		Used as Received	–	-
Process (Spray)	Time (Minutes)	Varies as Needed	5 – 15 Minutes	Varies as Needed	1 – 3 Minutes		–	Varies as Needed	Varies as Needed
	Temperature °F / °C	Ambient	Ambient	Ambient	120 – 140°F 49 – 60°C		–	Ambient	Ambient
	Mix Ratio (Product : Water)	1 part concentrate to 9 – 30 parts water	Use as received	3% – 30% in water	1 – 4 oz. / gal.		–	10 – 20%	1 part concentrate to 3 – 15 parts water
Products	New Product Name	**BONDERITE C-AK 5948DPM™ AERO**	**BONDERITE C-AK 5948DPM™ THK AERO**	**BONDERITE C-AK 5948R™ AERO**	**BONDERITE C-AK 4215NC™ AERO**		**BONDERITE C-MC 6802™ AERO**	**BONDERITE C-AK 6871™ AERO**	**BONDERITE C-AK AIR TEC 23™ AERO**
Regional Availability & Packaging	Asia Pacific	Drum, Pail	Pail	Drum, Pail	–		Drum	–	Drum, Pail
	Europe / Middle East / Africa	Drum, Pail, Tot	Pail	Drum, Pail	Pail		Pail, Tot	–	Drum, Pail
	Latin America	Drum, Tot	Drum	Drum, Pail	–		Drum	–	Drum
	North America	Bottle, Drum, Pail	Bottle, Drum, Pail	Bottle, Bulk, Drum, Pail	–		Drum	Drum, Pail	Bottle, Bulk, Drum, Pail
Description		**BONDERITE C-AK 5948DPM™ AERO** is an alkaline, water-based, blue concentrated compound formulated to effectively clean painted and unpainted aircraft exterior and interior surfaces when diluted with water. It is ideally suited for use on all models of jet aircraft and is also designed to be used in immersion tanks for dip applications.	**BONDERITE C-AK 5948DPM™ THK AERO** is an environmentally advantaged thixotropic, water-based, heavy-duty aircraft cleaner. It is formulated to effectively cling to painted and unpainted aircraft exterior and interior surfaces. It is ideally suited for use on all jets, especially in baggage bins, flap and wheel well areas, and on engines before overhaul. It can be applied as spray or mop.	**BONDERITE C-AK 5948R™ AERO** is an alkaline, water-based, blue, concentrated compound formulated to effectively clean painted and unpainted aircraft exterior and interior surfaces when diluted with water. It is ideally suited for use on all aircraft large or small parts, and for cleaning engine parts during engine overhaul. It is also designed to be used in immersion tanks for dip applications.	**BONDERITE C-AK 4215NC™ AERO** is a granular mixture developed to clean aerospace metals, including the ones that come in contact with LOX. It is ideal for cleaning fuel, hydraulic components and articles that require adhesive bonding, anodizing and conversion coatings.		**BONDERITE C-MC 6802™ AERO** is a clear, amber liquid developed to remove platter's wax and similar low melting stop-off compounds by immersion in the heated product. It is free of chlorinated hydrocarbons, phenols, and chromate. It can be used on all metals.	**BONDERITE C-AK 6871™ AERO** is a clear, straw-colored alkaline concentrate designed to be diluted with water to clean painted and unpainted exterior aircraft surfaces by spraying or foaming methods.	**BONDERITE C-AK AIR TEC 23™ AERO** is a clear, straw-colored, alkaline concentrate designed to be diluted with water to clean painted and unpainted exterior aircraft surfaces by spraying or foaming methods. It meets requirements of MIL-C-87936A, Type I.

Notes



Metal Pretreatment: Cleaners

Applications	Immersion for Parts		
	Spray / Brush	•	
	Spray Recirculate		
	Wipe		•
Substrate	Aluminum	•	•
	Magnesium		
	Magnesium – Die Cast		
	Mild Steel	•	
	Stainless Steel	•	
	Titanium	•	
	Ferrous	•	
	Nonferrous	•	
Product Characteristics	Consistency	Liquid	Liquid
	Form	Concentrated	Ready-to-Use
	Chemistry	Alkaline, Solvent	Alkaline, Emulsion
Process (Immersion)	Time (Minutes)	–	–
	Temperature °F / °C	–	–
	Mix Ratio (Product : Water)	–	Use as Received
Process (Spray)	Time (Minutes)	15 Minutes	–
	Temperature °F / °C	68 – 86°F 20 – 30°C	–
	Mix Ratio (Product : Water)	20% v / v	–
Products	New Product Name	**BONDERITE C-AK 5975A™ AERO**	**BONDERITE C-MC 1495™ X AERO**
Regional Availability & Packaging	Asia Pacific	Pail, Drum	Pail
	Europe / Middle East / Africa	Pail	Pail
	Latin America	–	Pail
	North America	–	–
Description		**BONDERITE C-AK 5975A™ AERO** is a solvent containing high pressure cleaner and can be used on ferrous and nonferrous alloys. It is suitable as an aircraft exterior cleaner.	**BONDERITE C-MC 1495™ X AERO** is a medium-heavy duty aircraft polish and cleaner. It quickly removes oxide films.

Notes

For a perfect surface finish:

BONDERITE etchants

With etchants, you can achieve an optimum surface appearance

As a specialist, you know that surface preparation is fundamental to paint adhesion, surface bonding and corrosion protection. Therefore, for secondary operations, it is important to prepare metal by cleaning and providing a high-quality, fine satin, etched surface.

With BONDERITE etchants, you can take advantage of optimum process benefits

Besides a high-quality etched surface and lighter weight, BONDERITE etchants make sure that the metal is etched away only in exposed areas. You can dissolve metallic aluminum to gain a smoother, uniform surface appearance while providing an extended bath / tank life for your process.

Why choose BONDERITE Etchants?

- Good for very sharp and defined surfaces
- Controlled etch rates
- Achieve surface smoothness
- Prevent caustic mist from escaping into the workplace

BONDERITE etchants:

Facts at a glance

BONDERITE etchants key features:

- Nonflammable
- Readily mix with cold water
- Produce minimal amount of soft, non-caking sludge
- Operations up to 105°C / 221°F
- Produce uniform etch on most aluminum alloys
- Easily controlled by simple titration

Key factors to consider when choosing the right BONDERITE etchant

- Type of alloy
- Type of chemical milling maskant
- Required specification

Surface preparation

Cleaning

To ensure a uniform etch in the bath containing alkaline etchant, aluminum work pieces must be thoroughly cleaned using a non-silicated cleaner prior to being placed in the etch bath.

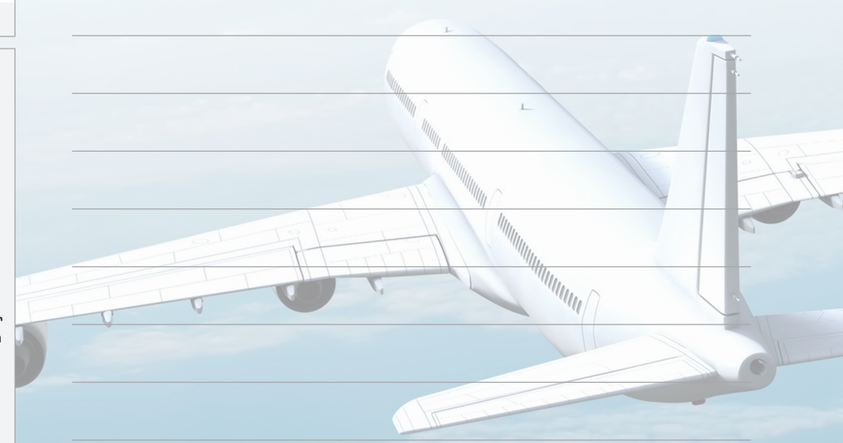
Water Rinsing

After cleaning, the metal must be thoroughly rinsed with water, preferably warm. The rinse should be overflowed continuously at a rate which will keep it clean and free from scum and contamination.

Metal Pretreatment: Etchants

Applications	Immersion for Parts							
	Spray / Brush							
	Spray Recirculate							
	Wipe							
	Etchant	•	•	•	•		•	•
Substrate	Aluminum	•	•	•	•			
Product Characteristics	Consistency	Liquid	Liquid	Liquid	Powder		Liquid	Liquid
	Form	Concentrated	Concentrated	Concentrated	Concentrated		Ready-to-Use	Concentrated
	Chemistry	Strong Alkaline	Strong Alkaline	Strong Alkaline	Alkaline		Alkaline	Strong Alkaline
Process (Immersion)	Time (Minutes)	1 – 5 Minutes	10 – 60 Minutes	10 – 60 Minutes	3 – 5 Minutes		15 – 60 Minutes	15 – 60 Minutes
	Temperature °F / °C	120 – 180°F 49 – 82°C	167 – 221°F 75 – 105°C	194 – 221°F 90 – 105°C	122 – 158°F 50 – 70°C		175 – 204°F 80 – 95°C	150 – 190°F 66 – 88°C
	Mix Ratio (Product : Water)	4% – 10% v / v	14, 5% v / v	50% v / v	37.5 to 52.5 g / L of water		75% - 25% v / v	15% – 100% v / v
Process (Spray)	Time (Minutes)	–	–	–	–		–	–
	Temperature °F / °C	–	–	–	–		–	–
	Mix Ratio (Product : Water)	–	–	–	–		–	–
Products	New Product Name	**BONDERITE C-AK EC-202L™ AERO**	**BONDERITE C-AK ETCH 9HL™ AERO**	**BONDERITE C-AK ETCH 17L™ AERO**	**BONDERITE C-AK ALUM ETCH 2 AERO**		**BONDERITE C-AK 5578-GL™ AERO**	**BONDERITE C-AK 5578-L™ AERO**
Regional Availability & Packaging	Asia Pacific	–	Drum	Drum	–		–	–
	Europe / Middle East / Africa	–	Drum	Drum, Tote	Pail		Drum	–
	Latin America	–	–	–	Pail		–	–
	North America	Bulk, Drum, Pail, Tote	Drum	Drum	Drum		Drum, Tote	Bottle, Bulk
Description		**BONDERITE C-AK EC-202L™ AERO** is a liquid alkaline aluminum etch cleaner for immersion applications that will produce a lightly etched finish on aluminum alloys, while simultaneously removing any oils and other soils present on the work surface. It produces a stable foam blanket which effectively entraps the gases evolved during the etching operation. It contains a special blend of detergents and dispersing agents to minimize hard scale formation. Therefore, it makes equipment maintenance a much easier and less costly operation.	**BONDERITE C-AK ETCH 9HL™ AERO** is equivalent to a 50 percent water solution of the dry flake BONDERITE C-AK ETCH 9H AERO. It was developed to provide a convenient means to charge and rejuvenate caustic chemical milling baths for aluminum.	**BONDERITE C-AK ETCH 17L™ AERO** is a specially compounded caustic etchant for use on the majority of aluminium alloys in the chemical milling process.	**BONDERITE C-AK ALUM ETCH 2 AERO** is a white granular mixture formulated to clean light soils and etch aluminum by immersion methods. Its solution has a low surface tension which causes a uniform wetting of the metal surface and produces a smooth matte finish on extrusions, structural shapes, aircraft components and similar aluminum parts.		**BONDERITE C-AK 5578-GL™ AERO** is a liquid product formulated for alkaline etching on titanium, columbium and tantalum alloys by immersion systems or spray applications. It is an effective etchant prior to adhesive bonding, diffusion bonding, painting, welding and brazing.	**BONDERITE C-AK 5578-L™ AERO** is an amber liquid compound formulated to clean and etch titanium, columbium and tantalum alloys by spray or immersion systems. It readily removes mill soils, marking inks, lube oils, cutting oil and fingerprints at a low concentration and will etch titanium at higher concentrations. It is an effective etch prior to adhesive bonding, diffusion bonding, painting, welding and brazing.

Notes



If it has to be cleaner than clean:

Deoxidize and desmut with BONDERITE

Best preparation for bonding and painting: remove everything

For a professional aircraft preparation, oxide layers and smut have to be removed completely before any bonding or painting applications. Both challenges require specific cleaning solutions that consider the alloy and surface condition, the type of conversion coating being used, the environmental regulations and individual customer requirements.

Best choice: BONDERITE

It offers exactly the solution you need. Regarding oxides, the high-quality BONDERITE deoxidizers remove corrosion products as well as heavy storage oxides or residues. At the same time, its desmutting products completely remove surface deposits. In short: You can depend on Henkel to provide solutions for all your surface treatment needs.

Why choose BONDERITE Deoxidizers and Desmutters?

- Complementary chemical solutions
- Proven performance
- Chrome-free chemical options
- Solutions for a wide variety of applications

BONDERITE deoxidizing and desmutting products:

Facts at a glance

BONDERITE deoxidizers and desmutters will remove oxides and smut from the substrate

- Corrosion products
- Heavy storage oxides
- Residues of abrasive cleaning
- Remnants of shot peening
- Traces of foreign metal contamination

Necessity of smut removal

Smut is the combination of intermetallics, metals and metal oxides that remain after cleaning and / or etching.

Smut:

- Is loosely adherent to the surface
- Will inhibit proper formation of conversion coating
- Inhibits paint adhesion
- Contaminates processing solutions
- Initiates corrosion

Key factors to consider when choosing the right BONDERITE deoxidizer and desmutter

- Alloy and surface condition
- Type of conversion coating being used
- Environmental concerns and regulations
- Equipment and tank availability
- OEM process requirements
- Process water conditions

Available types of deoxidizers and desmutters

Nitric-based

- Not suitable for silicon alloys (castings)
- Fluoride needs to be added to improve efficiency
- Eventually leads to staining problems
- Can cause fuming

Chrome-based

- Allows for long transfer times
- Longer bath life than nitric based

Iron-based

- Environmentaly responsible
- Good performance

Non-chrome / non-iron based

- Environmentally responsible
- Aids in copper passivation
- Regulatory compliance with REACh

Metal Pretreatment: Deoxidizers and Desmutters

Applications	Chrome	•						
	Iron		•	•	•		•	
	Non-chrome / Non-Iron							•
Substrate	Aluminum	•	•	•	•		•	
	Titanium							•
Product Characteristics	Consistency	Liquid	Liquid	Liquid	Liquid		Liquid	Liquid
	Form	Concentrated, Two Packages	Concentrated, Two Components	Concentrated, Two Components	Concentrated, One Package		Concentrated, One Package	Concentrated
	Chemistry	Chromate	Non-Chrome, Iron-Based	Non-Chrome, Iron-Based	Non-Chrome, Iron-Based		Non-Chrome, Iron-Based	Non-Chrome, Non-Iron
Process (Immersion)	Time (Minutes)	1 – 15 Minutes	1 – 15 Minutes	1 – 15 Minutes	1 – 15 Minutes		1 – 15 Minutes	–
	Temperature °F / °C	Ambient	Ambient	Ambient	Ambient		Ambient	Ambient – 140°F Ambient – 60°C
	Mix Ratio (Product : Water)	7% v / v D6 M/U, 10% v / v Nitric Acid	10 – 20% v / v D2310, 20 – 30% Nitric Acid	15% v / v Aldox V, 26% Nitric Acid	19% v / v		19% v / v	–
Process (Spray)	Time (Minutes)	–	–	1 – 15 Minutes	15 – 60 Seconds		15 – 60 Seconds	–
	Temperature °F / °C	–	–	Ambient	Ambient		Ambient	–
	Mix Ratio (Product : Water)	–	–	15% v / v Aldox V, 26% Nitric Acid	19% v / v		19m% v / v	–
Products	New Product Name	**BONDERITE C-IC DEOXDZR 6MU™ AERO**	**BONDERITE C-IC 2310™ AERO**	**BONDERITE C-IC ALDOX® V AERO**	**BONDERITE C-IC SMUT-GO® NC AERO**		**BONDERITE C-IC SMUT-GO® NCB AERO**	**BONDERITE C-IC 4104™ AERO**
Regional Availability & Packaging	Asia Pacific	Drum, Pail	–	–	Drum		Drum, Pail	Drum, Pail
	Europe / Middle East / Africa	–	Pail	–	Pail, Drum, Tote		Drum, Pail, Tote	Pail
	Latin America	Drum, Pail	Drum	–	Drum		Drum	–
	North America	Bottle, Bulk, Drum, Tote	Bulk, Drum, Tote	Bottle, Drum, Tote	Bottle, Drum		Bottle, Drum	Drum, Pail
Description		**BONDERITE C-IC DEOXDZR 6MU™ AERO** in a solution of nitric acid or sulfuric acid removes oxides and alkali residues of preceding alkaline degreasing or etching processes on aluminium and its alloys. It is used in an immersion process.	**BONDERITE C-IC 2310™ AERO** is a chromium-free concentrated acidic liquid product specifically formulated for deoxidizing and desmutting wrought aluminum alloys. It is extremely effective in removing surface oxides, discolorations due to heat treatment or thermal deburring, and smut which develops during alkaline etching and chemical milling. It develops a stain-free surface on aluminum alloys and is used prior to finishing operations such as anodizing, chemical milling, penetrant dye inspection and spot or resistance welding.	**BONDERITE C-IC ALDOX® V AERO** is a chromium-free, brown liquid formulated to deoxidize, desmut, and lightly etch aluminum alloys. It can be applied as spray or immersion methods that require low surface resistance, prior to anodizing, conversion coating, bonding or welding.	**BONDERITE C-IC SMUT-GO® NC AERO** is a dark brown liquid formulated to deoxidize and desmut aluminum alloys by spray or immersion methods. It is chromate-free and ideal for processing alloys that require low surface resistance, prior to anodizing, conversion coating, bonding or welding. The nominal etch rates for most aluminum alloys will normally be in the range of 0.02 – 0.10 mils/surface/hour.		**BONDERITE C-IC SMUT-GO® NCB AERO** is a dark brown liquid formulated to deoxidize and desmut aluminum alloys by spray or immersion methods. It is chromate-free and ideal for processing alloys that require low surface resistance, prior to anodizing, conversion coating, bonding or welding. Nominal etch rates for most aluminum alloys will be in the range of 0.1 to 0.9 mils/surface/hour. If lower etch rates are required, BONDERITE C-IC SMUT-GO® NC AERO may be used.	**BONDERITE C-IC 4104™ AERO** is a clear, colorless liquid acidic compound designed to be added to nitric acid / water solutions to enhance the descaling and pickling of stainless steels and heat resistant alloys, including titanium alloys, by immersion methods. It is also effective in descaling or pickling cobalt, chrome, nickel and copper based alloys.

Notes

The foundation of every successful surface treatment:

BONDERITE conversion coatings

First step: surface protection

Whenever a high bare corrosion protection is necessary, an anodization is not possible or a repair coating for small areas is required, you will need a reliable surface treatment before bonding and painting: A protective surface layer created by a chemical reaction between the metal and a chemical solution.

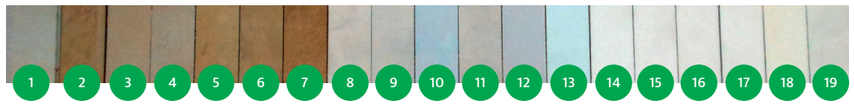
First choice: BONDERITE conversion coatings

Once the conversion coating has been applied as fundamental surface layer, there is no chance to replace it – reason enough to choose high-performance coatings only. With BONDERITE, Henkel offers multiple options in conversion and chemical coatings for all your metal pretreatment processes and for more applications than any other chemical provider. This high-end quality is the reason why our different types of proven BONDERITE conversion coatings are listed in many OEM process specifications.

Why choose BONDERITE conversion coatings?

- Stabilize metal surface
- Protect metal surface from corrosion
- Inhibit corrosion spread
- Improve paint adhesion and adhesive bonding

Non-chrome | Hexachrome | Trichrome



1 – 7 Hexachrome
8 – 10 Trichrome
11 – 13 Non-chrome
14 – 17 Adhesion promoter
18 Anodizing surface
19 FPL

BONDERITE conversion coatings:

Facts at a glance

Where BONDERITE conversion coatings are used

- For the corrosion protection of aluminum surfaces
- For metal pretreatment before bonding and painting
- For high bare corrosion protection
- Substituting anodization by inappropriate shape of substrates
- As repair coating for small areas
- For critical military applications according to MIL-DTL-81706B

BONDERITE conversion coatings capabilities

- Stabilize metal surfaces before and after painting
- Inhibit corrosion spread
- Optimize paint adhesion
- Improve adhesives bonding
- Maintain electrical resistance
- May insulate one metal from another

Available chemistries:

- Hexavalent chrome (Cr^{6+})
- Trivalent chrome (Cr^{3+})
- Non-chrome
- Adhesion promoters

Qualified Products List for MIL-DTL-81706B*

TYPE 1 Composition with Cr^{6+}	Class		Material Form						Application Method			
	1A	3	1 Form I Concentrated Liquid	2 Form II Powder	3 Form III Premix Liquid	4 Form III Premix Liquid	5 Form V Premeasured Powder	6 Form VI Premixed Liquid	A Spray	B Brush	C Immersion	D Applicator
BONDERITE M-CR 1001™ AERO		•	•						•		•	
BONDERITE M-CR 1132™ AERO	•	•						•				•
BONDERITE M-CR 1132™ M AERO	•	•						•				•
BONDERITE M-CR 1200™ AERO	•			•					•	•	•	
BONDERITE M-CR 1200™ AERO		•		•							•	
BONDERITE M-CR 1200S™ AERO	•			•					•	•	•	
BONDERITE M-CR 1200S™ AERO		•		•							•	
BONDERITE M-CR 1201™ AERO	•				•					•		
BONDERITE M-CR 1500™ AERO		•	•						•		•	
BONDERITE M-CR 1600™ AERO	•	•	•								•	
BONDERITE M-CR 600™ AERO	•	•		•					•	•	•	
BONDERITE M-CR 600™ RTU AERO	•	•			•				•	•	•	

TYPE 2 Composition with Cr^{+3}	Class		Material Form						Application Method			
	1A	3	1 Form I Concentrated Liquid	2 Form II Powder	3 Form III Premix Liquid	4 Form III Premix Liquid	5 Form V Premeasured Powder	6 Form VI Premixed Liquid	A Spray	B Brush	C Immersion	D Applicator
BONDERITE M-CR T 5900® AERO	•	•	•						•	•	•	
BONDERITE M-CR T5900™ RTU AERO	•	•			•				•	•	•	
BONDERITE M-CR 871™ AERO	•	•						•				•
BONDERITE M-NT 65000	•	•	•								•	

BONDERITE, known as ALODINE®, conversion coating products per MIL-DTL-81706B, are actively managed by Henkel Aerospace Products and Services with NAVAIR. As required by NAVAIR, Henkel maintains rigorous formulation and manufacturing site control, as well as quality control batch release testing for these MIL-SPEC products. To extend the Henkel warranty and certification, customers are instructed to procure these products from authorized manufacturing sites and from Henkel authorized aerospace distributors. The customers are liable for compliance with its process requirements. For more information on Henkel products and approval sites per MIL-DTL-81706B, visit: **www.henkel-adhesives.com/aerospace-quality and www.henkel-adhesives.com/aerospace-distributor.**

Metal Pretreatment: Conversion Coatings

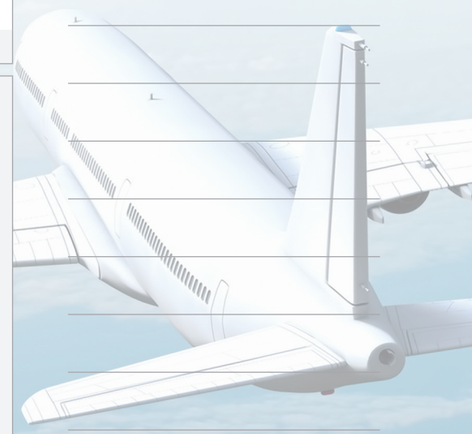
Applications	Chrome 6 (MIL-SPEC)	•	•	•	•		•	•	•	•
	Chrome 3									
	Non-Chrome									
	Adhesion Promoter									
Substrate	Aluminum	•	•	•	•		•	•	•	•
	Magnesium									
	Magnesium – Die Cast									
	Titanium									
Product Characteristics	Consistency	Liquid	Powder	Liquid	Powder		Liquid	Powder	Liquid	Liquid
	Form	Concentrated	Concentrated	Concentrated, Two Packages	Concentrated		Ready-to-Use	Concentrated	Ready-to-Use	Ready-to-Use
	Chemistry	Chromate	Chromate	Chromate	Chromate		Chromate	Chromate	Chromate	Chromate
Process (Immersion)	Time (Minutes)	2 – 5 Minutes	15 Seconds – 3 Minutes	1 – 5 Minutes	3 – 5 Minutes		3-10 Minutes	15 Seconds – 3 Minutes	2 – 5 Minutes	Until Dry
	Temperature °F / °C	Ambient	70 – 100°F 21 – 38°C	60 – 130°F 16 – 54°C	70 – 100°F 21 – 38°C		70 - 100°F 21 - 38°C	70 – 100°F 21 – 38°C	Ambient – 100°F Ambient – 38°C	Ambient
	Mix Ratio (Product : Water)	25%	6.3 lbs. / 100 gals. 7.55 g / L	0.65% v / v 1.3% v / v	12.5 lbs. / 100 gals. 15 g / L		–	6.3 lbs. / 100 gals. 7.55 g / L	33% by Volume	Used as Received
Process (Spray)	Time (Minutes)	2 – 5 Minutes	15 Seconds – 1 Minute	1 – 5 Minutes	3-10 Minutes		3-10 Minutes	15 Seconds – 1 Minute	2 – 5 Minutes	–
	Temperature °F / °C	Ambient	70 – 100°F 21 – 38°C	60 – 130°F 16 – 54°C	70 – 100°F 21 – 38°C		70 – 100°F 21 – 38°C	70 – 100°F 21 – 38°C	Ambient – 100°F Ambient – 38°C	–
	Mix Ratio (Product : Water)	25%	6.3 lbs. / 100 gals. 7.55 g / L	0.65% v / v 1.3% v / v	12.5 lbs. / 100 gals. 15 g / L		Used as Received	6.3 lbs. / 100 gals. 7.55 g / L	50% – 100% v / v	–
Products	New Product Name	**BONDERITE M-CR 1001™ AERO**	**BONDERITE M-CR 1200S™ AERO**	**BONDERITE M-CR 1600™ AERO**	**BONDERITE M-CR 600™ AERO**		**BONDERITE M-CR 600 RTU™ AERO**	**BONDERITE M-CR 1200™ AERO**	**BONDERITE M-CR 1201™ AERO**	**BONDERITE M-CR 1132™ AERO**
Regional Availability & Packaging	Asia Pacific	Pail	Pail	–	Pail		Pail	Pail	Pail	Pen
	Europe / Middle East / Africa	–	Pail	–	Pail		–	Pail	–	Pen
	Latin America	Case	Pail	Drum	Pail		Pail	–	Pail	Pen
	North America	Case, Drum	Bulk, Can, Drum	Bottle, Drum, Pail	Can, Drum, Pail		Bottle, Drum, Pail, Tote	–	Bottle, Case, Drum, Tote	Pen
Description		**BONDERITE M-CR 1001™ AERO** is a nonflammable, chromic, acid-based coating chemical that produces a chrome conversion coating on aluminum and its alloys. This chrome conversion coating offers the best affordable substrate for both paint adhesion and corrosion resistance.	**BONDERITE M-CR 1200S™ AERO** is a powdered chemical used to produce a protective coating on aluminum to minimize corrosion and provide an improved bond for paint.	**BONDERITE M-CR 1600™ AERO** is a concentrated liquid two-package chemical used to produce a chromate conversion coating on aluminum and all its alloys. The color ranges from light iridescent gold to tan. It does not contain complex cyanides.	**BONDERITE M-CR 600™ AERO** is a powdered chemical used to produce a chromate conversion coating on aluminum and its alloys, which range in color from light, iridescent gold to tan. It can be applied by immersion or spray methods, does not contain complex cyanides, and is particularly recommended where a low dielectric resistance coating is desired.		**BONDERITE M-CR 600 RTU™ AERO** is a ready-to-use liquid product which produces a chromate conversion coating on aluminum and its alloys. The coating produced provides excellent protection for unpainted aluminum and bonds paint well.	**BONDERITE M-CR 1200™ AERO** is a powdered chemical used to produce a protective coating on aluminum which ranges in color from light iridescent gold to tan. The process is operated at room temperature. The coating produced minimizes corrosion and provides an improved bond for paint.	**BONDERITE M-CR 1201™ AERO** is a nonflammable, chromic, acid-based coating chemical that produces a chrome conversion coating on aluminum and its alloys.	**BONDERITE M-CR 1132™ AERO** is designed to save labor, material and time when applying a dry-in-place hexachrome conversion coating for touch-up applications. Its proper use also reduces worker contact to chromated solution and decreases wastewater such as rinse water generated from a chromating process.

Metal Pretreatment: Conversion Coatings

Applications	Chrome 6 (MIL-SPEC)	•								
	Chrome 3		•	•	•		•			
	Non-Chrome							•	•	
	Adhesion Promoter									•
Substrate	Aluminum		•	•	•		•	•	•	•
	Magnesium	•		•	•			•	•	
	Magnesium – Die Cast	•		•	•					
	Titanium			•	•			•	•	•
Product Characteristics	Consistency	Liquid	Liquid	Liquid	Liquid		Liquid	Liquid	Liquid	Liquid
	Form	Ready-to-Use, Two-Part Kit	Ready-to-Use	Concentrated	Ready-to-Use		Concentrated	Concentrated	Ready-to-Use	Ready-to-Use
	Chemistry	Chromate	Trivalent Chrome	Trivalent Chrome	Trivalent Chrome		Trivalent Chrome	Acid	Acid	Non-chrome, Organic
Process (Immersion)	Time (Minutes)	–	–	5 – 10 Minutes	5 – 10 Minutes		5 – 10 Minutes	30 Seconds – 5 Minutes	–	–
	Temperature °F / °C	–	–	75 – 110°F 24 – 42°C	70 – 100°F 21 – 38°C		65-86°F 20-30°C	Ambient	–	–
	Mix Ratio (Product : Water)	–	–	3 – 10% by Volume	Used as Received		25 - 60% by Volume	1 – 8%	–	–
Process (Spray)	Time (Minutes)	Until Dry	–	1.5 – 3 Minutes	1.5 – 3 Minutes			30 Seconds – 5 Minutes	1 – 5 Minutes	Dry-in-Place
	Temperature °F / °C	Ambient	–	75 – 110°F 24 – 42°C	70 – 100°F 21 – 38°C			Ambient	Ambient	Ambient
	Mix Ratio (Product : Water)	Used as Received	–	3 – 10% by Volume	Used as Received			1 – 8%	Used as Received	Used as Received

Products	New Product Name	**BONDERITE M-CR MAGNESIUM AERO**	**BONDERITE M-CR 871™ AERO**	**BONDERITE M-CR T5900™ AERO**	**BONDERITE M-CR T5900™ RTU AERO**		**BONDERITE M-NT 65000**	**BONDERITE M-NT 5200™ AERO**	**BONDERITE M-NT 5700™ AERO**	**BONDERITE M-NT 8800™ AERO**
Regional Availability & Packaging	Asia Pacific	Kit	Pen	–	–		25 kg	–	–	–
	Europe / Middle East / Africa	–	Pen	–	–		25 kg, 1000 kg	–	Pail	–
	Latin America	–	–	–	–		25 kg	–	–	–
	North America	Kit, Drum	Pen	Bottle, Drum, Pail	Drum, Pail, Tote		25 kg, 1000 kg	Bottle, Drum, Pail	Bottle, Case, Drum, Pail	Pail
Description		**BONDERITE M-CR MAGNESIUM AERO** contains products formulated for treating magnesium alloys to produce a chromate conversion coating conforming to SAE AMS-M-3171, Type VI. The application method conforms to requirements in NAVAIR 01-1A-509 and is meant primarily for touch-up and corrosion repair processes of magnesium alloys.	**BONDERITE M-CR 871™ AERO** is a trichrome dry-in-place conversion coating designed for use on aluminum and its alloys. The applicator used to deliver this product provides an easy and safe method of repairing bare areas of aluminum surfaces. Its proper use reduces worker contact to chemical solutions and decreases wastewater such as rinse water generated from a conversion coating process.	**BONDERITE M-CR T5900™ AERO** treatment develops a complex trivalent chromium conversion coating on aluminum and its alloys, metals coated with IVD aluminum, magnesium, titanium and zinc surfaces. The process provides bare ASTM-B117 salt spray resistance and serves as an excellent base for bonding of paints and adhesives.	**BONDERITE M-CR T5900™ RTU AERO** treatment is a complex trivalent chromium conversion coating formulated for treating aluminum and its alloys, metals coated with IVD aluminum, magnesium, titanium and zinc surfaces. This product is formulated as a ready-to-use material for manual spray applications.		**BONDERITE M-NT 65000 AERO** is a REACH compliant trivalent chromium-based conversion coating for aluminum and its alloys. It is applied by immersion application. BONDERITE M-NT 65000 AERO is listed on the QPL for MIL-DTL-81706, Type II, Classes 1A(A) and 3(B), Method C. BONDERITE M-NT 65000 AERO is authorized for use on parts that need to meet MIL-DTL-5541 Type II coatings. It complies with RoHS European directives 2002/95/CE called RoHS for electrical and electronic equipment.	**BONDERITE M-NT 5200™ AERO** treatment is a chromium-free product and specifically formulated for treating aluminum and its alloys. It may be used by spray or immersion. The process provides an excellent base for organic finishes.	**BONDERITE M-NT 5700™ AERO** treatment is a chromium-free conversion coating specifically formulated for treating aluminum and its alloys. This product is formulated as a ready-to-use material for spray applications. The process provides an excellent base for organic finishes.	**BONDERITE M-NT 8800™ AERO** is a sol-gel coating replacement specifically formulated for increasing adhesion to aluminum and titanium alloys. This product is suitable for spray, brush, and wipe-on applications. The coating produced provides an excellent base for organic finishes and surface preparation for adhesive bonding. It should not be rinsed after application.

Notes



For professional protection of parts:

BONDERITE maskants for chemical milling process

Protect all non-etched areas ...

Masking is the process of applying a coating to the metal surface to protect areas which will not be etched. Maskants are used to protect or repair edges, surface damage and cover tooling holes.

... but do it the easy way – with BONDERITE maskants

Why are Henkel's solutions the "easy way of masking"? First of all, because they allow many ways of application: by dip, spray, flow-coat or brush. Secondly, they save working hours as air dry copes with many of these applications. And thirdly, they are easy to remove by hand-peeling.

BONDERITE maskants:

Facts at a glance

BONDERITE maskants key features:

› Solvent-borne and 100 percent Solids (2K)
› Fast curing
› No oven drying / curing required
› Time-saving process

Key factors to consider when choosing the right BONDERITE maskant

› Sufficient adhesion resistance
› Chemical resistance

Chemical Milling: Maskants

Applications	Maskants	·	·	·	·
Substrate	Aluminum	·	·	·	·
	Composites Material				
	Magnesium	·	·		
	Magnesium – Die Cast				
	Mild Steel	·	·		
	Stainless Steel				
	Titanium	·	·		
	Ferrous			·	
	Nonferrous			·	
Product Characteristics	Consistency	Liquid	Liquid	Liquid	Liquid
	Form	Ready-to-Use	Ready-to-Use	Ready-to-Use	Two-Part Kit
	Chemistry	Solvent-Based Coating	Solvent-Based Coating	Solvent-Based Coating	Polyurethane
Process (Immersion)	Time (Minutes)	–	–	–	–
	Temperature °F / °C	68 – 86°F 20 – 30°C	–	–	–
	Mix Ratio (Product : Water)	Use as Received	–	–	–
Process (Spray)	Time (Minutes)	–	–	–	–
	Temperature °F / °C	–	Hot Airless Spray: 158 – 176°F 70 – 80°C	Hot Airless Spray: 158 – 176°F 70 – 80°C	–
	Mix Ratio (Product : Water)	–	Use as Received	Use as Received	1:1

Products	New Product Name	**BONDERITE S-MA 522™ AERO**	**BONDERITE S-MA 551™ LA-2 AERO**	**BONDERITE S-MA 5580™ G AERO**	**BONDERITE S-MA M-4001™ AERO**	**BONDERITE S-MA M-4002™ AERO**
Regional Availability & Packaging	Asia Pacific	Drum, Pail	Pail	Drum, Pail	–	–
	Europe / Middle East / Africa	Pail	Drum, Pail, Tote	Drum, Pail	Drum	Drum
	Latin America	–	–	–	–	–
	North America	–	–	–	–	–
Description		**BONDERITE S-MA 522™ AERO** is a tan, liquid, single component, air-curing product. It provides a peelable protective coating against the corrosive action of hot caustic and acidic solutions used in the chemical milling processing of aluminum, magnesium, steel and titanium alloys.	**BONDERITE S-MA 551™ LA-2 AERO** is a blue, hand-strippable coating formulated to provide protection to metal surfaces during successive fabrication operations such as: chemical milling, forming, chemical cleaning, conversion coating, Type I and Type II anodizing, adhesive bonding and machining.	**BONDERITE S-MA 5580™ G AERO** is a green, hand-strippable coating formulated to provide protection to metal surfaces during successive fabrication operations, such as: forming, chemical cleaning, conversion coating, Type I and Type II anodizing, adhesive bonding and machining.	**BONDERITE S-MA M-4001™ / M-4002™ AERO** is a 100 percent solid, two-component, polyurethane-based, self curing, hand-peelable coating that provides protection of metallic surfaces during mechanical fabrication and chemical processing. Due to its advanced chemistry, its rapid cure allows the user to process coated parts much faster than with conventional solvent or water-based maskants.	

Aircraft depainting is no small task.

Unless you choose BONDERITE paint removers

How to depaint your aircraft professionally

When performing aircraft corrosion checks and paint modifications, it is important to choose consistent and reliable depaint and repaint systems with industry-leading OEM qualifications.

And how to improve it easily: with BONDERITE

There is a way to make the complex as easy as possible: Henkel's BONDERITE depaint technologies are NESHAP compliant, thixotropic products – solvent, hydrogen peroxide and water-based. They are easy to apply as they cling to vertical surfaces. Furthermore, they eliminate the surface contamination of mechanical removal methods.

Why choose BONDERITE paint strippers?

- Reduction of material used, waste generated and overall costs
- Reduction of total paint stripping time
- Low to no odor, improved operator conditions
- Meets leading OEM process specifications

BONDERITE paint stripper: *Facts at a glance*

Key factors to consider when choosing the right BONDERITE paint stripper

- OEM process specification requirements
- Metal surface
- Stripping time
- Environmental concerns and regulations

Applications

Henkel offers a complete portfolio of solvent, hydrogen peroxide and water-based products for aircraft depaint and repaint for the following applications:

- Airframe structure
- Hard to reach flap and wheel well areas
- Landing gear and major component repair applications

Types of paint strippers

1. Regulated – Methylene Chloride:

- Fastest stripping times
- Safe on a majority of substrates

2. Environmentally Advantaged – Peroxide:

- Medium stripping times
- Can be used on a majority of substrates

3 Environmentally Advantaged – Acid Activated:

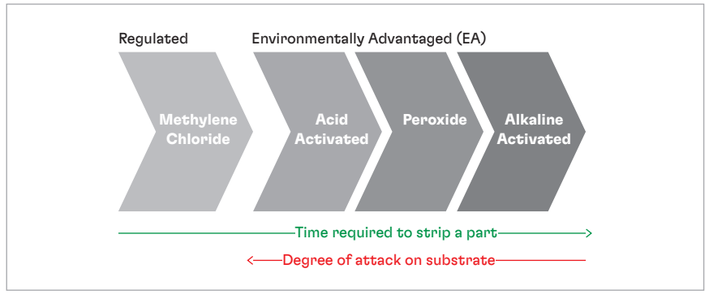
- Faster stripping times
- Can be used on a majority of substrates

4. Environmentally Advantaged – Alkaline Activated:

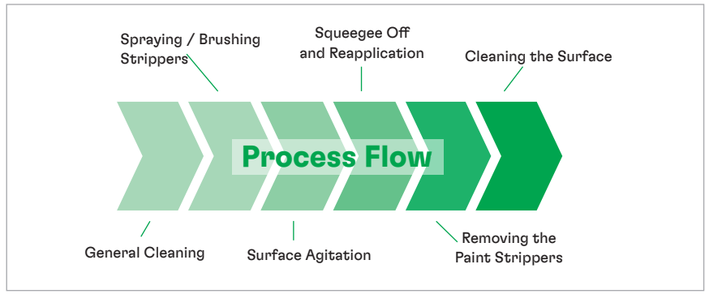
- Slower stripping times
- Safe on a majority of substrates

Objective of Surface Preparation – Aircraft prior to paint

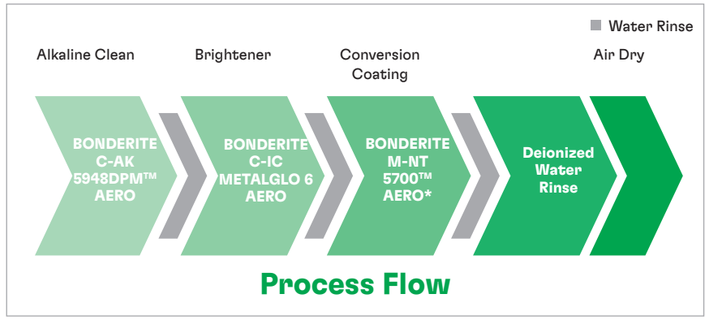
- Produce a properly prepared surface – clean, residue-free
- Ready to accept primer
- Corrosion-free
- Properly conversion coated



Effectiveness of paint stripper types



Depaint – Paint stripping process



Repaint – Metal pretreatment for spray application

* Non-chrome, Hexachrome, Trichrome

Depaint: Cleaners

Applications	Applications	•	•	•
Substrate	Aluminum	•	•	•
	Composites Material			
	Magnesium	•		•
	Mild Steel			
	Stainless Steel	•	•	•
	Titanium	•	•	•
	Ferrous	•	•	•
	Nonferrous	•	•	•
Product Characteristics	Consistency	Liquid	Liquid	Liquid
	Form	Concentrated	Concentrated	Concentrated
	Chemistry	Alkaline, Water-Based	Alkaline, Water-Based	Alkaline, Water-Based
Process (Immersion)	Time (Minutes)	5 – 15 Minutes	–	5 – 15 Minutes
	Temperature °F / °C	130 – 170°F 65 – 80°C	–	130 – 170°F 65 – 80°C
	Mix Ratio (Product : Water)	3% – 20% by value	–	3% – 20% by value
Process (Spray)	Time (Minutes)	Varies as Needed	5 – 15 Minutes	Varies as Needed
	Temperature °F / °C	Ambient	Ambient	Ambient
	Mix Ratio (Product : Water)	1 part concentrate to 9 – 30 parts water	Use as Received	3% – 30% in water

Products	New Product Name	**BONDERITE C-AK 5948DPM™ AERO**	**BONDERITE C-AK 5948DPM™ THK AERO**	**BONDERITE C-AK 5948R™ AERO**
Regional Availability & Packaging	Asia Pacific	Drum, Pail	Pail	Drum, Pail
	Europe / Middle East / Africa	Drum, Pail, Tote	Pail	Drum, Pail
	Latin America	Drum, Tote	Drum	Drum Pail
	North America	Bottle Drum, Pail	Bottle, Drum, Pail	Bottle, Bulk, Drum, Pail
Description		**BONDERITE C-AK 5948DPM™ AERO** is an alkaline, water-based, blue concentrated compound formulated to effectively clean painted and unpainted aircraft exterior and interior surfaces when diluted with water. It is ideally suited for use on all models of jet aircraft and also designed to be used in immersion tanks for dip applications.	**BONDERITE C-AK 5948DPM™ THK AERO** is an environmentally advantaged, thixotropic, water-based, heavy-duty aircraft cleaner. It is formulated to effectively cling to painted and unpainted aircraft exterior and interior surfaces. It is ideally suited for use on all jets, especially in baggage bins, flap and wheel well areas, and on engines before overhaul. It can be applied as spray or mop.	**BONDERITE C-AK 5948R™ AERO** is an alkaline, water-based, blue, concentrated compound formulated to effectively clean painted and unpainted aircraft exterior and interior surfaces when diluted with water. It is ideally suited for use on all large or small aircraft, and for cleaning engine parts during engine overhaul. It is also designed to be used in immersion tanks for dip applications.

Depaint: Paint Strippers

Applications	MeCl	•			
	Acid		•		
	Peroxide			•	
	Alkaline				
Substrate	Aluminum	•	•	•	•
	Composites Material				•
	Magnesium	•			
	Magnesium – Die Cast				
	Mild Steel				•
	Stainless Steel	•	•	•	•
	Titanium	•	•	•	•
	Ferrous	•	•	•	•
	Nonferrous	•		•	•
Product Characteristics	Consistency	Liquid	Liquid	Liquid	Liquid
	Form	Ready-to-Use	Ready-to-Use	Ready-to-Use	Ready to use
	Chemistry	Neutral, Methylene Chloride-Based	Acidic	Peroxide-Activated, Water-Based	Neutral
Process (Spray)	Time (Minutes)	Varies as Needed	Varies as Needed	Varies as Needed	Varies as needed
	Temperature °F / °C	Ambient	Ambient	Ambient	Ambient
	Mix Ratio (Product : Water)	Use as Received	Use as Received	Use as Received	Use as Received

Products	New Product Name	**BONDERITE S-ST 5351™ THIN AERO**	**BONDERITE S-ST 6776™ LO AERO**	**BONDERITE S-ST 6930™ AERO**	**BONDERITE S-ST 9100™ AERO**
Regional Availability & Packaging	Asia Pacific	Drum, Pail	Drum, Pail, Tote	Drum, Pail	Drum, Pail
	Europe / Middle East / Africa	Pail	Drum, Pail	Drum, Pail	Drum, Pail
	Latin America	Drum, Pail	Drum	Drum	Drum, Pail
	North America	Drum, Pail	Bottle, Drum, Pail	Drum, Pail	Drum, Pail
Description		**BONDERITE S-ST 5351™ THIN AERO** is an amber, diphase liquid developed to remove epoxy, polyurethane and other catalyzed finishes from ferrous and non-ferrous surfaces. It does not contain free acidic or alkaline constituents and is approved for use on high strength steels. It should not be used on materials that are affected by chlorinated hydrocarbons.	**BONDERITE S-ST 6776™ LO AERO** environmentally advantaged paint remover is low-odor, thixotropic, developed for effective stripping of resistant finishes such as epoxies, epoxy primers, polyurethanes and similar catalyzed paints. It offers a significant advance in workplace safety. It does not contain methylene chloride, chlorinated solvents, phenols, chromates, ammonia or amines.	**BONDERITE S-ST 6930™ AERO** environmentally advantaged paint remover is low odor, thixotropic, activated by hydrogen peroxide. It was developed for effective stripping of such resistant finishes as epoxies, epoxy primers, polyurethanes, and similar catalyzed aircraft paints. It offers a significant advance in paint stripper technology. It complies fully with NESHAP. It meets the corrosivity requirements of TT-R 2918A. It is not recommended for use on magnesium.	**BONDERITE S-ST 9100 AERO** is a viscous pink emulsion that does not contain any phosphates, borates, silicates or hydrogen peroxide. It was developed as a neutral pH product for removal of paint systems utilizing a polyamide type intermediate coating to allow for selective stripping of the topcoat layers while leaving the primer layer intact. it conforms to AMS 4872A except magnesium and BSS7432.

Depaint: Paint Strippers

Applications	MeCl			
	Acid			
	Peroxide			
	Alkaline	•	•	•
Substrate	Aluminum	•	•	•
	Composites Material	•	•	
	Magnesium			•
	Magnesium – Die Cast			
	Mild Steel			
	Stainless Steel			•
	Titanium			•
	Ferrous			•
	Nonferrous			•
Product Characteristics	Consistency	Liquid	Liquid	Liquid
	Form	Ready-to-Use	Ready-to-Use	Ready-to-Use
	Chemistry	Alkaline	Alkaline	Alkaline, Water-Based
Process (Spray)	Time (Minutes)	Varies as Needed	Varies as Needed	Varies as Needed
	Temperature °F / °C	Ambient	Ambient	Ambient
	Mix Ratio (Product : Water)	Use as Received	Use as Received	Use as Received

Products	New Product Name	**BONDERITE S-ST 1270-5™ AERO**	**BONDERITE S-ST 1270-6™ AERO**	**BONDERITE S-ST 6813E™ AERO**
Regional Availability & Packaging	Asia Pacific	Pail	Pail	Drum, Pail
	Europe / Middle East / Africa	Drum, Pail	–	Pail
	Latin America	–	–	Drum, Pail
	North America	–	Bottle, Drum, Pail	Drum, Pail
Description		**BONDERITE S-ST 1270-5™ AERO** is a viscous white emulsion that does not contain any of the hazardous or highly toxic components of conventional paint removers. It is free of aromatic hydrocarbons, chlorinated solvents, phenol and chromates. It is particularly effective in selective removal of topcoats from painted composites.	**BONDERITE S-ST 1270-6™ AERO** is a viscous white emulsion that does not contain any of the hazardous or highly toxic components of conventional paint removers. It is free of aromatic hydrocarbons, chlorinated solvents, phenol and chromates. It is particularly effective in selective removal or topcoats from painted composites.	**BONDERITE S-ST 6813E™ AERO** water-based, environmentally advantaged paint remover is a viscous, pink liquid formulated to remove multiple coats of aircraft paints such as epoxies, polyurethanes and resistant primers. It clings to vertical as well as overhead surfaces and can be used on aluminum, magnesium, cadmium plated steels and other ferrous metals. It can be applied as spray or brush.

Repaint: Brighteners

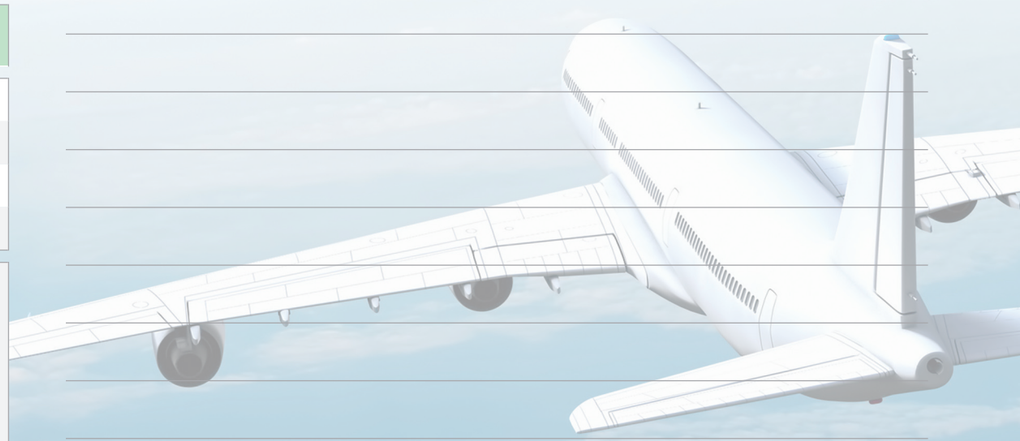
Applications	Fluoride	•
	Non-Fluoride	
Substrate	Aluminum	•
	Composites Material	
	Magnesium	
	Mild Steel	
	Stainless Steel	
	Titanium	
	Ferrous	
	Nonferrous	
Product Characteristics	Consistency	Liquid
	Form	Concentrated
	Chemistry	Acid, Solvent
Process (Immersion)	Time (Minutes)	–
	Temperature °F / °C	–
	Mix Ratio (Product : Water)	–
Process (Spray)	Time (Minutes)	Varies as Needed
	Temperature °F / °C	Ambient – 120°F Ambient – 49°C
	Mix Ratio (Product : Water)	Full strength or 1:1

Products	New Product Name	**BONDERITE C-IC METALGLO 6 AERO**
Regional Availability & Packaging	Asia Pacific	Pail
	Europe / Middle East / Africa	Pail
	Latin America	Drum
	North America	Bottle, Drum
Description		**BONDERITE C-IC METALGLO 6 AERO** is a nonflammable triacid, detergent, solvent-based cleaner, brightener, deoxidizer and prepaint conditioner for aluminum. It is a viscous liquid used for the removal of oxides and corrosion from aircraft and aluminum surfaces. It produces a chemically clean, water-break-free and streak-free surface when used according to directions.

Repaint: Conversion Coatings

Applications	Chrome 6 (MIL-SPEC)						•
	Chrome 3	•	•				
	Non-Chrome			•	•		
Substrate	Aluminum	•	•	•	•		•
	Composites Material						
	Magnesium	•	•	•	•		
	Magnesium – Die Cast	•	•				
	Mild Steel						
	Stainless Steel						
	Titanium	•	•	•	•		
	Ferrous						
	Nonferrous						
Product Characteristics	Consistency	Liquid	Liquid	Liquid	Liquid		Liquid
	Form	Concentrated	Ready-to-Use	Concentrated	Ready-to-Use		Ready-to-Use
	Chemistry	Trivalent Chrome	Trivalent Chrome	Acid	Acid		Chromate
Process (Spray)	Time (Minutes)	1.5 – 3 Minutes	1.5 – 3 Minutes	30 Seconds – 5 Minutes	1 – 5 Minutes		1 – 5 Minutes
	Temperature (°F / °C)	75 – 110°F 24 – 42°C	70 – 100°F 21 – 38°C	Ambient	Ambient		70 – 100°F 21 – 38°C
	Mix Ratio (Product : Water)	3 – 10% by Volume	Used as Received	1 – 8%	Used as Received		Used as Received
Products	New Product Name	**BONDERITE M-CR T5900™ AERO**	**BONDERITE M-CR T5900™ RTU AERO**	**BONDERITE M-NT 5200™ AERO**	**BONDERITE M-NT 5700™ AERO**		**BONDERITE M-CR 600RTU™ AERO**
Regional Availability & Packaging	Asia Pacific	–	–	–	–		Pail
	Europe / Middle East / Africa	–	–	–	Pail		–
	Latin America	–	–	–	–		Pail
	North America	Bottle, Drum, Pail	Drum, Pail, Tote	Bottle, Drum, Pail	Bottle, Case, Drum, Pail		Bottle, Drum, Pail, Tote
Description		**BONDERITE M-CR T5900™ AERO** is a complex trivalent chromium conversion coating formulated for treating aluminum and its alloys, metals coated with IVD aluminum, magnesium, titanium and zinc surfaces. This product is formulated as a ready-to-use material for manual spray applications. It provides spray resistance and also serves as an excellent base for organic finishes and adhesives.	**BONDERITE M-CR T5900™ RTU AERO** is a complex trivalent chromium conversion coating formulated for treating aluminum and its alloys, metals coated with IVD aluminum, magnesium, titanium and zinc surfaces. This product is formulated as a ready-to-use material for manual spray applications. It provides spray resistance and also serves as an excellent base for organic finishes and adhesives.	**BONDERITE M-NT 5200™ AERO** is a chromium-free product specifically formulated for treating aluminum and its alloys. It provides an excellent base for bonding of adhesives and organic finishes. It can be applied as spray or immersion.	**BONDERITE M-NT 5700™ AERO** is a chromium-free product specifically formulated for treating aluminum and its alloys. It provides an excellent base for bonding of adhesives and organic finishes. It can be applied as spray or immersion.		**BONDERITE M-CR 600RTU™ AERO** is a ready-to-use liquid product which produces a chromate conversion coating on aluminum and its alloys. The coating provides excellent protection for unpainted aluminum and bonds paint well.

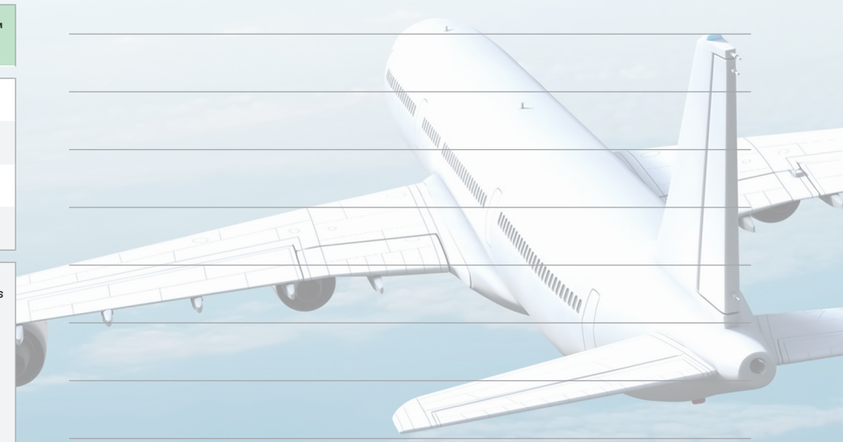
Notes



Repaint: Conversion Coatings Touch Up

Applications	Chrome 6 (MIL-SPEC)			•	•		•	•
	Chrome 3		•					
	Adhesion Promoter	•						
Substrate	Aluminum	•	•	•			•	•
	Composites Material							
	Magnesium				•			
	Magnesium – Die Cast				•			
	Mild Steel							
	Stainless Steel							
	Titanium	•						
	Ferrous							
	Nonferrous							
Product Characteristics	Consistency	Liquid	Liquid	Liquid	Liquid		Liquid	Liquid
	Form	Two-Part Kit	Ready-to-Use	Ready-to-Use	Ready-to-Use		Ready-to-Use	Ready-to-Use
	Chemistry	Non-chrome, Organic	Trivalent Chrome	Chromate	Chromate		Chromate	Chromate
Process (Spray/Brush)	Time (Minutes)	Dry-in-Place	–	–	Until Dry		1 – 5 Minutes	–
	Temperature (°F / °C)	Ambient	–	–	Ambient		Ambient	–
	Mix Ratio (Product : Water)	Used as Received	–	–	Used as Received		Used as Received	–
Products	New Product Name	**BONDERITE M-NT 8800™ AERO**	**BONDERITE M-CR 871™ AERO**	**BONDERITE M-CR 1132™ AERO**	**BONDERITE M-CR MAGNESIUM AERO**		**BONDERITE M-CR 120™ BRUSH AERO**	**BONDERITE M-CR 1132™ M AERO**
Regional Availability & Packaging	Asia Pacific	–	Pen	–	Kit		–	–
	Europe / Middle East / Africa	–	Pen	–	–		–	–
	Latin America	–	–	–	–		Kit	–
	North America	Pail	Pen	Pen	Kit, Drum		Kit	Pen
Description		**BONDERITE M-NT 8800™ AERO** is a sol-gel coating replacement specifically formulated for increasing adhesion to aluminum and titanium alloys. This product is suitable for spray, brush, and wipe-on applications. The coating produced provides an excellent base for organic finishes and surface preparation for adhesive bonding. It should not be rinsed after application.	**BONDERITE M-CR 871™ AERO** is a trichrome dry-in-place conversion coating designed for use on aluminum and its alloys. The applicator used to deliver this product provides an easy and safe method of repairing bare areas of aluminum surfaces. Its proper use reduces worker contact to chemical solutions and decreases wastewater such as rinse water generated from a conversion coating process.	**BONDERITE M-CR 1132™ AERO** is designed to save labor, material and time when applying a dry-in place hexachrome conversion coating for touch-up applications. Its proper use also reduces worker contact to chromated solution and decreases wastewater such as rinse water generated from a chromating process.	**BONDERITE M-CR MAGNESIUM AERO** contains products formulated for treating magnesium alloys to produce a chromate conversion coating conforming to SAE AMS-M-3171, Type VI. The application method conforms to requirements in NAVAIR 01-1A-509 and is meant primarily for touch-up and corrosion repair processes of magnesium alloys.		**BONDERITE M-CR 120™ BRUSH AERO** contains the conversion coating BONDERITE M-CR 1201 AERO and the deoxidizer BONDERITE C-IC 605 AERO. These are products formulated for treating aluminum. This kit contains sufficient chemicals for cleaning and coating approximately 100 ft^2 of aluminum surface when used under normal conditions.	The Henkel **BONDERITE M-CR 1132 M AERO** pen is a miniature version of the BONDERITE M-CR 1132 AERO pen. It is designed to save labor, material, and time when applying a dry-in-place military specification approved chromate conversion coating for touch-up applications. This miniature format is ideal for coating the inside of rivet holes and harder to reach areas due to its smaller format. Its proper use also reduces worker contact to chromating solutions and waste, such as rinse water generated from a chromating process.

Notes



For proven engine maintenance solutions, trust Henkel's engine overhaul and compressor washer products:

BONDERITE engine cleaners

Engine maintenance: a matter of safety

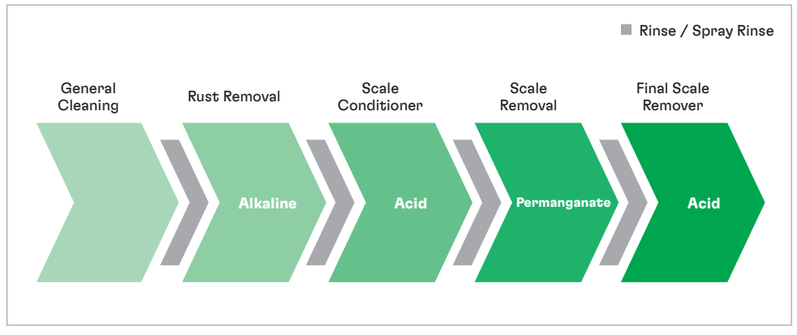
In the interest of safety, many external considerations from regional regulatory agencies to engine OEMs / shop requirements contribute to and determine the appropriate engine maintenance protocol. Engine parts need to be professionally and thoroughly cleaned for effective Non-Destructive Testing (NDT) inspection and corresponding engine overhaul or parts replacement activities.

No compromises: BONDERITE engine cleaners

Providing one of the broadest portfolios in the industry, BONDERITE engine overhaul and compressor washers meet major OEM process specifications while being available globally. Whether you require an on-wing or off-wing solution, BONDERITE removes metal oxide scales, sulfadations and carbonaceous material. BONDERITE is highly cost-effective and provides reliable results – day by day.

Why choose BONDERITE engine cleaners?

› Meet many OEM process requirements
› Cost-effective with excellent rust and contaminant removal properties
› Efficient scale removal properties
› Total engine overhaul package solution



Engine Overhaul Process

BONDERITE engine cleaners:

Facts at a glance

Key factors to consider when choosing the right BONDERITE engine cleaner

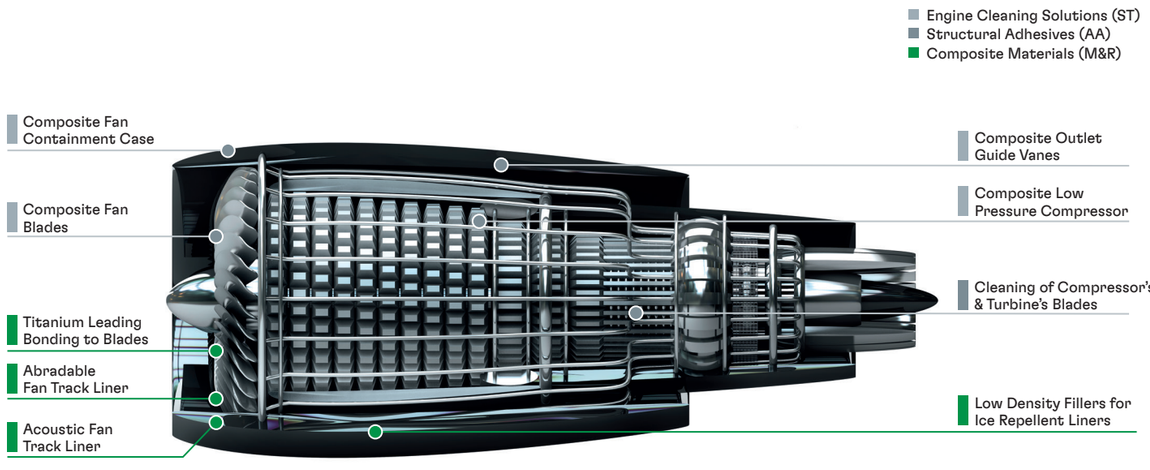
› Meets OEM qualified process requirements
› Metal substrate
› Soil types (organic or inorganic)
› Environmental concerns and regulations
› Disposal system compatibility
› Bath life
› Rinse conditions (procedures, steps, water availability)
› Transfer times
› Special purposes – applications like field repair

Engine cleaning sections

› On-wing cleaning – compressor washers
› Off-wing cleaning – engine overhaul
» Cold section
» Hot section

Key factors influencing the cleaning performance

› Product concentration
› Temperature
› Time
› Product agitation
› Metal surface conditions
› Contamination and age of bathing solution
› Rinsing



Solution selling – Engine overhaul surface treatment and structural adhesives

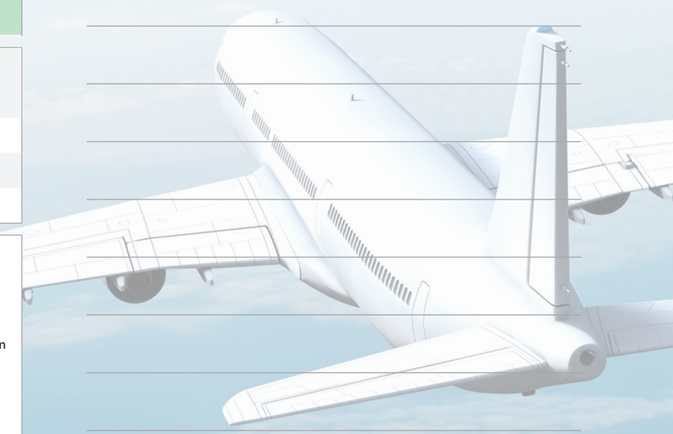
Engine Maintenance: Engine Overhaul

Applications	Rust Remover		•					
	Permanganate	•						
	Scale conditioner			•		•		
	Rinse Aid						•	
	Wax Remover							•
Substrate	Aluminum							
	Composites Material							
	Magnesium		•					
	Magnesium – Die Cast							
	Mild Steel						•	
	Stainless Steel		•	•		•		
	Titanium		•	•		•		
	Ferrous	•	•	•		•		•
	Nonferrous							•
Product Characteristics	Consistency	Liquid	Liquid	Liquid		Liquid	Liquid	Liquid
	Form	Two-Part Kit	Concentrated	Concentrated		Concentrated	Concentrated	Ready-to-Use
	Chemistry	Alkaline, Permanganate	Alkaline	Acid-Activated		Mildly Acidic	Alkaline	Solvent
Process (Immersion)	Time (Minutes)	30 – 60 Minutes	General: 15 – 60 Minutes Titanium: 15 – 30 Minutes	30 Minutes		30 – 60 Minutes	Varies as needed	Until wax is completely softened and dissolved
	Temperature °F / °C	176 – 203°F 80 – 95°C	General: 176 – 203°F 80 – 95°C Titanium: 158 – 167°F 70 – 75°C	176 – 194°F 80 – 90°C		140 – 176°F 60 – 85°C	Ambient – 204°F Ambient – 95°C	50 – 68°F 10 – 20°C
	Mix Ratio (Product : Water)	25 – 35% by volume	General: 50 – 75% in water Titanium: 12 – 15% with water	20 – 30% by volume in water		20 – 30% by volume in water	0.7 – 1.75% by value	–

Products	New Product Name	**BONDERITE C-AK 4338™ L AERO**		**BONDERITE C-AK 4181™ L AERO**	**BONDERITE C-IC SCALEGON 5 AERO**	**BONDERITE C-IC SCALEGON 7 AERO**	**BONDERITE L-GP RUST BLOC AERO**	**BONDERITE C-MC 6802™ AERO**
Regional Availability & Packaging		Part 1	Part 2	Turco® 4181™ L	Drum, Pail	–	Pail	Drum
	Asia Pacific	Drum, Pail	Drum, Pail	Drum, Pail				
	Europe / Middle East / Africa	Drum, Pail, Tote	Drum, Pail, Tote	Drum, Pail, Tote	Drum, Pail	Drum	–	Pail, Tot
	Latin America	–	Drum	–	–	–	Pail	Drum
	North America	Bottle, Drum	Bottle, Drum	Bottle, Bulk, Drum	Drum	–	Drum, Pail	Drum

Description	**BONDERITE C-AK 4338™ L AERO** is a liquid alkaline permanganate formulation developed specifically for jet engine cleaning. It modifies high temperature heat scale by chemically changing the structure of the oxide deposit to one that is properly conditioned for ease of chemical removal in subsequent processing steps.	**BONDERITE C-AK 4181™ L AERO** is an amber, liquid compound formulated to remove rust, paints, lube oils, drawing pastes, cutting oils and protective oils from ferrous alloys by immersion methods.	**BONDERITE C-IC SCALEGON 5 AERO** is an acid activated yellow liquid used in the BONDERITE Jet Engine Process to condition and remove high temperature scale from jet engine parts.	**BONDERITE C-IC SCALEGON 7 AERO** is a mildly acidic yellow liquid used as a single step or in combination with the proven BONDERITE Jet Engine Process to condition and remove high temperature scale from jet engine parts. This process is designed to facilitate non-destructive testing (penetrant) and reconditioning of parts. It is especially suited for the treatment of CrNi and Ni Alloys such as Nimonic® and ferritic chromium steels.	**BONDERITE L-GP RUST BLOC AERO** is an alkaline liquid used as a rust inhibiting rinse additive or cleaner. It provides temporary in-plant rust protection for steel and cast iron.	**BONDERITE C-MC 6802™ AERO** is a clear, amber liquid developed to remove platter's wax and similar low melting stop-off compounds by immersion in the heated product. It is free of chlorinated hydrocarbons, phenols and chromate. It can be used on all metals.

Notes



Engine Maintenance: Compressor Washers

Applications	Compressor Cleaners	•	•	•
Substrate	Aluminum	•	•	•
	Composites Material	•	•	•
	Magnesium	•	•	•
	Magnesium – Die Cast	•	•	•
	Mild Steel	•	•	•
	Stainless Steel	•	•	•
	Titanium	•	•	•
	Ferrous	•	•	•
	Nonferrous	•	•	•
Product Characteristics	Consistency	Liquid	Liquid	Liquid
	Form	Concentrated	Ready-to-Use	Concentrated
	Chemistry	Solvent	Alkaline	Alkaline
Process (Spray)	Time (Minutes)	Varies as Needed	Varies as Needed	Varies as Needed
	Temperature °F / °C	Ambient	Ambient	Ambient
	Mix Ratio (Product : Water)	1 : 4 Ratio	Used as Received	1 : 4 Ratio
Products	New Product Name	**BONDERITE C-MC 5884™ AERO**	**BONDERITE C-MC 6783-10™ AERO**	**BONDERITE C-MC 6783-50™ AERO**
Regional Availability & Packaging	Asia Pacific	Drum, Pail	Pail	Drum, Pail
	Europe / Middle East / Africa	Drum, Pail	–	Pail
	Latin America	Pail	Drum	Drum, Pail
	North America	Drum, Pail	Drum, Pail	–
Description		**BONDERITE C-MC 5884™ AERO** is a concentrated liquid cleaner which effectively removes oil, salt and solid deposits from compressor blades, guide vanes and rotors of in-service jet engines. Periodic cleaning of these components is necessary to avoid power loss, abnormal temperature increases and increased fuel consumption.	**BONDERITE C-MC 6783-10™ AERO** is an aqueous compressor cleaner which effectively removes oil, salt and solid deposits from compressor blades, guide vanes and rotors of in-service turbine engines. Periodic cleaning of these components is necessary to avoid power loss, abnormal temperature increases, increased fuel consumption and excessive NOx emissions. It is supplied in a ready-to-use liquid form.	**BONDERITE C-MC 6783-50™ AERO** is a concentrated aqueous compressor cleaner which effectively removes oil, salt and solid deposits from compressor blades, guide vanes and rotors of in-service turbine engines. It is used at 20 percent by volume in distilled, demineralized or good drinking quality water. For cold weather (below 32°F / 0°C) add 20 percent by volume isopropanol, ethanol or glycol.

Index

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