

LOCTITE[®]

Mold Release Agents for the Aerospace Composites Industry



Henkel

LOCTITE FREKOTE: The Aerospace Standard for Release Materials.

Henkel's LOCTITE FREKOTE release agents, sealers and cleaners are based on over 50 years of technical experience and are the most trusted for consistent release of composite parts from tools. These wax- and silicone-free release agents polymerize to create a low surface energy film which is durable, chemically resistant and thermally stable. A minimal transfer to molded components, low clogging, easy application and the highest number of releases possible per application are guaranteed.

Henkel provides optimum solutions to meet the most rigorous requirements and is qualified worldwide at all major aircraft manufacturers. With support from its authorized aerospace distribution network, Henkel delivers LOCTITE FREKOTE mold release agents for aerospace customers throughout the globe.

LOCTITE FREKOTE Mold Release Benefits

- › No volatile organic compounds (VOCs)
- › No CFCs releases
- › Semi-permanent mold release bonds to mold surface for consistent release
- › Higher productivity and profitability through reduced downtime
- › Low reject rates
- › Dispensing equipment available



Key Factors to Consider When Choosing the Right LOCTITE Product

- › Water based vs. solvent based
- › Slip/release characteristics
- › Use temperature
- › Transfer characteristics

Product type	Mold Cleaner		Mold Sealer			
Application	Wax Removing	Residue removing	Sealing		Compression Molding, Casting and Vacuum bagging	
Finishing	–	Gloss Finish	–		Matte Finish	
Mold sealer	–	–	–		LOCTITE FREKOTE B15 AERO	
Product appearance	Clear Liquid	Beige-pasty Liquid	Clear Liquid		Clear Liquid	
Cure Temperature (°F / °C)	Ambient	Ambient	Ambient	210 – 300 °F 100 – 150 °C	Ambient	210 – 300 °F 100 – 150 °C
Cure Time at RT / at 210 °F – 100 °C	–	5 mins	24 hours	60 mins	3 hours	15 mins
Application Temperature Range	68 – 86 °F / 20 – 30 °C	68 – 104 °F / 20 – 40 °C	68 – 140 °F / 20 – 60 °C		60 – 140 °F / 15 – 60 °C	
Storage Temperature (°F / °C)	46 – 70 °F / 8 – 21 °C	46 – 70 °F / 8 – 21 °C	46 – 70 °F / 8 – 21 °C		46 – 70 °F / 8 – 21 °C	
Storage Time	2 years from date of manufacture	24 months at room temperature	1 year from date of manufacture		1 year from date of manufacture	
Benefits	<ul style="list-style-type: none"> › Easy to use › Eliminates contaminants › Enhances release effectiveness 	<ul style="list-style-type: none"> › Water-based polisher › Removes cured films 	<ul style="list-style-type: none"> › Seals mold porosity, scratches, and imperfections › Non-contaminating transfer › High thermal stability 	<ul style="list-style-type: none"> › Better mold utilization › Non-contaminating transfer › No mold build-up › Significantly lower mold maintenance costs 		
Regional availability*	▲ ■ ● ◆	■ ◆	▲ ■ ● ◆		▲ ■ ◆	
Description	LOCTITE FREKOTE PMC AERO helps dissolve and remove wax from polyester molds without dulling the surfaces. It can also clean epoxy and metal mold surface, brushes and equipment. It is highly recommended for preparing polyester mold surfaces prior to application of FREKOTE mold sealers and mold release agents.	LOCTITE FREKOTE 915WB AERO is a water-based cleaner developed for removing residue from mold surfaces. The high-grade surfactants and emulsifiers in combination with fine abrasives give excellent results without dulling the mold surface.	LOCTITE FREKOTE B-15 AERO is a sealer for metal molds with micro porosity and small surface scratches. Used in conjunction with other FREKOTE products, B-15 provides an excellent base coat enhancing the release advantages offered.		LOCTITE FREKOTE 44-NC AERO should be your first choice release agent where non-transference of release is important. It forms a micro thin film which is stable at high temperatures. It can be used for the release of epoxies, polyester resins, thermoplastics, adhesives, and rotational molded plastics.	
New Product Name	LOCTITE FREKOTE PMC AERO	LOCTITE FREKOTE 915WB AERO	LOCTITE FREKOTE B-15 AERO		LOCTITE FREKOTE 44-NC AERO	
Known As	Frekote® PMC™	Frekote® 915WB™	Frekote® B-15™		Frekote® 44-NC™	

* Asia Pacific: ▲, Europe, Middle East, Africa: ■, Latin America: ●, North America: ◆

Solvent Based Mold Release				Water-Based Mold Release			
Compression Molding, Casting and Vacuum bagging		High Slip		Filament Winding		Composites Release	
Satin Finish		Gloss Finish		Gloss Finish		Matte Finish	
LOCTITE FREKOTE B15 AERO		LOCTITE FREKOTE B15 AERO		LOCTITE FREKOTE B15 AERO		LOCTITE FREKOTE B15 AERO	
Clear Liquid		Clear Liquid		Clear Liquid		Clear Liquid	
Ambient	210 – 300 °F 100 – 150 °C	Ambient	210 – 300 °F 100 – 150 °C	Ambient		Ambient	210 – 300 °F 100 – 150 °C
30 mins	5 mins	10 mins	5 mins	5 – 10 mins		3 hours	5 – 15 mins
60 – 140 °F / 15 – 60 °C		60 – 275 °F / 15 – 135 °C		60 – 140 °F / 15 – 60 °C		59 – 122 °F / 15 – 50 °C	
46 – 70 °F / 8 – 21 °C		46 – 70 °F / 8 – 21 °C		46 – 70 °F / 8 – 21 °C		Ambient	
1 year from date of manufacture		1 year from date of manufacture		1 year from date of manufacture		9 months from date of manufacture	
<ul style="list-style-type: none"> > Fast drying > Non-contaminating transfer > High thermal stability > Non-CFC > No mold build-up 		<ul style="list-style-type: none"> > No chlorinated solvents > High gloss finish > High slip > Non-contaminating transfer > No mold build-up 		<ul style="list-style-type: none"> > Non-contaminating transfer > High gloss finish > High slip > No mold build-up > Low odor 		<ul style="list-style-type: none"> > High slip > Easy application > Multiple releases > Low transfer > No corrosion / oxidation of the mold surface > Minimal mold build-up 	
▲ ■ ◆		▲ ■ ● ◆		▲ ■ ● ◆		▲ ■ ● ◆	
<p>LOCTITE FREKOTE 55-NC AERO is a release agent where a non-transferring release is necessary. It forms a micro thin film which is stable at high temperature. It can be used for the release of epoxies, polyester resins, thermoplastics, adhesives, and rotational molded plastics.</p>		<p>LOCTITE FREKOTE 700-NC AERO offers excellent release properties for the most demanding applications and is a great all-purpose release agent. It releases epoxies, polyester resins, thermoplastics, rubber compounds, and most other molded polymers.</p>		<p>LOCTITE FREKOTE 770-NC AERO offers excellent release for various molding applications. It is particularly well-suited for tougher to release processes such as filament winding and non-gel-coated polyester and fiberglass molding.</p>		<p>LOCTITE FREKOTE C-800 AERO is designed for releasing composite materials. It offers easy application and higher number of releases which reduces product usage and minimizes operator exposure to chemicals.</p>	
LOCTITE FREKOTE 55-NC AERO		LOCTITE FREKOTE 700-NC AERO		LOCTITE FREKOTE 770-NC AERO		LOCTITE FREKOTE C-800 AERO	
Frekote® 55-NC™		Frekote® 700-NC™		Frekote® 770-NC™		Frekote® Aqualine® C-800™	

LOCTITE FREKOTE Mold Release Materials: All Facts at a Glance.

Henkel's coatings can be applied to the following surfaces:

- › Thermoset epoxies, phenolics and BMIs
- › Thermoset prepregs
- › Thermoplastic polymers
- › Thermoplastic prepregs
- › Natural & Synthetic rubbers
- › Silicones
- › Urethanes
- › Polyester resins
- › Vinyl ester resins
- › MRO & repair

Henkel mold releases can be used in all composite manufacturing processes:

- › Hand lay-up
- › Automated fiber placement & tape laying
- › Autoclave molding
- › Vacuum bag only molding
- › Resin transfer molding
- › Vacuum infusion processes
- › Resin film infusion
- › Filament winding
- › Injection molding
- › Compression molding
- › Pultrusion
- › Rotational molding
- › Metallic, ceramic and composite tooling
- › Automated spray application

Troubleshooting Guide

Problem	Cause	Solution
Complete failure to obtain release.	<ul style="list-style-type: none"> › Insufficiently cleaned mold surface has prevented LOCTITE FREKOTE from bonding to the mold. › Improperly cured LOCTITE FREKOTE film. › Precipitated and thus ineffective LOCTITE FREKOTE. 	<ul style="list-style-type: none"> › Strip out part. Thoroughly clean mold and reapply LOCTITE FREKOTE. › Ensure that LOCTITE FREKOTE is fully cured before molding. › Examine LOCTITE FREKOTE. If separation is present replace with fresh material. Clean mold and reapply.
Poor release accompanied by small particles of molding material left on mold surface. Particles of molding material left on mold surface.	<ul style="list-style-type: none"> › Micro-porosity present in mold. 	<ul style="list-style-type: none"> › Thoroughly clean mold and apply a LOCTITE FREKOTE mold sealer. Reapply LOCTITE FREKOTE top coats.
Poor release accompanied by white patches on parts.	<ul style="list-style-type: none"> › Insufficiently cleaned mold surface that prevents LOCTITE FREKOTE from bonding properly, resulting in transfer to parts. 	<ul style="list-style-type: none"> › Thoroughly clean mold and reapply LOCTITE FREKOTE.
Poor release accompanied by discolored blemishes on parts.	<ul style="list-style-type: none"> › Solvent-based FREKOTE contaminated by use of synthetic application cloths. Contaminants applied to tool surface. 	<ul style="list-style-type: none"> › Thoroughly clean mold and reapply LOCTITE FREKOTE ensuring the use of non-synthetic application cloths.
Poor release in high-draft areas.	<ul style="list-style-type: none"> › Lack of slip due to mold geometry in difficult high-draft areas. 	<ul style="list-style-type: none"> › Apply one or two extra coats of LOCTITE FREKOTE.
Inability to achieve multiple releases.	<ul style="list-style-type: none"> › Unconditioned mold surface. › Separated and thus ineffective LOCTITE FREKOTE. 	<ul style="list-style-type: none"> › Reapply LOCTITE FREKOTE frequently for initial production shift. Thereafter gradually decrease the frequency of application. › Examine LOCTITE FREKOTE. If separation is present, use fresh material.
Good release but build-up of LOCTITE FREKOTE on mold surface.	<ul style="list-style-type: none"> › Over-application of LOCTITE FREKOTE. 	<ul style="list-style-type: none"> › Thoroughly clean mold and reduce amount of LOCTITE FREKOTE applied.
Good release but parts exhibit white blemishes.	<ul style="list-style-type: none"> › Excessive FREKOTE applied to mold, resulting in transfer to parts. 	<ul style="list-style-type: none"> › Thoroughly clean mold and reduce amount of LOCTITE FREKOTE applied.

LOCTITE®
BONDERITE®
TECHNOMELT®
TEROSON®
AQUENCE®

NORTH AMERICA

Henkel Corporation Aerospace

P. O. Box 312
2850 Willow Pass Road
Bay Point, CA 94565
United States
Tel.: +1.925.458.8000
Fax: +1.925.458.8030

LATIN AMERICA

Henkel Brazil Ltda

Rua Karl Huller, 136
Diadema – SP
Brazil
09941-410
Tel.: +55.11.3205.8955

Henkel Mexicana

Boulevard Magnocentro No.8 Piso 2
Centro Urbano Interlomas
52760 Huixquilucan
Edo. De México
Tel.: +52.55.33.00.30.00

EUROPE

Henkel Nederland B.V.

Brugwal 11
3432 NZ Nieuwegein
Netherlands
Tel.: +31.30.6073.911
Fax: +31.30.6054.457

Henkel Aerospace

Rue de Maubec 82
31300 Toulouse
France
Tel.: +33.5.34.36.40.60
Fax: +33.5.34.36.40.69

Henkel AG & Co. KGaA

Aerospace

Henkelstraße 67
40589 Düsseldorf
Germany
Tel.: +49.211.797.5192
Fax: +49.211.798.12998

ASIA-PACIFIC

Henkel (China) Co. Ltd

No. 928 Zhang Heng Road
Pu Dong, 201203 Shanghai
China
Tel.: +86.21.2891.8882
Fax: +86.21.6360.6070

Henkel Japan Ltd.,

Henkel Technology Center

27-7 Shin Isogo-cho, Isogo-kut
Yokohama-shi
Kanagawa 235-0017
Japan
Tel.: +81.45.758.1800
Fax: +81.45.758.1851

Henkel Australia Pty. Ltd., Kilsyth

135-141 Canterbury Road
3137 Kilsyth, VIC
Australia
Tel.: +61.3.9724.6444
Fax: +61.3.9728.5877

List of authorized distributors: www.henkel-adhesives.com/aerospace/distributor-search-26829.htm

Henkel Aerospace Products: www.henkel-adhesives.com/aerospace