



Henkel – Your partner worldwide

Fifty years of success and commitment to research and development have made Henkel one of the world's leading global players, with a depth and diversity of product solutions that is second to none.

Henkel operates worldwide in markets as diverse as electronics, automotive, aerospace, machine building and medical devices, as well as many fields of general industry. The Frekote® line, offering multiple release and non-contaminating transfer formulas, is part of an extensive line of high-performance adhesives and sealants designed for industrial use. This line includes anaerobic, cyanoacrylate, UV and visible light curing, specialty silicone and epoxy adhesives. In addition to chemical specialty products, Henkel offers standard and custom-built dispensing and application equipment.

Frekote® products exemplify Henkel's market-led approach of quickly responding to customer needs. Frekote® products are just a part of Henkel's portfolio of success – a success based on leadership, technology and innovation. Henkel products, developed for use in a wide variety of industries, are also sold through distributors. That's why Henkel's local distributor network is equally important, with the knowledge and capability to quickly and efficiently deliver the right products for your application. Henkel sets high standards for its distributors and works closely with them to ensure they can supply the products you need – on time, every time.

In over 80 countries worldwide, Henkel products – designed and manufactured to the highest standards – ensure that its customers remain on top of their game.

For more information, please visit www.henkelaero.com where you can download catalogs, data sheets, technical papers and application examples.

Visit our Website at: www.henkelaero.com

Data contained herein are intended as reference only. Please contact your local Technical Representative for assistance and recommendation on specifications for these products.

Alodine® Frekote® Hysol® Turco®

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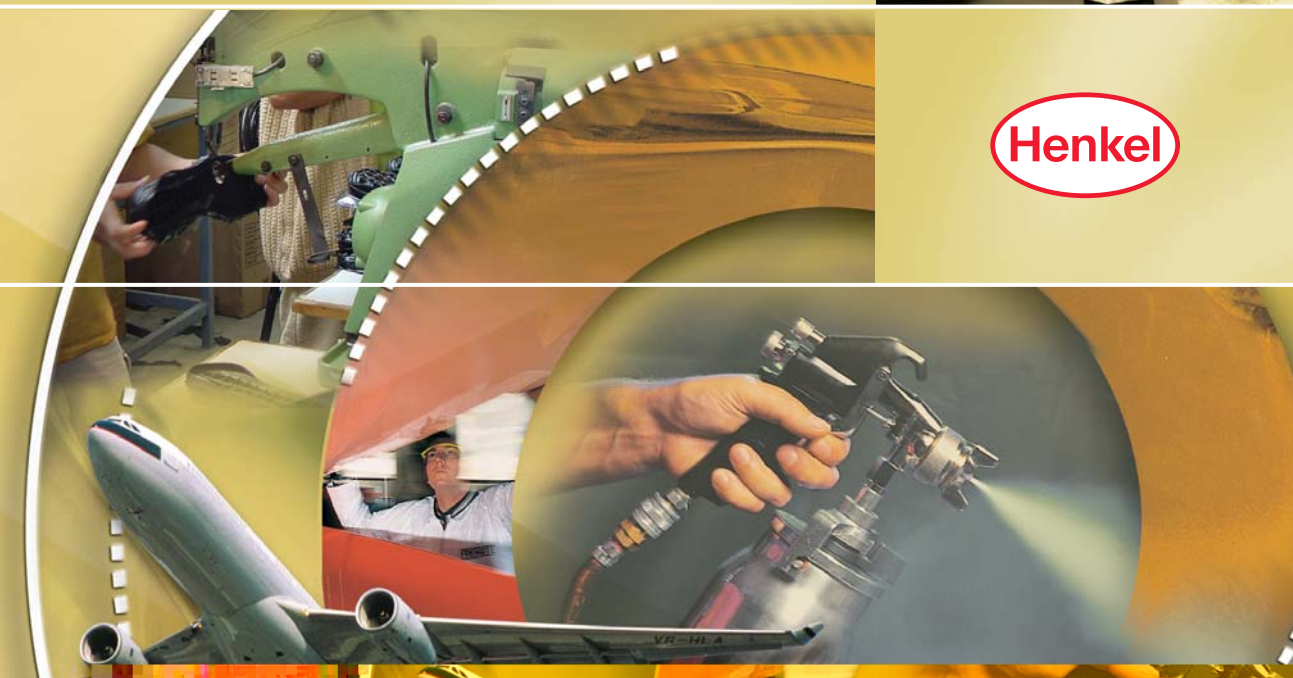
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Mold Release Agents for the Aerospace Composite Industry



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Advanced Solutions

Henkel Corporation is much more than just a manufacturer of adhesives and sealants – it is, and has always been, solution-driven with a high regard for innovation and deep commitment to research and development. Finding better, more cost-effective ways has always been the Henkel mission. With the Frekote® brand, Henkel has become a leading supplier of mold release systems for the aerospace industry.

World Standard for Release Application Products – Henkel appreciates that collaboration with customers is a highly effective way of finding solutions to difficult molding and application problems. Customers around the globe turn to Henkel not just for unique Frekote® mold release products, but also for expertise in developing “customized” solutions. Henkel takes pride in our knowledge, experience, and responsiveness in providing the best technical service to our customers around the globe.

The Frekote® Line is the Broadest Mold Release Line – Frekote® mold release agents, backed by over 40 years of research and development, are the global industry standard for performance, quality and value. By pioneering release solutions for many of the world's largest manufacturing organizations, Henkel understands what it takes to release the most complex materials in the most demanding applications. Henkel has designed mold release agents for virtually all composite and plastic molding operations. The Frekote® line offers the broadest product range in the industry. From jumbo jets to tennis rackets, truck tires to o-rings, bathtubs to custom yachts, Frekote® has the release agent you need for most composite and rubber materials.

Lowest Cost per Release – Frekote® semi-permanent release agents minimize fouling and ensure the highest number of releases possible per application. Henkel customers realize higher productivity and profitability through reduced downtime, low reject rates, and higher quality products. Frekote® products are the industry standard replacement for release agents. Unlike sacrificial waxes or silicones, Frekote® semi-permanent mold release agents do not transfer to parts; instead they chemically bond with the mold surface. The parts release cleanly, and will not stick to the low surface energy film created by Frekote® mold release. Frekote® products are designed to reduce costs.

Making the Right Choice

This comprehensive guide is designed to make it easy for you to select the right Frekote® mold release agent for a variety of applications in the aerospace composite market. Simply select a suitable release agent for demolding specific substrates and compare the characteristics of different products using the technical data. Choose the compatible dispensing equipment for your application and see the product list for ordering information.

Markets Served

For the initial market overview

Thermoset Plastics

ADVANCED COMPOSITES - Epoxy Systems

- Aerospace OEM - Aircrafts, Helicopters, Space Vehicles ...
- Aerospace MRO - Repair, Panel Fabrication ...
- Special - Compression Molding, RTM, RIF ...

Application Selector Guide

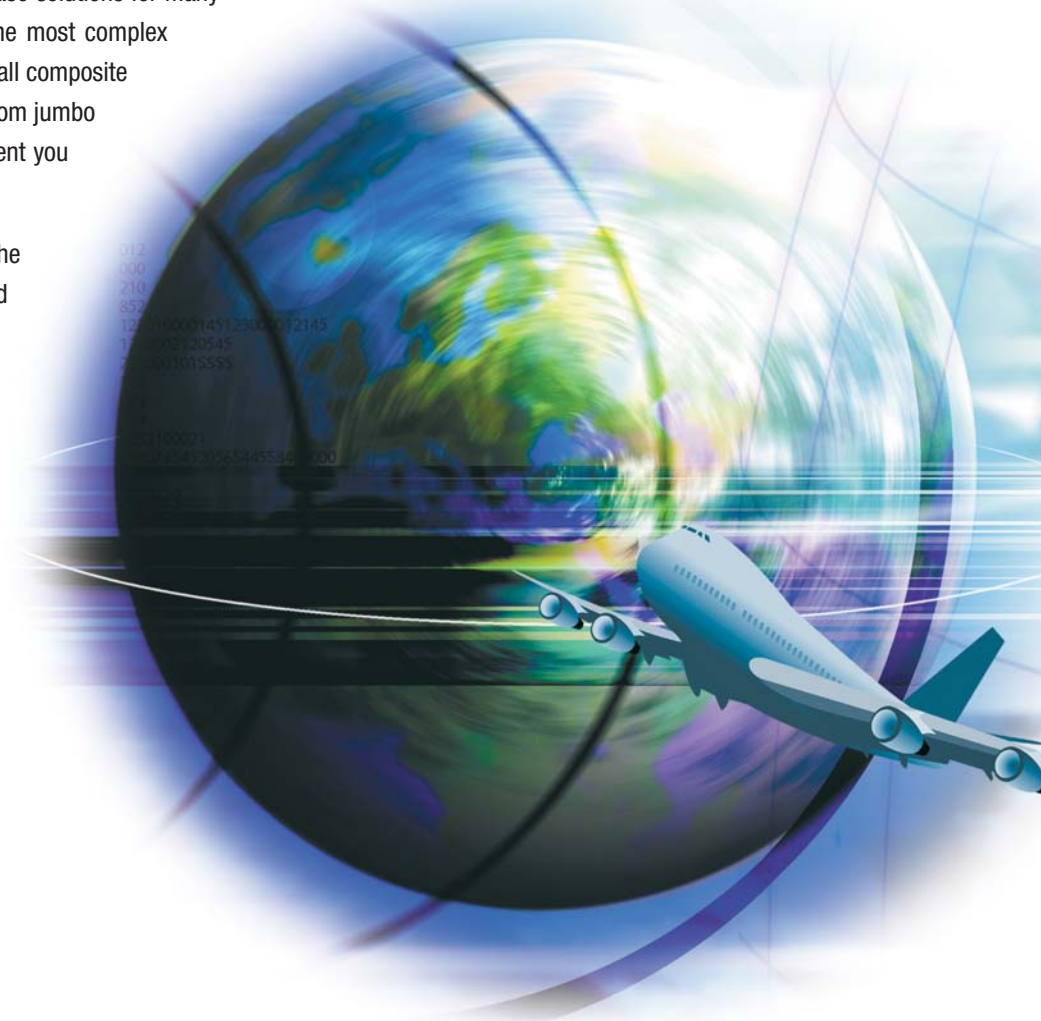
To meet your individual requirements

- Release Agents for Advanced Composites

The Frekote® Advantage

NEW WATER-BASED FREKOTE® 900-WB™ - MOLD RELEASE

- Can be applied and cured at room temperature
- Room temperature storable
- No sealer required, which lowers the cost of application
- Environmentally compliant
- One system for 250°F (121°C) or 350°F (177°C)
- No CFCs
- Non-flammable
- Non-transferring mold release interface
- Paintable with minimal surface preparation





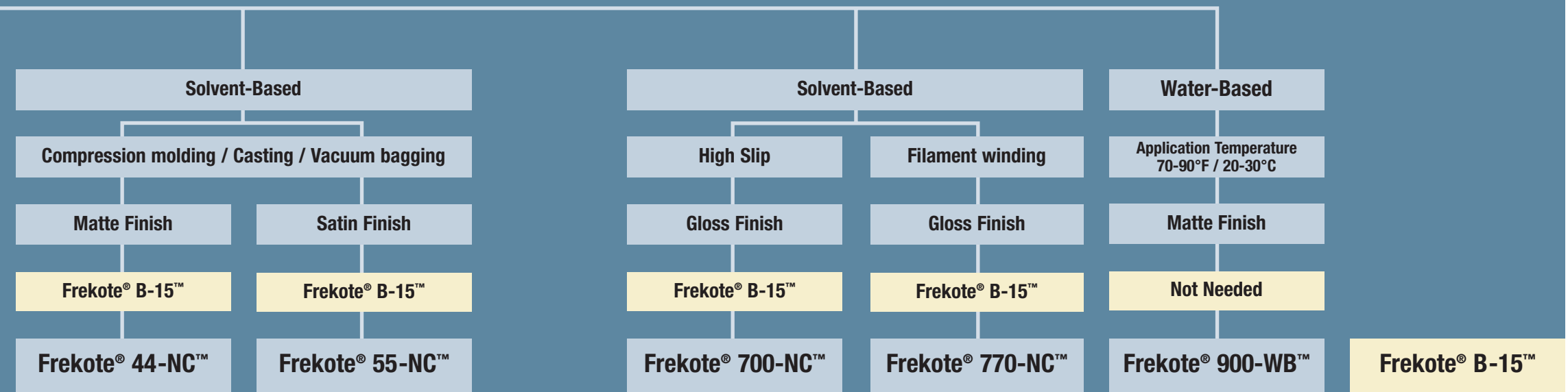
Frekote® Release Agents for Advanced Composites



Your application

Handy Hints:

- Frekote® B-15™ Mold Sealer is mostly used for metal and epoxy molds
- Frekote® PMC™ is a universal cleaner prior to application of Frekote® Release Agents



Solution

Description:	Release agent	Release agent	Release agent	Release agent	Release agent	Mold sealer
Appearance:	Clear liquid	Clear liquid	Clear liquid	Clear liquid	White emulsion	Clear liquid
Application Temperature:	60-140°F / 15-60°C	60-140°F / 15-60°C	60-275°F / 15-135°C	60-140°F / 15-60°C	70-90°F / 20-30°C	60-140°F / 15-60°C
Cure Time at RT:	3 hrs.	30 min.	10 min.	5-10 min.	1 hr.	24 hrs.
Cure Time at 210°F / 100°C:	15 min.	5 min.	5 min.	n.a.	n.a.	60 min.
Thermal Stability:	up to 750°F / 400°C	up to 750°F / 400°C	up to 750°F / 400°C	up to 750°F / 400°C	up to 480°F / 250°C	n.a.

Product Description

Frekote® 44-NC™

- No mold build-up
- No contaminating transfer
- High thermal stability

Frekote® 44-NC™ is a semi-permanent release polymer designed to provide multiple releases for most molding processes with no contaminating transfer. Apply 3-6 coats to clean mold surfaces by wiping, brushing or spraying a thin, continuous wet film. Allow 15 min. between coats to dry. Curing of the final coat takes 3 hrs. at room temperature and can be shortened by baking the mold for 15 min. at 210-300°F/100-150°C.

Frekote® 55-NC™

- Fast cure time
- No mold build-up
- Reduced odor

Frekote® 55-NC™ is a semi-permanent release polymer designed to provide multiple releases for most molding processes with no contaminating transfer. Apply 3-6 coats to clean mold surfaces by wiping, brushing or spraying a thin, continuous wet film. Allow 5 min. between coats to dry. Curing of the final coat takes 30 min. at room temperature and can be shortened by heating the mold for 5 min. at 210-300°F/100-150°C.

Frekote® 700-NC™

- Fast RT cure
- High gloss and high slip
- Releases most polymers

Frekote® 700-NC™ is a versatile release agent that provides high slip where mold geometry problems are encountered. It cures rapidly at room temperature to give a high gloss finish to the molded parts. Apply to clean mold surfaces by spraying, brushing or wiping with a clean, lint-free, cotton cloth. Apply up to 4 coats, allowing 5-10 min. between coats. Touch up as necessary.

Frekote® 770-NC™

- Fast RT cure
- High gloss and high slip
- Releases most polymers

Frekote® 770-NC™ is a versatile release agent that provides high slip where mold geometry problems are encountered. It cures rapidly at room temperature to give a high gloss finish to the molded parts. Apply to clean mold surfaces by spraying, brushing or wiping with a clean, lint-free cotton cloth. Apply up to 4 coats, allowing 5-10 min. between coats. Touch up as necessary.

Frekote® 900-WB™

- Non-toxic, water-based
- RT curable
- Multiple releases
- Low VOC

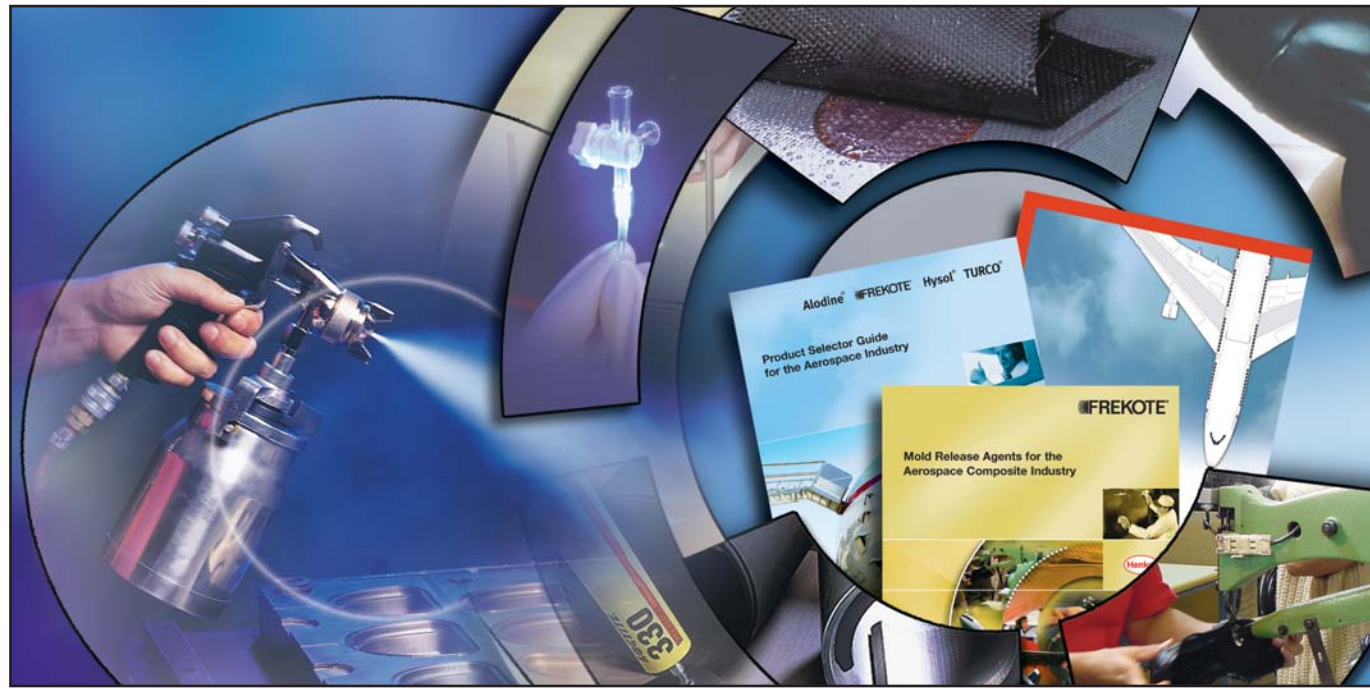
Frekote® 900-WB™ is a proprietary water-based emulsion developed for releasing aerospace and other high performance composite structures. This release is designed to be applied and cured at ambient shop temperatures. Call for information on our water-based mold cleaners and water-based part cleaner materials. Complementing this Frekote® water-based mold release is a companion water-based mold preparation material, Frekote® 910-WB™, and a water-based mold release remover, Frekote® 915-WB™.

Frekote® B-15™

- Easy to apply
- Seals mold porosity
- High thermal stability

Frekote® B-15™ Mold Sealer is formulated to seal mold micro-porosity and light surface scratches. Used in conjunction with other Frekote® products, B-15™ provides an excellent base coat, enhancing the release advantages offered. Apply light uniform coats to clean mold surfaces by spraying, brushing, dipping or wiping with a clean, lint-free cotton cloth. Apply a minimum of 2 coats, allowing 30 min. between coats. The final coating will cure within 24 hrs. at room temperature.





In addition to Frekote® mold release products, Henkel formulates and manufactures a wide variety of structural bonding and surface treatment materials for the aerospace industry. These materials provide our customers with practical, economic, and performance benefits.



Technical Support – If you require information or advice, Henkel has engineers and technical personnel trained to provide on-site technical assistance for the evaluation of Frekote® mold release products, process recommendations, or application troubleshooting. Henkel also has in-house analytical capabilities to assist customers in the chemical evaluation of materials, perform surface analysis evaluations, or simulate process conditions. Henkel recognizes that partnering with manufacturers and sharing expertise is critical to the successful selection of the right mold release product.

Troubleshooting Guide

Problem	Cause	Solution
Complete failure to obtain release.	Insufficiently cleaned mold surface has prevented Frekote® from bonding to the mold.	Strip out part. Thoroughly clean mold and reapply Frekote®.
	Improperly cured Frekote® film.	Ensure that Frekote® is fully cured before molding.
	Precipitated and thus ineffective Frekote®.	Examine 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.	Micro-porosity present in mold.	Thoroughly clean mold and apply a Frekote® mold sealer. Reapply Frekote® top coats.
Poor release accompanied by white patches on parts.	Insufficiently cleaned mold surface that prevents Frekote® from bonding properly, resulting in transfer to parts.	Thoroughly clean mold and reapply Frekote®.
Poor release accompanied by discolored blemishes on parts.	Solvent-based Frekote® contaminated by use of synthetic application cloths. Contaminants applied to tool surface.	Thoroughly clean mold and reapply Frekote® ensuring the use of non-synthetic application cloths.
Poor release in high-draft areas.	Lack of slip due to mold geometry in difficult high-draft areas.	Apply one or two extra coats of Frekote®.
Inability to achieve multiple releases.	Unconditioned mold surface.	Reapply Frekote® frequently for initial production shift. Thereafter gradually decrease the frequency of application.
	Separated and thus ineffective Frekote®.	Examine Frekote®. If separation is present, use fresh material.
Good release but build-up of Frekote® on mold surface.	Over-application of Frekote®.	Thoroughly clean mold and reduce amount of Frekote® applied.
Good release but parts exhibit white blemishes.	Excessive Frekote® applied to mold, resulting in transfer to parts.	Thoroughly clean mold and reduce amount of Frekote® applied.

Product List / Ordering Information

Frekote® Product	Description	Package Size	No./Ctn	Frekote® Product	Description	Package Size	No./Ctn
44-NC™	Release Agent	Pint	4 per carton	770-NC™	Release Agent	9.6 oz. aerosol	12 per carton
		Gallon	4 per carton			Pint	4 per carton
		Five gallon pail	N.A.			Gallon	4 per carton
		55 gallon drum	N.A.			Five gallon pail	N.A.
						55 gallon drum	N.A.
55-NC™	Release Agent	9.6 oz. aerosol	12 per carton	900-WB™	Release Agent	Gallon	4 per carton
		Pint	4 per carton			Five gallon pail	N.A.
		Gallon	4 per carton				
		Five gallon pail	N.A.			55 gallon drum	N.A.
		55 gallon drum	N.A.				
700-NC™	Release Agent	10.5 oz. aerosol	12 per carton	B-15™	Mold Sealer	Pint	4 per carton
		Pint	4 per carton			Gallon	1 per carton
		Gallon	4 per carton			Five gallon pail	N.A.
		Five gallon pail	N.A.				
		55 gallon drum	N.A.				
PMCTM	Cleaner	Pint	4 per carton				
		Gallon	4 per carton				
		Five gallon pail	N.A.				
		55 gallon drum	N.A.				