



3M™ Controltac™ Non-PVC Film with Comply™ Adhesive 3545C

For Piezo Inkjet and Screen Printing
A good choice for the environment!

Product Description

3M™ Controltac™ Non-PVC Film with Comply™ Adhesive 3545C is a 0.1mm, 100 micron caliper film with a slideable and repositionable, pressure-activated adhesive with air release channels for fast and easy application. This film, which is removable, is ideal for medium-term graphics and indoor or outdoor graphic applications. 3545C is designed for piezo inkjet, screen and electrostatic printing.

3M's Environmental Solutions

3M recognises that sustainability involves much more than a product offering. You can learn about 3M's ISO certification, EHS Management system, 3P programme, LCM review and other sustainability programs at www.3m.com/sustainability. These programmes exemplify how 3M strives to responsibly operate in a manner that can help make the world we live in a better place. That is why the Dow Jones Sustainability Index has included 3M in the index for 9 consecutive years. More information is available at www.3M.co.uk in Displays and Graphics. 3M is also taking steps at the product level by offering alternatives such as polyolefin film 3545C and polyolefin overlamine 8908, which has no monomeric plasticizer or polyvinylchloride in its construction and is made using less solvent in manufacturing when compared to traditional solvent based adhesive products. Chloride free constructions such as these eliminate halogen related disposal concerns. When printed with UV ink, VOC emissions associated with solvent inks are dramatically reduced, resulting in a graphic construction that has less impact on the environment.

Recommended Types of Graphics and End Uses

When constructed and used as described in this Bulletin, these types of graphics and end uses may be warranted by the 3M™ MCS™ Warranty and/or the 3M Performance Guarantee. Please read the entire Bulletin for details.

- Outdoor and indoor graphics and signs
- Vending or dispensing machine and cooler graphics
- Point of purchase or displays

Limitations of End Uses

3M specifically does not recommend or warrants the following uses, but please contact us to discuss your needs or recommend other products.

Unsuitable End Uses for This Film Graphics applied to:

- Corrugated, channels, complex curves, highly-irregular surfaces or sharply raised areas
- Flexible substrates
- Non-3M films
- Paint that is not thoroughly cured or dried
- Substrate surfaces that are not clean and smooth (little or no variation in texture)
- Stainless steel
- Surfaces exposed to abrasion when clear 1920DR or 9800CL is used
- Horizontal applications

3M accepts no liability for glass breakage etc

Graphic removal from:

- Applications with poor paint-to-substrate adhesion
- Existing graphic that must remain intact
- Aged paint or metal that may have surface oxidation or chalking
- Graphics subjected to petrol vapours or spills

Compatible Products

3M Graphic Materials

This Bulletin provides details about the base film and construction options and warranty. Additional specific information about compatible products can be found in the Product and Instruction Bulletins listed in 3M Related Literature at the end of this bulletin.

Piezo Inkjet Printers and Inks

Ink Series

3M™ Piezo Inkjet Ink Series 2700UV
3M™ Piezo Inkjet Ink Series 1500v2

3M™ Piezo Inkjet Ink Series 4600
3M™ Piezo Inkjet Ink Series 4800
3M™ Piezo Inkjet Ink Series 6800
3M™ Piezo Inkjet Ink Series 600

Printers

Durst Rho 160R and 351R Printers
EFI™ VUTEk™ 150, 2360/3360,
3300/5300 and 3000/5000 Printers
HP Scitex Pressjet-W™ Printer
HP Scitex TJ8300 Series Digital Press
Océ Arizona 180 and 90 Printers
Mutoh Blizzard and Spitfire Printers

Screen Printing

3M™ Screen Printing Ink Series 1900

Other Products

- 3M™ Premasking Tape SCPS-100
- 3M™ Prespacing Tape SCPS-55

Characteristics

These are typical values for unprocessed product; processing may change the values. Contact your 3M representative for a custom specification.

Physical Characteristics

Characteristic	Value
Material	Polyolefin
Colour	White, opaque
Gloss Level	Matte
Thickness	Without adhesive: 0.10 mm With adhesive: 0.11-0.13 mm
Adhesive type	Pressure-activated, slideable, positionable, with air release channels
Adhesive colour	Grey
Liner	Polyethylene-coated paper
Tensile strength	35.6N/25mm (8 pounds/inch)
Adhesion 24 hours after application	Aluminum, anodized: 8.9 - 10.2 N/25mm (2 -2.3 pounds/inch) Fruehauf pre-painted panels: 4.9 – 5.8 N/25mm (1.1-1.3 pounds/inch)
Chemical resistance	Resists mild alkalis, mild acids, salt and water does not include immersion

Application Characteristics

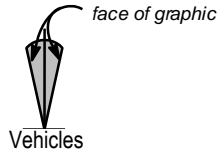
Characteristic	Value
Finished graphic application recommendation	Surface type: <ul style="list-style-type: none">• Smooth, flat without rivets; simple curves• Clear coated with 1920DR: Flat and smooth (no surface texture) Substrate type: Acrylic, aluminum, glass (uncoated), painted metal, polycarbonate, rigid vinyl, PETG and smooth painted substrates
Application temperature:	4°C -38°C (40°F -100°F) air and substrate <i>For applications nearing the minimum temperature range, please contact your local technical service representative to confirm suitability of application</i>
Application method:	Dry
Applied shrinkage	0.08-0.18 mm
Finished graphic exposure temperature	-40°C - +93°C (-40°F - 200°F)
Graphic removal	Removable with heat; leaves little or no adhesive residue. Removal temperature: Minimum ambient and substrate temperature -2°C (28°F)

Warranty & Durability

The warranted durability given in the Product Bulletin that is current at the time you purchased the film is the one that 3M will honour. The warranties in the following table(s), given in years, are for finished graphics exposed in a vertical exposure. See the warranty sections following this table for additional information.

See the 3M™ MCS™ Warranty Document for complete warranty and remedy details. The warranty given in the Product Bulletin that is current at the time you purchased the film is the one that 3M will honour.

The face of the graphic is + 10° from



3M recommend the following non-PVC overlamineate

Screen Print / Piezo Ink Printed Constructions	With Graphic Protection	Fleet			Exterior			Interior		
		Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3
1900	8908	-	-	-	1 year	1 year	1 year	5 years	5 years	5 years
1500v2		-	-	-	1 year	1 year	1 year	5 years	5 years	5 years
4600		-	-	-	1 year	1 year	1 year	5 years	5 years	5 years
4800		-	-	-	1 year	1 year	1 year	5 years	5 years	5 years
6800		-	-	-	1 year	1 year	1 year	5 years	5 years	5 years
600		-	-	-	1 year	1 year	1 year	5 years	5 years	5 years
2700UV		-	-	-	1 year	1 year	1 year	5 years	5 years	5 years
8700/8800		-	-	-	1 year	1 year	1 year	5 years	5 years	5 years

Additionally the following non-PVC clear coat can be used

Any of the above inks	9800CL	3 years	2 years	1.5 years	3 years	2 years	1.5 years	5 years	5 years	5 years
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Alternatively the following overlamineate and clear coat can be used

Any of the above inks	8519/ 1920DR	3 years	2 years	1.5 years	3 years	2 years	1.5 years	5 years	5 years	5 years
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3M Performance Guarantee Graphic Constructions and Durability For 3M Product Performance Only

Graphics constructed as described in the table below are eligible for the 3M Performance Guarantee when exposed in a vertical exposure. This warranty covers the performance of only the recommended 3M products used in the graphic construction when imaged with the printers and OEM inks listed in the most current version of Performance Guarantee Printer and Ink. That Matrix may also list certain restrictions for using the film covered in this Bulletin. 3M will honour the warranty given in the version of this Bulletin that was current at the time you purchased the film.

Film	Graphic Protection	Vehicle	Outdoor	Indoor	Inks and Printers
3545C	8908	-	1 year	5 years	See the Performance Guarantee Printer and Ink Matrix

Important Notice to Purchaser

The 3M products described in this publication are covered by a 3M warranty and limitation of liability.

3M's warranty provides that if 3M finds that goods are defective in material or workmanship they will be replaced or the price refunded at 3M's option but note that 3M does not accept liability for other direct losses (except for personal injury or death) or consequential losses relating to defective products or from information supplied by 3M.

Purchasers and users of 3M products, and not 3M supplying companies, are always solely responsible for deciding on the suitability of the 3M product for their required or intended use.

Piezo Inkjet Printing Ink

Always read and follow the ink manufacturer's written instructions on usage.

Total Ink Coverage for 3M™ MCS™ Warranty and Performance Guarantee Constructions

The maximum recommended total ink coverage for this film is:

270% when printed with all approved 3M piezo solvent inks.

280% when printed with all approved 3M UV inks.

250% when printed on the Mimaki JV5 Series printer with HS ink series (Performance Guarantee).

Do not exceed the recommended total ink coverage for the ink series used on this film.

Too high a total physical ink amount on the film results in media characteristic changes, inadequate drying, overlamine lifting, and/or poor graphic performance. Refer to the Product & Instruction Bulletin for the ink system being used for additional details about total ink coverage.

Colour Profiles

This film accepts ink differently than you may be accustomed to. Make sure you use the appropriate printer profile and machine calibrations. Immediately after printing with solvent ink, the top layer of the film remains soft for several hours. During this time, abrasion and pressure to the printed surface can mar it. Allow the film to dry, *unrolled*, for at least 8 hours at least 24°C (75°F) before applying an overlamine or screen-printed clear coat, cutting, trimming, mounting or applying the graphic.

Important Note! Adequately Dry Graphics

Inadequate drying can result in graphic failure including curling, increased shrinkage and adhesion failure, which are not covered under warranty. Always build enough time into your process to ensure adequate drying of the graphic. Poorly dried film may become soft and stretchy, and the adhesive may become too aggressive. This can cause difficulty when applying an overlamine, rolling the graphic, and applying the film. See the ink's Instruction Bulletin for more details.

Electrostatic Printing

- For electrostatic imaging, refer to Product Bulletin Trident and Instruction Bulletin 4.7.
- Graphic protection is required for a graphic to be warranted.

Screen Printing

Graphic protection is required for a graphic to be warranted.

Graphics Manufacturing



Heat Sensitivity when processing this film

This film can be more heat sensitive than vinyl film. Do not subject it to excessive heat during graphic fabrication. Excessive heat may cause the graphic to shrink or curl. Heated rollers may mar the surface.



Surface Abrasion Sensitivity when Fabricating This Film

Protect the Printed Graphic

After printing, this film has less abrasion resistance than vinyl film. Be careful not to scratch or mar the surface prior to applying the overlamine or clear coat.

Apply an Application Tape When Using 1920DR

Screen print clear 1920DR provides limited abrasion resistance. Always use an application tape, handle gently during installation, and do not mar the surface with tools after the application tape is removed.

Graphic Protection

Graphic protection is required for all warranted graphics.

- Clear coat 1920DR should be applied by screen printing.
- Overlamines must be applied with a cold roll laminator.

Cutting

This film is suitable for cutting shapes larger than 20 cms (8 inches), but not for numbers or copy.

- Guillotine
- Hand cut
- Cold steel-rule die
- Electronic

Application Tapes

When to Use Premasking Tape

- As an application aid to increase stiffness, and prevent stretching and damage during application.
- When little or no liner is exposed.

When to Use Prespacing Tape

- Hold cut and weeded letters or graphics in registration after removing the film liner.
- Protect cut graphic parts from scratching or damage during application.
- Use when large amounts of liner are exposed.

How to Select a Tape

Determine whether you want to premask the graphic or prespace cut pieces of film such as letters. Then locate the graphic protection on your graphic in the table below and use the corresponding tape. See Instruction Bulletin 4.3 for complete details.

Graphic Protection: Refer to the warranty table on Page 4 to determine what graphic protection is approved for your graphic construction

Tape	Graphic Protection (Refer to the warranty table on Page 4 to determine what graphic protection is approved for your graphic construction)		
	None	8908	1920DR
Premasking SCPS-100	■ ¹	■	■
Prespacing SCPS-55	■ ²	NR ³	■

¹ All Solvent Inks

² All UV Inks

³NR: A construction using this graphic protection is not recommended for cut graphics.¹
All solvent inks. ² All UV

Install the film using the dry application method.

Refer to the 3M Related Literature section, located at the end of this bulletin, for a list of the Instruction Bulletins that may be needed to apply or install this film.

Adhesive

This film has a pressure-activated adhesive that allows the film to slide easily on the substrate, be positioned with light finger pressure, and repositioned if it is not in the right place. However, by design so that a good adhesive bond is established, the positionability feature is lost when firm pressure with a squeegee or other application tool is applied, at application temperatures above 38°C (100°F) even if only light finger pressure was used for tacking, and if any part of the film is removed from the original liner and reapplied to the same or another liner. Solvent from piezo inkjet ink that has not completely dried also affects slideability and positionability.

These films also have air release channels, a characteristic of Comply adhesive. Removing and attempting to change liners or reapply the same liner damages air release channels.

Always work from the centre out to the edges of the graphic to allow trapped air to exit through the air release channels. If the channels are closed off by firm pressure and air is trapped, use an air release tool to aid in removing air bubbles. See Instruction Bulletin 5.4 for details.

Working with Rivets

This film will tent when applied over rivets. If the rivets are closely spaced, the film will bridge between rivets. Tented or bridged film may fail prematurely, which is not covered by the 3M MCS warranty or 3M Performance Guarantee. For the best appearance and durability, 3M recommends cutting around the rivet, removing the circle of film, and then re-squeegeeing around the rivet.



CAUTION

Heat Sensitivity when processing this film

This film can be more heat sensitive than vinyl film. Do not subject it to excessive heat during graphic fabrication. Excessive heat may cause the graphic to shrink or curl. Heated rollers may mar the surface.

Maintenance and Cleaning

Use a cleaning system designed for high-quality painted surfaces. They must be wet, non-abrasive, without strong solvents, and have a pH value between 3 and 11 (neither strongly acidic nor strongly alkaline).

Shelf Life, Storage and Shipping

Shelf Life

Total shelf life: 2 years from the date on the original box

Up to 2 years unprocessed, *OR* process within 1 year *and* apply within 1 year of processing

Storage Conditions

- 4°C - 38°C (40°F - 100°F)
- Out of sunlight
- Clean dry area
- Original container

Bring the film to print room temperature before using

Shipping Finished Graphics

Flat, or rolled printed side out on 13 cm (5 inch) or larger core. This helps prevent the liner and, if used, the application tape from popping off.

Health & Safety

CAUTION

Refer to the package label and the Material Safety Data Sheet for health, safety, and handling information on the products referenced in this bulletin. For 3M products, if necessary, you may contact our Toxicology/Product Responsibility Department on 01344 858000. When using any equipment, always follow the manufacturers' instructions for safe operation.

Heavy Metals

To the best of our knowledge, film 3545C does not contain any intentionally added Lead (Pb), Cadmium (Cd), Hexavalent Chromium (Cr6+) or Mercury (Hg), polybrominated diphenyl compounds (PBB) or polybrominated diphenyl ether compounds (PBDE). The user is responsible for determining and complying with all applicable standards and regulations.

3M Related Literature

Before starting any job, be sure you have the most current Product and Instruction Bulletins.

The information in 3M Product and Instruction Bulletins is subject to change. Current Bulletins are available at 3Mgraphics.com. The following applicable Bulletins provide information and processes you need to properly make the graphics described in this Bulletin. Additional Bulletins may be needed as indicated in the 3M Related Literature section of other 3M components you use.

Bulletin types: PB = Product Bulletin; IB = Instruction Bulletin

Subject	Type	Bulletin No.
3M™ Piezo Inkjet Ink Series 2700UV	PB	2700UV
3M™ Piezo Inkjet Ink Series 1500v2	PB	1500
3M™ Piezo Inkjet Ink Series 600	PB	600
3M™ Piezo Inkjet Ink Series 4600	PB	4600
3M™ Piezo Inkjet Ink Series 4800	PB	4800
3M™ Piezo Inkjet Ink Series 6800	PB	6800
3M™ Screen Printing Ink Series 1900 and Overprint Clear 1900DR	PB	1900
- Screen printing with ink series 1900- line colour,- 4-colour	IB	3.12
	IB	3.11
3M™ Scotchcal Luster Overlaminates 8908	PB	8908
3M™ Screen Printing UV Ink Series 9800CL Screen Print Clear	PB	9800
3M™ Screen Print Gloss Clear 1920DR	PB-IB	1900
- Applying screen printing clear 1920DR		3.12
Performance Guarantee Printer Matrix	PB	PG Matrix
Design of graphics	IB	2.1
Scoring and cutting	IB	4.1
Using 3M application tapes; premasking and prespacing for films	IB	4.3
Cold roll lamination	IB	4.22
Application, substrate selection, preparation and substrate-specific application techniques	IB	5.1
Special Applications and Vehicles	IB	5.4
A guide to understanding and applying graphics to common indoor and outdoor wall surfaces	IB	5.37
Storage, handling, maintenance, removal	IB	6.5

Warranties

3M™ MCS™ Warranty booklet

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