

3M + Dow: A winning combination.

3M™ Scotchpak™ Release Liners and Dow Corning® brand BIO-PSA Silicone Adhesives

To help ensure a successful outcome for patients, a consistent and accurate dose of medication is critical. That's why it's critical that the materials used in the construction of transdermal patches perform well together and stay active for the right amount of time.

Material compatibility is especially important when it comes to your adhesive and release liner, which can both have a significant impact on product performance. 3M™ Scotchpak™ Release Liners are formulated to provide optimal performance with adhesives commonly used in drug delivery patches, and we have the research to prove it.

Over a three-month study, Dow Food, Pharma & Medical Solutions measured the performance of Scotchpak release liners with four Dow Corning® brand BIO-PSA Silicone Adhesives (4200, 4300, 4500 and 4600). These tests showed that Scotchpak release liners performed well with all four adhesives, including when an amine-containing drug (API) was used.

See reverse side for details.

Trusted performance.

3M™ Scotchpak™ Release Liners are available in fluoropolymer and fluorosilicone formulations (see chart below). All Scotchpak liners performed well with each of the *Dow Corning*® brand BIO-PSA Silicone Adhesives tested, although the best results were observed with the *Dow Corning*® BIO-PSA 7-42XX Silicone Adhesives and *Dow Corning*® BIO-PSA 7-43XX Silicone Adhesives series.

- 3M™ Scotchpak™ Release Liner 1022 consistently displayed the highest release rate, followed by 3M™ Scotchpak 9744 and 9709.
- When used with an amine-containing drug* and amine-compatible adhesive, Scotchpak 9709 release liners displayed stable performance during the 3-month test.
- All three Scotchpak release liners are compatible with major transdermal adhesive systems and carry regulatory supporting documentation including drug master file (DMF).
- 3M release liners were developed for use with silicone adhesives. It is important that silicone release liners should not be used with silicone adhesives.
- Neat adhesive must be varied depending on the liner used.
- Additional 3M release liner options are available.

Dow tested three 3M liners for compatibility with different Dow adhesive series for use in transdermal drug delivery patch design.

	1022	9744	9709
	Fluoropolymer release coating	2X the fluoropolymer release coating	Fluorosilicone release coating**
	PET Backing	PET Backing	PET Backing
<i>Dow Corning</i>® BIO-PSA 7-45XX Silicone Adhesives	Strongest release	Strong release	Standard release
<i>Dow Corning</i>® BIO-PSA 7-46XX Silicone Adhesives	Strong release	Standard release	Standard release
<i>Dow Corning</i>® BIO-PSA 7-42XX Silicone Adhesives and <i>Dow Corning</i>® BIO-PSA 7-43XX Silicone Adhesives	Standard release	Standard release	Standard release
<i>Dow Corning</i>® BIO-PSA 7-43XX Silicone Adhesives (Amine-Compatible Silicone Adhesives)	NA	Increased release with time	Standard release

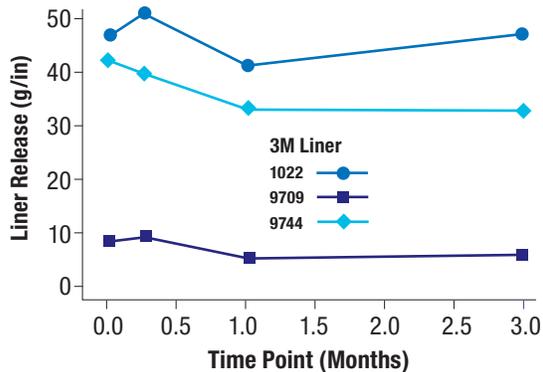
*Amine-containing functional drugs may exhibit increasing liner release over time with fluoropolymer liners (1022 and 9744).

**Designed for use with amine based API formulations.

Backed by science.

Liner release (g/in) vs time point (months)

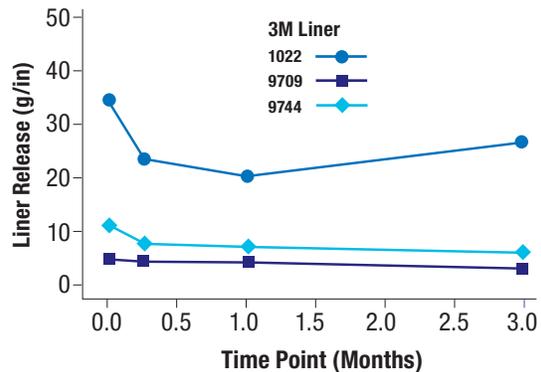
Adhesive = *Dow Corning*® BIO-PSA 7-4560 Silicone Adhesive



Choice of liner makes a significant difference for the *Dow Corning*® BIO-PSA 7-4560 Silicone Hot Melt Adhesives.

Liner release (g/in) vs time point (months)

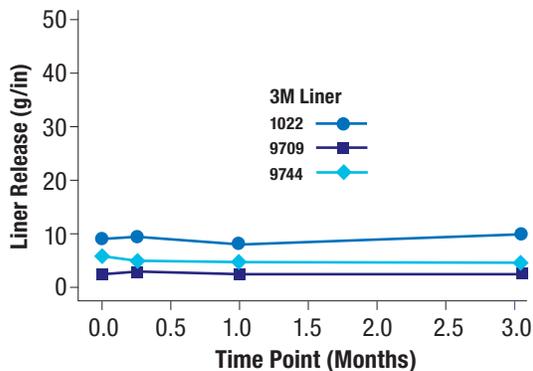
Adhesive = *Dow Corning*® BIO-PSA 7-4602 Silicone Adhesive



For the *Dow Corning*® BIO-PSA 7-46XX Silicone Adhesive series, the 1022 will give higher release than the 9700 series liners.

Liner release (g/in) vs time point (months)

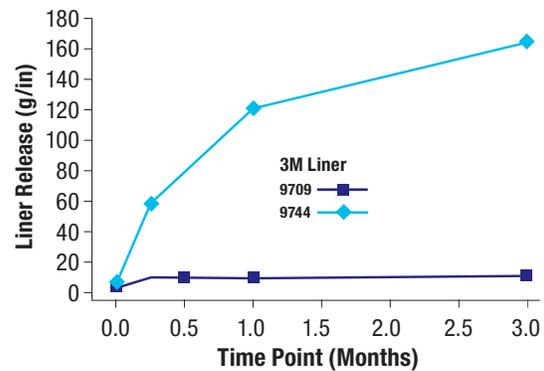
Adhesive = *Dow Corning*® BIO-PSA 7-4301 Silicone Adhesive (similar for *Dow Corning*® BIO-PSA 7-4201 Silicone Adhesive)



The *Dow Corning*® BIO-PSA 7-43XX Silicone Adhesives and *Dow Corning*® BIO-PSA 7-42XX Silicone Adhesives series give similar release regardless of the liner.

Liner release (g/in) vs time point (months)

Adhesive = *Dow Corning*® BIO-PSA 7-4302 Silicone Adhesive with clonidine



Combining different liners with the *Dow Corning*® BIO-PSA 7-43XX Silicone Adhesives series only matters when using an amine drug formulation (e.g. clonidine). In this case, the 9744 will give much higher release over time.

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3M Drug Delivery Systems partners with pharmaceutical and biotech companies to develop and manufacture pharmaceutical products using 3M's inhalation, transdermal or microneedle drug delivery technology. 3M offers a full range of feasibility, development and manufacturing capabilities to help bring products to market. Regulatory expertise, quality assurance, operations, marketed product support and other in-house resources are available for each step of the development and commercialization process.

For more information, please visit www.3M.com/dds or call 1-800-643-8086.



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About Dow

Dow (NYSE: DOW) combines the power of science and technology to passionately innovate what is essential to human progress. The Company is driving innovations that extract value from material, polymer, chemical and biological science to help address many of the world's most challenging problems such as the need for clean water, clean energy generation and conservation, and increasing agricultural productivity. Dow's integrated, market-driven, industry-leading portfolio of specialty chemical, advanced materials, agrosiences and plastics businesses delivers a broad range of technology-based products and solutions to customers in approximately 180 countries and in high-growth sectors such as packaging, electronics, water, coatings and agriculture. In 2015, Dow had annual sales of nearly \$49 billion and employed approximately 49,500 people worldwide. The Company's more than 6,000 product families are manufactured at 179 sites in 35 countries across the globe. On June 1, 2016, Dow became the 100 percent owner of Dow Corning Corporation's silicones business, a global company with sales of greater than \$4.5 billion in 2015, 25 manufacturing sites in 9 countries and approximately 10,000 employees worldwide. References to "Dow" or the "Company" mean The Dow Chemical Company and its consolidated subsidiaries unless otherwise expressly noted. More information about Dow can be found at www.dow.com.

About Dow Food, Pharma & Medical

Dow Food, Pharma & Medical designs differentiated solutions that enable pharmaceutical delivery & nutritional benefits to customers around the world. A business of the Dow Consumer Solutions Portfolio, Dow Food, Pharma & Medical offers a single interface to all Dow and Dow Corning technologies and expertise focused on solutions serving the pharmaceutical, medical device and food manufacturing markets. We provide highly functional food ingredients, functional excipients, active pharmaceutical ingredients (APIs), medical-grade elastomers and adhesives to help people around the world live healthier, more convenient and enjoyable lives.

For more information, please visit www.dow.com



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