SilForce™ SS4195A Release Coating

Product Description

SilForce* SS4195A-D1 is a condensation cured primer for SilForce phenyl-based silicone pressure sensitive adhesives (PSAs) It is a toluene solution of curable polyorgano-siloxanes which has been found useful as a primer for high temperature PSA filmstock such as polyester, polyimide, polyetherimide, polytetrafluoroethylene (PTFE), and fluoroethylene propylene (FEP).

System Components

The SilForce SS4195A-D1 system consists of the following components:

- SilForce SS4195A-D1 polymer
- SilForce SS4191B crosslinker
- SilForce SS4192c catalyst
- SilForce SS4259c cure accelerator

Typical Physical Properties

Property	Value
Solids, %	30
Solvent	Toluene
Color	Water-Clear
Density, lbs/gal	7.5
Specific Gravity @25^{0}C (77^{0}F)	0.904
Flash Point-PMCC, ^{0}C (^{0}F)	4 (40)

Typical properties are average data and are not to be used as or to develop specifications.

General Considerations for Use

NA

Patent Status

Nothing contained herein shall be construed to imply the nonexistence of any relevant patents or to constitute the permission, inducement, or recommendation to practice any invention covered by any patent, without authority from the owner of the patent.

Product Safety, Handling and Storage

CAUTION

SS4191B methyl hydrogen crosslinker generates a flammable gas when it is brought into contact with acidic, basic, or oxidizing agents and metal catalysts such as tin soaps and noble metals (Pt, Rh, etc.), therefore procedures must be established which assure that SS4191B crosslinker at full strength does not come in contact with either SS4192c catalyst or SS4259c accelerator.

The warranty period for SilForce* SS4195A-D1 is 6 months and the warranty period for SS4192B, SS4192c and SS4259c is 12 months from date of shipment if stored in the original unopened container at 25ºC (77ºF).

Customers should review the latest Safety Data Sheet (SDS) and label for product safety information, safe Handling instructions, personal protective equipment, if necessary, emergency service contact information, and any special storage conditions required for safety. Momentive Performance Materials (MPM) maintains an around the-clock emergency service for its products. SDS are available at www.momentive.com or, upon request, from any MPM representative. For product storage and handling procedures to maintain the product quality within our stated specifications, please review Certificates of Analysis, which are available in the Order Center. Use of other materials in conjunction with MPM products (for example,

primers) may require additional precautions. Please review and follow the safety information provided by the manufacturer of such other materials.

Processing Recommendations

Test Data

Formulation A was used for the priming of polyester, polyimide, and PTFE films as delineated in Table I, Primed Film Preparations.

Table I Primed Film Samples

Sample	Primer	Film Substrate	Meyer Rod
1	SS4195A-D1	Polyester	12
2	SS4195A-D1	Polyimide	8
3	SS4195A-D1	Polyester	12
4	SS4195A-D1	PTFE	12
5	SS4191A	Polyester	12
6	SS4191A	Polyimide	12
7	SS4191A	PTFE	12

Note: Polyester and Polyimid 1mil, PTFE 2 mil thickness Curing conditions: 20sec @130 °C(265 °F)

Two peroxide catalyzed silicone PSA solutions were prepared: PSA518 and PSA610, each catalyzed with 2.0% Benzoyl Peroxide (by weight to the silicone solids). PSA518 is a phenyl-based silicone PSA and PSA610 is a methyl-based silicone PSA. These prepared PSAs were coated onto primed and unprimed polyester, polyimide, and PTFE films to achieve a 1.5 mil dry adhesive coating thickness. Each coated sample was cured for 90 seconds @ 90ºC (194ºF) (solvent flash), followed by 2 minutes @ 165ºC (329ºF) (peroxide cure).

Tape samples of the cured silicone PSAs were then evaluated for degree of anchorage by initiating a slit in the tape followed by propagating a tear along its length. The width of the generated adhesive 'web' was then visually estimated using an inch-scale ruler. A poorly anchored PSA tape will generate a wide adhesive layer 'web' due to adhesive delamination along the slit-edges. The success of adhesive anchorage is determined by the primer's ability to prevent slit-edge delamination, thus effectively eliminating adhesive 'web' generation.

Table II summarizes the results of this testing.

The data presented there clearly illustrate the superior performance of SS4195A-D1 in securing the effective anchorage of phenyl-based silicone PSA518 to different industrial tape backings. It should be noted that this primer is specific in use for phenyl-based adhesives such as PSA518 and it provides only marginal anchorage improvement for methyl-based adhesives such as PSA610.

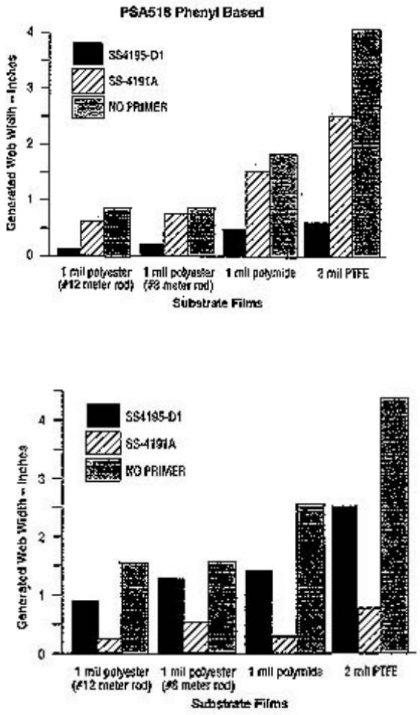
Table II Slit-edge 'Web' Generation (Width, Inches)

Silicone PSA	Film Substrate	Meyer Rod Number	Primer		No Primer
			SS4195A	SS4191A	
PSA518	Polyester	12	1/64	5/8	7/8
PSA518	Polyester	8	1/16	¾	7/8
PSA518	Polyimide	12	3/8	1 ½	1 ¾
PSA518	PTFE	12	½	2 ½	4
PSA610	Polyester	12	7/8	1/8	-
PSA610	Polyester	8	1 1/8	3/8	1 ½
PSA610	Polyimide	12	1 ¼	1/8	2 ¼
PSA610	PTFE	12	2 ¼	5/8	4 ¼

*All PSA's catalyzed with 2.0% Benzoyl Peroxide (by solids weight), coated onto film at 1.5 mil dry thickness, cured for 90 sec. @95 °C followed by 2 min. @165 °C

Figure1, Generated 'Web' Widths for PSA Tapes, further illustrates this specificity in use. It is interesting to point out that both of these tested primers provided at least some degree of improved anchorage for these tapes, even if not used in direct combination with the specified methyl- or phenyl-based silicone PSA.

Figure1 Generated' Web' Widths for PSA Tapes



Preparing the Coating Bath

SS4195A-D1 primer is suggested for use at a bath concentration of 3-5% solids. Meyer rod #8 or #12 may be used for applying the primer to the film. To prepare the catalyzed bath, the following procedure may be useful:

- Weigh SS4195A-D1 in a clean, rust-free container/mixing vessel.
- Add solvent to obtain the desired concentration of SS4195A-D1 and stir until dissolved Toluene, xylene, naptha, or aliphatic solvents such as hexane or heptane may be used for dilution.
- Add the SS4191B crosslinker and stir for several minutes.
- Add the SS4259c accelerator and stir for several minutes.
- Add SS4192c catalyst and stir for several more minutes to assure homogeneity.

TYPICAL FORMULATIONS

The following formulations may be used as starting points to determine the optimum levels of crosslinker, catalyst, and accelerator suitable for SS4195A-D1 primer preparation:

Component	Formulation (parts by weight)	
	A	B
SS4195A-D1	13.3	9.8
SS4191B	0.3	0.2
SS4192c	0.5	0.4
SS4295c	0.5	0.4
Toluene	85.4	90.2

Suggested cure conditions: 20-30 seconds @235ºF (112ºC)

Bath Life

Bath life evaluations have indicated that catalyzed SS4195A-D1 primer baths remain suitable to use for up to 12 hours. Bath life will be affected by the temperature of the bath and by the solvent selection. It is recommended that the bath life be determined by performing laboratory tests for specific applications and processing conditions.

Limitations

Customers must evaluate Momentive Performance Materials products and make their own determination as to fitness of use in their particular applications.

Availability

SS4195A-D1, SS4191B, SS4192c, and SS4259c may be ordered from Momentive Performance Materials, Waterford, NY 12188, the Momentive Performance Materials sales office nearest you or an authorized Momentive Performance Materials distributor.

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