Technical Data Sheet

SilGrip™ PSA590 Pressure Sensitive Adhesive

Description

PSA590 silicone pressure sensitive adhesive is a toluene solution of polysiloxane gum and resin. It is supplied at 60 percent silicone solids and may be further diluted with aromatic, aliphatic or chlorinated solvents. PSA590 may be blended with SR545 resin dispersion or with other methyl based silicone pressure sensitive adhesives to obtain specific performance properties. PSA590 adhesive has been found useful in coating of film and fabric substrates for manufacturing industrial pressure sensitive tapes. It may be an excellent choicefor splicing tapes due to its high tack properties.

Key Features and Typical Benefits

- Wide temperature range performance, maintains good shear and tack properties at intermittent temperatures up to 500 oF
- Adhesion to a wide variety of surfaces including low energy surfaces (silicones, fluoropolymers, polyolefines)
- Resistance to moisture, weathering (ozone, sunlight), chemical (acids, alkalis, oils) and biological (fungus) attack
- Accepts filler
- Excellent tack

Typical Physical Properties

Property	Value
Silicone Solids, %	60
Specific Gravity	0.99

Density, lbs/gal	8.27
Viscosity at 25 ° (77 °F), cps (Brookfield RVF, #3 Spindle)20 rpm)	18,000
Color	Light Straw
Flash Point, PMCC, °C (°F)	1.6 (35)
Solvent	Toluene

Typical Cured Adhesive Properties

Peel Adhesion, (1) oz/in	40
Tack, (2) g/cm^2	870

(1) 2 mil dry adhesive thickness, 1mil polyester film, 1.5% benzoyl peroxide(3), curing cycle: 10 minutes air dry, 90 seconds at 177oC, stainless steel, 12 inches/minute, 180o angle
(2) Polyken Tack Tester, 100g weight, 0.5 sec dwell time, 0.5 cm/sec draw speed, 2 mil dry adhesive thickness, 1 mil polyester film, 1.5% benzoyl peroxide(3), curing cycle: 10 minutes air dry, 90 seconds at 177°C
(3) Luperox® A98 from Elf Atochem North America, Inc.

The properties of a cured silicone adhesive are affected by several factors such as type and amount of catalyst, cure cycle, adhesive thickness and backing type and thickness. Higher benzoyl peroxide catalyst concentration will increase cohesive strength of the adhesive and improve shear strength, but it will reduce its adhesive strength resulting in lower tack and peel values as illustrated in Table 1.

Table 1.

Benzoyl Peroxide(3)%	Adhesion(5) (g/inch)	Tack(6) (g/cm2)
1.0	2087	1300
1.5	2037	1085
2.5	1947	949
3.0	1877	890

(3) Luperox® A98 from Elf Atochem North America, Inc.
(4)3 mil polyimid film, 2 mil dry adhesive thickness, cure cycle: 90 seconds at 90°C, 180 seconds at 165°C
(5)TLMI, stainless steel, 180° angle, 20 minutes dwell time
(6)Polyken Tack Tester, 100 g weight, 0.5 seconds dwell time, 0.5 cm/second draw speed

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

The warranty period is 6 months from date of shipment from Momentive Performance Materials if stored in the original unopened container at 25º C (77º F).
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

Application

PSA590 silicone adhesive is supplied at a viscosity suitable for conventional tape coating equipment. If necessary, it may be thinned with toluene, xylene or other compatible solvents. After the adhesive is applied to the backing, it is exposed to a two step process: solvent removal and curing.

Solvent Removal

To achieve optimum adhesive properties, it is essential to optimize the drying step of the process in order to assure that the solvent is removed from the adhesive film before the curing step of the process starts. Improper drying will result in residual solvent entrapment within the adhesive. If the adhesive is then exposed to temperatures higher than 93.5 o C (200 o F), decomposing peroxide catalyst can cause crosslinking reaction between solvent and adhesive through methyl groups on siloxane chains and on solvent molecules and adversely affect the properties of the adhesive. Typical temperature range for the drying step of the process is 83 o C (180 o F) to 90 o C (194 o F). A typical drying cycle is 2 minutes at 90 o C (194 o F).

Curing Process

Once the solvent is removed from the adhesive film, the peroxide cure should be initiated by exposure to heat. A typical curing cycle is 2 minutes at 165 o C (329 o F).

Longer exposure time and higher temperature, up to 204 o C (400 o F), can be used without adverse effects. The exact conditions required to achieve a complete cure will depend on oven length and efficiency, peroxide type and type of substrate used, and should be established during experimental trials on the machine.

Catalysts

High purity, 98% benzoyl peroxide (3) in the quantity of 1 to 3% based on silicone solids, has been found to give the most consistent results in curing of silicone pressure sensitive adhesives. In applications requiring low temperature cure, 2,4 -dichlorobenzoyl peroxide, which is activated at 132 o C (270 o F), can be used. It should be noted that 2,4-dichlorobenzoyl peroxide may generate polychlorinated biphenyls during the curing process. Please refer to Code of Federal Regulations, title 40, part 761 regarding incidental PCB byproducts if 2,4- dichlorobenzoyl peroxide is utilized.
The peroxide should be dispersed in solvent before it is mixed with the adhesive. Thorough mixing of the peroxide and adhesive to achieve homogeneous dispersion is essential for consistency of finished product.
(3) Available from: Elf Atochem North America, Inc.,

Priming

In certain applications, the anchorage of the adhesive to the backing may be insufficient and the coating of a primer prior to the adhesive coating may be required. A typical formulation for a primer may be found in Table1 below. The formulation may need to be adjusted depending on required bath life, coating equipment and backing material. The primer may be coated by direct gravure, wire wound rod or other coating technique suitable for solvent based coatings, and must be cured prior to adhesive application. The curing conditions will depend on equipment capabilities, substrate type and formulation used and should be established during experimental trials on the machine.

Table1. Typical Primer (7) Formulation

Component	Parts by Weight
SS4191A	13.30
SS4191B	0.16
SS4192c	0.50
SS4259c	0.30
Solvent(8)	85.74

(7)Refer to document #CDS4994, SS4191 Silcone Release Coating System, for more information
(8)Typical solvents: toluene, heptane, toluene/heptane mixtures

Limitations

Customers must evaluate Momentive Performance Materials products and make their own determination as to fitness of use in their particular applications.
From automotive to healthcare, from electronics to construction, products from Momentive Performance Materials Inc. are practically everywhere you look. We are a global leader in silicones and advanced materials with a 70+ year heritage of innovation and being first to market – with performance applications that improve everyday life. By knowing our customers' needs and creating custom technology platforms for them, we provide science based solutions to help customers increase performance, solve product development issues and engineer better manufacturing processes.

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