

SilFORT™ TAC2000 Coating

Description

SilFORT TAC2000 coating is an anti-fog coating applied to transparent polycarbonate (PC) or polymethyl-methacrylate (PMMA) substrates to help prevent the formation of water droplets on a coated surface. This thermally cured two component coating offers a long-lasting anti-fogging effect, along with a high transparency that allows automotive specifications for headlamp and autonomous driving assistance systems to be met.

Key Features and Typical Benefits

- Excellent anti-fog and anti-drop properties
- Two component coating – base and hardener
- Spray, dip or flow application

Standard Mixing Ratio for Spray Coating

Application Method	TAC2000 Base A1	Antifog Hardener B1	Solvent	Solids Content [%]
Spray	80 % by weight	20 % by weight	-	Approx. 17

Typical Physical Properties of Components⁽¹⁾

SiIFORT TAC2000 Base A1	Unit	Value
Physical Form	-	Liquid
Color	-	Pale yellow
Solids Content	%	16
Dynamic Viscosity (@ 25°C)	mPa s	Approx. 18
Density (@ 25°C)	g/cm ³	Approx. 0.87
Storage Conditions	°C	5°C – 43°C
Shelf Life	Days	365 ⁽²⁾

AF-Hardener B1	Unit	Value
Physical Form	-	Liquid
Color	-	Colorless
Solids Content	%	21
Dynamic Viscosity (@ 25°C)	mPa s	Approx. 4
Density	g/cm ³	Approx. 0.96
Storage Conditions	°C	5°C – 43°C
Shelf Life	Days	365 ⁽²⁾

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

(2) From date of manufacturing, in original unopened container.

Typical Physical Properties after Mixing (Base: Hardener 80:20)

Property	Unit	Value
Physical Form	-	Liquid
Appearance	-	Clear, pale yellow
Solids Content	%	17
Dynamic Viscosity (@ 25°C)	mPa s	Approx. 14
Density	g/cm ³	Approx. 0.89
Processing Temperature	°C	Below 30
Pot Life below 30°C	Days	5

Typical Anti-fog Performance⁽³⁾

Durability Test Method	Test Conditions	Performance
High humidity test	60°C @ 95% rel. humidity – 240 h	Pass
Climate cycle test	-20°C-85°C @ 85% rel. humidity – 120 h	Pass
Condensation test	40°C @ 100% rel. humidity – 240 h	Pass
High heat test (PC substrates)	240 h @ 120°C	Pass

Typical Anti-fog Performance - Coating Thickness⁽⁴⁾

Coating Thickness	Appearance	Initial Anti-fog	Durability
0.5 µm	OK ⁽⁵⁾	OK	NOK
1 µm			
2 µm			OK
3 µm			
4 µm			
5 µm			
6-9 µm			
> 9 µm	Spray sagging possible		

(3) Note: Typical data on clear PC. Actual results may vary.

(4) Typical data. Actual results may vary and are not to be used as or to develop specifications.

(5) OK: Passes all durability tests (see table “Typical Anti-fog Performance”)

Potential Applications

Exterior automotive devices, such as lenses, sensor covers, housings, etc., that may have stringent requirements for transparency in moist, water-condensing environments.

General Considerations for Use

Application Methods	Spray, flow, dip (premixed coating)
Reducing solvents ⁽⁶⁾	Iso-Butanol (CAS#78-83-1)
	2-Butanol (CAS#78-92-2)
	1-Methoxy-2-propanol (CAS#107-98-2)
Application and flash off conditions	22 – 55 % rel. humidity (@ 25°C) 20 – 30 °C >5 minutes ⁽⁷⁾
Cure	80 – 120 °C 20 – 60 minutes ⁽⁸⁾
Recommended Film Thickness ⁽⁹⁾	2 - 9 µm

(6) Other solvents may also be compatible.

(7) Higher flash off temperatures up to 50°C, may reduce the flash off time to approx. 2 minutes

(8) 80°C applies only to PMMA. For details on PC, refer to “Anti-fog properties under various curing conditions” below

(9) Thickness as little as 0.5 µm may be sufficient, depending on performance requirements

The coating area should be well-ventilated, clean and free from dust, with a recommended cleanroom environment in accordance with ISO14644-1, Class 7 or better. If necessary, parts should be washed or wiped clean with isopropanol, a mild detergent solution and clean water rinse or ultrasonic bath followed by a filtered-air blow-off and a final ionized- air blow-off. Coating solution should be filtered continuously or just prior to use through a 1.0 µm absolute gel filter, using a 5 to 10 µm pre-filter. The use of electric or indirect gas-fired ovens is recommended for cure.

The anti-fog coating can be applied to parts by spray, flow or dip coating methods. To adjust coating thickness or optical quality of the surface, the product can be reduced with appropriate solvents before application.

The two components (base and hardener) should be mixed in a ratio of 80:20 with an accuracy of ±5%. The mixed coating should be consumed ideally within 5 days. The pot life can depend on the ambient conditions and the solids level.

Anti-fog Performance on Polycarbonate under various curing conditions⁽¹⁰⁾

Oven Curing	20 min	30 min	40 min	50 min	60 min
90°C	Reduced performance		Full performance		
100°C	Reduced performance		Full performance		
110°C	Full performance				
120°C	Full performance				

(10) Adhesion and durability performance

Packaging

Base and hardener are currently available in:

SilFORT TAC2000 Base A1: 16 kg Pail

AF-Hardener B1: 4 kg Pail

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

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.

Limitations

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

Contact Information

Email

commercial.services@momentive.com

Telephone

Americas	Latin America	EMEAI- Europe, Middle East, Africa & India	ASIA PACIFIC
+1 800 295 2392 Toll free*	Brazil +55 11 4534 9650 Direct Number	Europe +390510924300 Direct number	China 800 820 0202 Toll free +86 21 3860 4892 Direct number
+704 805 6946 Direct Number	Mexico +52 55 2169 7670 Direct Number	India, Middle East & Africa + 91 44 71212207 Direct number*	Japan +81 3 5544 3111 Direct number
*All American countries		*All Middle Eastern countries, Africa, India,	Korea +82 2 6201 4600

For literature and technical assistance, visit our website at: www.momentive.com

DISCLAIMER:

THE MATERIALS, PRODUCTS AND SERVICES OF MOMENTIVE PERFORMANCE MATERIALS INC. AND ITS SUBSIDIARIES AND AFFILIATES (COLLECTIVELY “SUPPLIER”), ARE SOLD SUBJECT TO SUPPLIER’S STANDARD CONDITIONS OF SALE, WHICH ARE INCLUDED IN THE APPLICABLE DISTRIBUTOR OR OTHER SALES AGREEMENT, PRINTED ON THE BACK OF ORDER

ACKNOWLEDGMENTS AND INVOICES, AND AVAILABLE UPON REQUEST. ALTHOUGH ANY INFORMATION, RECOMMENDATIONS, OR ADVICE CONTAINED HEREIN IS GIVEN IN GOOD FAITH, SUPPLIER MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, (i) THAT THE RESULTS DESCRIBED HEREIN WILL BE OBTAINED UNDER END-USE CONDITIONS, OR (ii) AS TO THE EFFECTIVENESS OR SAFETY OF ANY DESIGN INCORPORATING ITS PRODUCTS, MATERIALS, SERVICES, RECOMMENDATIONS OR ADVICE. EXCEPT AS PROVIDED IN SUPPLIER'S STANDARD CONDITIONS OF SALE, SUPPLIER AND ITS REPRESENTATIVES SHALL IN NO EVENT BE RESPONSIBLE FOR ANY LOSS RESULTING FROM ANY USE OF ITS MATERIALS, PRODUCTS OR SERVICES DESCRIBED HEREIN. Each user bears full responsibility for making its own determination as to the suitability of Supplier's materials, services, recommendations, or advice for its own particular use. Each user must identify and perform all tests and analyses necessary to assure that its finished parts incorporating Supplier's products, materials, or services will be safe and suitable for use under end-use conditions. Nothing in this or any other document, nor any oral recommendation or advice, shall be deemed to alter, vary, supersede, or waive any provision of Supplier's standard Conditions of Sale or this Disclaimer, unless any such modification is specifically agreed to in a writing signed by Supplier. No statement contained herein concerning a possible or suggested use of any material, product, service or design is intended, or should be construed, to grant any license under any patent or other intellectual property right of Supplier covering such use or design, or as a recommendation for the use of such material, product, service or design in the infringement of any patent or other intellectual property right.

*SiIFORT is a trademark of Momentive Performance Materials Inc.

The use of the "™" symbol designates registered or unregistered trademarks of Momentive Performance Materials Inc. or its affiliated companies. Momentive and the Momentive logo are trademarks of Momentive Performance Materials Inc.