

BRENNTAG MID SOUTH, INC.
 1405 Highway 136 West
 Henderson, Kentucky 42420-0020
 Tel. (270) 830-1200 • Fax (270) 826-1486

@ 2200# --ONE WAY PIBC-K

CERTIFICATE OF ANALYSIS

Propylene Glycol USP/Kosher

B/T#832607

CUSTOMER:	LOT NUMBER: 144461378239
	DATE ANALYZED: 08/25/2018

PARAMETERS	ANALYSIS	SPECIFICATIONS
Identification by IR	PASS	Pass/Fail
Appearance	PASS	Clear, colorless with no suspended matter
Specific gravity @ 25°C (77°F)	1.036	1.035 to 1.037
Water Content, % by weight	0.010	0.20 Max.
Acidity, ml	0.02	< 0.20mL
Residue on Ignition* mg.	0.76	3.5mg/50g Max.
Chlorides, PPM	< 70	0.5 Max
Sulfates PPM	< 60	60 Max
Heavy Metals* PPM	< 5.0	5ppm Max.
Organic Volatile Impurities*	PASS	Meets requirements
Assay as C ₃ H ₈ O ₂ *	99.94	≥ 99.5%

*Analytical results as reported by Vendor.

INCOMING PRODUCT INFORMATION (VENDER AND CARRIER)

BMS:PO# 811422- DOW CHEMICAL	CARRIER: RAILCAR
DOW BATCH NUMBER: D207I88L05	VEHICLE NUMBER : DOWX071194

Analyst: KENNETH SAUMENIG	Approved: TIM SCHUE
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cc: With Shipment
 Lab File

MANUFACTURE DATE :08/08/2018
EXPIRATION DATE : 07/08/2020


Direct questions concerning certification of this product to personnel at the location marked below.

- Kennesaw, GA 770-429-1405
- St. Louis, MO 314-832-5010


Form Approval: JAMES CLEMENTS
 Form Approval Date: October 31, 2006

C:\RD1\WORD\COA\PROP GLYCOL USP KOSH


IMPORTANT: All information provided is believed to be accurate and complete. The data provided is representative of the product quality on the date of analysis for the lot number indicated. This certificate of analysis may not include all of the constituents of the product. Persons using this information should make their own determination regarding its suitability for their particular application. This certificate of analysis shall not in any way limit or preclude the operation and effect of the applicable terms and conditions of sale.

 <p>THE DOW CHEMICAL COMPANY</p>	<p>BRENNTAG MID-SOUTH INC KENNESAW BRANCH 3200 MOON STATION RD KENNESAW GA 30144-2767</p> <p style="text-align: right; font-size: 1.2em;">14614 100160</p> <p>Ship From: PLAQUEMINE po/pg PLAQUEMINE Louisiana, United States</p>																																																						
<p style="text-align: center;">Certificate of Analysis</p> <p>Product Number 00000360603 Product Name PuraGuard™ Propylene Glycol USP/EP Delivery No. 813646475 / 000010 Order Number 108543168 Shipping Units 83279.491 KG Date Shipped 2018-08-10 (YYYY-MM-DD) Shipment No. 32707636</p>	<p style="text-align: center;">Customer Information</p> <p>Customer Name BRENNTAG MID-SOUTH INC Customer PO number 811422 Customer Product Code 682951 Container ID DOWX071194 Specification Number 000000133084</p>																																																						
<p>Batch Number D207I88L05 Seal Number 568848 568849 568998 568999 19778 19779 19788 19789</p> <p>Expiration Date 2020-08-07 (YYYY-MM-DD) Manufacturing Date 2018-08-08 (YYYY-MM-DD)</p> <p>Quantity 83279.491 KG Net Weight 183600.000 LB</p> <p>Manufacturing Plant PLAQUEMINE po/pg Manufacturer Address 21255 LA HWY 1 South PLAQUEMINE Louisiana 70764-5125</p>																																																							
<p style="text-align: right;">CUSTOMER _____ PO # _____ CODE # _____ LOT # <u>144461378239</u> BOL # _____</p>																																																							
<p>It is hereby certified that the material indicated above has been inspected and tested in accordance with the conditions and requirements of the contract or purchase order and, unless agreed otherwise conforms in all respects to the specification relevant thereto and it meets all requirements of the current United States Pharmacopoeia, current Food Chemical Codex, current European Pharmacopoeia and current Pharmacopoeia of Japan.</p>																																																							
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Test</th> <th>Unit</th> <th>Lower Limit</th> <th>Upper Limit</th> <th>Value</th> <th>Method</th> </tr> </thead> <tbody> <tr> <td>Assay</td> <td>%</td> <td>99.80</td> <td>-</td> <td>99.94</td> <td>Current USP</td> </tr> <tr> <td>M Acidity</td> <td>ml</td> <td>-</td> <td>0.20</td> <td>0.02</td> <td>Current USP</td> </tr> <tr> <td>M Chlorides</td> <td>ppm</td> <td>-</td> <td>70</td> <td>< 70</td> <td>Current USP</td> </tr> <tr> <td>M Heavy Metals</td> <td>ppm</td> <td>-</td> <td>5.0</td> <td>< 5.0</td> <td>Current USP</td> </tr> <tr> <td>M Residue on Ignition per 50g</td> <td>mg</td> <td>-</td> <td>3.50</td> <td>0.76</td> <td>Current USP</td> </tr> <tr> <td>M Specific Gravity @ 25/25degC</td> <td></td> <td>1.035</td> <td>1.037</td> <td>1.036</td> <td>Current USP</td> </tr> <tr> <td>M Sulfate</td> <td>ppm</td> <td>-</td> <td>60</td> <td>< 60</td> <td>Current USP</td> </tr> <tr> <td>Water Content</td> <td>%</td> <td>-</td> <td>0.200</td> <td>0.010</td> <td>Current USP</td> </tr> </tbody> </table>		Test	Unit	Lower Limit	Upper Limit	Value	Method	Assay	%	99.80	-	99.94	Current USP	M Acidity	ml	-	0.20	0.02	Current USP	M Chlorides	ppm	-	70	< 70	Current USP	M Heavy Metals	ppm	-	5.0	< 5.0	Current USP	M Residue on Ignition per 50g	mg	-	3.50	0.76	Current USP	M Specific Gravity @ 25/25degC		1.035	1.037	1.036	Current USP	M Sulfate	ppm	-	60	< 60	Current USP	Water Content	%	-	0.200	0.010	Current USP
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 THE DOW CHEMICAL COMPANY		BRENNTAG MID-SOUTH INC KENNESAW BRANCH 3200 MOON STATION RD KENNESAW GA 30144-2767			
		Ship From: PLAQUEMINE po/pg PLAQUEMINE Louisiana, United States			
M ID Test A	-	-	-	Pass	Current USP
matches IR scan					
ID Test B	-	-	-	Pass	Current USP
Limit of Ethylene Glycol					
ID Test B	-	-	-	Pass	Current USP
Limit of Diethylene Glycol					
ID Test C	-	-	-	Pass	Current USP
Matches GC Scan					
M Acidity	ml	-	0.05	0.01	Current EP
M Boiling Point	°C	184	189	184	Current EP
M Clarity	-	-	-	Pass	Current EP
M Color	-	-	-	Pass	Current EP
M Heavy Metals	ppm	-	5.0	< 5.0	Current EP
O Melting Point	°C	121	128	125	Current EP
M Oxidizing Substances	ml	-	0.20	0.05	Current EP
0.05M sodium thiosulfate					
M Reducing Substances	-	-	-	Pass	Current EP
M Refractive Index		1.431	1.433	1.433	Current EP
@ 20degC					
M Relative Density		1.035	1.040	1.038	Current EP
@ 20/20degC					
M Sulfated ash	%	-	0.0100	0.0008	Current EP
Water Content	%	-	0.200	0.010	Current EP
Assay	%	99.80	-	99.94	Current FCC
M Acidity	-	-	-	Pass	Current FCC
Appearance	-	-	-	Pass	Current FCC
clear & colorless					
M Distillation, IBP	°C	185.0	-	187.2	Current FCC
M Distillation, DP	°C	-	189.0	188.2	Current FCC
O Lead (Pb)	ppm	-	1.0	< 1.0	Current FCC
M Identification	-	-	-	Pass	Current FCC
matches IR scan					
M Residue on Ignition	%	-	0.0070	0.0022	Current FCC

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M Specific Gravity @ 25/25degC		1.035	1.037	1.036	Current FCC
Water Content	%	-	0.200	0.010	Current FCC
M Acidity	-	-	-	Pass	Current JP
M Arsenic	ppm	-	2.0	< 2.0	Current JP
M Chlorides	%	-	0.007	< 0.007	Current JP
M Distilling Range 184 - 189 degC	% vol	95	-	97	Current JP
M Glycerine (Odor)	-	-	-	Pass	Current JP
M Heavy Metals	ppm	-	5.0	< 5.0	Current JP
O Melting Point	°C	174	178	175	Current JP
M Odor	-	-	-	Pass	Current JP
M Residue on Ignition	%	-	0.0050	0.0031	Current JP
M Specific Gravity @ 20/20degC		1.035	1.040	1.038	Current JP
M Sulfate	%	-	0.002	< 0.002	Current JP
Water Content	%	-	0.500	0.010	Current JP
Acidity as acetic acid	%	-	0.0020	0.0001	DOWM 101370
Appearance clear, free of suspended matter	-	-	-	Pass	Visual
Chlorides	ppm	-	1.0	< 1.0	DOWM 101867
Color, Pt-Co	-	-	10	2	ASTM D5386
Dimer, Trimer & Higher Polymers	%	-	0.100	0.060	DOWM 100687
Ethylene Glycol	%	-	0.0080	< 0.0080	DOWM 100687
Diethylene Glycol	%	-	0.0080	< 0.0080	DOWM 100687
Odor practically odorless	-	-	-	Pass	Olfactory
M Spec. Grav. @ 20C		1.0376	1.0389	1.0380	ASTM D4052
Iron	ppm	-	0.30	0.07	ASTM E394
Note 1: Values reported for Assay, Ethylene Glycol and Diethylene Glycol under USP and for Assay under FCC are obtained using the validated equivalent Dow GC Method DOWM 100687.					

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M:Quarterly Sample O:Annual Sample	
Plant Quality Coordinator For inquiries please contact Customer Service or local sales ®™ Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow	

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Orthodox Union Letter of Certification

Union of Orthodox Jewish Congregations of America
איחוד קהילות אורתודוקסים באמריקה

December 20, 2017

This is to certify that the following product(s) prepared by

Dow Chemical U.S.A., 2030 Dow Center, Midland, MI 48674

at the following facility(ies) are under the supervision of the Kashruth Division of the Orthodox Union and are kosher as indicated below.

Brenntag Mid-South, Inc.-St. Louis-Soper, St. Louis, MO

Product Name	UKD-ID	Status	Certification Requirements
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Brand: DOW

- Propylene Glycol USP/EP

OUV4-D0E8333

Pareve

Certified when bulk shipped in OU approved carriers.

Placing the OU logo on products not listed above constitutes an unauthorized use of the OU symbol, which is a federally registered trademark.

Rabbi Menachem Genack, Rabbinic Administrator, CEO

This certification is valid through 12/31/2018

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Eleven Broadway - New York, NY 10004 - (212) 613-8382 - Fax: (212) 613-0654 - Email: KosherLetter@ou.org - www.oukosher.org

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