

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

CERTIFICATE OF ANALYSIS

Propylene Glycol USP/Kosher

CUSTOMER:	LOT NUMBER: 144461678354151
	DATE ANALYZED: 12/22/2018

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	0.006	0.2 Max.
Acidity, ml of 0.10N NaOH*	0.01	< 0.20mL Max.
Residue on Ignition*	0.18	3.5mg/50g Max.
Chlorides, Wt %*	<0.007	≤ 0.007%
Sulfates, Wt %*	<0.006	≤ 0.006%
Heavy Metals*	<5.0	5ppm Max.
Organic Volatile Impurities*	PASS	Meets requirements
Assay as C ₃ H ₈ O ₂ *	99.93	≥ 99.5%

*Analytical results as reported by vendor.

INCOMING PRODUCT INFORMATION (VENDOR AND CARRIER)	
VENDOR: DOW CHEMICAL CO	CARRIER: KIRBY
VENDOR LOT NUMBER: D207IBN004	VEHICLE NUMBER: 10528

Analyst: JORDAN AACH	Approved: GENE RIXFORD
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cc: With Shipment
 Lab File

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

- | | |
|---|---|
| <input type="checkbox"/> Kennesaw, GA 770-429-1405
<input type="checkbox"/> St. Louis, MO 314-832-5010 | <input type="checkbox"/> Orlando, FL 407-857-9310
<input type="checkbox"/> Durham, NC 919-596-0681 |
|---|---|

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.

Date: 12/11/2018

Certificate of Analysis

Mfg date: 11/23/2018

Expiration date: 11/22/2020

Material: PURAGUARD PROPYLENE GLYCOL USP/EP BULK

Customer Material:

PO #

Delivery note:

Batch Number: D207IBN004

Ship from: THE DOW CHEMICAL COMPANY

PLAQUEMINE

LA UNITED STATES

Manufacturing Location: This product is manufactured in Freeport, Texas and/or Plaquemine, Louisiana

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.

Feature	Units	Results		Limits		Method	
		D207IBN004	Minimum	Maximum			
Assay	%	99.93	99.80	----	Current USP		
Acidity	mL	0.01	----	0.20	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	0.18	----	3.50	Current USP		M
Specific Gravity @ 25/25degC	-	1.036	1.035	1.037	Current USP		M
Sulfate	ppm	< 60	----	60	Current USP		M
Water Content	%	0.005	----	0.200	Current USP		
IDENTIFICATION TEST A Identification matches IR scan		Passes			Current USP		M
IDENTIFICATION TEST B Ethylene Glycol		Passes			Current USP		
Diethylene Glycol		Passes			Current USP		
IDENTIFICATION TEST C Identification matches GC scan		Passes			Current USP		
Acidity	mL	0.01	----	0.05	Current EP		M
Boiling Point	degC	184	184	189	Current EP		M
Clarity		Passes			Current EP		M
Color		Passes			Current EP		M

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Date 12/11/2018

The Dow Chemical Company
Certificate of Analysis

Cust P.O.

Delvry Note:

Material: PURAGUARD PROPYLENE GLYCOL USP/EP BULK

Spec: 00111814-S

Cust Mt:

Feature	Units	Results		Limits		Method	
		D207IBN004		Minimum	Maximum		
Water Content	%	0.005		----	0.200	Current EP	
Assay	%	99.93		99.80	----	Current FCC	
Acidity		Passes				Current FCC	M
Appearance		Passes				Current FCC	
clear & colorless							
Distillation, IBP	degC	186.2		185.0	----	Current FCC	M
Distillation, DP	degC	188.4		----	189.0	Current FCC	M
Lead (Pb)	ppm <	1.0		----	1.0	Current FCC	O
Identification		Passes				Current FCC	M
matches IR scan							
Residue on Ignition	%	0.0052		----	0.0070	Current FCC	M
Specific Gravity	-	1.036		1.035	1.037	Current FCC	M
@ 25/25degC							
Water Content	%	0.005		----	0.200	Current FCC	
Acidity		Passes				Current JP	M
Arsenic	ppm <	2.0		----	2.0	Current JP	M
Chlorides	% <	0.007		----	0.007	Current JP	M
Distilling Range	% vol	98		95	----	Current JP	M
184 - 189 degC							
Glycerine (Odor)		Passes				Current JP	M
Heavy Metals	ppm <	5.0		----	5.0	Current JP	M
Melting Point	degC	175		174	178	Current JP	O
Odor		Passes				Current JP	M
Residue on Ignition	%	0.0040		----	0.0050	Current JP	M
Specific Gravity	-	1.038		1.035	1.040	Current JP	M
@ 20/20degC							
Sulfate	% <	0.002		----	0.002	Current JP	M
Water Content	%	0.005		----	0.500	Current JP	
Acidity	%	0.0000		----	0.0020	DOWM 101370	
As Acetic Acid							
Appearance		Passes				Visual	
Clear, free of suspended matter							
Chlorides	ppm <	1.0		----	1.0	DOWM 101867	
Color, Pt-Co	-	2		----	10	ASTM D5386	
Dimer, Trimer	%	0.070		----	0.100	DOWM 100687	
& Higher Polymers							
Ethylene Glycol	% <	0.0080		----	0.0080	DOWM 100687	
Diethylene Glycol	% <	0.0080		----	0.0080	DOWM 100687	
Iron	ppm	0.01		----	0.30	ASTM E202	
Odor		Passes				Olfactory	M
practically odorless							
Spec. Grav. @ 20C	-	1.0380		1.0376	1.0389	ASTM D4052	M

SOURCE OF ANALYSIS

M Quarterly Sample

O Annual Sample

For inquiries please contact Customer Service or local sales.

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Date: 12/11/2018

Certificate of Analysis

Cust P.O.

Dlvy Note:

Material: PURAGUARD PROPYLENE GLYCOL USP/EP BULK

Spec: 000000059518

Cust Mtl:

Note:

Values reported for Assay, Ethylene Glycol and Diethylene Glycol under USP and for Assay under FCC are obtained using the validated Dow GC Method DOWM 100687.

Plant Quality Coordinator

For inquiries please contact Customer Service or local sales.

* Trademark of The Dow Chemical Company

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