

Certificate Of Analysis

LBI@BRENNTAG.NL
NETHERLANDS

METAPHARMACEUTICAL

N DE LOTE:

0070623

Qm
08/06/2023

Customer Order No. : 5722010075461995
Customer Number : 126241
Date Shipped : May 11, 2023
Lyondell Order No. : 5011948478 000010
Delivery Item No. : 8106589133 000010

Ship-To:

BRENNTAG NEDERLAND B.V. (DRUMMING)
C/O BRENNTAG MOERDIJK
JUPITERWEG 3
4761 RW MOERDIJK
NETHERLANDS

Lyondell Material : 499204 PROPYLENE GLYCOL USP/EP, BULK
Customer Material : 572201000000000040901000
Batch Number : AD23051104
Vehicle Number : GCAU 795.274/7

Test Description	Specifications		Test Result	Unit of Measure
	Minimum	Maximum		
Manufacturing Date			8052023	
Inspection Lot			4260646	
Source Tank			1703	
Lot Number			.	
Miscellaneous Text			.	
Assay as PG, on a dry basis	99,80		99,95	weight %
PG Retention Time, ID Test C	Pass		Pass	
Water		0,200	0,006	weight %
Appearance	Pass		Pass	
Odor	Pass		Pass	
Iron		0,50	0,02	weight ppm
Color, Pt-Co		10	< 5	APHA Color
Ethylene Glycol		0,008	< 0,001	weight %
Diethylene Glycol		0,008	0,003	weight %
TYPICAL VALUES			SHOWN BELOW	
Refractive Index @ 25 C	1,4300	1,4320	.	
Refractive Index @ 20 C	1,4310	1,4330	.	
Specific Gravity @ 25/25C	1,0350	1,0370	.	
Distillation DP @760 mmHg		189,0		degrees C
Distillation IBP @760 mmHg	186,0			degrees C
Acidity (ml 0.1N NaOH/10 ml)		0,05		.

(*** Continued ***)

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For Further Questions, Please Contact your Customer Service Representative

France/Portugal: 00.31.10.275.4410 Italy: 00.31.10.275.4430 Spain: 00.31.10.275.4435 Oxyfuels: 00.31.10.275.4219
Middle East/Africa: 00.31.10.275.4414 Benelux: 00.31.10.275.4402 UK/Scandinavia: 00.31.10.275.4406
Germany/Switzerland: 00.31.10.275.4423

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The Lyondell method numbers and the reference/base method numbers are located on the specification document.

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Test Description	Specifications		Test Result	Unit of Measure
	Minimum	Maximum		
Chlorides as Cl		1		ppm
Sulfate		0,002		weight %
Heavy Metals as Pb		5		weight ppm
Oxidiz Subst as ml thiosulfate		0,20		Milliliter
Reducing Substances	Pass			
Residue on Ignit./Sulfat. Ash		0,0050		weight %
Residual Solvents	Pass			
Arsenic as As		1		weight ppm
IR Spectrum	Pass			
Lead		1,00		ppm
End of Test Data				

Compendia

Lyondell Chemical Company Propylene Glycol USP meets or exceeds all requirements of the United States Pharmacopeia, the European Pharmacopeia, Japanese Pharmacopeia and the Food Chemicals Codex. This product is not for use as an Active Pharmaceutical Ingredient (API)

EU Food and Animal Feed Regulations and Certifications

Propylene Glycol USP/EP manufactured at our European plants is HACCP certified and GMP+ FSA assured. Propylene Glycol USP/EP is listed on the European Catalogue for Feed Materials under number 13.11.1. Food additive E 1520 restricted use in food.

Site of Manufacture

All propylene glycol USP sold by Lyondell Chemical Company in the United States, Canada and Central and South America is manufactured at the Lyondell Bayport plant at 10801 Choate Road, Pasadena, TX 77507.

All propylene glycol USP sold by Lyondell Chemical Company in Europe, the Middle East and Africa is manufactured at the Lyondell Chemie Nederland (RB) plant at Theemsweg 14, 3197 KM Rotterdam and Lyondell Chimie France (FL) plant at Route du Quai Mineralier, 13270, Fos-sur-Mer.

All LyondellBasell PG USP/EP batches starting with "AD" are manufactured at Fos-sur-Mer

All propylene glycol USP/EP sold by Lyondell Chemical Company in Asia is manufactured at the Lyondell Bayport plant at 10801 Choate Road, Pasadena, TX 77507 unless otherwise stated.

Date of Manufacture

(** Continued **)

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Test Description	Specifications		Test Result	Unit of Measure
	Minimum	Maximum		

For shipments from Lyondell's Bayport, Rotterdam and Fos plants the date of manufacture is shown as the Manufacturing Date in the data fields above. The date is in the format yyyyymmdd, where yyyy is the year, mm is the month and dd is the day. This date of Manufacture also applies to the European packaged material shipped from our Fos facility.

For shipments from terminals in Europe, the date of manufacture may be determined from the batch number. The batch number is shown in format Source-YY-MM-DD-sequence number. For example, a batch number of AD11100501 indicates that the batch was finalized on 05th October, 2011 at terminal ADPO.

For shipments from the IMTT terminals in Bayonne, NJ, and Lemont, IL, the date of manufacture may be determined from the Lot Number in the Test Description portion of the Certificate of Analysis. The Lot Number is the format DATE-SOURCE-TANK. For example, a Lot Number of 50811-IMTT-14100 indicates that the material shipped from the IMTT terminal, the manufacturing date was August 11, 2005, (ymmdd) and the product shipped from tank 14100. Each bulk storage tank has a unique number.

IMTT Bayonne: 2 Commerce Street Bayonne, NJ 07002

IMTT Lemont: 13589 Main Street Lemont, IL 60439

This coding applies only to shipments made by Lyondell from Lyondell-owned or leased bulk storage tanks. It does not apply when a new lot number is assigned by a third party such as a chemical distributor.

Lot Number and Traceability

For shipments from Lyondell's plant lot traceability may be maintained through either the Batch Number or Delivery Item No. in the header or through the Inspection Lot in the data field under Test Description

Batch number is coded as Plant code-Year-month-date-sequence number (BA-Y-MM-DD-XXX).

Plant codes: RB-Botlek, FL-Fos, AD-ADPO, EC-Cogex. All LyondellBasell PG USP/EP batches starting with "EC" are manufactured at Fos-sur-Mer.

Shelf Life

The shelf life of propylene glycol USP manufactured and delivered by Lyondell Chemical Company when stored and handled under appropriate conditions is two years from the manufacturing date. Subsequent handling and/or repackaging by intermediaries such as distributors may affect shelf life. Therefore, the user of this material should confirm this shelf life via testing or with their immediate supplier.

Residual Solvents

(*** Continued ***)

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Test Description	Specifications		Test Result	Unit of Measure
	Minimum	Maximum		

The United States Pharmacopeia Current Edition of USP, in section <467> "Residual Solvents", specifies limits on Residual Solvents. Section <467> lists classes of Residual Solvents which may not be completely removed by practical manufacturing techniques.

None of the solvents listed as Class 1, Class 2, Class 3 or those listed in Table 4 are used as raw materials or processing aids, none are expected to be by-products of the manufacturing process, and none are added to the final product. Therefore this product meets USP guidelines for Residual Solvents.

Propylene glycol is manufactured by the reaction of propylene oxide and water and no other solvents are used. By virtue of the manufacturing process no residual propylene oxide is likely to be present in propylene glycol.

Dipropylene glycol, which is typically present at 0.10 - 0.20%, is not currently listed in USP current ed. <467> as a residual solvent.

PG Retention Time (Identification Test C)

The retention time of the propylene glycol peak in the chromatogram of the sample solution corresponds to that obtained in the chromatogram of the standard solution.

Typical Properties

Analytical test parameters listed under Typical Properties are not tested on every lot of material based on our knowledge of the manufacturing process and controlled handling, shipping and storage of the material. Random, statistical sampling has shown that Lyondell Chemical Company Propylene Glycol USP, if tested, will fall within the limits indicated under Test Result.

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