Biesterfeld
NEWS

Biesterfeld
Competence in Solutions

NEWS SPECIAL DUPONT TATE & LYLE / ZEMEA® October 2017

Content

zemea
bio-based performance
DuPont Tate & Lyle BioProducts

Short & Sweet:
Zemea® USP-NF Propanediol

As the largest global producer of bio-based 1,3-propanediol, DuPont Tate & Lyle provides its customers with a competitive advantage by offering improved, higher-performing ingredients from a petroleum-free, sustainable, and renewable source.

DuPont Tate & Lyle Bio Products Company, LLC, is a joint venture between DuPont, a global science innovator, and Tate & Lyle, a world-leading specialty ingredients and solutions company. DuPont Tate & Lyle Bio Products provides natural and renewably sourced ingredients that enhance product performance.

It offers solutions for a wide variety of markets and applications through bio-based performance brands, Susterra® and Zemea®.

Zemea® USP-NF propanediol is a naturally derived solvent, carrier, and humectant that provides formulators with an alternative to petroleum-based glycols and glycerine. Applications include pharmaceutical, dietary supplements, personal care, and others that require the USP-NF standard.

Additionally, Zemea® USP-NF propanediol may be used as an excipient for over-the-counter (OTC) and dermal / topical medical device applications.

Zemea® USP-NF propanediol fulfils the following approvals and certifications:

- Natural Products Association (NPA)
- USDA BioPreferred® Program – 100% Bio-based

- Natural Health Products Ingredient – Health Canada
- Complies with ISO 16128-1:2016
- Halal, Kosher, GRAS
- USP-NF

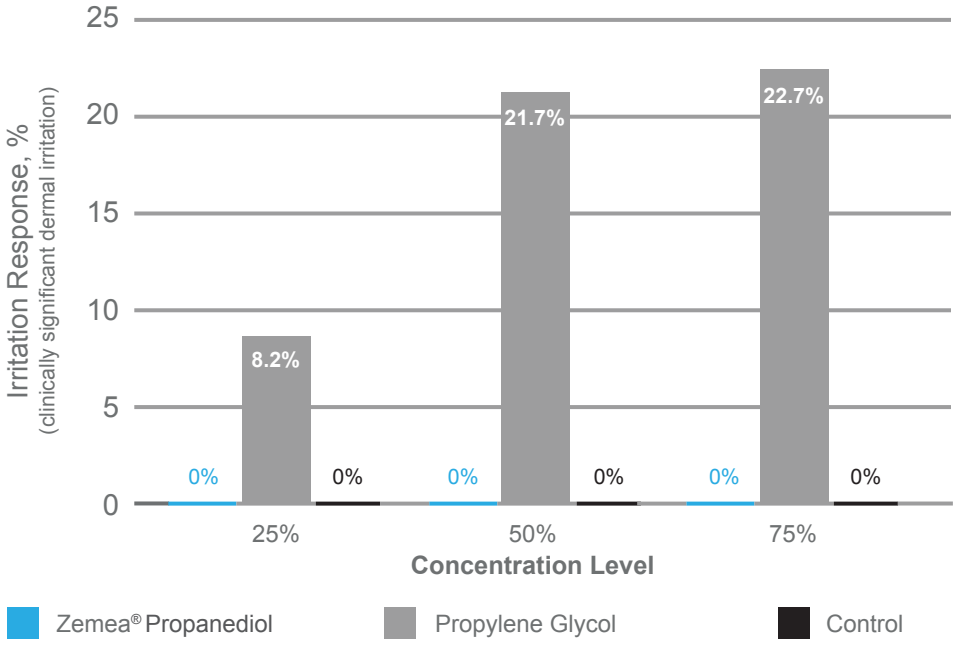
Reducing skin irritation

In multiple studies using the modified Draize Repeat Insult Patch Test method, Zemea® propanediol produced no skin irritation, fatigue, or sensitisation – even at high concentrations. Researchers observed no clinically significant dermal irritation or allergic contact following exposure of up to 75% Zemea® propanediol at three different pH levels.

By contrast, skin irritation was observed with propylene glycol (PG) at a concentration of 25%, with nearly one quarter of the test population indicating positive irritation at a 75% concentration. Results from these studies show that Zemea® propanediol has low potential to irritate or sensitise human skin.

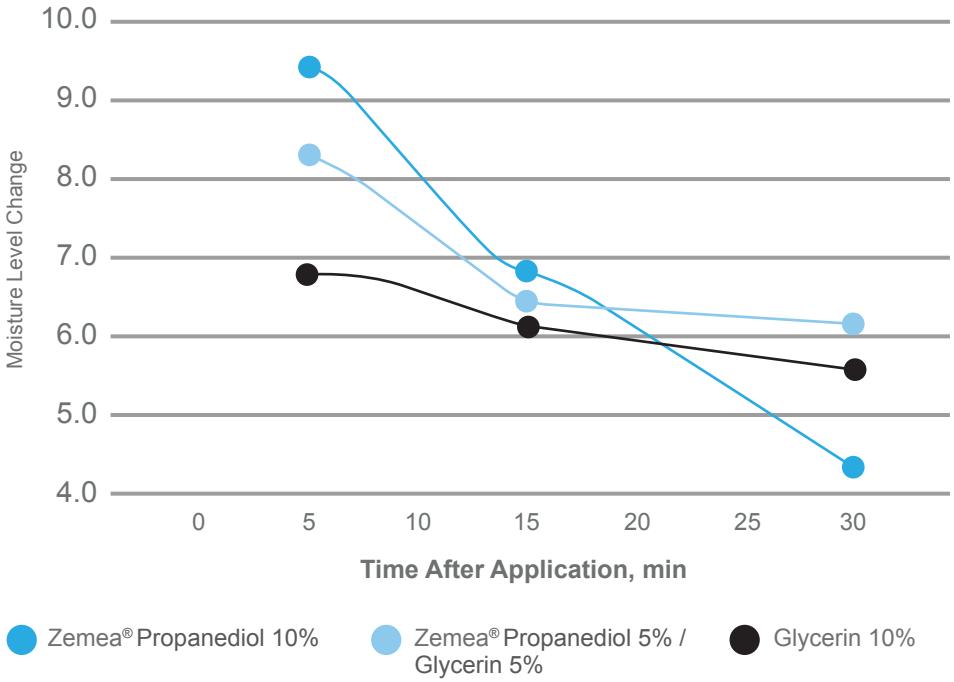
Human Skin Patch Test Results

207 individuals exposed to Zemea® propanediol or Propylene Glycol or Control at 7pH



At concentrations as high as 75%, Zemea propanediol has not produced skin irritation or sensitization reactions.

Skin Moisturization Increase Compared to 10% Glycerin



Moisturisation performance vs. glycerine

In tests comparing the moisturising effect of Zemea® propanediol to glycerine at a 10% use level, measurements taken with a Corneometer ASA-M2 showed that Zemea® propanediol provides improved skin moisturisation during initial application.

A mixture of 5% Zemea® propanediol/5% glycerine in formulation demonstrated a synergistic effect that improved and extended skin moisturisation. Formulating with a Zemea® propanediol/glycerine mixture also requires less glycerine and may reduce tackiness.

Preservative-boosting performance

CTFA Preservative Challenge Testing has shown that Zemea® propanediol can boost the efficacy of preservatives in a formulation. Seven different preservatives were tested at 50% of the recommended use level in a skin care emulsion.

Zemea® propanediol use level was varied from 0-6% to determine the minimum level of Zemea® propanediol needed to pass the challenge test.

Minimum Percentage of Zemea® Propanediol Needed to Boost Preservative Efficacy

Preservatives		Challenge Organisms				
		gram-positive	gram-negative	gram-negative	yeast	mold
		Staphylococcus aureus	*Escherichia coli*	*Pseudomonas aeruginosa*	*Candida albicans*	*Aspergillus niger*
phenoxyethanol-based	Microcare PM3 (0.15%)	2%	2%	2%	4%	2% (1 log reduction)
	euxyl® PE 9010 (0.25%)	4%	4%	2%	6%	2% (1 log reduction)
	Neolone PE (0.3%)	2%	2%		6%	2% (1 log reduction)
	Jeecide CAP-4 Optiphen (0.25%)	2%	2%		6%	2% (1 log reduction)
natural	Lexgard® Natural (0.5%)	Preservative levels provided sufficient reduction to <1.00 CFU/g without addition of Zemea® propanediol.				2% (1 log reduction)
	Dermosoft 688 ECO (0.1%)				2%	2% (1 log reduction)
	Geogard® ULTRA (0.5%)				2%	2% (1 log reduction)

Organisms reduced to <1.00 CFU/g at Day 7

Why use Zemea® USP-NF propanediol?

Zemea® USP-NF propanediol is made from the fermentation of glucose, and contains no added preservatives, petroleum-based ingredients, or animal by-products. Benefits include:

- Improved/Excellent humectancy
- No skin irritation or sensitisation
- Boosts/Improves preservative efficacy
- Improves sensory characteristics
- May help deliver actives to the skin
- Maximum solubility

Formulation proposal

Composition, manufacturing procedure, and specification values are available on our formulation sheets. For further information on the individual ingredients, as well as their functionality, please contact us.

BSC PH 1707, Substantive Cream Base with Zemea®

Appearance: white emulsion

Trade Name	Supplier	%
Dow Corning® TI-7012 Solid Resin	Dow Corning®	12,00
Dow Corning® TI-1050 Fluid 1.5 cst	Dow Corning®	15,00
Dow Corning® TI-6021 W/O Formulation Aid	Dow Corning®	5,00
Dow Corning® Q7-9120 Silicone Fluid 20 CST	Dow Corning®	1,00
Aqua demin.		54,00
Palmera G995E	KLK Oloe	5,00
Sodium Chloride	various	1,00
Zemea® USP-NF Propanediol	DuPont Tate & Lyle Bio Prod.	4,50
Euxyl PE 9010	Schülke & Mayr	1,00
D-Panthenol 75 W	Hangzhou Xinfu	1,50
		100,00
	% oilphase	33,00

BSC PH 1707:

Zemea® USP-NF Propandiol was choosen as ingredient for its benefit to increase moisturisaton and to reduce the tackiness of glycerine.

BSC PH 1703, Spot Off – Intense

Trade Name	Supplier	%
Palmera G995E	KLK Oleo	15,00
Zemea® Propanediol	DuPont Tate & Lyle	5,00
Kaolin	Biesterfeld	1,00
Deionised Water		49,00
Sodium Chloride	various	1,00
Niacinamide	Jubilant	4,00
Dow Corning® TI-1050 Fluid 5 cst	Dow Corning®	13,00
Dow Corning® TI-6021 W/O Formulation Aid	Dow Corning®	1,00
Dow Corning® TI-3021 Silicone Elastomer Blend	Dow Corning®	10,00
Euxyl PE 9010	Schülke & Mayr	0,70
Tea Tree Oil Cineolless Ph. Eur. 1001305	Düllberg	0,30
		100,00

BSC PH 1703:

Zemea® USP-NF Propandiol was choosen as ingredient for its benefit to reduce the tackiness of glycerine and the preservative boosting efficacy.

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Published by:
Biesterfeld Spezialchemie GmbH – Healthcare
Ferdinandstrasse 41
20095 Hamburg, Germany
Phone: +49 40 32008-612
Fax: +49 40 32008-696
Mail: healthcare@biesterfeld.com

Registered Office: Hamburg, Commercial Register: AG Hamburg, HRB 66970, VAT ID DE196 930 661

Managing Directors: Dr. Nicole Hamelau, Peter Wilkes