



SMA'RT™ Guard ZEM

- **Natural Glycol - COSMOS & ECOCERT**
- **Moisturizing**
- **Anti-microbial Booster**
- **GMO Free**

100% Natural Origin

SMA'RT™ Guard ZEM is an 100 % natural glycol (approved by COSMOS & ECOCERT) and derives from bio-fermentation process. It is colorless and odorless. SMA'RT™ Guard ZEM can be used for skincare and personal care products as a cosmetic solvent, humectant, emollient replacing synthetic and petroleum product. Light skin feeling and easy spreadable character are very attractive to the formulator. With good anti-microbial boosting effect and no skin irritation, SMA'RT™ Guard ZEM is very useful and widely spreading in cosmetics and natural solvent.

Technical Information

INCI Name	Propanediol
Technical / Other name	1,3-Propylene glycol, 1,3-Propanediol
CAS No.	504-63-2
Appearance	Transparent liquid
Aspect	Colorless, Odorless
Solubility	Water soluble
Recommended dosage	~ 30 %

Skin Safety **Human Skin Patch Test**

SMA'RT™ Guard ZEM under the single application patch test for 48 hrs to female adults subjects can be considered no irritant.

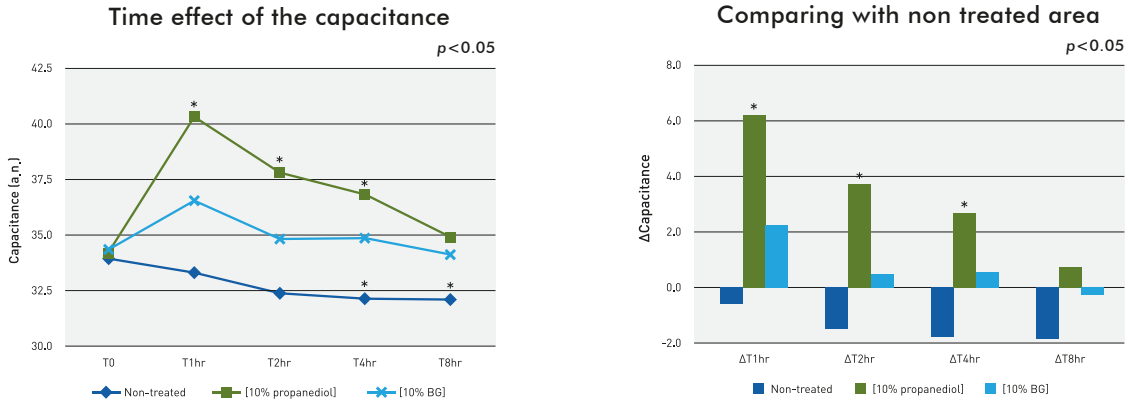
Test Sample	Concentration	Result
SMA'RT™ Guard ZEM	100 %	No irritant



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Efficacy

1) Moisturizing effect



SMA'RT™ Guard ZEM significantly increased skin moisturizing effect than 1,3-Butylene glycol.

2) Anti-microbial effect

SMA'RT™ Guard ZEM

Days	1	4	6	8
Microorganism	Bacteria	ND	-	-
Microorganism	Yeast	ND	-	-
Microorganism	Mold	1.7 x 10 ³	ND	-

better

similar

1,3-BG

Days	1	4	6	8
Microorganism	Bacteria	ND	-	-
Microorganism	Yeast	ND	-	-
Microorganism	Mold	1.2 x 10 ³	1 X 10	ND
Microorganism	Mold	1.2 x 10 ³	1 X 10	2 X 10

Glycerin

Days	1	4	6	8
Microorganism	Bacteria	ND	-	-
Microorganism	Yeast	ND	-	-
Microorganism	Mold	1.1 x 10 ³	ND	-

As a result of challenge test, SMA'RT™ Guard ZEM showed better preservative effect than 1,3-Butylene glycol and has similar effect with Glycerin.