Surfactants
Cosmetic products depend strongly on their emulsifiers. There are technical considerations regarding the best emulsifier that define the product concept and stability of the formulation. This is the basic requirement for emulsifiers and a whole set of compounds is necessary to serve the different concepts in cosmetics. But also the sensorial profile is strongly influenced by the choice of emulsifiers, and so the skin feel of cosmetics can be altered by certain emulsifiers. Finally sustainable sourcing of natural raw materials or absence of certain chemicals may play an important role in the product development.

Natural polyglyceryl esters meet many of the requirements for modern formulations. Under the roof of our dermofeel® brand there are many emulsifiers with entirely different properties. There is one common feature in our emulsifiers: they are produced using only natural building blocks. The majority of the range consists of polyglyceryl esters of edible fatty acids, forming a broad range of emulsifiers covering the whole HLB-range. The range is completed by anionic emulsifiers dermofeel® GSC and dermofeel® SL.

Emulsions are best formed and stabilized with our non-ionic dermofeel® emulsifiers that cover w/o-applications as well as o/w-concepts. With the great variety of chain lengths at the hydrophilic polyglyceryl unit and the use of different fatty acids as lipophilic moieties we create an array of products that gives freedom for developing modern naturally oriented and PEG-free cosmetic concepts. Please refer to the list below to learn more about the properties and applications. In contrast to PEG-derived products our dermofeel® range is 100% vegetable based, readily biodegradable and free from potentially toxic impurities. It may be interesting to know, that the technically determined distribution of different chain lengths gives an extra of emulsion stability. It has been shown, that a certain distribution in size is beneficial, as the molecules of different sizes can fill gaps in the interface and thus lower surface tension better than structurally uniform emulsifiers. The polyglycerol section of the molecules consists of vegetable glycerine, which is polymerized in a mild and environmentally unobjectionable process.

Anionic co-emulsifiers are commonly used for further stabilization of emulsions. They are located at the interface along with other emulsifiers used in the formulation and due to their anionic charge the approach and coalescence of oil droplets within the emulsion is hindered. Furthermore these emulsifiers build up structures within the emulsion and help to increase the viscosity. Both effects are used as a general stabilising principle and also to compensate the slightly destabilizing effect that some modern antimicrobial agents exhibit in emulsions. Thus the long term stability of emulsions can be enhanced. Our vegetable food grade emulsifiers dermofeel® GSC (Glyceryl Stearate Citrate) and dermofeel® SL (Stearoyl Lactylate) are designed for that purpose. The beneficial effect on the emulsion stability of dermofeel® GSC and dermofeel® SL are completed by the elegant skin feel, they help to produce in the formulation.

Convenience is what can be achieved with a versatile emulsifier blend like our symbio®-mul GC. This innovative blend comprises a powerful anionic emulsifier, a structurizing co-emulsifier and a wetting agent to allow a quick formation of emulsions at temperatures as low as 40°C. Different viscosities can be achieved and the blend gives a basic preservation to the finished product. This allows a minimized use of preservatives or creating a preservative free

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**Fig. 1:** The whole HLB-range is covered by the flexible combination of different chain lengths of the polyglycerol unit and the different fatty acid moieties. Thus, with only plant derived raw materials it is possible to form emulsifiers for every product concept.

**Fig. 2:** Dermofeel GSC (Glyceryl Stearate Citrate) can effectively help to maintain the viscosity even with high levels of Caprylyl Gycrol or other surface active compounds which may tend to lower the viscosity.
formulation, as long as other antimicrobial agents (e.g. dermsof®) are used.

**Solubilizers** are used to stabilize small amounts of oils in aqueous products. The oil components may be fatty oils to create a certain sensorial effect and add caring properties to aqueous formulations or essential oils to form a scent and define the first and probably most important impression of a cosmetic product. dermofeel® G 6 CY (Polyglyceryl-6-Caprylate) and dermofeel® G 10 L (Polyglyceryl-10-Laureate) perfectly fulfill the requirements and are used as powerful, PEG-free solubilizers. Many product concepts have been realized with dermofeel® G 10 L as a solubilizer and show that effective solubilisation can well be achieved with purely natural raw materials.

**Natural and safe.** These attributes apply to all our vegetable based emulsifiers. They are derived from plant sources and designed to meet the needs of cosmetic formulations. Only natural sustainable resources are used and rule out any presence of toxic impurities like halogenated or ethoxylated organic compounds. To underline the safe use of the presented raw materials a long history of use in the food industry of many polyglycerylesters shall be mentioned. Dermofeel emulsifiers can be used for natural cosmetics concepts. They are fully biologically degradable. The new line of organic ingredients underlines our efforts to develop ingredients respecting natural production. dermorganics® are ingredients produced using the highest possible degree of building blocks derived from organic sources. Yet they are proven functional ingredients that match the requirements for modern cosmetic products.

### Our non-ionic O/W Emulsifiers

<table>
<thead>
<tr>
<th>INCI</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>symbio® muls GC</td>
<td>Easy to use emulsifying blend, for homogenous elegant creams and lotions. Can be used at low temperatures. Natural origin.</td>
</tr>
<tr>
<td>dermofeel® PS</td>
<td>Vegetable food grade emulsifier for O/W-emulsions (HLB ~ 9)</td>
</tr>
<tr>
<td>dermofeel® PP</td>
<td>Vegetable food grade emulsifier for O/W-emulsions (HLB ~ 10)</td>
</tr>
<tr>
<td>dermofeel® G 2 L</td>
<td>Re-fattying and consistency agent (HLB ~ 9)</td>
</tr>
<tr>
<td>dermofeel® G 5 L</td>
<td>Vegetable emulsifier for O/W-emulsions (HLB ~ 13)</td>
</tr>
<tr>
<td>dermofeel® G 5 O</td>
<td>Natural vegetable emulsifier for oilgels (HLB: ca. 11,5)</td>
</tr>
<tr>
<td>dermofeel® G 5 DO</td>
<td>Natural vegetable emulsifier (HLB: ca. 8)</td>
</tr>
<tr>
<td>dermofeel® G 10 DI</td>
<td>Natural vegetable emulsifier (HLB: ca. 11)</td>
</tr>
</tbody>
</table>

### Our W/O Emulsifiers

<table>
<thead>
<tr>
<th>INCI</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>dermofeel® PR</td>
<td>Highly versatile emulsifier for W/O emulsions of low viscosity (HLB ~ 4)</td>
</tr>
<tr>
<td>dermofeel® PO</td>
<td>Co-emulsifier for W/O-emulsions</td>
</tr>
</tbody>
</table>

### Our Solubilizers

<table>
<thead>
<tr>
<th>INCI</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>dermofeel® G 6 CY</td>
<td>Non-ionic solubilizer (HLB ~ 15)</td>
</tr>
<tr>
<td>dermofeel® G 10 L</td>
<td>Highly skin-friendly solubilizer and surfactant (HLB ~ 16)</td>
</tr>
<tr>
<td>dermofeel® G 10 LW</td>
<td>Highly skin-friendly solubilizer and surfactant (HLB ~ 16)</td>
</tr>
</tbody>
</table>

### Our Anionic O/W Co-emulsifiers

<table>
<thead>
<tr>
<th>INCI</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>dermofeel® SL</td>
<td>Vegetable food grade co-emulsifier for O/W-emulsions</td>
</tr>
<tr>
<td>dermofeel® GSC</td>
<td>Vegetable food grade emulsifier for O/W-emulsions</td>
</tr>
</tbody>
</table>

### Our Organic Emulsifier

<table>
<thead>
<tr>
<th>INCI</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>dermorganics® GSC</td>
<td>O/W-Emulsifier from organic sources</td>
</tr>
</tbody>
</table>
OUR REPRESENTATIVES ABROAD

Europe

Benelux
Jan van Laarhoven-Waalwijk b.v.
E-Mail: laarhoven@planet.nl

Bulgaria
Biesterfeld Pro Specialty Chemicals
E-Mail: pavels.makedonski@biesterfeldpro.com
www.biesterfeldpro.com

Croatia
Biesterfeld Spezialchemie d.o.o.
E-Mail: gordana.peric@biesterfeld.hr
www.biesterfeld.hr

Czech Republic
Biesterfeld Silcom s.r.o.
E-Mail: terezie.sestakova@bisi.cz
www.bisi.cz

Denmark/Iceland/Norway
Bionord A/S
E-Mail: info@bionord.dk
www.bionord.dk

France
Lucas Meyer Cosmetics S.A.
E-Mail: info@lmcosmetics.fr
www.lmcosmetics.fr

Great Britain
Gemro Products Ltd.
E-Mail: stephen.blech@gemroproducts.com
www.gemroproducts.com

Greece
Celtco Chemicals Ltd.
E-Mail: paraskevopoulos@celco.gr

Hungary
Biesterfeld Special Chemicals Hungary Ltd.
E-Mail: ivereckei@biesterfeld.hu
www.biesterfeld.hu

Italy
Pharma Cosm Poli srl
E-Mail: info@pharmacosm.it
www.pharmacosm.it

Poland
Biesterfeld Polska Sp.z.o.o.
E-Mail: cborzyminska@biesterfeld.com.pl
www.chemia.biesterfeld.com.pl

Romania
Biesterfeld Spezialchemie Romania S.R.L.
E-Mail: cmicu@biesterfeld.ro
www.biesterfeld-specialchemie.ro

Spain
Comercial Quimica Jover, S.L.
E-Mail: comercial@cqjover.com
www.cqjover.com

Sweden/Finland
Bionord AB
E-Mail: lena@bionord.se
www.bionord.se

Switzerland
Rahn AG
E-Mail: schuler@grrahn-group.com
www.rahn.ch

Asia/Pacific

Iran
Tooska-E-Khorasan Trading Co.
E-Mail: hr@tooskaaco.com
www.tooskaco.com

Israel
Efal chemical industries ltd.
E-Mail: roni@efal.com
www.efal.com

Korea
HANA Trading Company
E-Mail: Hoffnung@hitel.net

Phillippines
CTC Far East Phils. Inc.
E-Mail: faith@ctcfareastphils.com
www.ctc-group.com

Thailand
Adinop Co. Ltd.
E-Mail: mail@adinop.co.th
www.adinop.co.th

Australia/New Zealand
RejuvaCare
E-Mail: smorse@rejuvacare.com.au
www.rejuvacare.com.au

Argentina/Brazil
nordest nova s.a.
E-Mail: sergio.egrassia@nordest-nova.com
www.nordest-nova.com

USA
Kinetik Technologies, Inc.
E-Mail: chi@kinetiktch.com
Web: www.kinetiktch.com

Colombia
Cromaroma Ltda
E-Mail: cromaroma@teltb.net.co

Africa

South Africa
Meganede
E-Mail: megan.jones@meganede.com
www.meganede.com

Dr. Straetmans Chemische Produkte GmbH
Merkurring 60–62 · D-22143 Hamburg
Phone: +49 40-86 93 56 60 · Fax: +49 40-66 93 56 310
email: info@dr-straetmans.de · www.dr-straetmans.de