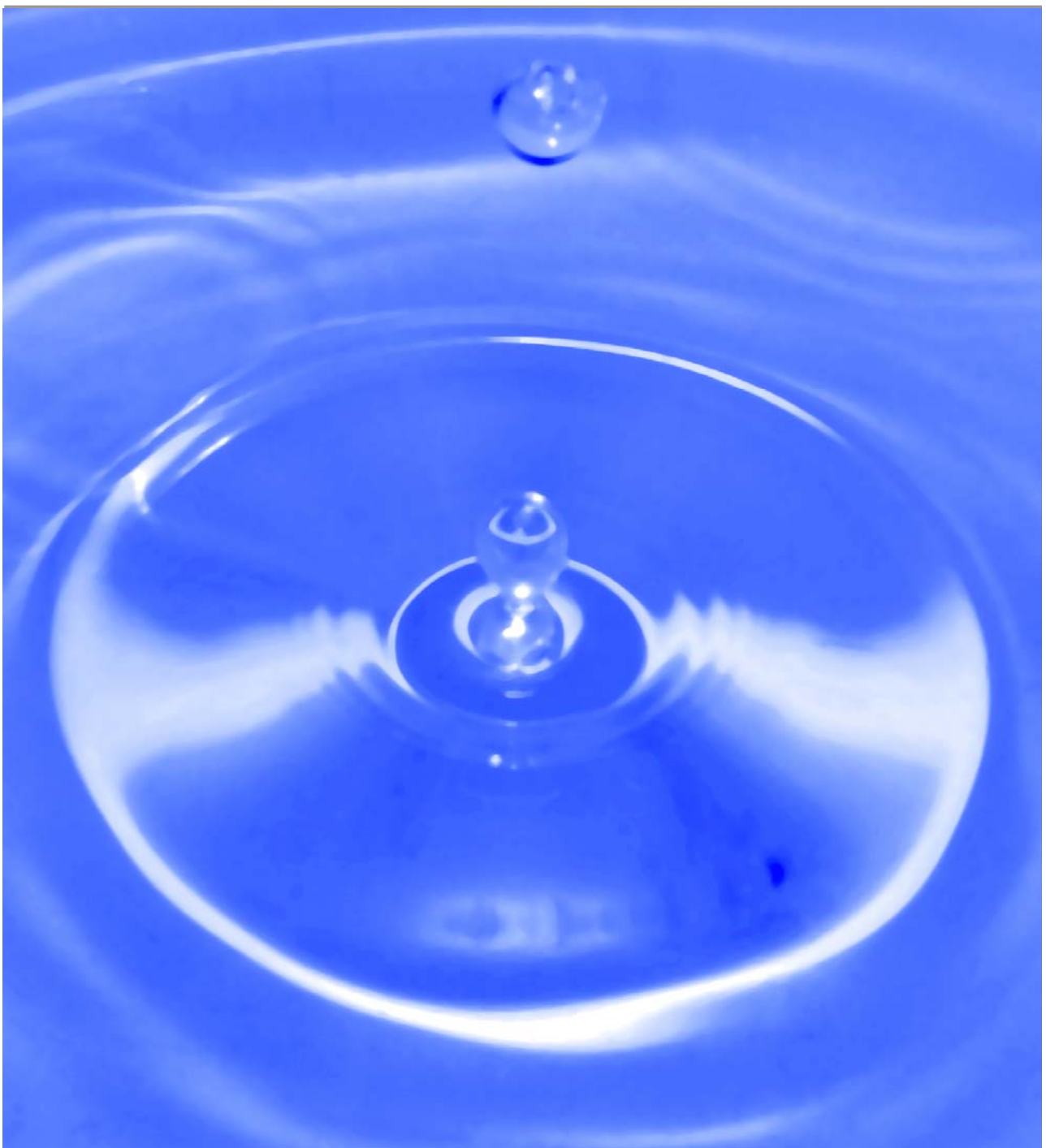


Crystal Clear Solutions for Food, Health, Cosmetics & Pharma



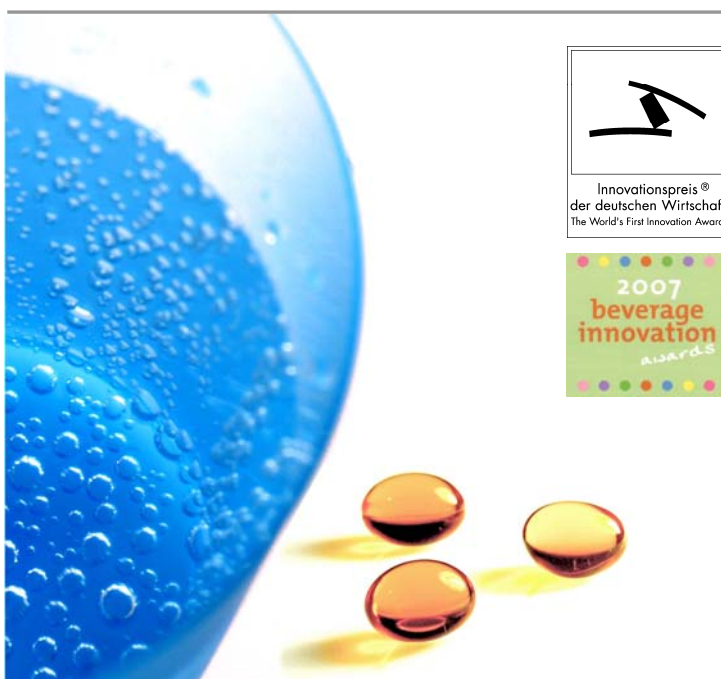


Crystal Clear Solutions for Food, Health, Cosmetics & Pharma

AQUANOVA is a leading supplier of innovative liquid solutions ("solubilisates") for a broad spectrum of well known raw materials and active substances (e.g. vitamins, fatty acids or phytoextracts). AQUANOVA develops, produces and together with partners markets these solubilisates (product brand "NovaSOL®") utilizing its proprietary and patent protected technology.

AQUANOVA focuses on close cooperation and relationships with renowned scientists and industry experts. Therefore its strategy, marketing activities and all NovaSOL® solubilisates can rely on a profound research and a reliable business basis.

All products utilize the superior characteristics and benefits of AQUANOVA's advanced solubilisation technology. For the first time a broad variety of fat soluble substances are now available as crystal clear water soluble liquids. The same is true for the former purely water soluble substances. Unlike other formulations, NovaSOL® solubilisates are both water and fat soluble ("ambiphilic").



NovaSOL® solubilisates

Liquid, at the same time water and fat soluble raw materials & ingredients:

- Vitamins
- Omega 3 fatty acids
- Coenzyme Q10
- Isoflavones, flavonoids, carotenoids
- Phyto extracts
- Essential oils
- Preserving agents
- Food colors

A key technology

The NovaSOL® technology has been awarded several times and offers outstanding and reliable functional & technical characteristics:

- Crystal clear & liquid solutions
- Superior carrier system
- No modification of substances
- Superior bioavailability
- High effectiveness of actives
- Both water & fat soluble ("ambiphilic")
- Mechanically, thermally, pH stable
- Easy & ready to use for production
- Processing without additives
- Safe for broad use (e.g. "GRAS status")
- Patent protected
- Complies with high industry standards

2006

FROST & SULLIVAN

Excellence in Technology Award

Scientific basis

The effect of NovaSOL® solubilisates rely on a broad range of randomized controlled blinded studies:

- e.g. for Coenzyme Q10
- e.g. for skin penetration
- e.g. for preservation capacity
- e.g. for antioxidative capacity



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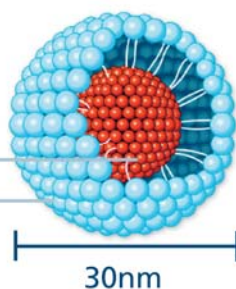
Micelle structures are an essential and natural part of life (e.g. casein sub-micelle in milk, HDL/LDL micelle in hen eggs, physiological built micelle in the intestinal tract) AQUANOVA adopts this principle for ingredients and raw materials in an innovative and reliable way. The product micelles completely comply with nature's architecture and are based on AQUANOVA solubilisates. They have a diameter of around 30 nanometers (a billionth of a meter) and therefore are even smaller than the wavelength of light. This makes it possible for NovaSOL® solubilisates to create crystal clear solutions, which prove to have a significantly higher bioavailability than other formulations on the market today.

Thus NovaSOL® solubilisates go far beyond the scope of standard powders or other standard formulations. NovaSOL® solubilisates can be used in a broad variety of applications and products such as beverages or dietary supplements, e.g. as soft gel capsules. Furthermore the solubilisates are proven to be very stable and ready to use for production. Thus AQUANOVA opens up a new space for your creation of innovative products in the food, health, cosmetics and pharmaceutical sectors.

NovaSOL® Product micelle

Core (active substance)

Shell



Conventional emulsions and microemulsions exhibit particle sizes of up to approx. 3000 nm. This facilitates no improvement in the bioavailability or penetration. A disadvantage of conventional formulations is also their restricted stability. Liposomes are, for example, often mechanically, thermally and pH unstable and are already partially broken down during the production process (incorporation into the end product). Furthermore, in comparison to product micelles, liposomes offer a 40% smaller core or loading volume.

Reliable & effective

AQUANOVA allows utilizing nature like micelle structures in an effective way:

- All NovaSOL® solubilisates are based on a stable micelle structure.
- Micelle structures are an essential part of nature's architecture (e.g. in milk or in hen eggs)
- The size of 30 nm offers a perfect balance of superior bioavailability, effectiveness and high loading capacity
- All active substances are chemically unmodified.
- AQUANOVA applies the highest industry standards for its production as well as the substances.

Application & Industry Focus

AQUANOVA offers solutions for your industry and specific requirements:

- Nutraceutical ingredients / Supplements
- Food Additives & Functional Ingredients
- Beverage colors
- Cosmeceutical ingredients
- Surface disinfection
- Preservation of products & machinery
- Pharmaceutical products



Product Presentation

NovaSOL® products are offered in a variety of ready to use forms such as:

- Pure liquid bulk solubilisate
- Soft gel Capsules in bulk or full service
- Drink ampules in bulk or full service

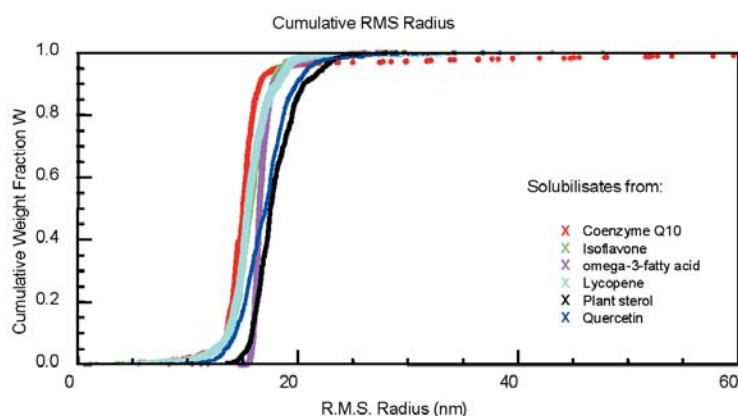


Crystal Clear Solutions for Food, Health, Cosmetics & Pharma

In contrast to liposomes and other microencapsulation technologies, the product micelles developed by AQUANOVA are thermally and mechanically stable, also in gastric acid (pH value = 1.1) and, in tune with the start of the era of nanotechnology, they exhibit an average diameter of only approx. 30 nm. The AQUANOVA product micelles therefore are the "nanosomes" of the future with reliable, beneficial and proven features. Through these properties the micelles, which are loaded with lipophilic and/or hydrophilic substances, generate crystal clear liquid solutions not just from an optical viewpoint.

The nano dimension of the micelles is demonstrated by their radial distribution in the AQUANOVA solubilisates in aqueous dilution as measured with field flow fractionation. It is clearly smaller than most liposomes or nanosomes which normally have particle sizes of from 100 nm upwards.

Here, where micro-emulsions and liposomes prove to be problematical and unsuitable, the product micelle represents the optimum solution in the fields of foodstuffs (functional food), cosmetics, pharmaceuticals and biotechnology (nutritional solutions for cell and bacterial cultures). The product micelle, which is soluble in water and fats, can be integrated, homogeneously absolutely stable, directly and independently of recipe characteristics into final products in the quoted fields.

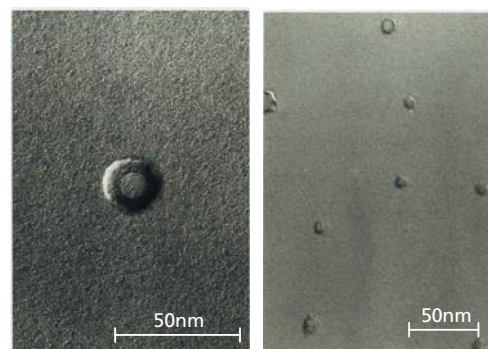


Patent protection

AQUANOVA's technology and products rely on a strong patent portfolio:

- More than 100 patent applications
- More than 50 patents granted
- Constant IP development and protection in order to service the global players on a reliable basis.

Electron-microscopic image
(technical university of Darmstadt, Germany)
in an aqueous dilute solution (1:1000)



Vitamin A Micelle

Vitamin E Micelle

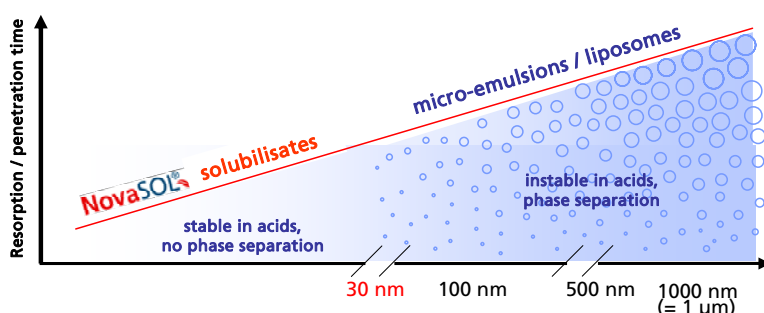
Documentation & Samples

All products are professionally documented and AQUANOVA can furthermore furnish valuable and application oriented research:

- Product data sheets
- Certificates of analysis
- Material safety data sheets (MSDS)
- Summary bioavailability studies
- Product samples



Crystal Clear Solutions for Food, Health, Cosmetics & Pharma



| | NovaSOL® solubilisates | Micro-emulsions / liposomes |
|--|---|---|
| Visual appearance | Completely and irreversibly water-soluble, Fully transparent in aqueous solution | Water-insoluble (turbid to opaque in aqueous media) |
| Stability | Thermally and mechanically stable, also in gastric acid, and microbiologically less susceptible | Thermally and mechanically instable, also in gastric acid and susceptible microbiologically |
| Oral application | High and fast intestinal resorption (without involving gastric acids) | Lower and slower resorption (with the aid of bile acids) |
| Dermal application | High and fast penetration | Lower and slower penetration |
| Integration into end products | Optimal and direct integration into end products, irrespective of condition of end products | Complex and sometimes problematic Integration into end products |
| Loading capacity (for d = 30nm) | Micelles : 9200 nm ³ | Liposomes : 5600 nm ³ |

In the intestinal region (small intestine), lipophile substances can only be rendered restorable in the form of micelles, which are established with the aid of bile salts. Due to this micelle formation by the body, which is generally taken as a prerequisite for the resorption of lipophile substances, fat-soluble vitamins are in the extreme case ingested or resorbed by only up to 2%. AQUANOVA's product micelles in the solubilisates enable an optimum (up to four times higher or quicker) resorption of the raw or active substances located in them.

Due to their properties, the solubilisates prove to be an optimum "transport system" for various substances for a higher and quicker intestinal and dermal resorption or penetration of active substances.

Functional benefits

NovaSOL® solubilisates are "enabler" for new and innovative products:

- Liquid and crystal clear solutions
- Significant higher bioavailability
- Significant better dermal penetration
- Protection of human body (lower dose / better effectiveness)
- Stability: Mechanically + thermally + pH
- Utilize real & proven nanotechnology

Technical benefits

NovaSOL® solubilisates are a "booster" for production and create return on investment:

- Significant reduction of oxidation
- Protection of resources & environment
- Integration without matrix design
- Processing without additives
- Lower dosis for same effect
- Natural and liquid ingredients
- Stability: Mechanically + thermally + pH



"Ambiphilic" character

NovaSOL® solubilisates overcome the border of former only hydrophilic or only lipophilic substances:

- Real solutions in aqueous phase
- Finest, stable homogeneity
- In W/O and/or O/W emulsions
- Without matrix design, additives or intervening of production steps



Crystal Clear Solutions for Food, Health, Cosmetics & Pharma

Wide range of application: NovaSOL® solubilisates clear the way.

There are hardly any boundaries to the range of applications of AQUANOVA's nanostructured solubilisates. The NovaSOL® product family – all based on the product micelle as the nano carrier - today is only at the beginning of their successful development.

In general solubilisates are used in the following fields for functional (e.g. significantly better bioavailability for dietary supplements) as well as for technical applications (e.g. superior antioxidative protection of vegetable oils):

| | NUTRITION | HEALTH | COSMETICS | PHARMA |
|-------------------------|-----------|--------|-----------|--------|
| Technical Applications | | | | |
| Functional Applications | | | | |
| General Solubilisation | | | | |

With the product micelle AQUANOVA has generated the prerequisites for overcoming the previous hurdles of the bioavailability and the incorporation of starting and active substances in end products in the food, cosmetics and pharmaceutical sectors.

The size of the micelles in the nano range plays a decisive role in the realization of the necessary functions and objectives. Last, but not least, the miniaturization in the form of the product micelle produces another result: Higher quality of life due to sustained improvements to products on a wide front.

Broad scientific basis

The solubilisates offer advantages which have been demonstrated, for example, by the following recognized studies:

- In 2004 the clearly higher bioavailability of solubilised vitamin E was proven in a study by the University of Hohenheim (refer to the publication in "European Journal of Nutrition" of 23.02.2005).
- In 2003, the superiority of solubilised coenzyme Q10 compared to its fat-soluble counterpart was confirmed at the same university under the leadership of Prof. Dr. Biesalski.
- In a study at the Dermatology Clinic Karlsruhe in 2003 it was shown that the solubilisates are superior to conventional formulations with regard to the penetration of tocopherol, retinol and coenzyme Q10 in deeper skin layers.
- The improvement in the vitamin supply for the reduction of the "oxidation stress", which is sometimes caused by diseases such as mucoviscidosis, is decisively supported by the micelle. For the according study the Dr. Evelyn Back was awarded the Dr. Werner Fekl Sponsor Prize 2004 for clinical nutrition.
- AQUANOVA has proven the superior CoQ10 bioavailability (up to four times faster and higher absorption) of its product "NovaSOL® Q" in a controlled blinded and randomized study (2005) with 60 participants.





Crystal Clear Solutions for Food, Health, Cosmetics & Pharma

Examples for lipophile substances incorporated into the NovaSOL® Solubilisate = Extension of the hydrophilic character by solubilisation (= soluble in fats and water)

- Vitamin E,
 - Lutein,
 - Alpha-lipoic acid,
 - Omega-3 fatty acids,
 - Various flavonoids,
 - Other various lipophile active substances for the pharmaceutical sector and nutrient solutions
- Vitamins A, D, K,
 - Quercetin,
 - Ethereal oils,
 - β -carotene,
 - Ubichinon (coenzyme Q10),

Examples hydrophile substances incorporated into the NovaSOL® solubilisate = Extension of lipophile character by solubilisation (= soluble in water and fats):

- Ascorbic acid,
 - Citric acid,
 - Potassium sorbate,
 - Other various pharmaceutical active substances
- Sodium ascorbate ,
 - Sweeteners,

Plant extracts = Integration of the lipophile and/or hydrophile fractions into the micelle (= soluble in water and fats). For industrial production and for end products, all AQUANOVA solubilisates offer decisive advantages:

- In contrast to the original starting substances contained in them, the solubilisates can be incorporated into end products in the food, cosmetics and pharmaceutical sectors without the addition of additives and without any further processing steps and without matrix design.
- Improvement of the oxidative protection of the starting and/or active substances enclosed in the micelle (N.B.: As does the natural mixed micelle, which in the small intestine enables the release of the starting and active substances via the intestine-blood barrier for fulfilling the fat metabolism mechanism, the product micelle fulfills this function in optimized form.
- Retention of transparency in the end product after the addition of the solubilisate.



Strong Partners

AQUANOVA is positioned as a partner for the global industry players and manage to establish according relationships such as:

- for Vitamin E (beverage): marketing by BASF as „Solu™ E“
- for alpha-lipoic acid: marketing by Cargill as „Alipure® SOL“





Crystal Clear Solutions for Food, Health, Cosmetics & Pharma

By means of NovaSOL® products, AQUANOVA addresses a wide range of applications such as:

| Application (Segment) | Benefits |
|---|--|
| Functional Food (Nutrition) | Liquid solutions for the creation of health oriented food products |
| Supplements (Health) | Unique formulations for significantly higher bioavailability |
| Functional beverages (Nutrition) | Crystal clear solutions for innovative beverage formulations |
| Clear, natural colors (Nutrition) | Crystal clear color solutions on basis of natural colors (including replacements for azo dyes) |
| Meat & sausages (Nutrition) | Curing agent and superior antioxidative capacity / fully fat soluble ascorbic acid |
| Essential oils (Nutrition) | Superior antioxidative capacity with natural substances |
| Vitamin supply (Health) | New formulations for effective galenics (e.g. mucoviscidosis) |
| Oral Care (Health) | Unique formulation for liquid oral application |
| Skin Care (Cosmetics) | Effective formulation for superior proven penetration of skin |
| Nutrient solutions (Pharma) | Unique formulation for effective supply of micro organisms |
| Desinfection (General) | Food grade benzoic- and sorbic acid solubilisates for sustainable surface protection |
| Preservation (Nutrition) | Superior effectiveness and application of preservation substances |



In accordance with its industry and B2B focus AQUANOVA is committed to the highest standards and material criteria such as:

- ISO 9001:2008
- GMP
- Kosher
- HALAL
- GMO free
- HACCP
- BSE free
- Allergen free
- Dioxin free
- ...:



Strong Network

The reliability and credibility of AQUANOVA solutions is also based on a strong network of experts and institutions:

- University of Hohenheim (Prof. Biesalski)
- University of Munich (Prof. Elstner)
- University of Berlin (Prof. Weber)
- Albert-Ludwigs-Universität, Freiburg
- Technical university of Darmstadt
- University of California (UCLA)



Crystal Clear Solutions for Food, Health, Cosmetics & Pharma



AQUANOVA is a supplier of innovative and versatile formulations of food and cosmetic ingredients, nutrients and pharmaceutical actives with superior properties providing new application opportunities. AQUANOVA in close cooperation with renowned scientists develops and manufactures (under ISO / GMP) liquid formulas (solubilisates with product brand "NovaSOL®") utilizing its proprietary technology. The solubilisates have a micelle structure, which is thermally, mechanically and pH stable, even in gastric acid. Owing to the special properties of this micelle structure, the solubilisates support the development of novel innovative and pioneering dietary supplements, functional foods and beverages, cosmetic products and pharmaceuticals. The company's headquarter is located in Darmstadt (near Frankfurt), Germany.

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