



Crystal Clear Solutions



Product Micelle

Shell

Core (active substance)



2006

F R O S T & S U L L I V A N

Excellence in Technology Award



2006 Advances in Medical and Specialty Nutrition, Excellence in Technology Award



AWARD DESCRIPTION

Frost & Sullivan's Excellence in Technology Award is bestowed upon a company that has pioneered the development and introduction of an innovative technology into the market; a technology that has either impacted or has the potential to impact several market sectors. This award recognizes a company's successful technology development that is expected to bring significant contributions to the industry in terms of adoption, change, and competitive posture. It also recognizes the company's overall technical excellence and its commitment towards technology innovation.

RESEARCH METHODOLOGY

To choose the award recipient, Frost & Sullivan's analyst team tracks technology innovation in key hi-tech markets. The selection process includes primary participant interviews and extensive primary and secondary research via the bottom-up approach. The analyst team shortlists candidates on the basis of a set of qualitative and quantitative measurements. The analysts also consider the pace of technology innovation, and the potential relevance or significance of the technology to the overall industry. The ultimate award recipient is chosen after a thorough evaluation of this research.

MEASUREMENT CRITERIA

In addition to the methodology described above, there are specific criteria used to determine the final rankings. The recipient of this award has excelled based on one or more of the following criteria:

- Number of new technologies developed or introduced
- Significance of a technology/ technologies in the industry
- Competitive advantage of technology/ technologies vis-à-vis competing technologies
- Ease of adoption of new technology/ technologies
- Potential of technology/ technologies to become an industry standard



Aquanova German Solubilise Technologies (AGT) GmbH

The Frost & Sullivan 2006 Excellence in Technology Award in the field of solubilisation processes for functional foods and dietary supplements goes to Aquanova German Solubilise Technologies (AGT) GmbH, in recognition of the company's development of the highly sophisticated NovaSOL® Nanosome technology, which enables the encapsulation of active functional food and supplement ingredients. Unlike the conventional emulsion and microemulsion particles with massive particle size, this technology enables the formation of micelles, which are just 30 nm in diameter, for encapsulating the active substance, thus enhancing its bioavailability many times over.

The human body needs to convert especially fat soluble nutrients into micelles prior to absorbing them. Micelle structures are nature's way of nutrient delivery and are part of daily products such as hen eggs ("LDL micelles" with a diameter of 20-60nm) or milk ("Casein sub-micelles" with a diameter of 10-20nm). As nutrients are delivered in the micelle form in accordance with nature's "nano architecture", the NovaSOL® technology enables cutting down on the amount of the active ingredient, which would have otherwise been lost in the conversion process. Based on the product micelle, the hydrophilic and hydrophobic substances are converted into NovaSOL® solubilisates that are soluble in both fat and water.

The Germany-based company has applied its technology to a broad variety of substances such as ascorbic acid in the patented NovaSOL® C, being the first and only fat soluble and chemically unmodified vitamin C worldwide. Other examples are Coenzyme Q10 ("NovaSOL® Q"), Vitamin E ("NovaSOL® E") or isoflavones ("NovaSOL® ISO"). Also Aquanova makes phytoextracts (e.g. rosemary extract or various polyphenol extracts) available as fully water and fat soluble solutions, which are easy to handle and to integrate into end products. Aquanova has been granted a US patent (Patent US 6,774,247 B2) as well as a German patent (DE 101 58 447 B4) for their ascorbic acid solubilise. The technology creates nanosized carriers within which the active ingredient is contained. There exists a core within which the

chemically unmodified substance (e.g. Coenzyme Q10) is present as the active substance surrounded by a shell, which is 30 nm in diameter and forms the nanocarrier. The technology makes substances both water and fat soluble ("ambiphilic") in addition to enhancing their bioavailability for humans.

The increase in bioavailability has been proven in many high standard clinical studies such as the 2005 study for Coenzyme Q10 ("NovaSOL® Q") with a trial population of 60 male subjects and the prove that NovaSOL has an up to 4 times higher bioavailability compared to straight CoQ10.

Soyisoflavones, as an example, belong to the category of phytoestrogens and exhibit a weak estrogen-like action. They play an important role in terms of lowering the rate at which aging occurs in perimenopausal women and find use as an alternative to hormone replacement therapy—helping women control menopause symptoms without the administration of any drug. An important challenge that isoflavone products encounter is the effective absorption of the active substance since the effect of phytoestrogens is several times weaker than that of estrogen. Aquanova has recently been granted a European patent for its new isoflavone solution ("NovaSOL® ISO").

Aquanova's technology offers advantages of processing without using additives, uses patent protected formulas (more than 30 patents are already issued), producing solutions that create superior bioavailability, are thermally, mechanically, and pH stable, chemically unmodified active substances, water- and fat-soluble solutions, with excellent antioxidant capacity, and creation of liquid and crystal-clear solutions. It has the potential to be applied to innovative beverages, cosmetic products, pharmaceutical products, dietary supplements, and functional foods. Global Players like BASF or Degussa Food Ingredients (acquired by Cargill in 2006) are already partners and can rely on Aquanova's high production and material standards such as ISO certification, GMP orientation, Kosher, Halal, GMO free, Allergen free, etc.

Frost & Sullivan acknowledges Aquanova German Solubilise Technologies (AGT) GmbH's technological excellence and its outstanding design and engineering efforts, as illustrated by its development of the unique, sophisticated NovaSOL® technology, and recognizes the company with the prestigious 2006 Excellence in Technology Award.

AQUANOVA receives Technology Award for its pioneering solubilisation technology
Frost & Sullivan awards AQUANOVA the “Excellence in Technology Award”

Darmstadt, August 30th, 2006 – AQUANOVA, leading supplier of nanostructured liquid formulas (“solubilisates”) for active substances, has been awarded the Frost & Sullivan “2006 Excellence in Technology Award” for developing the highly sophisticated solubilisation technology, based on nanoscaled encapsulation of nutrients and ingredients for functional foods and dietary supplements.

Frost & Sullivan’s Award is bestowed upon a company that has pioneered the development and introduction of an innovative technology that has either impacted or has the potential to impact several market sectors. The award recognizes, that AQUANOVA’s technology delivers nutrients and ingredients in the micelle form in accordance with nature’s ‘nano architecture’. Hereby hydrophilic and hydrophobic substances are converted into the liquid solubilisates (brand name “NovaSOL®”), which are soluble in both fat and water (“ambiphilic”). These solubilisates have proven to offer superior functional as well as technical application advantages.



The human body needs to convert fat-soluble nutrients into micelles prior to absorbing them. Here, AQUANOVA’s technology enables the formation of product-micelles, which are just 30 nanometer (billionth of a meter) in diameter for the encapsulation of active functional food and supplement ingredients (e.g. vitamins, phytoextracts, coenzyme Q10 or fatty acids), thereby enhancing its bioavailability many times over. High standard clinical studies such as the 2005 study for Coenzyme Q10 (NovaSOL® Q), have proven a bioavailability up to four times higher when compared to straight CoQ10.

As Frost & Sullivan reports, droplet sizes in conventional emulsions and microemulsions are up to approximately 3,000 nm and do not significantly enhance absorption or penetration. Moreover, these formulations often have a limited stability. NovaSOL® solubilisates on the contrary contain nanosized micelles, which are thermally, mechanically and pH stable and encapsulate the nutrients / ingredients with superior loading capacity.

Besides improving the efficacy of nutrients by improving their absorption, the solubilization technology also allows adding fat soluble nutrients to crystal clear beverages, which in that way had never been possible before. The technology also offers advantages in terms of processing, because it can be applied without the utilisation of additives. The patent-protected formulas (more than 30 patents are already issued) and the underlying production process leave the substances involved chemically unmodified.



The technology, which has its roots back in 1995 (when AQUANOVA was founded), has been applied to a broad variety of substances such as ascorbic acid in the patented NovaSOL® C (the first and only fat-soluble and chemically unmodified vitamin C) and Coenzyme Q10 (NovaSOL® Q), among others. It also offers innovative features for phytoextracts, making them available as fully water and fat-soluble solutions, which are easy to handle and to integrate into end-products such as soft gels. Underpinned by the company’s commitment to high production and material standards (such as ISO, GMP, Kosher, Halal, etc.) the unique benefits of its technology offer the potential for applications in a broad industry spectrum.



Company profile AQUANOVA:

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). Completely in accordance with the era of nanotechnology and nature's architecture, AQUANOVA develops, produces and together with partners markets these solubilisates (product brand "NovaSOL®") utilizing its proprietary and patent protected technology in close cooperation with renowned scientists and experts. The basis are nanostructured carriers (so called "product micelles"), which are thermally, mechanically and pH stable. These carriers, which are structured according to nature's architecture, exhibit an average diameter of only approx. 30 nm. AQUANOVA solubilisates are ready to use enablers for the development and production of innovative and pioneering products in the fields of nutraceuticals, (functional) food, cosmetics, and pharmaceuticals. The absorption of the active substances, carried by the solubilisate (product micelles) and the resulting bioavailability is significantly increased and optimized. In addition the solubilisates generate unique technical features and benefits such as superior antioxidative capacity for oils and fats. The ISO certified company, who also works for global players such as BASF and Degussa, was founded in 1995 and is headquartered in Darmstadt (near Frankfurt), Germany. For more information, visit www.aquanova.de.

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About Frost & Sullivan:

Frost & Sullivan, a global growth consulting company, has been partnering with clients to support the development of innovative strategies for more than 40 years. The company's industry expertise integrates growth consulting, growth partnership services and corporate management training to identify and develop opportunities. Frost & Sullivan serves an extensive clientele that includes Global 1000 companies, emerging companies, and the investment community, by providing comprehensive industry coverage that reflects a unique global perspective and combines ongoing analysis of markets, technologies, econometrics, and demographics. For more information, visit www.frost.com.

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AQUANOVA Receives Frost & Sullivan Award

Related News

Aug 29, 2006-**With their technology, nutrients are delivered in the micelle form in accordance with nature's 'nano architecture'. Hydrophilic and hydrophobic substances are converted into liquid NovaSOL solubilisates that are soluble in both fat and water.**



29/08/06 Frost & Sullivan has awarded the "2006 Excellence in Technology Award" to Aquanova German Solubilisate Technologies (AGT) GmbH for developing the highly sophisticated solubilisation technology, based on nanoscaled encapsulation of nutrients and ingredients, for functional foods and dietary supplements.

"With this technology, nutrients are delivered in the micelle form in accordance with nature's 'nano architecture'. Hydrophilic and hydrophobic substances are converted into liquid NovaSOL solubilisates that are soluble in both fat and water," notes Frost & Sullivan Research Analyst Ms. Kasturi Nadkarny. "In doing so, the solubilisation technology enables cutting down on the amount of the active ingredients, which would have otherwise been lost in the conversion process."

The human body needs to convert fat-soluble nutrients into micelles prior to absorbing them. Here, the Aquanova technology enables the formation of micelles, which are just 30 nm in diameter, for the encapsulation of active functional food and supplement ingredients, thereby enhancing its bioavailability many times over.

Nutrients in NovaSOL solubilisates are encapsulated and delivered as nanosized micelles of approx. 30nm in diameter, as required for enhanced absorption. This results in superior bioavailability of the encapsulated ingredient (e.g. vitamins, phytoextracts, coenzyme Q10 or fatty acids). High standard clinical studies such as the 2005 study for Coenzyme Q10 ("NovaSOL Q"), have proven a bioavailability up to four times higher when compared to straight CoQ10.

Droplet sizes in conventional emulsions and microemulsions are up to approximately 3,000 nm. They do not enhance absorption or penetration. Moreover, these formulations have a limited stability. NovaSOL solubilisates contain stable nanosized micelles, which encapsulate and deliver the nutrients / ingredients, and offer great advantages with respect to bioavailability, loading capacity, stability and ease of use.

Besides improving the efficacy of nutrients by improving their absorption, the solubilization Technology also allows adding fat soluble nutrients to crystal clear beverages, which had never been possible before.

"NovaSOL solubilisates are crystal-clear, even in water and offer excellent antioxidant capacity," states Ms. Nadkarny. "It also offers advantages of processing without the utilisation of additives, uses patent-protected formulas (more than 30 patents are already issued) and the process leaves substances chemically unmodified, providing thermal, mechanical and pH stability."

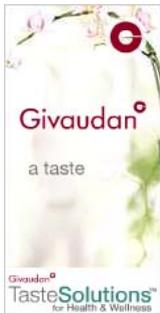
The technology, which has its roots back in 1995 (when AQUANOVA was founded), has been applied to a broad variety of substances such as ascorbic acid in the patented NovaSOL C (the first and only fat-soluble and chemically unmodified vitamin C worldwide) and Coenzyme Q10 ("NovaSOL Q"), among others. It also offers innovative features for phytoextracts, making them available as fully water and fat-soluble ('ambiphilic') solutions, which are easy to handle and integrate into end-products.

Aquanova has recently been granted a European patent for its new ambiphilic (both water and fat soluble) isoflavone solution ("NovaSOL ISO"). This holds special significance since soyisoflavones (which belong to the category of phytoestrogens), exhibit a weaker effect than that of estrogen and the efficient absorption of the active substance has been always been a major challenge. These NovaSOL features allow the easy processing with softgels or beverages.

Underpinned by the company's commitment to high production and material standards (such as ISO, GMP, Kosher, Halal, etc.) the unique benefits of its technology offer potential for its application in functional foods and dietary supplements, as well as innovative clear beverages, cosmetic products and pharmaceutical products.

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Company Information

Frost & Sullivan was founded in 1961. Our mission from the start was to research and analyze new opportunities for corporate growth. Over the history of the company we have established ourselves as one of the world leaders in research, training, consulting and corporate strategy. Frost & Sullivan is positioned to be an ideal partner to its clients to support them in creating innovative global growth strategies with its 25 global offices and more than 1000 analysts and consultants worldwide.



Through the 1960s, Frost & Sullivan pioneered market consulting, monitoring new technologies, tracking changes in distribution channels, forecasting market trends, and performing strategic analysis of competitors. Frost & Sullivan was always at the forefront - just as new markets and technologies appeared - with up-to-date research on potential markets. Frost & Sullivan was the first company to offer its services on electronic tape media, delivering world military equipment market data in 1962.

In the 1970s, Frost & Sullivan established a European headquarters in London and developed the first pan-European growth consulting reports.

The company founded its **Corporate Training** division in 1972. Today it is one of Europe's premier corporate training centers. The training focuses on corporate management, leadership skills, sales and marketing, data communications, and information technology.

Frost & Sullivan's **Events** division was also launched in the 1970s. Frost & Sullivan Events are uniquely designed to integrate training, research, and strategic growth consulting skills with communication among the players in the industry. The events provide senior-level management executives with insights into market opportunities, competitive threats, technical trends, emerging markets, and competitive strategies. Frost & Sullivan continues to provide participants with unique strategic content, competitive benchmarking, industry focus, and the opportunity to network with other key industry executives. Our one-of-a-kind Executive Summit format leverages the mass of brainpower of all of our participants. Jam-packed with dynamic networking activities and hands-on content, our programs are over 80% interactive. Brainstorm with your peers and validate solutions to your personal needs and challenges through workshops, ThinkTanks, panels, roundtables, and mindshares.

In the 1980s, Frost & Sullivan developed the "Market Engineering" **Consulting** system and began working directly with clients struggling to address key industry challenges, opportunities, and problems. The "Market Engineering" system has proven to be very effective in addressing our clients' business challenges and has developed into a strong and thriving Frost & Sullivan consulting business.

In the 1990s, client demand supported Frost & Sullivan's expansion into Asia with research and consulting **offices** in Singapore, China, India, and Japan. Frost & Sullivan or its clients will not overlook the continuing economic growth and potential of these markets.

Frost & Sullivan also developed several worldwide "Customer Engineering Centers" in the early 1990s to fulfill our clients' requests for more customer surveys and analysis on new product launches and product development ideas. These centers have world-class survey instrument-development and analysis skills as well as covering virtually every language in the world. They play a major role in helping our clients become more "customer-focused".

The year 1998 witnessed the successful launch of a new division called **Stratecast**. This division delivers actionable, conclusive and insightful strategic analysis utilized by telecommunications industry senior executives in making critical business strategy, technology strategy and tactical strategy decisions. Stratecast offers a three part solution made up of: Access to its strategy staff; Access to the "fruits" of its sustaining research and analysis practice; and, Access to its incomparable strategic assessments of communications companies and technology sectors. Please visit www.stratecast.com for more information on the division.

The Decision Support Database (DSD) service was to provide clients with a comprehensive and standardized database of demographic data. This DSD service has become an invaluable business planning and forecasting tool for all the "**Growth Partnership Services**" clients. A DSD service is available for every industry which Frost & Sullivan supports.

In 2001 Frost & Sullivan successfully launched the **Economic Research & Analytics (ERA)** service that provides economic analysis and forecasting by industry rather than by country. Also, launched in 2001 was a program of comprehensive industry newsletters provided to our clients to keep them abreast of market trends and news. **Growth Opportunity Newsletters** are written by our global analyst and consulting team to provide value to each issue.

In March 2001, Frost & Sullivan acquired **Technical Insights (TI)** adding a superior technology research capability to its suite of services. Technical Insights offers several technology subscription services as well as high-end technology analysis reports. TI's mission is to provide intelligence to executives and technology managers worldwide on technical developments that seem poised for the fastest growth.

Expanding on Frost & Sullivan's success of our popular **Analyst Briefings** and **Events**, Frost & Sullivan's **eBroadcast Division** delivers cutting-edge business strategies and solutions to its executive clients through interactive forums on the Internet. By combining the immediacy of the Web with the impact of streaming audio and video, Frost & Sullivan's eBroadcasts are one-hour topic-specific seminars packed with the information and insights needed to address real-world business needs.

In 2004 we began a program of integrating all our research programs to better support our clients. In our new **Growth Partnership Services (GPS)** programs we now integrate all our research teams to fully support our clients in their decision making process. Our **TEAM** methodology provides a client with all the research sources they need to make optimal decisions in their growth strategy process. **TEAM** represents the 4 key elements of our global research team: T = Technology, E = Economics, A = Applications for Growth, M = Markets. These 4 elements are crucial to support the successful development of a growth strategy.

In 2005 the company was ranked #1 in the industry in terms of revenue growth, thus providing great credibility that Frost & Sullivan has what it takes to be a growth consultant for its clients. Frost & Sullivan has consistently outperformed the average industry growth rates of the research, information and consulting industry.

In 2006 we plan to take major steps to provide clients with an overwhelming flow of innovative ideas, research and strategy to support them in their own corporate growth objectives.

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