

2005

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

**Product Differentiation Innovation Award**

## Frost & Sullivan Award for Product Differentiation Innovation



### AWARD DESCRIPTION

The Frost & Sullivan Product Differentiation Innovation Award is presented to the company that has best demonstrated the ability to develop and / or advance products with more innovative capabilities than competition. This Award recognizes the company's successful adoption of new or existing technology that has become a part of its well designed product family. Such innovation is expected to significantly contribute to the industry in terms of product performance and degree / rate of technical change.

### RESEARCH METHODOLOGY

Before considering the recipient of this Award, the analyst team tracks competing market participants' product differentiation strategies through ongoing research. This research consists of market participant interviews, end-user surveys, and extensive secondary research. The data compiled through this research is analyzed based upon specific measurement criteria for this Award. Participants are then ranked with respect to the measurement criteria. The Award recipient is ranked number one in the industry.

### MEASUREMENT CRITERIA

In addition to the methodology described above, there are specific criteria used in determining the final ranking of industry competitors. The recipient of this Award has excelled based on one or more of the following criteria:

- Degree of differentiation in innovation compared to other market participants
- Positive impact on sales directly related to product differentiation
- Time to market improvement based upon product differentiation strategy
- Benefit to end users due to product differentiation
- Effect of product differentiation on ease of adaptability for new end-user applications
- Effect of product differentiation on market maturation

### AWARD RECIPIENT: VARTA MICROBATTERY GMBH

#### NICKEL METAL HYDRIDE BATTERY V500HT

In the mature nickel battery market, Varta Microbattery has grown by focusing and streamlining their inherent strengths and product line toward the development and expansion of their nickel metal hydride (NiMH) line by introducing the V-500HT. For this ability

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to grow and sustain a leadership position, Frost & Sullivan presents Varta Microbattery with the 2005 Product Differentiation Innovation Award in the world nickel rechargeable battery market.

Varta has had an illustrious career in manufacturing primary and secondary batteries for the past 100 years for a wide range of applications ranging from consumer to automotive, industrial and medical. Varta Microbattery believes in constantly undertaking research and development (R&D) in order to improve the essential features of the batteries that are reliability, longevity, size and weight. With the rapid decline of the battery market for traditional chemistries such as nickel cadmium (NiCad) and nickel metal hydride (NiMH) due to the introduction of superior chemistries like lithium-ion (Li-ion) and lithium-ion polymer (Li-ion poly), it is imperative that manufacturers undertake R&D in order to induce greater product differentiation in the market, thereby helping the market to maintain stability and grow.

The V-500HT is an innovative NiMH battery that incorporates a multiple-foam electrode and can tolerate the extremes of temperature (up to 80oC). The most notable feature of this battery is that it can withstand trickle charging at temperatures of 45oC up to 55oC thus lasting for over 3 years. To date, NiCad and lead acid batteries are considered to be the most suitable for high drain applications and also for applications withstanding the extremes of temperature such as power tools, emergency lighting, flashlights and backup power. The V-500HT, with its advanced features, will enable Varta Microbattery to penetrate into new markets.

### PRODUCT DIFFERENTIATION FEATURES AND BENEFITS

-Continuous trickle charge at temperatures of 45oC to 55oC

-Ability to perform in high temperatures (up to 80oC)

-Long life expectancy of 3 years when trickle charged at temperatures of 45-55oC and a life expectancy of 5 years when trickle charged at room temperature

-Small size (flat form factor of 6.3mm) with high battery capacity of 510mAh

-UL Recognized and environment friendly

-Lack of memory effect

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The key benefits that accrue due to the above features providing higher value to the customers include:

-Standard NiMH batteries have poor overcharge preferred for such batteries. Trickle charging not only compensates for the self-discharge but also restores the energy lost during the intermittent use of the battery. The V-500HT offers advantages in terms of allowing continuous trickle charge, even at temperatures of 45°C to 55°C due to its superior battery chemistry, thereby facilitating the use of the battery at the shortest notice. Normally standard NiMH batteries have a higher self-discharge rate than NiCad batteries, around 30 percent per month. However, Varta's V-500HT has a very low self-discharge rate of approximately 35 percent in 12 months at a storage temperature of 20°C.

-Typically, NiMH batteries have not been used in applications that operate in the extremes of temperature as their performance deteriorates considerably. NiCad and lead acid batteries have been preferred for such harsh and high temperature applications. Varta Microbattery strives to change this perception with its new and better battery chemistry technology, thus opening up new vistas for NiMH batteries.

-Trickle charging usually leads to deterioration of the battery and hence a lower life expectancy. The V-500HT though, is expected to have a lifetime of 3 years when trickle charged at temperatures of 45-55°C and life expectancy of 5 years when trickle charged at room temperature.

-New applications coming up in the market incorporate batteries that are light in weight, small sized and provide high energy for longer run times. With massive reduction in weight of NiMH batteries, they are now better positioned to compete with recent chemistries such as lithium-ion (Li-ion) and lithium-ion polymer (Li-ion poly). The V-500HT has a thin and flat form factor of 6.3mm which is 60 percent thinner than the AA size.

-The V-500HT conforms to all safety tests and regulations developed by Underwriters Laboratories (UL). This instills greater confidence of the public in this product. Moreover, it is 100 percent environment friendly since it contains no cadmium, mercury, lead or any other toxic metal that may in any way harm humans, animals or the surrounding environment.

-Overall, NiMH batteries suffer from a lesser

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degree of memory effect than NiCad batteries. However, Varta Microbattery's V-500HT exhibits no memory effect. Memory effect occurs due to partial discharging and then recharging of nickel batteries due to which there is a fall in capacity. The V-500HT has been introduced for use in computers, instrumentation and high temperature applications. In fact it has already been designed in by major computer manufacturers and has received phenomenal response.

Although a maturing market, NiMH battery chemistry is an area that can still be exploited to its fullest potential with more research dedicated to it. By introducing a superior quality battery, the foremost in the industry, Varta Microbattery has opened up new application opportunities and markets for NiMH batteries overall, proving that the market is very much alive and holds bright prospects for growth.

### CONCLUSION

Varta Microbattery V-500HT is an innovative product in the NiMH battery market segment. Since the NiCad and NiMH battery markets are mature and reaching saturation, such feature enhancements undertaken by manufacturers help to penetrate into new areas and also induce the much needed product differentiation.

The V-500HT, with its multiple foam electrodes, continuous trickle charging feature, small size, ability to operate at high temperatures and environment friendly characteristics, not only offers fierce competition to the alternative chemistries such as Li-ion and Li-ion poly but also presents enhanced features as compared to conventional NiMH batteries. The combination of these features and benefits makes Varta Microbattery a worthy recipient of the 2005 Frost & Sullivan award for Product Differentiation Innovation in the NiCad and NiMH world battery market.

### FOR MORE INFORMATION, CONTACT

Varta Microbattery GmbH

[www.varta-microbattery.com](http://www.varta-microbattery.com)

-or-

Frost & Sullivan

[www.frost.com](http://www.frost.com)

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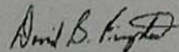
PRODUCT DIFFERENTIATION INNOVATION AWARD

*Presented to*

**VARTA MICROBATTERY GMBH**

*for its*

**HIGH TEMPERATURE NICKEL METAL HYDRIDE BATTERY V500HT**



CHAIRMAN

Founded in 1961, Frost & Sullivan is recognized as a global leader in growth consulting. Frost & Sullivan Awards are presented to companies that demonstrate excellence in its industry, commending the diligence, commitment, and innovative business strategies required to advance in the global marketplace. Recipients are selected based on in-depth analysis of the market, interviews with industry participants, and extensive secondary research.

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