

PRESS RELEASE

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Novaled Develops New Air-Stable n-Dopant and ETL Materials to Improve Efficiency and Lifetimes for OLED TV and Mobile Displays

Novaled to Exhibit at SID Display Week 2012 and Present Latest OLED Display and OLED Lighting Developments

[Novaled](#), a recognized leader in research, development and commercialization of [technologies](#) and [materials](#) that enhance the performance of organic light-emitting diodes ([OLEDs](#)) and other organic electronics, today announces a new class of n-doped electron transport layer (ETL) materials for OLED TV and OLED mobile displays. By pairing either of its two new air-stable dopants with either of its two new host molecules, Novaled can achieve the optimum combination of efficiency, voltage and lifetime for a specific display application. This innovative approach results in materials that are air-stable and can double the lifetime of the display compared to the previous OLED stack. The new materials are the next step toward achieving an optimum balance between long lifetime and high power efficiency for display applications using OLEDs.

Novaled will highlight its recent advances in OLED display and OLED lighting at the Society for Information Display's (SID) 49th annual International Symposium & Exhibition, "Display Week 2012," June 3 - 8, 2012, in Booth #3313 at the Boston Convention and Exposition Center, Boston. Dr. Jan Birnstock, Vice President Technology & Products at Novaled, will present a paper on June 6 about Novaled's new class of OLED materials for OLED TV and OLED mobile display applications. Dr. Sven Murano, Product Senior Manager at Novaled, will present a paper on June 7 about Novaled's outcoupling materials for high-efficiency white OLEDs – light extraction crucial for both lighting and display applications.

Optimized OLED Lifetime and Efficiency Performance

Novaled's new generation of materials includes NET-164 and NET-142 hosts, and NDN-77 and NDN-87 ETL dopants. Using various combinations of these dopants and hosts, Novaled can optimize OLED performance for lifetime or efficiency, depending on application requirements. Thus the new generation material addresses two previous OLED weaknesses:

- Low driving voltage caused lower lifetime due to higher charge carrier density in the emission zone.
- Air-sensitive N-side dopant materials required more complicated loading in mass production tools.

Effective Outcoupling for Better Light Efficiency

To achieve maximum efficiency in white PIN OLED devices, Novaled uses evaporation processable outcoupling layers – thin NET-61 layers in n-doped ETLs. The use of crystallizing outcoupling enhancement layers leads to corrugation of the reflective cathode, significantly reducing the plasmon absorption losses. Novaled has

deepened its expertise on effective outcoupling and, during its presentation on June 7, will introduce its latest data about a three-unit white stacked PIN OLED using NET-61.

About [OLEDs](#)

OLEDs (organic light-emitting diodes) are solid-state devices composed of multiple thin layers of organic materials often only a few nanometers thick that emit diffuse light when electricity is applied to them. Because they are an area light source, OLEDs are a key part of fulfilling the dream of the rapidly growing flat panel display market: paper-thin, highly-efficient displays with brilliant colors and excellent design flexibility. OLEDs may also lead to new lighting products that combine color and shape to create innovative decorative lighting applications and personalized environments. In addition, OLED lighting products have the potential to offer greater cost and energy savings than current lighting technologies.

About [Novaled](#)

Novaled AG is a leader in the research, development and commercialization of technologies and materials that enhance the performance of OLEDs (organic light-emitting diodes) and other organic electronics. Novaled offers OLED product manufacturers a unique combination of proprietary technology, materials and expertise, and is currently the only company in the OLED industry licensing and selling organic conductivity doping technology and materials for use in the commercial mass production of display products. Novaled has developed strategic partnerships with key OLED innovators and producers throughout the world and, with a broad portfolio of more than 500 patents granted or pending, has a strong IP position in OLED technologies, structures and materials. Commercially active since 2003, Novaled was founded in 2001 as a spin-off of the Technical University and the Fraunhofer Institute of Dresden. Novaled is headquartered in Dresden with sales offices in Korea and Japan. For more information, please visit www.novaled.com.

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