Lonza Group Ltd.
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Press Release

Novoset, LLC and Lonza Announce the Introduction of New, Ultra-Low Dielectric Loss and High-Temperature Materials for High-Speed Telecommunication Industries and Bendable Electronic Devices

Peapack, NJ (USA) and Basel, Switzerland, 27 January 2014 -- Novoset, LLC and Lonza are pleased to announce the introduction of Primaset™ ULL-950 and Primaset™ HTL-300 ultra-low loss and high-temperature thermoset materials for the telecommunication and advanced semiconductor packaging industries. These thermoset resins are based on Cyanate Ester (CE) chemistry.

Primaset™ ULL-950 is suitable for high-performance applications such as power amplifiers for 4G LTE and 4G LTE advanced base stations for smartphones, internet infrastructure and high-layer count servers for "cloud computing". Low dielectric properties coupled with high glass-transition temperature (T_g) make Primaset™ HTL-300 an ideal candidate for advanced Integrated Circuit (IC) substrates for semiconductor packaging materials and next-generation application processors for mobile chips.

Depending on the backbone structure, Primaset™ ULL-950 has a dissipation factor (D_f) ranging from 0.0009 to 0.003 and a dielectric constant (D_k) between 2.3 - 2.6 up to 40 GHz. The T_g can vary between 175˚C and 320˚C. High-temperature bendable devices can be fabricated utilizing its flexibility.

These products also exhibit low moisture uptake and short lamination cycles. The high-temperature capabilities and toughness are critical for lead-free assemblies in Printed Circuit Boards (PCB) and build-up films. Low moisture uptake and wet T_g retention with toughness also may open the door for the use of these Cyanate Esters for structural aerospace applications.

The processing of these materials is similar to epoxy resins and other commercial Primaset™ materials. The products co-react with epoxy resins, Polyphenylenether (PPE), Styrene Maleic Anhydride (SMA), Triallyl Cyanurate (TAC), Bismaleinimide (BMI), Vinyl Polymers, Primaset™ BA-230S, Primaset™ BA-3000 and other Cyanate Esters. The products are soluble in Methyl Ethyl Ketone (MEK), Toluene, Xylenes and other solvents at high concentration. These products also give excellent adhesive characteristics with various substrates and can be highly filled with the types of fillers used for applications requiring a low thermal expansion (CTE).

Dr. Sajal Das, President & CEO of Novoset, LLC stated: "We now can design and fabricate high-layer count ultra-low dielectric boards without using Teflon™. The electrical performance of Primaset™ ULL-950 is similar to that of Polytetrafluoroethylene; but it can be processed as easily as FR-4 technology, and it reaches T_g of Cyanate Esters or Polyimides."

Pointing out how this technology might be used in the future, Dr. Das added: "We are getting close to fabricating bendable tablets, smartphones and other devices from high-temperature thermosets such as derivatives of Primaset™ ULL-950 and Primaset™ HTL-300 in the foreseeable future."

Primaset™ ULL-950 and Primaset™ HTL-300 were developed at Novoset Technology Center, in Berkeley Heights, NJ (USA). Lonza will manufacture and market these two products globally under the Primaset™ trade name.

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About Novoset, LLC
Novoset, LLC was established in 2011 as a product design, development and marketing company specializing in high performance thermoset plastics and formulated intermediate products for the electronics, aerospace, space and defense industries. Novoset, LLC has opened its Technology Center in October 2012. Lonza is Novoset's manufacturing partner.

Novoset, LLC is located in Peapack, New Jersey, USA. Further information can be found at www.novoset.com.

About Lonza
Lonza is one of the world's leading suppliers to the pharmaceutical, healthcare and life science industries. Products and services span its customers' needs from research to final product manufacture. It is the global leader in the production and support of chemical and biological active pharmaceutical ingredients. Biopharmaceuticals are one of the key growth drivers of the pharmaceutical and biotechnology industries. Lonza has strong capabilities in large and small molecules, peptides, amino acids and niche bioproducts which play an important role in the development of novel medicines and healthcare products. Lonza is also the world leader in microbial control providing innovative, chemistry-based and related solutions to destroy or to selectively inhibit the growth of harmful microorganisms. Its activities encompass the areas of water treatment, personal care, health and hygiene, industrial preservation, materials protection, and wood treatment. In addition, Lonza is a leader in cell-based research, endotoxin detection and cell therapy manufacturing. Furthermore, the company is a leading provider of ingredients to the nutrition and agro markets world and a producer of high performance thermoset resins and various advanced intermediates with backward integrated feedstock capabilities.

Lonza is headquartered in Basel, Switzerland and is listed on the SIX Swiss Exchange and secondary listed on the Singapore Exchange Securities Trading Limited ("SGX-ST"). Lonza is not subject to the SGX-ST's continuing listing requirements. Lonza is subject to the listing rules of the SIX Swiss Exchange, which do not have specific requirements equivalent to the listing rules of the SGX-ST in respect of interested person transactions, acquisition and realizations, and delisting. In 2013, the company had sales of around CHF 3.6 billion. Further information can be found at www.lonza.com.

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