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## Air Liquide and ASM sign agreement on advanced high-k ALD precursors

press release

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### **Air Liquide Electronics**

Air Liquide Electronics serves the semiconductor industry worldwide with activities in ultra-pure and specialty gases, new molecules, related equipment and customized services. The Electronics division management is based in Tokyo to enhance its proximity to the semiconductor, TFT-LCD and PV markets in Asia.

ASM International N.V. and the Air Liquide Group announce that their collaboration has led to the signature of a **license and preferred supplier agreement for ALOHA™ advanced precursors**. Under the terms of the agreement, Air Liquide will have access to ASM's key processes and material intellectual property related to the deposition of **advanced ultra-high-k insulator films** such as Yttrium-doped Zirconia, STO and BST. ASM and Air Liquide's customers will benefit from Air Liquide's **ALOHA global research, manufacturing and supply chain capability**, with ASM's well known **Pulsar® atomic layer deposition (ALD) system**.

The first high-k materials were introduced in mainstream DRAM manufacturing in the mid 2000's, and more recently as a gate insulator material in logic manufacturing. The materials are expected to be used in both types of devices to **further enhance transistor and capacitor performance**.

Ivo Raaijmakers, chief technology officer of ASM stated, *"It is essential that the whole supply chain, including chemicals, their transportation and storage, deposition equipment and source containers reaches maturity before new materials will be adopted by our customers. The agreement with Air Liquide is a key step to enable ultra high-k materials for the industry."* Jean-Marc Girard, chief technology officer of Air Liquide Electronics commented, *"We are proud to become a preferred supplier of the leader in high-k ALD technology for these advanced thin film products. It is essential for chemical suppliers to closely cooperate with tool suppliers on an ongoing basis. High-Tech is a growth driver of Air Liquide."*

ASM International N.V., headquartered in Almere, the Netherlands, and its subsidiaries design and manufacture equipment and materials used to produce semiconductor devices. ASM International and its subsidiaries provide production solutions for wafer processing (front-end segment) as well as assembly and packaging (Back-end segment) through facilities in the United States, Europe, Japan and Asia. ASM International's common stock trades on NASDAQ (symbol ASMI) and the Euronext Amsterdam Stock Exchange (symbol ASM). For more information, visit ASM's website at [www.asm.com](http://www.asm.com).

**Air Liquide is the world leader in gases for industry, health and the environment**, and is present in over **75 countries** with **43,000 employees**. Oxygen, nitrogen, hydrogen and rare gases have been at the core of Air Liquide's activities since its creation in 1902. Using these molecules, Air Liquide continuously reinvents its business, anticipating the needs of current and future markets. The Group innovates to enable progress, to achieve dynamic growth and a consistent performance.

**Innovative technologies** that curb polluting emissions, lower industry's energy use, recover and reuse natural resources or develop the energies of tomorrow, such as hydrogen, biofuels or photovoltaic energy... Oxygen for hospitals, homecare, fighting nosocomial infections... Air Liquide combines many products and technologies to develop valuable applications and services not only for its customers but also for society.

**A partner for the long term**, Air Liquide relies on employee commitment, customer trust and shareholder support to pursue its vision of sustainable, competitive growth. The **diversity** of Air Liquide's teams, businesses, markets and geographic presence provides a solid and sustainable base for its development and strengthens its ability to push back its own limits, conquer new territories and build its future.

**Air Liquide explores the best that air can offer to preserve life, staying true to its sustainable development approach**. In 2008, the Group's revenues amounted to **€13.1 billion**, of which almost 80% were earned outside France. Air Liquide is listed on the Paris Euronext stock exchange (compartment A) and is a member of the CAC 40 and Dow Jones Euro Stoxx 50 indexes.