BACKGROUND INFORMATION:

SAL MICROFAB
SILICON AUSTRIA LABS RESEARCH CLEANROOM IN VILLACH

WHAT IS A CLEANROOM?

A cleanroom **is a controlled environment that has a low level of particles, and the air cleanliness is classified by particle concentration**. This is a prerequisite for working on microchips and miniaturized sensors, such as those found in many modern devices. These can be rendered inoperable by even the smallest foreign particles. Therefore, a certain number of particles must not be exceeded in the cleanroom.

HOW CLEAN IS SAL'S CLEANROOM?

Cleanrooms are divided into different ISO classes (DIN EN ISO 14644-1 - 2016-06) according to maximum permitted number of particles in one cubic meter. Currently, SAL already has a 300 m² ISO 5 cleanroom in Villach, which has been expanded by 1,100 m² in July 2022 (check out the SAL MicroFab video on YouTube), dedicated to 200mm substrate size with a possibility of processing up to 25 wafers in a single batch. In the cleanroom at High Tech Campus 2, three areas will be available with a total area of over 1,100 m²:

Cleanroom class	size in Villach	Application areas
ISO 4	170 m^2	Photolithography High resolution Metrology
ISO 5	590 m^2	Thin-film Deposition Plasma Etching Thermal processes Wet processes Metrology Backend process
ISO 6	340 m^2	Maintenance area

WHAT DISTINGUISHES SAL'S CLEANROOM IN VILLACH?

The cleanroom at High Tech Campus 2 in Villach will be the largest research cleanroom in Austria, with a total area of 1,100 m². The focus of SAL MicroFab will be the combination of research and development, design and simulation, reliability testing, prototyping and small

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series microfabrication. SAL therefore offers industry a one-stop-shop to develop innovative technologies in the new cleanroom.

WHICH KEY TECHNOLOGIES IS SAL RESEARCHING IN VILLACH?

The European Commission has defined six key technologies that strengthen industrial innovation, address societal challenges and create sustainable and advanced economies. These key technologies include micro- and nanoelectronics as well as photonics. SAL's teams in Villach are conducting research in both of these areas.

More-than-Moore microsystem technologies:

"More-than-Moore" refers to a law observed by Gordon Moore in 1965, according to which the number of circuit components on a chip doubles every one to two years while costs remain the same. But the current trend shows that more is possible – more functionality and more efficiency in even smaller components. Or to put it another way: "More than Moore".

The goal of research into More-than-Moore technologies at SAL is to reduce complexity, miniaturize and increase the efficiency of components. By covering the entire research value chain combined with high-tech manufacturing technology, a unique selling point of SAL in Villach is made possible.

Highly integrated photonic systems:

Mastering light in any form is at the heart of photonics. Photonics is a key technology in digitization, as it provides the basis for optical sensor and measurement systems that can help overcome the limits of other technologies in terms of accuracy, sensitivity, miniaturization and safety.

Complete photonic systems that can analyze at high speed are essential, for example, for Industry 4.0, autonomous driving, and also next-generation consumer electronics.

ABOUT SILICON AUSTRIA LABS (SAL)

Silicon Austria Labs GmbH (SAL) is Austria's top research center for Electronics and Software Based Systems - they are the technological backbone of digitalization. At the sites in Graz, Villach and Linz, research is conducted in the fields of Microsystems, Sensor Systems, Power Electronics, Intelligent Wireless Systems and Embedded Systems on future-oriented solutions for environmental protection, health, energy, mobility, and security. SAL brings together key players from industry and research and thus valuable expertise and know-how, and conducts cooperative, application-oriented research along the value chain. Cooperative projects are co-financed by SAL and enable an unbureaucratic and fast project start. Thus, SAL shapes the high-tech location Austria and Europe and unfolds the future.

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