



X-FAB is fortifying European semiconductor manufacturing across industries

Best practice category

Strengthening
manufacturing capacities

Stakeholder group

Large enterprises

Value chain position

Fabrications

General Information

X-FAB is one of the world's leading specialty foundry groups for analog and mixed-signal semiconductor technologies, with a clear focus on automotive, industrial, and medical applications. X-FAB is based in Tessenderlo (Belgium) with headquarters in Erfurt (Germany).

The foundry operates through 6 manufacturing sites in Germany, France, Malaysia and the US, producing over 100,000 200mm wafers per month. It constitutes one of the most important players in Europe.

Activities and best practices

X-FAB is a pure-play foundry which provides both manufacturing and design support services to its customers that design analog or mixed-signal ICs and other semiconductor devices. Given its three decades in the sector, X-FAB has developed expertise across the foundry value chain, with 6 manufacturing sites that operate across automotive, medical, industrial, and communications and consumer applications.

Automotive constitutes a large share of the company's manufacturing volumes – around 50% – representing an 11% market share for analog automotive ICs worldwide. The Drawing on the high quality and safety demands of the car electronics industry, X-FAB develops its quality management systems for the rest of its portfolio accordingly, integrating features like safe launch and risk mitigation support or technology reliability control across applications for the other sectors.

Moreover, X-FAB uses its complementary metal-oxide semiconductor (CMOS) and sensor technologies in the medical field. The foundry applies its portfolio and capabilities to Lab-on-a-chip (LOC) applications and BCD-on-SOI processes to personal medical and measurement devices. The real-life applications range from ultrasound pulsers, cardiac pacemakers, spinal-cord stimulators to traditional and implanted hearing aids.

For the industrial power applications, X-FAB offers high-voltage, high-power and high-temperature support, development of varied sensor and sensor interfaces, support for industrial communication networking standards, as well as the technologies driving motor drivers, gate drivers and control ICs. The foundry utilises both open-platform technologies and standard process blocks (SPB) to allow for timely deployment of solutions in sectors ranging from IoT and Industry 4.0 to green and efficient energy production.

Finally, X-FAB's services extend to the development of 5G network standards and AI technologies as part of its work on consumer devices and communications. X-FAB also participates continuously in R&D and innovation projects related to future-oriented technology and product fields. Similarly as with its market solutions, the main topics of X-FAB's research interest include future emission-free and safe mobility, smart energy supply, ultralow power technologies, data security and AI for smart sensor systems.

As part of the Important Project of Common European Interest in Microelectronics and Communication Technologies (IPCEI ME/CT) announced by the European Commission in October 2023, X-FAB will participate in an €80 million scheme for innovation in microelectronics and communication solutions. Three X-FAB sites in Europe will work on distinct aspects of the project. Corbeil-Essonnes (France) facility will work on smart sensors and drivers, new architectures, photonics and radio frequency technologies; the Erfurt site (Germany) will research novel manufacturing platforms for smart integrated sensor systems; and the Itzehoe site (Germany) will focus on the development and implementation of new methods for processing glass wafers. Once developed, these solutions will not only broaden X-FAB's technology offering, but also help the EU to meet the demands of future markets in the automotive, medical, and industrial sectors.

Challenges addressed with this practice

Developing and implementing new methods for processing glass wafers is crucial in expanding manufacturing capabilities, potentially unlocking new avenues for semiconductor production – especially in applications where glass substrates offer advantages over traditional silicon substrates. Moreover, capacity expansion and specialisation at each production site allows X-FAB to hone specific manufacturing capabilities and to explore innovative applications for architectures, photonics, RF technologies, and smart sensors.