

High-tech industry



Did you know...
Two major companies provided products made in Luxembourg for the 206-storey Burj Khalifa Tower in the United Arab Emirates. The tallest tower on Earth includes 600,000 m² of Guardian Luxguard low-emissivity glass and 3,000 tonnes of ArcelorMittal steel beams.

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Advanced materials, competitive production technologies

Luxembourg's manufacturing sector was established over a century ago during the heyday of the steel industry. Over subsequent decades, the focus shifted from traditional materials to **high added value niche products**, many of which have become the market leaders of today.

Advanced materials produced in Luxembourg include **composites, nanomaterials, high performance steel, biodegradable and recyclable materials, glass, concrete, rubber and plastics**. The sector also demonstrates expertise in the functionalisation of surfaces. The main fields of interest and expertise include highly automated production lines, cyber-physical manufacturing systems, robotics, additive manufacturing and the reduction of energy consumption and waste production.

Building a bridge between business and academia

The **Materials Research and Technology Department (MRT)** of the **Luxembourg Institute of Science and Technology (LIST)** translates cutting-edge materials research into applied technologies in the fields of material development and production at laboratory scale as well as the modelling, characterisation and testing of materials.

Nanomaterials and nanotechnologies are a key research field within which the MRT specialises in multifunctional ferroic materials, transparent and optical tuneable electronics, nano-enabled medicine and cosmetics, and new surface treatments. Bio-based and functional composites, adhesion and interface engineering are central to its research on composite materials.

At the **University of Luxembourg**, the Physics and Material Sciences Research Unit is dedicated to R&D and innovation in photovoltaics, energy materials, nanomagnetism, polymer physics, the theory of condensed matter physics, complex systems and statistical mechanics as well as theoretical solid-state physics. The Research Unit in Engineering carries out strategic research projects in the fields of construction and design, energy and environment, automation, mechatronics, and geophysics.

High(-tech) facts

High-tech components supplier Saturne Technology specialises in the design and configuration of high-tech laser applications for cutting, drilling, welding, resurfacing and laser sintering as well as in additive manufacturing of high-performance metals. In 2015, the company configured and commissioned **the world's largest additive manufacturing machine**.

If you are into Do It Yourself activities, riding, skiing or have recently been to the doctor, there is a very good chance that you have already been in direct contact with their products. CERATIZIT produces unique cutting tools and wear protection solutions for industrial clients worldwide in the automotive, aerospace, construction, consumer electronics, energy, mechanical engineering, and medical sectors. Its high-tech expertise can be found in drills, cars, wind turbines, and other abrasion resistant applications.

The new production line of International CAN S.A. has a production capacity of **12,000 cans per hour or 60 million cans a year**. The company is currently expanding its activities in Luxembourg and produces, among other things, aluminium cans for aerosol products.

An innovation made in Luxembourg: Air Cargo Covers

DuPont™ Tyvek® is a unique nonwoven fabric that offers a high level of protection. Tyvek® Air Cargo Covers help reduce loss of perishable items by limiting the exposure to their environment, decreasing the impact of sudden ambient temperature changes and allowing excessive moisture to escape.

With a presence in the Grand Duchy for some five decades, DuPont de Nemours produces polyester films, high-tech construction materials, medical packaging and industrial personal protection equipment. The Luxembourg production plant also serves as a key regional research and development centre.

- Luxembourg is home to the headquarters of global steel producer ArcelorMittal. Its high-performance steel produced in the Grand Duchy is used in large construction projects worldwide, including the One World Trade Centre in New York, the Bow in Calgary, the Federation Tower in Moscow and the Shanghai World Financial Centre in China.

By substituting common steel with ArcelorMittal's high-strength Histar®, the weight of steel columns is reduced by 32% and of beams by 19%. The lighter structures enable savings in greenhouse gases, with a 30% reduction in carbon emissions during production.