

## ADDITIVE MANUFACTURING / FRANCE-GERMANY-POLAND

### FRANCE

France is a relatively new player in the AM market and represents 3% of the global market. It is the fourth AM market in Europe after Germany, United Kingdom, and Italy. There are approximately 200 companies in the AM field (raw manufacturers, machine manufacturers, software developers and production contractors), 60 R&D centers, and 40 clusters, innovation centers & labs. Most of the French companies are small- and medium- sized firms (SME). In 2017, the **French government supported investment of 47 million Euros** in government & private funds for R&D in the AM field.

In terms of use and applications, 28% is used for product development, 16% for product customization, and 13% for production flexibility. Prototyping represents around 34% of AM production. Although medical and aerospace represent the bulk of the application, new applications have started to develop in industries such as energy, construction, luxury goods, and mechanics.

As far as raw materials are concerned, plastic is still the main raw material used and metal powders, are becoming more and more popular. **A program called 3D Start PME** was launched in France in 2017, with the support of organizations such as the CETIM, SYMOP and the CEA, to help French SMEs develop metal 3D printing parts.

**France is renowned globally for its research on materials.** Polymer manufacturers, such as Sartoma Arkema, work with thermoplastic powders, and Selective Laser Sintering technology is led by companies Arkema and Exceltec. Three companies dominate 3D systems manufacturing (i.e. printer and supplies manufacturers) for industrial applications in France: Stratasys, a U.S. company, 3D Systems, also a U.S. company and Electro Optical Systems (EOS), and a German company, are leading companies in the French market.

Today, France has three manufacturers working specifically on metal additive manufacturing: Prodways, the largest French 3D printer manufacturer, is focused on process speeds; AddUp, a joint venture from companies Fives and Michelin, develops machines and industrial production lines, specifically with metal additive manufacturing. In 2018, AddUp acquired 100 % of BeAM, which focuses on alternative technology.

For the most part, 3D printer software suppliers are small publishers. However, some developers are large, traditional software companies that develop 3DP software, such as: Dassault Systèmes: specialty 3DP manufacturer; Materialise: specialty manufacturer and Sokaris: large, traditional software company.

## **GERMANY**

Germany is **the US' largest European trading partner** and the sixth largest market for U.S. exports.

Germany's \$1.1 billion AM market (a 9.4% global share) is the largest in Europe and hosts Formnext, Europe's largest AM show. Formnext is scheduled from November 19-22, 2019 and received Trade Fair Certification by the U.S. Department of Commerce in 2018 and 2019.

Exhibitors and attendees from across the world, representing the entire production chain, and across various industries involved in additive manufacturing will be present. The show attracts specialists in design and product development, simulation, prototyping, industrial tooling, production solutions, quality management, AM printers, post processing, research & development, digitization and measurement technology as well as leading providers of basic materials and components. A technical conference, organized by TCT/ Rapid News Publications, is also held in conjunction with the show.

In 2018, **Formnext showcased 632 exhibitors** on 37,231 m<sup>2</sup> of space with the largest number of foreign exhibitors, 40, coming from the U.S., including HP; Autodesk; Desktop Metal; GE Additive; HP; Sigma Labs; Stratasys, Xact Metal and several SMEs. The show attracted **26,919 visitors** (49% from outside of Germany).

In addition, Formnext 2019 is honoring the United States as Partner Country highlighting U.S. participation and drawing special attention to the United States. The Trade Mission delegates will be able to participate in the special USA Day activities on November 20.

USFCS will highlight the U.S. participation in special events; promote the delegates' companies and the U.S. exhibitors across its international network; and provide on-the-show-floor-support via the Business Information Office in the U.S. Pavilion. Counseling sessions with USFCS country experts and B2B matchmaking with potential German and international partners will be available as well.

## **POLAND**

Poland is a growing manufacturing power in Europe and there is increased demand for new and innovative manufacturing technologies. The Polish Government is pushing the development and investment in new technologies, such as AM, through grants and other resources available to support innovative R&D.

Poland is **the sixth largest manufacturing** country within the EU, with manufacturing contributing 27% of the country's Gross Domestic Product (GDP). Leading manufacturing sectors include; food and beverages, automotive, metal products, rubber and plastic, refined petroleum products, chemicals and chemical products, electrical equipment, non-metallic mineral products, basic metal products, miscellaneous machinery and equipment, and furniture. In 2018, the manufacturing sector grew by 5.8%, compared to the overall GDP growth rates of 5.1%. In February 2019, manufacturing grew by 6.9%.

The Polish Government's economic development agenda heavily focuses on supporting innovation. Poland currently ranks as a moderately innovative country (21st place in the Bloomberg Innovation Index) as measured by R&D spending, manufacturing capability and high-tech companies' presence. To help Polish industry move to the next level, **the Polish Government launched its Industry 4.0 Platform in 2019**. The aim of this project is to increase the innovativeness of Polish companies, popularizing knowledge about 4.0 processes and developing competences in areas such as robotics and automation.

According to the Polish officials, the amount of investment in innovation in Poland equals \$9 billion, and more than 300 R&D centers have been created in the last few years to improve innovation. One of the most innovative investments of last years was a 3M SuperHub in Wroclaw, a modern production plant which became a model for the region. The plant, called the "manufacturing plant of the future", has highly automated production and supply chain, as well as modern safety and security measures controlled by drones. U.S. companies like Raytheon have partnerships with Polish educational institutions to increase engineering capabilities and develop the manufacturing process of their Polish partners and support engineering and robotics education among Polish students.

Today, the AM market in Poland accounts for over 200 companies, with **sales of approximately \$14 million**. U.S. producers, such as Stratasys and 3D Systems are already present on the market. According to studies, Polish companies are responsible for around 7-10% of the global 3D printing market.

In the sector of 3D printers, Polish SMEs have sales of approximately \$10 million annually. However, the market capacities are much higher, considering increasing world market value. The income of the seven biggest companies comes mostly from exports. Zortrax with 7% of the market is the leader, according to Deloitte. Other local 3D printers' producers are: Sinterit, ZMorph, Omni3D, 3DGence. The 3D printing Industry is composed of around 30 distributors. Today, AM in Poland is used mainly for prototyping (60%), construction of parts (33%) and helping production and quality control (7%). Even though AM technologies are not common yet, the demand for AM is expected to increase. The opportunities for 3D printing will exist mainly in the aerospace and automotive sectors, which are considered as the most innovative in Poland.