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# World 3D Printing (Additive Manufacturing)

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Industry Study with Forecasts for **2017 & 2022**

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Study #3123 | December 2013 | \$6100 | 293 pages

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*Rapid gains in 3D printer demand will be driven by professional uses such as prototyping, and by the manufacture of direct production parts and finished goods.*

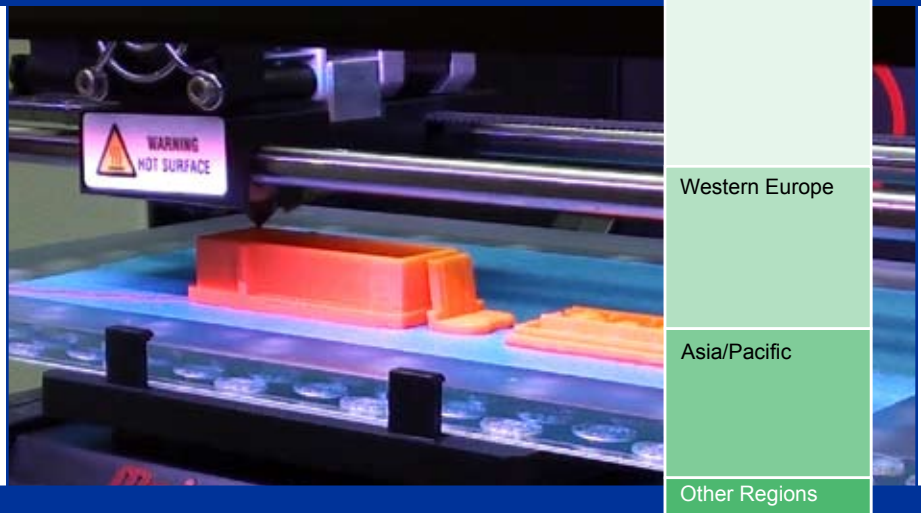
## World demand to rise 21% annually through 2017

World demand for 3D printers and related materials and software is projected to rise 21 percent per year to \$5.0 billion in 2017. While professional uses such as prototyping will continue to account for the majority of demand, the more rapid growth will be seen in production and consumer applications. 3D printers will increasingly be used to manufacture direct production parts and finished goods in a wide variety of applications. In the consumer segment, projected price drops in desktop 3D printers will motivate purchases by hobbyists and do-it-yourselfers.

## Plastics to remain most common printing material

Robust growth will be seen in demand for printing materials, as the rapidly expanding installed base of 3D printers fuels related materials consumption. Plastics such as acrylonitrile-butadiene-styrene (ABS), polylactic acid (PLA), and nylon were the first types of materials used in 3D printing, and remain the simplest to work with. Plastics will continue to account for the majority of materials demand, but faster growth is projected for metals, based on their greater strength and resistance, as well as rapid gains in markets such as aerospace. Demand for software and other 3D printing products such as 3D scanners will grow in line with the overall average, supported by the ongoing need for technological updates and upgrades.

## World 3D Printing Demand, 2017 (\$5 billion)



## Medical, dental market to be among fastest growing

Some of the fastest growth will be seen in the medical and dental market, with especially good opportunities expected in dental applications such as braces, prostheses, crowns, bridges, dental aligners, and models for dental restoration procedures. Other significant markets for 3D printing products include consumer products (e.g., jewelry, toys, fashion clothing, consumer electronics), automotive, and aerospace. For instance, in 2013 General Electric announced plans to use 3D printers to produce fuel nozzles for its next-generation jet engine. These nozzles are expected to be lighter and stronger than

those produced using conventional production techniques.

## US to remain top market

The US will remain by far the largest national 3D printing market in the world, accounting for 42 percent of global sales in 2017. In developed areas such as the US and Western Europe, 3D printing market value will be supported by the growing presence of metal-based 3D printers for the production of finished parts, as such systems are significantly more expensive than plastics-based 3D printing systems. Rapid gains are expected in China, where most applications center on design, sample testing, or prototyping.

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**Sample Text,  
 Table & Chart**

**WESTERN EUROPE**

A number of organizations and associations contribute to the development of Germany's 3D printing industry. For instance, the Institute for Laser Technology (ILT) continues to research new production techniques including laser additive manufacturing and rapid prototyping using selective laser melting and powder-bed processes. In part, the Direct Manufacturing Research Center (DMRC) was founded in 2008 by Boeing, EOS, Evonik Industries, and SLM Solutions in conjunction with the University Paderborn. Other partners in the DMRC include Production, Eisenhuth, Siemens, Stratasys, and Stükerjürgen Composites (SAC). The DMRC is a research center dedicated to the advancement of additive manufacturing in production applications.

Through 2017, demand for 3D printing in Germany is expected to rise to \$1.5 billion. Above average growth is expected in the advanced medical product industries in the region. O Bremer Goldschlägerei, a locally-based dental prosthodontics, agreed to license its patents for dental applications to Renishaw (United Kingdom), a major producer of 3D printing systems.

The country's well-developed automotive and aerospace industries will also support gains and continue to represent important markets for 3D printing. For instance, in October 2013 domestically-based Seuffer, a manufacturer of parts for household appliances and commercial vehicles, announced it would incorporate Stratasys' technology into its manufacturing process in order to impart time and cost savings to the firm's production of injection molded sample parts. At the company, the use of additive manufacturing technologies reduced prototyping and production costs by more than 90 percent.

108

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**TABLE V-6**

**GERMANY: 3D PRINTING DEMAND BY PRODUCT & MARKET  
 (million dollars)**

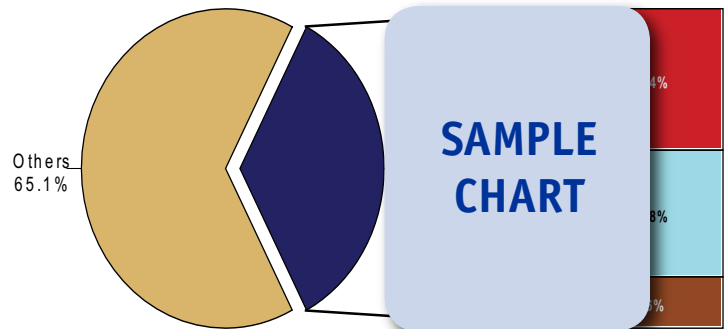
Item	2002	2007	2012	2017	2022
Population (mil persons)	82.0	82.0	82.0	82.0	82.0
\$ 3D printing/capita	0.0	0.0	0.0	0.0	0.0
3D Printing Demand	0.0	0.0	0.0	0.0	0.0
By Product:					
3D Printers	0.0	0.0	0.0	0.0	0.0
Materials	0.0	0.0	0.0	0.0	0.0
Software & Other	0.0	0.0	0.0	0.0	0.0
By Market:					
Consumer Products	0.0	0.0	0.0	0.0	0.0
Automotive	0.0	0.0	0.0	0.0	0.0
Medical & Dental	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0
% Germany	0.0	0.0	0.0	0.0	0.0
Western Europe 3D Printing Demand	0.0	0.0	0.0	0.0	0.0

**SAMPLE  
 TABLE**

**SAMPLE  
 TEXT**

**CHART VIII-1**

**WORLD 3D PRINTING MARKET SHARE  
 (\$2.0 billion, 2012)**



**SAMPLE  
 CHART**

**Sample Profile,  
 Table & Forecast**

**TABLE III-1**

**WORLD 3D PRINTER INSTALLED BASE BY REGION  
 (units)**

Item	2002	2007	2012	2017	2022
World Population (mil persons)	61	67	75		
3D printers/mil persons					
World 3D Printer Installed Base					
North America:					
United States					
Canada & Mexico					
Western Europe					
Asia/Pacific:					
China					
Japan					
Other Asia/Pacific					
Central & South America					
Eastern Europe					
Africa/Mideast					



**COMPANY PROFILES**

**Arcam AB**  
 Krokslätts Fabriker 27A  
 43137 Mölndal  
 Sweden  
 46-31-710-32  
 http://www.arcam.com

Revenues: \$  
 Employment  
 Key Products  
 melting techn

**SAMPLE  
 PROFILE**

use electron beam

Arcam produces additive manufacturing systems that form metal components used primarily in the orthopedic implant and aerospace industries. The Company also offers related metal powders and power handling equipment, and provides training, application support, maintenance, and other services.

Arcam is active in the world 3D printing industry through the production of additive manufacturing systems that utilize electron beam melting (EBM) technology to form metal components primarily used in the aerospace and orthopedic implant industries. Among Arcam's additive manufacturing systems are ARCAM A2, ARCAM A2X, and ARCAM A2XX models that produce metal parts for aerospace and general industry applications. In March 2013, the Company introduced the ARCAM Q10 additive manufacturing system, which is designed to produce small- to medium-sized orthopedic implants. The system features improved build platform insulation, enhanced resolution, and Arcam's ARCAM LAYERQAM camera-based monitoring system for inline part quality verification. The Company also sells related metal powders, including titanium- and cobalt chrome-based types, suitable for use with its additive manufacturing systems.

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**STUDY  
 COVERAGE**

**World 3D Printing (Additive Manufacturing)** is a Freedonia industry study that offers historical data (2002, 2007, and 2012) plus forecasts for 2017 and 2022 by product, market, world region and for 14 countries. The study also assesses key market environment factors, reviews emerging technology, evaluates company market share and profiles 40 competitors in the global industry.

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**OTHER STUDIES**

**Machine Tools in China**

Demand for machine tools in China is forecast to increase 9.2 percent per annum to ¥600 billion in 2017. Both metal cutting and forming machine tools and machine tool accessories will grow at a similarly strong pace. Transportation equipment and electrical/electronic equipment manufacturing will be the fastest growing markets. This study analyzes the ¥386 billion machine tool industry in China, with forecasts for 2017 and 2022 by product, market and region. The study also evaluates company market share and profiles industry participants.

#3090 .....December 2013 ..... \$5300

**World Plastics Processing Machinery**

Global plastics processing machinery demand will rise 6.9 percent yearly through 2017 to \$37.1 billion. Plastics packaging production equipment will exhibit the fastest and largest gains in demand. Injection molding equipment will remain the most popular product type, while 3D plastics printers will grow the fastest. This study analyzes the \$26.6 billion world plastics processing machinery industry, with forecasts for 2017 and 2022 by type, process, market, world region, and for 30 major countries. The study also evaluates company market share and profiles industry players.

#3093 ..... November 2013 ..... \$6100

**World Packaging Machinery**

Growth in worldwide demand for packaging machinery is expected to climb at a 4.6 percent annual pace through 2017 to \$41.8 billion. Machines used in the packaging of chemicals, pharmaceuticals, and personal care products will post the most rapid gains. The Asia/Pacific region will remain the fastest growing market. This study analyzes the \$33.4 billion world packaging machinery industry, with forecasts for 2017 and 2022 by product, market, world region, and for 31 countries. The study also evaluates company market share and profiles industry players.

#3063 .....September 2013..... \$6200

**World Robots**

Global robot demand will rise 10.5 percent annually through 2016 to \$20.2 billion. Five countries -- the US, Japan, Germany, China, and South Korea -- will continue to dominate demand, with the US remaining the largest national market. Smaller, less expensive service robots will outpace more sophisticated, high-value industrial and medical robots. This study analyzes the \$12.3 billion world robot industry, with forecasts for 2016 and 2021 by type, market, world region and for 14 countries. The study also evaluates company market share and profiles industry players.

#2950 .....December 2012 ..... \$6100

**World Food Processing Machinery**

Global sales of food processing machinery are expected to climb 7.3 percent per year to \$53.3 billion in 2016. The Asia/Pacific region will record the fastest demand gains, led by China, India, Indonesia and Thailand. Bakery and pasta machinery will remain the largest segment and post the highest value gains. This study analyzes the \$37.4 billion world food processing machinery industry, with forecasts for 2016 and 2021 by type, world region and for 21 major countries. The study also evaluates company market share and profiles industry participants.

#2931 ..... November 2012 ..... \$5900

**About The Freedonia Group**

The Freedonia Group, Inc., is a leading international industry market research company that provides its clients with information and analysis needed to make informed strategic decisions for their businesses. Studies help clients identify business opportunities, develop strategies, make investment decisions and evaluate opportunities and threats. Freedonia research is designed to deliver unbiased views and reliable outlooks to assist clients in making the right decisions. Freedonia capitalizes on the resources of its proprietary in-house research team of experienced economists, professional analysts, industry researchers and editorial groups. Freedonia covers a diverse group of industries throughout the United States, the emerging China market, and other world markets. Industries analyzed by Freedonia include:

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