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## **The Future is Now: 3D Printing**

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Rapid developments in additive manufacturing, or three-dimensional (3D) printing, are driving a phenomenal expansion of this means of production utilized to custom design and manufacture many products including medical devices and jet engine parts, among others. Some estimate that the growth of 3-D printers will reach 200 percent in 2015 based upon its ability to fabricate cost-effective, safe, and reliable products with shortened production times and less equipment. As with most innovation, the benefits of scientific and engineering breakthroughs such as 3D printing bring concomitant risks, including liability exposure and challenges in assessing the risk of producing products with short-run manufacturing. We will explore this topic in our seminar.

### **What is 3D Printing?**

3D printing is any of various processes to make a three-dimensional object. In 3D printing, additive processes are used, in which successive layers of material are laid down under computer control. These objects can be of almost any shape or geometry, and are produced from a 3D model or other electronic data source.

3D printing initially referred to processes that sequentially deposit material onto a powder bed with inkjet printer heads. More recently the meaning of the term has expanded to encompass a wider variety of techniques such as plastic extrusion and sintering based processes. Technical standards use the term additive manufacturing (AM) for this broader sense.<sup>1</sup>

### **What are its applications?**

There are many applications for AM technologies, including architecture, construction (AEC), industrial design, automotive, aerospace, military, engineering, dental and medical industries, biotech (human tissue replacement), fashion, footwear, jewelry, eyewear, education, geographic information systems, food..<sup>2</sup>

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<sup>1</sup> Extracted from Wikipedia

<sup>2</sup> Extracted from Wikipedia

While the cost per item is higher than conventionally manufactured items, set up expenses are far lower. For example, one aerospace firm cuts its construction time by 70% and overall costs by 80% when it switched to manufacturing cable housing by 3D methods rather than using conventional manufacturing.

Another benefit to the technology is the ability to customize a product to its end user's requirements. For example, custom built earphones designed to fit the customer's ear canals, based upon photographs, can now be built in a couple of days.

Since the start of the 21st century there has been a large growth in the sales of AM machines, and their price has dropped substantially. The market was \$3.1 billion in 2013. It is expected to grow to \$12.5 billion by 2018 and \$21 billion by 2020 according to a November 2014 Financial Times article. 3D Printers are now being manufactured for home use to make novelty items such as action figures.

One of the largest challenges to the growth of this industry is obtaining regulatory approval for products made in this fashion. Regulators are concerned about the safety of these products due, in some cases, to the uniqueness of each item. In other cases, the materials being used are not the same as those being used by conventionally manufactured products, whose properties are well known and which have stood the test of time. Regulators wish to ensure these products meet or exceed their predecessors particularly in the health and aerospace industries. They are therefore struggling with how to test these products to ensure they meet the standards.

### **What liability challenges will 3D Printing/Additive Manufacturing present?**

Will the private individual's ability to purchase such equipment lead to the rapid proliferation of new products manufactured in-home? With the growing distribution of products over the internet, will distribution of such products increase exponentially?

Basic questions that will arise have to do with the obligations of the designer or product manufacturer? How will they know that these products will stand up over time? What type of testing must they do prior to marketing these products? What will be the exposure of the manufacturer of the 3D printing machines if a product fails during usage? How should contracts between these two parties be drafted to mitigate exposures?

Will these products require any changes to traditional product liability doctrines? Strict liability? Breach of Warranties? Negligence? Will any changes be required?

Will loss exposures expand for manufacturers of such products? How should these exposures be financially protected? How will the growth of private manufacturing by in-home practitioners impact financial responsibility? How can brokers and underwriters be educated to better appreciate and anticipate these exposures? What implications will this have for the insurance industry?

Finally, from a loss control perspective, what are the known shortcomings of these processes and how can manufacturing and testing processes be designed to reduce these exposures?

We invite you to attend this seminar to learn more about this new technology and how it will transform the world we all live in.