

# Changing Paradigms

## A Materials Transformation in Manufacturing

Manufacturing is experiencing a significant and fundamental shift. Industries are not only adopting new, advanced materials, they are looking to each other for innovation—and changing the paradigms of how materials are used.

**10 OF THE TOP 50**

**\$250 MILLION**

U.S. manufacturers have announced programs to use innovative materials<sup>1</sup>

invested in advanced materials innovation by the Materials Genome Initiative<sup>2</sup>



## Everything Old is New Again

Many of the manufacturing technology and materials innovations developed for one industrial sector can be readily transferred and successfully applied in others. Gaining knowledge and adopting best practices from other industries allows manufacturers to create new standards using smarter materials, enable new functionalities, and optimize their products.

## It's a Material World

Longer service life with **Titanium**  
Boeing 787 is 15% titanium, more than double the amount in the 777<sup>3</sup>

Medical device innovation using **shape memory alloys**

Corrosion resistance through **advanced ceramics**

Operating in extreme environments with **super alloys**

Meeting rising fuel economy standards with **aluminum**  
249 kg of Al projected per car by 2025, up from current average of 110-145 kg<sup>4,5</sup>

Lighter aircraft with **advanced composites**  
Within aerospace, composite materials demand grew by 10.7% in 2014<sup>6</sup>

Automobile lightweighting using advanced **high strength steels**  
20 new grades of AHSS available in 2015-2020<sup>7</sup>

Environmentally friendly consumer electronics with **bioplastics**  
Worldwide biomaterials market expected to reach \$84 billion by 2017<sup>8</sup>

**Dissimilar materials** joining for improved performance  
Joining a variety of materials is critical to extending the life of nuclear power plants

More efficient wind turbines with **carbon fiber**  
Global demand for carbon fiber-reinforced plastic expected to grow 15 percent annually through 2020<sup>9</sup>

## Cross-Industry Expertise Solves Problems More Quickly and Efficiently

Drawing from its broad expertise and proven experience across a wide array of manufacturing sectors, EWI leads the way in using new and smarter materials. We develop innovative joining solutions, process monitoring techniques, and inspection methods for metal, composite, plastic, and ceramic products to allow manufacturers to stay on the cutting edge of the Manufacturing Revolution.

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<sup>1</sup>http://dupress.com/articles/the-transformation-of-manufacturing/#end-notes  
<sup>2</sup>https://www.whitehouse.gov/sites/default/files/microsites/ostp/materials\_genome\_initiative\_-\_three\_years.pdf  
<sup>3</sup>http://www.boeing.com/commercial/aeromagazine/articles/qtr\_4\_06/article\_04\_2.html  
<sup>4</sup>http://www.alcoa.com/car\_truck/en/pdf/Randall\_Scheps\_Platts\_2014.pdf  
<sup>5</sup>http://www.aluminiumleader.com/en/around/transport/cars  
<sup>6</sup>http://compositesmanufacturingmagazine.com/2015/01/what-will-drive-composites-growth-in-2015/3/  
<sup>7</sup>http://www.steel.org/~media/Files/Autosteel/NAIAS/AHSS%20Benefits%20and%20Applications.pdf  
<sup>8</sup>http://www.reportlinker.com/ci02343/Advanced-Material.html  
<sup>9</sup>http://www.themadeinamericamovement.com/uncategorized/the-transformation-of-manufacturing/