Markets for Smart Composites: 2015 to 2022

Description: Smart composites leverage the commercial success of the composite technology model and apply it specifically to smart materials. In regular composites two materials are combined to create a new material with functionality that is significantly different to the original materials. Typically, a smart composite is a smart material embedded in polymer, textiles, metal or concrete. In a few cases, smart composites are fabricated from two "dumb" materials that become smart only when they are combined.

This analysis suggests that these smart composites will have a growing role in a number of important applications and industry sectors. Many smart composites are inherently multifunctional and the latest smart composite technology even promises the ability to embed programmability into materials, enabling robotics-like behavior without embedded electronics.

This report discusses the latest products and R&D developments in smart composites from a business perspective and how product/market strategies related to these materials are emerging at both the largest specialty chemical and glass companies, and at as startups.

Materials and Technology:

This report provides complete coverage of the opportunities for smart composites examining the role of both the smart materials and substrates into which they are encapsulated. Components for smart materials that are analyzed in this report include:

- Piezoceramics
- Shape memory alloys
- Magneto-restrictive materials
- Electro-restrictive materials
- Carbon and optical fiber
- Thermoelectric and thermally responsive materials
- Others.

The report also looks at how smart composites compare with conventional smart materials and how smart composite fabrication technology is evolving. In particular, we examine the commercial potential of so-called 4D printing technology to take smart composites to a new level of intelligence within the context of smart material applications.

Applications and Markets for Smart Composites:

This report also includes an analysis of the application areas where smart composites are seen generating significant revenues in the next decade.

These areas include:

- Energy storage,
- Sensing and diagnostics
- Self-healing surfaces
- Robotics
- Clothing and fabrics
- Smart structures for the construction and aerospace industries.

Eight-Year Forecasts:

This report contains detailed forecasts of the smart composites market including

- Revenue ($ Millions)
- Volume (square meters or Kgs)
- Breakout by application
- Breakout by materials and technology
Strategic profiles:

This report also examines the product/market strategies of the firms to watch in smart composites including their current R&D programs. Coverage includes both smart composites activities of leading composites firms such as DuPont, 3M and Teijin, as well as innovative small firms and start-ups.

The evaluation of smart composites markets in this report is based on interviews with key influencers in smart materials markets, as well as numerous secondary resources. It also draws on insider knowledge of the smart materials business.

We believe that this report will be invaluable reading for marketing and business development specialists in coatings firms, specialty chemical companies and glass firms, electronics and robotics OEMs, as well as sophisticated investors interested in this space.

Contents:

Executive Summary

E.1 Eight-Year Forecasts by End-User Sector: Aerospace as Leader
E.2 Eight-Year Forecasts of Smart Composites by Functionality
E.2.1 Approaches to Segmentation of the Smart Composite Market
E.2.2 Eight-Year Forecasts
E.3 Analysis of Smart Composites Market by Functionality
E.4 Eight-Year Forecasts of Smart Composite Markets by Volume

Chapter One: Introduction
1.1 Objective of this Report
1.2 Scope of this Report
1.3 Forecasts and Methodology
1.4 Plan of this Report

Chapter Two: Smart Composite Technologies
2.1 Why the Future of Advanced Composites will be Smart
2.1.1 Composite Technology: State of the Art
2.1.2 A Shift to Smartness in Composites
2.2 Smart Composites as Next-Generation Smart Materials
2.2.1 The Shift towards Multi-functionality
2.2.2 Smart Composites with Embedded Sensors
2.2.3 Smart Coatings and Smart Composites
2.2.4 The Use of Biological Materials in Smart Composites
2.3 The Role of Nanotechnology in Smart Composites
2.3.1 Nanomanufacturing Processes
2.3.2 A Role for Carbon Nanotubes in Smart Composites
2.4 Important Technical Requirements for Smart Composites
2.4.1 Commercialization of Smart Composites: Routes and Issues
2.5 Smart Composites and 4D Printing
2.5.1 University of Colorado
2.5.2 MIT Self-Assembly Lab
2.6 Key Points from this Chapter

Chapter Three: Aerospace Markets for Smart Composites
3.1 Aerospace will become the Largest User of Smart Composites
3.1.1 Current and Future Use of Composites by the Aerospace Industry: Implications for Smart Composites
3.1.2 Marketing Smart Materials in the Aerospace Industry
3.2 Intelligent Aerospace Structures Pave the Way to Use of Smart Composites
3.2.1 Structural Health Monitoring
3.2.2 Structural Health Monitoring Plus Self-Healing
3.2.3 Smart Composite Work at NASA: Aurora Flight Sciences and Nanosonic
3.3 Eight-Year Forecasts of Smart Composites in the Aerospace Industry
3.4 Key Points from this Chapter

Chapter Four: Smart Composites in the Automotive Industry
4.1 Current Use of Composites in the Automotive Industry: Implications for Smart Composites
4.1.1 Benefits and Uses of Composites in the Automotive Sector: Can Smart Composites Expand Markets?
4.1.2 Patterns of Use for Composites in the Automotive Sector: Smart Not Yet to the Fore
4.1.3 Challenges to the Use of Smart Composites in the Automotive Sector
4.1.4 Why We Think that the Automotive Industry Will Embrace Smart Composites over Time
4.2 How Smart Materials Usage is Paving the Way for Smart Composites in the Automotive Industry
4.3 Eight-Year Forecasts of Smart Composites in the Automotive Industry
4.4 Key Points from this Chapter

Chapter Five: Smart Composites in the Construction Industry
5.1 Why Smart Composites in the Construction Industry are Different
5.2 Smart Concrete
5.2.1 Self-Healing Concrete and Beyond
5.2.2 Bacteria-based Self-Healing Concrete
5.3 Smart Asphalt
5.3.1 State-of-the-Art
5.3.2 University of Delft
5.4 Smart Wood
5.4.1 Air Purification in Smart Floors
5.5 Structural Health Monitoring
5.5.1 Self-Diagnosing (or Self-Monitoring) Fiber Reinforced Composites
5.6 Eight-Year Forecasts of Smart Composites in the Construction Industry
5.7 Key Points from this Chapter

Chapter Six: Other Markets for Smart Composites
6.1 Other Markets
6.2 Robotics: A Doubly Uncertain Future for Smart Composites
6.3 Clothing and Fabrics: Niche Market?
6.4 A Possible Future Market for Energy Storage using Smart Composites.
6.5 Eight-Year Forecast of Other Smart Composite Applications

Acronyms and Abbreviations Used In this Report
About the Author

List of Exhibits
Exhibit E-1: Eight-Year Forecast of Smart Composites by Application ($ Million)
Exhibit E-2: Eight-Year Forecast of Smart Composites Markets by Functionality ($ Millions)
Exhibit E-3: Opportunities in the Smart Composite Business by Type of Supplier
Exhibit 2-1: Selected Types of Composites
Exhibit 2-2: Emergence of Smartness in Composites
Exhibit 3-1: Eight-Year Forecast of Smart Aerospace Composites by Application
Exhibit 4-1: Forecast of Smart Composites Used in the Automotive Industry ($ Millions)
Exhibit 5-1: Smart Composites Used in the Construction Industry
Exhibit 5-2: Forecast of Smart Composites Used in the Construction Industry
Exhibit 6-1: Forecast of Smart Composites Used in Other Applications ($ Millions)

Ordering:
Order Online - http://www.researchandmarkets.com/reports/3513686/
Order by Fax - using the form below
Order by Post - print the order form below and send to

Research and Markets,
Guinness Centre,
Taylors Lane,
Dublin 8,
Ireland.
Fax Order Form

To place an order via fax simply print this form, fill in the information below and fax the completed form to 646-607-1907 (from USA) or +353-1-481-1716 (from Rest of World). If you have any questions please visit http://www.researchandmarkets.com/contact/

Order Information

Please verify that the product information is correct and select the format(s) you require.

Product Name: Markets for Smart Composites: 2015 to 2022
Web Address: http://www.researchandmarkets.com/reports/3513686/
Office Code: SCH3OFTJ

Product Formats

Please select the product formats and quantity you require:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic (PDF)</td>
<td></td>
</tr>
<tr>
<td>Single User:</td>
<td>USD 3495</td>
</tr>
<tr>
<td>1 - 10 Users:</td>
<td>USD 4295</td>
</tr>
<tr>
<td>Enterprisewide:</td>
<td>USD 4995</td>
</tr>
</tbody>
</table>

Contact Information

Please enter all the information below in BLOCK CAPITALS

Title: [Mr] [Mrs] [Dr] [Miss] [Ms] [Prof]
First Name: ______________________ Last Name: ______________________
Email Address: * ______________________
Job Title: ______________________
Organisation: ______________________
Address: ______________________
City: ______________________
Postal / Zip Code: ______________________
Country: ______________________
Phone Number: ______________________
Fax Number: ______________________

* Please refrain from using free email accounts when ordering (e.g. Yahoo, Hotmail, AOL)
Payment Information

Please indicate the payment method you would like to use by selecting the appropriate box.

☐ Pay by credit card: You will receive an email with a link to a secure webpage to enter your credit card details.

☐ Pay by check: Please post the check, accompanied by this form, to:

Research and Markets,
Guinness Center,
Taylors Lane,
Dublin 8,
Ireland.

☐ Pay by wire transfer: Please transfer funds to:

Account number 833 130 83
Sort code 98-53-30
Swift code ULSBIE2D
IBAN number IE78ULSB98533083313083
Bank Address Ulster Bank,
27-35 Main Street,
Blackrock,
Co. Dublin,
Ireland.

If you have a Marketing Code please enter it below:

Marketing Code: ____________________________

Please note that by ordering from Research and Markets you are agreeing to our Terms and Conditions at http://www.researchandmarkets.com/info/terms.asp

Please fax this form to:

(646) 607-1907 or (646) 964-6609 - From USA
+353-1-481-1716 or +353-1-653-1571 - From Rest of World