

Emerging Innovations in Composites Industry

<https://marketpublishers.com/r/E2A504BC934EN.html>

Date: February 2015

Pages: 406

Price: US\$ 4,850.00 (Single User License)

ID: E2A504BC934EN

Abstracts

Composites have already proven their worth as the materials having excellent performance benefits. The current challenges lying ahead are to make them cost-effective and speed up the manufacturing process. The efforts to meet these challenges have resulted in the development of advanced manufacturing techniques and innovative materials. The future market is expected to be highly competitive, and companies with innovation capability can thrive and gain market share.

The market for one of the composite materials, such as glass fiber, which is used as a reinforcing material for a variety of applications, such as boat, construction, wind, pipe and tank, and consumer goods, was approximately \$8.1 billion in 2013. Manufacturers of glass fibers are expected to focus on continuously developing high-performance glass fibers to meet higher mechanical and chemical requirements of different applications. Recently, PPG, 3B, Jushi Group, Owens Corning, and others have launched products to meet the requirements of the industry.

Lucintel, a leading global management consulting and market research firm, has analyzed innovations in the global composites market by material, application, and technology and has come up with a comprehensive research report, "Emerging Innovations in Composites Industry". This report provides an analysis of innovations in composites manufacturing technologies, applications and materials, including the market potential of materials, value chain, key drivers, unmet need, and the future roadmap for innovations in the composites industry. The study also includes the global composites market forecasts through 2025, by application.

Innovations in the composites industry are categorized or presented in the report as under the following headings:

Megatrends in composites by:

Materials

Applications

Technology

Innovations in the global composites industry by material:

Glass Fiber

Carbon Fiber

Natural Fiber

Resins

Compounds

Core Materials

Innovations in the global composites industry by application:

Aerospace

Automotive

Wind Energy

Construction

On the basis of its comprehensive research, Lucintel expects significant innovations in the composites market in the next 50 years. Most of the innovations in composite materials are focusing on performance improvement and cost benefits.

Contents

1. EXECUTIVE SUMMARY

2. INNOVATIONS OVERVIEW

- 2.1: Why innovation is required
- 2.2: Innovations in composites industry

3. COMPOSITES INDUSTRY INSIGHTS AND UNMET NEEDS ANALYSIS

- 3.1: Composites manufacturing technologies
- 3.2: Composite market- materials and applications
 - 3.2.1: Composites market by material
 - 3.2.2: Advanced composites market
 - 3.2.3: Raw materials market
- 3.3: Value chain analysis
- 3.4: Growth drivers and challenges
 - 3.4.1: Driving forces for the use of composite materials
 - 3.4.2: Industry challenges in recent years
 - 3.4.2.1: The energy cost squeeze
 - 3.4.2.2: Challenges for glass fiber industry
 - 3.4.2.3: Resin producers are relatively safe
 - 3.4.2.4: Fabricators' challenge
- 3.5: Unmet needs analysis
 - 3.5.1: Need for low-cost raw materials
 - 3.5.2: Resins and fiber materials with higher strain to failure
 - 3.5.3: Better UV- and chemical-resistant materials
 - 3.5.4: Low-cost manufacturing process for large and small parts
 - 3.5.5: Need for high temperature composite materials
 - 3.5.6: Low shrinkage materials
 - 3.5.7: Low wear and tear composite materials
 - 3.5.8: Damping and noise resistance materials
 - 3.5.9: Optimal resin and additive systems for closed molding operations
 - 3.5.10: Products manufacturability and affordability
 - 3.5.11: Flexible gel coats
 - 3.5.12: Flame-resistant materials
 - 3.5.13: Self-healing material
 - 3.5.14: Manufacturing process with lower processing time

- 3.5.15: Flexible honeycomb core
- 3.5.16: Fabric wrinkling
- 3.5.17: Method of cutting wet prepregs
- 3.5.18: Need for moisture-resistant honeycomb core
- 3.5.19: Fast cure epoxy resin

4. EMERGING INNOVATIONS IN COMPOSITE MATERIALS

- 4.1: Innovations in glass fiber
- 4.2: Innovations in carbon fiber
- 4.3: Innovations in natural fiber
- 4.4: Innovations in resins
- 4.5: Innovations in compounds
- 4.6: Innovations in core materials

5. EMERGING INNOVATIONS IN COMPOSITES APPLICATIONS

- 5.1: Emerging innovations in aerospace market
- 5.2: Emerging innovations in automotive market
- 5.3: Emerging innovations in wind energy market
- 5.4: Emerging innovations in construction market
- 5.5: Emerging innovations in composites manufacturing technologies

6. FUTURE ROADMAP FOR INNOVATIONS IN COMPOSITES INDUSTRY

7. OTHER RECENT LAUNCHES

- 7.1: Glass fiber
- 7.2: Carbon fiber
- 7.3: Natural fiber
- 7.4: Resin
- 7.5: Compounds
- 7.6: Core materials

List Of Figures

LIST OF FIGURES

Chapter 2. Innovations Overview

Figure 2.1: Six aspects of business values created by innovation

Figure 2.2: Unmet needs and the scope of innovation

Chapter 3. Composites Industry Insights and Unmet Needs Analysis

Figure 3.1: Classification of composite processing techniques

Figure 3.2: Advanced composites market share in global composites industry in 2013

Figure 3.3: Advanced composites market size (Million Pounds) in global composites industry in 2013

Figure 3.4: Advanced composites market distribution (\$M) in global composites industry in 2013

Figure 3.5: Advanced composites market size (\$M) in global composites industry in 2013

Figure 3.6: Raw material shipment (Million Pounds) in global composites industry in 2013

Figure 3.7: Global composites market breakdown (%) by raw materials used in 2013

Figure 3.8: Raw material shipment (\$M) in global composites industry in 2013

Figure 3.9: Global composites market breakdown (%, \$M) by raw materials used in 2013

Figure 3.10: Composites industry value chain

Figure 3.11: Flow chart of value chain for the composites industry

Figure 3.12: Dollar (\$) and gross profit flow chart through various nodes of the value chain (from raw material to end product)

Figure 3.13: Supply chain of composites industry

Chapter 4. Emerging Innovations in Composite Materials

Figure 4.1: Single-end roving

Figure 4.2: Multi-end roving

Figure 4.3: Chopped strand mat

Figure 4.4: Veil mat

Figure 4.5: Chopped strand

Figure 4.6: Fabrics

Figure 4.7: Woven roving

Figure 4.8: Recent glass fiber product launches towards high strength

Figure 4.9: Recent glass fiber product launches towards high modulus

Figure 4.10: Fiber glass direct roving from Johns Manville

Figure 4.11: 248A and PerforMax 249A short fiber application parts

Figure 4.12: Chopped strand reinforcements

Figure 4.13: Glass fiber products from AGY

Figure 4.14: Type 30 SE2307 single-end roving from Owens Corning

Figure 4.15: Recently launched glass fiber products by Owens Corning for automotive

Figure 4.16: Recently launched glass fiber products by Owens Corning for wind energy

Figure 4.17: Recently launched glass fiber products by Owens Corning for construction and others

Figure 4.18: Some of the other glass fiber product launches (I)

Figure 4.19: Some of the other glass fiber product launches (II)

Figure 4.20: Some of the other glass fiber product launches for application (I)

Figure 4.21: Some of the other glass fiber product launches for application (II)

Figure 4.22: Different types of carbon fiber forms

Figure 4.23: Typical continuous carbon fiber

Figure 4.24: Typical chopped carbon fiber

Figure 4.25: Typical metal (nickel)-coated carbon fiber

Figure 4.26: Recent carbon fiber product launches directed towards high strength

Figure 4.27: Tensile modulus of a few carbon fiber products launched since last five years

Figure 4.28: Carbon fiber structure

Figure 4.29: C-PLY SPREAD from Chomarat

Figure 4.30: DIALEAD K13916 from Mitsubishi Plastics, Inc.

Figure 4.31: Some of the major carbon fiber product launches in automotive application

Figure 4.32: Some of the major carbon fiber product launches in automotive and aerospace application

Figure 4.33: Future innovations towards improving tensile strength in natural fibers

Figure 4.34: Tensile strength of natural fiber products launched during 2009-2012

Figure 4.35: Future innovations to improve strength-to-stiffness ratio in natural fiber

Figure 4.36: Areas of innovation in natural fibers

Figure 4.37: Recent launches of continuous natural fibers and their properties

Figure 4.38: AmpliTex light fabric properties and their markets

Figure 4.39: Expected increase in usage of natural fibers in pultrusion and filament winding processes in future

Figure 4.40: Natural fiber treatments methods

Figure 4.41: Study of viscosity of recently launched resins suggest more launches in low

viscosity resins during last six years

Figure 4.42: Dow VORAFORCETM 5300 epoxy resin from The Dow Chemical Company

Figure 4.43: Beyond 1 resin for wind composites applications from DSM

Figure 4.44: Part developed with carbon fiber and epoxy resin

Figure 4.45: Profile and structure

Figure 4.46: EPIKOTE MGS RIMR 145 resin for wind turbine blade application from Momentive Performance Materials Inc

Figure 4.47: Some of the other resin product launches (I)

Figure 4.48: Some of the other resin product launches (II)

Figure 4.49: Some of the resin product launches for applications (I)

Figure 4.50: Some of the resin product launches for applications (II)

Figure 4.51: Short fiber, long fiber, and continuous fiber

Figure 4.52: Classification of thermoplastic composite materials

Figure 4.53: Sheet molding compound from core molding technologies

Figure 4.54: SymTerra sheet molding compounds (SMC) that combine renewable resource raw materials

Figure 4.55: Hyperion air handler made of SMC from CSP

Figure 4.56: The “Canopy LENS Antenna” uses molded BMC IB-2240 for its frontal enclosure

Figure 4.57: LFT pellets

Figure 4.58: Some of the major compound materials product launches

Figure 4.59: Use of core materials in wind blade

Figure 4.60: Study of strength property for recent product launches in core materials

Figure 4.61: More core material product launches are concentrated in low density area

Figure 4.62: SAER foam from SAERTEX

Figure 4.63: ArmaFORM PET foam from Armacell

Figure 4.64: BALTEK Banova lightweight panel from 3A Composites

Figure 4.65: ROHACELL, PMI-based structural foam from Evonik

Figure 4.66: DOW Wind Energy

Figure 4.67: Some other major product launches of core materials (I)

Figure 4.68: Some other major product launches of core materials (II)

Figure 4.69: Some other major product launches of core materials (III)

Figure 4.70: Some other major product launches of core materials (IV)

Figure 4.71: Some other major product launches of core materials (V)

Chapter 5. Emerging Innovations in Composites Applications

Figure 5.1: Forecast of buy material market in global aerospace and defense industry in

B lbs. 2013-2025

Figure 5.2: Material dominance in aerospace industry

Figure 5.3: Composites usage in different Boeing models

Figure 5.4: Trends in materials usage

Figure 5.5: Aerospace market need and areas of innovation

Figure 5.6: Boeing's B787 improvements over B767

Figure 5.7: Aerospace industry expectations from composites

Figure 5.8: Aerospace industry trends

Figure 5.9: Increased usage of carbon composites in primary structures

Figure 5.10: Increasing composites usage in all current and future leading programs

Figure 5.11: Genx CFRP front fan blades and front fan case

Figure 5.12: Current innovations to meet aerospace industry expectations

Figure 5.13: Lockheed martin incorporated CNRP into F35 lightning II wingtip fairings resulting in significant cost and weight reduction

Figure 5.14: Aerospace programs using automated material laying up techniques

Figure 5.15: Composites industry is shifting towards AFP and ATL processes

Figure 5.16: MAG's Gemini (combing AFP and ATL together)

Figure 5.17: GroFi platform- Multi-Lay-Up approach

Figure 5.18: Increasing focus towards Out-of-Autoclave

Figure 5.19: Boeing's different aircraft depicting reduced parts count

Figure 5.20: One piece fuselage of Boeing and HondaJet

Figure 5.21: Carbon fiber recycling as the innovation trend towards sustainability

Figure 5.22: Increasing need for recyclability of aircraft materials

Figure 5.23: Boeing's CFRP recycling

Figure 5.24: Forecast of buy materials market in automotive industry in million pounds and material dominance in automotive industry

Figure 5.25: Automotive industry expectation from composites

Figure 5.26: Manufacturing expectation – low-cost precursor and processes for carbon fiber

Figure 5.27: Industry putting efforts on alternative precursors and improvization in manufacturing process to reach desired level of \$5-\$6/lbs

Figure 5.28: Manufacturing expectation – improvization of part manufacturing process cycle time

Figure 5.29: Improvization in part manufacturing processes cycle time

Figure 5.30: HP RTM in mass produced vehicles

Figure 5.31: HP RTM process steps in detail

Figure 5.32: Partners of HP RTM process and fabricators using this process

Figure 5.33: Lamborghini – Callaway forged composites

Figure 5.34: Forged composite and RTM costs overview

Figure 5.35: Forged composite production rate improvements

Figure 5.36: Gurit SPRINT CBS

Figure 5.37: Comparison of vacuum bag process and press molding process cycle time

Figure 5.38: Electric vehicle made from Toho Tenax Technology

Figure 5.39: Manufacturing expectation – part consolidation or one piece design

Figure 5.40: Part Consolidation – one piece Monocoque

Figure 5.41: Few examples of one piece design

Figure 5.42: Monolithic design concept, a composites car door

Figure 5.43: Sustainability – recyclability of carbon composites

Figure 5.44: Recyclable CFRP composites in BMW I3

Figure 5.45: BMW's CFRP recycling technology

Figure 5.46: Sustainability – usage of natural fiber composites

Figure 5.47: Natural fiber composites in BMW I3

Figure 5.48: Cost reduction – inline compounding

Figure 5.49: Inline compounding system, such as D-LFT, D-GMT, and D-SMC

Figure 5.50: Forecast of buy materials market in wind energy industry in M lbs and material dominance in wind energy industry

Figure 5.51: Wind energy industry expectations from composites

Figure 5.52: Manufacturing expectation (wind energy) – increased usage of carbon fiber

Figure 5.53: Increasing demand of weight reduction in longer wind blades is leading to increased usage of carbon fiber

Figure 5.54: Industry focusing on higher MW size turbines and incorporating carbon fiber for reducing blade weight and increasing energy output

Figure 5.55: Manufacturing expectation (wind energy) – monolithic design

Figure 5.56: Monolithic design -- Siemens B75 - world's largest fiberglass component cast in one piece

Figure 5.57: Manufacturing expectation (wind energy) – seamless modular technology

Figure 5.58: Modular design -- blade dynamics using patented seamless modular technology for ETI's project of developing world's largest blades

Figure 5.59: Blade dynamics' D49 rotor blades for onshore using seamless modular technology

Figure 5.60: Manufacturing expectation (wind energy) – Fibramatic automated lay-up process

Figure 5.61: Automated manufacturing process Gamesa's Fibramatic automated lay-up for 100% automated infusion wind blade

Figure 5.62: Construction industry expectations from composites

Figure 5.63: Manufacturing expectation (construction industry) – increasing usage of polyurethane urethane composites

Figure 5.64: Increasing usage of polyurethane urethane composites

Figure 5.65: Manufacturing expectation (construction industry) – use of FRP in waterless toilet system

Figure 5.66: Use of FRP in waterless toilet system

Figure 5.67: Sustainability (construction industry) – usage of natural fiber composites

Figure 5.68: Use of natural fiber composites in construction

Figure 5.69: Sustainability (construction industry) – reduce greenhouse gas emission

Figure 5.70: Need to reduce greenhouse gas emission

Figure 5.71: Major emerging trends in composites technologies

Chapter 6. Future Roadmap for Innovations in Composites Industry

Figure 6.1: Innovation megatrends in composites market

Figure 6.2: Megatrend towards achieving light-weighting

Figure 6.3: Future direction towards improving performance

Figure 6.4: Innovations directed towards price reduction

Figure 6.5: Increasing use of eco-friendly materials

Figure 6.6: Emergence of monolithic design

List Of Tables

LIST OF TABLES

Chapter 2. Innovations Overview

Table 2.1: Key Emerging Innovations in Composite Materials

Chapter 3. Composites Industry Insights and Unmet Needs Analysis

Table 3.1: Global composites shipment by raw material type in 2013 (Source: Lucintel)

Table 3.2: Impact properties of some selected materials (I)

Table 3.3: Impact properties of some selected materials (II)

Table 3.4: Maximum continuous use temperatures for various thermoset and thermoplastics

Chapter 4. Emerging Innovations in Composite Materials

Table 4.1: Lucintel's rating methodology

Table 4.2: Lucintel's innovation attractiveness rating of new glass fiber technology from Johns Manville

Table 4.3: Lucintel's innovation attractiveness rating of ME1510 EP multi-end roving from Owens Corning

Table 4.4: Lucintel's innovation attractiveness rating fiber glass roving from Owens Corning

Table 4.5: Lucintel's innovation attractiveness rating of S-3 UHM glass fiber from AGY

Table 4.6: Lucintel's innovation attractiveness rating of type 30 SE2307 single-end roving from Owens Corning

Table 4.7: Some more emerging innovations in glass fiber in 2014.

Table 4.8: Lucintel's innovation attractiveness rating of CFRP lasso from Nanjing Loyalty Composite Equipment Manufacture Co. Ltd.

Table 4.9: Lucintel's innovation attractiveness rating of C-PLY SPREAD from Chomarat

Table 4.10: Lucintel's innovation attractiveness rating of DIALEAD K13916 from Mitsubishi Plastics, Inc

Table 4.11: Lucintel's innovation attractiveness rating of Dow VORAFORCETM 5300 Epoxy resin from The Dow Chemical Company

Table 4.12: Lucintel's innovation attractiveness rating of Beyone 1 resin for wind composites applications from DSM

Table 4.13: Lucintel's innovation attractiveness rating of EPIKOTE resin 05475 and EPIKURE curing agent 05500 system from Momentive Specialty Chemicals

Table 4.14: Lucintel's innovation attractiveness rating of Daron 220 resin from DSM

Table 4.15: Lucintel's innovation attractiveness rating of EPIKOTE MGS RIMR 145 resin for wind turbine blade application from Momentive Performance Materials Inc.

Table 4.16: Some more emerging innovations in resin in 2014

Table 4.17: Lucintel's innovation attractiveness rating of sheet molding compound from Core Molding Technologies

Table 4.18: Lucintel's innovation attractiveness rating of SymTerra composites from Premix

Table 4.19: Lucintel's innovation attractiveness rating of Hyperion air handler made of SMC from CSP

Table 4.20: Lucintel's innovation attractiveness rating of canopy LENS antenna molded with BMC IB-2240

Table 4.21: Lucintel's innovation attractiveness rating of a non-halogenated FR LFT-PP compound ECO-FORTE(TM) from RESIN (Products & Technology) B.V

Table 4.22: Some More Emerging Innovations in Compound in 2014

Table 4.23: Lucintel's Innovation Attractiveness Rating of SAER Foam from SAERTEX

Table 4.24: Lucintel's Innovation Attractiveness Rating of ArmaFORM PET Foam from Armacell

Table 4.25: Lucintel's Innovation Attractiveness Rating of BALTEK Banova Lightweight Panel from 3A Composites

Table 4.26: Lucintel's Innovation Attractiveness Rating of ROHACELL, PMI-Based Structural Foam from Evonik

Table 4.28: Lucintel's Innovation Attractiveness Rating of DOW COMPAXX 900 Foam Core System from Dow

Chapter 5. Emerging Innovations in Composites Applications

Table 5.1: Some emerging innovations in aerospace & defense in 2014

Table 5.2: Increasing usage of natural fiber composites applications

Table 5.3: Some emerging innovations in automotive in 2014

Table 5.4: Some emerging innovations in wind energy in 2014

Table 5.5: Some emerging innovations in construction in 2014

Table 5.6: Some emerging innovations in other industry in 2014

Table 5.7: Some emerging technological innovations in 2014

I would like to order

Product name: Emerging Innovations in Composites Industry

Product link: <https://marketpublishers.com/r/E2A504BC934EN.html>

Price: US\$ 4,850.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/E2A504BC934EN.html>

To pay by Wire Transfer, please, fill in your contact details in the form below:

First name:
Last name:
Email:
Company:
Address:
City:
Zip code:
Country:
Tel:
Fax:
Your message:

****All fields are required**

Customer signature _____

Please, note that by ordering from marketpublishers.com you are agreeing to our Terms & Conditions at <https://marketpublishers.com/docs/terms.html>

To place an order via fax simply print this form, fill in the information below and fax the completed form to +44 20 7900 3970