

Smart Materials – A Global Market Overview

“The report reviews, analyzes and projects the global market for Smart Materials for the period 2014-2023. Smart Material types analyzed in this study include Electrostrictive Materials, Magnetostrictive Materials, Piezoelectric Materials, Phase Change Materials, Shape Memory Alloys and Other Smart Materials (includes Wet Electroactive Polymers, Electrorheological and Magnetorheological Fluids, Electroluminescent and Photoluminescent Materials and Electrochromic Materials)”

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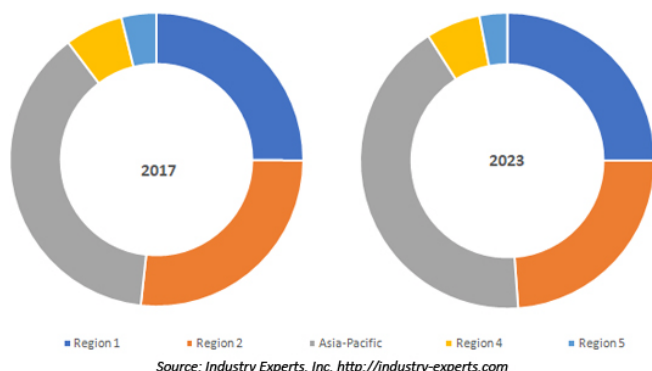
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Report Synopsis

Smart Materials constitute a class of advanced materials capable of sensing and responding to a wide variety of stimuli that can include electric and magnetic fields, temperature, pressure, mechanical stress, hydrostatic pressure, nuclear radiation and pH change. The inherently unique characteristics of these materials make it possible for them to revert back to their original state after the external stimulus is removed. This next generation of intelligent materials displays adaptive capabilities and alters its physical properties such as shape, stiffness and viscosity in a specified manner. Smart Materials have multiple functionalities, such as self-adaptability, self-sensing, self-healing and memory, which allow them to be used in a variety of applications.

As per the findings by the analysts at Industry Experts Inc., Phase Change Materials (PCMs) constitute the fastest growing material type with a robust 20% CAGR in the global market for Smart Materials. The increasing application of structural products in applications, such as building resources, electronics cooling, energy storage, shipping and packaging would further propel demand for these materials. Piezoelectric Materials corner the largest share of the global Smart Materials market, accounting for a forecast 66% share in 2018.

Global Smart Materials Market by Geographic Region 2017 and 2023



Research Findings & Coverage

- Smart Materials market is analyzed in this report with respect to all major material types and their key sub-types
- The study extensively studies each material type and the sub-type in all major global regions and prominent geographies in these regions
- Thermal Properties of Bio-based PCMs Enhanced with Exfoliated Graphite Nanoplatelets

- Energy Harvesting Applications Get a Boost with Biodegradable Piezoelectric Polymer
- Latest Advances in High Temperature Shape Memory Alloys
- Key business trends focusing on product innovations/developments, M&As, JVs and other recent industry developments
- Major companies profiled – 43
- The industry guide includes the contact details for 143 companies

Product Outline

The report analyzes the market for the key material types and sub-types types of Smart Materials including:

- Electrostrictive Materials
 - Lead Magnesium Niobate-Lead Titanate (PMN-PT)
 - Polymers
- Magnetostrictive Materials
 - Ferrites
 - Rare Earth Materials
- Piezoelectric Materials
 - Piezoceramics
 - Piezocomposites
 - Piezocrystals
 - Piezopolymers
- Phase Change Materials
 - Bio-Based
 - Inorganic
 - Organic
- Shape Memory Alloys
 - Copper-Based
 - Iron-Based
 - Nickel-Titanium
- Other Smart Materials (include wet electroactive polymers, electrorheological & magnetorheological fluids, electroluminescent & photoluminescent materials and electrochromic materials)

Analysis Period, Units and Growth Rates

- The report reviews, analyzes and projects the global Smart Materials market for the period 2014-2023 in terms of market value in US\$ and the compound annual growth rates (CAGRs) projected from 2017 through 2023

Geographic Coverage

- **North America** (The United States, Canada and Mexico)
- **Europe** (France, Germany, Italy, Russia, Spain, The United Kingdom and Rest of Europe)
- **Asia-Pacific** (China, India, Japan, South Korea and Rest of Asia-Pacific)
- **South America** (Argentina, Brazil and Rest of South America)
- **Rest of World**

SAMPLE COMPANY PROFILE

CERAMTEC GMBH (GERMANY)

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Website: www.ceramtec.com

Business Overview

Established in 1977, Ceramtec GmbH (Ceramtec) produces and supplies advanced ceramics and materials with well over 10,000 varied products for a wide range of applications worldwide. The company is specialized in the development, manufacturing and sales of parts, components and products made from ceramic materials. Ceramtec’s ceramics and materials are used in automotive industry, in electronics, energy and environmental technology, equipment, mechanical, and medical engineering applications. With more than 3,500 employees and production sites and subsidiaries in Europe, America and Asia, CeramTec has a worldwide presence. Ceramtec has offices in Guernsey, London, Frankfurt, Paris, Milan, Luxembourg and Hong Kong.

Product Analysis

Piezo-ceramics in Automotive Engineering

Knock sensors, back-up sensors, acceleration sensors, gyroscopes, sonar transducers for object recognition, sonar transducers for positioning/navigation, level sensors, air-mass meters and power generation for tire pressure sensors

Piezo-ceramics in Equipment and Mechanical Engineering

Ultrasonic distance sensors, Level sensors, Flow rate measurement (liquid and gaseous media), Ultrasonic cleaning, Ultrasonic welding (plastic and metal), Ultrasonic material processing, Non-destructive material testing and Active vibration dampening of tools

Piezo Ceramic Components

CeramTec presents a wide range of PZT and dielectric materials for all of your capacitor, sensing and transducer requirements.

Piezoceramic Composites

The Technical Ceramics business of CeramTec supplies piezoceramic composites offer divergent requirements of a wide variety of ultrasound and sonar applications.

Lead Zirconate Titanate (PZT)

Lead Zirconate Titanate (PZT)’s attributes of producing an electrical charge when mechanically compressed or vibrating when an electrical charge is applied, make it very conducive for passive sensing, active transmitting and mechanical displacement applications.

Ceramtec utilize three predominant types of piezoelectric materials, each providing a set of unique properties suitable for a range of applications. These three types of piezoelectric ceramics include our High Power “Hard” variant, our High Sensitivity “Soft” variant and also custom-made materials.

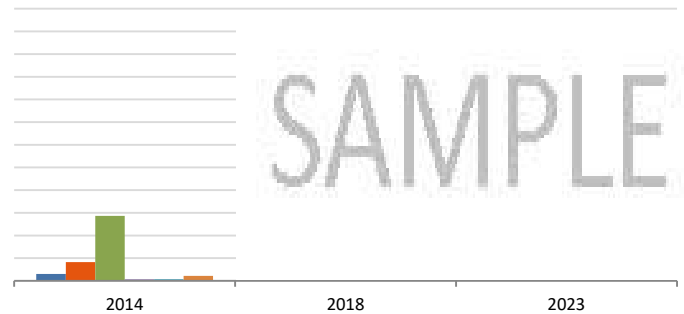
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SAMPLE TABLE/CHART

Glance at 2018 Global Smart Materials Market Share (%) by Region – North America, Europe, Asia-Pacific, South America and Rest of World



Asia-Pacific Smart Materials Market Analysis (2014-2023) by Material Type – Electrostrictive Materials, Magnetostrictive Materials, Piezoelectric Materials, Phase Change Materials, Shape Memory Alloys and Other Smart Materials in USD Million



KEY PLAYERS PROFILED

- APC International Ltd.
- Arkema SA
- Cedrat Technologies SA
- Ceramtec GmbH
- Channel Technologies Group, LLC
- Climator Sweden AB
- Croda International PLC
- Dynalloy, Inc.
- Fort Wayne Metals, Inc.
- G.RAU GmbH & Co., KG.
- Harris Corporation
- Honeywell Electronic Materials, Inc.
- Johnson Matthey Piezo Products GmbH
- Kyocera Corporation
- Metglas, Inc.
- Midé Technology Corporation
- Morgan Advanced Materials Plc
- Noliac A/S
- Peier Tech
- Phase Change Energy Solutions, Inc.
- Physik Instrumente (PI) GmbH & Co., KG.
- Piezo Kinetics, Inc.
- Qortek, Inc.
- Rubitherm Technologies GmbH
- SAES Getters SpA
- Smart Material Corporation
- Solvay SA
- Ultimate Niti Technologies, Inc.

.....more

TABLE OF CONTENTS

PART A: GLOBAL MARKET PERSPECTIVE 1

1. INTRODUCTION1

1.1 Product Outline..... 3

1.1.1 An Introduction to Smart Materials 3

1.1.2 Electrostrictive Materials 4

1.1.2.1 Lead Magnesium Niobate (PMN) and Lead Magnesium Niobate-Titanate (PMN-PT)..... 4

1.1.2.2 Electrostrictive Polymers 5

1.1.2.2.1 Relaxor Ferroelectric Polymers 5

1.1.2.2.2 Electrostrictive Graft Copolymers 6

1.1.2.2.3 Liquid Crystal Elastomers (LCEs) 6

1.1.3 Magnetostrictive Materials..... 7

1.1.3.1 Concept of Magnetostriction 7

1.1.3.2 A Brief History 8

1.1.3.3 Behavior of Magnetostrictive Materials 9

1.1.3.3.1 Magnetic Anisotropy..... 9

1.1.3.3.2 Magnetic Hysteresis..... 9

1.1.3.4 Properties of Magnetostrictive Materials 10

1.1.3.5 Production of Terfenol-D 10

1.1.4 Piezoelectric Materials..... 11

1.1.4.1 A History of Piezoelectricity 11

1.1.4.2 Types of Piezoelectric Materials 12

1.1.4.2.1 Piezocrystals 12

1.1.4.2.2 Piezoceramics 13

1.1.4.2.2.1 Barium Titanate (BaTiO₃) 14

Synthesis of Barium Titanate 14

Conventional Solid-State Reaction 14

Chemical Methods 14

Sol-Gel Method 15

Hydrothermal Method 16

Coprecipitation Method 16

Polymeric Precursor Method 17

Mechanochemical Synthesis 17

Piezoelectric Properties of BaTiO₃ 18

1.1.4.2.2.2 Lead Zirconate Titanate (PZT) 19

1.1.4.2.2.3 Lead Titanate (PbTiO₃) 19

1.1.4.2.3 Piezopolymers..... 20

1.1.4.2.3.1 Semicrystalline Piezopolymers..... 21

Polyvinylidene Fluoride (PVDF)..... 22

Poly (Vinylidene Fluoride-Trifluoroethylene and Tetrafluoroethylene) Copolymers..... 23

Other Semicrystalline Polymers 24

Polyamides..... 24

Polyureas 25

Biopolymers 26

1.1.4.2.3.2 Amorphous Piezopolymers 26

Polyvinyl Chloride (PVC)..... 27

PVDCN Copolymers..... 27

Other VDCN Polymers..... 27

Polyacrylonitrile (PAN)..... 28

Nitrile-Substituted Polyimide..... 28

Even Numbered Nylons 29

1.1.4.2.4 Piezocomposites 30

1.1.5 Phase Change Materials (PCMs) 30

1.1.5.1 Overview 30

1.1.5.2 Mechanism of PCMs 30

1.1.5.3 Types of PCMs..... 31

1.1.5.3.1 Inorganic PCMs 31

1.1.5.3.2 Organic PCMs..... 34

1.1.5.3.2.1 Paraffins..... 34

1.1.5.3.2.2 Non-Paraffins 35

1.1.5.3.3 Eutectic Mixtures 35

1.1.6 Shape Memory Alloys 36

1.1.6.1 A Brief History of SMAs..... 37

1.1.6.2 Fundamental Properties of SMAs 37

1.1.6.3 Types of SMAs..... 38

1.1.6.3.1 Copper-Based SMAs..... 38

1.1.6.3.2 Iron-Based SMAs..... 39

1.1.6.3.2.1 Material Properties 41

1.1.6.3.3 Nickel-Titanium (Ni-Ti) SMAs 42

1.1.7 Other Smart Materials 44

1.1.7.1 Wet Electroactive Polymers (EAPs)..... 44

1.1.7.2 Electrorheological and Magnetorheological Fluids 44

1.1.7.3 Electroluminescent and Photoluminescent Materials 46

1.1.7.4 Electrochromic Materials..... 46

2. KEY MARKET TRENDS.....48

2.1 Lead-Free Piezoceramics Alternative to Lead-Based PZT 48

2.2 Waste Sawdust-Based Composite Phase Change Materials Show Superior Thermal Conductivity 49

2.3 Energy Harvesting Applications Get a Boost with Biodegradable Piezoelectric Polymer 50

2.4 Latest Advances in High Temperature Shape Memory Alloys..... 51

2.5 Thermal Properties of Bio-based PCMs Enhanced with Exfoliated Graphite Nanoplatelets..... 51

3. KEY GLOBAL PLAYERS.....53

Apc International Ltd. (The United States) 53

Arkema Sa (France) 54

Cedrat Technologies Sa (France)..... 54

Ceramtec GmbH (Germany)..... 55

Channel Technologies Group, Llc (The United States)..... 57

Climator Sweden Ab (Sweden)..... 57

Croda International Plc (The United Kingdom)..... 58

Dynalloy, Inc. (The United States) 58

Fort Wayne Metals, Inc. (The United States)..... 59

G.Rau GmbH & Co., Kg. (Germany) 60

Harris Corporation (The United States) 61

Honeywell Electronic Materials, Inc. (The United States) 63

Johnson Matthey Piezo Products GmbH (Germany) 63

Kyocera Corporation (Japan)..... 64

Metglas, Inc. (The United States) 67

Midé Technology Corporation (The United States) 68

Morgan Advanced Materials Plc (The United Kingdom) .. 70

Noliac A/S (Denmark)..... 73

Peier Tech (China)..... 74

Phase Change Energy Solutions, Inc. (The United States) 74

Physik Instrumente (Pi) GmbH & Co., Kg. (Germany) 75

Piezo Kinetics, Inc. (The United States) 76

Qortek, Inc. (The United States)..... 78

Rubitherm Technologies GmbH (Germany) 80

Saes Getters SpA (Italy)..... 81

Smart Material Corporation (The United States)..... 82

Solvay Sa (Belgium)..... 83

Ultimate Niti Technologies, Inc. (The United States) 83

4. KEY BUSINESS & PRODUCT TRENDS.....84

Fine Tubes Ltd and International Titanium Association Conduct Presentation at Titanium Europe Conference 2018 in Seville, Spain 84

KYOCERA Corporation Launches New Ultra-Durable Coating Technology and Base Material 84

Fine Tubes Ltd Exhibits Titanium Based Tubes for Oil and Gas Extraction 84

KYOCERA Corporation Showcases Fine Ceramic Innovations at Hannover Messe 2018, Germany Trade Fair 85

AVX Corporation Launches New T4Z Medical Series HRC4000 Tantalum Capacitors for Non-Critical Medical Devices..... 85

SASOL Chemicals Announce Alumina Production Capacity... 86

AMETEK to Exhibit at Titanium Asia 2018 86

Allegheny Technologies Incorporated Enters into Agreement with General Dynamics (GD) Land Systems .. 86

Fort Wayne Metals Buys G&S Titanium 87

ATI to Supply Nickel-Based Alloy Product for a Large Oil Pipeline Repair Project..... 87

LEMA™ Alumina-Based Materials from Morgan Advanced Materials are Ideal for Investment Casting of Turbine Engine Blades 87

AMETEK Showcases Specialty Metal Tube, Strip and Powder for Critical Medical Applications at Medical Design and Manufacturing Minneapolis Exhibition 2017 88

Allegheny Technologies Incorporated and Tsingshan Group Join Forces to Form Joint Venture Company..... 88

Croda International Plc Opens Centre of Innovation for Formulation Science at the University of Liverpool's new Materials Innovation Factory (MIF) 89

Advanced Materials Development, LLC Expands in Columbia City 89

Morgan Advanced Materials Establishes Metals and Joining Center of Excellence in Hayward, California, USA89

Allegheny Technologies Incorporated and GE Aviation Announce Titanium Joint Venture plant 90

Electric Vehicle Market Grows with the industry-Wide Adoption of Alumina and Silicon Carbide Components .. 90

Morgan Advanced Materials Develops New Materials P-57 and P-59 for Use in Aerospace Components..... 91

Fine Tubes Ltd and Superior Tube Presents Titanium, Stainless Steel and Nickel Alloy Tubes at Aeromart Toulouse, France 91

Morgan Advanced Materials Establishes New Silicon Carbide Manufacturing Facility in Stourport, UK 91

KYOCERA Corporation Unveils Super Alloy, Aluminum, Titanium and Cast Iron Cutting Tools at AMB Trade Fair in Stuttgart, Germany..... 92

Morgan Advanced Materials Launches New Nilcra® Zirconia TS Grade Ceramic Die for Copper and Brass Extrusion 92

Morgan Advanced Materials Unveils Hafnium Oxide Material..... 92

Morgan Advanced Materials Develops Zirconia Material 93

Honeywell Electronic Materials Inc Launches Honeywell PTM6000 Phase Change Material 93

Metglas, Inc Unveils MBF90 Alloy..... 93

Metglas, Inc to Introduce MBF 601 and 602 Iron-Nickel based Brazing Foils 94

Morgan Advanced Materials Introduces PGS-100 Graphite-Loaded Silicon Carbon 94

AMETEK, Inc Acquires Global Tubes 94

Kuwait National Petroleum Company (KNPC) and Fine Tubes Ltd Enter into Contract..... 94

Fine Tubes Ltd and Superior Tube Co. Announce Titanium Tubing Solutions for Aerospace Applications..... 95

5. GLOBAL MARKET OVERVIEW96

5.1 Global Smart Materials Market Overview by Material Type 97

5.1.1 Electrostrictive Materials Market Overview by Global Region 99

5.1.1.1 Global Electrostrictive Materials Market Overview by Material Sub-Type..... 101

5.1.1.1.1 Electrostrictive Materials Sub-Type Market Overview by Global Region..... 103

5.1.1.1.1.1 Lead Magnesium Niobate-Lead Titanate (PMN-PT) 103

5.1.1.1.1.2 Polymers 105

5.1.2 Magnetostrictive Materials Market Overview by Global Region 107

5.1.2.1 Global Magnetostrictive Materials Market Overview by Material Sub-Type..... 109

5.1.2.1.1 Magnetostrictive Materials Sub-Type Market Overview by Global Region 111

5.1.2.1.1.1 Ferrites..... 111

5.1.2.1.1.2 Rare Earth Materials 113

5.1.3 Piezoelectric Materials Market Overview by Global Region 115

5.1.3.1 Global Piezoelectric Materials Market Overview by Sub-Type 117

5.1.3.1.1 Piezoelectric Materials Sub-Type Market Overview by Global Region	119	6.4.1.1.1.3 Piezoelectric Materials.....	198	7.4.2.1.1.1 Electrostrictive Materials	280
5.1.3.1.1.1 Piezoceramics	119	6.4.1.1.1.4 Phase Change Materials.....	200	7.4.2.1.1.2 Magnetostrictive Materials.....	282
5.1.3.2.1.2 Piezocomposites	121	6.4.1.1.1.5 Shape Memory Alloys	202	7.4.2.1.1.3 Piezoelectric Materials.....	284
5.1.3.2.1.3 Piezocrystals	123	6.4.2 Canada.....	204	7.4.2.1.1.4 Phase Change Materials.....	286
5.1.3.2.1.4 Piezopolymers.....	125	6.4.2.1 Canadian Smart Materials Market Overview by Material Type.....	205	7.4.2.1.1.5 Shape Memory Alloys	288
5.1.4 Phase Change Materials Market Overview by Global Region	127	6.4.2.1.1 Canadian Smart Materials Type Market Overview by Material Sub-Type.....	207	7.4.3 Italy	290
5.1.4.1 Global Phase Change Materials Market Overview by Sub-Type	129	6.4.2.1.1.1 Electrostrictive Materials	207	7.4.3.1 Italian Smart Materials Market Overview by Material Type	291
5.1.4.1.1 Phase Change Materials Sub-Type Market Overview by Global Region	131	6.4.2.1.1.2 Magnetostrictive Materials.....	209	7.4.3.1.1 Italian Smart Materials Type Market Overview by Material Sub-Type.....	293
5.1.4.1.1.1 Bio-Based	131	6.4.2.1.1.3 Piezoelectric Materials.....	211	7.4.3.1.1.1 Electrostrictive Materials.....	293
5.1.4.2.1.2 Inorganic.....	133	6.4.2.1.1.4 Phase Change Materials.....	213	7.4.3.1.1.2 Magnetostrictive Materials.....	295
5.1.4.2.1.3 Organic.....	135	6.4.2.1.1.5 Shape Memory Alloys	215	7.4.3.1.1.3 Piezoelectric Materials.....	297
5.1.5 Shape Memory Alloys Market Overview by Global Region	137	6.4.3 Mexico.....	217	7.4.3.1.1.4 Phase Change Materials.....	299
5.1.5.1 Global Shape Memory Alloys Market Overview by Sub-Type	139	6.4.3.1 Mexican Smart Materials Market Overview by Material Type	218	7.4.3.1.1.5 Shape Memory Alloys	301
5.1.5.1.1 Shape Memory Alloys Sub-Type Market Overview by Global Region	141	6.4.3.1.1 Mexican Smart Materials Type Market Overview by Material Sub-Type.....	220	7.4.4 Russia	303
5.1.5.1.1.1 Copper-Based	141	6.4.3.1.1.1 Electrostrictive Materials	220	7.4.4.1 Russian Smart Materials Market Overview by Material Type	304
5.1.5.1.1.2 Iron-Based.....	143	6.4.3.1.1.2 Magnetostrictive Materials.....	222	7.4.4.1.1 Russian Smart Materials Type Market Overview by Material Sub-Type.....	306
5.1.5.1.1.3 Nickel-Titanium	145	6.4.3.1.1.3 Piezoelectric Materials.....	224	7.4.4.1.1.1 Electrostrictive Materials.....	306
5.1.6 Other Smart Materials Market Overview by Global Region	147	6.4.3.1.1.4 Phase Change Materials.....	226	7.4.4.1.1.2 Magnetostrictive Materials.....	308
		6.4.3.1.1.5 Shape Memory Alloys	228	7.4.4.1.1.3 Piezoelectric Materials.....	310
		7. EUROPE	230	7.4.4.1.1.4 Phase Change Materials.....	312
		7.1 European Smart Materials Market Overview by Geographic Region	231	7.4.4.1.1.5 Shape Memory Alloys	314
		7.2 European Smart Materials Market Overview by Material Type	233	7.4.5 Spain.....	316
		7.2.1 European Smart Materials Type Market Overview by Material Sub-Type	235	7.4.5.1 Spanish Smart Materials Market Overview by Material Type	317
		7.2.1.1 Electrostrictive Materials	235	7.4.5.1.1 Spanish Smart Materials Type Market Overview by Material Sub-Type.....	319
		7.2.1.2 Magnetostrictive Materials.....	237	7.4.5.1.1.1 Electrostrictive Materials.....	319
		7.2.1.3 Piezoelectric Materials.....	239	7.4.5.1.1.2 Magnetostrictive Materials.....	321
		7.2.1.4 Phase Change Materials.....	241	7.4.5.1.1.3 Piezoelectric Materials.....	323
		7.2.1.5 Shape Memory Alloys	243	7.4.5.1.1.4 Phase Change Materials.....	325
		7.3 Major Market Players	245	7.4.5.1.1.5 Shape Memory Alloys	327
		Admedes GmbH (Germany)	245	7.4.6 The United Kingdom.....	329
		Arkema Sa (France)	245	7.4.6.1 United Kingdom Smart Materials Market Overview by Material Type.....	330
		Cedrat Technologies Sa (France).....	246	7.4.6.1.1 United Kingdom Smart Materials Type Market Overview by Material Sub-Type	332
		Ceramtec GmbH (Germany)	247	7.4.6.1.1.1 Electrostrictive Materials	332
		Climator Sweden Ab (Sweden).....	249	7.4.6.1.1.2 Magnetostrictive Materials.....	334
		Croda International Plc (The United Kingdom)	249	7.4.6.1.1.3 Piezoelectric Materials.....	336
		Euroflex GmbH (Germany)	249	7.4.6.1.1.4 Phase Change Materials.....	338
		Fine Tubes Ltd. (The United Kingdom)	250	7.4.6.1.1.5 Shape Memory Alloys	340
		G.Rau GmbH & Co., Kg. (Germany)	254	7.4.7 Rest of Europe.....	342
		Johnson Matthey Piezo Products GmbH (Germany)	254	7.4.7.1 Rest of Europe Smart Materials Market Overview by Material Type.....	343
		Morgan Advanced Materials Plc (The United Kingdom).....	255	7.4.7.1.1 Rest of Europe Smart Materials Type Market Overview by Material Sub-Type.....	345
		Noliac A/S (Denmark)	258	7.4.7.1.1.1 Electrostrictive Materials.....	345
		Phase Change Material Products, Ltd. (United Kingdom).....	259	7.4.7.1.1.2 Magnetostrictive Materials.....	347
		Physik Instrumente (Pi) GmbH & Co., Kg. (Germany)	260	7.4.7.1.1.3 Piezoelectric Materials.....	349
		Rubitherm Technologies GmbH (Germany)	261	7.4.7.1.1.4 Phase Change Materials.....	351
		Saes Getters SpA (Italy)	262	7.4.7.1.1.5 Shape Memory Alloys	353
		Solvay Sa (Belgium)	263	8. ASIA-PACIFIC.....	355
		7.4 Country-wise Analysis of European Smart Materials Market	264	8.1 Asia-Pacific Smart Materials Market Overview by Geographic Region	356
		7.4.1 France	264	8.2 Asia-Pacific Smart Materials Market Overview by Material Type	358
		7.4.1.1 French Smart Materials Market Overview by Material Type	265	8.2.1 Asia-Pacific Smart Materials Type Market Overview by Material Sub-Type.....	360
		7.4.1.1.1 French Smart Materials Type Market Overview by Material Sub-Type.....	267	8.2.1.1 Electrostrictive Materials.....	360
		7.4.1.1.1.1 Electrostrictive Materials	267	8.2.1.2 Magnetostrictive Materials.....	362
		7.4.1.1.1.2 Magnetostrictive Materials.....	269	8.2.1.3 Piezoelectric Materials.....	364
		7.4.1.1.1.3 Piezoelectric Materials.....	271	8.2.1.4 Phase Change Materials.....	366
		7.4.1.1.1.4 Phase Change Materials.....	273	8.2.1.5 Shape Memory Alloys	368
		7.4.1.1.1.5 Shape Memory Alloys	275		
		7.4.2 Germany.....	277		
		7.4.2.1 German Smart Materials Market Overview by Material Type	278		
		7.4.2.1.1 German Smart Materials Type Market Overview by Material Sub-Type.....	280		
PART B: REGIONAL MARKET PERSPECTIVE ..149					
REGIONAL MARKET OVERVIEW.....	151				
6. NORTH AMERICA	151				
6.1 North American Smart Materials Market Overview by Geographic Region.....	152				
6.2 North American Smart Materials Market Overview by Material Type.....	154				
6.2.1 North American Smart Materials Type Market Overview by Material Sub-Type.....	156				
6.2.1.1 Electrostrictive Materials	156				
6.2.1.2 Magnetostrictive Materials.....	158				
6.2.1.3 Piezoelectric Materials.....	160				
6.2.1.4 Phase Change Materials.....	162				
6.2.1.5 Shape Memory Alloys	164				
6.3 Major Market Players	166				
Ai Technology, Inc. (The United States).....	166				
Allegheny Technologies Incorporated (United States).....	168				
APC International Ltd. (The United States)	171				
AVX Corporation (The United States)	172				
Channel Technologies Group, LLC (The United States) ..	174				
Confluent Medical Technologies (The United States) ..	174				
Dynalloy, Inc. (The United States).....	175				
Fort Wayne Metals, Inc. (The United States)	176				
Harris Corporation (The United States)	177				
Honeywell Electronic Materials, Inc. (United States).....	179				
Metalwerks Pmd, Inc. (The United States).....	180				
Metglas, Inc. (The United States).....	181				
Midé Technology Corporation (The United States).....	182				
Phase Change Energy Solutions, Inc. (United States).....	184				
Piezo Kinetics, Inc. (The United States).....	185				
Qortek, Inc. (The United States)	187				
Smart Material Corporation (The United States)	189				
Ultimate Niti Technologies, Inc. (The United States)	190				
6.4 Country-wise Analysis of North American Smart Materials Market	191				
6.4.1 The United States.....	191				
6.4.1.1 United States Smart Materials Market Overview by Material Type.....	192				
6.4.1.1.1 United States Smart Materials Type Market Overview by Material Sub-Type.....	194				
6.4.1.1.1.1 Electrostrictive Materials	194				
6.4.1.1.1.2 Magnetostrictive Materials.....	196				

8.3 Major Market Players	370	8.4.4 South Korea	419	9.3.1.1.1.3 Piezoelectric Materials.....	467
Baoji Seabird Metal Co., Ltd. (China)	370	8.4.4.1 South Korean Smart Materials Market		9.3.1.1.1.4 Phase Change Materials.....	469
Grikin Advanced Material Co., Ltd. (China).....	371	Overview by Material Type.....	420	9.3.1.1.1.5 Shape Memory Alloys	471
Kyocera Corporation (Japan)	372	8.4.4.1.1 South Korean Smart Materials Type Market		9.3.2 Brazil.....	473
Nippon Seisen Co., Ltd. (Japan)	375	Overview by Material Sub-Type.....	422	9.3.2.1 Brazilian Smart Materials Market Overview by	
Nippon Steel & Sumitomo Metal Corporation (Japan).....	376	8.4.4.1.1.1 Electrostrictive Materials	422	Material Type	474
Peier Tech (China)	377	8.4.4.1.1.2 Magnetostrictive Materials.....	424	9.3.2.1.1 Brazilian Smart Materials Type Market	
Tdk Corporation (Japan)	377	8.4.4.1.1.3 Piezoelectric Materials.....	426	Overview by Material Sub-Type.....	476
Xi'an Saite Metal Materials Development Co., Ltd. (China)	378	8.4.4.1.1.4 Phase Change Materials.....	428	9.3.2.1.1.1 Electrostrictive Materials.....	476
8.4 Country-wise Analysis of Asia-Pacific Smart		8.4.4.1.1.5 Shape Memory Alloys	430	9.3.2.1.1.2 Magnetostrictive Materials.....	478
Materials Market	380	8.4.5 Rest of Asia-Pacific	432	9.3.2.1.1.3 Piezoelectric Materials.....	480
8.4.1 China	380	8.4.5.1 Rest of Asia-Pacific Smart Materials Market		9.3.2.1.1.4 Phase Change Materials.....	482
8.4.1.1 Chinese Smart Materials Market Overview by		Overview by Material Type.....	433	9.3.2.1.1.5 Shape Memory Alloys	484
Material Type	381	8.4.5.1.1 Rest of Asia-Pacific Smart Materials Type		9.3.3 Rest of South America	486
8.4.1.1.1 Chinese Smart Materials Type Market		Market Overview by Material Sub-Type	435	9.3.3.1 Rest of South American Smart Materials	
Overview by Material Sub-Type.....	383	8.4.5.1.1.1 Electrostrictive Materials	435	Market Overview by Material Type	487
8.4.1.1.1.1 Electrostrictive Materials	383	8.4.5.1.1.2 Magnetostrictive Materials.....	437	9.3.3.1.1 Rest of South American Smart Materials	
8.4.1.1.1.2 Magnetostrictive Materials.....	385	8.4.5.1.1.3 Piezoelectric Materials.....	439	Type Market Overview by Material Sub-Type	489
8.4.1.1.1.3 Piezoelectric Materials.....	387	8.4.5.1.1.4 Phase Change Materials.....	441	9.3.3.1.1.1 Electrostrictive Materials	489
8.4.1.1.1.4 Phase Change Materials.....	389	8.4.5.1.1.5 Shape Memory Alloys	443	9.3.3.1.1.2 Magnetostrictive Materials.....	491
8.4.1.1.1.5 Shape Memory Alloys	391	9. SOUTH AMERICA.....	445	9.3.3.1.1.3 Piezoelectric Materials.....	493
8.4.2 India	393	9.1 South American Smart Materials Market		9.3.3.1.1.4 Phase Change Materials.....	495
8.4.2.1 Indian Smart Materials Market Overview by		Overview by Geographic Region.....	446	9.3.3.1.1.5 Shape Memory Alloys	497
Material Type	394	9.2 South American Smart Materials Market		10. REST OF WORLD	499
8.4.2.1.1 Indian Smart Materials Type Market		Overview by Material Type.....	448	10.1 Rest of World Smart Materials Market Overview	
Overview by Material Sub-Type.....	396	9.2.1 South American Smart Materials Type Market		by Material Type	500
8.4.2.1.1.1 Electrostrictive Materials	396	Overview by Material Sub-Type.....	450	10.1.1 Rest of World Smart Materials Type Market	
8.4.2.1.1.2 Magnetostrictive Materials.....	398	9.2.1.1 Electrostrictive Materials	450	Overview by Material Sub-Type.....	502
8.4.2.1.1.3 Piezoelectric Materials.....	400	9.2.1.2 Magnetostrictive Materials.....	452	10.1.1.1 Electrostrictive Materials	502
8.4.2.1.1.4 Phase Change Materials.....	402	9.2.1.3 Piezoelectric Materials.....	454	10.1.1.2 Magnetostrictive Materials.....	504
8.4.2.1.1.5 Shape Memory Alloys	404	9.2.1.4 Phase Change Materials.....	456	10.1.1.3 Piezoelectric Materials.....	506
8.4.3 Japan	406	9.2.1.5 Shape Memory Alloys	458	10.1.1.4 Phase Change Materials.....	508
8.4.3.1 Japanese Smart Materials Market Overview by		9.3 Country-wise Analysis of South American Smart		10.1.1.5 Shape Memory Alloys	510
Material Type	407	Materials Market	460	PART C: GUIDE TO THE INDUSTRY.....	512
8.4.3.1.1 Japanese Smart Materials Type Market		9.3.1 Argentina	460	1. NORTH AMERICA	512
Overview by Material Sub-Type.....	409	9.3.1.1 Argentine Smart Materials Market Overview		2. EUROPE.....	515
8.4.3.1.1.1 Electrostrictive Materials	409	by Material Type.....	461	3. ASIA-PACIFIC.....	517
8.4.3.1.1.2 Magnetostrictive Materials.....	411	9.3.1.1.1 Argentine Smart Materials Type Market		PART D: ANNEXURE.....	519
8.4.3.1.1.3 Piezoelectric Materials.....	413	Overview by Material Sub-Type.....	463	1. RESEARCH METHODOLOGY	519
8.4.3.1.1.4 Phase Change Materials.....	415	9.3.1.1.1.1 Electrostrictive Materials.....	463	2. FEEDBACK	521
8.4.3.1.1.5 Shape Memory Alloys	417	9.3.1.1.1.2 Magnetostrictive Materials.....	465		

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