

## Phase Change Materials: Technologies and European Markets

https://marketpublishers.com/r/PD6D4EC7F5CEN.html

Date: November 2018 Pages: 98 Price: US\$ 1,250.00 (Single User License) ID: PD6D4EC7F5CEN

### Abstracts

Report Scope:

This research report incorporates an in-depth analysis of the European PCM market, including market estimates and trends through 2023. The report analyzes the market dynamics of such applications across Europe. Major players, competitive intelligence, innovative technologies, market dynamics and market opportunities are discussed in detail. European phase change materials technologies are analyzed by phase change material type, application and country analysis.

The report also discusses recent corporate developments among major players, as well as their product portfolios. Companies selected for profiles are global and regional companies operating in the region. Furthermore, the report also includes an analysis of patents over the past two to three years in Europe.

Estimated values used are based on manufacturers' total revenues. Projected and forecasted revenue values are in constant U.S. dollars, unadjusted for inflation.

Report Includes:

17 data tables and 38 additional tables

Industry analysis of the phase change materials (PCMs) or latent heat storage materials within the European region

Analyses of global market trends, with data from 2017 to 2018, and projections of compound annual growth rates (CAGRs) through 2023



A brief study of various PCMs such as salt hydrates, paraffin, fatty acids, eutectic salts on the basis of applications, materials and region

An outline of track alliances, joint ventures, mergers and acquisitions, new products and other developments and research and development (R&D) in the PCM market

Patent analysis of the PCMs and gain insight into trends over the past 2–3 years

Examination of competitive landscape and corporate profiles of major market players, including CSafe Global, DuPont, Henkel, Micron, Phase Change Material Products Ltd., Shin-Etsu Chemical Co. Ltd. and TCP Reliable



### Contents

#### **CHAPTER 1 INTRODUCTION**

Study Goals and Objectives Scope of Report Intended Audience Research Methodology Geographic Breakdown Analyst's Credentials BCC Custom Research Related BCC Research Reports

#### **CHAPTER 2 SUMMARY AND HIGHLIGHTS**

#### **CHAPTER 3 MARKET OVERVIEW**

Product Description
Market Classification
Analysis of PCM Business Structure
Types of PCMs
Categorization of Phase Change Materials
Paraffins as PCMs
Salt Hydrates as PCMs
Bio-Based and Fatty Acid-Based PCMs
Market Dynamics of the PCM Market
Drivers
Restraints
Opportunities
PCM Applications: Competitive Analysis
R&D and Innovations
PCM Materials: Temperature Analysis
Quality and Testing Regulations for PCMs
Phase Transition Temperature and Stored Heat (Enthalpy Temperature Gradient)
Making the Measurements
Contents of the Test Result and the Test Report
Reproducibility of the Phase Transition
Damage Criteria
Cycling Category



Thermal Conductivity

#### CHAPTER 4 ANALYSIS OF PHASE CHANGE MATERIALS BY TYPE

Technical Analysis of Salt Hydrate-based PCMs Technical Analysis of Fatty Acid-based PCMs Technical Analysis of Paraffin-based PCMs Encapsulation Microencapsulation Applications for Microencapsulated Products Macroencapsulation European Market for PCMs by Product Paraffin-Based PCM Market Salt Hydrate-Based PCM Market Other PCM Markets

## CHAPTER 5 EUROPEAN MARKET FOR PHASE CHANGE MATERIALS BY APPLICATION

Introduction Market Dynamics PCM Manufacturers Analysis of PCM Applications Building and Construction HVAC Energy Storage Commercial Refrigeration Shipping and Transportation Textiles Other Applications

# CHAPTER 6 EUROPEAN MARKET FOR PHASE CHANGE MATERIALS BY COUNTRY

Germany United Kingdom France Rest of Europe



#### **CHAPTER 7 COMPETITIVE LANDSCAPE**

Industry Growth Strategies Recent Developments in European PCM Market

#### **CHAPTER 8 COMPANY PROFILES**

**AAVID KUNZE** ADVANSA BV AI TECHNOLOGY INC. **CIAT GROUP** CLIMATOR SWEDEN AB COSELLA-DORKEN SYSTEMS INC. **CRODA INTERNATIONAL PLC** CSAFE GLOBAL DATUM PHASE CHANGE LTD. DUPONT EMCO KLIMATECHNIK GMBH & CO. KG EWALD DORKEN AG HENKEL **KAPLAN ENERGY** LAIRD TECHNOLOGIES MICRON **OUTLAST TECHNOLOGIES** PARKER CHOMERICS PHASE CHANGE MATERIAL PRODUCTS LTD. **RUBITHERM TECHNOLOGIES** SHIN-ETSU CHEMICAL CO. LTD. TCP RELIABLE

#### CHAPTER 9 APPENDIX: LIST OF ACRONYMS



## **List Of Tables**

#### LIST OF TABLES

Summary Table: European PCM Market, by Application, Through 2023

- Table 1: Temperature Properties of Phase Change Materials
- Table 2: Paraffin Temperatures
- Table 3: Salt Hydrate Temperatures
- Table 4: Biomaterials/Fatty Acids Temperatures
- Table 5: PCM Temperatures and Applications
- Table 6: Temperature Analysis of Commonly Used Paraffin-based Phase Change Materials
- Table 7: Temperature Analysis of Commonly Used Salt Hydrate-based PCMs
- Table 8: Temperature Analysis of Commonly Used Fatty Acid-based or Bio-based PCMs
- Table 9: Reproducibility Specified, by Cycling Categories
- Table 10: Comparative Analysis of Phase Change Materials
- Table 11: Comparative Analysis of Salt Hydrate-based Phase Change Materials
- Table 12: Comparative Analysis of Fatty Acid-based PCMs
- Table 13: Comparative Analysis of Paraffin-based Phase Change Materials
- Table 14: Comparative Analysis of Encapsulation Techniques
- Table 15: European PCM Market, by Type, Through 2023
- Table 16: European Market for Paraffin-based PCM, by Country, Through 2023
- Table 17: European Market for Salt Hydrate-based PCM, by Country, Through 2023
- Table 18: European Market for Other PCMs, by Country, Through 2023
- Table 19: Comparative Analysis of PCM Manufacturers, by Application
- Table 20: European Market for PCM in Building and Construction Applications, by Country, Through 2023
- Table 21: European Market for PCM in HVAC Applications, by Country, Through 2023
- Table 22: Commercially Available Phase Change Materials for Energy Storage
- Table 23: European Market for PCM in Energy Storage Applications, by Country, Through 2023
- Table 24: European Market for PCM in Commercial Refrigeration Applications, by Country, Through 2023
- Table 25: European Market for PCM in Shipping and Transportation Applications, by Country, Through 2023
- Table 26: European Market for PCM in Textile Applications, by Country, Through 2023 Table 27: European Market for PCM in Other Applications, by Country, Through 2023 Table 28: European PCM Market, by Country, Through 2023



Table 29: German PCM Market, by Application, Through 2023

- Table 30: U.K. PCM Market, by Application, Through 2023
- Table 31: French PCM Market, by Application, Through 2023
- Table 32: Rest of European PCM Market, by Application, Through 2023
- Table 33: Activities by Major Players in the European PCM Market, 2013-2017
- Table 34: Aavid Kunze: Product Portfolio
- Table 35: AI Technology Inc.: Product Portfolio
- Table 36: CIAT Group: Product Portfolio
- Table 37: Climator Sweden AB: Product Portfolio
- Table 38: Cosella-D?rken: Product Portfolio
- Table 39: Croda International Plc: Product Portfolio
- Table 40: CSafe Global: Product Portfolio
- Table 41: Datum Phase Change Ltd.: Product Portfolio
- Table 42: DuPont: Product Portfolio
- Table 43: EMCO Klimatechnik GmbH & Co. KG: Product Portfolio
- Table 44: Henkel: Product Portfolio
- Table 45: Kaplan Energy: Product Portfolio
- Table 46: Laird Technologies: Products Portfolio
- Table 47: Micron: Product Portfolio
- Table 48: Outlast Technologies: Product Portfolio
- Table 49: Chomerics: Product Portfolio
- Table 50: Phase Change Material Products Ltd.: Product Portfolio
- Table 51: Rubitherm Technologies: Product Portfolio
- Table 52: Shin-Etsu Chemical Co. Ltd.: Product Portfolio
- Table 53: TCP Reliable: Product Portfolio
- Table 54: Acronyms Used in This Report



## **List Of Figures**

#### **LIST OF FIGURES**

Summary Figure: European PCM Market, by Application, 2017-2023

- Figure 1: Classification of Phase Change Materials
- Figure 2: Business Structure of the Phase Change Material Market
- Figure 3: PCM Conversion Cycle
- Figure 4: Phase Change Materials in Textile Manufacturing
- Figure 5: European Carbon Dioxide Emissions, by End-Use Sector, 2017
- Figure 6: European Greenhouse Gas Emissions, by End-Use Sector, 2017
- Figure 7: Cooling and Heating Process, Through PCM
- Figure 8: Energy Consumption in Residential and Commercial Buildings, by Segment, 2017
- Figure 9: Temperature Fluctuations with and without PCM
- Figure 10: Shift in Electrical Load in a 24-Hour Cycle
- Figure 11: Characteristics of Phase Change Materials
- Figure 12: Raw Materials Share of Paraffin Production, by Type
- Figure 13: Paraffin Production Process
- Figure 14: Microencapsulation Process
- Figure 15: European Market for PCM, by Application, 2017
- Figure 16: European Market for PCM in Building and Construction Applications, by Country, 2017-2023
- Figure 17: Role of PCM in Cooling Tower
- Figure 18: European Market for PCM in HVAC Applications, by Country, 2017-2023
- Figure 19: European Market for PCM in Energy Storage Applications, by Country, 2017-2023
- Figure 20: European Market for PCM in Commercial Refrigeration Applications, by Country, 2017-2023
- Figure 21: European Market for PCM in Shipping and Transportation Applications, by Country, 2017-2023
- Figure 22: European Market for PCM in Textile Applications, by Country, 2017-2023
- Figure 23: European Market for PCM in Other Applications, by Country, 2017-2023
- Figure 24: European PCM Market, by Country, 2017-2023
- Figure 25: German PCM Market, by Application, 2017-2023
- Figure 26: U.K. PCM Market, by Application, 2017-2023
- Figure 27: French PCM Market, by Application, 2017-2023
- Figure 28: Rest of European PCM Market, by Application, 2017-2023



#### I would like to order

Product name: Phase Change Materials: Technologies and European Markets Product link: <u>https://marketpublishers.com/r/PD6D4EC7F5CEN.html</u>

> Price: US\$ 1,250.00 (Single User License / Electronic Delivery) If you want to order Corporate License or Hard Copy, please, contact our Customer Service: <u>info@marketpublishers.com</u>

#### Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <u>https://marketpublishers.com/r/PD6D4EC7F5CEN.html</u>

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

Custumer signature \_\_\_\_\_

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

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