

The Global Market for Phase Change Materials 2024-2034

<https://marketpublishers.com/r/GB7D348E449EEN.html>

Date: September 2023

Pages: 150

Price: US\$ 1,250.00 (Single User License)

ID: GB7D348E449EEN

Abstracts

Phase Change Materials (PCMs) are thermal compounds that absorb and release thermal energy during phase

transitions between solid and liquid. This allows effective thermal storage and temperature regulation. A wide range

of PCMs have been developed including organic (paraffins and fatty acids), inorganics (salt hydrates and metallic)

and eutectic mixtures of organic and/or inorganic materials. PCM products are used to improve whole-building

energy efficiency in retail, commercial, hospitality, and industrial applications; enable safe transport of sensitive

food and pharmaceutical products; and provide enhanced thermal storage capabilities for industrial and

commercial processes, among other applications.

The Global Market for Phase Change Materials 2024-2034 provides a comprehensive analysis of the global phase

change materials (PCMs) market. The report covers PCM types including paraffins, fatty acids, salt hydrates,

eutectics, and metallics. Applications in buildings, cold chain, electronics cooling, textiles, aerospace, automotive,

and energy storage are assessed.

The report provides PCM global market revenues, regional market breakdowns, growth drivers, trends, technology

overview, SWOT analysis, pricing, patents, and profiles 60+ leading PCM manufacturers.

Multiple tables summarize key properties, advantages/disadvantages, applications, and market metrics for major

PCM technology segments. Future outlook assesses opportunities in encapsulation, bio-PCMs, heating/cooling

integration, electronics substrates, medical textiles, building integration and cold storage.

The report helps decision makers in the PCM value chain including materials suppliers, heating/cooling OEMs,

electronics brands, logistics providers, architects, and specialty chemical companies understand the fast-growing

multi-billion dollar PCM market and identify new application and partnership opportunities.

Report contents include:

Overview of phase change materials, their properties, classification, and applications.

PCM market size, growth drivers, competitive landscape, developments, opportunities.

Working principle, types of PCMs, encapsulation methods, comparative analysis.

Thermal energy storage concepts.

Recent patents related to PCM technologies.

Cost ranges for different PCM types.

Total PCM global market size and forecasts. Breakdown by market segments and regions.

PCM adoption in buildings, electronics cooling, cold storage, textiles, aerospace, automotive etc.

Profiles of 60+ companies manufacturing various types of PCMs. Companies profiled include

Axiotherm GmbH, Climator Sweden AB, HeatVentors, i-TES, Kaneka, Lightstandard Technology,

PureTemp LLC, Rubitherm Technologies, and Swave Photonics NV.

Contents

1 EXECUTIVE SUMMARY

- 1.1 What are Phase change materials (PCMs)?
 - 1.1.1 Key properties
 - 1.1.2 Classification
- 1.2 Markets
- 1.3 Market drivers
- 1.4 Properties of Phase Change Materials (PCMs)
- 1.5 Factors restraining adoption
- 1.6 Recent market developments
- 1.7 Competitive landscape
- 1.8 Growth Opportunities
- 1.9 Future market outlook

2 INTRODUCTION

- 2.1 Overview and working principle
- 2.2 Types
 - 2.2.1 Organic phase change materials
 - 2.2.1.1 Paraffin wax
 - 2.2.1.1.1 Properties
 - 2.2.1.1.2 Advantages and disadvantages
 - 2.2.1.1.3 Applications of paraffin PCMs
 - 2.2.1.1.4 Commercial paraffin PCM products
 - 2.2.1.2 Non-Paraffins (fatty acids, esters, alcohols)
 - 2.2.1.2.1 Fatty Acids
 - 2.2.1.2.2 Esters
 - 2.2.1.2.3 Alcohols
 - 2.2.1.2.4 Glycols
 - 2.2.1.2.5 Advantages and disadvantages
 - 2.2.1.3 Bio-based phase change materials
 - 2.2.1.3.1 Fatty Acids
 - 2.2.1.3.2 Plant Oils
 - 2.2.1.3.3 Agricultural Byproducts
 - 2.2.1.3.4 Advantages and disadvantages
 - 2.2.1.3.5 Commercial development
 - 2.2.2 Inorganic phase change materials

- 2.2.2.1 Salt hydrates
 - 2.2.2.1.1 Properties
 - 2.2.2.1.2 Applications of Salt Hyhydrate PCMs
 - 2.2.2.1.3 Advantages and disadvantages
 - 2.2.2.1.4 Commercial Salt Hydrate PCM Products
- 2.2.2.2 Metal and metal alloy PCMs (High-temperature)
 - 2.2.2.2.1 Properties
 - 2.2.2.2.2 Applications
 - 2.2.2.2.3 Advantages and disadvantages
 - 2.2.2.2.4 Recent developments
- 2.2.3 Eutectic PCMs
 - 2.2.3.1 Eutectic Mixtures
 - 2.2.3.2 Examples of Eutectic Inorganic PCMs
 - 2.2.3.3 Benefits
 - 2.2.3.4 Applications
 - 2.2.3.5 Advantages and disadvantages of eutectics
 - 2.2.3.6 Recent developments
- 2.2.4 Encapsulation of PCMs
 - 2.2.4.1 Benefits
 - 2.2.4.2 Macroencapsulation
 - 2.2.4.3 Micro/nanoencapsulation
 - 2.2.4.4 Shape Stabilized PCMs
 - 2.2.4.5 Commercial Encapsulation Technologies
 - 2.2.4.6 Self-Assembly Encapsulation
- 2.2.5 Nanomaterial phase change materials
- 2.3 Thermal energy storage (TES)
 - 2.3.1 Sensible heat storage
 - 2.3.2 Latent heat storage
- 2.4 Comparative analysis

3 PATENT ANALYSIS

4 PRICING

5 GLOBAL REVENUES, 2019-2034

5.1 Total market and growth

5.2 By market

5.3 By region

6 END USER MARKETS FOR PHASE CHANGE MATERIALS

6.1 BUILDING AND CONSTRUCTION

6.1.1 Integration in Buildings

6.1.2 Improved energy efficiency

6.1.3 Concrete

6.1.3.1 Benefits

6.1.3.2 Commercial PCM Concrete Products

6.1.4 Wallboards

6.1.4.1 Benefits

6.1.4.2 Commercial PCM Wallboards

6.1.5 Trombe Walls

6.1.5.1 Benefits

6.1.5.2 Products

6.1.6 HVAC

6.1.7 Heat Pumps

6.1.8 Solar Heating

6.2 ELECTRONICS

6.2.1 Thermal management and cooling

6.2.1.1 Benefits

6.2.1.2 Applications

6.2.1.2.1 Heat Sinks

6.2.1.2.1.1 Benefits

6.2.1.2.1.2 Applications

6.2.1.2.1.3 Commercial PCM Heat Sinks

6.2.1.2.2 PCM Substrates

6.2.1.2.2.1 Benefits

6.2.1.2.2.2 Applications

6.2.1.2.2.3 Products

6.2.1.2.3 PCM Encapsulants

6.2.1.2.3.1 Benefits

6.2.1.2.3.2 Applications

6.2.1.2.3.3 Products

6.3 COLD STORAGE

6.3.1 Benefits

6.3.2 PCM Integration

6.3.3 Applications

6.3.3.1 Temperature-controlled shipping

6.3.3.2 Commercial refrigeration

6.3.3.3 Commercial PCM Cold Chain Products

6.4 THERMAL STORAGE SYSTEMS

6.4.1 Water heaters

6.4.2 Thermal batteries for water heaters and EVs

6.5 TEXTILES

6.5.1 Methods to Incorporate PCMs into Textiles

6.5.2 Temperature controlled fabrics

6.5.2.1 Applications

6.5.2.2 Commercial PCM Fabrics

6.5.3 Cooling vests

6.5.3.1 Applications

6.5.4 PCM Medical Textiles

6.5.4.1 Applications

6.5.4.2 Commercial PCM Medical Textiles

6.6 AEROSPACE

6.6.1 Coatings

6.6.2 Propulsion

6.7 AUTOMOTIVE

7 COMPANY PROFILES 99 (61 COMPANY PROFILES)

8 RESEARCH METHODOLOGY

9 REFERENCES

List Of Tables

LIST OF TABLES

Table 1. Markets and applications for Phase Change Materials.

Table 2. Market drivers for phase change materials.

Table 3. Properties of PCMs.

Table 4. Recent market developments in phase change materials.

Table 5. PCM Types and properties.

Table 6. Advantages and disadvantages of paraffin wax PCMs.

Table 7. Advantages and disadvantages of non-paraffins.

Table 8. Advantages and disadvantages of Bio-based phase change materials.

Table 9. Advantages and disadvantages of salt hydrates

Table 10. Advantages and disadvantages of low melting point metals.

Table 11. Advantages and disadvantages of eutectics.

Table 12. Comparative analysis of PCMs-Properties, advantages/disadvantages, applications.

Table 13. Recent PCM patents.

Table 14. Pricing of phase change materials

Table 15. Global Phase Change Materials Market Revenues, 2018-2034 (Millions USD).

Table 16. Global revenues for phase change materials, 2019-2034, by market, (millions USD).

Table 17. Global revenues for phase change materials, 2019-2032, by region, (millions USD).

Table 18. Market assessment for PCMs in building and construction-market age, applications, key

benefits and motivation for use, market drivers and trends, market challenges.

Table 19. Market assessment for PCMs in electronics-market age, applications, key benefits and

motivation for use, market drivers and trends, market challenges.

Table 20. PCMs used in cold chain applications.

Table 21. Market assessment for phase change materials in packaging and cold chain logistics market age, applications, key benefits and motivation for use, market drivers and trends, market challenges.

Table 22. Market assessment for PCMs in refrigeration systems -market age, applications, key

benefits and motivation for use, market drivers and trends, market challenges.

Table 23. Market assessment for PCMs in thermal storage systems-market age,

applications, key

benefits and motivation for use, market drivers and trends, market challenges.

Table 24. Commercially available PCM cooling vest products.

Table 25. Market assessment for PCMs textiles and apparel-market age, applications, key benefits

and motivation for use, market drivers and trends, market challenges.

Table 26. Market assessment for PCMs in automotive-market age, applications, key benefits and

motivation for use, market drivers and trends, market challenges.

Table 27. Type of PCM produced, by company.

Table 28. Target markets for PCMS, by company.

Table 29. CrodaTherm Range.

List Of Figures

LIST OF FIGURES

- Figure 1. PCM mode of operation.
- Figure 2. Applications of PCM by temperature range.
- Figure 3. Classification of PCMs.
- Figure 4. Phase-change materials in their original states.
- Figure 5. Thermal energy storage materials.
- Figure 6. Phase Change Material transient behaviour.
- Figure 7. Phase change materials patents 2001-2021.
- Figure 8. Global Phase Change Materials Market Revenues, 2018-2034(Millions USD).
- Figure 9. Global revenues for phase change materials, 2019-2032, by market, (millions USD).
- Figure 10. Global revenues for phase change materials, 2019-2032, by region, (millions USD).
- Figure 11. Global energy consumption growth of buildings.
- Figure 12. Energy consumption of residential building sector.
- Figure 13. Schematic of PCM use in buildings.
- Figure 14. Comparison of the maximum energy storage capacity of 10 mm thickness of different building materials operating between 18 °C and 26 °C for 24 h.
- Figure 15. Schematic of PCM in storage tank linked to solar collector.
- Figure 16. UniQ line of thermal batteries.
- Figure 17. PCMs-containing microcapsules incorporated into textiles.
- Figure 18. PCM cooling vest.
- Figure 19. Schematic representation of the PCM de-icing.
- Figure 20. Ultraguard -70°C Phase Change Material (PCM) being loaded into a Stirling Ultracold ULT25NEU portable freezer.
- Figure 21. Solid State Reflective Display (SRD®) schematic.
- Figure 22. Transtherm® PCMs.
- Figure 23. HI-FLOW Phase Change Materials.
- Figure 24. Cr?do™ ProMed transport bags.

I would like to order

Product name: The Global Market for Phase Change Materials 2024-2034

Product link: <https://marketpublishers.com/r/GB7D348E449EEN.html>

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:

info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/GB7D348E449EEN.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