

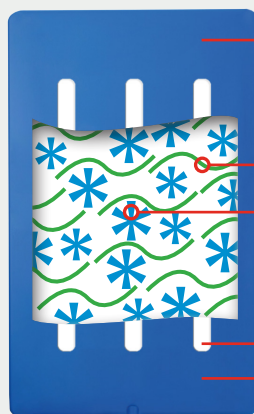
### Safe transport of pharmaceutical products

During transport and storage of medical products, the specified temperature ranges must be observed. The new Axiotherm PCM polymers make this much easier and therefore more economical.

Development goals	Axiotherm solution
Clearly defined delivery condition of the transport box to reliably protect the pharmaceutical product from heat and cold	✓ With Axiotherm PCM polymer, 2 different PCMs can be realised in a single medPaxx. When the box is delivered, one PCM is liquid and one PCM is solid
Simplified conditioning of PCM elements in standard cold rooms compared with the current state of the art	✓ The narrow temperature window for conditioning increases from typically 0.5 - 1 Kelvin to 2 - 3 Kelvin. PCM polymer 3/7 can be conditioned between 3.5 and 6.5 °C
Different temperatures to choose from for common transport tasks	✓ PCM polymers available for all temperature ranges: <math><-20\text{ °C}</math>, <math>2-8\text{ °C}</math> and <math>15-25\text{ °C}</math>, or individually configurable
Optimum environmental compatibility of the PCM	✓ Special products available without hazard statement and on a biological basis
Protection against leakage, even if the element is damaged	✓ Through dimensional stability of the PCM polymers
Increase of the possible transport time compared to the state of the art	✓ Proven in comparative tests with customers
Use of the PCM in any shapes and installation position	✓ Customer-specific shapes can be produced and the PCM permanently performs in any installation position

## medPaxx

The medPaxx product range includes special storage elements for use in various transport boxes for medical products.



Exemplary cooling element

### Up to two different PCMs in one element

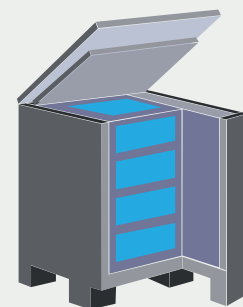
PCM 3 °C liquid

PCM 7 °C solid

Both PCM materials form an optimal cooling transport safety

100 % leak-proof

Food-safe plastic



Box for international transport

### Customer benefit / profit

- Ensuring the test results assured to the pharmaceutical customer in daily practice
- Savings through the use of standard cold rooms for conditioning
- Simplified processing by one contact person:  
From customer-specific development, certification and production of PCM and blow shapes parts to support in the development of cool boxes and complete systems (EPP, PS & VIP).



Box for small transports  
e.g. medical practice



Box for larger quantities  
e.g. hospitals

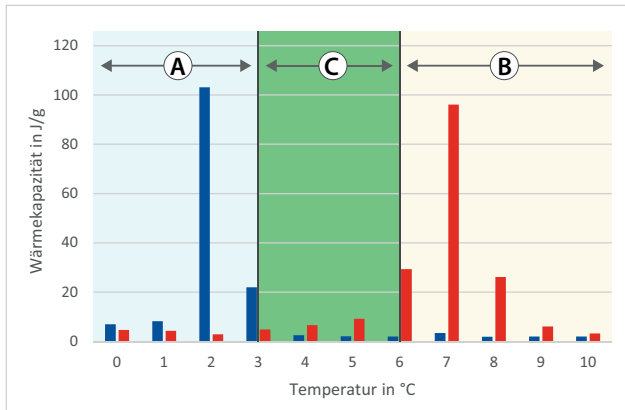
# Comparison Axiotherm PCM polymers with reference product

**A** Protection from cold  
release heat – PCM solidifies

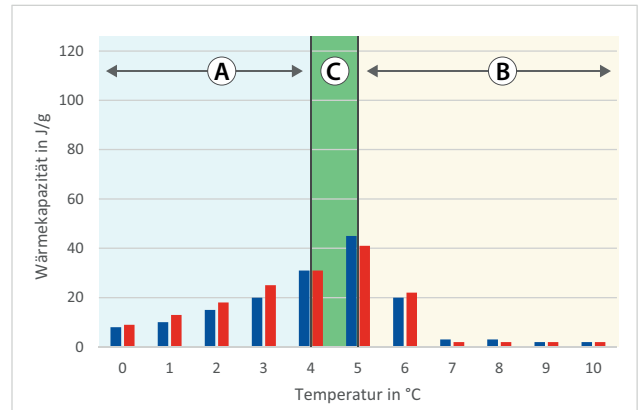
**C** Area of the  
Conditioning

**B** Protection from heat  
absorbs heat – PCM melts

PCM polymer ATC 3 and ATC 7



Reference product XX 5



Clearly defined functional areas of Axiotherm PCM polymers allow simple and repeatable conditioning for safe transport at full capacity.

The use of a standard PCM requires absolutely precise preconditioning within a very small temperature window and thus places very high demands on the cold stores.

With the Axiotherm solution, which is clearly tailored to specific requirements for protection against cold and heat, satisfied customers confirm to easier handling and longer transport time compared to the standard PCM from the competition.



Developed for the space travel of tomorrow - safe pharmaceutical transport today

Spacecraft components are exposed to permanent temperature fluctuations.

In order to avoid overheating or undercooling, Axiotherm has developed a PCM polymer for thermal stabilisation that is always dimensionally stable and was thus able to prevail over a large number of international competitors and was also named the overall winner in all categories of the InnoSpace Master.

The aim of the INNOspace Masters competition of the German Aerospace Center (DLR) on behalf of the Federal Ministry of Economics and Energy (BMWi) is to promote innovative technologies for the next generation of space travel and their transfer to other industries.



## Axiotherm - the company

## Contact

With its leading competence in thermal energy storage solutions, AXIOTHERM enables industry and service companies to benefit from increased efficiency and effectiveness offered by PCM (Phase Change Materials).

Offering extensive experience in development and application planning, AXIOTHERM is a manufacturer and expert partner for leading companies, and your specialist for cost-efficient systems based on approved macro encapsulations.

### Products

Axiotherm PCMs are available in preferably macro-encapsulated shapes with an optimised surface-to-mass ratio.

### The main features of Axiotherm PCM are:

- High heat storage capacities
- Consistent, repeatable performance over thousands of thermal cycles (melting / solidification)
- Long term stability
- Simple and safe handling
- Also based on renewable raw materials
- Non-toxic and biodegradable

### Fields of application

- Industry & Buildings
- Sector coupling
- Mobile thermal storage facilities
- Cooling technology
- Logistics and cold chains



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