# EcoTek™

MICROENCAPSULATED PCM · BIODEGRADABLE CAPSULE

## Durable in use.

## Biodegradable at end of life.

*A proven phase change core inside a capsule engineered for two jobs: staying intact through manufacturing and years of use, then biodegrading once the product's life is over. OECD 301F compliant.*

**IN USE · END OF LIFE · PROVEN**



Intact in the finished product | Biodegrades at end of life | OECD 301F Compliant

The capsule holds its core through drying, lamination and shear, and for the life of the product. It breaks down only under the microbially active conditions of end-of-life. **Same performance. Different ending.**

**63.3%**
OECD 301F RESULT
*biodegradation vs. reference*

**27–31 °C**
MELT POINT RANGE
*grades matched to the application — EcoTek 29 is the lead grade*

**~165 J/g**
LATENT HEAT
*typical by DSC — matched on melting and crystallization*

**USA**
MADE IN THE
*vertically integrated — from microcapsule manufacture to formulated coating*

## What EcoTek is

**A biodegradable microcapsule around a proven PCM core.** Conventional capsule walls are engineered for one job — durability. EcoTek's is engineered for two: durability in use, and biodegradation at end of life. It moves the sustainability story beyond bio-based content (where a material comes from) to biodegradability (where it goes), in grades from 27 to 31 °C starting with EcoTek 29.

### 1 Biodegradable

OECD 301F compliant: **63.3%** biodegradable after 28 days. In-house testing by Microtek Laboratories, an Alexium company.

### 2 Durable in use

Survives **drying, lamination, coating-line shear** and foam or slurry formulation; 98% weight retained at 200 °C (TGA).

### 3 Melt points 27–31 °C

Grades tuned to the application across the comfort range. **EcoTek 29** leads: ~165 J/g latent heat, matched on cooling.

### 4 Drop-in for your line

Same **coating, foam, lamination and formulation** processes as Alexium's current mPCM. Wet cake, dry powder or slurry.

## Why it matters to your buyer

Retailers, regulators and end customers are asking what happens to a product after it is retired. EcoTek lets a manufacturer answer that question for the PCM without giving up cooling performance or changing the line. The claim is specific and test-backed: OECD 301F is the screening method regulators and certification bodies use as the first gate for a biodegradability claim, and the substantiation comes with the material.

**APPLICATIONS**

Bedding & Mattresses | Textiles & Apparel | Footwear | Furniture & Foam | Building & Construction | Packaging & Cold Chain | Electronics | Transportation | Life Science & Med Device | Personal Comfort & Safety

**SUPPLIED AS**

Wet cake | Dry powder | Slurry | Formulated coating

PRODUCT DATA · ECOTEK™ MICROENCAPSULATED PCM

# The test, the capsule, and the standards behind the claim.

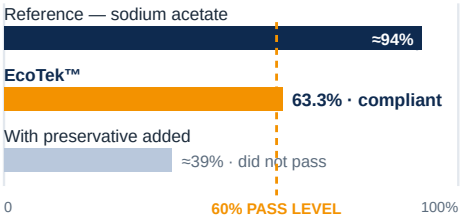
Biodegradation result, product specification and where EcoTek stands against the recognized biodegradability methods.

## BIODEGRADATION TEST SUMMARY

| PROPERTY | ECOTEK™ |
|---|---|
| **Method** | OECD 301F — Manometric Respirometry, a ready-biodegradability screening test |
| **Conditions** | Aerobic, 28 days, sodium acetate reference substance |
| **Result** | **63.3% biodegradation relative to the reference** — pass level is 60% over 28 days COMPLIANT |
| **Comparison** | EcoTek with a preservative added did not pass — the preservative hindered biodegradation. EcoTek is supplied without it. |
| **Tested by** | Microtek Laboratories, an Alexium company — in-house testing to OECD 301F methodology; test summary on request |

**Biodegradation at day 28 — OECD 301F**

Percent biodegradation relative to the reference substance




28-day aerobic test, sodium acetate reference. Comparison: same capsule plus a preservative.

## ECOTEK™ FAMILY SPECIFICATION — typical values from the EcoTek 29 lab batch; thermograms on the EcoTek 29 data sheet

| PROPERTY | ECOTEK™ |
|---|---|
| **Capsule** | Biodegradable capsule around a phase change core |
| **Family** | Joins Alexium's NexTek™, VivTek™ and Micronal® microencapsulated PCM capsule families |
| **Grades** | Melt points 27–31 °C, matched to the application · EcoTek 29 (melt peak 29.8 °C) is the lead grade |
| **Latent heat** | ~165 J/g typical — EcoTek 29: 164.5 J/g melting, 166.6 J/g crystallization (DSC, normalized) |
| **Thermal stability** | 98% weight retained at 200 °C; 10% loss at 233 °C (TGA, EcoTek 29) |
| **Particle size** | Median ~25 µm, $d_{90}$ under 40 µm (volume distribution, EcoTek 29) |
| **Forms** | Wet cake, dry powder, slurry; formulated coating on request |
| **Preservative** | None — supplied without preservative to protect the biodegradation result |
| **Process durability** | Withstands drying, lamination, coating-line shear, foam and slurry formulation; intact for the life of the product |
| **Made in** | USA — vertically integrated manufacture from microcapsule to formulated coating |

## STANDARDS FRAMEWORK — the recognized biodegradability methods, and where EcoTek stands

| STANDARD | WHAT IT ESTABLISHES | ECOTEK™ |
|---|---|---|
| **OECD 301F** | Ready-biodegradability screening — aerobic, 28 days, manometric respirometry; part of the OECD 301 series | **Compliant — 63.3%** |
| **ISO 14851 · 14852 · 17556** | Ultimate aerobic biodegradability in water ($O_2$ demand / $CO_2$ evolution) and in soil; basis for TÜV AUSTRIA OK biodegradable WATER and SOIL certifications | Not yet run |

### DESIGN NOTES — WHAT THE CLAIM COVERS

**Where it applies.** Biodegradation occurs under the microbially active conditions the test simulates — at end of life, not in the product. Capsules stay intact through manufacturing and use.

**What was tested.** The OECD 301F result is for the EcoTek microcapsule. A finished-product claim depends on the whole construction and is the manufacturer's to substantiate; Alexium can support it.

**Preservative.** Adding a preservative hindered biodegradation in testing. EcoTek is supplied without one — talk to Alexium before adding biocides or other additives downstream.

**Suggested claim language.** "Contains EcoTek™ microencapsulated PCM, which is OECD 301F compliant." Keep the claim tied to the test method rather than using unqualified terms such as "fully biodegradable."