TECHNICAL DATA SHEET

# Aerocel™ Technical Data Sheet

Aerospace-grade flexible thermal matrix · standard industrial roll goods

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This data sheet reports laboratory measurements and third-party test results only. Metrics not listed here are not warranted.

# 1. Product description

Aerocel™ is a flexible thermal material converted for civilian use. The matrix is polymeric with a three-dimensional sealed micro-nano closed-cell network (pore size <50 nm); it is not powder-filled. Room-temperature thermal conductivity is 0.015 W/(m·K). It can be die-cut, CNC-cut, laser-cut, sewn and low-temperature hot-melt laminated.

The standard form is industrial roll goods in three thickness series — ultra-thin, thin and thick — serving apparel and outdoor equipment, home textiles and building efficiency, industrial thermal management, and smart appliances. All third-party testing was submitted under a laboratory series code, cited as "Aerocel™ (tested under lab series code BH-FIM)".

# 2. Specifications

## 2.1 Base parameters by series

| Item | Ultra-thin (thermal fabric) | Thin (high-elastic wadding) | Thick (extreme cold) |
|---|---|---|---|
| Thickness | 0.50–0.85 mm | 0.85–4.00 mm | 3.00–80.0 mm |
| Weight | 45–60 g/m² | 50–150 g/m² | 80–400 g/m² |
| Conductivity (RT) | 15 ± 3 mW/(m·K) | 18 ± 5 mW/(m·K) | 20 ± 10 mW/(m·K) |
| Clo (reference) | 0.4–0.6 | 0.6–2.5 | 1.5–8.0 |
| Usable width | 1.5 m | 1.5 / 2.5 m | 1.5 / 2.5 m |
| Typical uses | Jacket liners, shoulder/elbow reinforcement, curtain liners, air pads, gloves | Sleeping bag back panels, camp mats, wall covering backing, insulation jackets, appliance pads | Extreme-cold bags, BESS enclosures, cold-chain liners, cryogenic pipe wrap |

## 2.2 General physical and functional performance

| Item | Value | Basis / source |
|---|---|---|
| Thermal conductivity | 0.015 W/(m·K), about 44% below still air | Beihang Key Laboratory measurement |
| Warmth equivalence | 4 mm equivalent to 15 mm high-loft down | Laboratory thermal resistance comparison |
| Compression | No collapse under 50 kg/cm² sustained load; good recovery | Laboratory pressure test |
| Laundry durability | Insulation loss <5% after 10 standard machine washes; <10% after 50 | Laboratory wash test |

| Item | Value | Basis / source |
|---|---|---|
| Shedding | No shedding (polymeric closed-cell matrix) | Structural property + rub test |
| Breathability | Steam passes rapidly; natural moisture release | Laboratory vapour transmission test |
| Antimicrobial | S. aureus 99%, E. coli 97% inhibition (standard requires ≥70%) | Guangdong Institute of Microbiology 2026FM12672R01, GB/T 20944.3-2008 |
| Compliance | All 253 REACH SVHCs plus 1 potential SVHC at ≤0.1%; no asbestos, heavy metals or toxic plasticisers; 100% vegan | SGS NGBEC26005076901 (English original; Chinese original NGBEC26005076902) |
| Thermal performance (third party) | Insulation rate 35.3%; Clo 0.476; resistance 0.0737 m²·K/W; U-value 13.6 W/(m²·K) | CTTC BA26000414 (GB/T 11048-2008 method B, commissioned test; verdict "—", measured values only) |
| Flame behaviour | Self-extinguishing on removal from flame, no melt dripping (material level) | No third-party GB 8624 B1 / EN 13501-1 / UL 94 classification yet; joint testing available per project |

> On Clo: the clo is the standard unit of thermal resistance in textiles; 1 clo is the resistance that keeps a seated person comfortable in still air at 21°C. Values vary within a tolerance band by thickness and weight combination; select on measured data.

## 3. Processing guidance

| Process | Recommendation | Status |
|---|---|---|
| Low-temperature hot-melt lamination | Can be laminated or quilted to high-density shell fabrics, linings and decorative fabrics; recommended bonding at 90–110°C | Validated |
| Quilting | Stitch pitch and row spacing depend on the finished construction; avoid long spans that allow layer shift | Validated |
| Cutting | Die cutting, CNC cutting and laser cutting are all suitable; edges do not shed or fray | Validated |
| Sewing | Can be sewn; binding or tape at the edge is recommended to limit abrasion | Validated |
| Adhesive | Pre-coated low-temperature hot-melt or heat-resistant pressure-sensitive adhesive available to order | Validated |
| Washing | Standard commercial machine washing; no clumping, fill migration or debonding | Validated (10 / 50 cycles, see 2.2) |

The first order ships with a recommended window for bonding temperature, pressure, line speed and adhesive weight matched to the customer's substrate, together with first-article approval points. Production parameters are governed by the process card signed by both parties.

## 4. Packaging, storage and transport

| Item | Description |
|---|---|
| Packaging | Roll with moisture-barrier film, in carton or on pallet; roll length and slitting to order by width, weight and requirement |
| Storage | Dry, ventilated, out of direct sunlight, away from open flame and strong acids or alkalis; re-roll and seal the remainder after opening |
| Shelf life | Per the batch and recommended use-by date printed on the product label |
| Transport | Standard road and sea freight, protected from moisture and compression; export packaging per destination wood-packing rules |

## 5. Commercial and delivery

| Item | Description |
|---|---|
| Available formats | Thickness, weight and width per 2.1; slitting, die-cutting and adhesive lamination available |
| MOQ and lead time | Tiered by series and specification; quantity and lead time as stated in the order confirmation |
| Price | Quoted formally against current raw-material market, specification and volume; no prices in this document |
| Samples | Free samples dispatched within 24 hours; multi-specification comparison packs on request |
| Quality documents | Measured values of key metrics for the batch, with copies of test reports, shipped with the goods |

## 6. Test report register

| Report | Number | Coverage |
|---|---|---|
| SGS EU REACH SVHC screening report (English original) | NGBEC26005076901 | 253 substances of very high concern plus 1 potential SVHC, all ≤0.1% |
| SGS EU REACH SVHC test report (Chinese original) | NGBEC26005076902 | Same scope, Chinese original; cite to match the language of the document |
| Guangdong Institute of Microbiology antimicrobial report | 2026FM12672R01 | S. aureus 99%, E. coli 97% (GB/T 20944.3-2008) |
| CTTC test report | BA26000414 | Insulation rate 35.3%, Clo 0.476, resistance 0.0737 m²·K/W, U-value 13.6 W/(m²·K) |

> Citation rule: the commissioning party and producer named on all three third-party reports is the Beijing Key Laboratory of Powder Technology, Beihang University; Hongyuyao International Trade (Beijing) Co., Ltd. is the officially appointed promotion entity for Aerocel™. That relationship must be stated whenever the reports are cited. CTTC report BA26000414 is a commissioned test whose verdict field is "—"; it publishes measured values only and must not be described as "passed" or "qualified".

## Contact & Credentials

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- Technology source: Beijing Key Laboratory of Powder Technology, Beihang University (37 Xueyuan Rd, Haidian, Beijing)
- Production base: Jiangsu standardised industrial roll line

> Disclaimer: performance data in this document comes from measurements at the Beihang Key Laboratory and from third-party test reports whose numbers are cited in the text. Final thermal performance of a finished product depends on substrate, lamination adhesive, construction and operating conditions, and shall be confirmed by the customer's own sample testing. Nothing herein is a warranty of unlisted metrics.