# Fabric Decision Matrix for Sports & Gym Bags

Compare 12 fabrics across abrasion resistance, water column, weight, cost, and sustainability. Based on LantaoBags material testing lab data.

## Core Performance Fabrics

| Fabric | Denier / Weight | Abrasion (Martindale cycles) | Water Column (mm) | Weight (g/m²) | Relative Cost | Sustainability | Best For |
|---|---|---|---|---|---|---|---|
| **600D Polyester** | 600D | 3,000–5,000 | 300–500 (untreated) 1,500+ (PU coated) | 210–250 | $ | Recycled PET options available (GRS-certified) | Entry-level daily gym bags, promotional team orders |
| **900D Polyester** | 900D | 8,000–12,000 | 500–800 (untreated) 2,000+ (PU coated) | 300–350 | $$ | Recycled options available | Mid-range gym duffles, daily-use backpacks |
| **420D Nylon** | 420D | 5,000–8,000 | 400–600 (untreated) | 140–180 | $$ | Recycled options (ECONYL) | Lightweight gym sacks, packable duffles |
| **1000D Cordura Nylon** | 1000D | 15,000–25,000 | 800–1,000 | 310–340 | $$$ | bluesign approved options | Premium gym bags, heavy-use team gear, outdoor crossover |
| **1680D Ballistic Nylon** | 1680D | 25,000+ | 1,000–1,500 | 400–450 | $$$$ | Limited recycled options | Professional-grade equipment bags, tactical crossover |

## Waterproof & Specialty Fabrics

| Fabric | Denier / Weight | Water Column (mm) | Seam Type | Weight (g/m²) | Relative Cost | Best For |
|---|---|---|---|---|---|---|
| **TPU-Coated 500D Polyester** | 500D | 5,000–10,000 | Welded/heat-sealed | 280–350 | $$$ | Wet compartments, swim bags, poolside gear |
| **PVC Tarpaulin** | N/A | 10,000+ | HF welded | 500–650 | $$ | Fully waterproof dry bags, marine sports |
| **Ripstop Nylon (70D)** | 70D | 1,000–2,000 (coated) | Sewn + taped | 60–80 | $$ | Ultralight packable gym sacks, running belts |

## Mesh & Lining Fabrics

| Fabric | Type | Airflow | Antimicrobial Options | Weight (g/m²) | Best For |
|---|---|---|---|---|---|
| **3D Air Mesh (6mm)** | Polyester spacer | High | Silver-ion treatment available | 280–350 | Back panels, shoulder strap padding |
| **Honeycomb Mesh** | Polyester knit | Very High | Zinc-based treatment available | 120–180 | Shoe compartments, ventilation panels |
| **210D Polyester Lining** | Woven + PU backing | Low | Silver-ion coating (30+ wash cycles) | 60–80 | Main compartment lining, pocket interiors |
| **150D Polyester Taffeta** | Woven | Low | Not recommended — too thin for coating | 50–60 | Budget lining only — avoid for gym bags |

**Our Default Recommendation for Daily Gym Bags:** 900D polyester outer + 210D antimicrobial PU-backed lining. Gives the best balance of durability (8,000–12,000 cycles), cost (mid-range), and odor control. Upgrade to 1000D Cordura for premium positioning or team gear expected to survive 3+ seasons of daily use.

**For Wet/Dry Separation:** TPU-coated 500D polyester for wet compartments (welded seams), 3D air mesh for ventilation panels, and an activated carbon filter insert in the shoe pod. This is the minimum spec that actually prevents odor migration — mesh dividers alone do not work under compression.