

# NON-CERTIFIED PE FIBER TURF SYSTEM

Technical Data Sheet — Hybrid (SBR + Organic) & TPE Infill Options

*Mid-range solution: performance-grade without FIFA certification overhead*

**Hybrid Infill** — SBR crumb rubber blended with cork, coconut fiber, or organic material (30–50% rubber reduction)

**TPE Infill** — Thermoplastic elastomer granules; fully rubber-free, recyclable, low heat-gain

## 1. System Overview & Positioning

This data sheet defines technical specifications for a polyethylene (PE) fiber turf system using either a Hybrid (SBR + organic) or TPE (thermoplastic elastomer) infill. These systems occupy the mid-range of the football turf market — delivering performance closely matching FIFA Quality thresholds without incurring the product certification and annual inspection costs of the FIFA Quality Program.

Typical applications include:

- Club training grounds and academy facilities
- Municipal recreational football pitches
- School and college multi-use games areas (MUGAs)
- Private community pitches not hosting sanctioned FIFA/UEFA competitions
- Replacement of aging SBR+sand systems where environmental compliance is a priority

## 2. System Construction — Layer Specification

Layer	Component	Hybrid System	TPE System
1 — Sub-base	Crushed stone / compacted aggregate	100–150 mm compacted aggregate, 1% crossfall	100–150 mm compacted aggregate, 1% crossfall
2 — Drainage	Perforated drainage layer	60–120 mm/hr minimum flow	80–150 mm/hr minimum flow
3 — Shock Pad	Elastic underlay (foam/rubber crumb)	10–15 mm foam pad (optional but recommended)	12–20 mm foam or rubber composite pad (recommended)
4 — Turf Carpet	PE fiber pile on the backing	PE monofilament / fibrillated, 40–60 mm pile	PE monofilament, 40–60 mm pile
5 — Infill	Granular fill material	Sand base layer + SBR/organic blend top layer	Sand base layer + TPE granule top layer

### 3. PE Fiber Carpet Specifications

The following parameters apply to both infill variants — the fiber system is identical regardless of infill choice.

Parameter	Specification / Recommended Range
Fiber material	Polyethylene (PE) — monofilament or fibrillated
Pile height (installed)	40 – 60 mm
Pile height uniformity (field)	± 3 mm across the playing surface
Fiber weight (linear density)	≥ 9,000 dtex (10,000 dtex+ preferred)
Stitch rate	≥ 9 stitches per 10 cm
Stitch gauge	3/4" – 3/8" gauge
Total tuft weight	≥ 1,600 g/m <sup>2</sup>
Backing type	Double-layer woven polypropylene + polyurethane coating
Tuft bind strength	≥ 30 N (minimum; ≥ 35 N recommended)
Seam strength	≥ 0.8 kN/m
UV resistance	Pass — 500 hours Xenon-arc exposure (EN ISO 105-B02)
Color fastness	≥ Grade 4 on Grey Scale after UV exposure
Dimensional stability	≤ ± 0.5% change after conditioning
Antimicrobial treatment	Optional — recommended for high-use facilities

### 4. Infill Specifications

#### 4.1 Hybrid Infill (SBR Crumb Rubber + Organic Blend)

Parameter	Specification
Composition (by weight)	40–60% silica sand base + 30–40% SBR crumb rubber + 10–30% organic material (cork / coconut / olive kernel)
SBR particle size	0.5 – 2.5 mm
Organic particle size	0.5 – 3.0 mm
Sand particle size (base layer)	0.3 – 0.8 mm (rounded silica)
Total infill depth	30 – 45 mm (leaving 15–20 mm pile exposed)
Sand base layer depth	15 – 20 mm
Rubber+organic top layer depth	15 – 25 mm
Total infill quantity (approx.)	12 – 18 kg/m <sup>2</sup>
PAH content (SBR component)	Must comply with ECHA restriction — ≤ 1 mg/kg total PAH

Parameter	Specification
Heavy metals (SBR component)	Comply with EN 71-3 migration limits
Organic infill — moisture content	≤ 12% at time of installation
Top-up frequency	Every 12 months or as required by use intensity

#### 4.2 TPE Infill (Thermoplastic Elastomer)

Parameter	Specification
Material type	Virgin or recycled TPE (EPDM-based or SBS-based granules)
Particle size	1.0 – 3.5 mm
Bulk density	400 – 650 kg/m <sup>3</sup>
Composition	30–40% silica sand base layer + TPE granule top layer
Sand base layer depth	15 – 20 mm
TPE top layer depth	15 – 25 mm
Total infill quantity (approx.)	8 – 14 kg/m <sup>2</sup>
Chemical safety	Free of PAHs, heavy metals, phthalates — must pass EN 71-3 & REACH
Surface temperature advantage	15–25°C cooler than SBR in direct sunlight (lower heat absorption)
Recyclability	100% recyclable at the end of system life
Microplastic profile	Low shedding; larger granule size reduces airborne particle dispersion
Top-up frequency	Every 18–24 months under normal use

### 5. Expected Performance Parameters

Neither system requires FIFA certification, but both are engineered to operate within or close to FIFA Quality thresholds. The values below represent typical achieved performance for correctly installed systems of this type.

#### 5.1 Ball Behavior

Parameter	Hybrid Infill (typical)	TPE Infill (typical)
Ball Roll (FIFA 10 method)	4.5 – 9.5 m	4.0 – 9.0 m
Ball Rebound (from 2 m drop)	0.62 – 0.84 m	0.60 – 0.85 m
Angle of Ball Roll Deviation	≤ 6 %	≤ 5 %
Ball Rebound uniformity (CV)	≤ 12 %	≤ 10 %

### 5.2 Player–Surface Interaction

Parameter	Hybrid Infill (typical)	TPE Infill (typical)
Shock Absorption	55 – 72 %	58 – 72 %
Vertical Deformation	5 – 12 mm	4 – 11 mm
Rotational Resistance	25 – 52 Nm	28 – 50 Nm
Linear Friction (studded boot)	0.4 – 0.8	0.4 – 0.75
Energy Restitution	22 – 50 %	25 – 50 %

### 5.3 Surface Geometry & Drainage

Parameter	Hybrid Infill	TPE Infill
Surface evenness (3 m straightedge)	≤ 12 mm	≤ 10 mm
Cross-fall gradient	≤ 1.0 %	≤ 1.0 %
Drainage rate (permeability)	≥ 60 mm/hr	≥ 80 mm/hr
Max surface temp above ambient	≤ 50 °C (SBR retains more heat)	≤ 35 °C (TPE cooler surface)

## 6. Cost Comparison

All figures are approximate installed costs per square metre (USD) including sub-base preparation, shock pad, turf carpet, infill, and line marking. Excludes floodlighting, fencing, and site preparation.

System	Cost / m <sup>2</sup>	Full Pitch (~7,000 m <sup>2</sup> )	Notes
Traditional SBR + Sand (baseline)	\$60–\$90	\$420K–\$630K	Cheapest option; high env. concern
<b>PE Fiber + Hybrid Infill (this sheet)</b>	<b>\$80–\$110</b>	<b>\$560K–\$770K</b>	~25% premium over SBR+sand; reduced rubber, no cert fees
<b>PE Fiber + TPE Infill (this sheet)</b>	<b>\$90–\$115</b>	<b>\$630K–\$805K</b>	Fully rubber-free; cooler surface; higher upfront but lower risk
FIFA Quality (certified)	\$95–\$120	\$665K–\$840K	+ \$13K–\$30K certification & inspection; annual monitoring fees
FIFA Quality Pro (certified)	\$110–\$140	\$770K–\$980K	+ strict annual testing; required for pro/elite competition

## 7. Durability & Expected Lifespan

Parameter	Hybrid Infill	TPE Infill
Expected carpet lifespan	8 – 12 years	10 – 15 years
Infill lifespan (before full replacement)	6 – 8 years (SBR component)	8 – 12 years
Simulated wear — pile height retention	≥ 88% after 200K Lisport cycles	≥ 90% after 200K Lisport cycles
Fiber UV degradation (color + strength)	≤ 15% tensile loss after 500h UV	≤ 12% tensile loss after 500h UV
Annual playing hours capacity	2,000 – 3,000 hrs	2,000 – 3,500 hrs
End-of-life recyclability	Partial (SBR limits)	High (100% TPE recyclable)

## 8. Environmental & Safety Profile

Criterion	Hybrid Infill	TPE Infill
PAH risk	Low (reduced SBR content)	None (rubber-free)
Heavy metal risk	Low	None
Microplastic shedding	Medium	Low

Criterion	Hybrid Infill	TPE Infill
Surface heat (summer)	Medium (SBR retains heat)	Low (TPE 15–25°C cooler)
REACH compliance	Required — verify PAH levels of SBR batch	Inherently compliant (no rubber)
End-of-life disposal	Partial recycling — SBR to playground/tracks	Fully recyclable into new TPE products
Carbon footprint	Moderate	Low–Moderate

## 9. Recommended Maintenance Schedule

Proper maintenance is essential to sustaining performance and extending system life. No independent inspection body monitors these systems, so the facility manager is responsible for all upkeep.

Task	Frequency	Hybrid Infill Notes	TPE Infill Notes
Brushing & grooming	2–3× per week	Redistribute compacted rubber/organic infill	Redistribute TPE granules from high-traffic zones
Debris/litter removal	After each use	Leaves degrade organic infill faster — remove promptly	Standard removal
Infill top-up	Annually	Organic component compacts ~10–15% per year	TPE compacts ~5–8% per year; longer interval possible
Deep-clean (decompaction)	1–2× per year	Rotary brush + vacuum collection	Rotary brush; lower compaction than hybrid
Antimicrobial treatment	Annually	Organic infill is more prone to mold/bacteria in humid climates	Lower biological risk; still recommended in wet climates
Performance assessment	Every 2–3 years	Self-assess ball roll/bounce; engage the contractor if concerned	Same — no mandatory third-party testing required
Line-marking inspection	Monthly	Repaint or replace tape markings as needed	Same

## 10. Installation Key Requirements

- Sub-base must achieve a minimum CBR (California Bearing Ratio) of 15% before turf installation.
- Shock pad (where specified) must be installed in a single continuous layer with all seams taped — no overlaps.
- Carpet joins must be stitched or glued and achieve  $\geq 0.8$  kN/m seam strength before infill is applied.
- Infill must be installed in lifts of at least 10 mm using a drop-spreader, with mechanical brushing between lifts.
- The sand base layer must be leveled and compacted before the rubber/organic or TPE layer is applied.

- Final infill level: pile should protrude 15–20 mm above infill surface (measure after brushing, not after installation).
- Allow a 2–4 week settling period under normal use before performing any formal performance check.
- All drainage channels must achieve full flow capacity before the system is commissioned.

## 12. Disclaimer

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Specifications in this data sheet represent industry-standard guidance and typical achievable performance ranges for correctly installed mid-range turf systems. Actual performance will vary depending on climate, sub-base quality, use intensity, maintenance regime, and specific product selection. Always request third-party test data from your turf supplier for the specific product being specified.

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*Non-Certified PE Fiber System — Hybrid & TPE Infill | Technical Data Sheet | April 2026*