



EVA MAT **WHITE PAPER**

How to Pick the Perfect EVA Interlocking Mat
for Your Market.

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■ Executive Summary

Busy purchasing teams don't have hours to compare arcane material specs. This white paper condenses three decades of KenYo's field experience into a single playbook. It replaces subjective "feel" with quantifiable criteria—thickness × density × hardness × surface texture × interlock precision × odor—and provides scenario-based configuration tables and a procurement checklist to help buyers balance safety & compliance, durability, and total cost of ownership (TCO).



For categories that touch children and home use, this paper summarizes the essentials of EU Toy Safety (EN 71 series) and U.S. CPSIA for foam puzzle/toy materials, along with formamide emission limits—so procurement and suppliers can speak the same technical language. By the end, you'll walk away with a practical, vendor-neutral yardstick—and a sense of why KenYo's co-created, low-MOQ de-risks and speeds rollout.





Market-Scenario Map

This section profiles the six most common use cases at a glance—end users, stressors, and procurement risks—to **segment first, then pair with the Spec Matrix** to choose specs. (Dead-drop: rubber; EVA: functional/protective.)



Scene	End-User Profile	Primary Stressors	Key Procurement Risks
Early-learning / Day-care / Play areas	Children aged 0–6, parents, regulatory audits	Saliva, frequent wipe-downs & disinfection, frequent inspections	Chemical compliance, edge tearing
Home (Parents with kids 2–8)	Parents + young children	Multi-purpose use, easy cleaning, aesthetics	Color lot mismatch, odor complaints, loose interlocks, edge curling
Martial arts / Combat sports	Adult trainees	Frequent falls, torsion & shear	Insufficient shock absorption, edge curling, seam shifting
Functional fitness zone	Adult members	Dumbbell drops, sweat + cleaning agents	Compression set, loose interlocks, thickness inconsistency
Exhibitions / Events	Staff + visitors	Rapid install & teardown, heel point-loads	Weak interlocks, thickness inconsistency
OEM / Private label retail	Buyers / PMs	Time-to-market, margin pressure	Mass-production consistency, Quality Control

Note: For placing Heavy fitness equipment or in free-weight dead-drop zones, Rubber Surface EVA tiles are recommended. EVA works best in functional training/protection layers—state usage limits clearly on product pages.



■ Spec Landscape & Total Cost of Ownership (TCO)

Use this column view to turn specs into a one-page decision aid—pick your scene, then match thickness × density × hardness × texture × interlock; acceptance methods keep suppliers aligned.

Spec dimension	Typical range / options	Why it matters (buyer takeaway)
Thickness	10 / 12 / 14 / 20 / 30 / 40 / 50mm	More shock absorption & comfort as thickness increases; also raises unit cost and shipping volume
Density	By formulation / expansion ratio	Higher density → durability & compression resistance; balance with rebound
Hardness	Shore C	Match scene: kids/home vs. martial arts vs. functional training
Surface texture	Tatami / Iron / Woven / Cross / Checker / Circle; Printing Mat (surface-printed layer for rich patterns)	Sport mats offer multiple texture options with no new tooling. Printing mats enable branded or complex patterns— click to see our Design Lab for mock-ups service

Tip: Segment by use case first, use the table above to define your spec range, then pair it with the Application Guide to build the configuration.



Common Issues × KenYo Solutions

1) Strong odor (“very smell”)

- **Retailer complaint:** Unpleasant smell on opening; staff asked to air mats before floor use.
- **KenYo’s solution:** odorless material grades and stable formulation; we follow a strict quality control system, so mats are ready to use straight out of the box.

2) Curling edge / loosely interlocking teeth/edge warping

- **Retailer complaint:** Corners curl after installation; loose seams catch feet.
- **KenYo’s solution:** Optimized tooth geometry and fit, reinforced sheet stability, and packaging that keeps panels flat—yielding flush, tight interlocks on the floor.

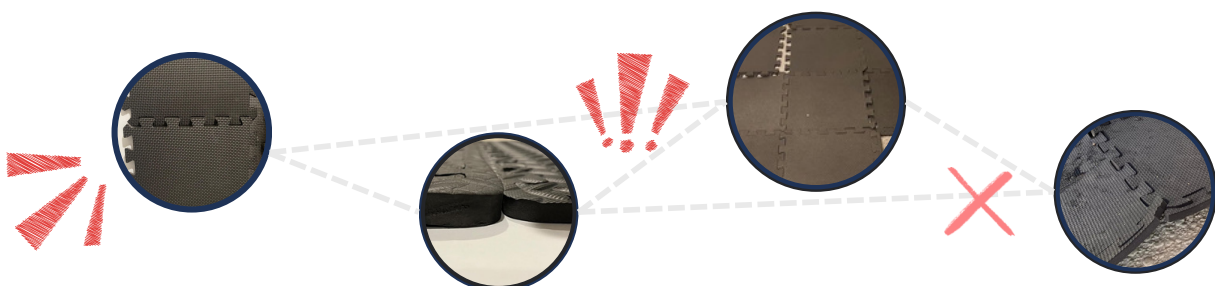
3) Thickness inconsistency

- **Retailer complaint:** Uneven thickness within a lot, causing uneven feel and steps at seams.
- **KenYo’s solution:** Tight control of manufacturing and slicing stability; lots run consistently, so each piece feels solid and even.

4) Softness/hardness mismatch (too soft / too hard)

- **Retailer complaint:** Too soft—foot sinks; too hard—slippery feel; poor user experience.
- **KenYo’s solution:** Scenario-matched density & hardness for kids/martial arts/functional/exhibition, balancing rebound, traction, and support.

KenYo’s role: We collect real consumer complaints from retail and resolve them in raw-material choices and process design—you pick the scenario, and we deliver the matched spec and fix in one go.





Quality & Compliance

Certifications

- **EC-REACH** – EU Toy Safety Requirements
- **EN 71-1, 2, 3, 9 / EN 1437**– Use the EU harmonised standards
- **U.S. CPSIA** – US market
- **ASTM F963-1**

Odorless Protocol

- **Five-person olfactory panel, score ≤ 2 (sniff scale 0–5)**
- **Ready-to-use straight out of the box—no airing or off-gassing period required**

Application Guide

This table summarizes four key usage scenarios—pick your use case, then match the minimum viable spec and an upgrade path to balance comfort, durability, and cost. The last column shows KenYo's recommended option for rapid fulfillment.

Scene	Min Spec	Upgrade Path	KenYo Rec. Option
Infant / Child / Home	10–12 mm EVA, easy-clean texture	20 mm in fall-prone zones; Odorless	12 / 14 mm EVA (precise interlock), Odorless
Martial arts / Combat	20–25 mm EVA, Tatami texture	30–40 mm for maximum shock absorption	30 mm EVA (per dojo preference)
Functional fitness	15 mm EVA, compression-resistant texture	Layering + protective top	20 mm EVA (with usage limitations noted)
Exhibitions / Events	10 mm EVA	15 mm for re-use cycles	12 mm EVA (fast install/teardown packaging)

Note: For placing Heavy fitness equipment or in free-weight dead-drop zones, using rubber surface EVA tiles is highly recommended.



■ Mini Case Snaps

Case 1 – European parenting retail

Pain: New stock “plastic smell” complaints from stores/parents

Fix: Switched to KenYo 12 mm Premium EVA, odorless.

Result: Return rate 3.8% → 1.1%

Case 2 – Judo/BJJ dojo

Pain: Loosening seams after each install/teardown

Fix: Introduce KenYo’s precise interlocking design + edge strips

Result: First-aid tape consumption –46%; Re-use Rate up

■ Procurement Checklist

- ☐ Scenario match (Kids/Home | Martial arts | Functional | Exhibitions)
- ☐ Interlock precision: tooth pitch/height tolerances + interchangeability sampling record
- ☐ Children-adjacent use: EN 71 series / CPSIA
- ☐ Formamide (foam puzzle/toy materials): $\leq 20 \mu\text{g}/\text{m}^3$ over 28 days (EU)
- ☐ MOQ aligns with forecast
- ☐ Lead-time
- ☐ Packaging supports
- ☐ Quality Control SOP
- ☐ Warranty & return terms agreed



Frequently Asked Questions

1. Is “thicker” always safer?

- No—Material x Density x Hardness matter equally.

2. What standards apply for children-adjacent use?

- EU EN 71 series and U.S. CPSIA (lead ≤ 100 ppm; phthalates $\leq 0.1\%$).

3. Can we customize textures, colors, or add branding without new tooling?

- Standard textures (Tatami / Cross / Checker / Circle) require no new tooling. For brand-forward surfaces, choose printing mats to apply complex patterns or logos; mock-up service helps you make tools without risk. Learn more via [KenYo's Design Lab](#).

4. Can EVA interlocking mats be used outdoors or in wet areas?

- Yes—suitable for camping and outdoor/event use on the ground or lawn. To extend lifespan, avoid placing mats on standing water or persistently damp surfaces, and dry them after use.

5. Can I private-label small MOQs?

- Yes, KenYo supports Flexible MOQ — Different SKUs have different flexibility. We help you test the market with minimal inventory and reduce capital occupation.

6. How long before mats need replacing?

- Depends on the use of the end customers, typically lasts for over 2 years or more, with proper care



Bibliography

^[1] European Commission — Harmonised standards for toys (Directive 2009/48/EC). OJEU listings are maintained via Implementing Decisions (e.g., 2023/740) and subsequent updates.

^[2] KenYo Internal Analysis, “Returns & Complaint Reduction Study,” Taiwan, 2024.

^[3] European Commission — Placing toys on the EU market. CE marking and conformity assessment overview.

^[4] EUR-Lex — Commission Directive (EU) 2015/2115. Formamide emission limit $\leq 20 \mu\text{g}/\text{m}^3$ over 28 days (foam toy materials).

^[5] CPSC — Total Lead Content. Children’s products: accessible parts $\leq 100 \text{ ppm}$.

Need the full spec sheet or wish to feel the difference yourself?

Book a 20-minute virtual coffee chat or request free samples. 



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