

HEXALOOM CONSUMER PRODUCTS: COMPLIANCE BRIEF HL-02 Asset Name: Non-Toxic Polymer Standards & Durability Benchmarks Series: Safety First / Unbreakable Innovation

1. Executive Summary: The Safety of Strength

Hexenon-Lite is a high-performance polymer composite reinforced with ultra-short carbon nanotube (CNT) fragments. While industrial Hexenon variants are designed for conductivity or ballistic resistance, Hexenon-Lite is engineered for "Consumer-Grade Safety." It provides the durability of aerospace composites in a form factor that is non-toxic, skin-safe, and virtually indestructible for toys, hobbyist drones, and wearable tech.

2. Non-Toxicity and Chemical Safety

For consumer applications, especially children's toys, chemical leaching is a primary concern. Hexenon-Lite uses a proprietary bio-resin matrix that permanently encapsulates the carbon nanotubes, ensuring no particulates are released even if the material is chewed or abraded.

Table 1: Global Safety Standard Compliance

Standard	Description	Status
ISO 10993-5	<i>Biological evaluation (In vitro cytotoxicity)</i>	Passed
EN 71-3	<i>Safety of toys (Migration of certain elements)</i>	Exceeded
FDA 21 CFR	<i>Food contact substance (Indirect additive)</i>	Approved
BPA/Phthalate Free	<i>Zero presence of endocrine disruptors</i>	Verified

Sales Insight: When pitching to toy manufacturers, emphasize that Hexenon-Lite is the first "structural polymer" that meets the same safety thresholds as food-grade silicone while maintaining the stiffness of aluminum.

3. "Unbreakable" Mechanical Durability

Hexenon-Lite's primary market advantage is its resistance to brittle failure. Traditional high-impact plastics (like ABS or Polycarbonate) shatter under extreme stress; Hexenon-Lite deforms elastically and returns to its original shape.

Table 2: Durability Benchmarks (vs. High-Impact Plastics)

Property	ABS Plastic	Polycarbonate	Hexenon-Lite
<i>Tensile Strength (MPa)</i>	40	70	450
<i>Notched Izod Impact (J/m)</i>	200	600	2,800
<i>Flexural Modulus (GPa)</i>	2.3	2.4	15.5
<i>Elongation at Break (%)</i>	10%	100%	18%

4. Thermal and UV Stability for Hobbyist Drones

For drone applications, Hexenon-Lite provides two critical advantages: vibration dampening and UV resilience.

- **Vibration Absorption:** The molecular weave in Hexenon-Lite absorbs high-frequency vibrations from drone motors, resulting in 15% smoother video footage without electronic stabilization.
- **UV Resistance:** Standard plastics become "yellowed" and brittle after 100 hours of direct sunlight. Hexenon-Lite's carbon scaffold naturally absorbs UV radiation, maintaining 99% structural integrity after 5,000 hours of exposure.

5. Sustainability and Lifecycle

Hexenon-Lite is 100% recyclable through the Hexaloom "Cradle-to-Cradle" program. Because the nanotubes do not degrade during the melting process, the material can be pelletized and re-injected into new products up to 10 times without losing mechanical properties.

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