

Exo Skeleton — Enabled by High-Performance Thermoplastics

How LEHVOSS Compounds enhance product performance

Carbon fiber reinforced thermoplastics are transforming exoskeleton design by combining lightweight construction with outstanding strength and durability.

- **Lightweight & strong** – Huge weight savings compared to metals, reducing inertia and energy consumption while improving responsiveness. 1 kg weight saving for the FIT-HV lumbar exoskeleton of ULS Robotics.
- **Ergonomic** – 20 % less weight means greater comfort and reduced user strain, especially in medical and industrial applications.
- **Design freedom** – Thermoplastics allow functional integration (e.g. cable guides, sensor housings) and easier repair compared to thermoset composites and metals.
- **Durability** – Excellent fatigue resistance ensures reliable performance over millions of load cycles.
- **Resistant & sustainable** – High resistance to heat, chemicals, and impact, with recyclability supporting circular economy goals.
- **Cost saving** – Lower raw material and labor costs, especially compared to CFRP.

In short: Carbon fiber reinforced thermoplastics make exoskeletons lighter, stronger, more efficient, and more ergonomic, while enabling sustainable design.



Materializing
Ideas

Introducing the FIT-HV from ULS Robotics

Short for Flexible Integrated Technology, the FIT-HV lumbar exoskeleton robot integrates cutting-edge technology, including an intelligent digital driver, an integrated modular deceleration system, and an adaptive motion control system from ULS Robotics. It also incorporates ULS Robotics' proprietary software for mechanical impedance, a self-learning adaptive gait, and an AI-driven motion control algorithm with pattern recognition.

The FIT-HV active electric-driven lumbar exoskeleton robot utilizes high-strength engineering materials and incorporates a hip joint width adjustment mechanism. This high level of man-machine integration significantly enhances the strength and endurance of the user's waist and hip joints, reducing the labor burden on workers by over 60%.



Want to know more? Simply contact our experts!

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