ASCEND PERFORMANCE MATERIALS

HiDURA® MED

A path to sustainable innovation in medical applications

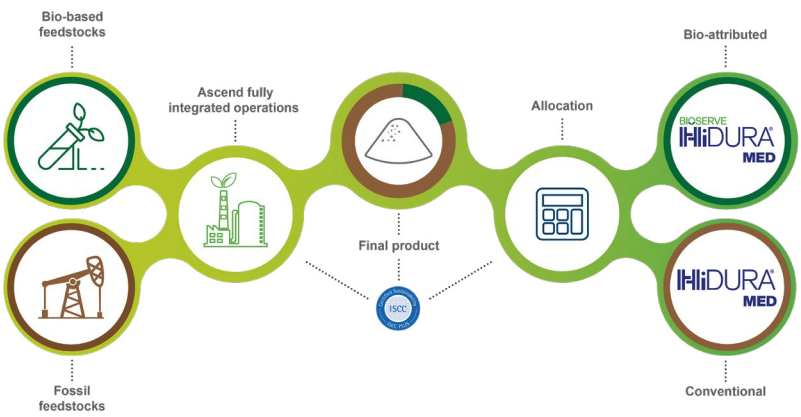
Mass balance and bio-based polyamides

As sustainability becomes a key priority in the healthcare industry, OEMs are increasingly seeking materials that reduce environmental impact without compromising performance or compliance. This white paper explores how mass balance methodology enables the introduction of bio-based polyamides, helping medical manufacturers advance sustainability goals while maintaining quality and reliability in demanding applications.

Mass balance and why it matters

Mass balance is a chain-of-custody method that enables the integration of sustainable, bio-derived feedstocks—such as soybean oil, used cooking oil, or tall oil—into the polymer supply chain without requiring process segregation. This approach allows manufacturers to allocate the bio-content to specific products based on verified bookkeeping. Medical-grade polyamides produced through mass balance retain identical performance to fossil-fuel-based materials; thereby limiting risks.

Figure 1. How mass balance integrates renewable content without sacrificing performance



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Why bio-based polyamides are ideal for medical OEMs

- Engineered for compatibility with existing specification
- Designed to reduce impact on part performance and qualification
- Supports corporate sustainability and ESG goals
- Enables traceable, lower-carbon sourcing via ISCC+ certification

Environmental and strategic impact

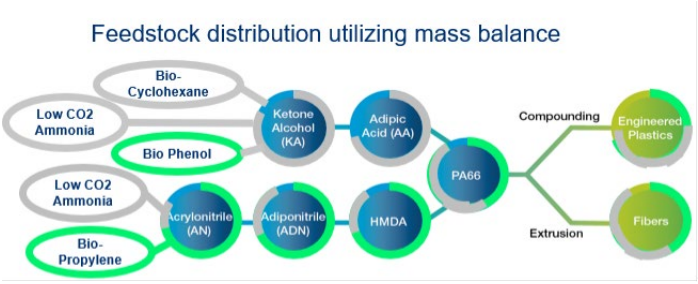
Integrating bio-based feedstocks into medical applications helps reduce reliance on fossil fuels and lowers Scope 3 emissions. When using 100% renewablae energy our, mass balance PA66 can offer a carbon footprint reduction of up to 34% without a change to formulation, and future developments target even greater reductions through feedstock innovation. OEMs benefit from supply security, regulatory alignment, and a future-ready materials strategy.

Future bio-feedstocks and roadmap

The development of new sustainable feedstocks is critical for advancing long-term environmental goals. Bio-propylene, bio-cyclohexane, and bio-phenol are among the next-generation inputs being piloted to support the medical market's need for high-performance, low-carbon materials.

These efforts are part of a phased roadmap spanning 2024 to 2028, designed to enable more bio-content in PA66 without disrupting current processing, performance, or validation standards.

Figure 2. Bio-Based Feedstock Implementation Roadmap



Ascend's roadmap to 100% bio-based polyamide

	2025	2026	2027	2028
Raw Material	Bio-phenol +Bio-propylene	Add Bio-cyclohexane	AA Blue Ammonia From RNG	Full-scale feedstock conversion
Bio content	46% bio-based	63%	82%	100% bio-based

These developments reinforce the industry's shift toward sustainable sourcing without compromising on functionality or safety in critical medical devices.

Conclusion

Mass balance bio-based polyamides represent a transformative opportunity for medical OEMs to align with global sustainability goals while maintaining the trusted performance of PA66. With certified traceability, supply reliability, and compatibility with regulatory standards, these materials provide a seamless bridge toward a more responsible future in healthcare manufacturing.

To learn more about sustainable and medical grade offerings, contact us.