

Innovation for Futureproof Foam Composites

Borealis Daploy™ WB140HMS and SPUR
HARDEX

Andrew Sanders, June 2025



Agenda

- Opportunities and Challenges of Lightweight Composites
- Innovative Solutions: Borealis Daploy™ WB140HMS
- Enhancing Foam Performance and Sustainability
- Circularity in Design with HARDEX
- Conclusions and Future Directions

Growing demand of Lightweight Composites

The **U.S. composites market** is expected to experience a **CAGR of 4.1% until 2028**, fueled by demand across the **transportation, aerospace, and renewable energy** industries.

Key driver:

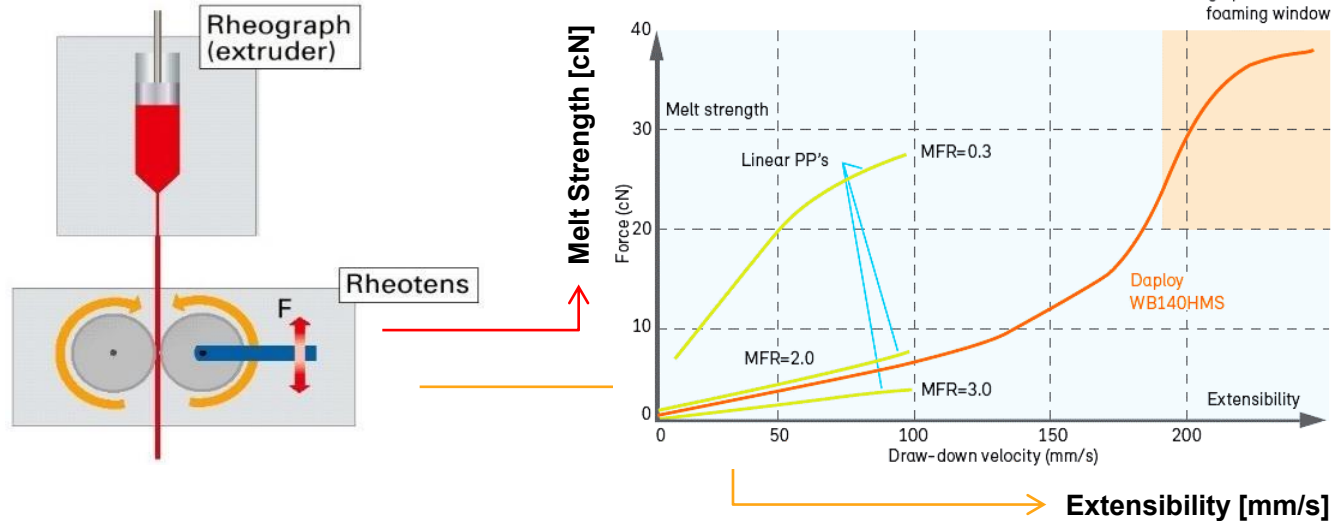
Electrification, upcoming legislations, PPWR, End-of-Life Vehicles Directive, the evolving Green Deal framework, and country-specific regulations...

Source: [2025 State of the Industry Report - American Composites Manufacturers Association](#)

Introducing DAPLOY WB140HMS: A Solution with Great Foamability and Performance

Daploy™ High Melt Strength (HMS) PP

In comparison to conventional PP the Daploy HMS PP has improved melt strength and melt extensibility due to long chain branching (LCB).



Branched

HMS
Polypropylene

Linear

Conventional
Polypropylene

The unique rheological properties of HMS PP enable the extrusion of low density foams (below 300 kg/m³) with physical blowing agents for extrusion, sheet, beads

Benefits of Daploy™ HMS PP



LIGHTWEIGHT
Performance /
replacement of heavier
Materials e.g. plywood



RECYCLABILITY
PP Mono-material
In variety of layers with
different properties



HI- PERFORMANCE
Tough and strong
With great impact
absorption



HEAT RESISTANCE
Up to 120C
With great thermal
conductivity values



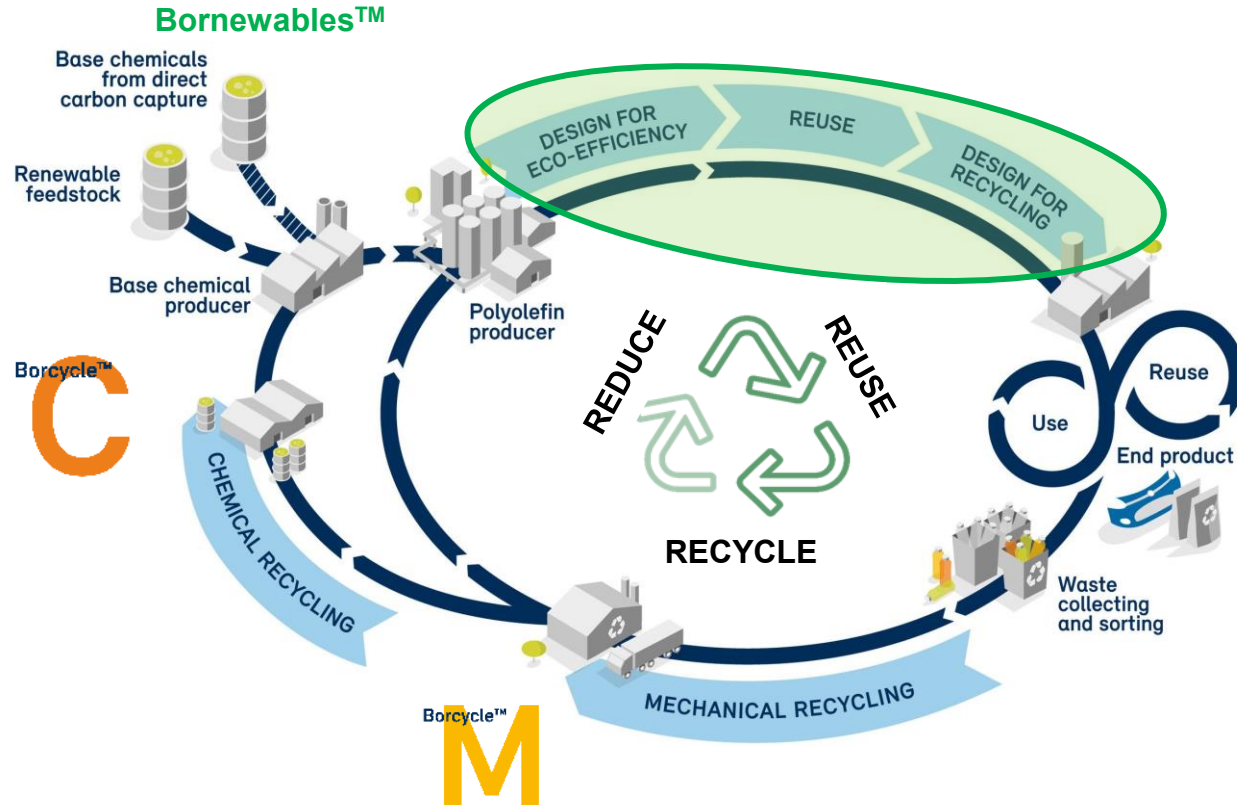
INSULATION
Great thermal
conductivity values



**DIMENSIONAL
STABILITY**
Low water absorption
transition rate

Why ultra-low density PP foams?

Enhancing Sustainability with Borealis materials



Design for eco-efficiency and recycling is a key enabler to increase circularity!

SPUR - HARDEX: Simplifying Circularity and Enhancing Design



HARDEX: Simplifying Circularity and Enhancing Design

HARDEX® is a lightweight, durable thermoplastic foam made from polypropylene (PP) with a straightforward molecular structure of hydrogen and carbon.

SPUR creatively uses this foam as a core material in sandwich panels and composites, providing a sustainable solution for numerous industrial uses.

Source: Spur ®

Information Classification: General



Better shelter



Transport sector



Transport sector



Automotive/ E-mobility

Source: Spur ®



Hardex - Case study: Full-Trailer Refresh: Floor + front wall + side walls

Section replaced	Conventional build (typical spec)	HARDEX™ XPP sandwich	Weight saved
Floor	Laminated ¾-in birch / mixed hardwood: ≈ 960 lb (39 m²)	20 mm HARDEX core 120kg/m³ or 150kg/m³ + GRP skins: ≈ 400 lb	-560 lb
Side walls (both)	Aluminum sheet + steel posts: quoted 300 lb heavier than “cell-core” composite	HARDEX 60-80kg/m³ cell-core panels	-300 lb
Front bulkhead	¾-in plywood liner: ≈ 85 lb	20 mm HARDEX 120kg/m³ panel	-45 lb
Doors	Aluminium / plywood / or : ≈ 180 lb	HARDEX foam core doors	-90 lb
Total trailer delta	—	—	≈ 9 95 lb (≈ 400 kg) lighter

(*53-ft dry-van example, U.S. units)

Impact	Annual saving	Easy picture
Diesel	approx. 630 gal	Enough to fill a hot-tub to the brim
CO ₂	approx. 14 000 lb (≈ 6.4 t)	Weight of a fully-loaded F-250 pickup every year
Carbon pay-back	HARDEX parts emits approx. 1,300 lb CO₂ to make, but save 14 000 lb/yr → paid back in < 5 weeks of service	

Source: Spur ®



Summary

- **Sustainability, lightweight, system cost or performance improvements** are the main drivers to move to Daploy™ HMS PP foam-based composites solutions for future proof solutions.
- **Smart Innovation** as a combination of **foaming technology such as HARDEX from SPUR, process setting, material and part design** to find an optimum solution.
- Borealis Circular technologies are scalable and ever-advancing, using value chain collaboration, experience and innovative strength.
- **Significant Capacity Increase in 2026 for Daploy™ HMS PP**, ensuring a more reliable supply for global markets.



Source: Spur ®

Let's re-invent!

Thank You

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