

# **Header**

Project Name: Plastic to Paper Packaging Transition

Product Line: Sleep Therapy Devices

Platform: Resironics Platform B

Primary Team: R&D

Supporting Teams: Quality, Supplier Quality, Operations, Sustainability

Project Phase: Design → Verification → Early Market Rollout

Timeline:

- Concept & Feasibility: Q2 2022 – Q3 2022
- Design & Material Selection: Q4 2022 – Q2 2023
- Verification & Transport Simulation: Q3 2023 – Q1 2024
- Regional Rollout & Monitoring: Q2 2024 – Ongoing

Document Type: Project History

Keywords: sustainable packaging, paper-based materials, transport damage, surface scratches, material sourcing, humidity exposure, verification testing

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## **Section 1 – Objective**

Transition from plastic protective packaging to paper-based packaging to reduce environmental impact and align with corporate sustainability targets, while maintaining equivalent or improved product protection during global transportation.

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## **Section 2 – Current Status**

Paper-based packaging deployed in selected regions following material grade refinement and extended verification testing.

Transport validation protocol updated to include expanded vibration and humidity simulations.

Supplier qualification criteria standardised across participating regions.

Monitoring phase ongoing to track cosmetic complaint rates post-rollout.

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## **Section 3 – What Went Well**

- Reduction in plastic usage across pilot markets.
- Early alignment with sustainability and marketing stakeholders.
- Cross-functional collaboration between R&D and Supplier Quality during material evaluation.

- Improved documentation of packaging verification assumptions.
  - Clear governance checkpoints before regional rollout.
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## Section 4 – What Went Wrong

- Initial paper grade caused surface lacerations and cosmetic scratches on device housings during transport.
  - Packaging strength degraded under prolonged humidity exposure.
  - Regional sourcing of consistent paper grade proved difficult in certain markets.
  - Early verification testing did not fully simulate long-duration transport stress.
  - Cosmetic damage acceptance criteria were not clearly defined during early design iterations.
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## Section 5 – Approaches Attempted

1. Substituted higher-density and coated paper grades to reduce abrasion.
2. Added internal cushioning inserts to isolate device surfaces from rigid edges.
3. Expanded vibration and humidity simulation testing beyond baseline protocol.
4. Introduced supplier pre-qualification standards specific to packaging durability metrics.
5. Defined explicit cosmetic damage tolerance thresholds prior to verification sign-off.

Material substitution alone reduced damage but increased cost and shipping weight.

A combined approach of material refinement, insert redesign, and expanded testing achieved acceptable protection levels.

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## Section 6 – Outcome

Paper-based packaging approved for phased regional rollout.

Transport validation protocol permanently updated to reflect worst-case environmental conditions.

Supplier qualification checklist revised to include material abrasion and humidity resilience metrics.

Ongoing post-market monitoring initiated to track complaint trends related to cosmetic damage.

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## Section 7 – Key Lessons

- Sustainability-driven design changes require full lifecycle transport validation.
- Environmental variability must be incorporated early in verification planning.
- Regional supplier capability should be validated rather than assumed.
- Cosmetic damage tolerances must be documented before design freeze.
- Material substitutions should trigger enhanced verification protocols.