

Waterless Textile Colouration (Amphico Japan Co., Ltd.)

○ Business Plan

The project aims to develop a waterless textile coloration technology that significantly reduces water consumption and CO₂ emissions. Pigmented masterbatches (6–10 base colors) are introduced directly during the spinning process to produce dope-dyed fibers. By leveraging optical color mixing, more than 20,000 colors can be expressed as textiles without a conventional dyeing process. This enables a reduction of 13–17% in production cost, over 90% reduction in water use, and over 75% reduction in CO₂ emissions.

○ Research Outline

This R&D project focuses on developing a waterless textile coloration technology by enhancing the dope-dyeing method in which pigments are integrated into polymer materials during the spinning process. Unlike existing products, this technology implements optical color mixing and AI/ML-based color recipe prediction models to fundamentally resolve industrial and environmental challenges such as large water consumption and high energy usage in dyeing. By eliminating conventional dyeing entirely and combining 6–12 base-colored yarns at the fiber stage, the system can achieve up to 50,000 color variations through optical blending. This process enables a 13–17% reduction in manufacturing cost, a 90% reduction in water use, and a 75% reduction in CO₂ emissions. Furthermore, by utilizing AI/ML color prediction models, it allows pre-production color accuracy, reducing sampling iterations and achieving a 100% one-shot color reproduction rate.

City	Year of Establishment	Founder
Minato-ku, Tokyo	2024	Jun Kamei

Partner VC	Latest round of Fundraising	Valuation
-	Seed	JPY 212 million

Business Area/Field	Research Period	Research Grant Amount	International collaborative technology demonstration
Materials	STS 2025-2027 FY	JPY 289 million	Taiwan

- International collaborative technology demonstration
 - Relationship development with potential local partner
 - Promotion of energy efficiency and structural transformation of manufacturing industries.

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