Solution:

Natural fibre based engineered leather products

Submitter: ICAR

Solution Overview

What is it, and what problem does it solve? Brief 2–3 sentence description.

- Natural fibre-based biodegradable engineered leather
- Plant fibre used to develop high quality leather like flexible composite
- Perturbed by the issue of climate change and animal welfare, an alternative to animal leather and petroleum based synthetic leather that are ethical, environmentally beneficial and animal free

Key Features & Benefits

Main components and why it is useful? Bullet points summarizing methods, tools, and value added.

- Different natural fibre like cotton, ramie, hemp, banana, jute as reinforcement and plant rubber (latex) based biodegradable formulation used as matrix
- Leather products are soft, flexible, bio-degradable and permeable
- Tensile strength and tear strength are 7-10 N/ mm2 and 80-120 N/mm whereas material sustain flex endurance up to 0.5L to 2.5 lakh cycles
- Can be used for making different life style items, apparel grade materials and footwear parts, seat cover etc.,

Methods

- Natural fibre based woven/ non-woven structure coated with latex formulation
- Coated prepreg was dried and vulcanized at high temperature and pressure
- Developed flexible composite coated with colour formulation in two layers
- Plate pressing and embossing (if required) of the colour side of flexible composite for getting leather like impression

Tools: Hydraulic hot press machine, padding machine, coating machine, embossing machine, small tools like weighing balance, stirrer machine etc.,

Value added: Anti-aging, UV protective and flame-resistant biodegradable fibre based engineered leather

Where It Works and Where It Can Work

Existing and potential target regions, agroecologies, or farming systems. Include examples if available.

Vegan Leather Market size is estimated to reach $204 million by 2030, growing at a CAGR of 11.4% during the forecast period 2023-2030. A robust rise in the vegan population across the globe coupled with an increasing demand for cruelty-free and climate-friendly products by consumers

- As product as very uplifting demand and raw materials are available in all parts of India so new venture of start up could be generated easily within affordable invest of capital.

Evidence & Impact

What results has it shown? Stats, pilot outcomes, or testimonials.

- Weight of leather: 350-450 g/ m2
- Tensile strength: 7-10 N/mm2
- Tear Strength: 80-120 N/mm
- Flex endurance: 0.5Lakh - 2.5 Lakh cycles
- Puncture resistance: 150-220 N/mm
- Air Permeability: 3.5 cc/sec/cm2

Scalability & Adoption Support

Why it can be scaled and what's needed to adopt it?

Low-cost, adaptable, partner-ready, etc.

Technology has been commercialised with Parna Creation Private Limited. They have launched a new start-up named "Parna Creation Pvt. Ltd" in Shivamogga, Karnataka to manufacture fibre based

biodegradable leather alternative using natural fibres obtained from locally available resource areca nut shells and also from pineapple, cotton, viscose and sisal fibres.

Other partners contacted for adopting vegan leather technology

- PKA International, Rajasthan, India, vegan leather from guar gum, rice bran, wheat bran
- Entrepreneurship cell, IIT Kharagpur for footwear production from vegan leather
- Planterra Banana Fibre Pvt. Ltd, Madhya Pradesh, for banana fibre-based leather
- Kavya Fashion Limited, Surat, Gujrat for making flax fibre based vegan leather
- ICAR-CCARI, Goa for Cashew Apple bagasse-based leather
- Esha Biodegradable, Ahmedabad for making banana fibre based vegan leather

Interest shown by industries for commercialisation and plant set up abroad

- Tigray cactus limited, Kenya for making cactus fibre based vegan leather
- Econasi Limited, Kenya for making pineapple fibre based vegan leather

Partners & Contact Info

Who's involved and how to connect? List of key contact and partners + email / phone.

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2. The Director, ICAR-National Institute of Natural Fibre Engineering & Technology, 12, Regent Park, Kolkata-700040, India; email: nirjaftdirectorcell13@gmail.com