



## STUDI KULIT DOMBA ECOPRINT YANG DISAMAK MENGGUNAKAN ZIRKONIUM

### INTISARI

Roselini Agustia Andini

22/500954/SPT/00235

Penelitian ini menggunakan kulit domba tersamak zirkonium dilanjutkan dengan prose finishing berbasis silikon untuk menciptakan kulit yang tahan air (ecoprint waterproof leather). Penelitian dibagi menjadi 3 tahap : (1) pengaruh konsentrasi zirkonium (7,5%, 10%, 12,5%, dan 15%) terhadap kekuatan tarik, kemuluran, ketebalan, kelemasan, kekuatan sobek, suhu kerut, dan kadar air; (2) penerapan motif ecoprint menggunakan berbagai jenis mordanting agent (tunjung dan tawas); serta pengaruh variasi konsentrasi minyak silikon (4%, 6%, 8%, dan 10%) terhadap kadar lemak, daya serap air, dan water vapour permeability (WVP). Penelitian ini bertujuan untuk menganalisis pengaruh konsentrasi zirkonium dan silikon terhadap sifat fisikokimia kulit domba tersamak dalam upaya menghasilkan kulit berkualitas tinggi yang ramah lingkungan. Hasil penelitian menunjukkan bahwa konsentrasi zirkonium 15% memberikan hasil terbaik pada kekuatan tarik (2578,09 N/cm<sup>2</sup>), kemuluran (99,08%), suhu kerut (102,8 °C), dan kekuatan sobek (324,17 N/cm), dengan struktur serat kolagen lebih padat dan homogen berdasarkan hasil SEM. Sementara itu, penggunaan silikon 10% meningkatkan kelemasan, kadar lemak (11,56%) serta WVP (8,40 mg/cm<sup>2</sup>/jam), meskipun daya serap air mencapai 92%, sedikit melebihi standard waterproof. Secara keseluruhan, kombinasi zirkonium dan silikon menghasilkan kulit domba tersamak yang kuat, elastis, tahan panas, dan tetap nyaman dipakai. Penelitian ini berkontribusi dalam inovasi penyamakan kulit berkelanjutan yang dapat diadopsi oleh industri kulit untuk memenuhi standar lingkungan dan kualitas internasional.

**Kata kunci:** Karakteristik fisikokimia, *Leather eco-print*, *Waterproof*, Zirkonium



## STUDY OF ECO-PRINTED SHEEP SKIN TANNED USING ZIRCONIUM

### ABSTRACT

Roselini Agustia Andini  
22/500954/SPT/00235

This research employed zirconium-tanned sheep leather, followed by a silicone-based finishing process, to develop ecoprint waterproof leather. The study was divided into three phases: (1) investigating the effect of zirconium concentration (7.5%, 10%, 12.5%, and 15%) on tensile strength, elongation, thickness, softness, tear strength, shrinkage temperature, and moisture content; (2) applying ecoprint motifs using two different mordanting agents (tunjung and alum); and (3) evaluating the influence of varying silicone oil concentrations (4%, 6%, 8%, and 10%) on fat content, water absorption capacity, and water vapour permeability (WVP). The objective was to analyze how zirconium and silicone concentrations affect the physicochemical properties of tanned sheep leather in order to produce high-quality, environmentally friendly leather. The results indicated that a 15% zirconium concentration yielded optimal performance in tensile strength (2,578.09 N/cm<sup>2</sup>), elongation at break (99.08%), shrinkage temperature (102.8 °C), and tear strength (324.17 N/cm), with scanning electron microscopy (SEM) revealing a denser and more homogeneous collagen fiber structure. Meanwhile, a 10% silicone treatment enhanced softness, fat content (11.56%), and WVP (8.40 mg/cm<sup>2</sup>·h), although water absorption reached 92%, slightly exceeding the standard for waterproof leather. Overall, the combination of zirconium tanning and silicone finishing produced sheep leather that is strong, elastic, heat-resistant, and comfortable to wear. This study contributes to sustainable leather tanning innovations that can be adopted by the leather industry to meet international environmental and quality standards.

**Keyword:** physicochemical characteristics, leather eco-print, waterproof, zirconium