

**DEVELOPMENT OF LEATHER USING SKIN OF  
TILAPIA AND TANNING FISH SKINS USING  
VEGETABLE AND ALUMINIUM TANNINS TO  
PRODUCE CHROME FREE LEATHER**

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## ABSTRACT

### **Development of Leather Using Skin of Tilapia and Tanning Fish Skins using Vegetable and Aluminium Tannins to Produce Chrome Free Leather**

Ecological pressures on chromium have now forced the leather industry to look for possible alternatives. A vegetable aluminum combination tannage has been studied, with special attention being given to intended final product. Aluminum is mineral tanning agents that are widely used to stabilize collagens in the leather industry. In this study, the cross linking of vegetable and aluminum, with collagens, have been explored. This kind of chrome free tannage give us leathers with shrinkage temperature around 125°C, elongation at break 65.6%, tensile strength 38 N/mm<sup>2</sup>, and tear strength 98 N/mm. The objective of the present experiment was to evaluate the resistance of fish skins submitted to tanning using vegetable and mineral tannins without use of chromium salts. Skins were distributed in a completely randomized design, with six treatments applied in the tanning stage (T1 = 10% vegetable tannin; T2 = 10% Alum tannin; T3 = 5% vegetable tannin + 5% Alum tannin; T4 = 12% vegetable tannin; T5 = 12% Alum tannin; T6 = 6% vegetable tannin + 6% Alum tannin). Five repetitions per treatment were conducted, and the leather was the experimental unit. For the tests of tensile strength, lengthening and progressive tearing resistance, an EMIC dynamometer was used. Tanning with vegetable tannin, mineral tannin and/or their combination, as well as the levels used within each tanning technique, interfered with the traction test; however, they did not influence in the lengthening and progressive tearing tests. Therefore, the tanning techniques do interfere in fish skin resistance. When the tilapia skins were tanned and re-tanned only with Alum tannins, regardless of the concentration (10 or 12%), they showed a worse resistance to traction. When compared to the skins that received 10% of tannins (vegetable and combination tannins), they did not present any difference in resistance.

**Key Words : Ecological Leather, Physico-Mechanicle Testing**