

Eco friendly tanning cycle based on natural/naturalized products



Alice Dall'Ara^A, Elena Salernitano^A, Federica Bezzi^A, Alessandra Strafella^A, Emilia Bramanti^B, Mercedes Roig^C, Maurizio Sabatini^D, Matias Cobo^E

^A Laboratory of Materials Technologies Faenza (TEMAF), Italian National agency for new technologies, Energy and sustainable economic development (ENEA), Via Ravegnana 186, 48018 Faenza (Italy)
^B Institute of Chemistry of Organo Metallic Compounds (ICCOM)- U.O.S. Pisa, Italian National Research Council (CNR), Via G. Moruzzi 1, 56124 Pisa (Italy)
^C INESCOP, Unidad Técnica Vall d'Uixó, Parc Ind. "La Vernicha", Nave1 12600 Vall D'uixó (Spain)
^D Newport, Vc. Abruzzi 9, S. Croce sull'Arno (Italy)
^E Tradelda S.L., Av San Luis de Cuba, 03600 Elda (Spain)

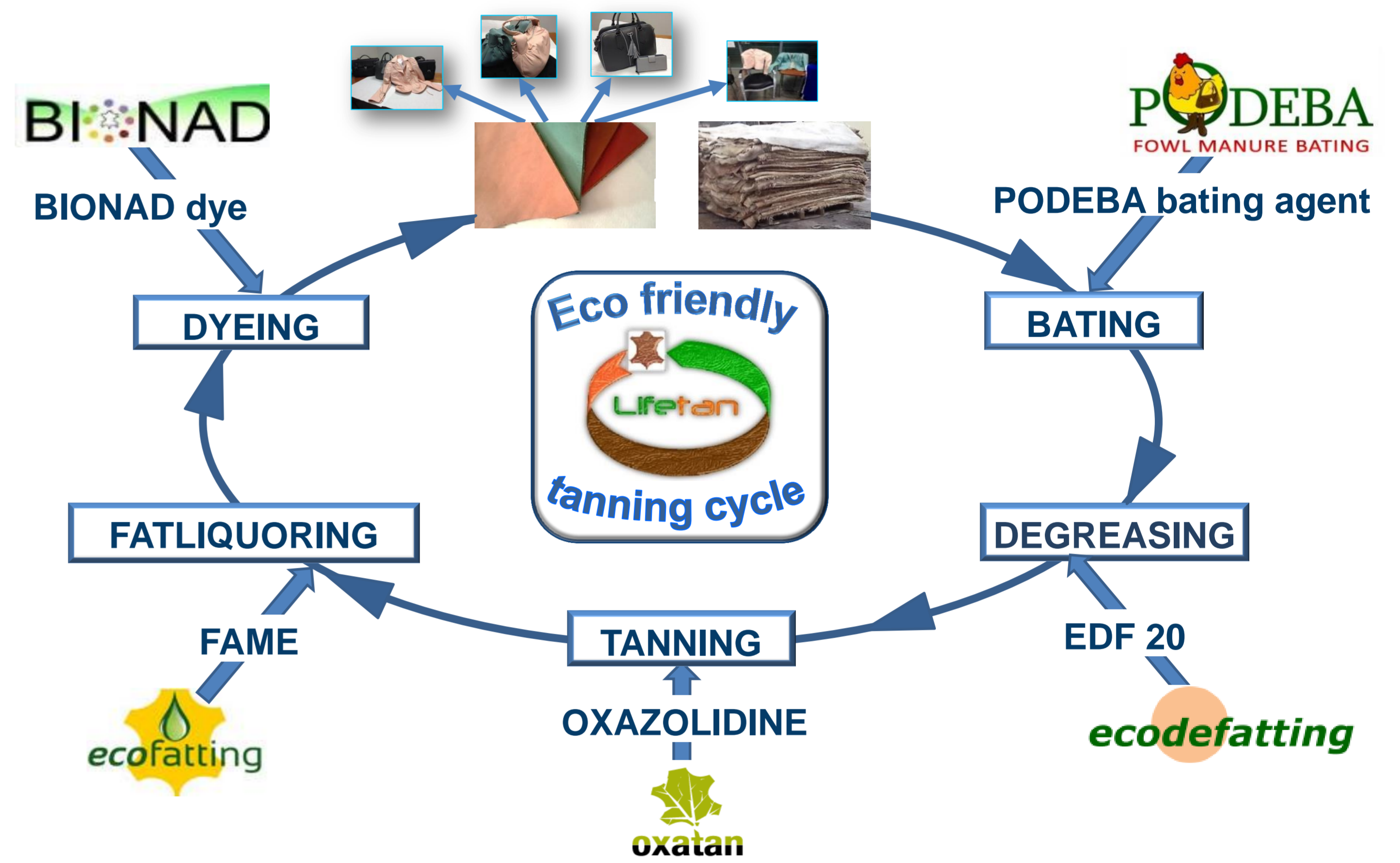
PROJECT

LIFETAN aims at demonstrating the use of innovative natural and naturalized products* and technologies for the bating, degreasing, tanning, fatliquoring and dyeing phases

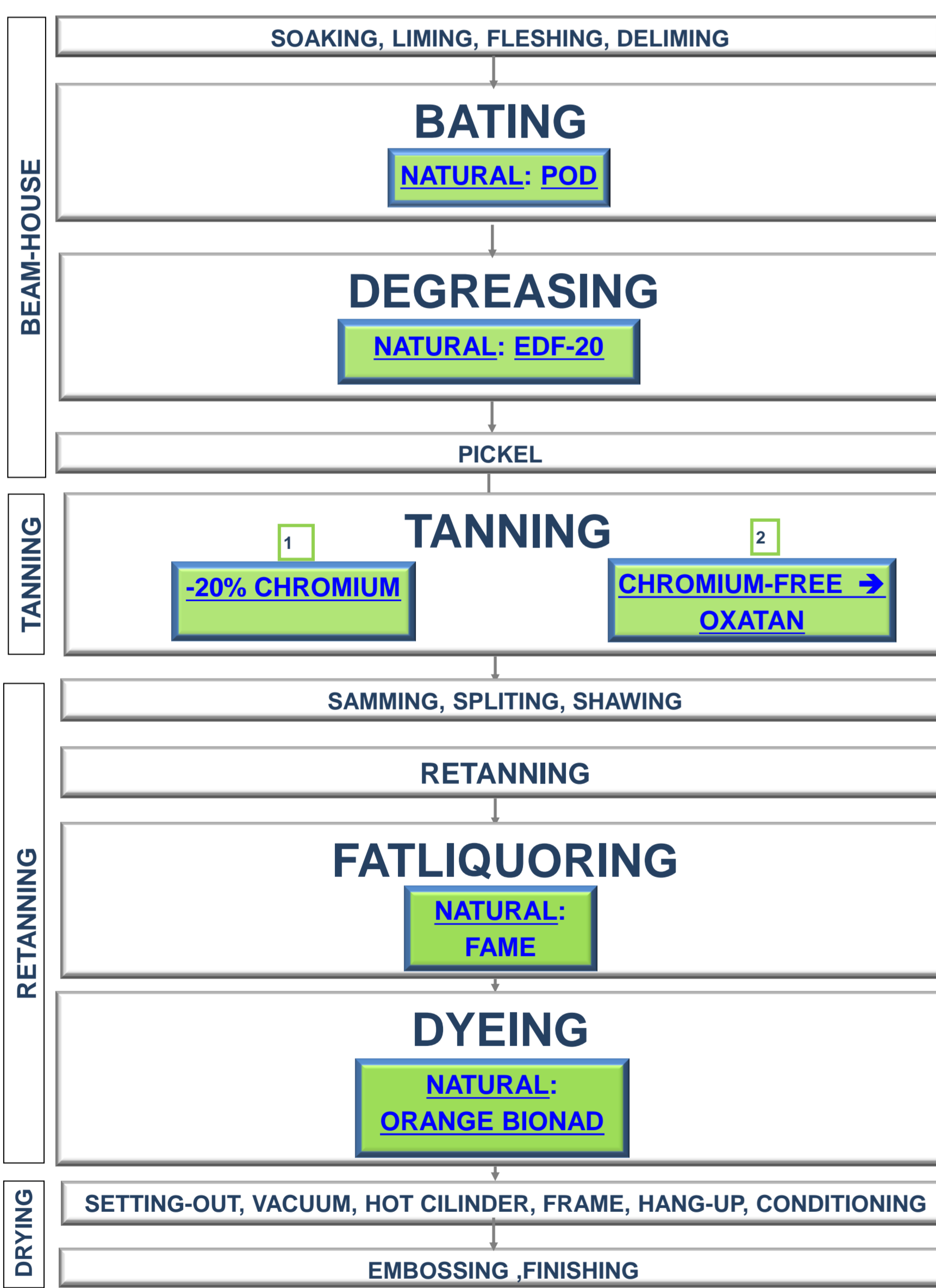
OBJECTIVES

- The main environmental, social and economic goal is the replacement of current commercial chemical and toxic products with natural and naturalized products* in the whole tanning cycle
- Maintaining the leather high quality standards, the project proposes two distinct achievements:
 - 20% reduction of Chromium salts with the new natural products
 - Chromium-free tanning cycle

* Often obtained from agro-industrial byproducts



NEW TANNING CYCLE & INNOVATIVE PRODUCTS



The use of the natural products technique is demonstrated at three different levels:

- **laboratory**
- **semi-industrial**
- **pre-industrial**

The leather samples were characterized by:

- **Thermogravimetric Analysis (TGA):** Thermal stability and decomposition phases (ΔT and %mass loss)
- **Scanning Electron Microscopy (SEM):** Morphological and semiquantitative analysis
- **Infrared Spectroscopy (ATR-FTIR):** Interaction products-proteins

The analyses focused on:

- the **interaction among the new products** in a whole tanning cycle
- the **comparison between traditional and new products** and their effects on leather properties

TANNING STAGE	TRADITIONAL PRODUCT	NATURAL PRODUCTS (or reduction of traditional products %)
BATING	Enzymatic products Ammonium sulphate	PODEBA → poultry manure
DEGREASING	Alkylphenol and alkylphenol ethoxilates	ECODEFATTING → lactose
TANNING	Chromium salts/Chromium VI	REDUCED percentages of CHROMIUM (4,5,6%) or OXATAN → oxalizidine
FATLIQUORING	Chlorinated paraffins short chain (C10-C13)	ECOFATTING → Palm kernel oil
DYEING	Azocolorants and azodyes	BIONAD → lactose

RESULTS



- The experimental results show that the introduction of natural/naturalized products did not modify the leather morphology, thermal behaviour and physical properties.
- The project contributes to the protection of the environment and development of a sustainable leather business, whilst maintaining the leather high quality standards (made in Italy).