Proviera®

Probiotics for Leather™

PROVIERA® FOR WATERPROOF LEATHER ARTICLES

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Learn more about our products.

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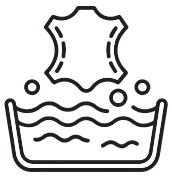
PART 1: THE ROLE OF SURFACTANTS IN THE LEATHER PROCESS AND THEIR IMPACT ON WATERPROOF PROPERTIES

Surface-active agents or surfactants are chemical substances that reduce surface or interfacial tension, allowing substances that normally don't mix (like oil and water) to interact more easily.

As auxiliary agents, surfactants are extensively used during different stages of the leather process for soaking, cleaning, degreasing and dispersion of natural substances not suitable to be tanned for leather and the chemicals.



SOAKING: *NON-IONIC SURFACTANTS (LOW FOAMING)*

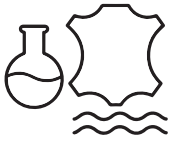
- Act as wetting agents to allow water to penetrate dried or salted hides quickly
- Help disperse dirt, proteins, and soluble impurities
- Reduce soaking time and improve uniform hydration

LIMING AND UNHAIRING: *ANIONIC SURFACTANTS*

- Improve penetration of lime and sulfides
- Help emulsify fats and grease
- Assist in hair loosening and removal
- Reduce uneven swelling

DELIMING AND BATING: *NON-IONIC OR AMPHOTERIC SURFACTANTS*

- Promote uniform removal of lime
- Improve enzyme penetration
- Aid in removal of degraded proteins and residues

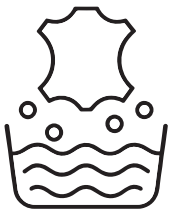


PICKLING: *NON-IONIC SURFACTANTS*

- Improve acid and salt penetration
- Prevent surface fixation and uneven pickling
- Help disperse remaining fats

TANNING: *NON-IONIC SURFACTANTS*

- Enhance penetration of tanning agents
- Prevent surface tanning
- Improve distribution of chrome or vegetable tannins



WET-END: *ANIONIC AND NON-IONIC SURFACTANTS*

- Wetting-back wet-blue
- Act as dispersing agents for dyes
- Improve level dyeing and shade uniformity
- Preventing dye aggregation
- Emulsify oils and fats into stable oil-in-water emulsions
- Enable deep penetration of lubricants
- Improve softness, flexibility, and tear strength

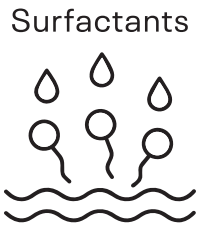
Proviera products can replace or be combined with all kinds of surfactants used in all the stages of the leather process

SURFACTANTS VS WATERPROOFING

Surfactants have a major influence on waterproofing:

Surfactants and waterproofing naturally oppose each other:

- Waterproofing works by making a surface hydrophobic (water-repellent)
- Surfactants are designed to make surfaces more wettable



Surfactants can REDUCE waterproofing:

- Increased wetting
  - Surfactants lower surface tension of water
  - Water spreads and penetrates more easily
  - This allows water to enter pores and fibers, reducing water repellency
- Removal of hydrophobic materials
  - Surfactants can emulsify and wash away waxes, oils, silicones, or fluorochemicals
  - This damages existing waterproof layers
- Residual surfactants attract water
  - Hydrophilic heads remain on the surface
  - These residues absorb moisture
  - Result: higher water uptake and poor waterproof performance

PART 2: MANUFACTURING WATER-PROOFING LEATHER ARTICLES. GENERAL APPROACH.

Leather must be treated aiming to resist water penetration while remaining flexible and breathable. All waterproofing systems are only effective when the whole process counts for this final property and each step must be considered.

- **Raw Hide Selection:** Waterproofing starts with the right leather.
  - Full-grain or top-grain cowhide
  - Dense fiber structure
  - Minimal surface damage
- **Tanning:** Tanning stabilizes the hide and prepares it to accept waterproofing agents.
  - Chrome tanning → flexible, water-resistant base. Chrome-tanned leather generally offers the best foundation for waterproof products.
  - Vegetable tanning → needs extra waterproof treatment
- **Retanning & Fatliquoring (Internal Waterproofing):**
  - This is where true waterproof leather is created. Several systems are available:
    - Hydrophobic oils
    - Synthetic waxes
    - Silicone or fluorocarbon compounds
  - These penetrate deep into the fiber structure, not just the surface
    - Prevent water from traveling between fibers
    - Maintain softness and flexibility
    - Improve resistance even if surface coating wears off
  - This step differentiates waterproof leather from merely water-repellent leather.
- **Others:** Drying and conditioning, finishing (topcoat).

PART 3: WHY PROVIERA PRODUCTS HELP WATERPROOFING SYSTEMS FOR LEATHER.

Application: Wet-end

Waterproofing:
Enhance performance
of waterproofing systems

Proviera properties vs. Traditional synthetic surfactant properties:

Surfactant	Proviera
Chemical synthesis	Natural fermented probiotic
Surfactant properties (single chemical)	Surfactant-like properties (broth of biochemicals)
Reduce surface tension	Reduce surface tension/ Break down molecules
Big molecule size	Small molecule sizes
High evaporation point	Low evaporation point
High solid residual	Low solid residual
High concentration	Low concentration
Difficult to rinse	Easy to rinse
Remain in the leather	Do not remain in the leather

OUR PRODUCTS

ProSoak

Proviera® ProSoak® is an all-natural, environmentally friendly hide soak that improves leather quality and ensures higher leather yields. It is best used in main soaking, especially with fresh hides, and washing wet-blue/wetting back.

ProSpread

Proviera® ProSpread® is an all-natural, surfactant-free wetting and dispersing agent that disperses fat far better than traditional chemicals. It can also be used in pre-soaking, liming, retanning, fatliquoring, and dyeing.

ProDegreaze

Proviera® ProDegreaze® is an all-natural, environmentally friendly degreaser that can strip high fat hides and skins effortlessly, as well as degrease sheepskins.

PROVIERA CASE STUDIES IN WATERPROOFING:

Case 1: Results of application tests. Data from Sichuan Decision New Material Technology, Co. Ltd.

a.) Degreasing in waterproofing process: Material 1.8 mm waterproof upper leather (maeser test):

Dosage	ProDegreaze	Synthetic degreasing agent
0.8%	24,103 cycles	7,402 cycles
1.2 %	17,746 cycles	1,536 cycles

b) Degreasing in waterproofing process: Material 1.35 mm waterproof (maeser test):

Dosage	ProDegreaze	Synthetic degreasing agent
0.8%	>130,000 cycles	67,920 cycles

c) Comparing dispersing agents in waterproofing process. (Maeser test)

Blank	2% ProSpread	2% Polymer	2% Naphthalene
35,832 cycles	86,376 cycles	81,132 cycles	16,250 cycles

Case 2: US wet blue, waterproof shoe upper leather article

Control drum wetting back chemicals are as follows:

200 % Water
0.30 % Formic Acid
0.20 % Chemical surfactant with wetting and emulsifying properties
0.50 % ProDegreaze
Running time 60 minutes

Proviera wetting back chemicals are as follows:

200 % Water
0.30 % Formic Acid
0.10 % Lipase
0.30 % ProSpread
0.70 % ProDegreaze
Running time 90 minutes

Checking wet-blue after wetting-back.

Control drum wet blue becomes slightly lighter in color compared with Proviera system and slightly more slippery to touch than Proviera system.

No differences in fullness.

Both processes continue to rechroming process and later retanning with same formulation with waterproofing treatment.

Retanned crust was later sent to samming/ setting out, vacuum, chamber dry and later conditioning and staking.

Final checking after crust was dried:

- Proviera system leather has a more uniform surface color compared to control leather.
- Proviera leather appears to have slightly more tightness than control leather.
- Waterproof leather is being cut and sent to lab for testing. All test passed specifications

Proviera Waterproof leather

Control Waterproof leather

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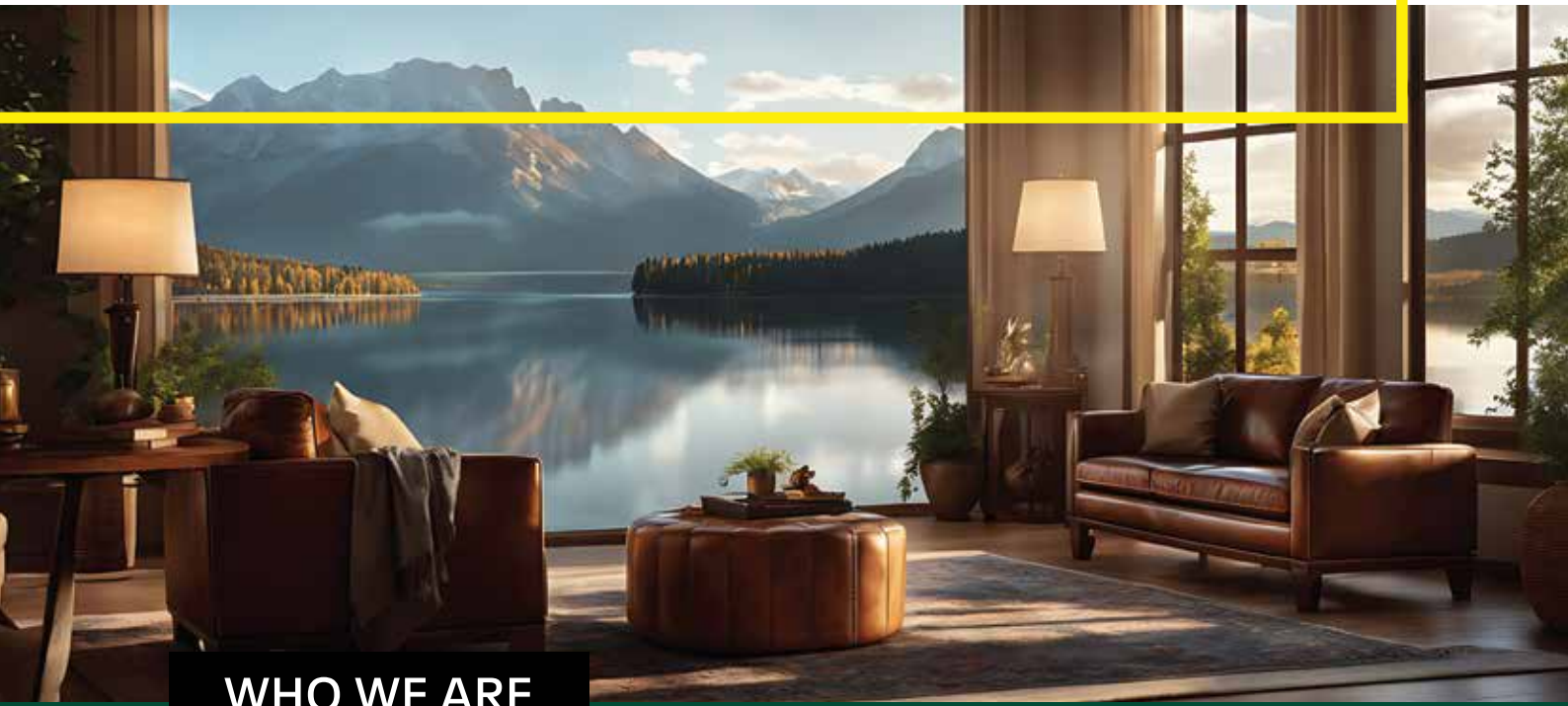
ALONG WITH OUR PARTNERS, WE'RE CHANGING THE WAY LEATHER IS MADE.



WHO WE ARE

Proviera® is committed to providing a full spectrum of probiotic and biochemical solutions for various Probiotics for Leather™ applications. Conceived through proprietary consortia technology, these products are designed to provide cutting-edge, superior performance, and cost-effect alternatives to traditional chemicals.

Learn more about our products.
Visit www.Proviera.com

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