

## **OROPON® advanced bating technology optimise usable area**

OROPON – the pioneer of modern bating agents which optimise the useable area of a hide

Since O. Röhm introduced enzymatic bating in 1907 the bating process evolved due to the achievements brought about by modern biotechnology. OROPON bating products have been optimised continuously and adjusted to the ever changing conditions of the industry. Further milestones include the introduction of acid OROPON bating products by Röhm, now TFL, in the 60's respectively beginning of the 80's. These products were used for pickled skins and wet-blues in order to improve layout and cleanliness.

### **Changing customer demands – the new challenge OROPON**

During the past 15 – 20 years we have seen significant changes in hide quality, preservation as well as customer demands. Cattle are being raised faster and the animals reach maturity at an earlier age. This leaves the collagen structure with less crosslinks and thereby more sensitive to e.g. alkali. The tanner is facing problems with looser grain and emptier flanks. On the other hand the increased cost pressure demands measures to be taken in the process to expand the area of the hide. We know that many things which are good for area yield are not so good for grain tightness and fullness of the bellies. The tanner finds himself in a dilemma: How can I expand the area of the hide and not sacrifice the so called “cutting yield” or better the useable area of leather.

**Relaxation of both the collagen and elastin take place at the same time and to a similar degree**

In order to achieve this ambitious goal enzymes play a critical role. In general, bating enzymes possess collagenolytic, elastolytic and lipolytic activity. Systematic studies with different enzymes showed that it is critical to have the right ratio between collagenolytic and elastolytic activity in order to achieve a good bating effect which can deliver also the best useable area of a hide. The degradation of elastin is important in order to relax and expand the grain and hide structure. If the degradation goes too far, more pronounced veins and looser grain and bellies can be noticed. To avoid this unwanted side effect we have to make sure that the collagen hide structure is “relaxed” as well.

This goal should be achieved in two ways:

- 1. Through further optimisation of the pancreatic enzyme complex which is now being used as a major component in OROPON bating products of the O series (OXX, OR, OO, ON2) as well as in the well-known OROPON W.**
- 2. Through developing new selective microbial proteases, formulated to mimic the proteolytic effect of the modified pancreatic enzyme, available in the OROPON MM –range.**

These important achievements could be made without sacrificing the other well-known properties of OROPON bating agents like good cleanliness, inner softness and improvement of tear strength.

### Further improvements of wet-blue quality

Many wet-blues are being traded around the globe. Often they lack good opening up and cleanliness due to poor beamhouse operations. Depending on the type of leather article to be made, those hides can be upgraded by an “after” bating process with special proteolytic OROPON products. The products OROPON WB (applied at pH 2 – 4), OROPON DVP (applied at pH 4 – 6) and OROPON SAN (applied at pH 5 and higher) are optimised for good elastin removal in chrome tanned hid and can lead to noticeable improvement in area yield. Due to their specific character there is little risk of looseness of nubucked grain.

### Quality and safety above the average

To judge the strength and performance of a bating agent only practical tests will work. The well-known LVU method is used to ensure a consistent strength of a bating product. The LVU activity is measured on casein as a substrate and tells very little about the real performance on leather. A bating agent with a low LVU activity (i.e. 800 LVU) and optimal enzyme composition can give the same or even better practical result compared to a product which has 1000 LVU.

**To ensure consistency of quality and good operational safety OROPON bating agents are checked regularly for their specific activities on collagen and elastin. OROPON products have low dust formation to ensure good operational safety.**

OROPON bating agents meet the requirements of the bating process in an optimum way

**OROPON bates show significant advantages compared with certain bacterial enzymes:**



Grain tightness comparison of conventional proteolytic bacterial protease from bac subtilis (left) versus modified OROPON bating product.



Grain tightness comparison of a proteolytic bacterial protease (left) versus modified OROPON bating product.



Loose leather parts used in articles. OROPON helps to improve layout but still keeps flanks full.

## Important properties of OROPOON bating agents

### Results of testing different enzymes on hide constituents

analytical data					
relative units are expressed in relation to LVU activity					
	elastase (rel. units)	collagenase (rel. units)	elastase – collagenase ratio	keratinase (rel. units)	lipase (FIP)
<b>modified pancreas enzyme</b>	<b>4.2</b>	<b>1.23</b>	<b>3.4</b>	<b>6.02</b>	<b>22500</b>
bacterial protease 1	7.8	1.17	6.6	4.3	< 100
bacterial protease 2	8.02	1.50	5.2	3.74	< 100
fungal protease FA	4.78	0.5	9.6	0.55	< 100

The low elastase/collagenase ratio explains why the modified pancreas helps to relax the hide but still keeps grain/flank tight and full.

results on leather					
	cleanliness	relaxation/ area gain	fullness flanks	softness	veins
<b>modified pancreas enzyme</b>	<b>++</b>	<b>+++</b>	<b>++</b>	<b>+++</b>	<b>+</b>
bacterial protease 1	–	+++	–	++	–
bacterial protease 2	+	++	+	++	–
fungal protease FA	++	0	++	–	++

The modified pancreatic enzyme combines good layout with full flanks and tight grain.

