



Horizon2020



Regional Activity Centre
for Sustainable Consumption
and Production

BAT: BEST AVAILABLE TECHNIQUES FOR TANNING OF HIDES AND SKINS

**Inputs to Guide for a more sustainable
tannery sector in the Medierranean**

Barcelona meeting 22-24 July 2015



THE USE OF SUSTAINABLE TECHNIQUES
AND PRACTICES IN THE TANNERY SECTOR IS A MUST !



IS A SPANISH COMPANY BASED IN LORCA (MURCIA)
SPECIALISED IN THE CONSTRUCTION OF TANNERY DRUMS
AND AUTOMATION SYSTEMS FOR TANNERY

OLCINA GROUP AND PARTNERS PROVIDE SOLUTIONS TO
THE TANNERY SECTOR IN PARTICULAR TO THE WET END OF
THE TANNERY THROUGH INNOVATION CONSTANT R&D &
SPECIALISED ENGINEERING,
LOOKING FOR SUSTAINABILITY OF LEATHER SECTOR.

SOLUTIONS PROVIDED BY OLCINA GROUP:



- ***BAT 1 : DESSALTING DRUM - “SALT SHAKER”***
- ***BAT 3 & 10: PATENTED TECHNOLOGY “CANGILONES NEXT” OR “BUCKET” SLOW SPEED DRUMS FOR TANNERY WET PROCESSES***
- ***BAT 10 : REPLACING PADDLES & CONVENTIONAL DRUMS BY NEW TECHNOLOGY “CANGILONES NEXT “ OR “Bucket” DRUMS FOR EFFICIENT WATER MANAGEMENT***
- ***BAT 10: HAIR SAVING IN LIMING THROUGH “ECO-COMPAC” FILTERS***
- ***BAT 10: AUTOMATION OF WATER MIXING AND BATCHING – “SYSTEM-MIX”***



"CANGILONES NEXT" NEW TECHNOLOGY DRUMS DIAM 4.2 X 4.5M FOR WATER SAVING & CAPACITY 20 TON OF WET SALTED HIDES



BAT N° 1 : REMOVAL OF SALT

- Due to climatic conditions the scope for green processing is limited in many countries, sodium chloride (SALT) is widely used to preserve raw hides and skins.





BAT n° 1 : SALTED HIDES

- Salt contributes to a high volume of total dissolved solids (TDS) in the soak waste liquor. No commercially viable technology for treating effluent has been developed to date. A large amount of the salt sticking to the hide and skin surface can be removed by shaking the hides mechanically or manually.

BAT N° 1 :



CLEAN TECHNOLOGY: DESALTING DRUM



OLCINA SALT-SHAKER DESSALTING DRUM
SALT REDUCTION : - 15% TDS

BAT N° 1 : CLEAN TECHNOLOGY: DESALTING DRUM



**"SALT SHAKER" IS A DESALTING DRUM INCLUDED IN ALL
OLCINA TANNERY ENGINEERING PROJECTS**

BAT 3 & BAT 10



BAT 3 : INCREASING EFFICIENCY OF CHROME TANNING

BAT 10: PROCESS WATER MANAGEMENT

AS AN ILLUSTRATION OF SOLUTIONS FOR THESE TWO BAT WE WILL EXPLAIN:

THE "CANGILONES NEXT" BUCKET DRUM TECHNOLOGY FOR :

- WATER SAVINGS IN ALL SOAKING / LIMING PROCESSES
- REDUCTION OF CHROME INPUT IN TANNING PROCESS WITH SHORT FLOATS



WORKING PRINCIPLE:

The Bucket Drum System like Cangilones NEXT replaces centrifugal force of traditional drums running at high speed by a mass effect at slow speed.

The waterfall mechanical action obtained at slow speed creates a sponge effect that allow the chemicals to penetrate the hide/skin structure by osmosis with shorter floats and with maximum efficiency.

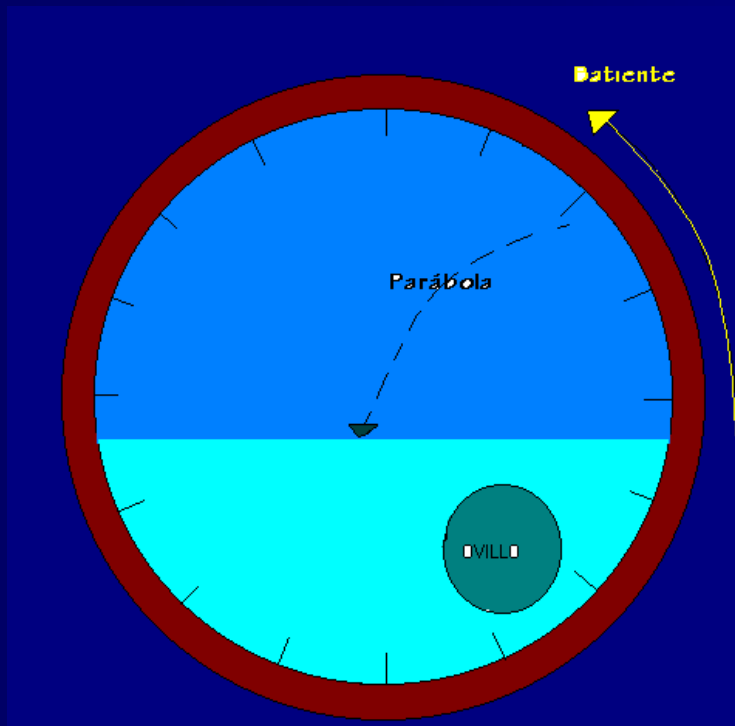


DRUM CHANGE:

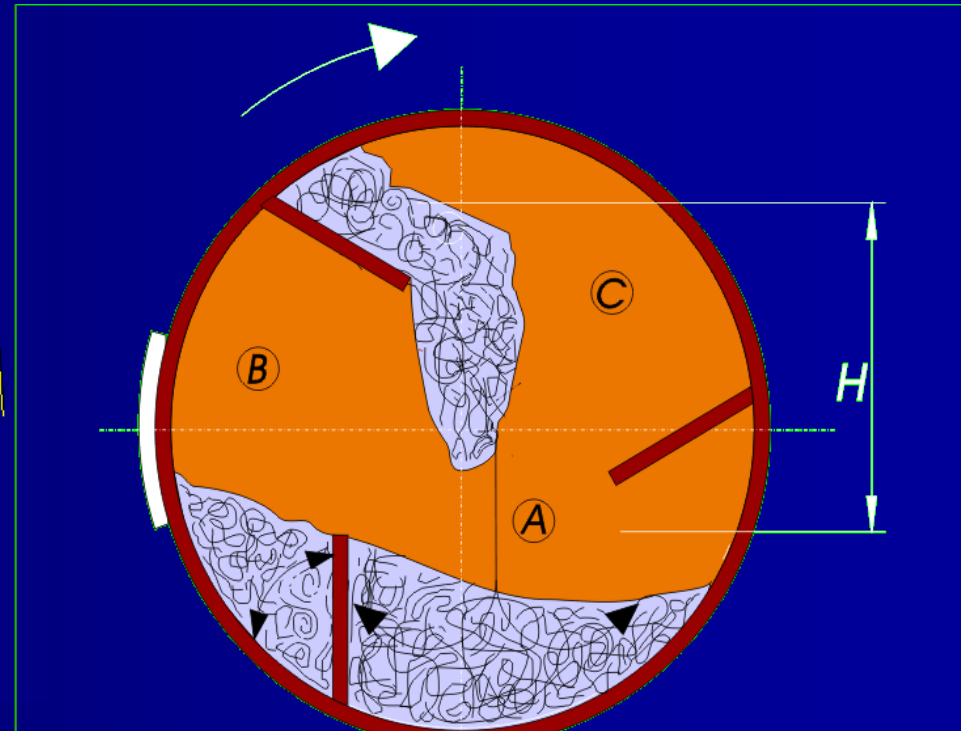
Less Is More

CONVENTIONAL DRUM

CANGILONES NEXT DRUM



CONVENTIONAL DRUM
WITH PEGS RUNNING AT HIGH SPEEDS



CANGILONES NEXT DRUM WITH CANGILONES SHELVES
RUNNING AT SLOW SPEEDS

FIG. 1



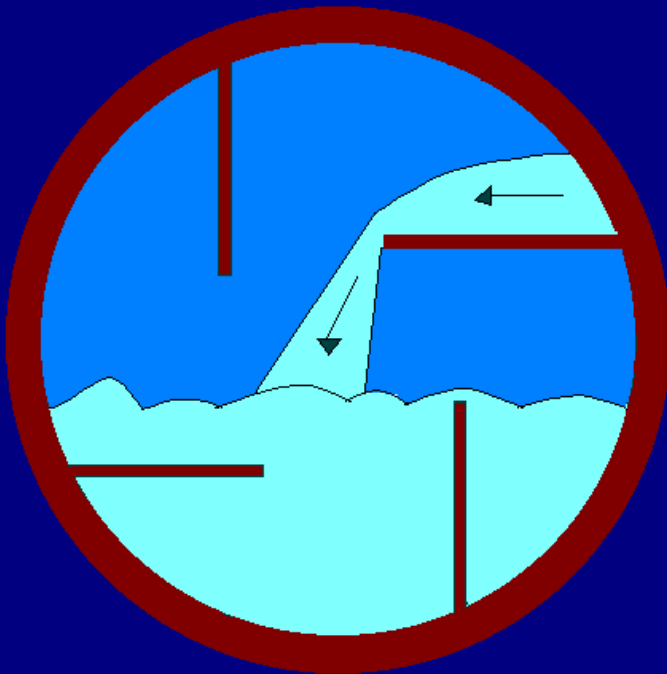
NEW
Cangilones
Xt

EVOLUTION TO

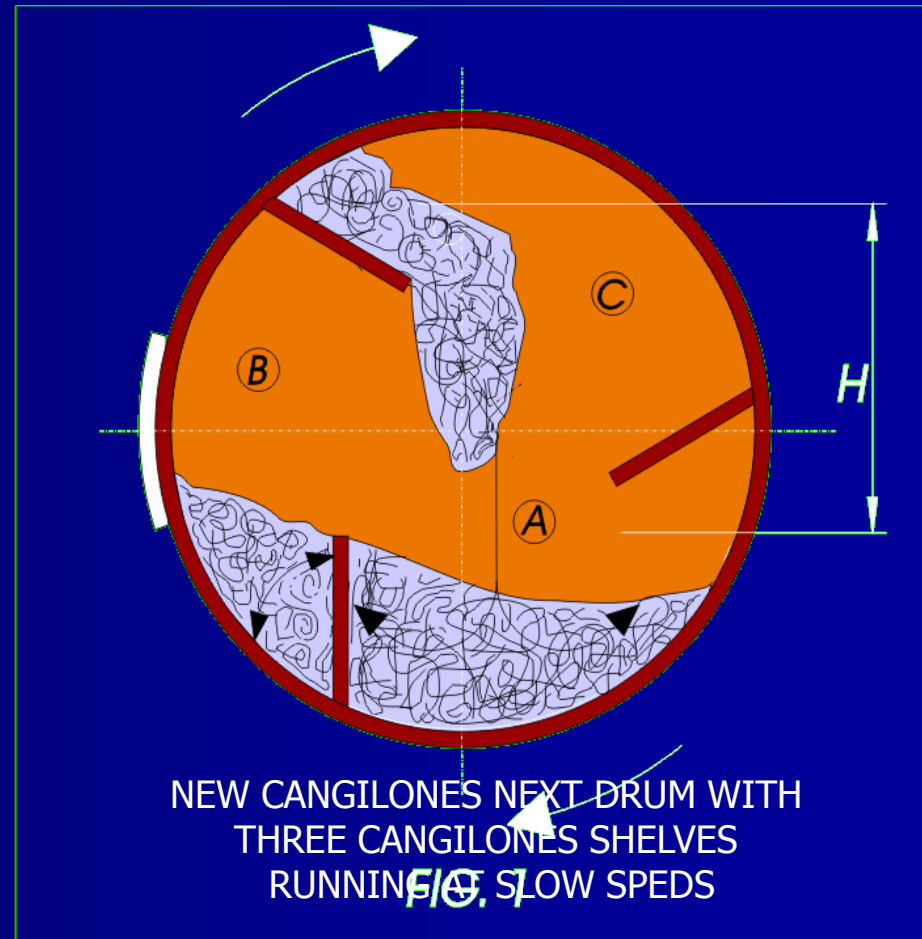
LESS IS MORE

OLD BUCKET/CANGILONES SYSTEM

NEW CANGILONES NEXT



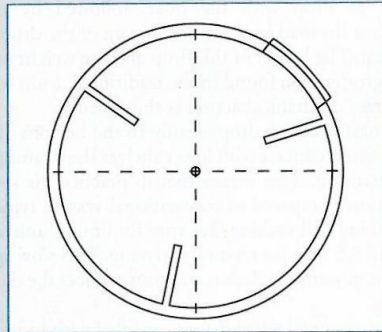
ORIGINAL CANGILONES SYSTEM
WITH FOUR SHELVES



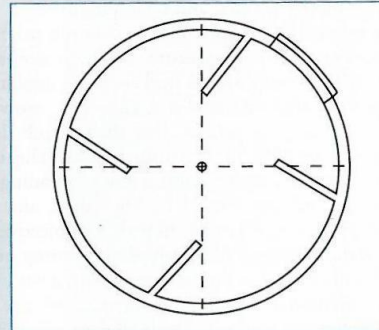
NEW CANGILONES NEXT DRUM WITH
THREE CANGILONES SHELVES
RUNNING FIG. 1



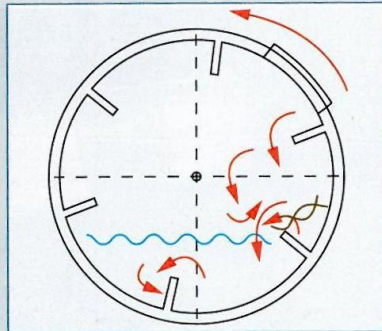
Construction and motion within drums fitted with deep shelves



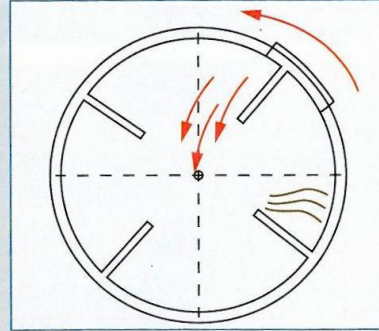
◀ **1:** Shows construction with three shelves orientated to the axle (centre).



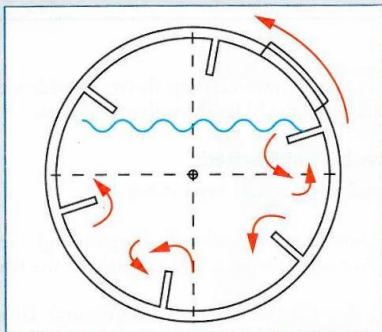
▶ **2:** Shows construction with four shelves orientated at an angle to the axle (centre).



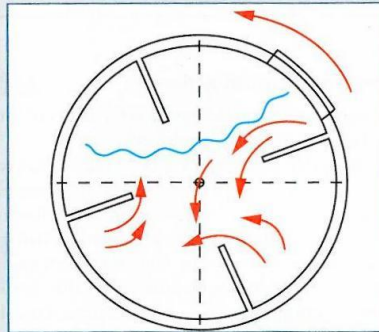
◀ **3:** In conventional drums, on rotation, a rolling motion of the hides and sides develops that leads to pieces twisting.



▶ **4:** With deep shelf construction and slow speed of rotation, pieces are lifted high in the drum, and then drop to the drum base without rolling.



◀ **5:** When conventional drums rotate with the load/float above the axle, the movement of the mass is restricted to the peripheral parts.



▶ **6:** With deep shelf construction with the load/float above the axle, movement occurs through the whole of the hide mass.

ARTICLE OF
WORLD LEATHER
DEC 2010/JAN2011
PRESENTING

FIRST
GENERATION OF
PATENTED
CANGILONES
SYSTEM

AND LESS
EFFECTIVE
IMITATION
SYSTEMS WITH
SHELVES LOOKING
TO DRUM CENTER

Cangilones_{xt}



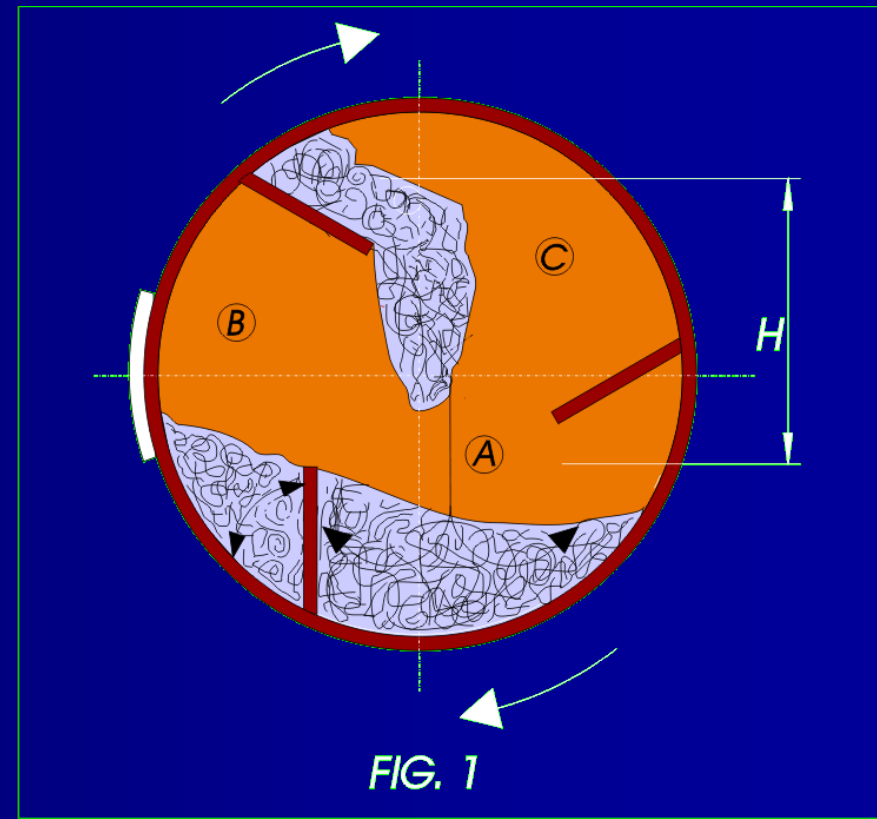
AUTOMATED CANGILONES NEXT DRUM AT ECCO (HOLLAND)

Cangilones_{Xt}

SYSTEM:



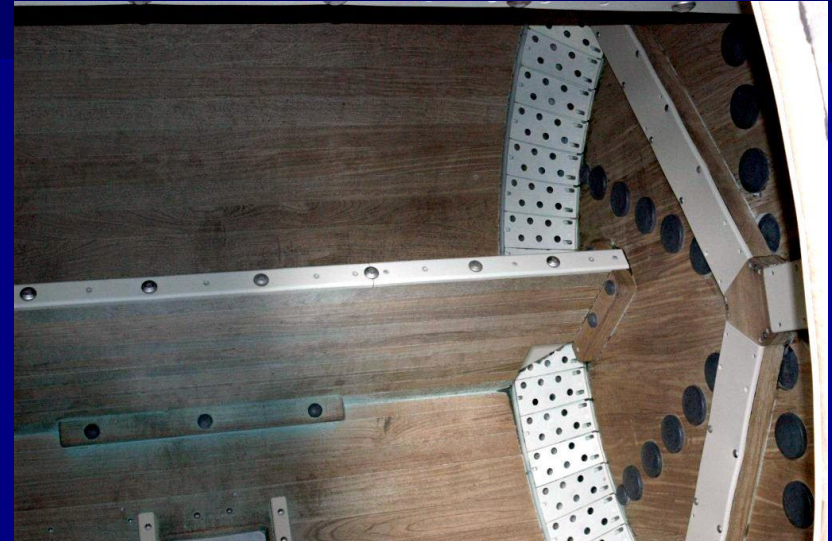
- ⑩ DRUM IS EQUIPPED INSIDE WITH THREE "CANGILONES" DEEP SHELVES THAT REPRODUCE BUCKETS ALLOWING COMBINED MOVEMENT OF HIDES AND CHEMICALS
- DRUM RUNS AT LOW SPEED EQUIPPED WITH LOW POWER AND MAY WORK WITH SHORT FLOATS
- THE SYSTEM & CONFIGURATION ARE VALID AS WELL FOR:
 - SOAKING & LIMING
 - TANNING
 - RETANNING & DYEING PROCESSES.



Cangilones_{xt}



- **DRUM EQUIPPED WITH SIDE DISTRIBUTORS FOR WATER CHEMICALS, STEAM INLET NEVER IN DIRECT CONTACT WITH HIDES.**
- **FOR TANNING DRUM IS EQUIPPED WITH HEATING SYSTEM BY STEAM**
- **AS AN OPTION THE DRUM CAN BE EQUIPPED WITH AN EXTERNAL RECIRCULATION SYSTEM AWITH OR WITHOUR HEAT EXCHANGER ALLOWING CONTINUOUS TEMPERATURE MONITORING AND CONTROL SYSTEM (COOLING & HEATING ARE AVAILABLE)**



Cangilones_{xt}

summary:



- HIDES MOVE TOGETHER WITH FLOAT
- LOW SPEED PROCESSING
0.7 -1.4 RPM – 2RPM
- POSSIBLE PROCESSING WITH SHORT FLOATS
- HIGHER PROCESS CONTROL (TEMPERATURE & PH)
- CHANGE IN MECHANICAL EFFECT – SPONGE EFFECT –





- ***60% in water***
- ***70% in energy***
- ***48% in space***
- ***30% in water treatment cost***



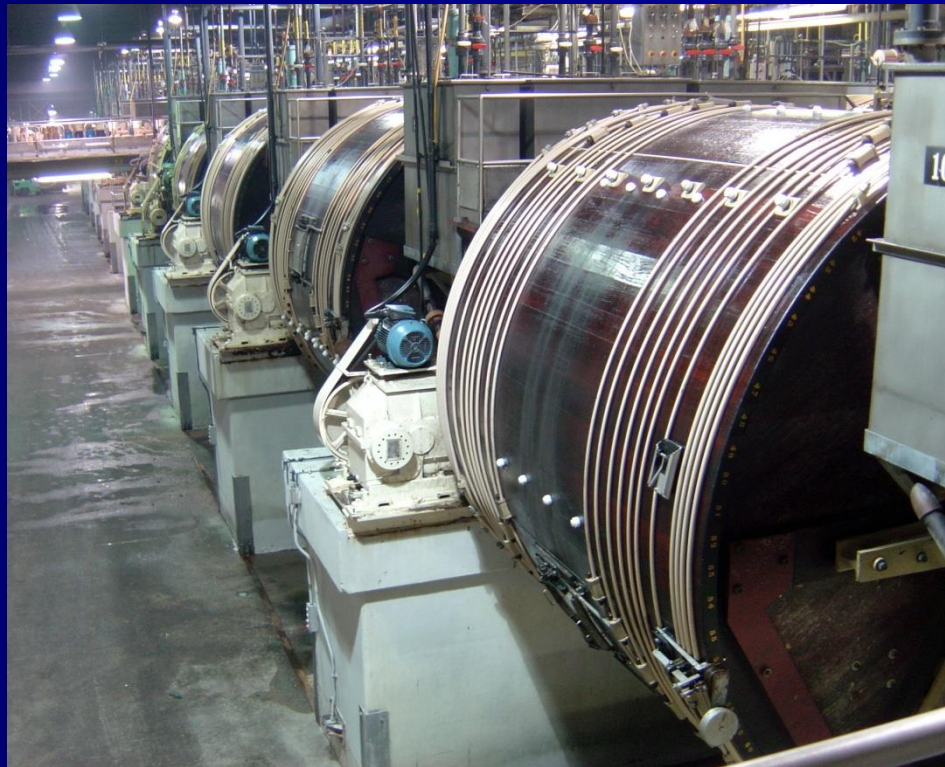
- *in chemicals*
- *in controls*
- *in maintenance*
- *in operations*

Cangilones_{xt}



IS A PATENTED TECHNOLOGY:

- IN SPAIN
- IN ITALY
- IN FRANCE
- IN TURKEY
- IN U.K.
- IN GERMANY
- IN U.S.A.
- IN ARGENTINA
- IN BRAZIL



PATENT RECOGNIZES THE INNOVATION ASPECT OF A STEP FORWARD OF THE INDUSTRY





BAT 3 & 10:

Less Water



Olcina Cangilones NEXT =

***Water Savings up to 60%
in all processes.***



***Energy efficiency through Water
savings and lower water treatment
cost***



Comparison of Water consumption per Kg of Hide from Raw to Wet Blue.



Conventional Drum wit Pegs and conventional "high" Speeds:	Cangilones NEXT Drums with off Center deep shelves at slow speeds and Hair Saving Filter	Cangilones NEXT Drums with Hair burn process (no Filtration in Liming)
12 Liters/Kg of Hide	6.5 Liters/Kg of Hide	7,1 Liters/Kg of Hide

Cangilones

Less is More Xt



Less Power

Olcina Cangilones NEXT =

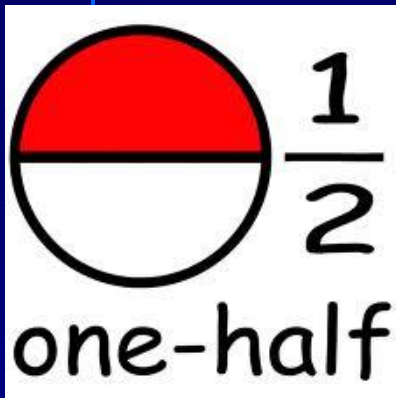
*Less power required in all processes,
Power Savings going
up to 70%
against conventional drums,
and up to 50%
against other system fakes.*

***Cangilones is a PATENTED TECHNOLOGY by
Olcina Group.***

Comparison of Power required for 1 Tanning Drum 4x4m.



<p>Conventional Drum 4x4m with Pegs at 4 & 8 rpm with 9200 Kgs capacity:</p>	<p>Cangilonos NEXT Drum 4x4m with <u>off center deep shelves</u> at 1 & 2 rpm. and 19000 Kgs capacity.</p>	<p>Imitation Drums with other shelves system looking to the axle and running at 3 & 6 rpm and 14000 Kgs capacity</p>
<p>75 HP</p>	<p>30 HP</p>	<p>60 HP</p>



Less Drums

Olcina Cangilones NEXT =

*Up to 24000 Kgs
in one single tanning Drum.*

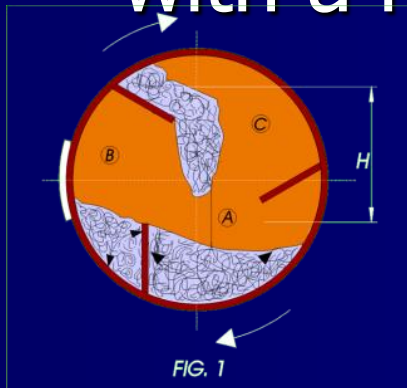
**1 CANGILONES NEXT DRUM =
2 CONVENTIONAL DRUMS**

***Maximum consistency.
Maximum processing efficiency.***



Example in TANNING:

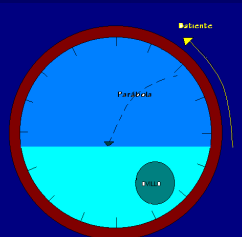
One Cangilones-NEXT Ø 4,2x4,5m.
with a max. capacity of 24 TONS



Ø4,2x4,5m
40HP

24 Tons
Green Weight
Total power: 40HP

Replaces two Conventional Drums same size



Ø4,2x4,5m
75HP

Ø4,2x4,5m
75HP

12Tons/each

Total power:
150HP



Less Speed = More Quality



Olcina Cangilones NEXT =

Lower processing speeds

resulting in:

No tearing,

No scuffing,

No reprocessing costs

Less Water as no reprocessing.

Energy efficiency through quality improvement.



More Consistency



Olcina Cangilones NEXT =

*Less Drums,
Less Automation & Controls,
Less Maintenance Costs,*

*Energy efficiency & Water savings
though higher consistency*



BAT n° 3:



INCREASING THE EFFICIENCY OF CHROMIUM TANNING





BAT N° 3

REDUCTION OF CHROME INPUT



Olcina Cangilones NEXT =

Reduction of Chrome input of around 20-30%

Maximum Chrome exhaustion = 90%

- Minimum chrome content

in water discharge PPM= 0.8/1

***- Possibility of processing with short floats
without damage to the leather (no scuffing)***

Energy efficiency through quality improvement.

Comparison of Chrome Input between Conventional Drums and Cangilones Next Drums:



Conventional Drum	Cangilones NEXT Drum
Average Chrome input : 6.5%	Average Chrome Input: 4,5 %
Chrome uptake: 60%. To the effluent: 40%	Chrome uptake 90% thanks to high exhaustion and sponge effect.

Cangilones_{xt}



- Full penetration of Chrome in Neck area with adjusted input.
- Optimized uptake of chrome.

Light and Bright
Wet Blue Color

BAT n° 10:

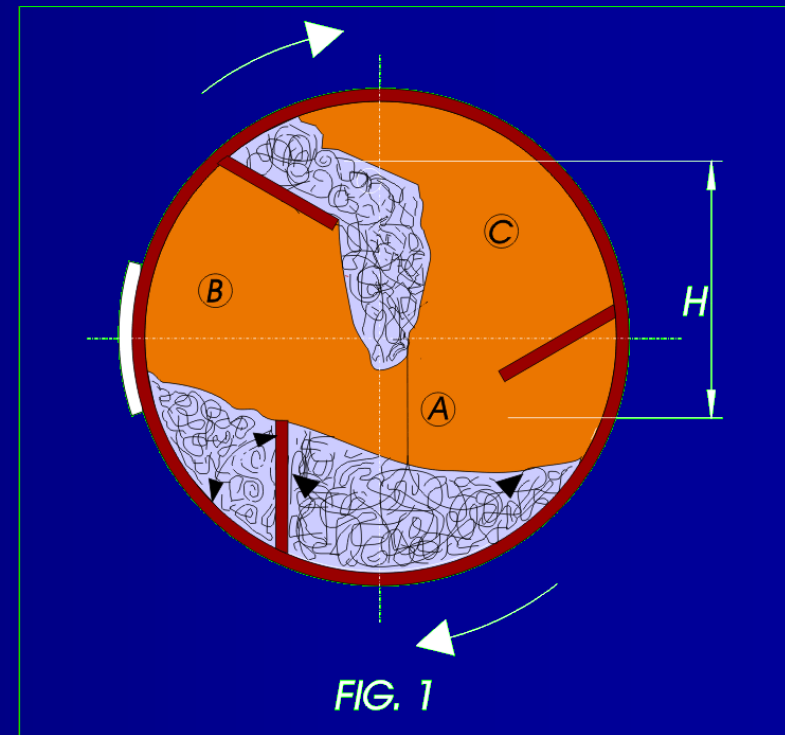


PROCESS WATER MANAGEMENT

To reduce environmental impact of the tanneries

- BAT 10/1 – “CANGILONES NEXT” DRUMS
- BAT 10/2 – “ECO-COMPAC” Hair Saving Filters
- BAT 10/3 – “SYSTEM-MIX” AUTOMATION of Water Batching an others.

BAT N° 10/1 : CANGILONES NEXT DRUMS for Wet Processing





BAT 10/1:

- **CANGILONES NEXT
REPLACE LESS EFFICIENT
PADDLES AND
CONVENTIONAL DRUMS**
- **ALLOW WATER SAVINGS
OF UP TO 60% FLOAT**
- **POSSIBLE PROCESSING
WITH SHORT FLOATS**
- **LOW SPEED PROCESSING
0.7 -1.4 RPM – 2RPM**
- **MAXIMUM LOADING CAPACITY**
- **HIGHER PROCESS CONTROL
(TEMPERATURE & PH)**
- **CHANGE IN MECHANICAL
EFFECT – SPONGE EFFECT –
INSTEAD OF CENTRIFUGAL FORCE**
- **IMPROVES QUALITY OF END PRODUCT**





BAT 10/1 – NEW TECHNOLOGY BUCKET DRUMS ARE ALSO USED FOR SKINS



HIGHER LOADS
AND SHORTER
FLOATS WITH
MORE
CONCENTRATED
CHEMICALS
RESULT IN
WATER SAVINGS
OF 50% IN
SKINS
PROCESSING

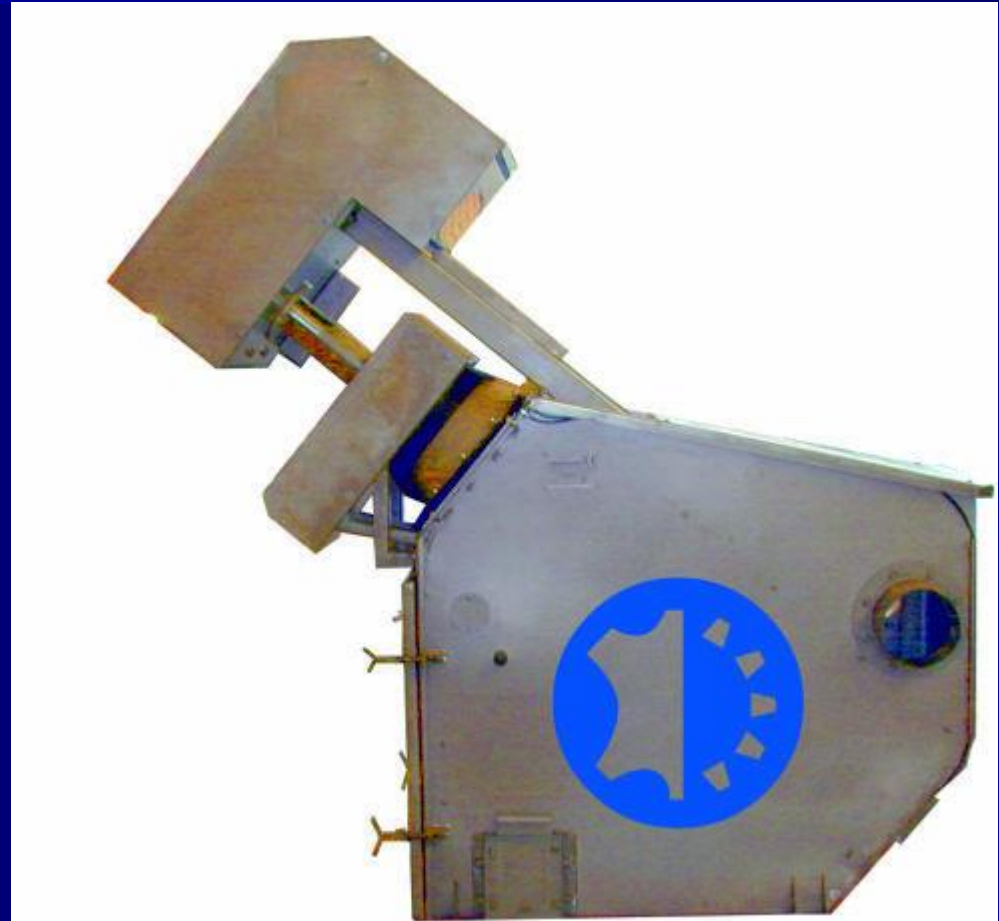
OLCINA STAINLESS STEEL AND WOODEN "CANGILONES NEXT" DRUMS FOR SKINS



BAT N° 10/2 : Filter for Hair Saving

FROM START OF HAIR
IMMUNIZATION, UP TO
2000 HAIR (10% OF
TOTAL HIDE WEIGHT) IS
SEPARATED IN 45
MINUTES.

DESTROYED HAIR DOES
NOR GO INTO THE
EFFLUENT = LESS B.O.D.



BAT N° 10/2 : Cangilones Next Drums with Eco Compac filter for Hair Saving





BAT N° 10/2 :

Eco Compac filter for Hair Saving

Hair Saving in Liming will result in:

- Reduction of BOD in the effluent
- Significant Water saving during the Liming process as less washing is of hides required.
- Reduction of Water treatment cost.
- Environmental benefits

BAT N° 10/2 : Bucket new technology Drums with filter for Hair Saving



CANGILONES NEXT DRUMS WITH ECO-COMPAC FILTERS (MEXICO)

BAT 10/3



Automation Systems



Bat 10/3 Water Management and Process Efficiency through Automation Systems



Bat 10/3 - Automatic Water batching and Dosing System



Bat 10/3

Water Dosing & Batching system – Control panel and Water Mixing Batteries System - Mix



Bat 10/3 – Automatic Dosing systems for liquid chemicals.



- Avoids Human Errors
 - Higher Accuracy
 - Allows Water & Chemical savings





CANGILONES NEXT Drums Technology in Mediterranean Bassin

The Mediterranean Basin





CANGILONES NEXT Drums at Piel Color Tannery Egypt

REPORTED

CHROME INPUT

REDUCTION :

20 %

WATER SAVINGS:

50%





CANGILONES NEXT Drums Technology at SMCP (Algeria)



REDUCTION OF
WATER
CONSUMPTION :
50%



Our Recommendations for the guide :

Towards a more sustainable tanning sector in the Mediterranean.

BAT 1 : Encourage and incentive the use of Desalting Drums like “Salt Shaker”.

- **BAT 3 & 10: Encourage and incentive the use of Bucket Drum Technology like “Cangilones NEXT” instead of conventional drums or paddles.**
- **BAT 10 : Encourage Filtering / Hair saving processes and Automation for Water batching**



Conclusion:

The use of recommended BAT

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THANK YOU !

Presenter: Joaquín Páez