



Corporacion Ambiental Empresarial  
Cámara de Comercio de Bogotá  
Sede SALITRE - Bogotá, Colombia  
9 de noviembre de 2015



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ASSOCIAZIONE NAZIONALE  
COSTRUTTORI TECNOLOGIE PER CALZATURE,  
PELLETTERIA E CONCIERIA

**SEMINARIO INTERNACIONAL  
GESTIÓN SOSTENIBLE DEL RECURSO HÍDRICO EN LA REGIÓN CAR  
CASO EMPRESARIAL – SECTOR CURTIEMBRES**

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Mejoras tecnológicas para el desarrollo sostenible de la industria de curtidos

*Roberto Vago*

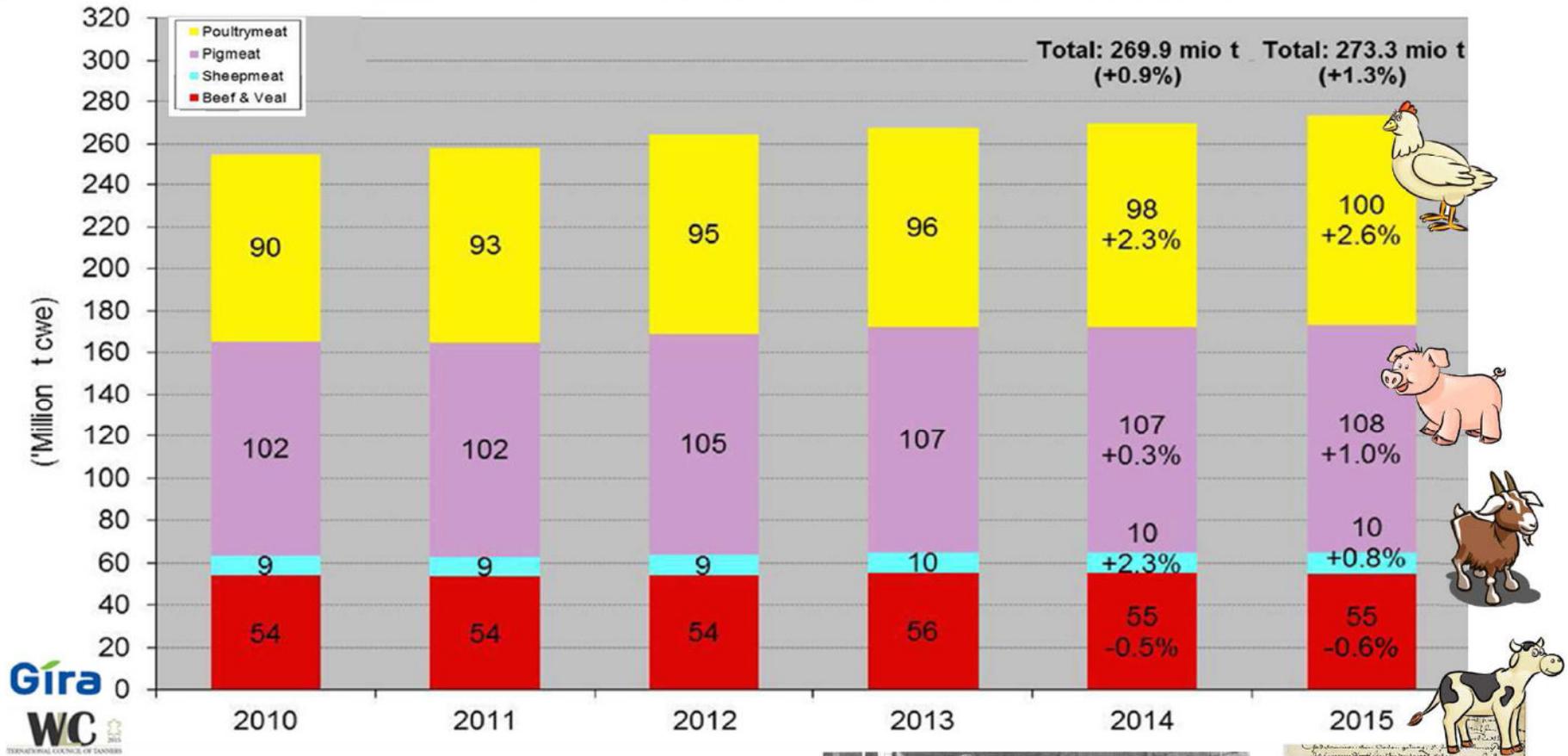


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30 años

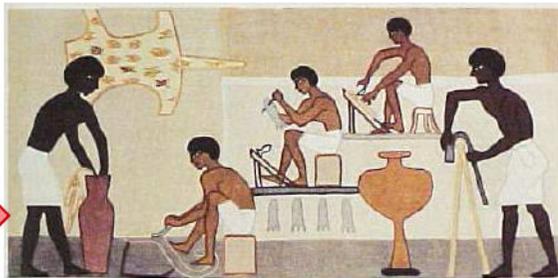


# GLOBAL Trend of meat consumption



Gira  
WC  
INTERNATIONAL COUNCIL OF TANNERS

...TANNING...  
historically oldest  
recycling process





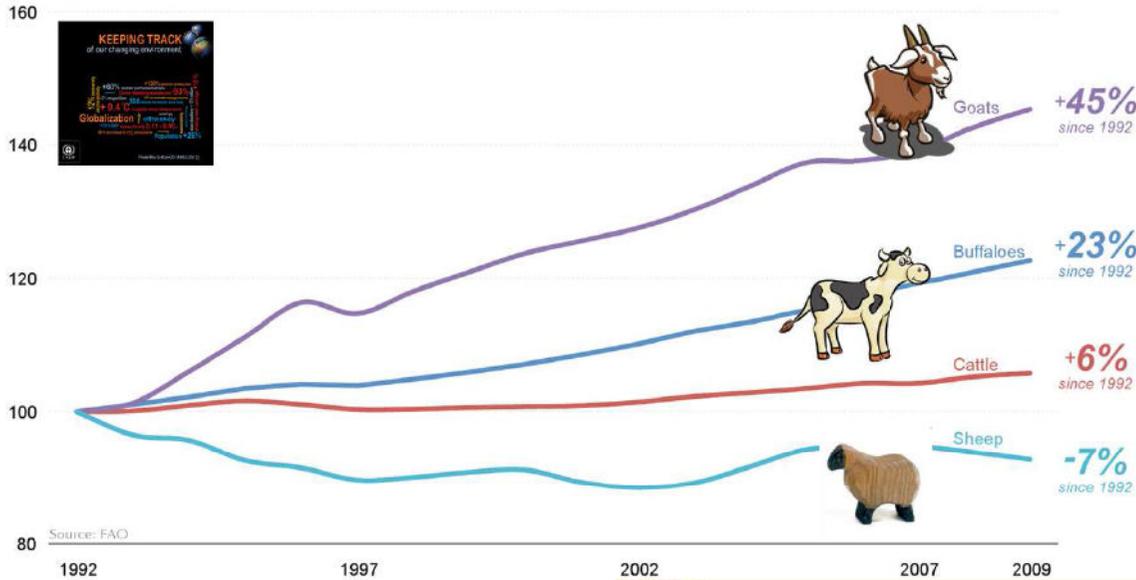
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# GLOBAL Trend of leather trade



Index, 1992=100

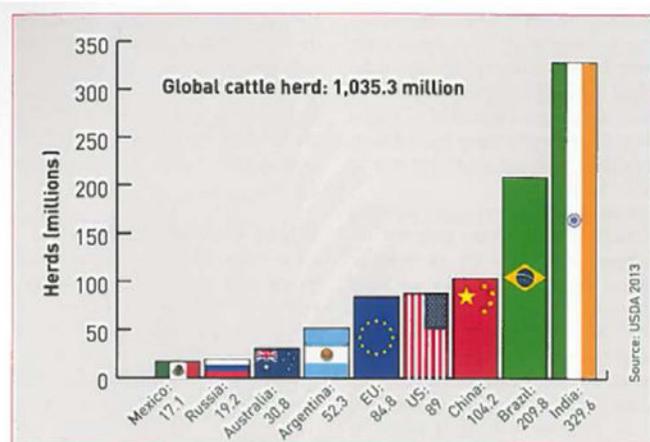


Figures suggested from meat industry  
**240 million cattle hides/year**  
**540 million sheepskins/year**  
**425 million goatskins/year**

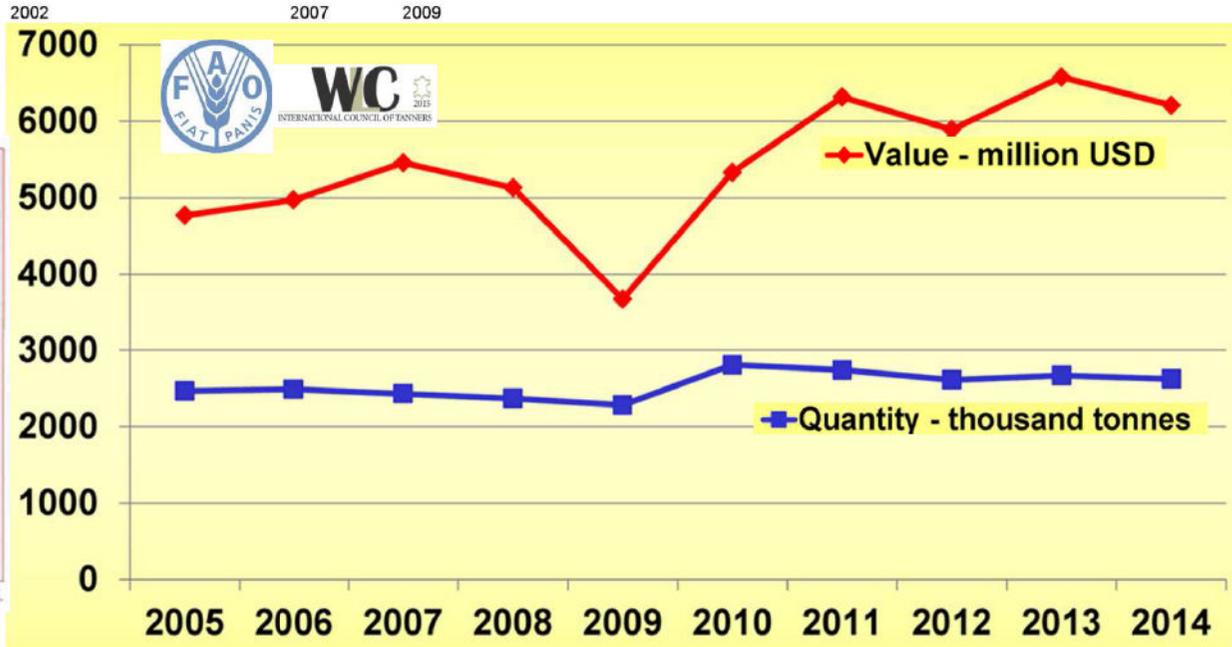
➤ *Transform it...*  
*in more attractive material*

☐ *Or ..*  
*how much is the cost to manage it?"*  
*World footwear July/August 2014*

Source: FAO



World footwear July/August 2014 Figure 1 - Cattle herds 2013.





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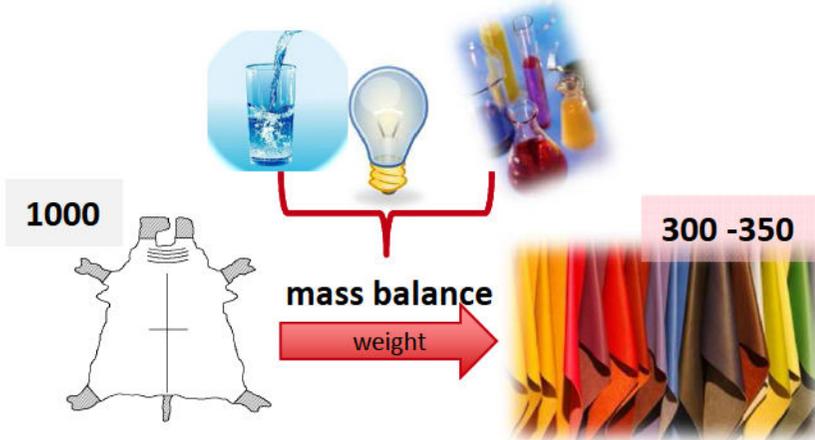
# Tannery Industry Considerations



raw hide represents something between **6-10%** (bovine) of the market value of an animal.

## Leather Industry impact:

- By-product from meat industry (gelatin, fertilizer, dog food ecc)
- Welfare for animal best raw material quality
- Valorization of waste converting hides and skins into...
- Best Available Technologies sustainable industry



30-40 m3 waste water  
 450-550 Kg solid waste  
 200 – 250 kg COD 80-100 kg BOD

## Good Manufacturing Practice (protocol)





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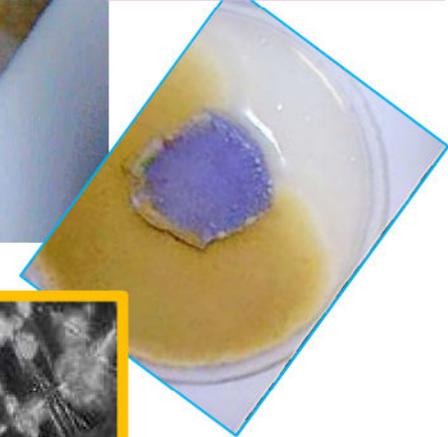
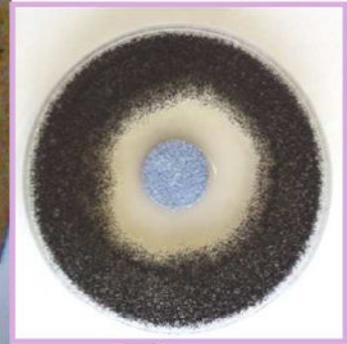
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# RAW HIDES

slaughtering



conservation





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# FROM HISTORY... TO THE FUTURE



Italy  
1950



## TECHNOLOGY and INNOVATION:

- Performance
- Reliability
- Sustainability



HOEPLI -1949 Dr A. GANSSE  
III edition





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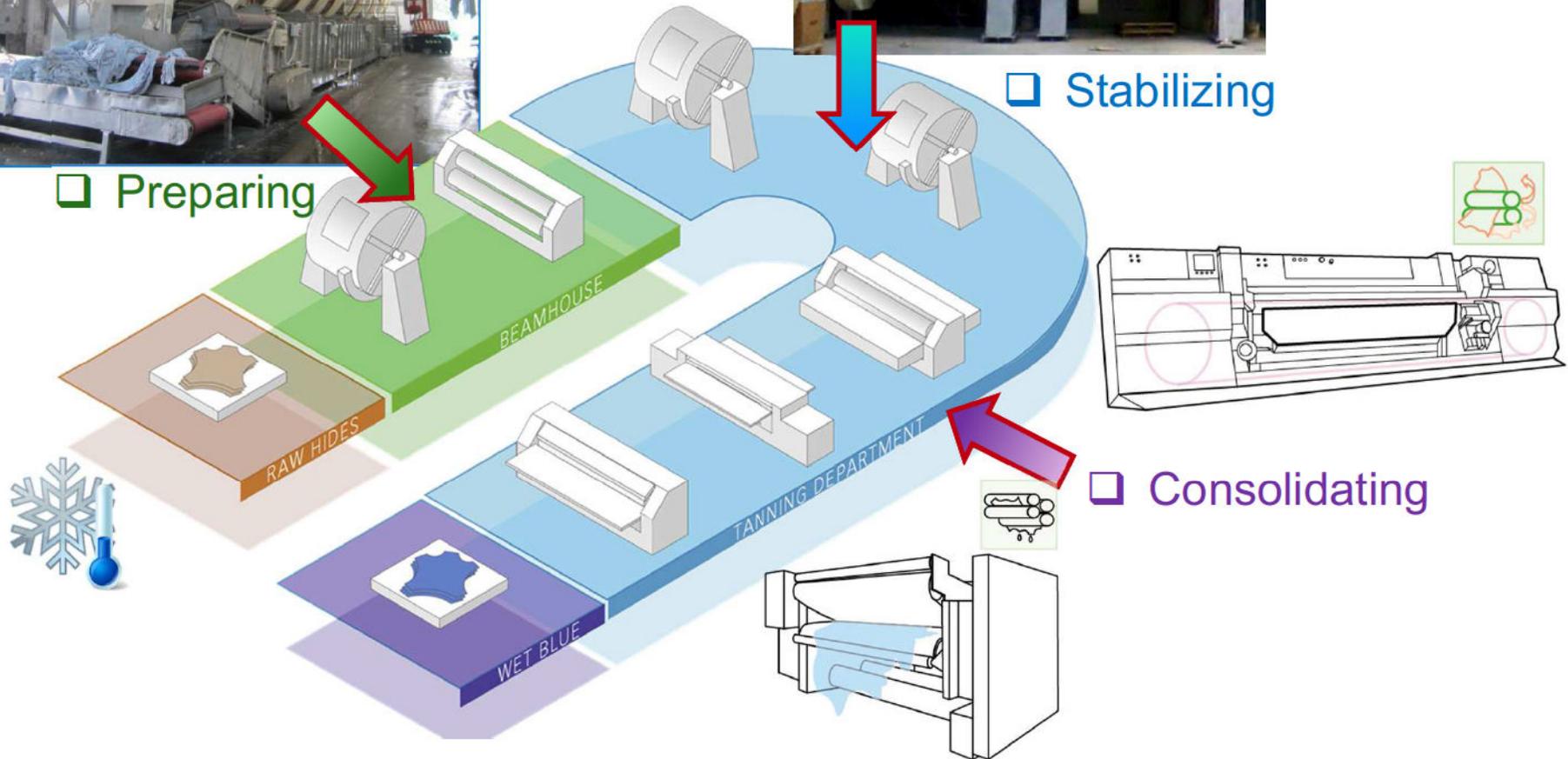
# BEAMHOUSE, Key points



Preparing



Stabilizing



# DRUM EVOLUTION

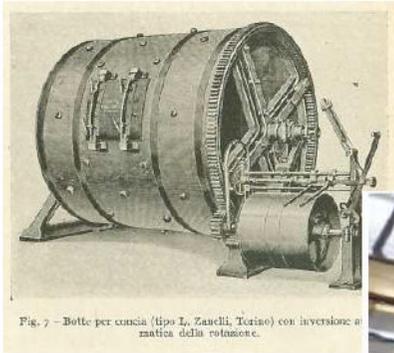


Fig. 7 - Botte per cuncia (tipo L. Zanelli, Torino) con inversione a matricia della rotazione.

**R...otating  
B...iochemical  
R...eactor**



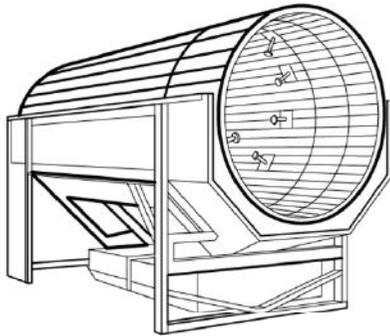
FEATURE	BENEFIT
<b>INVERTER</b>	<b>ENERGY ROTATION</b>
<b>MATERIAL</b>	<b>GEOMETRY SURFACE</b>
<b>CONTROL</b>	<b>PARAMETERS REPEATIBILITY</b>
<b>TOOLS</b>	<b>MIXING RECYCLING</b>



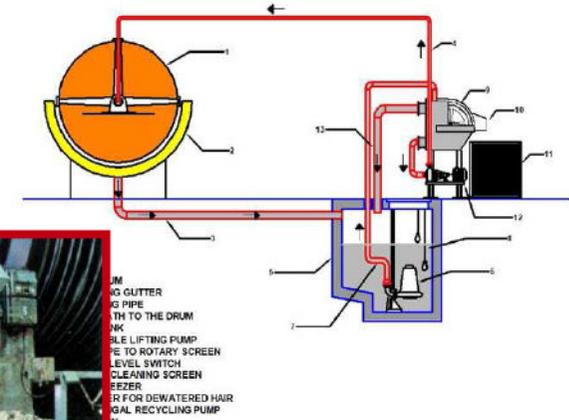
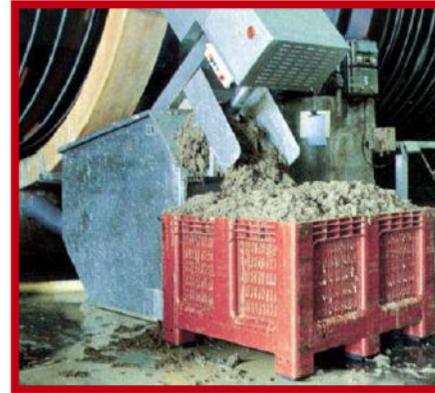
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# GUIDELINE IN BEAMHOSE

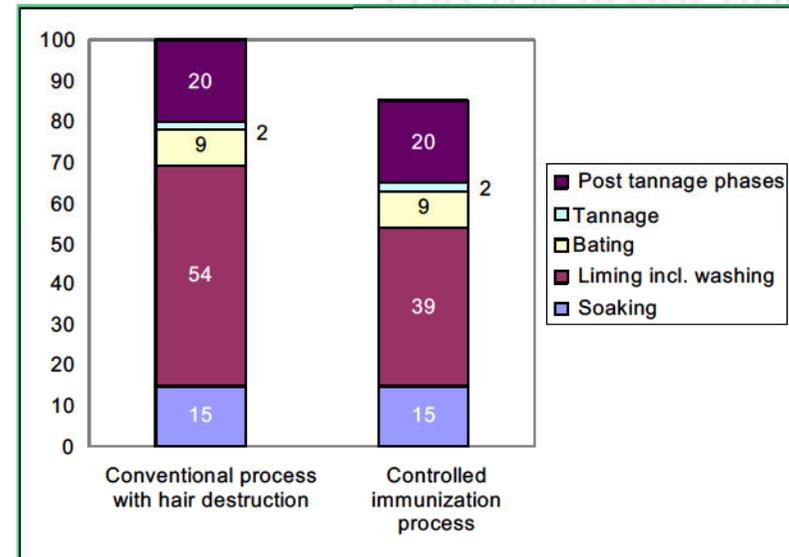
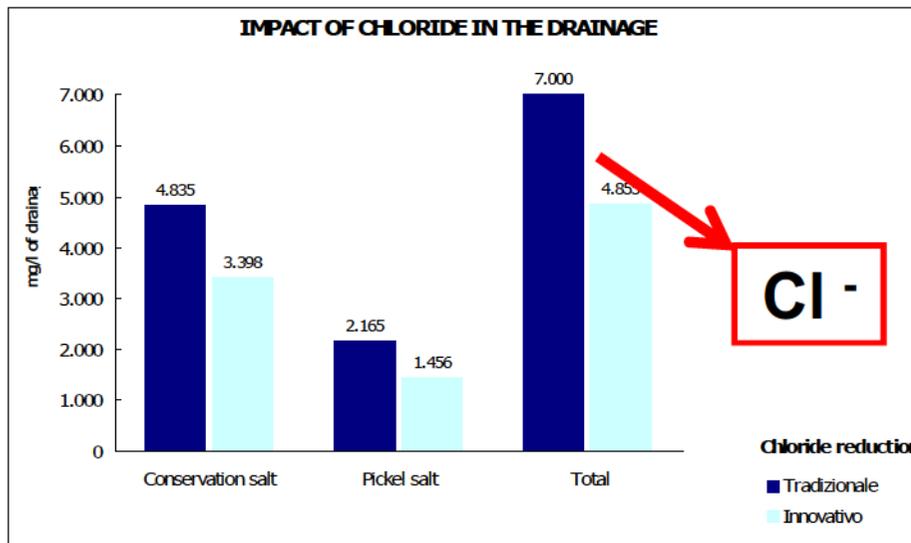
## Pretreatment



## Hair Recovery



### COD 15% REDUCTION





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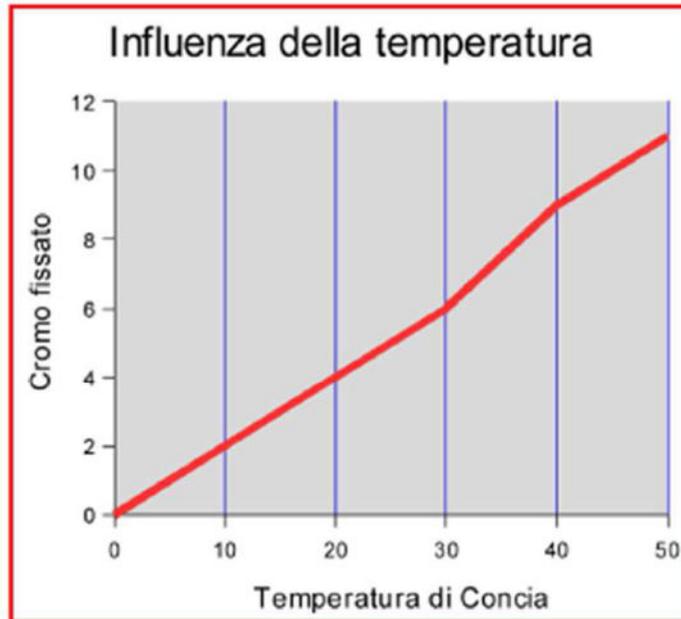
# CHROME GUIDELINE....MANAGEMENT

Cr

cluster

➤ **IN TANNERY** improve Cr fixation:

- Offered Cr (in Cr2O3)
- Length of the bath
- Final temperature of tanning
- Duration of tanning
- pH end tanning
- masking.



Total volume of Cr-effluents (m3/day)	80
Mean Cr III content (1) (g/L as Cr2O3)	3.25
Max. recoverable chrome (kg Cr2O3/year)	65,000
Plant working hours (2)	16 (one shift per day)
<b>Efficiency of recovery %</b>	<b>99 ca.</b>
Residual Cr III in the filtration waters (mg/L as Cr)	5-10



# SOLID WASTE IMPACT



**THICKNESS**  
case of study:



Speaking on bovine hides, the first *substance* (thickness) control point is after the lime splitting machine, where the hide tolerance is up to 0.4 mm. This difference which will be uniform later (shaving) on grain and on the split.

## SOLID WASTE IMPACT

N. Hides <i>daily production</i>	Economize <i>thickness</i>	Kg. Saving <i>per hide</i>	Tot. Kg. <i>per day</i>	Year <i>working days</i>	Tot Kg saved
2400	0,1 mm	1	2400	235	564.000



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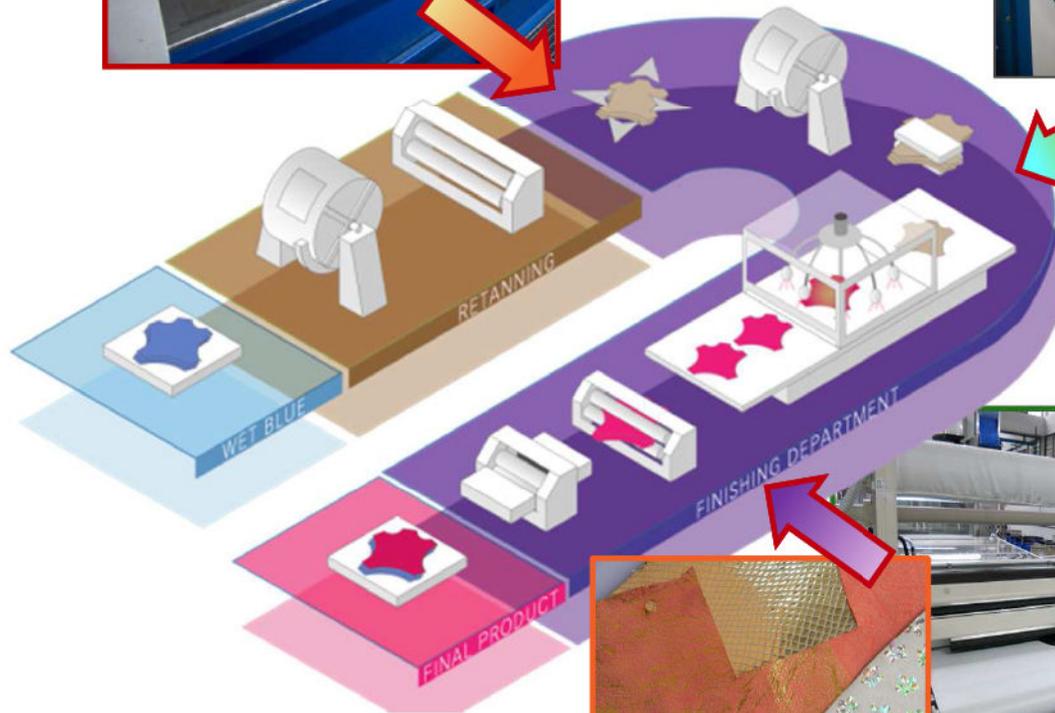
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# FINISHING, Key points

Drying



Coating



Layering





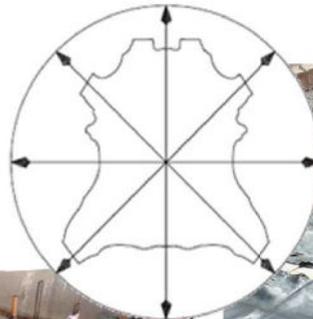
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# DRY Considerations



ATMOSPHERIC  
CONDITIONS





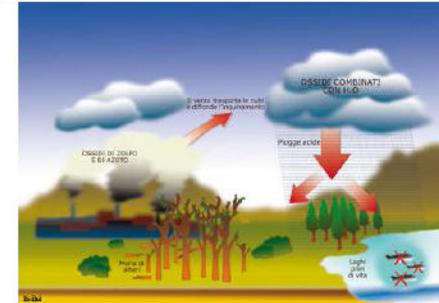
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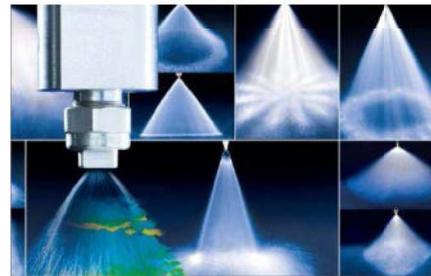
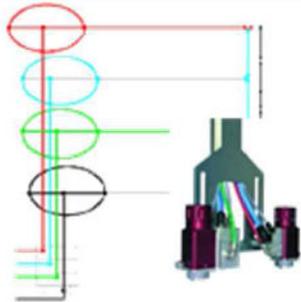
# ATMOSPHERIC Consideration



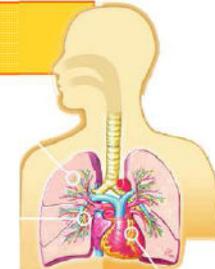
- ❖ FLEXIBILITY (white to black)
- ❖ UNIFORMITY ( coverage)



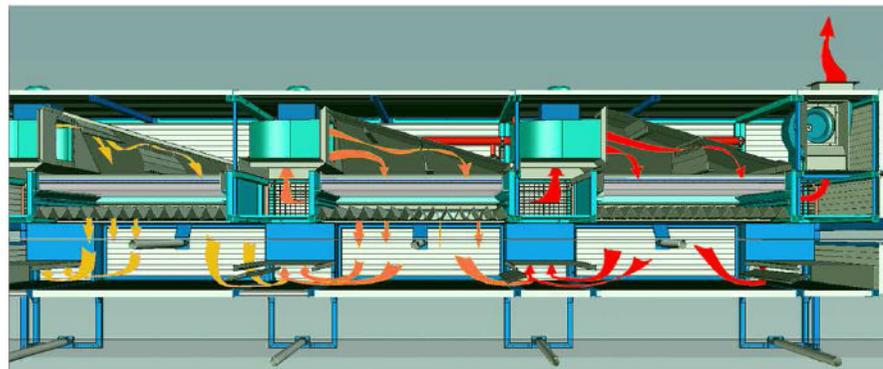
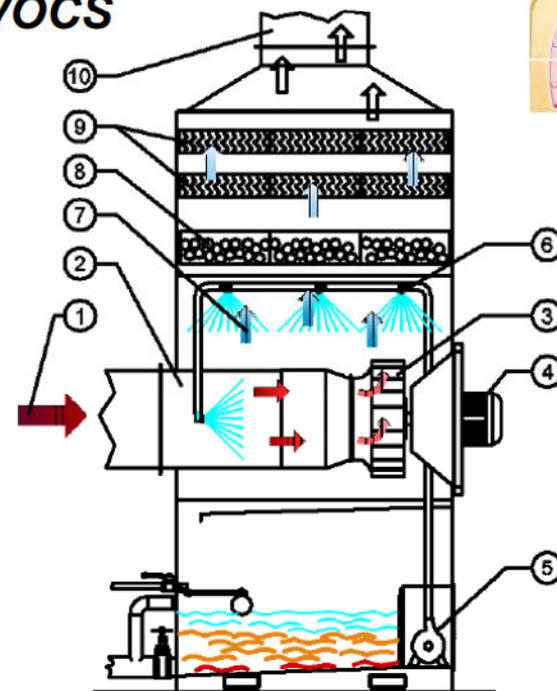
- ❖ CONSUMPTION (-15% up to 50%)
- ❖ AIR FLOW OPTIMIZATION



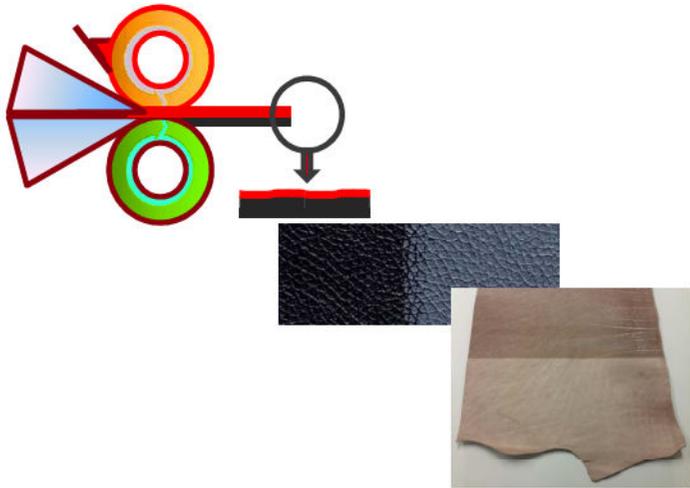
- ❖ EMISSION, control



## VOCS

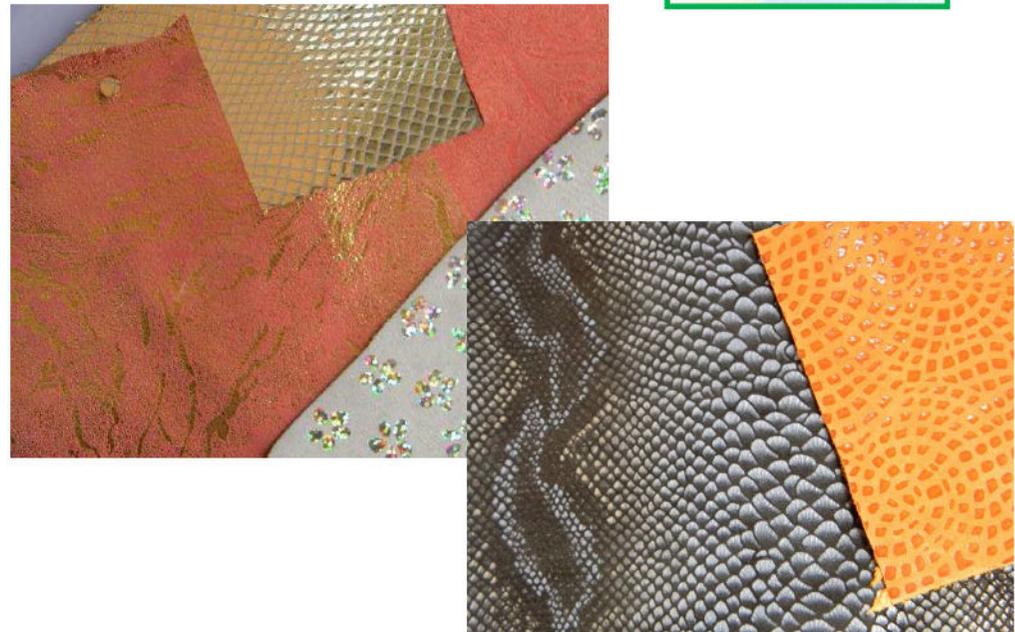
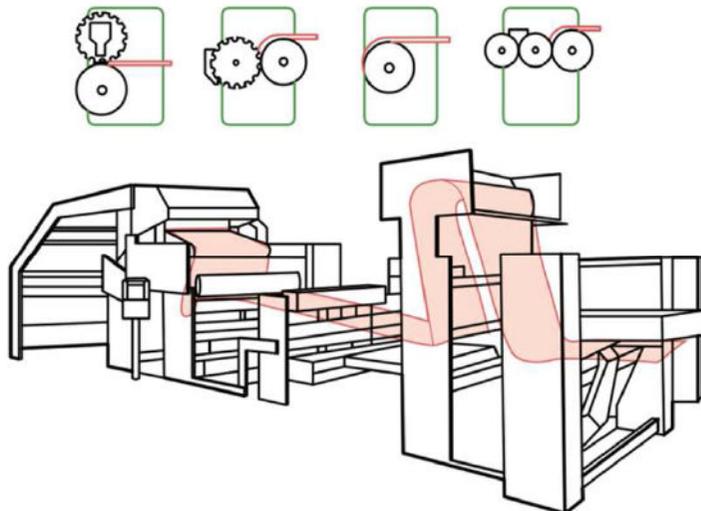


## LAYERING... FOR RECOVERY ...



**Lower consumption : 1.000.000 sq/ft finished leathers**

Reduction up to 21.000 Kg chemicals	- 50%
Reduction up to 5.980 kWh	- 80%
Reduction up to 31.400 lt. water	- 95%
Reduction up to 58.200.000 lt. of compressed air	- 95%
Reduction up to 21.000 Kg waste chemical	- 98%





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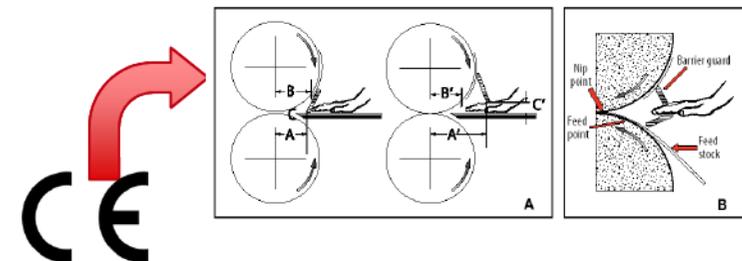
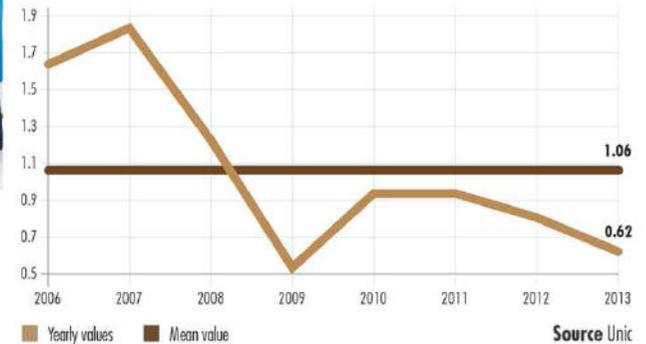
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# SAFETY CONDITIONS...LEATHER QUALITY!



Severity ratio (lost days/number of workers)  
2006-2013

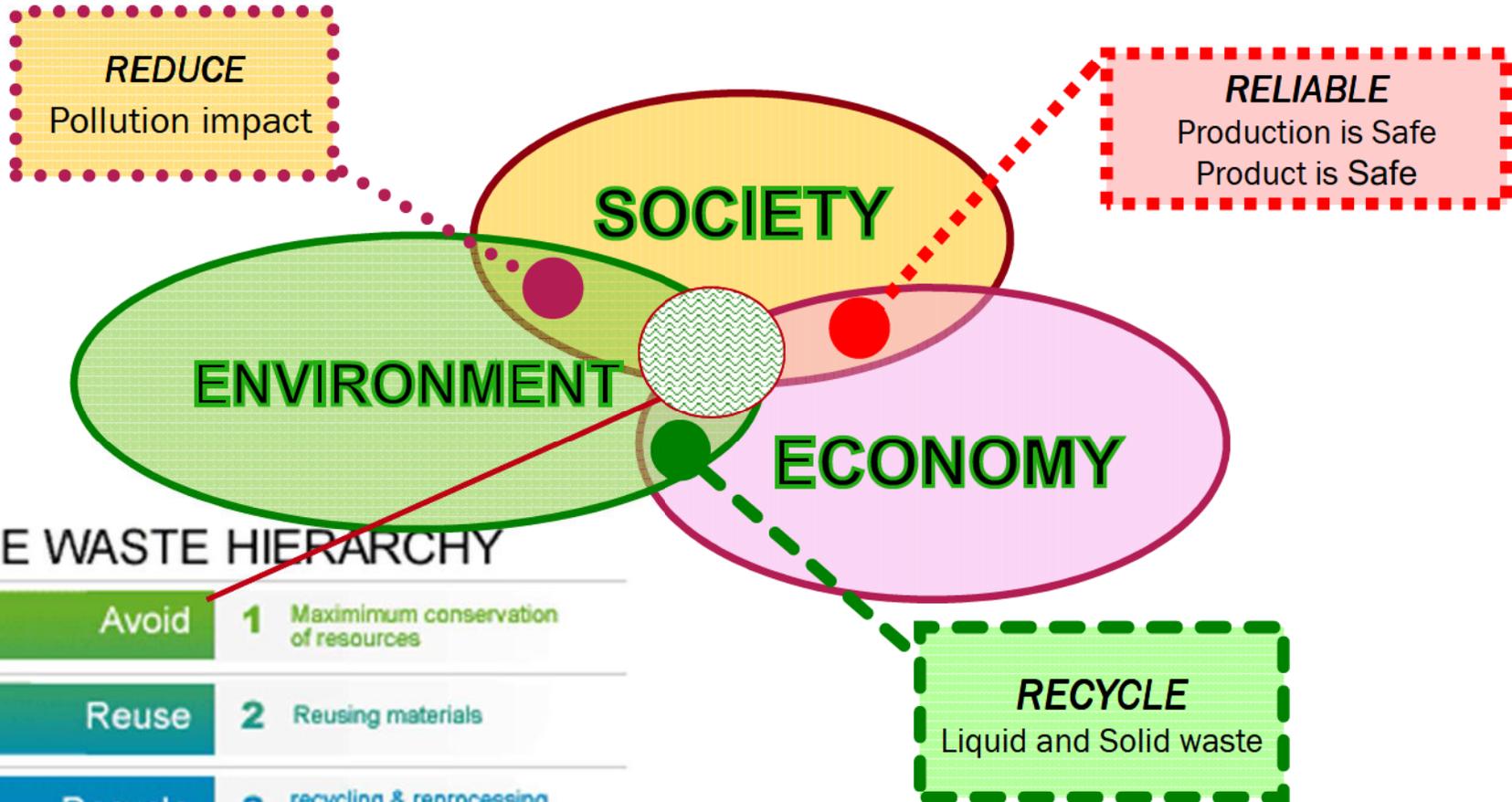
The incidence of injury statistics in the tanning industry shows a decreasing trend for the third consecutive year. This demonstrates the sensitivity of the companies of the leather sector regarding the importance of risk prevention in the workplace.



EN	Standard title
UNI EN 972	Reciprocating roller machines
UNI EN 13112	Bandknife shearing machines
UNI EN 1035	Moving platen machines
UNI EN 13113	Roller coating machines
UNI EN 13114	Rotating process vessels



# SUSTAINABILITY

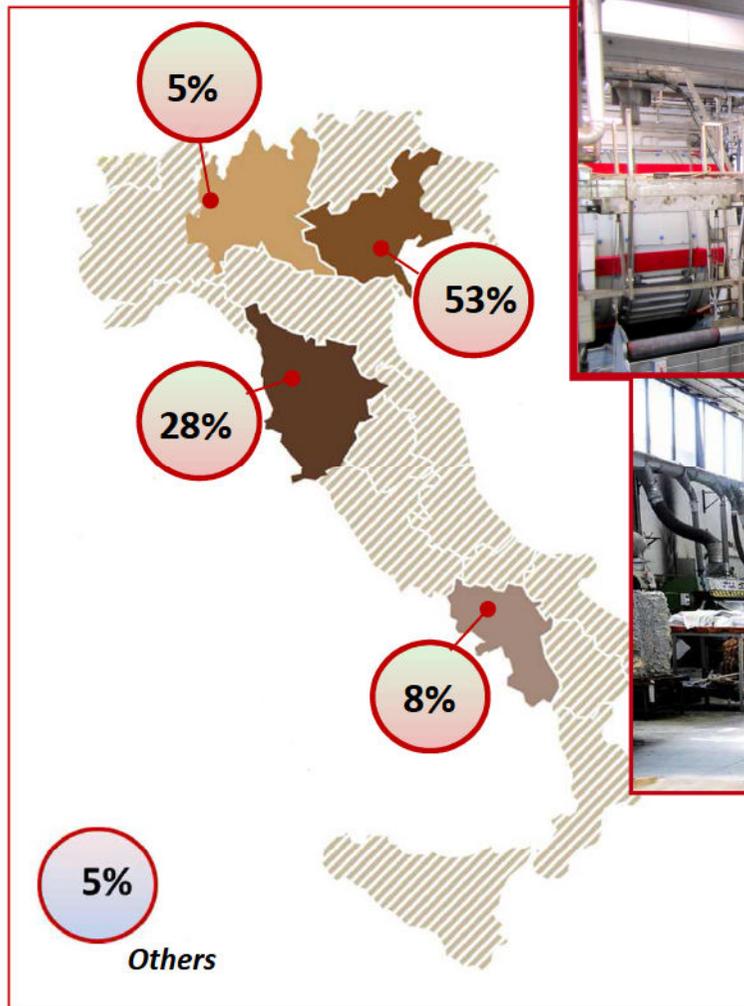


## THE WASTE HIERARCHY



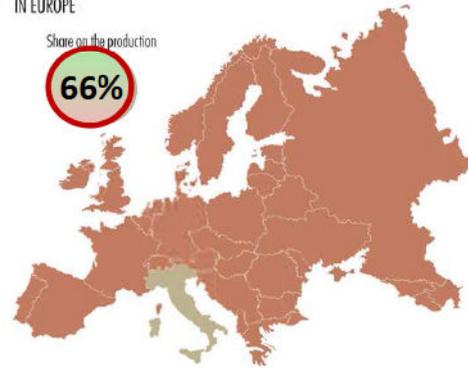
# CLEAN OR CLEANER...

# Italian Tannery Industry



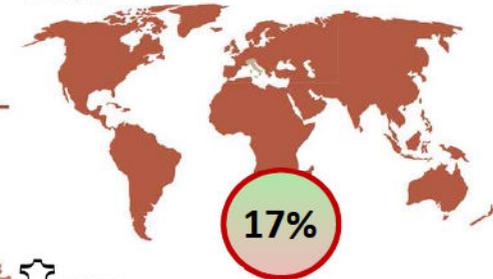
COMPANIES	1260
emploies	18000
sqm leather	127 millions
sqm sole leather	32 th. tons
revenues	5.3 billions €
Export 121 countries	4.1 billions € (75% of turnover)

IN EUROPE



**WC**  
INTERNATIONAL COUNCIL OF TANNERS

IN THE WORLD



2014  
UNIC Sustainability Report



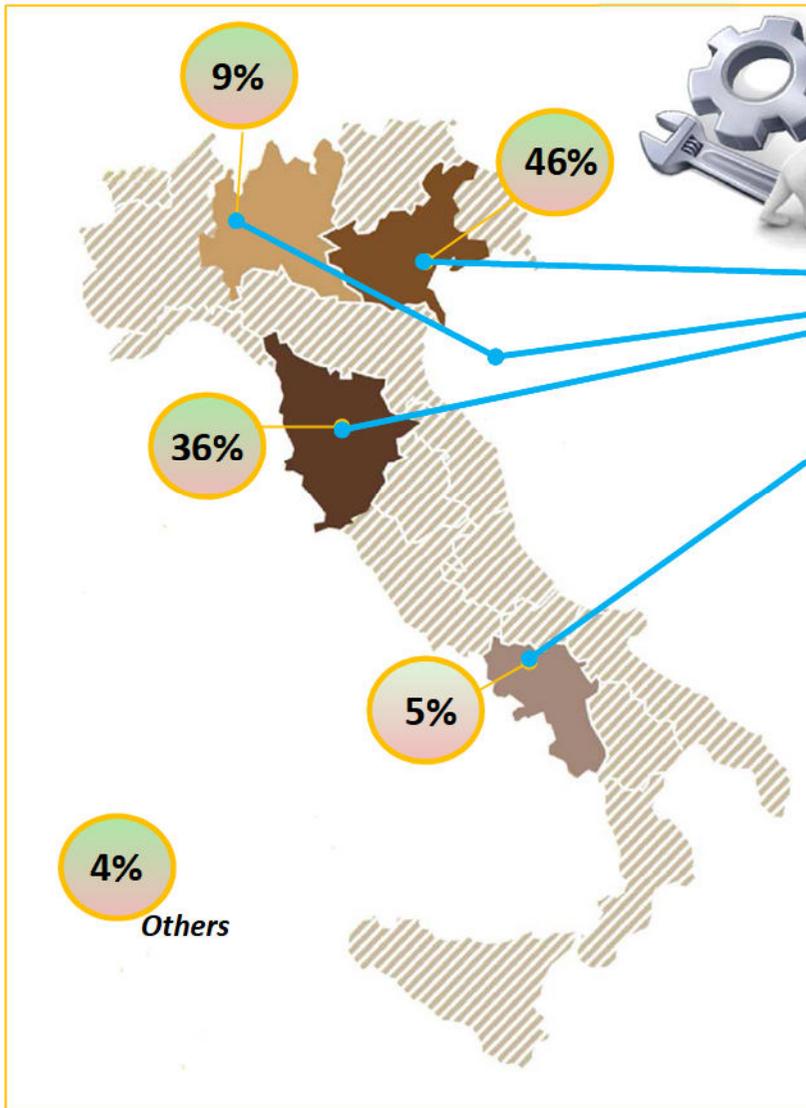
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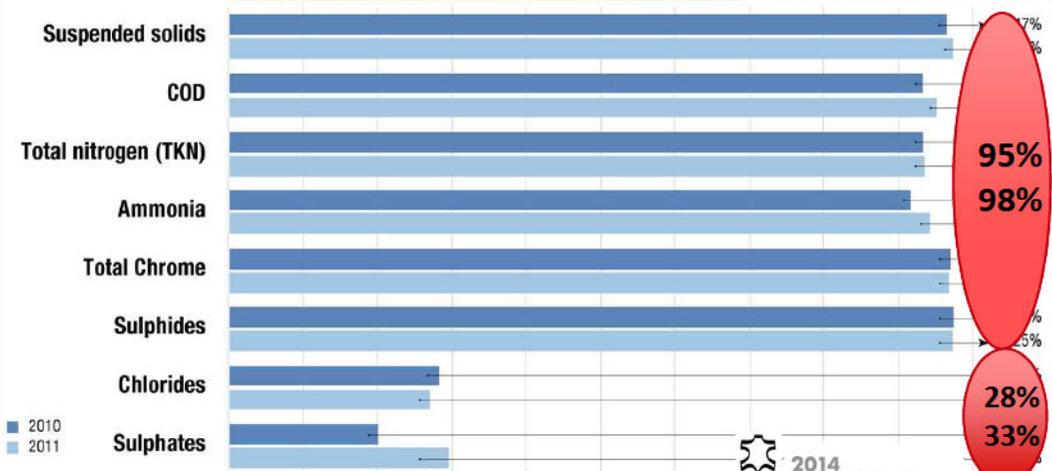
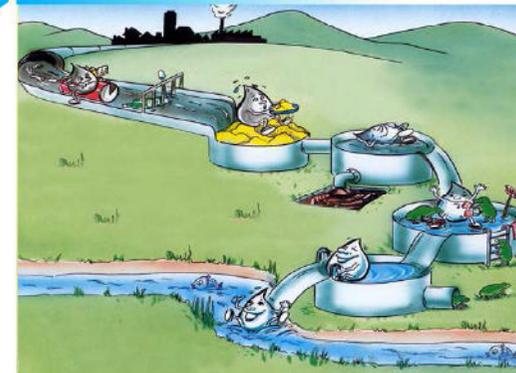
# Italian Tannery Contest



Tannery Supplier

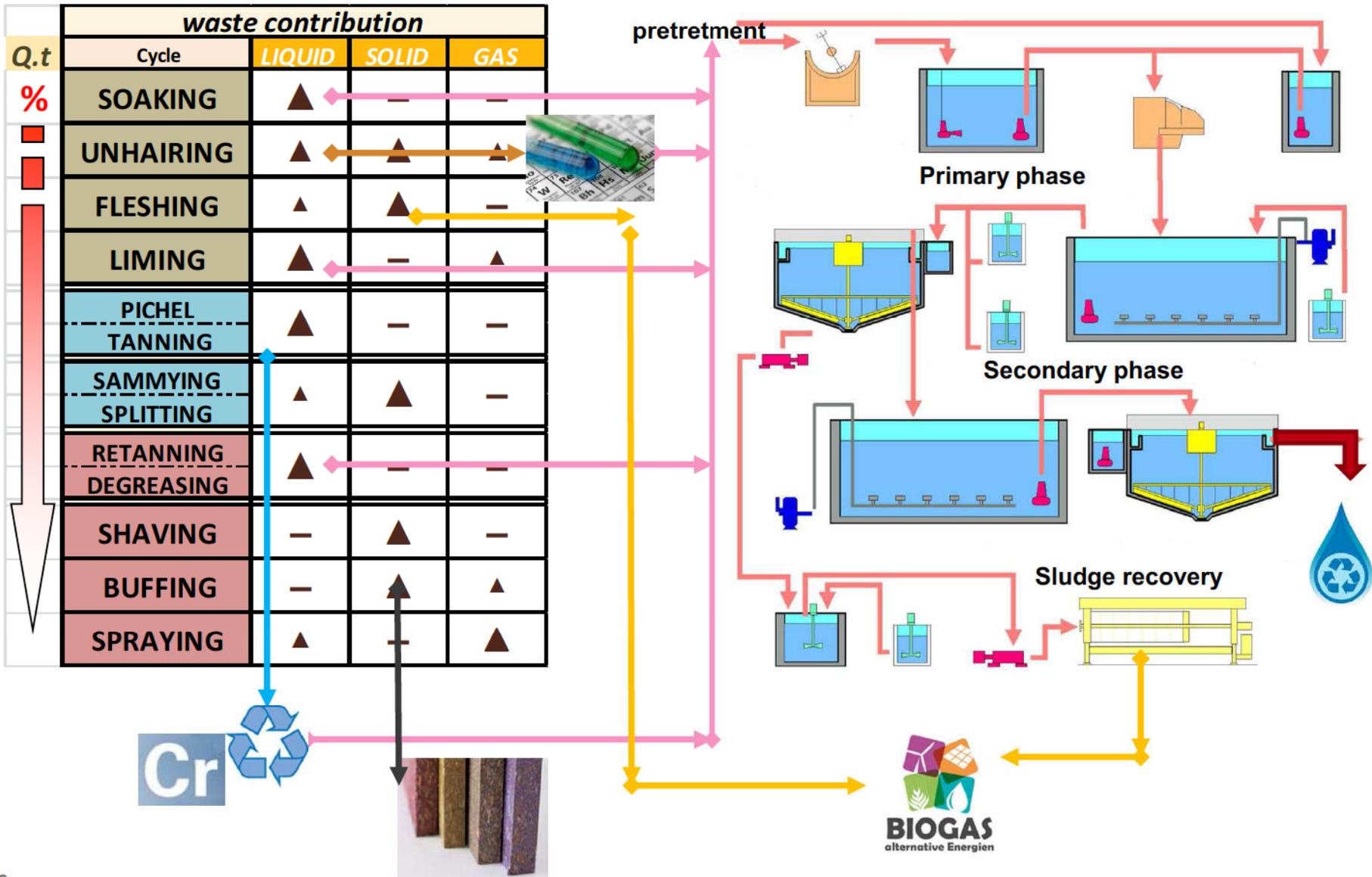


## Tannery Waste Management



UNIC 2014 Sustainability Report

*Upstream ...provide a good "SELECTION" for ensuring effective waste management ...Downstream*



## CASE OF STUDY



### ETP ARZIGNANO LEATHER CLUSTER

**136** Connected Companies  
94% tannery  
6% others

**POTENZIALITA**  
Linea industriale: 1.500.000 a.e.  
Linea Civile: 40.000 a.e.

**Portata reflui industriali trattati: 30.000 m3/d**  
**Portata reflui civili trattati: 10-15.000 m3/d**  
**Superficie coperta: 155.000 m2**  
**Potenza necessaria 7.000 kW**  
**Addetti dedicati all'esercizio 60**

- ✓ **WATER CONSUMPTION**
- ✓ **WATER RECYCLING**





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# SOLID WASTE ...

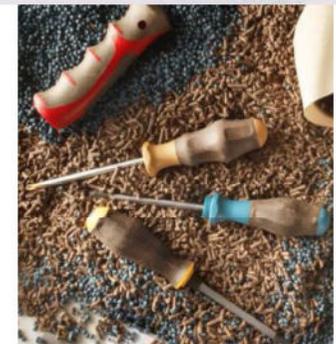
## Fertilizer



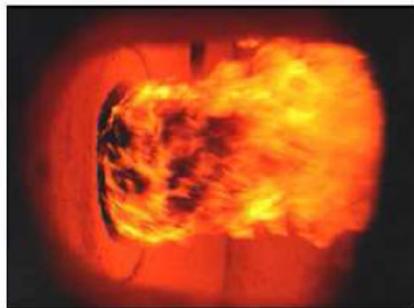
<http://www.ilsagroup.com>



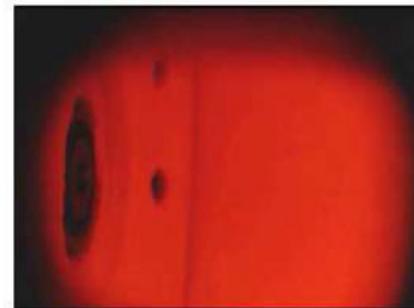
## Extrusions



<http://www.bader-leather.de>



Flame Combustion



Flameless Combustion

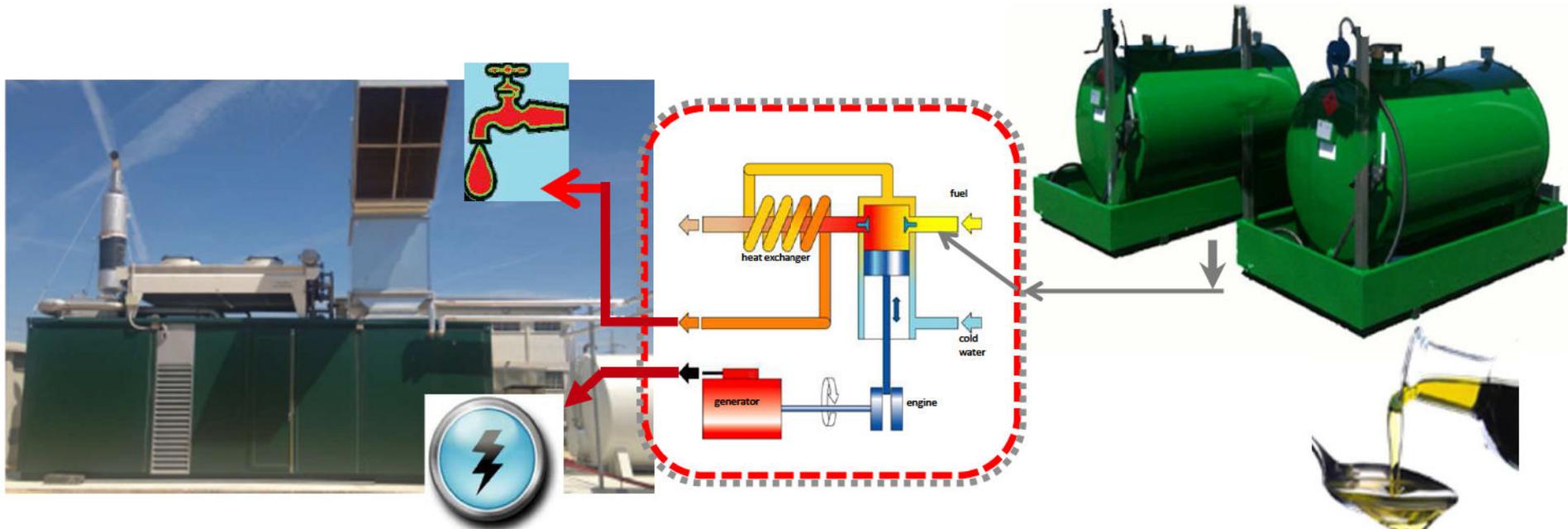
ON-FIELD,  
*some interesting results  
combustion without oxygen  
pyrolysis or  
gasification*



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# COGENERATION ...



<b>Electric Power generation</b>	<b>200 kWe</b>	<b>340 V 50Hz</b>
<b>Thermic Power generation</b>	210 kWt	
<b>Operation</b>	7000 h/year	
<b>Fuel consumption</b>	250 g/kWh	Fat or Veg. oil
<b>Process efficiency</b>	0,94	
<b>The system can be scaled up to 1 MW</b>		

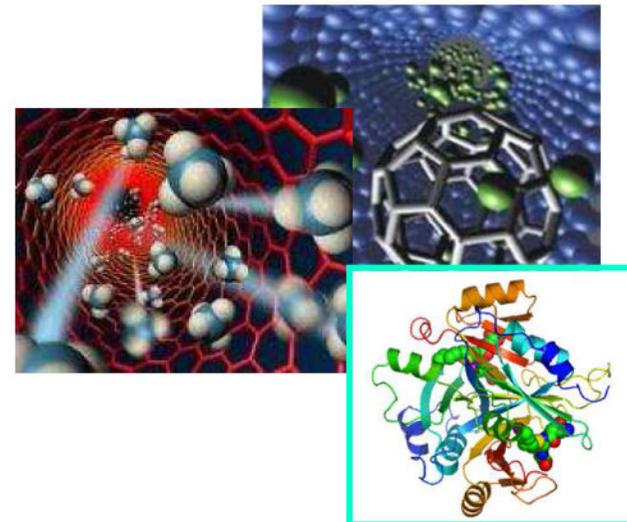


❖ Enhance process profitability



❖ Minimize wasting products

❖ Explore greener process





**B01.07 - Numeric control dieless cutting systems**

Cutting system for leather, fabrics and synthetic materials in rolls or sheets by means of oscillating knife, said vibrating blade, mounted on a movable head by means of a bridge arm. The cutting profile is determined from information transmitted by a vector data-file and projected directly onto the work plan for the optimal placement of shapes. Suction and blockage system of the material, head and multi tool system of automatic nesting complement the machine functions. Versions suitable for modeling, small and large productions..



Translate in: العربية, 简体中文, English, Français, Deutsch, Italiano, فارسی, Português, Русский, Español, Türkçe

Manufacturers

**A08.01 - Testing Drums**

Laboratory experimental drum. Pilote system that replicate the production conditions on laboratory scale and helps to design and make new leather application and products.



Translate in: العربية, 简体中文, English, Français, Deutsch, Italiano, فارسی, Português, Русский, Español, Türkçe

Manufacturers



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# PUBLICATIONS



#### 4. SHOE-BOTTOM LASTING AND PROCESSING



ASSOMAC INNOVATION NOTEBOOKS 

#### 3. THE DRUM



THE TANNING ENGINEERING NOTEBOOKS 

#### 1. THE LAST



ASSOMAC INNOVATION NOTEBOOKS 



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# REVIEW OF THE "INNOVATIONS" EXPOSED IN THE FAIR

# SEE YOU

at SIMAC TANNING TECH

23. 2016  
24. February  
25. MILAN-ITALY



www.simactanningtech.it

Pav. 18 and 14

fieramilano



## GUIDA VISITATORE VISITOR'S GUIDE

SALONI INTERNAZIONALI DELLE MACCHINE E DELLE TECNOLOGIE PER LE INDUSTRIE CALZATURIERA, PELLETTERIA E CONCIARIA  
INTERNATIONAL EXHIBITIONS OF MACHINES AND TECHNOLOGIES FOR FOOTWEAR, LEATHERGOODS AND TANNING INDUSTRY



## NOVITÀ TECNOLOGICHE TECHNOLOGICAL NEWS

RASSEGNA DELLE "INNOVAZIONI" ESPOSTE IN FIERA  
REVIEW OF THE "INNOVATIONS" EXPOSED IN THE FAIR



SEMINARIO INTERNACIONAL  
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**THANKS FOR YOUR ATTENTION**

---

**Roberto Vago**

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