



10-015 Psyr-FO_it

SCHEDA PROGETTO

Codice	10-015	Formazione
Titolo	Corso di formazione per manager e operatori della Conceria della Siria	
Data inizio	Ottobre o 2010	
Data fine	Ottobre 2010	
Area Geografica coinvolta	Medio Oriente	
Paese coinvolto	Siria	
Area-Località di svolgimento	<i>Tanning Tech</i>	
Settore	Conceria	
Tipo di Progetto	Formazione durante gli eventi Simac e Tanning Tech	
Idea Progetto	E' stato realizzato dal PISIE in collaborazione con ICE e Assomac, un corso per imprenditori della Siria del settore della conceria. Il programma delle lezioni che ha avuto una durata di quattro giorni è stato principalmente incentrato sulla presentazione degli ultimissimi aggiornamenti in fatto di tecnologia del comparto attraverso la visita alla Fiera TANNING-TECH a Bologna.	
Obiettivi generali	Il corso è stato attuato per permettere a delegati siriani del settore della conceria di avere una migliore conoscenza della realtà del cluster italiano e quindi di acquisire nuove conoscenze per migliorare le produzioni di tutto il comparto locale.	
Obiettivi specifici	Trasferimento di know how e illustrazione delle novità presenti in fiera	
Tipo di attività svolte	<ol style="list-style-type: none"> 1) Visita ad imprese 2) Corso sugli aspetti chimici del ciclo conciario 3) Seminario sugli aspetti meccanici della produzione conciaria. 4) Corso sugli aspetti ambientali del settore conciario e seminario relativo al problema della etichettatura ecologica europea dei prodotti in pelle e della calzatura 	
Valore del progetto	€11.000,00	
Finanziatori	MSE, ICE, ASSOMAC	
Esecutori	PISIE	
Partner	ASSOMAC	
Beneficiari	Imprenditori siriani della concia	
Risorse umane	5 esperti per la formazione e per l'organizzazione	



Corso di formazione per manager e operatori della Conceria della Siria

(Progetto PISIE 10-015)

Relazione Finale

Santa Croce sull'Arno – Bologna

10 - 15 ottobre 2010

Sommario

Corso di formazione per manager e operatori della Conceria della Siria

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Corso di formazione per manager e operatori della Conceria della Siria 10 - 15 ottobre 2010 (Progetto PISIE 10-015)

E' stato realizzato dal PISIE in collaborazione con ICE e Assomac, un corso per imprenditori della Siria del settore della conceria. Il programma delle lezioni che ha avuto una durata di quattro giorni è stato principalmente incentrato sulla presentazione degli ultimissimi aggiornamenti in fatto di tecnologia del comparto attraverso la visita alla Fiera TANNING-TECH a Bologna.

1. Origine

Il gruppo di rappresentanti delle Aziende della Siria è stato selezionato dall'ICE, attraverso questionari rivolti alle aziende interessate a partecipare a questo corso formativo. Alla fine della Si tratta di 7 operatori.

2. Obiettivi

Il corso è stato attuato per permettere a delegati siriani del settore della conceria di avere una migliore conoscenza della realtà del cluster italiano e quindi di acquisire nuove conoscenze per migliorare le produzioni di tutto il comparto locale.

3. Attività

La delegazione arrivata domenica 10 ottobre a Bologna e si è trasferita presso un Hotel della città.

Il corso è iniziato il giorno successivo secondo il seguente programma:

- Lunedì 11/10 trasferimento in pullman al distretto conciario di Santa Croce sull'Arno, dove i corsisti sono stati accolti da operatori locali. La giornata è stata interamente dedicata a visite presso importanti società rappresentanti costruttori di macchine per conceria, produttori di prodotti chimici conciari, concerie e lavorazioni conto terzi per il settore conciario.
- Martedì 12/10 si è svolto, presso la Fiera Tanning-Tech a Bologna, il primo seminario tenuto dal dott. Roberto Vago relativamente agli aspetti chimici del ciclo conciario. Si è quindi effettuata la visita presso gli stand della manifestazione fieristica con particolare attenzione ai produttori di prodotti chimici.



Presentazione delle delegazioni ICE in fiera

- Mercoledì 13/10 si è svolto, sempre presso Tanning-Tech, il secondo seminario tenuto dall'ing. Andrea Favazzi relativamente agli aspetti meccanici della produzione conciaria. Durante la giornata sono state effettuate le visite presso gli stand dei produttori di macchine con particolare attenzione alle tecnologie individuate dai corsisti.
- Giovedì 14/10 si sono tenuti, sempre presso Tanning-Tech, il terzo seminario da parte del dott. Simone Galluzzi sugli aspetti ambientali del settore conciario e il seminario relativo al problema della etichettatura ecologica europea dei prodotti in pelle e della calzatura. A fine corso sono stati consegnati ai partecipanti i diplomi alla presenza delle autorità coinvolte nell'organizzazione dell'iniziativa.



Alcuni stand della fiera Tanning-Tech

Con la giornata di venerdì 15 ottobre i delegati, a conclusione dell'iniziativa programmata, hanno potuto riprendere la propria attività ordinaria.

4. Valutazioni e considerazioni finali sul corso

Il gruppo di operatori siriani del settore conciario invitati dall'ICE per il corso di aggiornamento sull'innovazione tecnologica e le strategie di management ha partecipato con interesse ai seminari programmati interpellando gli esperti coinvolti sulle proprie problematiche e instaurando un dialogo attivo e costruttivo volto a trovare soluzioni per risolvere la crisi internazionale che ha colpito il mercato mondiale.

Molti di loro si sono mostrati sensibili all'acquisto di nuovi macchinari e tecnologie per l'ammodernamento del parco macchine esistente attualmente al fine di sostenere un miglioramento qualitativo della produzione.

E' altresì stata sottolineata la difficoltà di fare ricorso al credito per poter acquisire tecnologia, soprattutto in relazione al recente trasferimento delle aziende conciarie siriane in strutture più ampie all'interno del nuovo distretto industriale.

5. Follow-up

Il corso ha evidenziato una buona conoscenza delle problematiche tecniche da parte degli operatori. Parallelamente si è notata una debolezza per quello che riguarda l'orientamento e l'approccio a rispondere alle esigenze del mercato internazionale.

Abituati a lavorare in assenza di precisi ordini dai parte dei clienti, i managers siriani trovano difficoltà ad orientarsi con propri marchi, collezioni e prodotti fashion.

Sia in fiera che in fase di visite aziendali si è cercato di dare il maggior rilievo possibile alle spiegazioni su tali tematiche, focalizzando poi il discorso sull'aspetto maggiormente strategico: l'internazionalizzazione delle produzioni.

Potrebbero essere studiate iniziative da poter svolgere il loco, sia dal punto dell'assistenza tecnica che dal punto di vista della formazione, con trasferimento di know-how e tecnologia, mettendo l'accento sulla necessità di un contatto costante con le industrie italiane produttrici di macchine e prodotti chimici.

Allegato 2 - Elenco dei Partecipanti

Name	Company	City	email
DENNO ABDOLMALEK	Denno Brothers	Damascus	adama.co@hotmail.com
AHMAD ALJAZMATI	Alamira Tannery	Damascus	MJqzmaty@net.sy
BASHAR ABID ALAAL	Abid Alaal	Damascus	
BILAL AYOUB	Ayoub Trading Company	Damascus	aypbros@hotmail.com
ISSAM IBRAHIM	Queen Leather	Damascus	
MHD BASHAR HALLAK	Hallak	Damascus	
MOHAMAD JALANBO HAISAM	Almah Company	Damascus	Haitham- Jalanbo@hotmail.com

Allegato 3 – Fac-simile Certificato

 Italian Institute for Foreign Trade	 National Association of Italian Manufacturers of Footwear,Leathergoods and Tannery Machines and Accessories	
 PISIE		
<h1>CERTIFICATE</h1>		
We attest that		
<i>Name</i>		
Has participated in the course for		
MANAGERS OF TANNERIES INDUSTRIES OF SYRIA		
Organized by		
I.C.E.	P.I.S.I.E.	ASSOMAC
11 - 14 October 2010 in Bologna and Santa Croce sull'Arno ITALIA		
I.C.E. Riccardo Zucconi	P.I.S.I.E. Carlo Milone	ASSOMAC Mario Pucci

Allegato 4 - Materiale didattico consegnato

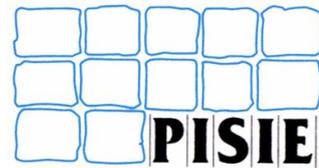
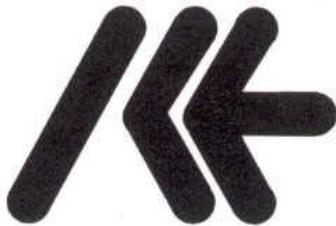
Dispense :

- “Leather Chemical Options” (R. Vago)
- “Eco Label Footwear” (C. Milone)
- “Tanning Technology” (A. Favazzi)
- “Tanning Wastes” (S. Galluzzi)

**TRAINING COURSE FOR
TANNING MANAGERS AND ENTREPRENEURS
FROM SYRIA**

10 - 15 October 2010

Project PISIE n. 10-015



POLITECNICO INTERNAZIONALE PER LO
SVILUPPO INDUSTRIALE ED ECONOMICO

Workshop on “Leather Chemical Options”
(R. Vago)

TANNING CHEMICAL ISSUES

INTRODUCTION

This contains the contribution of individual Italian companies with technological innovation of the tanning process.

The issues are divided according to the same arguments presented in the summary above.

TOPICS

1. TECHNOLOGIES FROM RAW HIDES TO PICKEL

2. TECHNOLOGIES FROM PICKEL TO WET-BLUE

3. TECHNOLOGIES FROM WET-BLUE TO CRUST

4. TECHNOLOGIES FROM CRUST TO FINISHED

Cl⁻ SO₄²⁻ Reduction	1 TECHNOLOGIES FROM RAW HIDES TO PICKEL
Cr₂O₃ Reduction	2 TECHNOLOGIES FROM PICKEL TO WET-BLUE

ABSTRACT

GUIDELINES FOR AN ECOLOGIC BEAMHOUSE

- reduction of chloride in the waste water
- reduction of sulphate in the waste water
- reduction of tanning chrome in the waste waters

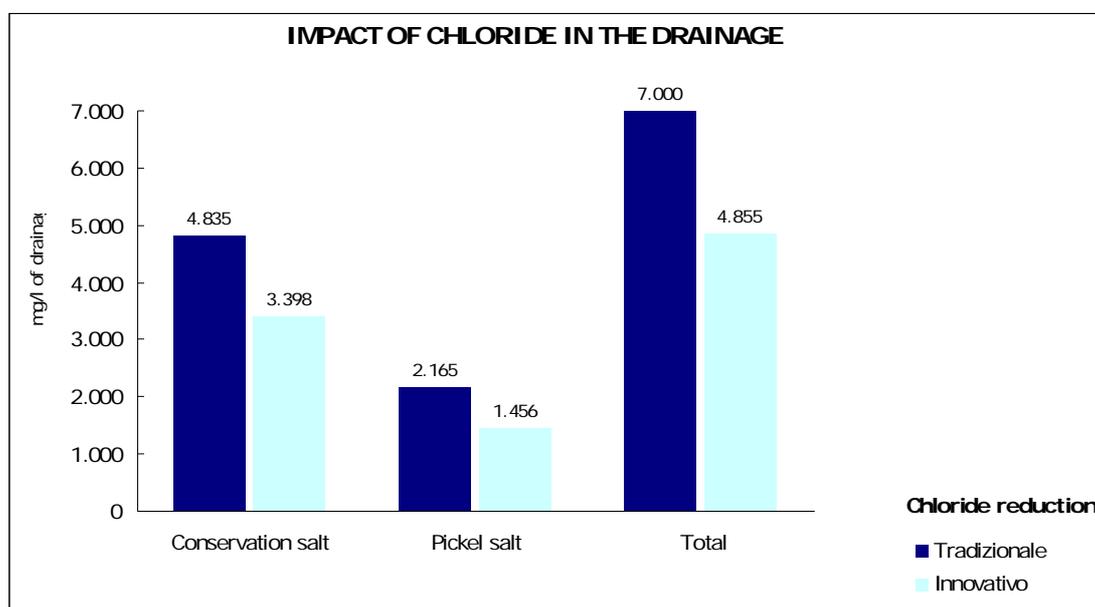
DESCRIPTION

Guidelines for a reduction of chloride in the waste water

The sodium chloride in tanning is basically used in the raw skins conservation process, and in the pickel stage, to inhibit the acid swelling.

The incidence of chloride in the environmental impact, relatively to the abovementioned processes, has a significantly different weight.

CHLORIDE ORIGINATING FROM PRESERVATION
 MECHANICAL DE-SALTING PROCESS
 UTILIZATION OF FRESH SKINS
 REDUCTION OF CHLORIDE USED IN PICKEL STAGE



Guidelines for the reduction of sulphate in the waste water

Most of sulphates in the waste water come from the delimiting , pickel and tanning process, and from the sulphide in the drainage of liming process, which becomes sulphate during the depuration phase. Less important contribution of sulphate, above all when in presence of the full cycle, are imputable to the dyes and the retanning agents.

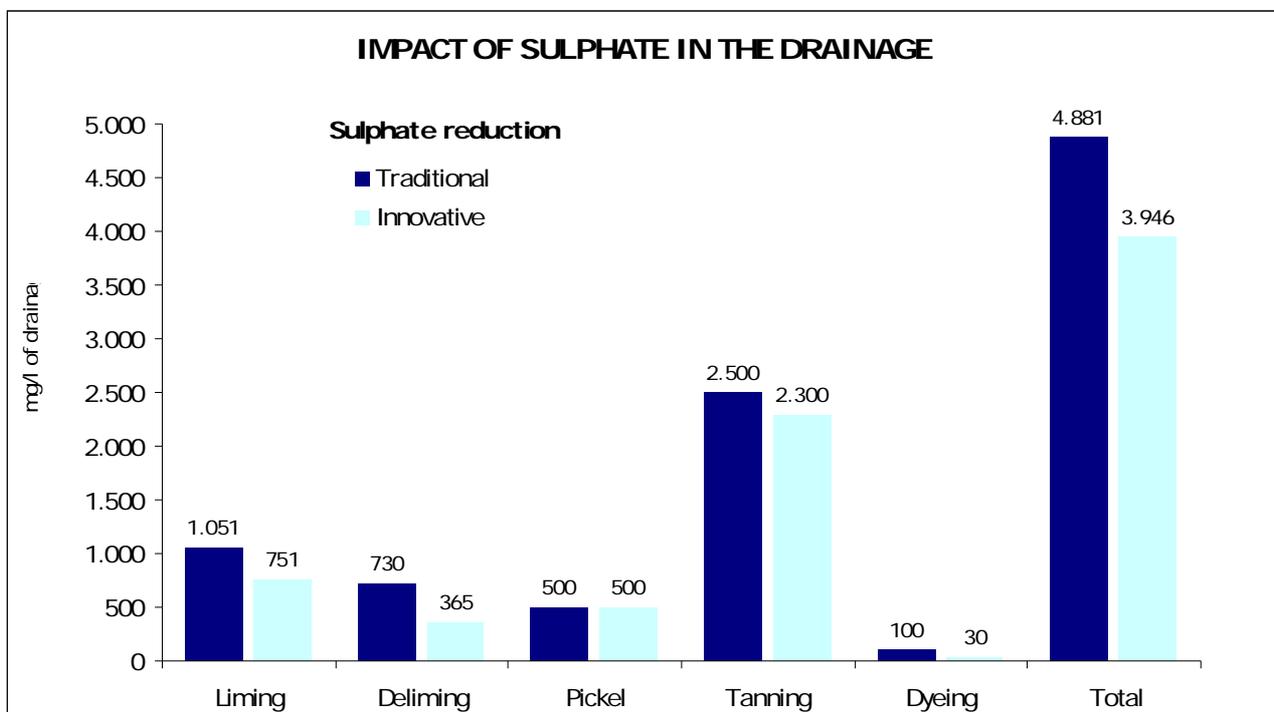
REDUCTION OF SULPHATE ORIGINATED FROM OXIDATION OF SULPHIDE

REDUCTION OF SULPHATE IN THE DELIMITING PROCESS

REDUCTION OF SULPHATE IN PICKEL

REDUCTION OF SULPHATE IN TANNING PROCESS

REDUCTION OF SULPHATE CREATED BY DYES AND RETANNING AGENTS



Guidelines for reduction of tanning chrome in the waste waters

The reduction of chrome content in the waste waters after tanning process can be prevalently done in two way:

- Recovery of chrome through precipitation with alkali and dissolution with sulphoric acid. The chrome properly reintegrated with fresh tanning agent is utilized in further chrome tannings
- Optimization of the chrome fixation efficiency on the leather and the exhaustion of the baths

RECOVERY OF CHROME

OPTIMIZATION OF CHROME FIXATION PERFORMANCE ON THE LEATHER

QUANTITY OF CHROME SALT (AS Cr2O3)

SIZE OF THE BATH

FINAL TANNING TEMPERATURE

DURATION OF TANNING PROCESS

pH AT TANNAGE END

MASKING EFFECT

PROCESSING WET-BLUE

For further information



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ABSTRACT

The leather industry, by its very nature, is a high human exposure industry that generates significant quantities of waste effluent. The long term survival of the leather industry is dependant upon maintaining a high quality product whilst being committed to reducing the environmental impact of the overall tanning process. A key part of the tanning process is the pretanning or tanning stages.

In order to improve the environmental image of tanning, high profile tanneries are keen to evaluate more environmentally friendly, less hazardous alternatives to existing process chemicals. For this reason, **Vandotan PH** tanning agent offers an exciting option for the leather industry, either as a standalone chrome free process or as an integral part of a low chrome process.

ENVIRONMENTAL BENEFITS TO THE LEATHER INDUSTRY

The use of **Vandotan PH** as primary tanning agent offers tanneries the combination of a versatile high performance tanning process with minimal environmental disturbances.

MINIMAL EFFLUENT CONCERNS

- ◆ **Vandotan PH** is readily biodegradable and doesn't bio-accumulate.
- ◆ **Vandotan PH** (based on THPS) is readily converted into the environmentally benign species THPO within the tannery drums. For most applications there will be no residual THPS left in the drums when the float is dropped.

RECYCLABLE SHAVINGS

- ◆ Unlike chrome shavings, **Vandotan PH** wet white shavings are biodegradable and can be easily disposed of at landfill sites.
- ◆ Wet white shavings are a freely available source of nitrogen and can be readily used as a supplementary, nitrogen rich fertiliser for a variety of composting applications.

REDUCED CONSUMPTION OF PROCESS CHEMICALS

- ◆ **Vandotan PH** exhibits a synergism with mineral and/or synthetic tannins, which can potentially result in a reduced requirement for such chemicals.
- ◆ **Vandotan PH** can, in certain processes (sheep/goat skins), be used without a pickling stage resulting in a reduction in the discharge of environmentally damaging pickling chemicals, such as salts and mineral acids which significantly contribute to effluent COD loadings.

CHROME EXHAUSTION

- ◆ **Vandotan PH** can be used to enhance the uptake of chrome based tanning agents and reduce the subsequent effluent loading.
- ◆ **Vandotan PH** can be used to eliminate problematic chrome (VI) from leather substrates.

PROCESS DESCRIPTION

INNOVATIVE TECHNOLOGY

Vandotan PH is an advanced tanning agent based upon the active ingredient THPS – Tetakis Hydroxymethyl Phosphonium Sulphate.

It's a total metal free product, easy to handle, with a very good penetration skill. The resulting tanned leathers show a very good lightfastness which lead to a milky colour wet white, able to be dyed by light shade dyestuffs, avoiding the undesirable yellowness of common wet white.

Other important fastnesses achieved in the automotive application are:

Light fastness, Heat fastness, Tear strength, Elongation, Breaking.

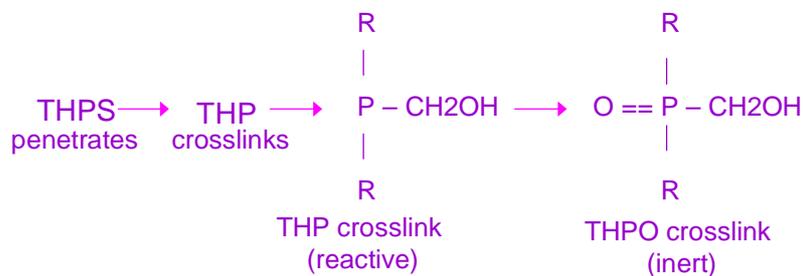
MECHANISM

Its tanning mechanism is allowed to penetrate into the pelt substrate in the unreactive form of THPS. Once the penetration is complete, THPS is converted into its active crosslinking form, usually by raising the pH of the system. The reactivity of **Vandotan PH** is dependant upon pH, concentration and temperature.

As shown in the below formulations:

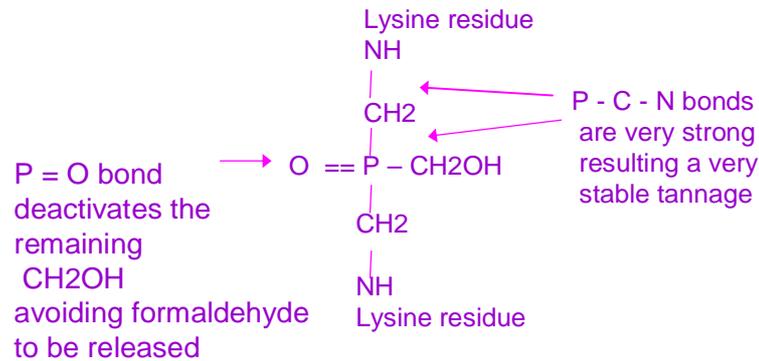
- Product penetrates in cationic quaternary form (THPS)
- Crosslinking occurs via collagen amino groups
- Conversion to tri-substituted, active form on basification (THP)
- Tannage starts around pH4 and continues crosslinking up to pH 7

The Basic Facts - Tanning Schematic



Increasing pH

The Basic Facts - Tanning Result



RESULTS

APPLICATION TECHNOLOGY

Tanning system :

After a pickling at pH 3,2-3,5 **Vandotan PH** is added to the tanning float in amount of 4-5 % on pelt weight. The penetration time, before to start with basification, is about 2 hrs, depending on the pelt thickness. The through cross-section must be monitored by a Selenium Indicator P (III)/(V) ratios. In order to crosslink the leather amino-groups, a slowly basification must be maintained up to pH 5,5-6,5.

The residual not reacted THP must be deactivate by oxidative washing with Hydrogen Peroxide or Borax. To scavenge "in-process" HCHO with appropriate washing-scavenger (Sodium meta-bisulfite) is recommended whether a very low HCHO leather is required (< 10 ppm).

Mix Tanning system:

A reduced Chrome usage is allowed when a mix tanning system is carried on. The use of 1% basic chromium sulphate in conjunction with 2% **Vandotan PH** is sufficient to give a fully tanned quality leather in terms of softness, fullness and handle. The reduced chrome usage is reflected in the levels of chromium detected in the effluent. Typical values of 120ppm Cr were measured compared to, typically, 3600ppm Cr for a conventional chrome tannage. The resultant crust could be ironed at 100°C and lasted at 115°C without any signs of shrinkage.

EXPERIMENTAL DATA

Properties and Characteristics

The wet white quality achieved by **Vandotan PH** system after retanning, is summarised in the following table:

	Wet white Glutaraldehyde	Wet White Vandotan PH
Shrinkage Temperature	68-72 C	75-80 C
Tear Strength	25-20 N	40-45 N
Stitch	87 N	120 N
Elongation	45%	54%
Light Fastness	3/4	4
Heat Fastness (aging 120C-4 hrs)	3/4	4
Fogging	5,5 mg	3.8 mg

For further information

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DESCRIPTION

KLF TECNOKIMICA has just recently developed a process of tanning FREE METAL, it allows to obtain white leather with a shrinkage temperature of 80 ° C + -1, completely free of metals such as chromium, aluminum, zirconium and titanium.

The tanning is completely organic based.

The finished leathers have a good softness, and brilliant shades of dye and filled with natural good technical characteristics, as reported in the analytical data described below and with very low rates of free formaldehyde.

Our process takes place through a special preparation of the leather; during pre-tanning, it allows already to obtain a well-tanned leather, with a sufficient swelling of collagen fibers that are prepared to fix definitely the synthetic products used in the next phase of retanning.

The hides thus prepared are reactive with fatliquoring products that are well secured to the fiber, giving the desired softness, this factor is very important in this type of leather that are usually hard and not very workable in terms of smoothness.

The process is based on combined action of two chemicals whose basic constitution is organic, capable of fixing the collagen fibers, forming a stable complex equal to that of a normal natural tannin, which has higher molecular size of normal synthetic organic products which are usually used to obtain white leather-free metals.

By the following procedure we treated both cattle hides both sheep-goat skins, obtaining excellent results in both types of leather.

We exhibit below the procedure done on hides of cattle from Europe and the setback weight 22/24 kg

Free Metal Leather Tanning Process: Pickled calf Ph 2.5

TRIAL IN KLF		TANNING PROCESS			
Date	11/02/2010	Client	KLF TECNOKIMICA		
Article	Metal free		Kind of leather	<i>Pickled calf</i>	
thickness		weight		%refer to	Pickled weight + 50%

PRODUCTS	°C	%	Kg.	Rot. Min	Check Operations
water	20	100			
WATER	20	70			
SALT		8		10	
FORMIC ACID		1		30	
SULPHURIC ACID		1		120	OVER NIGHT
					MORNING PH 3 DRAIN 2/3
PAROLIT FC		1.5		120	
PAROLIT JX		1		60	
PAROLIT JX		1		120	
WATER	38	100			
SODIUM ACETATE		3		90	IN 2 PORTIONS
SODIUM BICARBONATE		2		300	OVER NIGHT
					MORNING PH = 5.5/6 DRAIN
WATER	38	150			
IDROFIL A500		1.5		50	DRAIN WASHING
WATER	35	100			
FILTAN GN		1.5			
SOLFOIL 912H		2		60	DRAIN
					HORSE UP OVER NIGHT SAMMING
					SHAVING
					RE-TANNING PROCESS

TRIAL IN KLF		RETANNING PROCESS			
Date	14-02- 2010	Client	KLF TECNOKIMICA		
Article	White leather		Kind of Leather	<i>N.1 Wet white leather</i>	
Thikiness	1.1-1.3	weight	% refer to	Shaved	

PRODUCTS	°C	%	Kg.	Rot. Min	Check Operations
WATER	30	250			
LEDER RIV PO2		3			
OIL PV		2		30	
FILTAN GN		6		20	
FILTAN GN		6		30	DRAIN
WATER	35	150			
SODIUM FORMIATE		2			
SODIUM BICARBONATE		0.3		60	PH = 6 DRAIN WASH
WATER	30	100			
EMULOIL CRS		2			
LEDEROL ES/F		2			
SOLFOIL HW		2		30	
FILTAN RE		4		20	
LEDERFILLER CK		3			
FILTAN GN		20		180	OVER NIGHT MORNING DRAIN
WATER	45	150			
LEDERTAN RC		3		20	
LT BIANCO		2			
EMULOIL CRS		3			
SOLFOIL HW		4			
LEDEROL ES/F		5			
IDROFIL SOAP		0.5			
IDROFIL 1000		0.5		60	
FILTAN RE		3		40	
FORMIC ACID		1		30	
FORMIC ACID		1		30	
LT BIANCO		2		20	
FORMIC ACID		1		30	DRAIN WASH
					SETTING OUT- HANG-STAKING

RESULTS

In this type of work, what is most important is preparing the leather to the next phase of retanning and fatliquoring, which gives the characteristics of the leather in terms of fashion and the effect of soft hand required including finishing.

Indeed, in leather free metal, is essential tanning skin sufficiently to obtain good swelling of collagen fibers with the setting and curing of the same tanning agent reaching a shrinkage temperature of 78-80 ° C. The first tanning is that defines the main characteristics of the finished leather.

With most free metal processes, you get leather flat and hard, this is because the collagen fibers are not sufficiently tanned and cross from tanning so that it can not crosslink them. These organic tanning as mentioned above, are usually molecules not large enough as those of the natural tannins and thus the protein structure does not change the point of a real tan, but you get the so-called "pseudo-tanning."

With process PAROLIT FC and JX PAROLIT by KLF, the tanning is complete, the chemical agents acting on the fiber are well penetrated in the section of the fibrous structure of the dermis, cross linked fibers and permanently attached.

You get a leather with the typical characteristics of synthetic tanning similar to a real vegetable tanning.

Here below are the results of analytical data, chemical and physical achievements:

Determination of tear load Part 2: Double edge tear (UNI EN ISO 3377/2)

Test	Average thickness		Tear extension		Load				Load / Thickness			
	GOAT	CALF	GOAT	CALF	GOAT		CALF		GOAT		CALF	
n°	mm	mm	mm	mm	Kg	N	Kg	N	Kg/mm	N/mm	Kg/mm	N/mm
longitudinal	1,16	1,13	42,0	44,3	5,3	52,0	9,4	92,2	4,6	44,8	8,3	81,6
longitudinal	1,16	1,13	50,1	46,4	6,4	62,8	11,0	108,4	5,5	54,1	9,8	95,9
transversal	1,16	1,06	45,2	45,4	5,5	54,4	8,2	80,4	4,8	46,9	7,7	75,9
transversal	1,20	1,06	51,5	47,0	6,4	63,3	8,7	85,8	5,4	52,7	8,3	80,9
average	1,17	1,10	47,2	45,8	5,9	58,1	9,3	91,7	5,1	49,6	8,5	83,6

Determination of tensile strength and percentage extension (UNI EN ISO 3376 - I.U.P.6)

Test	Average thickness		Average cross-sectional area		Tear extension				Tear load				Load / Sectional area			
	GOAT	CALF	GOAT	CALF	GOAT		CALF		GOAT		CALF		GOAT		CALF	
n°	mm	mm	mm ²	mm ²	mm	%	mm	%	Kg	N	Kg	N	Kg/mm ²	N/mm ²	Kg/mm ²	N/mm ²
longitudinal	1,23	1,23	12,30	12,3	31,4	62,8	22,9	45,89	20,44	200,54	27,49	269,68	1,66	16,30	2,23	21,93
longitudinal	1,22	1,25	12,20	12,5	32,8	65,5	26,8	53,59	22,39	219,66	26,39	258,89	1,84	18,00	2,11	20,71
transversal	1,24	1,11	12,40	11,1	29,0	58,1	26,3	52,65	24,09	236,34	20,94	205,44	1,94	19,06	1,89	18,51
transversal	1,24	1,15	12,40	11,5	26,9	53,7	27,9	55,87	27,89	273,60	23,19	227,51	2,25	22,06	2,02	19,78
average	1,23	1,19	12,33	11,85	30,01	60,04	26,00	52,00	23,70	232,54	24,50	240,38	1,92	18,86	2,06	20,23

Determination of distension and strength of grain -- Ball burst test (I.U.P.9 UNI EN ISO 3379)

Test	Strength estension		Strength load				Tear extension		Tear load			
	GOAT	CALF	GOAT		CALF		GOAT	CALF	GOAT		CALF	
n°	mm	mm	Kg	N	Kg	N	mm	mm	Kg	N	Kg	N
1	10,16	10,99	26,39	258,8	32,24	316,3	13,56	14,98	52,40	514,1	60,90	597,4
2	12,05	10,95	34,78	341,2	31,39	307,9	15,26	14,17	60,46	593,1	56,40	553,3
3	11,33	9,39	39,56	388,1	31,88	312,7	14,24	11,99	58,11	570,1	54,09	530,6
Average	11,18	10,44	37,17	329,4	31,63	312,3	14,35	13,71	56,99	559,1	57,13	560,4

Determination of water vapour permeability (UNI EN ISO 14268:2006)

Test	RESULT				
	GOAT	CALF			
n°	mg/(cm ² h)	mm			
1	16,4	13,8			
2	17,1	13,5			
Average	16,8	13,7			

CHEMICAL ANALYSIS

ANALYSIS			GOAT	CALF
PH			5,00	4,8
DIFFERENTIAL INDEX			0,52	0,6
HUMIDITY (%)			10,30	10,7
ASHES (%)			5,50	4,8
FORMALDEHYDE (mg/Kg)			28,00	30,0
XENOTEST (scala di grigi)			4,00	4,0
SHRINKAGE TEMPERATURE (°C)			80,00	85,0
Cr, Al, Ti, Zr (mg/Kg)			assenti	assenti
SUBSTANCES EXTRACTED WITH CH ₂ CL ₂ (%)			11,60	8,1
TANNING DEGREE			22,10	25,70

For further information



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LOW DENSITY AND TOXICITY FUME DEVELOPMENT FIRE PROOFING PRODUCTS	4. TECHNOLOGIES FROM CRUST TO FINISHED
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ABSTRACT

Development of fire proofing products for drum treatment of leather in wet-blue to obtain leathers resistant to fire and with low dense and toxic gas emission in compliance with regulations NF F 16-101, BS 5852, DIN 54 341, UNI 9175 and ASTM E 1537-98.

DESCRIPTION

It seems that obtaining features of excellence in leather such as those required by the aeronautic, naval and furnishing market intended for large public venues can only be achieved thanks to the use of fire proofing agents and not through simple recombination of the working composites. The best available technologies have been emphasized by identifying the synergies between the products and the various methods of application, granting considerable reductions in the products used and immediate ecological and economical advantages for the company.

In terms of the combustion fumes toxicity and opacity, which are considered by the users of leathers to be yet another requirement for fire resistance, there is renewed importance granted to the absolute balance in the choice and methodology of products. Higher than necessary fire proofing quantities contribute to improving the extinguishing of flames and embers but can, however, have a negative effect on combustion gases produced by increasing the opacity beyond the allowed limits.

In regards to opacity observations, it was also confirmed by the toxicity tests for which were observed, at a flame resistance clearly higher than the requested parameters, higher quantities than the requested values of carbon monoxide, hydrogen cyanide and of halogen acid.

Stefani Chimis has developed recipes/products for the production of fire proof leathers that satisfy the strictest regulations (NF F 16-101, BS 5852, DIN 54 341, UNI 9175, ASTM E 1537-98).

RESULTS

In terms of toxicity and opacity of the combustion fumes, which are considered by the users of leathers to be yet another requirement for fire resistance, the importance of absolute balance in the choice and methodology of products offered is renewed. Quantities of greater than necessary fire proofing contribute to improving the extinguishing of flames and embers but can, however, have a negative effect on combustion gases produced by increasing the opacity beyond the allowed limits.

In regards to opacity observations, it was also confirmed by the toxicity tests for which were observed, at a flame resistance clearly higher than the requested parameters, higher quantities than the requested values of carbon monoxide, hydrogen cyanide and of halogen acid.

1 Despite the fact that the hide is an extremely heterogeneous support and its treatment may be affected by numerous factors, an effective fire proof product can be obtained through the appropriate study of working types and times and by taking advantage of the synergies between the various composites, which can be attributed to three fundamental classes:

- Anti-resistant agents
- Ember-resistant agents
- Smoke-resistant agents

2 The combination of the effects of these substances meets the requirements of highly selective tests, such as the FAR A, and the analyses of the specific optic density of the fumes, both in "no flaming" and in "flaming" modalities.

For further information



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ABSTRACT

Nanocomposites obtained by modification of polymeric materials with charges of nanometric size to increase the abrasion resistance.

DESCRIPTION

Nanocomposites, obtained by modification of polymeric materials with charges of nanometric size, represent a new class of materials which are drawing the attention of both the industrial world and the scientific community. The new materials, which derive from the combination of reinforcements on a nanometric scale with the traditional polymeric compounds, have outstanding physical and resistance properties for their specific intended application. Justification of this behaviour is not wholly due to the matrix reinforcement interaction effect, but rather from what has been defined as "nano-effect", which is the huge contact area generated when charges reach the nanometric size, combined with a polymeric interphase layer with much higher properties than the matrix. The aim set by the above mentioned research was to implement the water drop and solvent resistance of the finishing film, while increasing water vapour permeability.

Product blends based on crosslinkable polyurethane resins were prepared by trapping simple or functionalised nanocharges inside them. Leathers finished with polymers of this type are supposed to have greater abrasion resistance with better wet and in-alcohol rubbing performances. The aim is to combine the advantages of inorganic charges (perspiration properties and hardness) with organic binder charges (elasticity and chemical resistance). Alkylamine groups (-RNH₂) provide an example of organic functionalization of silica nanoparticles, able to chemically react with the groups present on leather and/or on the polymeric material establishing strong covalent bonds. Specific supplementary functionalization aims are the building of strong particle matrix bonds, uniform dispersion and limited particle agglomeration within the polymeric solution.

The characteristics obtained are reported in brief in the table (Table 1).

	Veslic dry no variation or breaking after n° cycles	Veslic wet no variation or breaking after n° cycles	Veslic with alcohol no variation or breaking after n° cycles	Taber value on grey scale after 300 cycles	Bally no variation or breaking after n° cycles	pot life	Spreading
Particles 30 nm approx. "S" 5%	40.000	2.000	150	4-5	50.000	poor	good
Particles 80 nm approx. "L" 5%	40.000	2.000	150	4	50.000	poor	good
Particles 250 nm approx. "T" 5%	40.000	2.000	150	4 small white abrasion	50.000	poor	good
Particles. "S" 9%	40.000	2.000	150	4-5	50.000	poor	good
Particles. "L" 9%	40.000	2.000	150	4-5	50.000	poor	good
Particles "T" 8.%	40.000	2.000	150	4-5	50.000	poor	good
Particles. "S" 13 %	40.000	2.000	150	3-4	50.000	poor	fairly good
Particles. "L" 13%	40.000	2.000	150	3-4	50.000	poor	fairly good
Particles "T" 13%	40.000	2.000	150	3-4	50.000	poor	fairly good
Blend 1:1 Particles T + S 9%	40.000	2.500	150	5	100.000	poor	good
Standard without nanoparticles	40.000	2.000	150	3-4	50.000	good	good

As can be observed there have been substantial variations in the abrasion resistances.

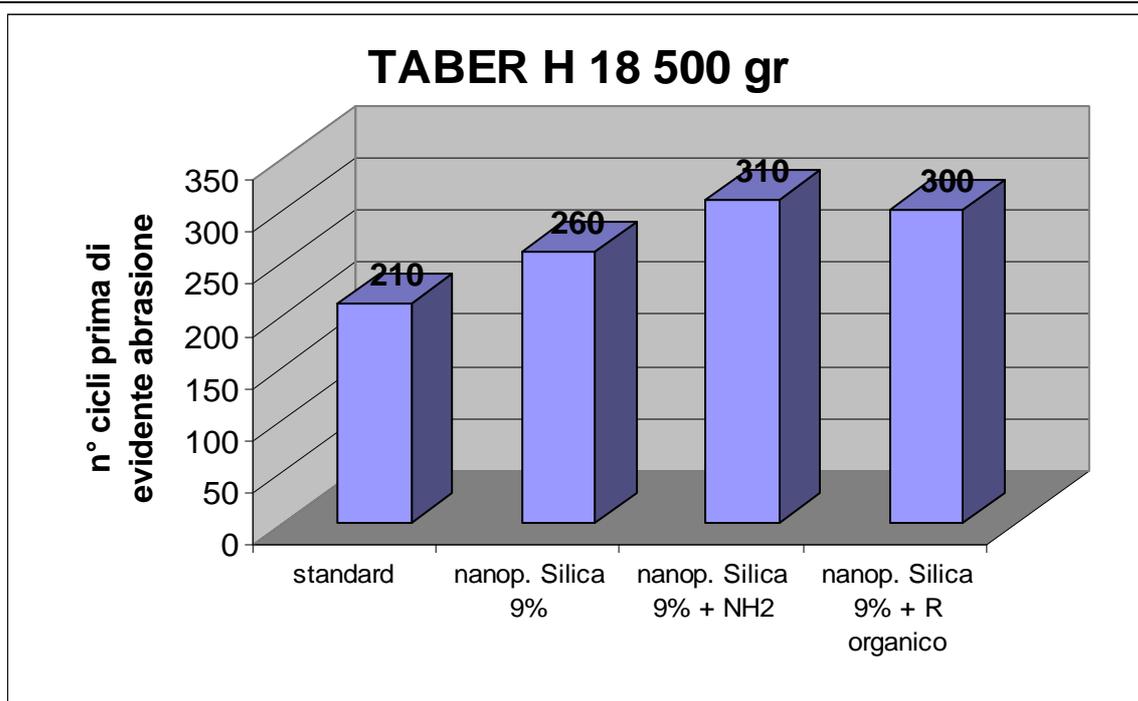
Taber tests demonstrated the effectiveness of a blend of differently sized nanoparticles compared with the effectiveness of a single type (Blend 1:1 Particles T + S).

Furthermore, II and III type nanoparticles were used and introduced with the same formulation used to constitute the initial fixing agent.

The results of the tests are shown in table 2

	Veslic dry no variation or breaking after n° cycles	Veslic wet no variation or breaking after n° cycles	Veslic with alcohol no variation or breaking after n° cycles	Taber value on grey scale after 300 cycles	Loss of weight after abrasion mg	Bally no variation or breaking after n° cycles	pot life
Particles type I - 9%	40.000	2.500	150	4-5	23.3	100.000	poor
Particles type II - 9%	100.000	5.000	260	5	19.8	100.000	Very good
Particles type III - 9%	100.000	5.000	260	5	18.0	100.000	Very good
Standard without nanoparticles	40.000	2.000	150	3-4	30.0	50.000	good

Taber test - Abrasion resistance (until abrasion of the film)



These additional tests, using functionalised nanoparticles, emphasized a notable improvement in general performance.

The chemical modification of nanocharges, moreover, also solved the problem of the short life span (pot-life).

It was also clear that fixing agents gained greater storage, electrolytes and frost stability.

No negative aesthetic variation was observed, in film opacity and evenness, and neither “touch” nor “hand” were in any way compromised by the addition of nanocharges.

The possibility of also easily formulating glossy nano-fixing agents has been demonstrated.

RESULTS

The research demonstrated how the introduction of SiO₂ nano-particles in polyurethane formulations for fixing agents considerably increases mechanical resistances, in particular abrasion resistances.

A hybrid inorganic-organic chemical bond between nanoparticles and the polymer is needed in order to reduce the hydrophilic behaviour of nano-particles: this solution increases the rubbing resistance of the film in wet conditions and alcohol.

Further investigations on the influence of particle size on the final performances of the fixing agent were also indispensable.

Furthermore, organic functionalizations of nano-particles revealed the positive influence both on the chemico-physical stability of the final product, and on the mechanical and aesthetical properties of the final finishing film on the different leather articles.

For further information



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SUMMARY

Technology	Company	Pag
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Cr2O3 Reduction	LETEx SPA	4
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TANNERY AND POLLUTION



GENERALIZED PROCESS FLOW FOR TANNED LEATHER

- Chrome Tanned Leather -



GENERALIZED PROCESS FLOW FOR TANNED LEATHER

- Veg Tanned Leather -

Strap & Russet
Upper Leather

Curing & Storing

Soaking

Liming & Unhairing

Fleshing & Splitting

Deliming, Bating
Washing & Dripping

Veg Tanning Pit

Dripping, Washing & Samming

Shaving

Fat Liquoring

Retanning, Dyeing
Fatliquoring

Staking, Buffing

Toggling & Ironing

Sole Leather

Curing & Storing

Soaking

Liming & Unhairing

Fleshing & Trimming

Deliming & Bating

Veg Tanning Pit

Washing & Samming

Fatliquoring

Drying

TANNERY PROCESS

*The tanning processes are
classified into three main stages*

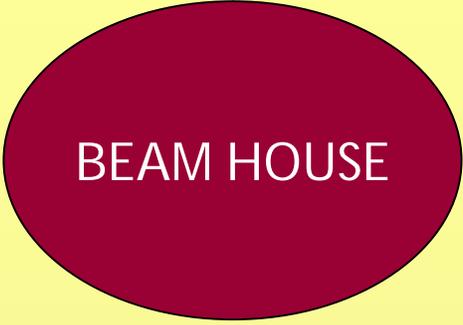


BEAM HOUSE

TANNING HOUSE

FINISHING HOUSE

TANNERY PROCESS



BEAM HOUSE

*Pre-tanning or Beam House Operations are:
The removal of constituents such as hair, flesh, fat and some interfibrillary material, leaving a concentrated network of high-protein collagen fibres, greatly dispersed and softened with water*

Liquid Wastes

*The beam house liquid wastes includes:
Aqueous effluent containing suspended and dissolved organic matter, curing salt and greases in addition to unused process chemicals and consequently*
HIGH OXYGEN DEMAND
HIGH DEGRADABLE WASTEWATER
TDS RELEASE

Solid Wastes

The solids and semisolids wastes are hair, hide trimmings and fleshings

Air Emissions

*Hydrogen sulphides, particulate and dispersed powders
ammonia, odours*

TANNERY PROCESS



Treating the hide with agents that displace the water and combines with the collagen fibres, greatly increasing resistance to heat, hydrolysis and deterioration. The process involve a tanning and a post-tanning operations based upon the quality of leather.

**TANNING TURNS HIDE INTO A NON-PUTRESCIBLE MATERIAL
RESISTANT TO BACTERIAL DEGRADATION**

Liquid Wastes

The tanning house liquid wastes includes:

Aqueous effluent containing suspended and dissolved organic matter, spent tanning bath and greases and in general produce

HIGH OXYGEN DEMAND

GOOD DEGRADABLE WASTEWATER

TDS RELEASE

HEAVY METAL RELEASE (CrIII)

Solid Wastes

*The solids and semisolids wastes are tanned trimmings and cutting
Chrome*

Air Emissions

*Hydrogen sulphides, particulate and dispersed powders
Ammonia, Odours*

TANNERY PROCESS



FINISHING HOUSE

Finishing the tanned leather to achieve the desired level of quality of the final product. It involves a series of mechanical/chemical operations to donate The required physical and aestethich characteristics to the leather.

Liquid Wastes

The finishing house liquid wastes includes:

Aqueous effluent containing dispersed pigments and polymers

Pasting and wash up generates a high strength low volume wastewater

HIGH OXYGEN DEMAND

LESSTDS RELEASE

WEAK DEGRADABLE WASTEWATER

Solid Wastes

The solids and semisolids wastes are finished trimmings and cutting

Air Emissions

Huge emissions of organic solvents and particulates

GENERALIZED PROCESS FLOW FOR TANNED LEATHER



SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Curing & Storing



Preservation is not performed in tanneries. The preservation agents are washed out during the first production step in the beam house, mainly with the soak effluent.

Conventional Process

SALT CURING

It is the most common method of preserving cattle hides. In this method the freshly hides are spread out, flesh side up, on a concrete floor and well sprinkled with salt (NaCl, Sodium Chloride). Coarse or round grained salt is preferred to fine salt, as the former spreads better, whilst the latter forms patchy wet cakes. The second hides is placed on the first one and is also sprinkled with salt. This is repeated until stack reachesthe height of 5-8 feet, the top hide is overlaid with salt.

- Salt used is normally 15-30% of Raw Hide Weight.
- About 60% of tannery chlorides (Cl-) originates from salted used for curing; the remaining comes from pickling and tanning processes.
- May involve the use of biocides as:
 - PCPs, DDT
 - Benzene Hexachloride
 - HCH
 - Dieldrin
 - Mercury and Arsenic based chemicals

SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Curing & Storing



Preservation is not performed in tanneries. The preservation agents are washed out during the first production step in the beam house, mainly with the soak effluent.

Clean Technology Options

AIR DRYING (+)

One of the standard method of preservation of most reptile, goat and fur skin and of a very large percentage of the hides and skins obtained in the tropical areas, especially in Africa.

Most practical in areas where salt is expensive and a small number of skins are to be cured

PROCESSING OF FRESH HIDES AND SKINS (++)

The best alternative in terms of chloride load to the effluent. No use of chemicals and bactericide results in better quality of effluent. Soaking procedure washing procedure only. "Green Fleshing" is with a further reduction of use of chemicals. However time elapsing between slaughtering and further treatment must not exceed few hours especially when air temperature is high.

CHILLING OF RAW HIDE AND SKINS (++)

Allow long preservation time as compared to the processing of the raw hides and skins which, depending upon the temperature applied may last upto 3 weeks. Some of the disadvantages include energy consumption, necessity of freezing equipment and cold storage.

PRESERVATION WITH BACTERICIDES

Can be used only for short time preservation as bactericides have severe ecological impacts if released to nature as well as to wastewater treatment plant (toxicity). Further to this there is nowadays a strict legislation which request their minimization.

SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Curing & Storing



Preservation is not performed in tanneries. The preservation agents are washed out during the first production step in the beam house, mainly with the soak effluent.

Clean Technology Options

SALT RECOVERY AND USE MINIMIZATION (+++)

Salt curing still remain the mostly widely used method for preservation of hides and skins. Although not considered a clean technology and despite intensive research works, no alternative process of comparable economic and ecological efficiency could be found.

Further options to achieve this goal are:

- Preflesh in the slaughter house (Green Flething) and consequently reduce the amount of salt to be used
- Shaking the salt hides in sieve drums or similar devices or even manually and return the recovered salt to the curing process again
- Introducing a washing step before soaking and after shaking the hides and to collect the effluent for sun drying in open dishes to achieve a dry salt to be reused in curing.

A desalting drum in AISI304



SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Soaking



Soaking is to wet back the dehydrated preserved skins. It is generally accomplished by placing the skins in water which may contain additives to facilitate the dispersion of water in the skin structure.

Conventional Process

Before soaking skins are trimmed in order to remove nose, ears, tails etc. Soaking may be performed in drums, paddle and pits. Wetting agent is commonly used.

- Water consumption may vary from 200% (on raw weight) to 3000% depending on the source of the raw material and the state of contamination with dirt and dung
- Biocides are added especially at high temperature at a rate of 0.1% on raw weight
- Enzymes and surfactants may be added to improve the soaking efficiency
- Further chemicals added may be:
 - Sodium Hydroxide (NaOH)
 - Sodium Hypochlorite (NaClO)
 - Sodium Bisulfite (NaHSO₃)
- About 60% of tannery chlorides (Cl⁻) originates from salted used for curing; the remaining comes from pickling and tanning processes.
- May involve the use of biocides as:
 - PCPs, DDT
 - Benzene Hexachloride
 - HCH
 - Dieldrin
 - Mercury and Arsenic based chemicals

SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Soaking



Soaking is to wet back the dehydrated preserved skins. It is generally accomplished by placing the skins in water which may contain additives to facilitate the dispersion of water in the skin structure.

Clean Technology Options

SOAKING IN DRUM WITH SEQUENTIAL WASHINGS (+++)

The use of pits or paddles for soaking operations results in a higher consumption of water, mainly for the washing phase which are much less efficient than when using drums. Even with drums it is recommended to operate with sequential washing instead of continuous rinsing which leads to the savings of enormous amount of water at this stage.

SOAKING UNHAIRING IN A SINGLE STAGE (++)

Reduction in water consumption can be achieved by matching the first two step in the same stage.

GREEN FLESHING (++)

Green Fleshing represent the shifting of the fleshing operation just after a deep soaking and before the liming process. This allow a good saving in chemicals as well as the production of a suitable by-product (fleshing) to be reused for fats and proteins production

SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Liming & Unhairing



Liming and unhairing are performed in one single operation to remove, hair, fats and unwanted proteins and to "open up" the skin fibres to the following processes.

Conventional Process

Hair removal is commonly carried out in pits and drums. The sodium sulfite (Na_2S), sulfhydryte (NaHS) and lime ($\text{Ca}(\text{OH})_2$) are introduced in the reactor. Hair destruction take place within a very short time (fifteen minutes). The hair destruction system requires a strong sulfide solution (3% on raw weight) with 6-7% hydrated lime.

After this process hides are washed to remove the sulphide and treated with additional lime for liming purposes.

- A typical process involves the use of
 - 300-600% of water
 - 3-4% of lime
 - 2.5-4% of Na_2S
 - At a pH of 13-13.5
 - Duration may vary from 16 to 48hrs

- Unhairing and liming process is responsible for:
 - 55% load of COD
 - 70% load of BOD₅
 - 40% load of nitrogen
 - 100% load of sulphides

- Upon acidification, solution containing sulfides, even in trace amounts will release H_2S gas into atmosphere. The gas is heavier than air and may accumulate in sewers or wherever solutions from acid processes and sulfide unhairing system come together. H_2S at a very low level has a noxious odor and at high enough levels could be fatal, paralyzing the nerves and fatality may result without warning.

SPECIFIC PROCESSES CLEAN TECHNOLOGY OPTIONS

Liming & Unhairing



Liming and unhairing are performed in one single operation to remove, hair, fats and unwanted proteins and to "open up" the skin fibres to the following processes.

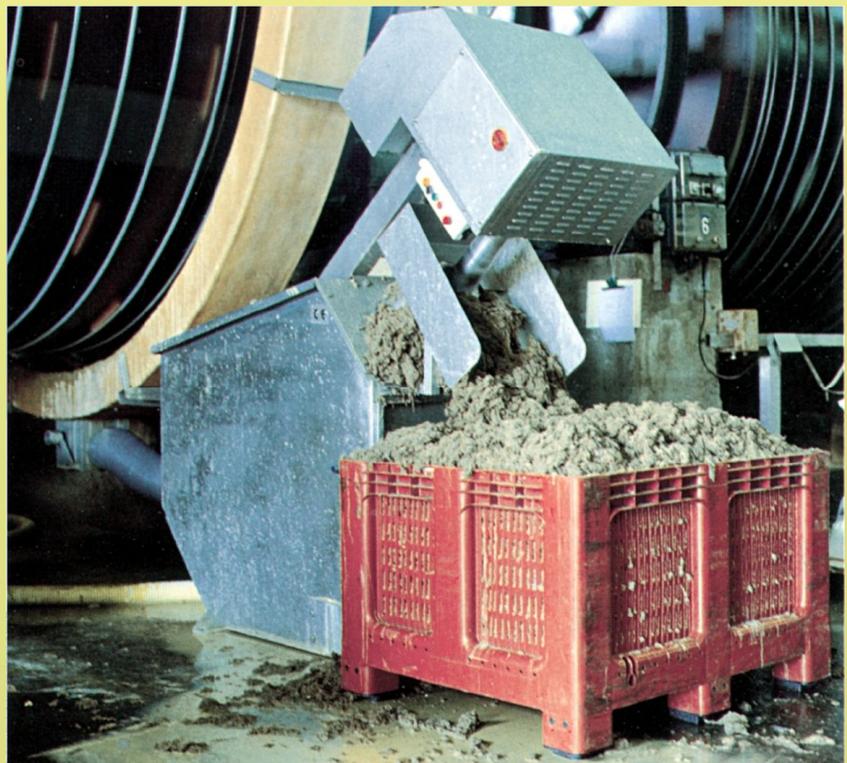
Clean Technology Options

HAIR SAVING METHODS (+++)

Hair saving systems use smaller quantities of sulphide as compared to hair destruction system and allow an easy separation of the proteins constituted by the undissolved hairs and hence imply less pollution than hair destruction process. In this process the hair is loosened and removed from the hides but not pulped or dissolved in the float.

The installation of a screen is required to remove the hair from the unhairing liquor.

Screening for Hair Saving Method



SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Liming & Unhairing



Liming and unhairing are performed in one single operation to remove, hair, fats and unwanted proteins and to "open up" the skin fibres to the following processes.

Clean Technology Options

LIMING LIQUOR RECYCLING (+++) - See PRACTICAL CASE SECTION -

The technique allow a reuse of the spent liquors after decantation and/or filtration to separate sludge containing lime, fat, proteins and the recharging with chemicals according to the recipes.

The nr of recycling steps depends on the efficiency of the clean-up process for the spent liming liquor and on the desired level of quality of the leather. The liquor may be reused upto 30 times. Sludge produced may be reused in agriculture. The procedure allow huge savings of water, sulphide and lime.

SULPHIDE OXIDATION (++)

A separate pre-treatment of the toxic sulphide salt and organic sulphide compounds formed during liming-unhairing is the oxidation to non-toxic sulphate. The procedure helps to avoid the formation of toxic gas as well as contributes to a higher and better economy of the final effluent treatment.

LIME SPLITTING AND TRIMMING (++)

Splitting and trimming is usually carried out after tanning which results in by-products of low quality containing chromium in it. If these procedures are carried out with pelt, the produced by-products can be sold easier in the market than than the the wet-blue.

The non tanned by-product will be a good raw material for the manufacturing of gelatin or animal feed stuff.

ALTERNATIVE UNHAIRING METHODS

- Dimethylamine Sodium Hydroxide System (DSH)
- Oxidative System
- Enzymatic Unhairing

SPECIFIC PROCESSES CLEAN TECHNOLOGY OPTIONS

Fleshing & Trimming



To eliminate the excess connective tissue and fat from the flesh side of the hides.

Conventional Process

Fleshing is usually carried out after liming process reflecting in largest quantities of wet fleshings.

From 10 to 40% of the weight of hides and skins are removed as wet fleshings.

Clean Technology Options

- **GREEN FLESHING (RAW FRESH AND CHILLED HIDES/SKINS)**

Overall less consumption of water and chemicals in all the process

- **GREEN FLESHING (SOAKED-SALTED HIDE/SKINS)**

Overall less consumption of water and chemicals in all the process

SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Splitting



To split the leather into grain layer and flesh layer

Conventional Process

Splitting creates a grain layer and a flesh layer. If the flesh leather is thick enough it can be processed into particular types of leather, such a suede. Sometimes, the flesh layer will be split again depending on the thickness of the split and the end-use of the splits.

A wastewater stream is normally derived from this operation. This soapy water is leading to the production of an acidic waste stream containing surfactants.

Clean Technology Options

•LIMED PELTS

Overall less consumption of water and chemicals in all the process. However, tanneries do not always split in the limed stage for technical reasons or the specifications of the final product.

SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Deliming and Bating



To prepare the unhaired hides chemically and physically for tanning.
Deliming is the removal of absorbed calcium salts and pH adjustment for bating.
Bating is an enzymatic action for the removal of unwanted hide components.

Conventional Process

Deliming process solubilize the absorbed calcium and bring the skin to the desired pH level. Calcium has a good solubility in ammonium sulfate ($(\text{NH}_4)_2\text{SO}_4$) and ammonium chloride (NH_4Cl). Lime is gradually removed from the skin and the swelling effect are kept at a minimum level. Skin is also prepared for right pH for bating.

Some of the chemically resistant, fibrous protein must also be removed in order to obtain proper grain texture and leather softness. Bating refers to the action of enzyme on these components.

- A typical process involves the use of
 - 200% of water
 - 2-3% of ammonium sulphate or chloride
 - 2% auxiliary surfactants
 - 1 -5% pancreatic of bacterial enzymes

- Deliming and Bating process is responsible for:
 - Release of H_2S
 - 40% of load of nitrogen

SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Deliming & Bating



To prepare the unhaired hides chemically and physically for tanning.
Deliming is the removal of absorbed calcium salts and pH adjustment for bating.
Bating is an enzymatic action for the removal of unwanted hide components.

Clean Technology Options

CO2 DELIMING (+++)

A good removal in nitrogen load produced in deliming process can be achieved by using CO₂ gas as neutralizing agent. It also help in avoiding a further increase in COD value.

The CO₂ is injected directly in the axle of the drum.

The application rate is 1 to 1.5% of the weight pelts.

WEAK ACID DELIMING (+)

Optional deliming agents are weak acid as lactic acid, acetic acid, etc, but their cost limits their application to specific cases. This cost is 50 to 100% greater than conventional scheme.

SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Degreasing



For skins particularly greasy a degreasing stage is required before tannage. Excessive amounts of dye cause difficulties in finishing processes, and show dark greasy patches in the finished leather.

Conventional Process

Degreasing of skins is particularly important before chrome tannage, where chrome salt can react with some grease to produce chrome soap. For degreasing purpose solvents or surfactants are used as main degreasing agents. Enzymes and hot water may be applied as auxiliary agents. To be noticed that normally bovine hides do not require any degreasing stage.

Clean Technology Options

- **RECYCLING OF DEGREASING SOLVENT**
- **DEGREASING WITH SURFACTANTS**

SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Pickling



Pickling refers to the treatment of the hide with salt and acid to bring the skin to the desired pH for either preservation, for some time, or for tanning. At the end of the pickling operation the skin is theoretically a purified network of the hide protein.

Conventional Process

Hides and certain skins are pickled in salt and acid in order to prepare them for the tanning process. The combination of acids added to the pickle depends on type of tanning employed and the desired properties of the tanned leather. The most common acids used sulphuric and formic. Other acids may be used as hydrochloric, boric and weak acids as acetic or lactic.

- A typical process involves the use of
 - 80 to 100% of water
 - 0.5-3% of acid
 - 6% salt
- Pickling process is responsible for:
 - Very low pH spent bath
 - High amount of chlorides

Clean Technology Options

•RECYCLING OF PICKLING FLOAT

Mainly to reduce the amount of discharged chlorides is a well proven technology. After collection the used float is sieved and its acidity is controlled by lab test. After pH readjustment.

Technology leads a reduction in salt discharge of about 80%
Technology leads a reduction in acid consumption of about 25%

SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Tanning - CHROME



Tanning is the treatment of hides and skins for preservation and conversion into useful articles of commerce.

Conventional Process

Many ways to achieve this target are mineral tannage, vegetable tanning, aldehyde tannage and oil tannage. Other agents like aluminium, titanium and zirconium are also available for tanning.

Nowadays the chrome tanning methods employs the use of prepared trivalent chromium compounds both liquid and solids. Most of the times a combination chrome tannage/ vegetable retannage is seen.

- A typical process of mineral tanning with chrome is
 - 150-200% of water
 - 8-12% of chrome
 - 1% basifying agent as NaHCO_3

- Tanning process is responsible for:
 - Release of chrome
 - Release of salts
 - Low pH wastewater
 - 40% of load of nitrogen

- Exhaustion of original chrome in traditional tanning procedure is below 70%

SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Tanning - CHROME



Tanning is the treatment of hides and skins for preservation and conversion into useful articles of commerce.

Clean Technology Options

DIRECT RECYCLING OF CHROME TANNING FLOAT (+)

Small firms may adopt this technology after screening of the exhausted bath they can reuse the same in a new tannage. This may lead to a 20% save of the total chrome used in the process.

Although the system does not completely eliminate the chromium being discharged through the effluent or sludge, it can be seen as a part of a general environmental plan for a tannery.

RECYCLING AFTER PRECIPITATION (+++) - See PRACTICAL CASE SECTION -

Best option especially in case of medium-large size firms. After collection, screening and storage, the floats are precipitated with different types of coagulants including sodium hydroxide (NaOH), sodium carbonate (Na₂CO₃), magnesium oxide (MgO). A flocculation with polyelectrolite may follow. A dewatering system of the chrome sludge may also follow. A 90% recovery of the discharged chrome may be achieved

TANNING PRODUCTS THAT IMPROVE THE EXHAUSTION RATE (++)

A wide range of chemicals and recipes are available on the market to perform a tanning cycle inducing only small chromium wastes. These products are developed with the aim of bringing about the complete fixation of the chrome onto the protein fibres so that the exhausting chrome tanning contains little or no chrome. It works only on split hides

SPECIFIC PROCESSES CLEAN TECHNOLOGY OPTIONS

Tanning - VEGETABLE



Tanning is the treatment of hides and skins for preservation and conversion into useful articles of commerce.

Conventional Process

The techniques employed are based on controlled penetration of the vegetable tanning materials into the hide or the skin. In heavy leather where filling action and weight increase are important, in sole leather vegetable tanning is predominant due to the property of moldability required to the sole and for the building up of solid materials inside the hide to give more physical weight and greater wearing characteristics

- Tanning process is responsible for:
 - Release of tannins
 - Higher pollution load compared to chrome
 - Colored effluent
- Exhaustion of original chrome in traditional tanning procedure is below 70%

Clean Technology Options

•TANNINS RECYCLING

SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Retanning, Dyeing & Fatliquoring



RETANNING is to transfer different properties in the final leather products

DYEING to give the desired colour

FATLIQUORING is to give the desired "hand" to the final leather

Conventional Process

RETANNING

Many chemicals combine with, or affect, skins and cause resistance to putrefaction and impart a number of desirable properties. These includes salts of heavy metals, products of aromatic substances treated with formaldehyde and sulfuric acids.

Other materials including urea, di-cyanamide, bisphenol, triphenyl naphthalene sulfonic acid, benzyl alcohol etc. Vegetable tanning materials are also applied as retanning agents as well as syntans.

Retanning is carried out most commonly after splitting or shaving.

DYEING

In conventional dyeing processes, the dye is dissolved in water and the leather is treated with this solution. During dyeing the color fixes chemically to the leather, leaving the water colorless. Under ideal conditions all the dye offered is fixed to the leather and subsequent washing of the dyed leather with water should not remove any color. The dyeing is then said to be 100% wash fastness.

FATLIQUORING

Whatever the course of pretreatment and the tannage, the leather at the time of completion of the tannage does not contain sufficient lubricants to prevent it from drying into a hard mass.

Therefore proper lubrication of the leather fibres is one of the most important factors in determining the characteristics of the leather, both from a utilitarian and an aesthetic point of view.

SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Retanning, Dyeing & Fatliquoring



RETANNING is to transfer different properties in the final leather products

DYEING to give the desired colour

FATLIQUORING is to give the desired "hand" to the final leather

Conventional Process

➤ A typical process of re-tanning with:

- 30-100% of water
- chemicals of various nature as above reported

➤ A typical process of fatliquoring:

- 30-100% of water
- chemicals of various as sulphonated or sulphated oils, bisulfited oils, cationic, anionic, non-ionic emulsions

➤ Retanning, Dyeing and Fatliquoring are responsible for::

- Release of chrome and tannins
- Release of residues of dyes, fatliquors and tannery agents
- A various series of heavy metals contained in retanning agents as well as in dyes as cadmium
- Release of phenols

SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Retanning, Dyeing & Fatliquoring



RETANNING is to transfer different properties in the final leather products

DYEING to give the desired colour

FATLIQUORING is to give the desired "hand" to the final leather

Clean Technology Options

HIGH EXHAUSTION OF THE FLOATS (+++)

It can be seen from above mentioned processes description that the proper penetration of the material used in these processes is very important factor for the proper utilization of the chemicals and also for avoiding their serious environmental impacts.

Various substitutes are available commercially for this purpose. Some of the products have been developed which must be added to the fatliquoring oils. The oils are then converted into micro emulsions producing a significant reduction of COD in fatliquoring wastewater

SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Drying, Buffing, Trimming

Drying is more than the simple removal of the moisture to bring the leather to a practical, usable form; it also contributes to the chemical reactions of leather making. The drying of leather is one of the most important steps in practical leather quality.

Conventional Process

A range of techniques is available for this purpose:

-Air Drying

Skins are hung on hooks or sticks or placed on horizontal racks. Leather is dried by the natural passage around it. It has the advantage of low capital investment, no heat input, little chance of case hardening

-Tacking

A variation of the air drying. Leather is stretched out on boards and tacked. As the leather dries, the fibres tend to draw together and area loss results: this avoided by tacking.

-Tunnel Drying/Pasting or Hanging

Leather is pasted on large sheets of the plate glass, porcelain or metal. By this means the leather can be fully extended. The pasting plates are sent through a tunnel dryer keeping temperature and humidity under control.

Capital cost and operational cost are high

-Vacuum Drying

The most significant advancement in the drying technique. Leather is spread out, grain down, on a smooth, usually chromed plated, polished steel surface. Heat is applied to this surface under the table. The temperature and drying conditions are kept under control.

It is the most competitive in terms of cost as compared to paste dryers and especially considering the constance of results achievable.

Clean Technology Options

•POWER SAVE AND INSULATION (+++)

Power consumption may account to 10% of the total production costs, hence all efforts should be made on insulating pipelines and control equipment for temperature and humidity levels

Simone Galluzzi for PISIE - Italy

SPECIFIC PROCESSES

CLEAN TECHNOLOGY OPTIONS

Finishing

It concerns with imparting suitable physical properties to the leather for the particular end-use in mind, together with applying a decorative surface finish. Finishing imparts also durability and beauty of leather.

Conventional Process

A range of techniques is available for this purpose part of which will be analyzed in detail in the Mechanical Operations slides:

-Spray application

Medium large tanneries are using the automatic spray plant with drying chamber. The water circulation system is also provided. It captures unused finishing materials and hence provides better environmental conditions. Use of solvent and water based finishing material is done

Clean Technology Options

•WATER BASED CHEMICALS and ROLL COATING (++)

The environmental impact of finishing operations is mainly related to finishing chemicals (dyes and pigments dispersed in binder) which can reach effluent or are emitted to the air, like solvents or formaldehyde, which also causes occupational health problems.

Halogen containing hydrocarbons have to be replaced by water based finishers. Roll coating results in reduction of VOC's in the work place and financial savings.

GENERALIZED PROCESS FLOW FOR TANNED LEATHER INPUT & OUTPUT

Curing & Storing



Inputs

- Salt
- Energy for cooling/drying
- Biocides

Liquid Wastes

- Refer to Soaking

Solid Wastes

- Salt

Air Emissions

- Odours

GENERALIZED PROCESS FLOW FOR TANNED LEATHER INPUT & OUTPUT

Soaking



Inputs

- *Water*
- *Alkali*
- *Wetting Agents*
- *Surfactants*
- *Enzymes*
- *Biocides*

Liquid Wastes

- *COD, BOD, SS, DS from proteins, dung, blood etc*
- *Salts*
- *N-org*
- *AOX*
- *Emulsifiers, Surfactants*
- *Biocides*

Solid Wastes

-

Air Emissions

-

GENERALIZED PROCESS FLOW FOR TANNED LEATHER INPUT & OUTPUT

Liming & Unhairing



Inputs

- *Water*
- *Lime, Alkali, Sulphides*
- *Thioalcohols*
- *Enzymes*
- *Surfactants*

Liquid Wastes

- *Sulphides*
- *COD, BOD, SS, DS from fat, proteins, hair*
- *Lime*
- *High pH*
- *N-org, N-NH₄*
- *Biocides*

Solid Wastes

- *Hair*
- *Sludges from liming effluents*

Air Emissions

- *Hydrogen Sulphides*
- *NH₃*
- *Odour*

GENERALIZED PROCESS FLOW FOR TANNED LEATHER INPUT & OUTPUT

Fleshing & Trimming



Inputs

-Water

Liquid Wastes

-COD, BOD, SS, DS from fat, proteins and grease

Solid Wastes

-Fat, connective tissue, lime

Air Emissions

-

GENERALIZED PROCESS FLOW FOR TANNED LEATHER INPUT & OUTPUT

Deliming



Inputs

- *Water*
- *Ammonium slats*
- *Organic and Inorganic Acids*
- *CO₂*
- *Enzymes*

Liquid Wastes

- *COD, BOD, SS, DS from epidermis and skin*
- *Excess bating agents*
- *N-NH₄*
- *Sulphides*
- *Calcium Salts (mainly sulphates)*

Solid Wastes

--

Air Emissions

--

GENERALIZED PROCESS FLOW FOR TANNED LEATHER INPUT & OUTPUT

Degreasing



Inputs

- *Water*
- *Surfactants*
- *Organic Solvents*

Liquid Wastes

- *COD, BOD, SS*
- *Fat*
- *Surfactants*

Solid Wastes

--

Air Emissions

- *NH₃*
- *H₂S*
- *Dust from bating agents*

GENERALIZED PROCESS FLOW FOR TANNED LEATHER INPUT & OUTPUT

Pickling & Tanning



Inputs

- *Water*
- *Organic and Inorganic Acid Salts*
- *Fungicides*
- *Basifing salts*
- *Complexing agents*

Liquid Wastes

- *COD, BOD, SS, DS*
- *Salt*
- *Low pH*
- *Chrome*
- *Tannins*

Solid Wastes

--

Air Emissions

- *H₂S*
- *Acid fumes*

GENERALIZED PROCESS FLOW FOR TANNED LEATHER INPUT & OUTPUT

Samming & Splitting

Shavings



Inputs

--

Liquid Wastes

- COD, BOD, SS, DS
- Salt
- Low pH
- Chrome
- Tannins

Solid Wastes

- Split
- Shavings and Trimmings

Air Emissions

- Dust in case of dry shaving

GENERALIZED PROCESS FLOW FOR TANNED LEATHER INPUT & OUTPUT

Retanning, Dyeing & Fatliquoring



Inputs

- *Organic and Inorganic Acid Salts*
- *Fungicides*
- *Basifing salts*
- *Complexing agents*
- *Synthetics – mineral based oils*
- *Sulphonated animal vegetable oil and fish oil*
- *Chlorinated organic compound*

Liquid Wastes

- *COD, BOD, SS, DS*
- *Salt*
- *Low pH*
- *Chrome*
- *Tannins*

Solid Wastes

--

Air Emissions

- *H₂S*
- *Acid fumes*

GENERALIZED PROCESS FLOW FOR TANNED LEATHER INPUT & OUTPUT

Drying, Buffing & Trimming



Inputs

- *Energy*
- *Biocides*

Liquid Wastes

Solid Wastes

- *Trimmings*

Air Emissions

- *Dust*

GENERALIZED PROCESS FLOW FOR TANNED LEATHER INPUT & OUTPUT

Finishing



Finishing operations includes a series of mechanical operations which may vary depending of the finished leather characteristics as: staking, milling, coating, by-casting etc

Inputs

- *Water*
- *Lacquers (solvent based)*
- *Lacquers (water based)*
- *Binder and cross-linking agents*
- *Auxiliaries*

Liquid Wastes

- *COD, BOD, SS from finishing agents in aqueous solution*
- *Organic solvents*
- *Heavy metals*
- *Auxiliares*

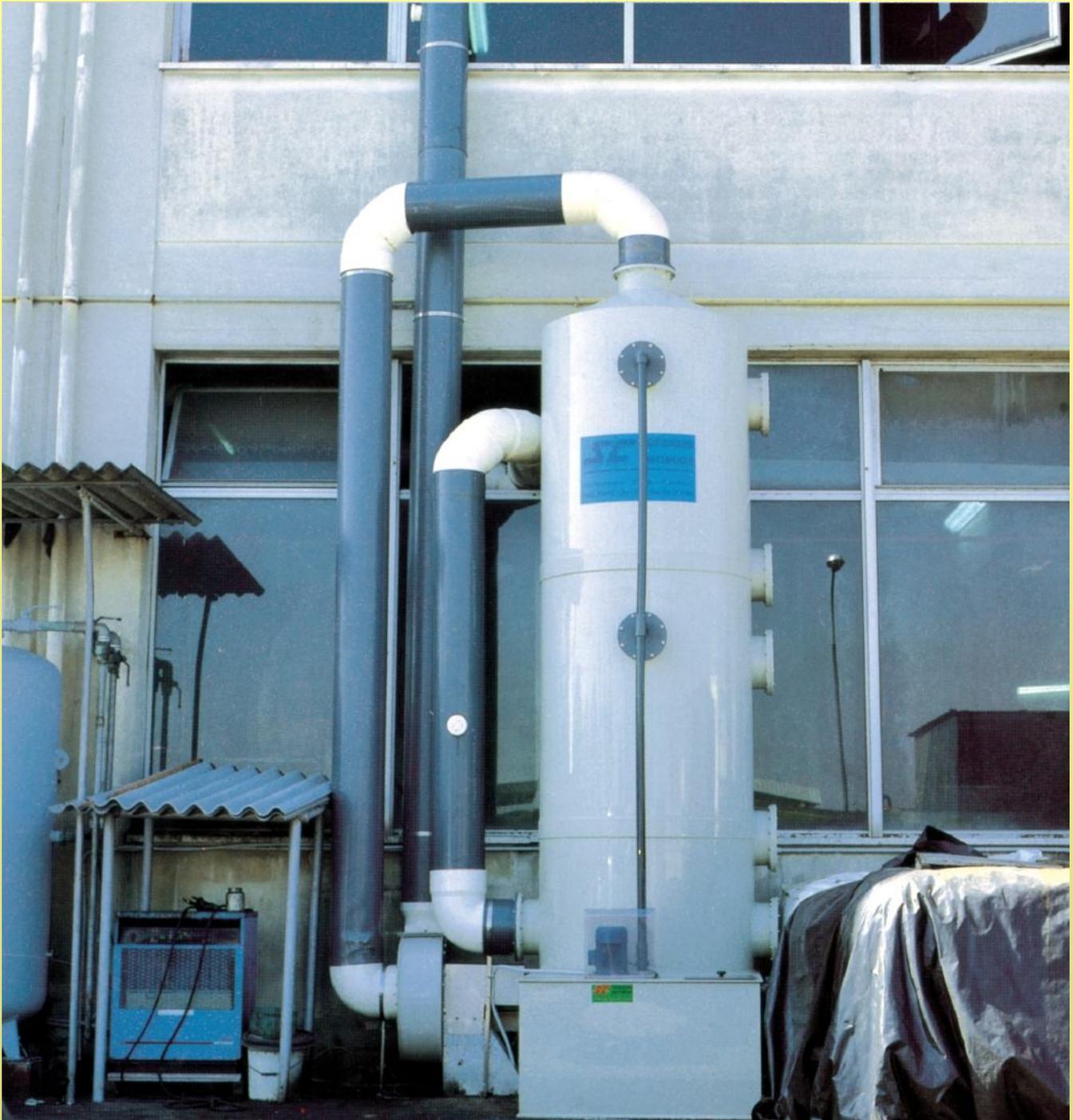
Solid Wastes

- *Wastes from wet scrubbers*
Trimming

Air Emissions

- *Organic solvents*
- *Aerosols*
- *Fixing agent as forlmadehyde*
- *Dust*

A FOCUS ON AIR EMISSIONS



A Scrubber System for H₂S Abatement

A FOCUS ON AIR EMISSIONS

Air emissions occurs generally in relatively small quantities. Traditionally tanneries have been associated with odour rather than any other emissions, although the emissions of organic solvents are a major problem.

Emissions have effect beyond the tannery site, but also affect the workplace and possibly the health aof the tannery workforce. Apart from odours, particular mention should be made for organic solvents, aerosols and dust emissions.

The main emissions to the environment in general arise from odour, organic solvents (VOCs) and total particulate, though emission limit values are also set for ammonia and sulphides.

• PARTICULATE

Definition ...

The majority of particulate emissions arise from dry processes such as milling, buffing and spray finishing operations.

• ORGANIC SOLVENTS

Definition ...

The source is from finishing operations. Tanneries using solvent based degreasing processes (mainly sheepskins) have also organic solvent emissions requiring special abatement.

• HYDROGEN SULPHIDE

The chemistry of H₂S is pH dependent. H₂S can be formed in Deliming processes and Pickling processes and any time streams containing sulphides are mixed with acidic effluent. An important source of H₂S is often the ETP premises, especially in storage tanks and in anaerobic treatment if any.

• AMMONIA

Ammonia can be formed in Deliming processes and in Dyeing processes.

• ODOUR

Normally arises from degradation of organic matter or from chemical substances. From storing hides and skins, from beamhouse operation (the "concept" of odour is almost completely related to the emission of H₂S and Ammonia)

A FOCUS ON AIR EMISSIONS

Particulates



The majority of particulate emissions arise from dry processes such as milling, buffing and spray finishing operations.

Clean Technology Options

IN-HOUSE DUST EMISSIONS CONTROL (+++)

For the effective control of dust and to prevent fugitive emissions:

- Dust must be controlled at source
- Dust producing machine/operations should be grouped as much as possible
- Centralised collector and treatment system lower initial and running costs

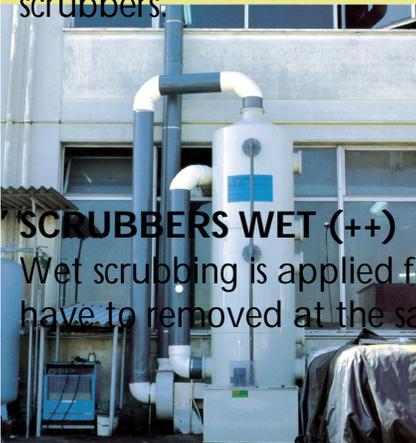
CYCLONES (++)

Allow efficient collection of most coarse and fine dust and have relatively low capital and running costs. May be utilized in combination with bag filters and scrubbers.



SCRUBBERS WET (++)

Wet scrubbing is applied for particulates especially if organic solvents and/or odours have to be removed at the same time



EXTRACTIONS FAN (+)

Centrifugal fans are often used. A focus has to be made on their efficiency which normally is max 50%.



A FOCUS ON AIR EMISSIONS

Organic Solvents



The source is from finishing operations. Tanneries using solvent based degreasing processes (mainly sheepskins) have also organic solvent emissions requiring special abatement.

Clean Technology Options

WATER SOLUBLE SOLVENTS (+++)

Best option to reduce the VOCs emissions alongwith solvent-saving finishing techniques.

SCRUBBERS WET (++)

Wet scrubbing is applied for particulates especially if organic solvents and/or odours have to removed at the same time

BIO FILTERS (+)

Among biological filter systems, bio-filters are increasingly used. Besides removing odours they can be used to oxidise organic solvents such as alcohol, ketones, esters and ethers. For reliable operation bio-filters requires a relatively high pollution load in the gas stream and is of only limited efficiency. The effectiveness depends on the vapour pressure of the solvents (or the mixtures). The condensate can be recycled or has to be disposed off.



A FOCUS ON AIR EMISSIONS

Ammonia and H₂S



The chemistry of H₂S is pH dependent. H₂S can be formed in Deliming processes and Pickling processes and any time streams containing sulphides are mixed with acidic effluent. An important source of H₂S is often the ETP premises, especially in storage tanks and in anaerobic treatment if any.

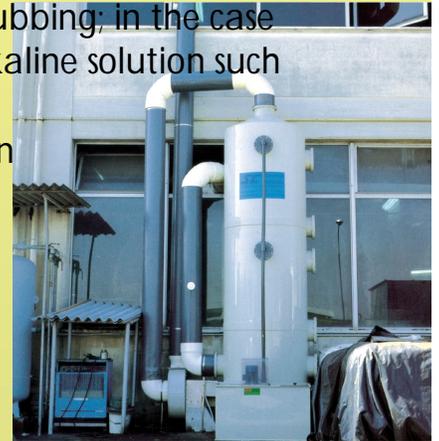
Ammonia can be formed in Deliming processes and in Dyeing processes.

Clean Technology Options

SCRUBBERS WET (++)

After all primary measures for ammonia and H₂S reuction have been used these substances are usually treated by good ventilation or by wet scrubbing; in the case of ammonia with acidic solutions and in the case of H₂S with alkaline solution such as NaOH.

For H₂S released into the wastewater refer to wastewater section



STANDARDS IN TANNERY WASTEWATER

The meaning of the main standards parameters utilized in wastewater characterization and their specific meaning in tannery.

The key-7 Parameters

 COD (Chemical Oxygen Demand) as mgO_2/lt

 Settable Solids as ml/l

 Suspended Solids as mg/lt

 Sulphides as $\text{mgS}^=\text{lt}$

 CrIII as mg/lt

 N-NH_3 Or N-NH_4 as mg/lt

 TDS (Total Dissolved Solids) as mg/lt

STANDARDS IN TANNERY WASTEWATER

The meaning of the main standards parameters utilized in wastewater characterization and their specific meaning in tannery.

The key-7 Parameters



COD (Chemical Oxygen Demand) as mgO₂/lt

It represents the Demand of Oxygen to oxidize Chemically al the oxidable substances being in dissolved, in suspension or as colloidal form in a sample of wastewater.

- Its way of expression is as mgO₂/lt.*
- Its ratio with BOD is in tannery wastewater:
BOD₅/COD = 0.5 to 0.6*
- Its ratio with SS is in tannery wastewater:
1 mg/l of SS = 0.8 to 1.1 mgO₂/lt of COD*
- Its testing can be done before and after filtration (on a 0.45um paper)
CODunfiltered: represent the strenght of a raw wastewater
COD filtered: represent the strenght of a pre-treated wastewater*
- With good approximation a CODfiltered is equal to BOD₅ of tannery ww*

STANDARDS IN TANNERY WASTEWATER

The meaning of the main standards parameters utilized in wastewater characterization and their specific meaning in tannery.

The key-7 Parameters



Settable Solids as ml/l

It represents the amount (as volume) of Solids which are settling in an Imhoff cone (1liter) after 1 hour

- Its way of expression is as ml/l.*
- It gives the amount of coarse solids present in raw wastewater*
- It provides with good approximation the information to establish the volume and surface of a pre-settling tank as well as of a Primary Sedimentation*

STANDARDS IN TANNERY WASTEWATER

The meaning of the main standards parameters utilized in wastewater characterization and their specific meaning in tannery.

The key-7 Parameters



Suspended Solids as mg/lt

It represents the amount of Solids which are stopped on a 0.45um paper filter. They are also call as Not-Filterable solids to differ them from the Filterable Solids

- Its way of expression is as mg/lt.*
- It gives the estimation in an indirect way of the Turbidity of the wastewater*
- It gives the amount of MLSS (Mixed Liquor Suspended Solids) when tested on a biomass sample from an oxidation tank*
- It gives the amount of MLVSS (Mixed Liquor Volatile Suspended Solids) when tested on a biomass sample from an oxidation tank, which are, with good approximation the estimation of the amount of live material (bacteria) present in a biomass system*

STANDARDS IN TANNERY WASTEWATER

The meaning of the main standards parameters utilized in wastewater characterization and their specific meaning in tannery.

The key-7 Parameters

Sulphides as mgS⁼/lt

It represent the amount of Sulphides present in a wastewater as S⁼. Sulphides are present in tannery wastewater due to their direct use in the process (as NaHS) as well as due to their release especially in Unhairing process due to their presence in the Hair Structure)

- Its way of expression is as mg/lt.*
- It represents an important estimation especially when designing an oxidation system due to their high demand of oxygen to be converted in Sulphates.*
- Sulphides is an health harming agent due to its toxicity and absence of smell when at high concentration*

STANDARDS IN TANNERY WASTEWATER

The meaning of the main standards parameters utilized in wastewater characterization and their specific meaning in tannery.

The key-7 Parameters



Chrome III as mg/lit

It represents the amount of Chrome as CrIII in tannery wastewater. It differs from CrTot and it has not to be confused with CrVI which is anymore present in tannery wastewater.

- Its way of expression is as mg/lit.*

STANDARDS IN TANNERY WASTEWATER

The meaning of the main standards parameters utilized in wastewater characterization and their specific meaning in tannery.

The key-7 Parameters



N-NH₃ Or N-NH₄ as mg/lit

It represents the amount of ammonia as NH₃ or as NH₄ present in wastewater. Ammonia is an agent which derives from direct use as well as development in the tannery process.

- Its way of expression is as mg/lit.*
- It represents an important estimation especially when designing an oxidation system due to its high demand of oxygen to be converted in Nitrate (NO₃) and to establish the criteria of designing of a Nitro-Denitro system*

STANDARDS IN TANNERY WASTEWATER

The meaning of the main standards parameters utilized in wastewater characterization and their specific meaning in tannery.

The key-7 Parameters

TDS as mg/lit

It represent the amount of Total Dissolved Solids in wastewater.

- Its way of expression is as mg/lit.*
- With good approximation it gives an estimation of the amount of salts which are dissolved in wastewater*
- Its value may be derived by the measurement of Conductivity as uS/cm*

STANDARDS IN TANNERY WASTEWATER

Examples of Standards Values in Tannery Wastewater

From Raw to Finish (value after Screening)	
CODunfiltr.	7250 mg/lit
CODfiltr.	4000 mg/lit
Settleable Solids	90 ml/lit
SS	3000 mg/lit
Sulphides	250 mg/lit
CrIII	80 mg/lit
N-NH3	120 mg/lit
TDS	8000 mg/lit

From WB to Finish (value after Screening)	
CODunfiltr.	3500 mg/lit
CODfiltr.	2500 mg/lit
Settleable Solids	20 ml/lit
SS	900 mg/lit
Sulphides	nil
CrIII	45 mg/lit
N-NH3	60 mg/lit
TDS	6500 mg/lit

STANDARDS IN TANNERY WASTEWATER

Examples of Standards Values in Tannery Wastewater

From Crust to Finish (value after Screening)	
CODunfiltr.	3000 mg/lt
CODfiltr.	1500 mg/lt
Settleable Solids	45 ml/lt
SS	2000 mg/lt
Sulphides	nil
CrIII	nil
N-NH3	15 mg/lt
TDS	2100 mg/lt

From Raw to WB (value after Screening)	
CODunfiltr	8500 mg/lt
CODfiltr	5000 mg/lt
Settleable Solids	20ml/lt
SS	4000 mg/lt
Sulphides	250 mg/lt
CrIII	120 mg/lt
N-NH3	100 mg/lt
TDS	6500 mg/lt

PRACTICAL CASES

- CHROME RECOVERY – Technology Application

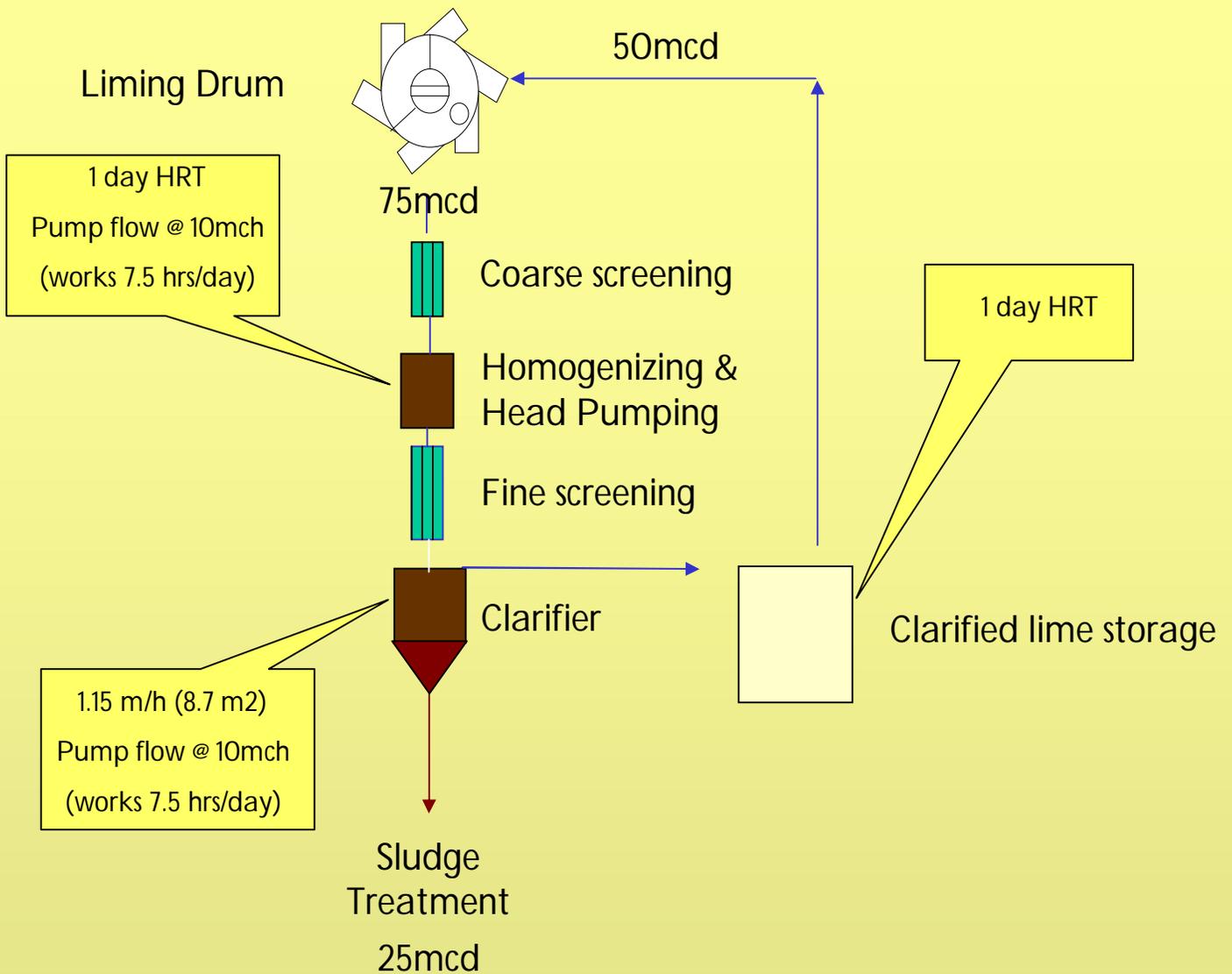
The technique allow a reuse of the spent liquors after decantation and/or filtration to separate sludge containing lime, fat, proteins and then recharging with chemicals according to the recipes. The nr of recycling steps depends on the efficiency of the clean-up process for the spent liming liquor and on the desired level of quality of the leather. The liquor may be reused upto 30 times. Sludge produced may be reused in agriculture. The procedure allow huge savings of water, sulphide and lime.

IT IS GIVEN THE CASE OF A 25,000KG SKINS/DAY PROCESSED
WATER @ 300% → 75M3/DAY

Chemicals	Initial Float	Residual Float
Na ₂ S	3.0%	1.5%
Ca(OH) ₂	2.0%	1.2%
TKN		0.5%
NaCl		0.8%
Fat material		0.35%
pH	12.8	12.7
COD		60.4g/lt
Suspended Solids		42.9 g/lt

- 50% reduction of initial Na₂S
- 40% reduction of initial Ca(OH)₂
- Huge load of COD and SS

Technology Application



Economy Balance

Na₂S 3% x 25000 kg/day = 750 kg/day -50% =

375 kg/day Recovered in the system

375 x 30 = 11,250 kg/month @ ...Rs/Kg = Rs/month Save

PRACTICAL CASES

- CHROME LIQUOR RECYCLING – Technology Application

Best option especially in case of medium-large size firms. After collection, screening and storage, the floats are precipitated with different types of coagulants including sodium hydroxide (NaOH), sodium carbonate (Na₂CO₃), magnesium oxide (MgO). A flocculation with polyelectrolite may follow. A dewatering system of the chrome sludge may also follow. A 90% recovery of the discharged chrome may be achieved

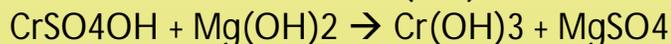
IT IS GIVEN THE CASE OF A 25,000KG SKINS/DAY PROCESSED
WATER @ 150% → 26.5M³/DAY

GIVEN AN AVERAGE CONTENT IN THE EXHAUSTED BATH OF
4 g/lit as Cr₂O₃

THEORETICAL AMOUNT OF CHROME TO BE RECOVERED IS
106 kg/day

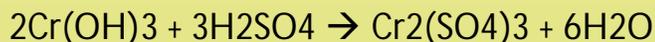
Reaction involved are for

PRECIPITATION OF THE RESIDUAL CHROME

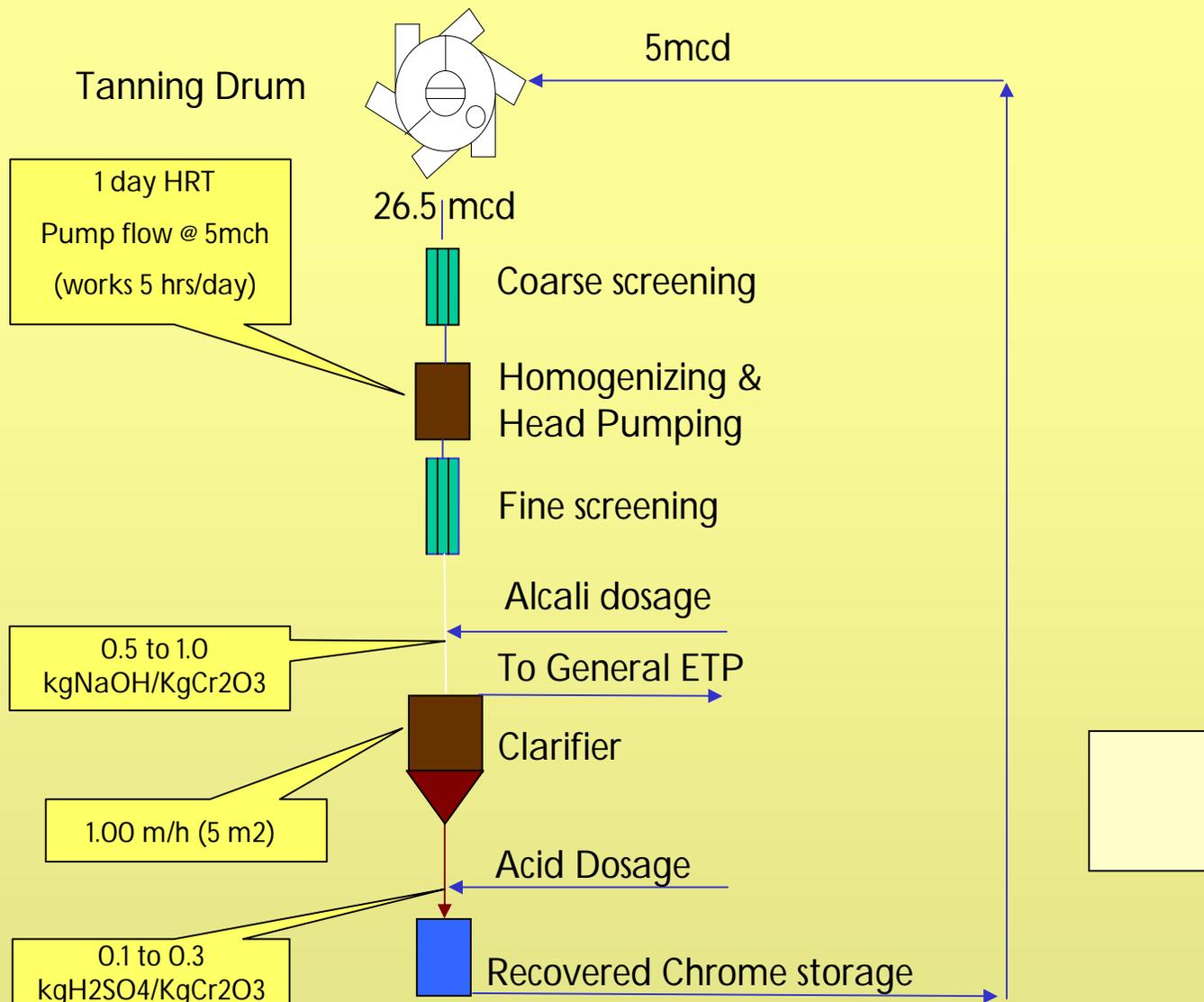


The precipitation occurs at pH values among 8.0 to 8.5

REDISSOLUTION OF THE PRECIPITATED CHROME



Technology Application



Economy Balance

Na2S 3% x 25000 kg/day = 750 kg/day -50% =

375 kg/day Recovered in the system

375 x 30 = 11,250 kg/month @ ...Rs/Kg = Rs/month Save

A FOCUS ON SOLID WASTE



Fleshings collected at a Fleshing Processing Unit

A FOCUS ON **SOLID WASTE**

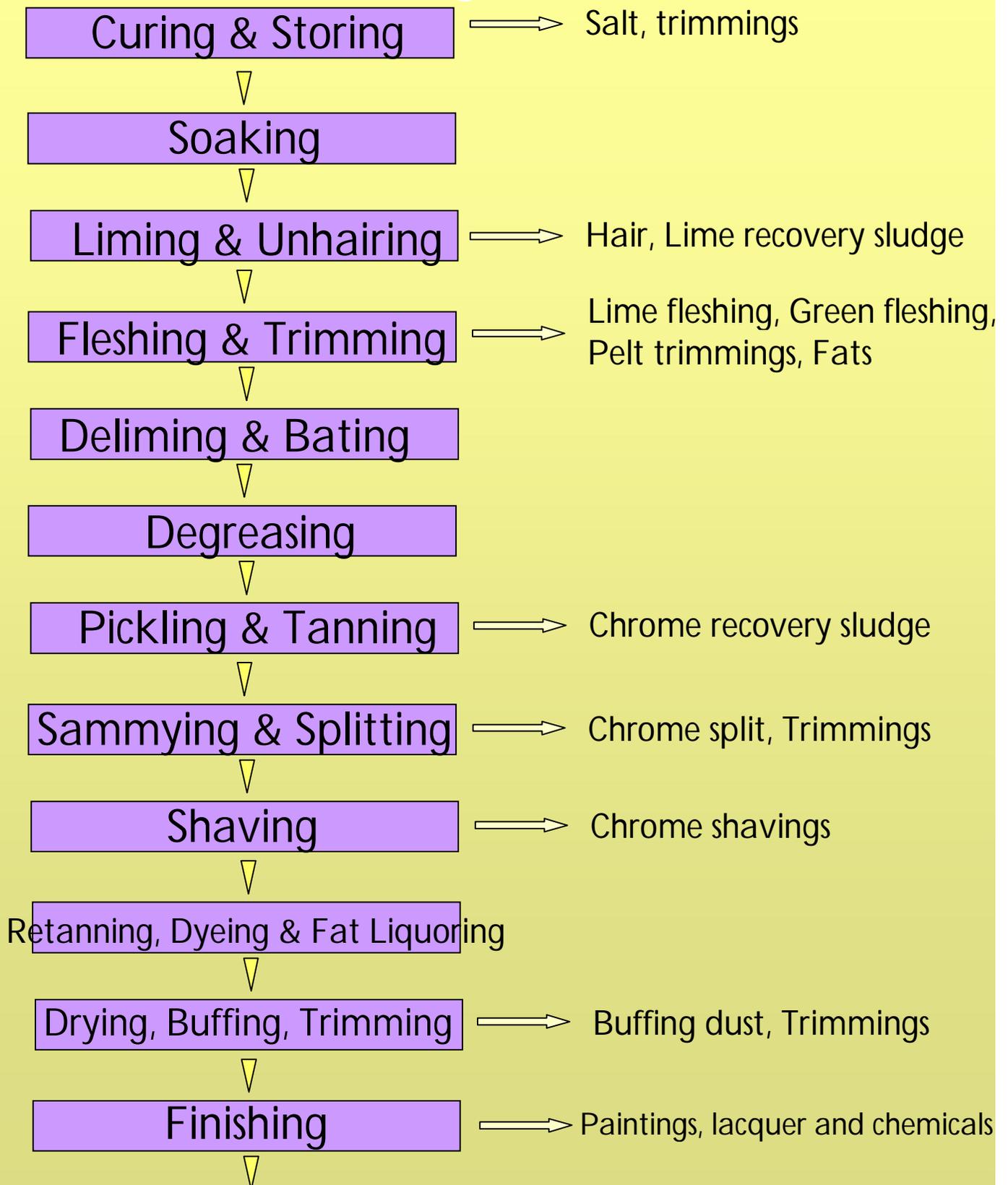
Only 20-25% of the weight of the raw hide is processed to leather, depending on, among other things, the animal species and product specification. The rest of the weight plus the chemical input end up as either waste or by-products, assuming that emissions are not discharged by wastewater.

Nature of residue solids may be resumed as:

- **SALT**
- **HAIR or WOOL**
- **TRIMMINGS**
- **FLESHING**
- **SPLITS**
- **SHAVINGS**
- **FATS & GREASE**
- **WASTE MACHINERY OILS**
- **SLUDGE FROM WWTP**
- **SOLIDS FROM AIR ABATEMENT**
- **PACKAGING MATERIAL**

From the technical point of view, further treatment, re-use or disposal options depend on the contamination the respective waste fraction carry. This contamination and the amounts of waste might vary significantly according to the process chosen for tanning or wastewater treatment

SOURCE OF SOLID WASTES IN LEATHER PROCESS categories



SOURCE OF SOLID WASTES IN LEATHER PROCESS distribution

Wastes fractions are separated or merged in different ways depending on the options for re-use/recycling and disposal.

Data for the percentage of various wastes fractions with respect to the total waste production for salted bovine hide are compiled in the table below.

	% on raw hides weight
Trimmings from raw hides	2 – 5
Lime fleshing	10 – 40
Lime split and pelt trimmings	10 – 20
Chrome shavings	20 – 30
Chrome split	
Chrome leather trimmings	
Buffing dust	0.2 – 1.0
Painting, laquer and other chemicals	0.5
Sludge from wwtp	40 – 50
Packaging	1.5

MASS ESTIMATION INPUT/OUTPUT

INPUT

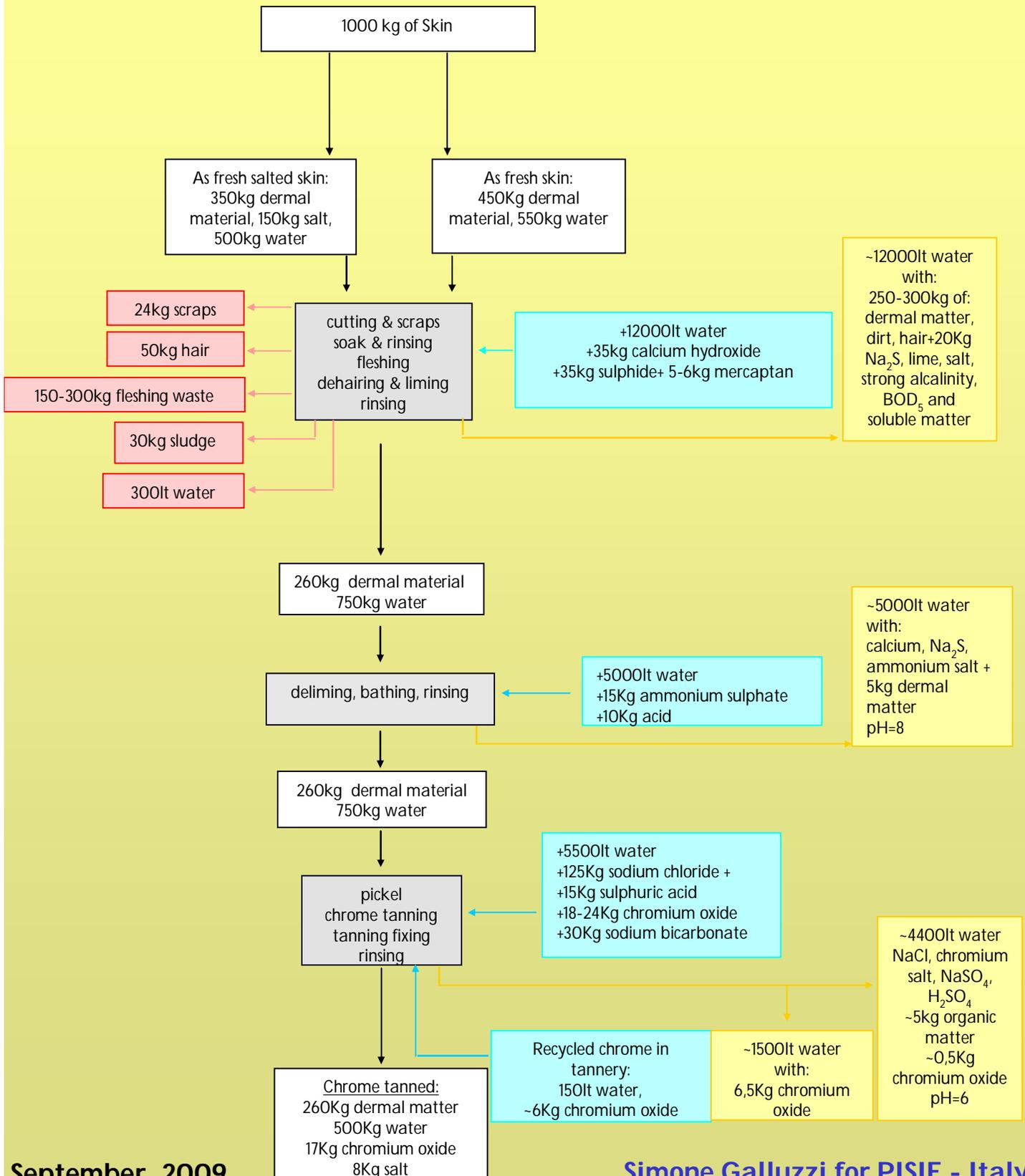
OUTPUT

Raw Hide 1 Ton	Leather 200 – 250 kg	
Water ~ 15 – 50 m3	Water ~ 15 – 50 m3	COD 230-250 kg BOD ~ 100 kg SS ~ 150 kg Chrome ~ 5-6 kg Sulphide ~ 10 kg
Energy 9.3 – 42GJ		
	Solid waste ~ 450 – 730 kg	Trimmings ~ 120 kg Fleshings ~ 70-350 kg Splits ~ 225 kg Shavings Dust ~ 2 kg Sludge(40%ds) ~ 500 kg
Chemicals ~ 500 Kg		
	Air ~ 40 kg	Organic Solvents

MASS BALANCE IN LEATHER PROCESSING

- A REAL CASE -

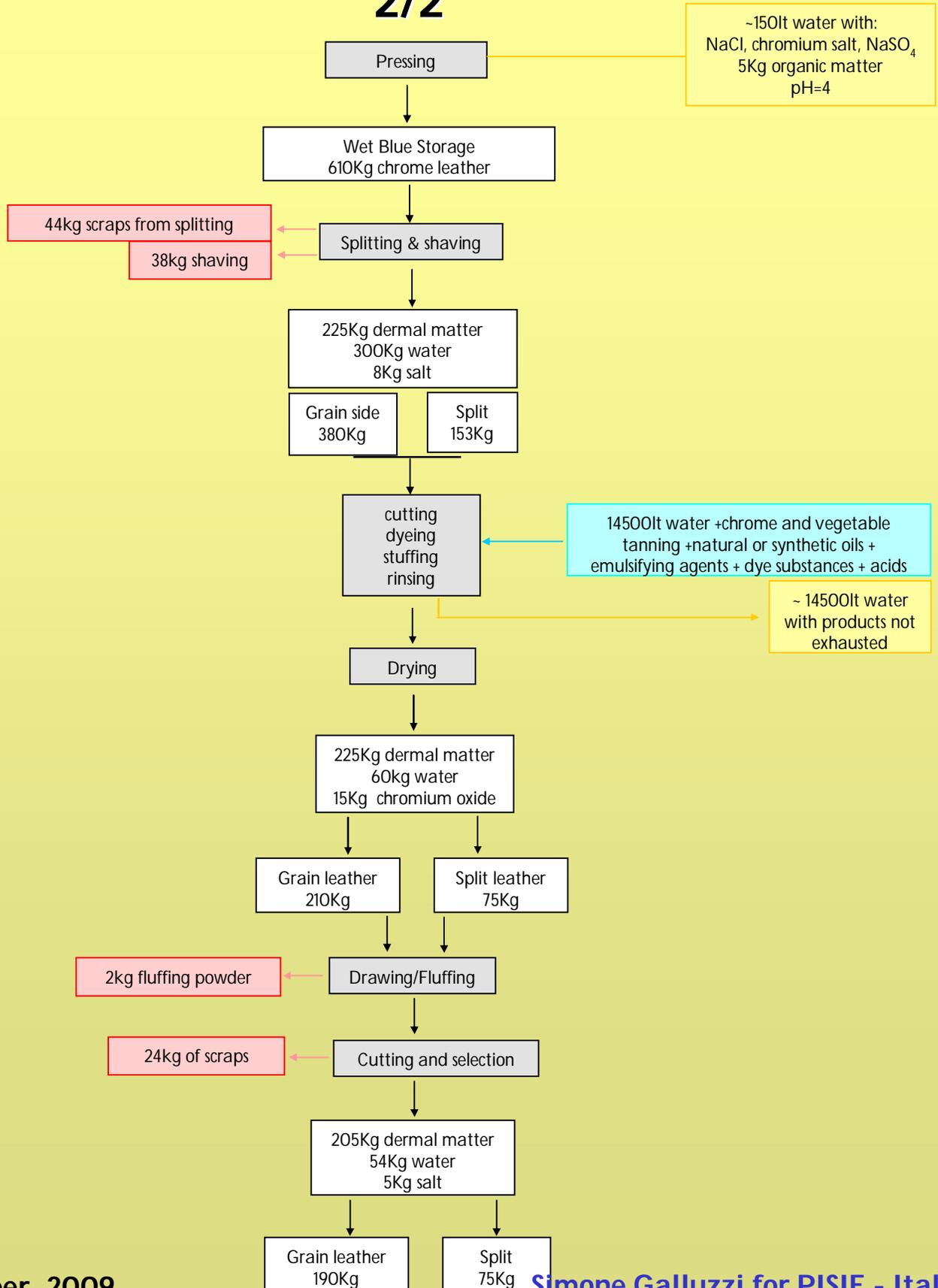
1/2



MASS BALANCE IN LEATHER PROCESSING

- A REAL CASE -

2/2



A FOCUS ON SOLID WASTE - Fleshing -

Fleshing may represent from 15 to 30% of the initial raw hide weight (ie 150-300 kg on 1000 kg raw weight), its chemical composition consists of water, fat, proteins (containing impurities due to the treatment of the leather with lime), sulphides.

Nature & Analysis of the solid waste

A Standard composition is as:

- 10% about of fat
- 7% of proteins
- 2% of not nitrogenous substances
- 8% of mineral salts
- Remaining is water

The mineral salts are, mainly, calcium salt and sodium, the first one added as an oxide in the liming operation, the second one coming from the salting of the leather. This composition represents anyhow an average indication as the various origins of the hides and the different pre-treatments make very variable the fleshing produced, especially with regard to the contents of fat and the residual chemical agents used

Clean Technology Options

•FLESHING FOR CONCRETE/ BRICK PRODUCTION (+)

The elimination of fleshing through the production of cement or bricks, even if possible, has to be considered as a waste of by-products. This utilization could be justified in case for some reasons there is a content of heavy metal or harmful substances which are not allowing the reuse of proteins and grease for food/agriculture industry.

•COMPOSTING (+)

The mixtures of fleshing and wood sawdust, while fermenting, has given raise to a good quality product, to be used profitably for agricultural purposes as it could also contain some microelements, very important for the plants growth. The contribution of undesirable elements would be scarce or null as this type of composting is coming from fleshing (a natural, organic product of an animal origin) and wood (also an organic material of a vegetable origin). This type of elimination needs a long time to allow the fermentative exothermic process, necessary for the stabilization of the composting, so that it is not applicable to so high quantities produced per day.

A FOCUS ON SOLID WASTE - Fleshing -

Fleshing may represent from 15 to 30% of the initial raw hide weight (ie 150-300 kg on 1000 kg raw weight), its chemical composition consists of water, fat, proteins (containing impurities due to the treatment of the leather with lime), sulphides.

Clean Technology Options

•PROTEIN AND FAT EXTRACTION (++)

Fleshing consists of substances having a good economic value: fat and proteins extraction of these products is industrially and commercially viable especially when the amount of fleshing is above 100 Ton/day. Under specific operations and practices it is possible to achieve the extraction of Purified Proteins to be sold as animal food and Purified Fat for soap industry.

•FLESHING DEWATERING BEFORE REUSE (+++)

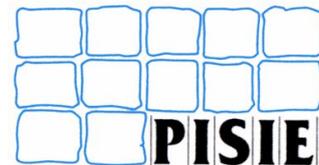
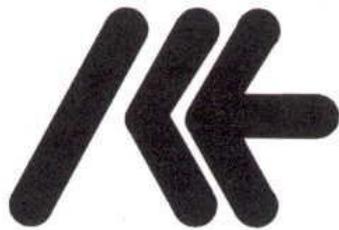
Whatever is the choice for reusing the fleshings byproducts a high concern is on its initial content of water which may vary from 55 to 75% and which represent the most influential characteristics for the reuse.

There are suitable recent technologies to allow a maximum reduction in water content in the fleshing which have a justification especially when the tannery is part of a cluster system and is paying (on weight basis) for disposing this by-product

**TRAINING COURSE FOR
TANNING MANAGERS AND ENTREPRENEURS
FROM SYRIA**

10 - 15 October 2010

Project PISIE n. 10-015



POLITECNICO INTERNAZIONALE PER LO
SVILUPPO INDUSTRIALE ED ECONOMICO

Workshop on “Eco Label Footwear”
(C. Milone)



ECOLABEL

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1. Market Access Requirements: Environmentally sound production

Environmentally sound production

Market access requirements on environmental issues might lead to activities aiming to reduce the damage of production to the environment; i.e. environmentally sound production. Although many requirements are set for the products traded within the EU borders, it still might be necessary to change production processes in order to comply with the products standards. These adaptations can vary from very radical (new technology) to hardly radical (based on the same technology and good-housekeeping). An example of a radical solution is ecodesign. This means that products are redesigned to make them less polluting in the process and easier to recycle in the consumer stage. While starting with environmentally sound production, non-radical measures are preferred. The simple measures often can reduce environmental damage against low costs.

Cleaner production

In respect to environmentally sound production, the term cleaner production is often used. Cleaner production depends only partly on new or alternative technologies. It can also be achieved through improved management techniques, different forms of work organisation and other 'software' approaches to products and processes. Cleaner production is as much about attitudes, approaches and management as it is about technology. That is why it is called cleaner production and not cleaner technology.

Cleaner production focuses on the causes of problems: pollution prevention by eliminating waste and emissions at the source. Ecodesign focuses on redesigning products to make them less polluting and easier to recycle. Both applications are the key to ecologically sustainable development.

Contents

Environmentally sound production requires the continuous application of an integrated preventive environmental strategy to processes and products, with a view to reducing risks to humans and the environment. There are no geographical or economical barriers: it is an objective approach to balancing maximum economic advantages with minimal environmental damage.

In general there are three types of measures to reduce production's impact on the environment:

- source-oriented measures
- process-integrated measures
- end-of-pipe measures

The first two are generally referred to as “cleaner production measures”, and form a preventive approach to reduce pollution and resource inefficiencies. An important feature of this category of environmental measures is that their application not only benefits the environment, but also generates financial gains for the company concerned.

- Source-oriented measures focus on the source of environmental pollution. For instance, by choosing the appropriate chemicals, or avoiding the use of chemicals altogether, environmental problems such as highly contaminated waste water can be prevented.
- Process integrated measures focus on improving production processes with a view to reduce contamination and / or improve resource use efficiency. In the case of good-housekeeping measures, the changes do not require investments, but in many cases technological improvements will have to be made. Examples are water and energy conservation, optimization of the process, and equipment modifications. The economic advantages gained by source-oriented and process-integrated measures are twofold: they reduce both the costs of production and the need for costly waste and pollution control facilities. At the same time, negative health and environmental impacts on workers and the surrounding community are reduced.
- End-of-pipe measures are the last option to be applied. In spite of the potential of the preventive approach to industrial pollution, treatment of waste and emissions will often still be necessary. This type of measure is the so-called end-of-pipe treatment. Important fields for environmental end-of-pipe measures are industrial waste water, air pollution and solid waste.

The importance of environmentally sound production

Industries in developing countries, as well as their European counterparts, will have to respond to ever changing and existing environmental pressures for governments as well as the market itself and therefore may well have to transform their management and production styles. This requires new approaches in companies, ranging from new management and employee awareness and commitment to integrate environmental issues fully into the production process, product development, and research and market strategies of the company.

Many companies are already improving process efficiency, including waste minimisation, and energy, water, and (raw) materials efficiency. The next steps are towards a more integrated approach of cleaner technologies and the production of more environmentally acceptable products.

Companies and sectors may find the need to completely re-orientate their activities, becoming joint manufacturing and service companies, with much greater integration and the development of a new set of sectoral and industrial alliances.

Industrial development through imported technology and concentration of small locally based industries in developing countries, has led to the introduction of uncontrolled and unknown wastes into the environment in liquid, solid and gaseous forms. The countries are facing the dilemma of whether to pursue economic development irrespective of environmental destruction to catch up with the industrialised countries, or to pursue an ecologically sustainable industrial development that combines economy and ecology. It is now widely acknowledged that developing countries are experiencing environmental problems that were unknown 20 to 30 years ago.

Experience in both developed and developing countries shows that environmentally sound production not only results in a cleaner environment, but also in substantial savings for industry and society. Some cleaner production measures do not even cost a single coin! If investments are needed, the savings achieved in terms of material and labour costs are often more than sufficient to offset initial higher investment costs. It is estimated that 70% of all current wastes and emissions from industrial processes can be prevented by the use of technically sound and economically profitable procedures.

Of course the environmentally sound production technologies cannot be transferred uncritically from industrialised countries to developing countries. But the used methods can!

What is needed?

Cleaner production is neither a complex nor a technically involved subject. In fact you may feel that it is too simple to be pursued and some results can be achieved even through a casual approach. However, to realise the full benefits of cleaner production, three important issues have to be taken care of:

Management Commitment

A successful Cleaner Production Programme demands a strong commitment. It would mean direct involvement and supervision and, most important, conviction. Seriousness has to be reflected in programmes and actions and not merely in words.

Operator's involvement

While involvement in decision making and propelling cleaner production activities is essential, ultimately the shop floor work has to be carried out by operators and supervisors. It is important that, right from the stage of formulating and launching a Cleaner Production Programme, the operators are actively involved. The involvement and innovativeness of operators is of great help in identifying and implementing measures for cleaner production. Incentive schemes, bonuses, rewards and other forms of recognition can be introduced to motivate employees and stimulate them to cooperate and participate.

Organised approach

For cleaner production to be effective and sustaining, it is essential that an organised approach is formulated and adopted. Initially it may be alluring to work on piecemeal basis, as the immediate benefits might be more appealing. However, the interest soon drops and long-term sustainable benefits are not realised. If some time and effort are spent to establish the organised approach, it will certainly pay back in the longer run. An organised approach in assigning responsibility, fixing targets, reviewing progress and timely implementation would enable to establish the programme as a continuous activity and develop a culture of 'doing better'. It can also help in drawing assistance from state sponsored schemes.

The benefits

Cleaner production offers several other benefits apart from reducing the requirement of resources as raw material, water and energy. The other benefits that cleaner production offers are:

Improvement of work environment

Cleaner production helps to improve the shop floor environment leading to higher efficiency and better working relations, because:

- o plant appearances are better
- o workers health problems are reduced
- o spillages are reduced

Quality improvement

The importance of quality and cost reduction needs no emphasis. There are many instances where cleaner production has directly led to improvement in quality of processed products.

Image

Cleaner production reflects and improves the overall image of the company. Company's image in the eyes of the public and regulatory bodies is improved. Its image becomes more environmentally sound.

Compliance

Environmental regulations are becoming tighter and often result in increased end-of-pipe treatment costs. Audit schemes also require companies to provide information regarding energy, waste and material use as well as waste and waste water generation. Cleaner production helps to cope with these problems and helps in optimising the production process and meeting the increasing quality demands (especially for export markets), at the lowest possible cost. In the future, more and more products have to be certified as having been produced in an environmentally sound way.

New market opportunities

Environmentally conscious product development is of particularly great economic importance: there is a growing demand for 'green' products in both professional and consumer markets. Moreover, environmental legislation governing both domestic and foreign products has an effect on the competitiveness of trade and industry. The growing demand for green products offers new opportunities to those businesses, which are able to take advantage of this trend through the timely introduction of innovations.

The knowledge and experience gained in the field of environmentally conscious product development can also be exported. This is an attractive financial proposition for industry, research agencies and consultants.

Environmental cost reduction

The effluent streams become smaller and less contaminated and can be treated in simpler and lower cost treatment plants, which results in:

- reduced energy consumption in treating waste
- amount of chemicals required for treating waste are reduced
- reduced manpower and equipment requirements for on-site pollution control and treatment
- area required for waste treatment and disposal is reduced
- waste disposal cost is reduced

2. International management system: ISO 14000 on environmental management

In brief

ISO 14001:2004 (hereafter referred to as ISO 14001) is by far the most widely used environmental management system (EMS) worldwide. It is part of the ISO 14000 series which addresses environmental management; ISO 14001:2004 provides the requirements for an EMS and ISO 14004:2004 gives general EMS guidelines.

The ISO 14001 standard can be implemented in all kinds of companies and organisations, regardless of size, public or private and sector. This broad scope is achievable because of the focus of ISO 14001, which is to provide a framework for a strategic approach to environmental policy, plans and actions, rather than specifying levels of environmental performance which would have to be product specific.

Market impact

The number of companies that are ISO 14001 certified is growing each year. The latest figures made available by ISO are for the year 2006, which show that almost 130 000 certificates had been issued in 140 countries and economies. This represented a growth of 16% compared to the year before.

Want to know more about the market impact in your sector?

Check out the websites of large companies in your sector and see what they do. Most companies report about ISO 14001 and other management systems on their websites. If you can't think of companies in your sector, check out relevant buyer requirements and market surveys in this database!

The certified companies operate in a range of industry sectors and service sectors. In some sectors, ISO 14001 does no longer provide an added value, but has rather become a prerequisite for finding international buyers. In other sectors, ISO 14001 certification could still provide an advantage above competitors.

For more information on the use of ISO 14001, please refer to the ISO survey for the year 2006 which you can find in the external links section.

Content

ISO 14001 provides a framework for introducing an EMS. An essential part is the aim for continuous improvement. It is a tool enabling an organization of any size or type to:

- **identify** and control the environmental impact of its activities, products or services, and to
- **improve** its environmental performance continually, and to
- implement a **systematic approach** to setting environmental objectives and targets, to **achieving** these and to **demonstrating** that they have been achieved.

For more information on ISO 14001, please refer to the ISO website. You can find a link in the external links section.

ISO 14001 can be implemented in combination with other management systems such as ISO 9001 on quality and OHSAS 18001 on occupational health and safety.

Monitoring

ISO does not require external certification, but in order to prove compliance to clients it may still be needed. In this case, the ISO 14001 system has to be certified by an authorised certifying body (such as Lloyd's, Veritas and SGS). A certificate is valid for three years. In order to maintain the certificate, regular audits, both internal (1-2 times per year) and external (2 times per year), are needed.

Costs

The cost of certification varies from one organisation to another, depending on factors such as the size and complexity of the organisation, the actual state of implementation of the EMS, the attitude and commitment of the top management, etc. If you are interested in knowing more about certification costs, it is advisable to contact a certification organisation for more information.

Organisation

ISO, International Organization for Standardization, is a network of national standards institutes from 157 countries. The central secretariat is based in Geneva. Its members are organisations from both the public and the private sector.

3. EU environmental label: eco-label for footwear

In brief

The EU Eco-label Award Scheme is the eco-label of the EU1. The label sets requirements for each product on the basis of a "cradle-to-grave" assessment of the environmental impact of the product group. This means that the complete life-cycle of a product is analysed, starting with the extraction of the raw materials, progressing through the production, distribution and use phases and ending with disposal after use. The label is awarded only to those products with the lowest environmental impact in a product range. Products need certification before they can be labeled with the eco-label.

This document presents an overview of the established environmental requirements of the EU eco-label for footwear. More specific criteria for footwear are given in Decision 1999/179/EC under the footwear category.

When to check the requirements of the eco-label

- Your EU buyer requests this label - so you will have to comply with the criteria and certify your footwear.
- You see a niche market for an eco-labelled product and you decide that eco labelling is a market strategy to follow.
- Your EU buyer prefers suppliers that include environmental issues in their production process. You can use the requirements of this eco-label to check and improve your own environmental performance. Therefore, the requirements can be used for your own business without considering the label and certification. European buyers do not always request certification, but might support the environmental criteria set.

Market impact

Although the EU label could be applied to many products, not so many companies are using the logo. Of the 440 companies awarded with an Eco-label there are 19 that produce footwear. These companies are located in Italy (15), Sweden (3) and Spain (1). However, considering the fact that some EU buyers might be interested in environmental issues, the environmental criteria might still be relevant without certification of the complete eco-label.

Outline of the eco-label criteria

I. Scope

The eco-label for footwear applies to all categories of shoes, including sports shoes, occupational, children's, men and women's town, specialist shoes for cold, casual, fashion and indoor. The environmental criteria of the eco-label require a series of scientific studies to be carried out that evaluate the environmental impact of each phase of the footwear life cycle.

During this analysis of the footwear life cycle all factors that are susceptible to affecting the environment are taken into account, beginning with raw materials that make up the final product, passing through the manufacturing process, distribution, use and final disposal. Energy consumption, natural resources used, emissions, waste, etc. must also be taken into account.

II. Criteria

The ecological criteria are also a result of a broad survey in the European Union Eco-labelling Board (EUEB) integrated by professionals from all the interested parties; Member States, environmental NGO's, consumer and industry associations, trade unions, SME's and commerce.



The flower logo is also accepted and present in those countries, which are signatories to the EEA Agreement (Norway, Iceland and Liechtenstein).

The criteria proposed by the EUEB must be approved by the state members and the European Commission before they can be used as requirements to award the European eco-label.

In the concrete case of footwear, the main objective pursued by the ecological criteria is to encourage limitations in the levels of toxic residues, in the emissions of volatile organic compounds and to encourage the production of more durable products. To summarise it is based on:

1. Residues in the final product

The use of the following substances is limited: chromium (VI), arsenic, cadmium and lead in the final product, as well as the amount of free formaldehyde in textile and leather components. Moreover, the testing methods for these substances are determined as well.

2. Emissions from the production of material

Special requirements for the treatment and disposal of waste water from leather tanning sites and from the textile industries exist.

3. Use of harmful substances (up until purchase)

The use of several harmful substances (pentachlorophenol, tetrachlorophenol, azo dyes that may cleave in certain aromatic amines, N-nitrosamines, chloroalkanes C10-C13) is prohibited.

4. Use of volatile organic compounds (VOCs) during final assembly of shoes

The use of volatile organic compounds (VOCs) is limited.

5. Use of PVC

Prohibiting the use of non-recyclable PVC in footwear. Recyclable PVC, however, can be used in outsoles.

6. Energy Consumption

The applicant is requested on a voluntary basis to provide detailed information on the energy consumption per pair of footwear.

7. Electric components

The use of electric or electronic components in footwear is prohibited.

8. Packaging of the final product

If cardboard boxes are used for the final packaging of footwear, they shall be made from a minimum of 80% recycled material. If plastic bags are used for the final packaging of footwear, they shall be made from recycled material.

9. Information on the packaging

The products should be marked with relevant user information related the EU eco label and its related product groups, the use and maintenance of the product and the recycling and disposal of

the product. The information also should include the following text: “ *for more information visit the EU Eco-label website: <http://europa.eu.int/ecolabel>”.*

10. Information appearing on the eco-label

The eco-label shall contain the following text:

- low air and water pollution,
- harmful substances avoided.

11. Parameters contributing to durability

The durability of a product translates into a lower quantity of waste that has to be properly dealt with for their elimination. Therefore, footwear awarded with the European Eco-label assures consumers that they are using footwear that fulfils certain durability requirements.

Organisation

Each EU Member State has established a Competent Body for the label. An application is done by contacting the EU Competent Body in the country of the origin of the product. If the product originates outside of the EU, such as from developing countries, one should present the application to a Competent Body in any one of the Member States in which the product is to be or has been placed on the market.

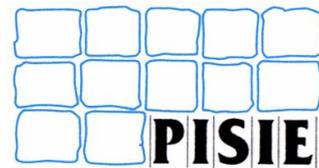
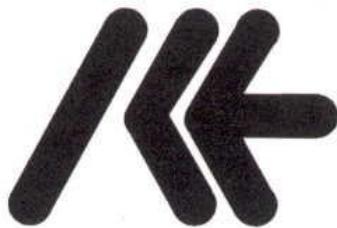
Monitoring

The ecological criteria are valid for a period of two to five years. Once this period is completed, the criteria are revised to eventually make them more restrictive, in this case in terms of market evolution and scientific and technological progress, to also improve the ecological efficiency of the product that carries the Eco-label.

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TANNING MANAGERS AND ENTREPRENEURS
FROM SYRIA**

10 - 15 October 2010

Project PISIE n. 10-015



POLITECNICO INTERNAZIONALE PER LO
SVILUPPO INDUSTRIALE ED ECONOMICO

**Workshop on “Tanning Technology”
(A. Favazzi)**

TANNING-TECH 2008

**ELENCO DI PRESENTAZIONE DELLE MACCHINE,
DELLE ATTREZZATURE E DEI SISTEMI, DELLE TECNOLOGIE
E DEI PRODOTTI CHIMICI PER CONCIERIA**

***LIST OF EXHIBITED MACHINES, EQUIPMENT AND SYSTEMS,
TECHNOLOGIES, CHEMICALS FOR THE TANNING INDUSTRIES***

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AREA 1	Rinverdimento, Concia e Tintura <i>Liming, tanning, dyeing</i>
<p>ALPE SPA OFFICINA MECCANICA Pad. 35 Stand C35-D34</p>	<p>Mod. MATRIX</p> <p>Rasatrice disponibile nelle luci di lavoro 3200, 3000, 2500, 1800 mm, di recente progettazione e con struttura e trave affilatore in un unico robusto monoblocco.</p> <p><i>Shaving machine available in the versions 3200, 3000, 2500, 1800 mm, manufactured with the actual technologies and with structure and grinder cross beam in a single welded fabrication.</i></p>
<p>ALPE SPAK SRL Pad. 35 Stand C35-D34</p>	<p>Mod. SUPREMA</p> <p>Spaccatrice 3150 mm con sistema brevettato per l'estrazione degli scarti di pelle tra lo schienale e il rullino senza necessità di fermare la macchina e togliere i rullini stessi.</p> <p><i>Splitting machine 3150mm with patented system for the extraction of leather's waste between the scraper and the ring roller, without necessity to stop the machine and to remove the ring rollers.</i></p>

AREA 1**Rinverdimento, Concia e Tintura**
Liming, tanning, dyeing**GEMATA SPA**

Pad. 35

Stand A5-B8

Mod. STARCOLOR

Macchina ad immersione per eseguire la riconcia e/o la tintura delle pelli in modo continuo. I vantaggi significativi che si ottengono utilizzando la Starcolor in alternativa al tradizionale bottale sono:

- Possibilità di tingere o riconciare anche piccole quantità di pelli e campionature.
- Riduzione drastica del consumo di acqua e conseguente riduzione impatto ambientale.
- Possibilità di disporre di un processo di riconcia e tintura molto più rapido del tradizionale.

Altre caratteristiche riguardano:

- Spreader per l'introduzione delle pelli.
- 2 vasche di prodotto per l'immersione delle pelli con livello costante + 1 di raccolta.
- 1 coppia di rulli spremitura in acciaio dopo la 1° immersione.
- 1 coppia di rulli spremitura gommati con carico variabile dopo la 2° immersione.
- 2 nastri trasportatori a rete con centraggio automatico.

Dip retanning machine designed to perform the leather re-tanning and/or dyeing with a through-feed process. The main advantages to be achieved by using the Starcolor in alternative to the traditional drum are:

- *Possibility to dye or re-tan even small quantities of leather and samplings.*
- *Less water consumption, higher environmental benefits.*
- *The re-tanning and dyeing process is much more rapid than the traditional one.*

Technical features:

- *Spreader for feeding hides.*
- *2 product tanks for dipping the hides with constant level + 1 collection tank.*
- *1 pair of steel press rollers after 1st immersion.*
- *1 pair of rubber press rollers with variable load after 2nd immersion.*
- *2 net conveyor belts with automatic centering system.*

AREA 1	Rinverdimento, Concia e Tintura <i>Liming, tanning, dyeing</i>
<p>RIZZI SPA Pad. 35 Stand A37-B38</p>	<p>Mod. ZETA</p> <p>Macchina elettro-idraulica per la spaccatura di pelli in trippa, cromo e secco completamente riprogettata per dare maggiori prestazioni di lavoro, minore manutenzione e grande semplicità d'uso per l'operatore. La macchina è dotata di estrattore incorporato per la lavorazione in trippa.</p> <p><i>Electro-hydraulic machine suitable for splitting in lime, wet blue and dry leather. Completely studied respect the previous model in order to grant best results, less wear and easier to be used for the operator. Machine equipped with take off device in case of splitting operation.</i></p> <p>Mod. BXR</p> <p>Macchina a rasare della famiglia FLAMAR per pelli intere in cromo e secco. Rivista e riprogettata per dare maggiori prestazioni di lavoro, minore consumo, minore usura lame, minore manutenzione e facile utilizzo per l'operatore.</p> <p><i>Shaving machine, FLAMAR type, suitable for whole chrome and dry leather. Completely studied respect to the previous model in order to grant best results, less wear and easier to be used for the operator.</i></p>
<p>VALLERO INTERNATIONAL SPA Pad. 35 Stand C11-D10</p>	<p>Mod. SYNTHESIS</p> <p>Bottale in materiale plastico senza saldature, monolitico. Interno del bottale estremamente liscio garantiscono versatilità e flessibilità nell'uso del colore. Materiale ecologico, riciclabile al 100%.</p> <p><i>Drum in plastic material made without welding all in one piece, monolythic. Perfectly smooth in the drum interior: versatility and flexibility. Colour proof for a very flexible use. Environmental friendly: 100% recyclable.</i></p>

AREA 2	Prefinitura e Rifinitura <i>Prefinishing and Finishing</i>
AF SRL Pad. 35 Stand A25-B26	Mod. AF 1600 Macchina intagliatrice e foratrice per effetti di taglio e foro programmabili da PLC. <i>Cutting machine and punching machine for cut and punch effects programming from PLC.</i> Mod. AF FOIL COBRA 1800 Macchina per applicazione carta e stiratrice adatta a ogni tipo di applicazione pellicola su pelle e tessuto. <i>Cutting machine and punching machine for cut and punch effects programming from PLC.</i>
BAGGIO TECNOLOGIE SRL Pad. 35 Stand C43	Mod. DRYING Linea completa di essiccaggio: tunnel e sottovuoto in continuo brevettato <i>Patented drying complete line: through feed tunnel and vacuum drier.</i>
BARNINI SRL Pad. 35 Stand B23-C24	Mod. ROTATING CABIN Cabina rotativa caratterizzata da modalità di distribuzione dell'aria verso le pistole che garantisce una maggiore uniformità nella deposizione della vernice. Altra sua caratteristica riguarda la tecnologia di immissione, filtraggio e climatizzazione dell'aria all'interno della cabina di verniciatura reso completamente indipendente dall'ambiente di lavoro. <i>Rotating cabin with innovative distribution of the air towards the spray guns present on the rotating central group, to guarantee a better distribution of the pigment on the leather. Moreover, the concept of the air flow has changed by using a new technology of air filtering and air conditioning.</i>
C M TANNERY MACHINES SPA Pad. 35 Stand B13-C10	Mod.RC/P Messa a vento in continuo brevettata per lavorare le pelli fianco-fianco. <i>Patented through-feed sammying and setting machine to process leathers belly to belly.</i>

AREA 2	Prefinitura e Rifinitura <i>Prefinishing and Finishing</i>
EQUITAN SRL Pad. 35 Stand D2	<p>Mod. CLEANING</p> <p>Macchina brevettata, studiata appositamente per pulire le pelli prima della rifinitura in modo da asportare le impurità residue, quali ad esempio piccoli brandelli, fibre o frammenti di pelle estranei alla superficie della pelle propriamente utile che causerebbero dei difetti sulla pelle rifinita.</p> <p><i>Patented machine for cleaning the top side of the leather before spray line or before roller coating.</i></p>
ESCOMAR ITALIA SRL Pad. 35 Stand A29-B32	<p>Mod. MVC</p> <p>Messa al vento idraulica in continuo. La pressione avviene con un sistema di cilindri pressatori particolarmente studiato per lavorare pelli di spessore uniforme.</p> <p>Sistema di stenditura brevettato: dapprima la pelle viene distesa dal primo gruppo di due cilindri, successivamente (in modo automatico all'aumento di pressione sulla pelle stessa) si attiva il secondo gruppo che completa la stenditura.</p> <p><i>Through feed sammying setting out machine fully hydraulic. The pressure is given by a pressing cylinder working from the bottom to the up, and this system is very good to process even thickness skins.</i></p> <p><i>Stretching system patented. The skin is completely stretched in all its surface. The first part of skin is stretched by the first group of two cylinders, and when the skin enters in pressure, the second group of two cylinders starts to work. In this system we reach the whole stretching, having a setting out effect and obtaining a very good stretching result on side, splits and whole hides.</i></p> <p>Mod. EVO</p> <p>Sistema di vuoto da applicare sui sottovuoti a piani, dotato delle seguenti caratteristiche:</p> <ul style="list-style-type: none"> · ecologico, funzionamento "a secco" non necessita di acqua od olio per produrre vuoto, eliminando i problemi di contaminazione di fumi e vapori delle pelli · potente, aspira fino a 1400 mc/ora raggiungendo depressioni di vuoto in grado di asciugare le pelli a bassa temperatura · economico, a regime consuma solo 18-20 Kw/ora e non necessita di manutenzioni particolari · affidabile, per semplicità costruttiva e dotazione di PLC che regola le valvole di regolazione e di sicurezza. <p><i>Dry vacuum system specific for the leather drying under vacuum. Its characteristics are:</i></p> <ul style="list-style-type: none"> · <i>ecologic, it works completely "in dry" and eliminates the contamination problems of the leather steam with water or oil</i> · <i>powerful, it is able to produce aspirations up to 1400 mc/hour and reach a strong vacuum depression able to dry leathers at low temperatures</i> · <i>economic, the average electric consumption is only 18-20 Kw/hour and no specific maintenance is required</i> · <i>reliable, it is simple and equipped with a PLC which controls the regulation and safety valves</i>

AREA 2	Prefinitura e Rifinitura <i>Prefinishing and Finishing</i>
GBL SRL OFFICINA MECCANICA Pad. 35 Stand C21-D20	Mod. LS 60 Macchina per lucidatura di pelli esotiche e di rettile, completamente innovativa nel funzionamento. Chiusura effettuata da pistoni pneumatici, biellismo su cuscinetti e sistema di sicurezza per l'operatore che rileva la presenza della mano in zona pericolosa bloccando immediatamente la macchina. <i>Machine to glaze exotic and reptile leathers, completely innovative in working.</i> <i>It uses pneumatic pistons for the closing. It has an high-resistant steel structure and connecting-rod system on bearings. It has also a safety system in order to reveal the presence of the operator's hand in a dangerous area and so to block immediately the machine.</i>
GEMATA SPA Pad. 35 Stand A5-B8	Mod. FOAMMIX 600 Schiumatrice per la produzione di schiume finissime con elevate caratteristiche di omogeneità ideali per essere utilizzate nei processi di rifinitura sia a rullo sia a racla. Utilizzabile solo con prodotti a base acqua. Caratteristiche: <ul style="list-style-type: none"> · Doppia camera di miscelazione costruita con materiali resistenti all'ossidazione. · Portata variabile da 60 a 600 Kg/h. · Pompe a vite a capacità variabile. · Facilità e rapidità di lavaggio. <i>Foaming machine for the production of very thin foams having high level features of homogeneity excellent to be used for roller and knife coating finishing process.</i> <i>Suitable for water based chemicals only.</i> <i>Machine characterized by:</i> <ul style="list-style-type: none"> · <i>Twin mixing chamber made of anticorrosive materials.</i> · <i>Variable capacity from 60 to 600 Kg/h.</i> · <i>Screw pumps with variable capacity.</i> · <i>Easy and quick to clean.</i>
ITALPROGETTI ENGINEERING SPA Pad. 35 Stand C33-D30/D41	Mod. MILLING Bottali a follonare in acciaio e polipropilene caratterizzati da: <ul style="list-style-type: none"> · sistema di immissione acqua e prodotti per mezzo di pistola ed evitando di far aspirare questi ultimi dal riciclo dell'aria; · sistema di preriscaldamento della botte; · software modellabile secondo le esigenze del cliente; · riduzione dei consumi energetici; · migliore coibentazione. <i>Stainless steel and polypropylene milling drums equipped with:</i> <ul style="list-style-type: none"> · <i>water and products inlet system by means of guns that avoids the mixing of products with water recycle;</i> · <i>drum pre-heating system;</i> · <i>customization of software according to customer request;</i> · <i>low energy consumption;</i> · <i>better thermal insulation</i>

AREA 2	Prefinitura e Rifinitura <i>Prefinishing and Finishing</i>
M.M. SNC DEI F.LLI MEGGIOLARO Pad. 35 Stand B33	Mod. SP-2/60Q.20.24.15C Piattaforma di sollevamento con sistema di pesatura automatico e collegata ad arrotolatore di pelli finite. <i>Lift platform with automatic weighing system combined to finished hide rolling up equipment.</i>
MOSTARDINI OM SRL Pad. 35 Stand B23-C24	Mod. MP7TS EVO Modello di pressa idraulica con 1250 tonnellate di potenza, barriere di sicurezza optoelettroniche e comando di apertura/chiusura a pedale, per aumentare la produttività senza pregiudicare la sicurezza, indicata per stampare ogni tipo di nuovo disegno pronto moda. <i>Model of hydraulic press with 1250 tons of power, photoelectric safety barriers and opening/closing command using pedals, in order to increase the productivity without to prejudice the safety; machine suitable for print every type of new design fashion leathers.</i> Mod. ROLLER HEATING SYSTEM Sistema di riscaldamento per presse rotative per stirare e stampare mod. CONTINUA WS, che permette un risparmio in termini di costi energetici e con tempi di raggiungimento della temperatura impostata 1/3 inferiori rispetto al passato. <i>Heating system on the through-feed rotary presses mod. CONTINUA WS, that allows to save the energetic costs and less of 1/3 of time for reach a set-point temperature than in the past.</i>
NOVUM TECHNOLOGIES GMBH Pad. 35 Stand B35	Mod. DESIGN Sistema per lo sviluppo di modelli per pressatura e stampa in tempi rapidi e con abbattimento dei costi. <i>Possibilities to develop designs for embossing and printing. Getting the first samples in a very short time and cost-saving.</i>
PAJUSCO TECNOLOGIE SPA Pad. 35 Stand A15-B16	Mod. MILLING Bottale da frollare caratterizzato da sistema XMilling, touch screen e filtro aspirazione migliorati. Adatto anche per pelli umide o bagnate. <i>Milling drum improved with internal movement system "X-MILLING": less time and more quality, "touch screen" computer system improvement and aspiration filter. Suitable for wet hides too.</i>

AREA 2	Prefinitura e Rifinitura <i>Prefinishing and Finishing</i>
<p>S.C. COSTRUZIONI MECCANICHE Pad. 35 Stand C14</p>	<p>Mod. PLATEPRESS 1200</p> <p>Modello di pressa a stampare con nuove soluzioni rivolte alla sicurezza e al comfort dell'operatore, quali le barriere laterali di protezione (brevettate) e il dispositivo di aspirazione vapori/fumi durante la lavorazione di pelli umide. Facilità e velocità di lavoro grazie al comando a pedale che permette ambedue le mani libere per tenere e distendere le pelli.</p> <p><i>Model of press provided with new solutions to further enhance safety and comfort for the operator. These are the (patented) protection side barriers and the vapours/fumes suction device during the working of the damp hides.</i></p> <p><i>It ensures ease and speed of execution thanks to the pedal control that leaves the operator free to hold and stretch hides with both hands.</i></p>
<p>THEMA SYSTEM SRL Pad. 35 Stand B9</p>	<p>Mod. DRY-FLAT TH013</p> <p>Condizionatore in continuo per pelli con due tappeti forati i trasporto pelli in sostituzione ai classici fili in Perlon. Questa soluzione consente alla pelle di non incepparsi nei fili e di non deformarsi, anche nel passaggio tra un tappeto e l'altro. Dall'ingresso nel tunnel, la pelle risulta tenuta in tensione tra i due tappeti fino alla fine del percorso.</p> <p><i>Continuous conditioner for skins equipped with two perforated conveyor belts and not with perlon threads. This allows the leather to not jammed itself in the threads and consequently to results without curlings or deformations, even in the passage from a belt to the other.</i></p> <p><i>The leather is held stretched flat between the conveyor belts, from its entry to the tunnel until the end of its path.</i></p>
<p>WEGA SRL Pad. 35 Stand C28</p>	<p>Mod. WEGAWIN</p> <p>Sistema di misura della pelle gestito da computer industriale dotato di sistema operativo Microsoft XP e di monitor LCD touch screen. Facilità di personalizzazione e programmazione. Scambio dati attraverso porte USB, Ethernet. Aggiornamento remoto e test macchina anche via internet.</p> <p><i>Hide measuring system with a computer integrated into industrial machine that uses Microsoft Windows XP OS and a touch screen monitor.</i></p> <p><i>Expandable and easy to customize.</i></p> <p><i>Easy to exchange database data by USB or Ethernet gates.</i></p> <p><i>Remote online program modifications and machine testing via internet.</i></p>

AREA 3	Gestione, Trasporto e Laboratorio <i>Management, Work Transportation and Laboratory</i>
CS AUTOMAZIONE SRL Pad. 35 Stand C40	Mod. REVOLAB T24 Sistema automatico di dosaggio per liquidi e paste, con esclusivo sistema di omogeneizzazione e prelievo dei prodotti senza agitatori, pompe e tubi. Azzerata le possibilità di blocco del sistema dovute a precipitazione dei prodotti all'interno di serbatoi, tubazioni e valvole. Ridotta manutenzione. <i>Automatic dosing system for liquid and pastes, with exclusive system of homogenisation and collecting of the products without agitators, without pumps, without pipes. It reduces to zero the possibilities of blocking of the system due to falling of the products into the tanks, of the tubes and of dosing valves. Maintenance of parts reduced.</i>
EL.PA. SERVICE SRL Pad. 35 Stand B27	Mod. Co.Fi.L. Sistema completo di gestione totalmente automatico per linee di rifinitura pelli. Una evoluta automazione hardware / software che va ad agire sulle potenze elettriche e termiche installate sulla linea di rifinitura modulando opportunamente in modo da ottenere le massime performance dal punto di vista produttivo e qualitativo, limitando i consumi di energia elettrica e termica allo stretto necessario per la lavorazione. Con l'utilizzo del sistema Co.Fi.L. si ottiene una drastica riduzione dei costi di produzione e conseguente riduzione dell'impatto ambientale. <i>A complete automatic system for finishing line management. An evolved hardware/software mix works on electrical and thermal users installed on the finishing line in order to obtain the maximum quality and productivity performances. Using COFIL system you obtain a huge production cost reduction because it use only the necessary power required. Reducing thermal and energy power requirement you also obtain an important reduction of the environmental impact.</i>
EQUITAN SRL Pad. 35 Stand D2	Mod. STAMPING Timbratore multifunzionale già disponibile per wet blue, trippa e pelli grezze, migliorato nelle parti pneumatiche e ora adatto anche per pelli con pelo. Si possono stampare fino a otto cifre in numero o in lettere. <i>Stamping device for wet blue, lime and raw hides. Adjustments were made to the pneumatic parts, thus improving power and speed. In addition, the digits have been upgraded to better suit raw leather. Up to eight digits, numbers or letter, can be printed.</i>

AREA 3**Gestione, Trasporto e Laboratorio
Management, Work Transportation and Laboratory****FELTRE SRL**Pad. 35
Stand D1**Mod. CARAVEL**

Sistema automatico per lo scarico delle botti di tintura. Permette la movimentazione automatica delle vasche di scarico pelli all'interno della conceria avviando all'utilizzo di carrelli elevatori e di operatori.

Caravel gestisce la movimentazione totale delle vasche all'interno della conceria, provvedendo a prelevarle vuote e a posizionarle sotto il bottale. Una volta eseguito lo scarico del bottale il sistema porta le vasche in eventuali zone di sosta, e provvede quindi al posizionamento nella zona adatta alla lavorazione successiva. Terminata questa fase le vasche vengono pulite e preparate per essere riutilizzate.

Automatic system to unload retanning-dyeing drums.

It allows the automatic movement of the hide unloading bin in the tannery without operators or forklifts.

The Caravel manages completely the movements of the unloaded box inside the tannery, providing to collect them when empty and move them underneath the correct drum. After the unloading operation the Caravel brings the bins finally to a storage area and thereafter provides to bring them to an area for the next work phase. After this phase the bins are cleaned and prepared to be reused.

GIULIANI TECNOLOGIE SRLPad. 35
Stand A1**Mod. BALLY FLEXOMETER**

Ultima versione del flessimetro Bally che coniuga alcuni aggiornamenti normativi a una migliorata progettazione ergonomica per permettere all'operatore di preparare ed eseguire il test in maniera più funzionale.

The latest version of Bally Type Flexometer, featuring newest standards releases application, related to internal technical design. The purpose is to allow an even better operator handling while preparing and evaluating samples behaviour during and after test.

AREA 3**Gestione, Trasporto e Laboratorio
Management, Work Transportation and Laboratory**

ITALPROGETTI Pad. 35 Stand C33-D30/D41	Mod. LABORATORY DRUM Bottalini per prove. Nella versione in acciaio inox è presente un sistema di riscaldamento brevettato che consente di ridurre il volume di liquido utilizzato nel circuito per far arrivare il bagno alla temperatura richiesta. La versione in polipropilene ha la porta completamente rivestita con lo stesso materiale. Questo particolare ne permette l'impiego in tutti quei processi di laboratorio e produzione che normalmente comportano problemi di corrosione e/o ossidazione su legno e acciaio, quali concia con sali di zirconio, bagni particolarmente acidi, depilazione con perossido di idrogeno, sbiancatura pelli di rettili in soluzioni di ipoclorito di sodio. <i>The stainless steel drums Italprogetti have a PATENTED heating system which allows to reduce the volume of water used in the circuit making the float reach the requested temperature in considerable shorter times.</i> <i>The other version, Polypropylene testing drums, have the door completely lined with the same material.</i> <i>The laboratory testing drums in polypropylene can be used without any consequence in the tests or production processes which are normally causing corrosion or oxidation problems on wood and stainless steel (for instance, the tannage with zirconium salts, or the floats with pH particularly acid, or the oxidative unhairing with hydrogen peroxide, or the bleaching of reptile skins in solutions with sodium hypochlorite, or acid treatments in high concentrations, etc.).</i>
PAJUSCO TECNOLOGIE SPA Pad. 35 Stand A15-B16	Mod. Environment Reparto di engineering dell'azienda dedicato a: <ul style="list-style-type: none">· depurazione acque di scarico di concerie· impianto di recupero grasso da carniccio· recupero cromo· sistema aspirazione concia <i>Servizio di engineering per seguire a 360° il cliente in qualsiasi sua esigenza di gestione della conceria.</i> <i>Engineering department able to:</i> <ul style="list-style-type: none">· water treatment depuration plant· fleshings recovery plant· chrome recovery plant· aspiration system tanning <i>Engineering service to follow completely the customer to front any process aspect in tannery.</i>

AREA 4**Prodotti Chimici
Chemicals****CHIMONT INTERNATIONAL SPA**

Pad. 32
Stand B21

FASHION FINIMONT

Linea studiata e realizzata da una stretta collaborazione con stilisti e professionisti del settore moda. Effetti perlacei camaleontici, perle "Fair" in versione lucida e "Fashion Bubble" per bolle di luce personalizzabili e altamente personalizzabile.

Range conceived and realised with collaboration of stylists and fashion experts. Chamaleon pearled effects, "Fair" pearls in glossy version and "Fashion Bubble" for lighting bubbles customized or highly customized.

TANNING-RETANNING

Linea J e riconcia breve (Chimotan R3A e Chimoil SU) saranno i principali protagonisti presentati in area Chimont, da sempre attenta alla massimizzazione di costi e benefici nei processi di concia e riconcia.

J range and short retanning (Chimotan R3A e Chimoil SU) will be shown in Chimont area. Chimont gives always attention to costs-benefits maximization in tanning and retanning processes.

DERMOCHIMICA SPAPad. 32
Stand A9**SUPPLETAN OXZ**

Conciante a base di triazina, che può essere utilizzato sia con cromo solfato che con tannini sintetici, accrescendo la reattività della pelle in ogni tipo di lavorazione.

Ciò che rende interessante ed innovativo il SUPPLETAN OXZ è che, grazie alla totale assenza di formaldeide libera, diminuisce l'impatto ambientale degli ausiliari utilizzati in bottale.

A new tanning product with triazine, which can be used with chromium sulphate or with synthetic tannins, increasing the reaction of the skin in any kind of working method.

SUPPLETAN OXZ is very interesting and innovative because, thanks to the total absence of free formaldehyde, it reduces the environmental impact of auxiliaries used in drum.

CORIOR STU e CORIOR SCLM

Ingrassi entrambi a base di oli sintetici solfosuccinati trattati in modo specifico per garantire un alto assorbimento, esaurimento dei bagni e solidità generali elevatissime. Grazie a questa loro peculiarità, permettono di ottenere pelli molto morbide e con peso specifico molto basso, pur utilizzando una quantità relativamente esigua di prodotto, il che migliora la qualità delle acque di scarico in termini di sostanza organica residua.

Two fat-liquors, both of them with sulfosuccinate synthetic oils, treated in a specific way in order to ensure a high absorption, exhaustion of baths and high general fastness. Thanks to these characteristics, CORIOR STU and CORIOR SCLW allow to obtain very soft leathers, with very low specific weight, using a small quantity of product and consequently improving the quality of waste waters by reducing the organic residue.

COMPOUND NAPPA CATIONICA e COMPOUND BURNISH DS3

Prodotti per rifinitura.

Il COMPOUND NAPPA CATIONICA è una miscela di caseine, resine e poliuretani con cui si ottiene una base di fondo cationica che conferisce una buona copertura senza caricare eccessivamente il fiore.

Il COMPOUND BURNISH DS3 è invece un composto di cere naturali e sintetiche dedicato agli articoli brush-off che conferisce alla spazzolatura un buon ritorno scurente.

Finishing products.

Using COMPOUND NAPPA CATIONICA, a mix of casein, resins and polyurethanes, it is possible to obtain a cationic ground which gives a good coating without overloading the grain.

COMPOUND BURNISH DS3 is a mix of natural and synthetic waxes, created for brush-off articles. It gives a good dark brushing.

AREA 4	Prodotti Chimici <i>Chemicals</i>
<p>FGL INTERNATIONAL SPA Pad. 32 Stand B11</p>	<p>RELEASYS Rivoluzionario processo di concia stusciato e realizzato per incrementare l'efficienza produttiva delle concerie in moso eco-compatibile. Benefici:</p> <ul style="list-style-type: none"> · incremento nelle performance della pelle, con un guadagno di superficie del 7% rispetto i metodi tradizionali; · minori rifiuti, abbattimento dei costi di smaltimento e meno inquinamento; · pelle metal-free che garantiscono uno smaltimento come rifiuti non nocivi a fine vita prodotto; · migliore resa del colore in comparazione metodi tradizionali in particolare con i colori chiari e il bianco; · nonostante sia un processo metal-free garantisce alla pelle ottime caratteristiche chimico-fisiche. <p>Le pelli ottenute possono essere impegnate per la produzione di calzature, elementi di arredo, abbigliamento e pelletteria.</p> <p><i>A revolutionary tanning process conceived and realised to increase the production efficiency of tanneries in an environment-friendly way.</i> <i>Benefits:</i></p> <ul style="list-style-type: none"> - <i>an increase in the performance of leather, with a greater surface yield of +7% compared to conventional methods.</i> - <i>less waste, entailing lower disposal costs and less pollution.</i> - <i>metal-free leather can be disposed of as non-special waste with a further reduction in disposal costs and a lower impact on the environment.</i> - <i>better colour rendering compared to traditional natural (metal-free) methods with the possibility of obtaining a whiter (colours will result cleaner and brighter).</i> - <i>this process, though metal-free, results in finished leather with a better chemical and physical performance.</i> <p><i>This renders the leather suitable for the production of footwear, furnishing elements, garments and leather goods.</i></p>
<p>FIGLI DI GUIDO LAPI SPA Pad. 32 Stand B3</p>	<p>SOLE Solution Esperienza, qualità e affidabilità al servizio dei cuoifici. Nel lungo e delicato processo di produzione del cuoio da suola, la costanza della qualità dei prodotti e l'affidabilità del servizio sono fondamentali per il risultato finale e il semplice prodotto non basta. Per far fronte alle mutevoli esigenze del mercato, è necessario intervenire con soluzioni dedicate ed efficaci. Per questo FIGLI di GUIDO LAPI ha creato SOLE solution: SOLESIN - Tannini Sintetici SOLEX - Ausiliari per la concia e la riconcia SOLEOL - Oli ed ingrassi SOLELIME - Ausiliari per Rinverdimento e Calcinaio</p> <p><i>Solution Experience, quality at service to sole leather tanneries.</i> <i>The sole leather process need a constant chemicals quality and a guaranteed service.</i> <i>To front this request from the market FIGLI di GUIDO LAPI offers SOLE solution:</i> <i>SOLESIN Syntans</i> <i>SOLEX Auxiliaries for tanning and re-tanning</i> <i>SOLEOL Oils and Fatliquors</i> <i>SOLELIME Auxiliaries for soaking and liming</i></p>

LETEX SPA

Pad. 32
Stand B8

NEOTAN WB

Nuovo ausiliario per Pickel a basso contenuto di solfati.

New auxiliary for Pickel with low sulphate content.

NEOFAT GS

Lecitina chimicamente modificata per l'ottenimento di pelli morbidiissime con grandi solidità.

Chemically modified lecithine which helps obtaining extremely soft leathers with high fastness.

NEOFAT LN

Estere sintetico modificato, compact per arredamento e abbigliamento

Modified synthetic ester, compact fatliquor for furniture and garment

Serie POKER

La serie POKER è costituita da dispersioni acquose a media concentrazione di pigmenti organici e/o inorganici contraddistinte soprattutto da un notevole potere coprente. L'alta qualità dei materiali impiegati rende tale serie decisamente interessante in rapporto qualità/prezzo.

POKER series consists of water dispersions of organic and/or inorganic pigments, with medium concentration, characterized by very high covering power. The high quality of the materials makes this series definitely interesting in terms of quality/price ratio.

Serie MICROTEx

MICROTEx è una serie speciale di pigmenti formulati con un particolare legante appositamente studiato e raffinati in modo tale da poter essere paragonati a degli inchiostri. La loro elevatissima brillantezza e trasparenza li rende idonei per la rifinitura alla placca ed alla lucidatura a vetro, ottenendo un aspetto anilina. D'altro canto, la loro alta solidità alla luce li rende adatti anche per effetti all'acqua in rifiniture per arredamento.

MICROTEx series is a special range of pigments, with a expressly developed binder. They are so highly refined that they can be compared to inks. Thanks to their brightness and transparency, they are suitable for plate finishing and glass polishing, obtaining an aniline appearance. On the other hand, thanks to their very high light fastness they are suitable also for two-tones effects on furniture leathers.

LETEX SPA

Pad. 32
Stand B8

FYL WAX 752

È una pseudo emulsione acquosa di cere ed esteri, naturali e sintetici destinata alla produzione di articoli "pull-up". Applicata sia a roller che a spruzzo permette di ottenere un effetto molto marcato, fortemente rilucidabile ed durevole nel tempo.

It is an emulsion of waxes and esters, both natural and synthetic, for the production of "pull up" articles.

Applied by roller coater or spray gun, it permits to obtain a strong effect, highly polishable and long time lasting.

FYL WAX DK13

È una emulsione acquosa di cere sintetiche, naturali e sostanze grasse. Permette di ottenere un ottimo effetto "burnish" unito ad un leggero effetto sbiancante sulle superfici delle pelli, favorendo così il mascheramento dei difetti e migliorando la mano e l'aspetto delle pelli finite.

It is an emulsion of synthetic and natural waxes alongwith fatty matters. It gives an excellent "burnish" effect, together with a lightly whitish effect of the surface. Due to his characteristics, it helps in masking the defects, leaving a pleasant natural appearance.

FYL WAX BURN

È una emulsione di olii e cere opportunamente studiata per ottenere ottimi effetti "burnish" sia alla lissa che alla rullatura, ad elevato potere autolucidante.

It is an emulsion of oils and waxes, duly developed in order to get strong "burnish" effect, both by glazing and polishing.

HYDROGRADE M 6058 SF

Fissativo all'acqua opaco pronto all'uso, completamente esente da solventi liberi. Viene usato principalmente su pelli destinate ad arredamento per ottenere un buon grado di opacità senza problemi di "sgrigiamento".

Water base top coat PU, completely volatile solvents free. It is mainly used on leathers for furniture, where it gives a good matt degree without greynish.

SILVACHIMICA SRLPad. 32
Stand A1**Ritan Plus**

Prodotto riconciante a base d'estratto vegetale per pelli wet bleu a cui conferisce un'ottima pienezza ed un evidente effetto burnish.

Modified vegetable retanning agent for chrome leathers with good filling and excellent burnishing properties.

Tara ES liq

Estratto liquido di tara con eccellente potere conciante in grado di dare un'ottima pienezza ed un colore naturale alla pelle.

Liquid Tara extract with excellent tanning properties for the production of light weight leathers and a very light natural colour.

Ledosol XT

Nuovo prodotto per preconcia e per la produzione di wet white con ottima T.G.

New pretanning agent for the production of wet white leathers with high shrinkage temperatures.

Blancotan BFS

Tannino economico per bianco con eccellenti risultati ai test di resistenza a luce e calore.

Economic white syntan with excellent whitening properties and excellent light and heat fastness.

Keusol TK

Ingrasso sintetico per la produzione di pelli molto morbide e leggere con un'ottima resistenza a luce e calore.

Fully synthetic fatliquor for the production of very soft and light weight leathers and with excellent heat and light fastness.

Keusol FF

Ingrasso semi sintetico per la produzione di pelli morbide con una buona mano, un'ottima grana e buona resistenza a luce a calore.

Semi-synthetic fatliquor for the production of very light and soft leathers with tight grain and good heat and light fastness

Keusol 805

Ingrasso economico semi sintetico per la produzione di pelli morbide con una grana fine e con una buona resistenza a luce e calore.

Economic semi-synthetic fatliquor for the production of very light and soft leathers with tight grain and good heat and light fastness

AREA 4**Prodotti Chimici
Chemicals****SILVACHIMICA SRL**

Pad. 32
Stand A1

Prodotto 1585

Ingrasso speciale composto da cere per un fortissimo effetto burnish.

Concentrated liquid lecithin base fatliquor with excellent softening properties which produces light weight leathers.

Keusol LF

Ingrasso a base di lecitina molto concentrato per la produzione di pelli molto morbide.

Special fatliquor based on waxes for a very high burnishing effect.

Keusol LC

Lecitina pastosa per produrre pelli morbide con una buona pienezza.

Paste version lecithin fatliquor with good softening properties which produces light weight leathers.

Kurtalicker FG

Ingrasso speciale per la produzione di pelli molto morbide con valori di fogging molto bassi indicate per la carrozzeria.

Special fatliquor for the production of very soft leathers with extremely low fogging values recommended for car seat articles.

STEFANI CHIMIS CENTRO
CAMPIONATURA SRL
Pad. 32
Stand A29

Fireproof - pelle resistente al fuoco secondo le vigenti normative internazionali FAR 25.853 per fumi a bassa tossicità e densità FAR A e B, UNI 9175 ecc...

Fireproof: *wet-end processes for leathers resistant to the fire according to the international normatives in force, FAR 25.853 for low dense and toxic smokes, FAR A and B, UNI 91/75 etc..*

Coloranti salt free - ad alta resa, brillantezza ed uniformità di tintura con basse concentrazione di solfati.

Salt free dyestuffs: *haig gain, brilliance, and good levelness with low content of sulphates.*

Prevenire il Cromo esavalente – prodotti per garantire la massima sicurezza assicurando l'assenza di Cr VI nelle pelli finite anche nel lungo termine.

Hexavalent chromium prevention: *products to guarantee the maximum safety, assuring the absence of Cr(VI) also in the long time term.*

Superfici Nanotecnologiche: innovativa gamma di fissativi all'acqua dotati di nanocompositi ibridi dalle eccellenti resistenze all'abrasione.

Nano-technological surfaces: *innovative range of water-based fixing agents endowed with hybrid nano-composed with excellent resistances to the abrasion.*

Idro-Oleo Stop : prodotti idro ed oleo repellenti che conferiscono alla pelle eccezionali prestazioni di impermeabilità dinamica e traspirabilità.

Water- oil stop: *products for water and oil rejecting that confer to the leather high performances for dynamic waterproofing and perspiration.*

Rifinitone traspirante: La tecnica "inner drain" consente di ottenere una pelle con elevati valori di permeabilità al vapor d'acqua mantenendo al contempo eccellenti prestazioni di resistenza chimico-fisiche.

Transpiring finishing: *the "inner-drain" technic allows to obtain leathers with high values of water vapour permeability, maintaining good chemical and physics properties.*

La sicurezza non è un dettaglio –Lavorazione per pelli destinate soprattutto all'abbigliamento sportivo che consente di raggiungere una straordinaria resistenza fisico-meccanica (martindale foro passante).

Safety is not a detail: *working process for sport wear leathers endowed with extraordinary resistance physical and mechanic (martindale, passing perforation).*

Tanspeed:la tecnologia che offre la possibilità di realizzare articoli per arredamento ad un costo molto competitivo con tutti i vantaggi di una lavorazione semplice e veloce dove i tempi complessivi di lavorazione sono di poco superiori alle 3 ore.

Tanspeed 200': *is the technology that offers the possibility to obtain upholstery leathers to a very competitive cost with all the advantages of a simple and rapid process, where the working time is few more than three hours.*

TANNING-TECH 2009

**ELENCO DI PRESENTAZIONE DELLE MACCHINE,
DELLE ATTREZZATURE E DEI SISTEMI, DELLE TECNOLOGIE
E DEI PRODOTTI CHIMICI PER CONCIERIA**

***LIST OF EXHIBITED MACHINES, EQUIPMENT AND SYSTEMS,
TECHNOLOGIES, CHEMICALS FOR THE TANNING INDUSTRIES***

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AREA 1**Rinverdimento, Concia e Tintura**
Liming, tanning, dyeing**BAUCE TRI.MA SRL**Pad. 32
Stand B25**Mod. BLUESTAR TA 2s 3000 VERSUS**

Pressa idraulica in continuo per l'apertura e spremitura di pelli conciate; versione con luce di lavoro utile di 3000 mm.

Le pelli possono essere inserite per il fianco e anche per i culatti. Ideale per pelli in pieno spessore e pelli spaccate in trippa.

- Potenza d'asciugatura con 6 cilindri disposti a doppia calandra e con 2 pressioni differenziate le quali sviluppano 80 tonnellate ciascuna.
- Cinque punti di contatto sulla pelle da pressare.
- Rapidità di manutenzione perché prevista quale semplice sostituzione di tutti i componenti soggetti ad usura, in particolare la sostituzione dei feltri.
- Semplicità d'uso con l'impiego di personale non specializzato perché automatizzato il ciclo di lavoro: visualizzato lo spessore della pelle e la velocità di lavoro.
- Nuovo sistema con due cilindri stenditori che lavorano contemporaneamente sulla pelle ottenendo un significativo aumento in superficie della stessa.
- Le lame del cilindro sono in acciaio inox e sono dotate di speciale profilo.
- Sistema di controllo con PLC Touchscreen completo con possibilità di salvare 50 diversi tipi di articoli e di gestire velocità, spessori, tempi di lavorazione presenti nelle modalità di lavoro: fianco a fianco, culatto testa, mezzine
- Modalità di lavoro fianco-fianco, culatto-testa, mezzine sono pure gestite dal PC.

Hydraulic sammying machine ideal for stretching and sammying chromium tanned hides.

The skins can be inserted for the belly and in the normal way simply changing the program of the touch screen.

- *Drying power with 6 drying rolls arranged in a double calender configuration with two differentiated pressures, developing 80 tonnes with each single press.*
- *Five points of contact on the leather to be pressed.*
- *Fast maintenance with the simple replacement of all the components subject to wear, in particular for changing the felts.*
- *Simple use suitable for operation by non-specialized personnel, with the automation of the working cycle: display of the thickness of the hide and the working speed.*
- *New system with double spreading cylinders that can work at the same time on the leathers allowing to increase the area of the hides. Spreader roll with blades in stainless steel and special profile.*
- *Touchscreen PLC control system complete with receipts to save 50 different types of articles and to regulate speed, thickness, working times for the different jobs: belly-belly, culatto-head, sides.*
- *Working jobs belly-belly, culatto-head and sides are also regulated by PC.*

AREA 1**Rinverdimento, Concia e Tintura**
Liming, tanning, dyeing**COSTR.MECC. PERSICO SRL**Pad. 32
Stand B9**Mod. SP 31 / 34**

Sono le due ultime versioni di scarnitrici. Il cuore della macchina scarnatrice è il sistema di contrasto che preme la pelle contro le lame, ed è proprio in questa specifica area che si sono concentrate lo studio e la progettazione per un nuovo prodotto, al fine di rendere la scarnatura più profonda ed uniforme. Il sistema applicato reagisce alle differenze di spessore della pelle in maniera così veloce da permettere una rifilatura della pelle curare al punto di lasciare anche i bordi puliti. La semplicità di utilizzo del sistema consiste nel regolare il cosiddetto "pneumatico di contrasto" fino a sfiorare le lame e non sono necessari altri interventi in presenza di pelli con spessori diversi, rendendo possibile la lavorazione di semilavorati assortiti senza modifiche della regolazione di posizione. Il dispositivo può anche essere applicato alle macchine di penultima generazione, dando la possibilità agli attuali utilizzatori di sperimentare una qualità superiore nella lavorazione. Il contributo di tale innovazione, unito alla capacità di una produzione massima di circa 600 pelli/ora rende queste scarnatrici uno strumento adatto alle aziende con produzione medio/alta fornendo un vantaggio competitivo in un mercato dove qualità e costo (di scarnatura) sono fattori chiave di successo.

These are the last fleshing machine versions. The heart of a fleshing machine is the "contrast system" that presses the hide against the blades, and this is where we have focused our latest research to make fleshing more uniform and more in-depth. The system reacts so quickly to hide thickness differences that hide trimming procedures are greatly reduced and edges are left clean. The system is simple to use: just adjust "the contrast bolster" until it barely touches the blades. No other adjustments are necessary when fleshing hides with different thicknesses and assorted hides can be processed without changing the position setting. This device can also be applied to the penultimate generation of machines so current users can also enjoy superior processing quality. This latest innovation, combined with a fleshing system that, in optimum conditions, can produce up to approximately 600 hides/hour, makes this a fleshing machine suitable for medium/high productivity companies, giving them a competitive edge in a market where fleshing quality and cost are key factors to success.

ESCOMAR ITALIA SRLPad. 32
Stand A25**Mod. STRETCHING DEVICE**

Questo dispositivo, brevettato, è installato nei modelli di macchine per asciugare pelli in wet blue ed è in grado di migliorare i risultati che riguardano la stenditura del semilavorato grazie alla presenza di un particolare sistema di compensazione dello spessore e attraverso un metodo di configurazione dello stesso a livello di decimi di millimetro.

This device (patented) can be installed on any models of Escomar wet blue sammying machines, able to improve the stretching results on the hides thanks to a particular compensation system of the thickness and the adjustable decimal thickness regulation system.

AREA 1	Rinverdimento, Concia e Tintura <i>Liming, tanning, dyeing</i>
FELTRE SRL Pad. 32 Stand C2	Mod. SHEEP SKIN CONVEYOR Linee di carico / scarico di bottali per pelli ovocaprine. La realizzazione di tali apparecchiature ha richiesto un attento studio per risolvere problemi legati a: <ul style="list-style-type: none"> · presenza del pelo o parti di questo e il suo deposito su componenti in movimento · uso di solfuri e altri agenti chimici cui vengono sottoposte tali pelli prima dell'immissione nei bottali; motivo che ha ulteriormente impegnato i progettisti nella ricerca di materiali innovativi, coinvolti nell'insieme delle parti che coinvolgono tale trasportatori, per evitare repentini deterioramenti e usura in tempi non accettabili dall'utilizzatore. <i>Drum loading and unloading line for sheep skins. The realisation of such a device has required careful study to resolve the inherent problems:</i> <ul style="list-style-type: none"> · <i>the presence of wool and pieces of wool and their deposits on moving parts of the system</i> · <i>the use of sulphides and other chemical agents that the hides are subjected to prior to their loading into the drum. The motives that have occupied the designers are the research into innovative materials for the parts involved in such conveying systems to avoid unexpected deterioration and unacceptable levels of wear and tear.</i>
MOSCONI SPA Pad. 32 Stand A29	Mod. ASTER Rasatrice realizzata nelle luci di lavoro da 1800 mm fino a 3200 mm. Si distingue per avere: <ul style="list-style-type: none"> - il cilindro a lame fisso - il gruppo di tenuta mobile (rullo gommato) che mantiene invariata la sua posizione e pressione di lavoro alla progressiva usura delle lame I benefici: <ul style="list-style-type: none"> - si preservano le "punte di petto" - si mantengono invariate le condizioni di sicurezza per l'operatore sia con lame nuove che con lame comunque usurate. <i>Shaving machine realized in different working width: 1800 mm up to 3200 mm. ASTER distinguishes itself for:</i> <ul style="list-style-type: none"> - <i>the blade cylinder in a fixed position</i> - <i>the upper held/kiping group (rubber roller) that can move. Its position and pressure don't change during the progressive wear of the knives.</i> <i>The benefits:</i> <ul style="list-style-type: none"> - <i>to preserve the "leather brisket"</i> - <i>to maintain constantly unchanged safety conditions of the user whether with new or worn out blade</i>
PAJUSCO TECNOLOGIE SPA Pad. 32 Stand A19	LITTLE DRUM Series Serie speciale di bottali per piccole produzioni, costruiti in acciaio aisi 316 oppure in materiale plastico polipropilene. <i>Series of special drums for small production, manufactured in stainless steel aisi 316 or in polypropylene plastic material.</i>

AREA 1**Rinverdimento, Concia e Tintura**
Liming, tanning, dyeing**VALLERO INTERNATIONAL SPA**Pad. 32
Stand C11**Mod. VORTEX**

Versione per bottali in plastica ed acciaio, dà luogo a:

- risparmio energetico superiore al 50%
- risparmio acqua dal 20 al 40%
- risparmio prodotti chimici dal 5 al 20%
- risparmio tempo di processo 15%
- riduzione costi di manutenzione: 70%
- maggiore silenziosità e sicurezza

Version for plastic and stainless steel drums, it gives rise to these performances:

- *save energy more than 50%*
- *save water from 20 to 40%*
- *save chemicals from 5 to 20%*
- *save process time 15%*
- *save maintenance cost 70%*
- *reduce noise drastically and improve safety*

AREA 2	Prefinitura e Rifinitura <i>Prefinishing and Finishing</i>
<p>AF SRL Pad. 32 Stand B13-C20</p>	<p>Mod. AF CUT</p> <p>Macchina studiata per intagliare e incidere con elevata precisione il fiore di pelli trattate per riprodurre fedelmente la struttura superficiale di pelli naturali quali ad esempio rettili di varia appartenenza. Ogni configurazione da dare al fiore della pelle è programmabile e supportata da PLC. Elevata la velocità di esecuzione del motivo scelto e programmato.</p> <p><i>Machine designed to incise and engrave with great precision the grain of leathers worked to produce accurately the natural reptile grain surface.</i> <i>The leather grain working is programmable by a PLC and the speed is appreciable.</i></p>
<p>BARNINI SRL Pad. 32 Stand B12</p>	<p>Mod. TUNNEL IR</p> <p>Tunnel di essiccazione con lampade ad emissione infrarossa, impiegato nelle linee di verniciatura automatiche oppure su impianti provvisti di tamponatrice a rulli. Le onde elettromagnetiche emesse dalle lampade attraversano l'aria senza riscaldarla forniscono calore in modo efficace e preciso direttamente sulla pelle. L'irraggiamento emesso dalle lampade, abbinato all'assenza o ad un minimo volume d'aria in riciclo, consente un notevole risparmio energetico. In pochi secondi è possibile raggiungere la temperatura desiderata misurata direttamente sulla pelle ed allo stesso modo è possibile risparmiare energia in assenza di pelle da essiccare (modalità stand by). L'assenza o ridotta ventilazione d'aria evita il propagarsi di polvere all'interno del tunnel e quindi la possibile contaminazione della superficie verniciata, ottenendo un miglior prodotto finito. Un moderno ed innovativo sistema di controllo automatico gestisce la potenza erogata dalle lampade istante per istante e consente di memorizzare i parametri di funzionamento per ogni articolo da produrre.</p> <p><i>Drying tunnel with infrared emission lamps used in automatic spraying lines of behind a roller coating machine.</i> <i>The emitted electromagnetic waves coming from the lamps cross the air without heating it by supplying an efficiency heating over the leather.</i> <i>The radiation emitted form the lamps, coupled with the absence or a minimal air volume enable to get an energetic saving. In a short time it is possible to catch up the wished temperature measured directly on the skin and in the same way it is possible to save energy in skin absence to be dried (stand by mode). The absence or reduced air ventilation avoids dust problem inside of the tunnel and also the possible contamination of the painted surface, by obtaining a best product.</i> <i>A modern and innovative automatic control system manages the power distributed from the lamps step by step and it allow to record the parameters of operation for every article to be produced.</i></p>

AREA 2**Prefinitura e Rifinitone
*Prefinishing and Finishing*****BARNINI SRL**

Pad. 32

Stand B12

Mod. HEAT RECOVERY UNIT

Unità di recupero di calore da installare sui tunnel di essiccazione. Il presente dispositivo è stato studiato per riscaldare, tramite uno scambio termico con i flussi d'aria estratti, l'aria che normalmente è aspirata dai tunnel e prelevata dall'ambiente di lavoro.

Con questo dispositivo si riduce la dispersione termica, ottenendo un risparmio energetico superiore al 30%.

L'unità di recupero calore può essere installata anche su impianti già esistenti e di altri costruttori.

Essi consentono di unire ad un modico investimento un elevato e sicuro risparmio energetico.

Unit of heat recovery to install on the drying tunnels.

The device has been studied in order to heat, through a thermal exchange with the extracted air flows, the air that normally is exhausted from the tunnels and captured from work environment.

Thanks to this device the thermal dispersion is reduced, obtaining an energy saving higher than 30%.

The heat recovery unit can be installed also on existing systems and on those of all other manufacturers.

They allow to join to a reasonable investment with a high and certain energetic saving.

BERGI SPA
Pad. 32
Stand A11-B4

Mod.STARLUX S

Pressa per stirare e stampare in continuo, è dotata di un innovativo sistema operativo che dà la possibilità di lavorare in due. Inoltre, per i tecnici più esperti c'è l'opportunità di lavorare con un mix tra i due modi per creare nuovi effetti oggi non possibili.

Al contrario delle presse in continuo tradizionali è dotata di rulli operatori motorizzati con velocità indipendente rispetto al traino principale (comunemente chiamato feltro). Questo permette alla macchina di lavorare non solo a pressione come una pressa incontinuo tradizionale ma anche a spessore ossia regolando la macchina in funzione dello spessore delle pelle.

Vari tipi di operazioni possibili:

- stampa con rulli finto fiore o correzione dei difetti, mediante rulli sabbiati con la tradizionale operazione a pressione, con velocità del rullo operatore controllata. Si ottiene così una più alta definizione della stampa grazie alla eliminazione delle sbavature dovute nel caso il rullo sia trascinato
- stiratura a spessore fisso per equalizzare la pelle (laminazione), senza schiacciarla in modo da mantenere la sua naturale morbidezza
- stiratura a spessore variabile

La macchina è equipaggiata, salvo diversa richiesta dell'utente, con un rullo a stirare cromato a specchio, un rullo sabbiato ed un rullo finto fiore, ognuno equipaggiato con la propria centrale di riscaldamento indipendente.

Il cambio rulli, a mezzo revolver, avviene in maniera totalmente automatica garantendo così rapidità, precisione e sicurezza per la macchina e gli operatori.

Through-feed ironing and embossing machine, it is the innovative pressing system that gives the chance to process leathers in two different modes: by pressure or by thickness. Moreover, for the most skilled operators there is the opportunity to work with a mix between the two modes, creating effects on the leathers that were not possible before.

Differently from these traditional machines, this is equipped with motorised operative rollers having independent speed in regard to the main traction (i.e. the felt conveyor). It gives the machine the possibility to work as a traditional through-feed press /i.e. by contact between operative roller and felt conveyor) or by thickness that is to say adjusting the gap between operative roller and felt conveyor according to the thickness of the processed leathers.

The following operations are possible:

- *embossing with haircell rollers or correcting the defects with sandblast roller with the classic operation "by pressure". Embossing leather having the roller running autonomously at the same speed of the felt, gives a higher definition of the print (particularly noticeable on the haircell prints) because it avoids the smears deriving from the action of a felt driven roller.*
- *ironing with set thickness to equalize the leather (lamination), allowing the tanner to iron without crushing the leather and keeping, in this way, natural softness and touch*
- *ironing with variable thickness*

The machine is generally equipped by a mirror chromed ironing roller, a sandblast roller and an haircell one. Each one served by its dedicated and independent heating unit. In any case, the machine can be equipped following the specific needs of any customer.

AREA 2**Prefinitura e Rifinitone
Prefinishing and Finishing****ERRETRE SPA**

Pad. 31

Stand B1-C2

Mod. Ambra RS

Bottale di follonaggio di ultima generazione studiato e realizzato per la rifinitura di articoli moda come tuffato, vintage, lavati e asciugati in botte, con la possibilità di aggiungere prodotti chimici ausiliari. Questa macchina è largamente computerizzata e dotata di una intuitiva interfaccia grafica tipo touch-screen per garantire costanza e ripetibilità di processo indipendentemente da fattori esterni.

The latest generation of Erretre milling drums is embodied by this version that is purposely equipped for the finishing of fashion and trendy articles like "tuffato" and vintage and leathers washed and then dried in the drum with the possibility of adding chemicals during milling. This cutting-edge machine stands out for being thoroughly computerized featuring a user-friendly and intuitive full-color touch-screen panel as interface as to guarantee consistency of results yet providing repeatability to the process regardless to the external environment.

Mod. Ecospray

Cabina di spruzzatura ad alto rendimento e tunnel di asciugaggio/reticolazione dotati di energy saving incorporato che garantiscono il mantenimento di basse temperature sulle pelli attraverso il controllo dei parametri termodinamici in ogni camera.

High efficiency spray cabin and drying/curing units equipped with a built-in energy saving system that enable keeping the leathers at low temperatures through the supervision of all the thermodynamic parameters individually stage by stage.

AREA 2	Prefinitura e Rifinitura <i>Prefinishing and Finishing</i>
ITALPROGETTI ENGINEERING SPA Pad. 32 Stand C30 C8	<p>Mod. ANTISTATIC DRY</p> <p>E' considerato l'evoluzione dei bottali a follonare quale prima macchina interamente progettata per l'essiccazione e il condizionamento delle pelli. Numerosi i vantaggi tecnici derivati anche dall'utilizzo del polipropilene per la costruzione della botte:</p> <ul style="list-style-type: none"> · ottimo isolamento termico con minor tempo per raggiungere le temperature richieste · completa tenuta per evitare qualsiasi tipo di infiltrazione · possibilità di pulizia anche tramite resciacquo · sistema di riscaldamento con scambiatori alimentati a vapore con notevoli risparmi energetici rispetto ai sistemi tradizionali alimentati con gruppi di resistenze elettriche · permette di soddisfare tutte le richieste presenti in concerria: follonaggio, ingrassi, lavaggi, lavaggi in capo o asciugatura pelli bagnate per ottenere effetti particolari di slavatura del colore o raggrinzimenti. <p><i>This is considered the evolution of modern dry millingdrums in stainless steel, the first machine expressly designed for the drting and milling of wet leathers or skins. Thanks to use of polypropylene, it presents many advantages:</i></p> <ul style="list-style-type: none"> · <i>excellent thermal insulation which means less time to reach the necessary temperatures</i> · <i>total watertight to avoid whatever infiltration of water</i> · <i>easy cleaning also possible through washing</i> · <i>heating system with heat exchanging batteries fed by steam; this solution has a higher thermal efficiency compared to the traditional electrical systems, and allows remarkable savings in energetic consumptions</i> · <i>allows the tannery to experiment new techniques for fatliquoring, washing and drying of leathers or semifinished leather goods and garments, to obtain particular effects of "washed" or "shruken grain"leather</i>
MOSTARDINI OM SRL Pad. 32 Stand B12	<p>Mod. 3000TB, 3500 TB E 3800TB</p> <p>Modelli di presse idrauliche tipo TB, con 3000, 3500 e 3800 tonnellate di potenza, 2 cilindri in acciaio forgiato, barriere di sicurezza optoelettroniche e comando di apertura/chiusura a pedale, per aumentare la produttività senza pregiudicare la sicurezza, adatti per stampare ogni tipo di nuovo disegno pronto moda in qualsiasi grandezza.</p> <p><i>Models of hydraulic presses TB, with 3000, 3500 and 3800 tons of power, 2 cylinders in forged steel, photoelectronic safety barriers and opening/closing command using pedals, in order to increase the productivity without prejudicing the safety. These machines are suitable to print every type of new design fashion leathers.</i></p>

AREA 2	Prefinitura e Rifinitura <i>Prefinishing and Finishing</i>
PAJUSCO TECNOLOGIE SPA Pad. 32 Stand A19	Mod. MILLING Nuovo programma del bottale a follonare in acciaio, modificabile seguendo tutte le specifiche personali, ottenendo così performance incredibili, perché è controllato da un sistema di auto-controllo dei parametri di lavoro. <i>New software of the st/st milling drum with a personal, that can be modified following all the personal adjustment, having an amazing performance, because it always controlled by a system of self-control of all the working parameters.</i>
THEMA SYSTEM SRL Pad. 32 Stand B19	Mod. TH018 Ottimizzazione del processo di trattamento aria nel sistema di impianto per verniciatura pelli, brevettato tramite un sofisticato software che combina nel miglior modo la pressurizzazione, la temperatura e la umidificazione dell'aria sia per la stanza di velatura che di essiccazione. Questo nuovo metodo di ottimizzazione del trattamento dell'aria viene trasferito anche per i sistemi di essiccazione in continuo DRY-FLAT TH013 e DRY-TUNNEL TH009 ed in batch DRY-ROOM TH004, per pelli dopo sottovuoto o dopo il trattamento con macchina a ritenere. <i>Optimization of the air treatment process on Patent leather finish application system, through a sophisticated software which combines in the best way the pressurization, temperature and humidity of the air both for the curtain room and drying room. All these optimizations on the air treatment modalities are transferred also on continuous drying systems mod. DRY-FLAT TH013 and DRY-TUNNEL TH009 as well as in batch mod. DRY-ROOM TH004, for leathers after vacuum drier or setting-out machine.</i>
WEGA SRL Pad. 32 Stand C16	Mod. WINSORT Il sistema è costituito da un PC industriale, un touch-screen e vari display e interfacce e progettato per selezionare le pelli wet blue. Prevede in ingresso una barra di misura della superficie, un tappeto con pesa, una pulsantiera e opzionalmente un sistema di misura dello spessore. I dati caratteristici della pelle vengono confrontati con una matrice di valori presenti in memoria del PC per decidere in quale pallet mettere la pelle. <i>It is a system consisting in an industrial PC, touch-screen and some displays and interfaces designed for selecting wet-blue hides. This is its layout: in input a surface measuring bar, a weighting conveyor, a push button board and optionally a thickness measuring gauge. The specific data of every hide are compared with a matrix of values in the PC memory to decide what pallet put the hide in.</i>

AREA 3**Gestione, Trasporto e Laboratorio**
Managment, Work Transportation and Laboratory**PAJUSCO TECNOLOGIE SPA**Pad. 32
Stand A19**Mod. WIRE-LESS**

Automazioni software e hardware del reparto bagnato utilizzando il sistema wire-less, ottenedo un sistema affidabile, veloce e con appilcazioni estremamente facili.

Automations software and hardware of the wet - department using the wire-less system , having a reliable system, fast and with extremely easy application.

AREA 4	Prodotti Chimici Chemicals
CENTRALKIMICA SPA Pad. 31 Stand B33	Mod. BIO CLEAN Sgrassante per pulire "roller coating" o altri macchinari utilizzati per l'applicazione di cere ed oli su articoli di moda. Usato anche in altri tipi di operazioni in cui è necessario un'azione energica evitando l'uso di prodotti caustici. <i>It is a strong degreaser suitable to clean roller-coater machines or other equipments from waxes and oils. It can be used in all operations where a powerful action is required avoiding caustic products.</i>
FGL INTERNATIONAL SPA Pad. 31 Stand A29	Mod. PROGETTO RELEASYS® E' un processo di concia ideato e realizzato per aumentare l'efficienza della produzione di concerie in un ambiente eco-friendly. I benefici che ne conseguono: <ul style="list-style-type: none"> · una resa di superficie superiore del 7% rispetto ai metodi tradizionali; · minore quantità di rifiuti: minori costi di smaltimento dei sottoprodotti e minore inquinamento; · la pelle metal-free può essere smaltita come rifiuto non speciale quindi con un'ulteriore riduzione dei costi di smaltimento e un minore impatto sull'ambiente; · una migliore resa dei colori rispetto ai tradizionali metodi naturali (privi di metalli), si ha la possibilità di ottenere WET RELEASYS® più bianco del wet white, sul quale i colori risulteranno più puliti e brillanti. Inoltre questa procedura richiede l'uso di una minore quantità di colore; · questo processo, anche se metal-free, dà comunque migliori prestazioni chimico-fisiche dei cuoi finiti con un aumento delle resistenze (strappo e scoppio) che rendono le pelli adatte alla produzione di calzatura, arredamento, abbigliamento e pelletteria. <i>It is a tanning process conceived and realized to increase the production efficiency of tanneries in an environmental-friendly way.</i> <i>The benefits reached:</i> <ul style="list-style-type: none"> - <i>an increase in the performance of leather, with a greater surface yield of +7% compared to conventional methods;</i> - <i>less waste, entailing lower disposal costs and less pollution;</i> - <i>metal-free leather can be disposed of as non-special waste with a further reduction in disposal costs and a lower impact on the environment;</i> - <i>better colour rendering compared to traditional natural (metal-free) methods with the possibility of obtaining a white WET RELEASYS® than wet white, on which the colours will result cleaner and brighter. Also, this procedure requires the use of a lower amount of colour;</i> - <i>this process, though metal-free, results in finished leather with a better chemical and physical performance and an increased resistance to tears and bursting. This renders the leather suitable for the production of footwear, furnishing elements, garments and leathersgoods.</i>