TECHNOLOGICAL
SEMINAR

TECHNOLOGICAL ISSUES ANNEX

1st Edition 2010

The high Italian technology for leather manufacture

Collection of technological and scientific issues developed by Mechanical and Chemicals Italian companies in the tanning area

TECHNOLOGICAL ISSUES ANNEX

THE HIGH ITALIAN TECHNOLOGY FOR LEATHER MANUFACTURE

INTRODUCTION

This collection is attached to the compendium "Seminars ASSOMAC technology - High ITALIAN TECHNOLOGY FOR THE MANUFACTURE OF LEATHER" and 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

X DRUM SYSTEM	2.1 TECHNOLOGIES FROM RAW HIDES TO PICKEL
	2.2 TECHNOLOGIES FROM PICKEL TO WET-BLUE
	2.4 TECHNOLOGIES FROM CRUST TO FINISHED

ABSTRACT

This development, named X Drum by Pajusco Tecnologie and under patent, was designed to substitute, with advantages, the traditional pegs and tables inside the tanning drums.

This system can be applied to liming drums, as well as tanning and dyeing ones, using the same actual recipes in any particular tannery.

DESCRIPTION

With the traditional pegs and tables, as well as with the new non radial tables arrangements, offered in the actual tanning drum market, the pelts are subjected to a rolling and rubbing effect along with some pumping effect of the bath through the leather.

In this systems, the welcomed pumping effect is accompanied with the undesirable rolling of the pelts, that tends to produce twisting, tieing or knotting, and the unwanted rubbing effect that tends to produce the abrasion of the grain (nubuck like look of the grain).

The new internal arrangement of the X Drum, generates a lifting and dropping of the pelts and bath, producing an optimum pumping effect of the float through the leather fibers.

This lifting and dropping is done in such a gentle manner that diminish the rubbing effect to a minimum.

In the liming drums, the results can be compared to the ones obtained with paddles.

In the tanning drums, the results show hides more distended and a better absorption of chemical products..

In the retannage, the twisting, tieing and knotting disappears, improving the dyeing results.

It can be obtained more consistent dyeing inside each piece of leather, among the pieces of leather in each lot and among different lots of same color.

Here also, the absorption of chemicals is improved, is more even and complete, getting a consequent better quality of the leather.

When low substance hides are processed, the leather tearing in the drums is brought to zero. This can produce a dramatic yield increase.

The quality improvement of the X Drum in all the processes, allows to rise the load of the drums, without losing this good results.

The load increase depends on several factors, but in general can be of around 30 %. In some cases it can be higher.

In addition of the previous advantages, the X Drum permits the tannery technicians to reduce the float of the bath, in certain processes, and to reduce the offer in chemical products too.

This will bring additional advantages in saving chemicals and water, with less waste water to be purified.

The system of the X Drum, can be applied to any size of drum and, in general, it is adaptable to actual running ones.

RESULTS

The X drums System are rotating drums for the tanning industry with internal elements arranged in a non-traditional manner.

The main advantages of such System are:

APPLIES TO ANY DRUM

It can be applied to drums of any dimensions.

WORKS IN OLD AND NEW

It is applicable to new drums as well as old running ones. In the later case, the structure of the drum is automaticaly reinforced. Old drums after installation, work as new ones.

MORE PRODUCTION / PRODUCTIVITY

The X drum System allows to increase the loads up to around 40%. In certain situations the increase can be higher.

INVESTMENT AND SAVINGS

The system in new drums imply less inversion and savings in floor area.

In existing drums, imply higher productivity of actual equipment.

LESS WATER CONSUMPTION

The system permits to save water since it can work with less float.

With normal formulations, depending on the particular process, the savings in water consumption can be around 30 to 60%. This can be related to savings in the water treatment plant, since there will be less volume to be purified.

IMPROVED LEATHER QUALITY

The leather inside the drums is treated more gently.

This means for example, less grain abrasion in the liming processes, improvement in grow and fold marks. In dyeing, the tie ups desappear, resulting in even dyeings without stains.

YIELD INCREASE

Because of the above, the X drum System improves the yield. In the retanning and dyeing of low substance leathers (upholstery, garment, small leather goods) this System brings the tearing of hides inside the drums to ***zero***.

Also the tearing resulting from untieing knots of leather after unloading, disappears.

In addition the effort of the workers picking up the hides after unloading diminishes in a great extent.

SAVINGS IN CHEMICALS

In some processes there can be a reduction in chemicals offer.

It must be pointed out that the variables of the processes, such as pH, temperature, penetration, etc, can be reached as usual in standard formulations running times.

In some processes they can be reached in less time.

In this cases you can choose in:

1. running less time or
2. running as usual and have an improved chemicals absorption.

LONGER LIFE DRUM EXPECTANCY

This is due to the fact that the X drum System imparts extra strength to the drums.

ECOLOGICAL ADVANTAGES

The contribution to the ecology can be numbered as: less water consumption, better uptake of chemicals, lower noise level, reduced volume of waste waters.

ADDITIONAL COMMENTS

The X drum System is unique, since it produces an improvement in quality and productivity at the same time. The presence of the X drum System in the drums do not imply to change neither formulations nor chemical products.

	
Inox drum	Plastic drum

For further information

PAJUSCO TECNOLOGIE spa

Via Marconi, 1

36050 - Zermeghedo (VI), Italy

Ph: +39 0444 685566

Fax: +39 0444 686166

pajusco@pajusco.com

MEMBER assomac

Cl^- SO_4^{--} Reduction	2.1 TECHNOLOGIES FROM RAW HIDES TO PICKEL
Cr_2O_3 Reduction	2.2 TECHNOLOGIES FROM PICKEL TO WET-BLUE

ABSTRACT

GUIDELINES FOR AN ECOLOGIC BEAMHOUSE

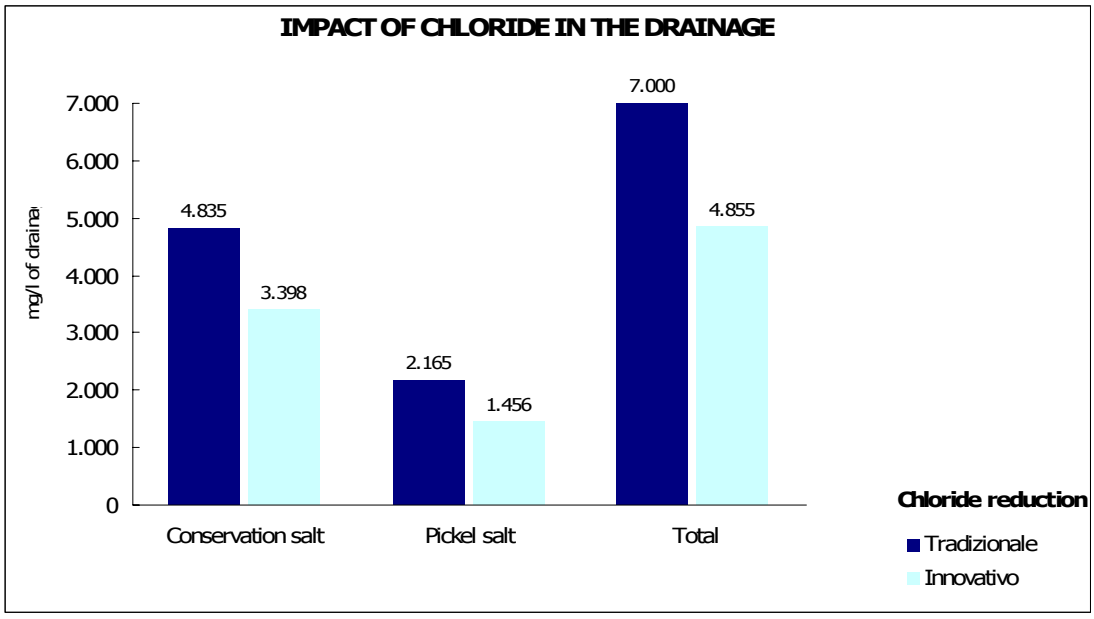
- reduction of chloride in the waste water
- reduction of sulphate in the waste water
- reduction of tanning chrome in the waste waters

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 theabovementioned processes, has a significantly different weight.

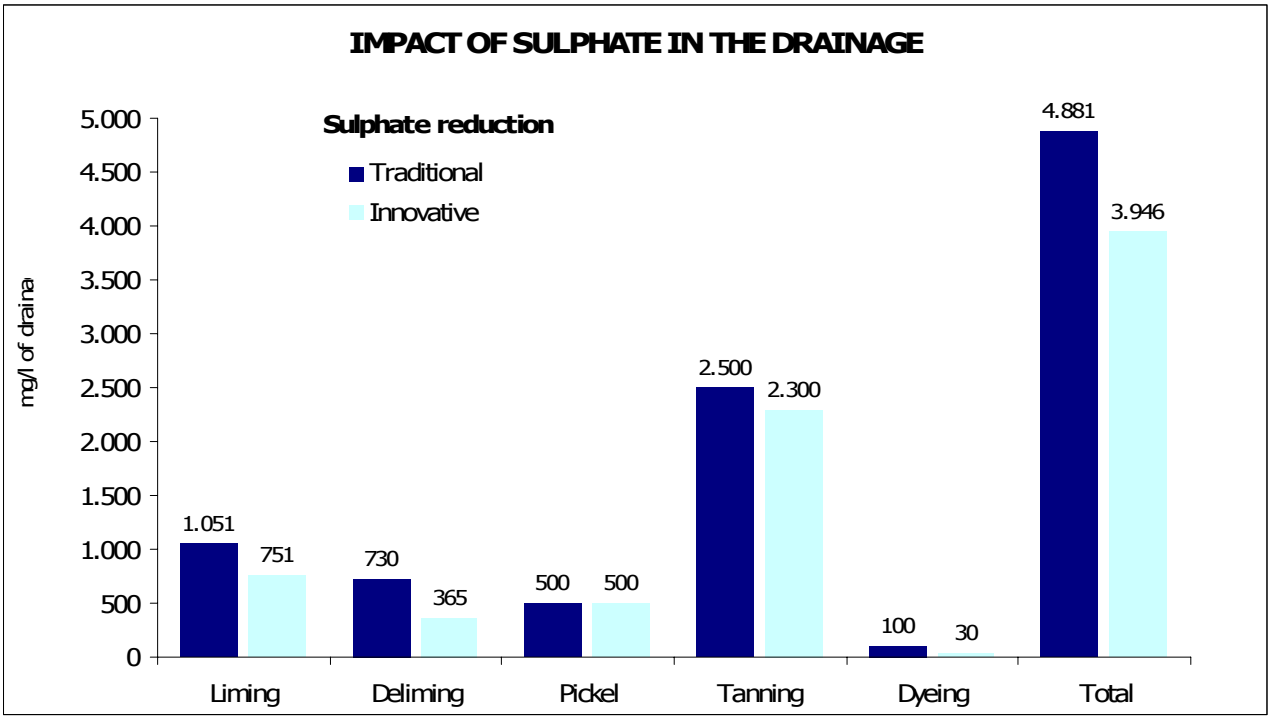
CHLORIDE ORIGINATING FROM PRESERVATION
MECHANICAL DE-SALTING PROCESS
UTILIZATION OF FRESH SKINS
REDUCTION OF CHLORIDE USED IN PICKEL STAGE



Guidelines for the reduction of sulphate in the waste water

Most of sulphates in the waste water come from the deliming , pickel and tanning process, and from the sulphide in the drainage of liming process, which becames 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 DELIMING 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

LETEX SPA

Via dell industria 15/16

36054 - Montebello Vicentino (VI), Italy

Ph: +39 0444 440496

Fax: +39 0444 440497

info@letex.it

http://www.letex.it

SPLITTING BAND KINIVES	2.1 TECHNOLOGIES FROM RAW HIDES TO PICKEL
	2.2 TECHNOLOGIES FROM PICKEL TO WET-BLUE
	2.4 TECHNOLOGIES FROM CRUST TO FINISHED

ABSTRACT

Benefits achievable through the use of our blades: more accuracy, precision and perfect cut, maintaining thickness, in the splitting procedure, with the guarantee of absence of any type of defect on the leather. Life of the blade correlated to the type of working.

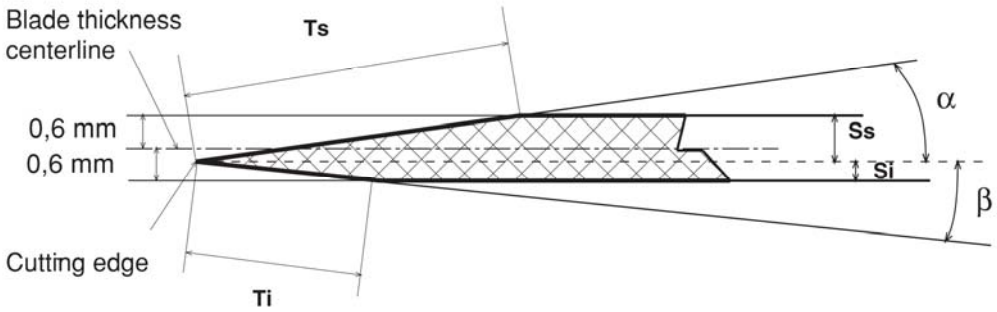
DESCRIPTION

According to customers' needs/type of working (from lime/pickled/ wet blue/ wet white/ crust to vegetal) we chose several steels with different technical characteristics, in order to offer a more performant product suitable to every type of splitting.

The most important characteristics are linearity and thickness of the blade because these two factors make it possible to realize more precisely the thickness of the leather.

For that reason we have very strict tolerances (declared and realized)

Trigonometric relationships of the blade face dimensions



$Ss = Ts * sen(\alpha)$ $\quad \alpha = arcsen(Ss/Ts)$

$Si = Ti * sen(\beta)$ $\quad \beta = arcsen(SiTi)$

with the restriction that $Ss + Si = 1.2mm$ (blade thickenss)

RESULTS

Companies that are using our blades don't have any damage during the splitting process.

LIFE OF THE BLADE

The best result depends on:

- On the regulation of the machine and the worker's skilfulness
- On how the worker makes the first bevel
- On the kind of hides
- On kind of tanning
- On how heavy the hides are
- On the quantity of salt inside the hides
- On the leather-wash
- On the way they are pressed
- On the stones used

consequently:

- a blade can split from 2000 pieces up to 87.350 or a blade can last from 24 hours to even 160 hours.

The relation of bevel

Usually, we advise customers to follow the instructions of manufacturers, about the inclination of bevel angle.

In wet blue: for this working, bevel is of mm 5, upper one, mm 3, lower one.

In lime: for this working, bevel is of mm 6, upper one, mm 3,5/4, lower one.

In dry: for this working, bevel is of mm 3,5 upper one, mm 2,5, lower one.

(Not longer, otherwise cutting can loose force).

Bevel must always be scratched - never shiny

GRINDING WHEEL SPECIFICATIONS FOR SHARPENING SPLITTING BANDKNIVES

A correctly sharpened bevel is essential for obtaining the best splitting performance with greater cutting precision and prolonging the life of the bandknife, translating into greater productivity in terms of leather or materials split.

There must be an optimal relationship between the steel of the blade and the composition of the grinding wheel in order these levels of performance.

This relationship should normally be as follows:

"Hard" steel / "soft" grinding wheel or "soft" steel / "hard" grinding wheel

The bevel of the blade should be checked visually to ascertain the correct relationship.

The bevel must ALWAYS be scratched and NEVER shiny.

Lamebo can manufacture splitting bandknives from steel of different hardnesses in order to meet customer requirements based on the type of grinding wheel already used or we can recommend the type of grinding wheel depending upon the steel ordered.

Grinding wheels are classified as resinoid, vitrified, ceramic or diamond depending upon the bond used to manufacture them. Note that resinoid grinding wheels are subject to deterioration over time and will thus expire.

Manufacturers of grinding wheels are required to indicate either the date of expiration or the date of manufacture for each grinding wheel.

We would also like to point out that the useful life of the grinding wheel may diminish considerably if it is improperly stored in a damp location or environment.

We therefore recommend that you check the expiration date of the equipment with your supplier in order to prolong their productive life.

For your information, we are providing the data contained in the international identification code of the technical specifications for grinding wheels below.

TYPE OF ABRASIVE - GRAIN - HARDNESS - BOND

For example, the code A 36 1 E 6 means:

Type of abrasive:	A	aluminum oxide
Grain:	36	36 grains per square inch
Hardness:	1	hardness
Bond:	E6	rubber lacquer

This is a "resinoid" grinding wheel and thus subject to expiration.

Below are a few grinding wheels that we recommend for use with the different steels of our bandknives:

Type of abrasive:	A	aluminum oxide
Grain:	36	36 or 46
Hardness:		G H I J K L M (preferably I J K)
Bond:	E 6	8V263 - 8V300 (vitrified) - B5
Wet blue:	A 36 IE6 - resinoid	
	22 A 46 JOT 8V 300	
Pelt:	A 46 RS 5280	
Dry:	A 36 IE6	
Rubber:		88 A 46 I 8 V 263 (46 -54 grain)

For further information

Lamebo S.R.L

Viale Kennedy – 10040 – Leinì (TO) – Italy

Ph. No. +39 011 9910383

Fax no. 011 9910424

e-mail: Lamebo@lamebo.it - skype Lamebo

MEMBER assomac

Metal & Formaldehyde free Wet-White process	2.2. TECHNOLOGIES FROM PICKEL TO WET-BLUE

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 – Tetrakis Hydroxmethyl 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.

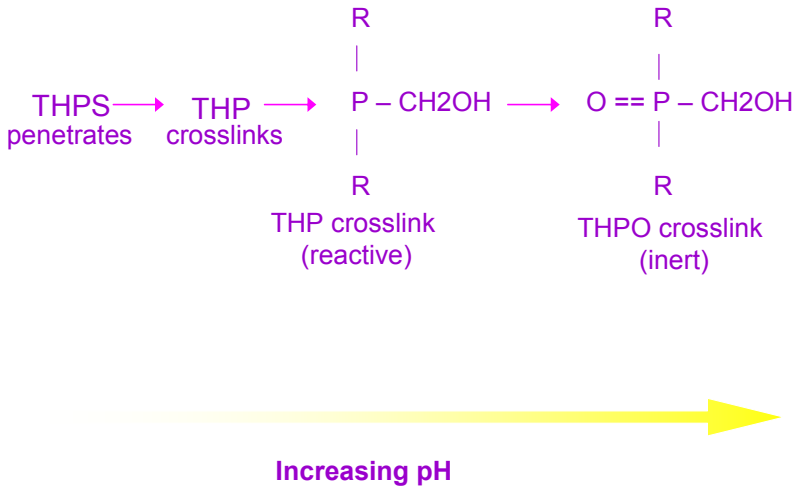
MECHANISM

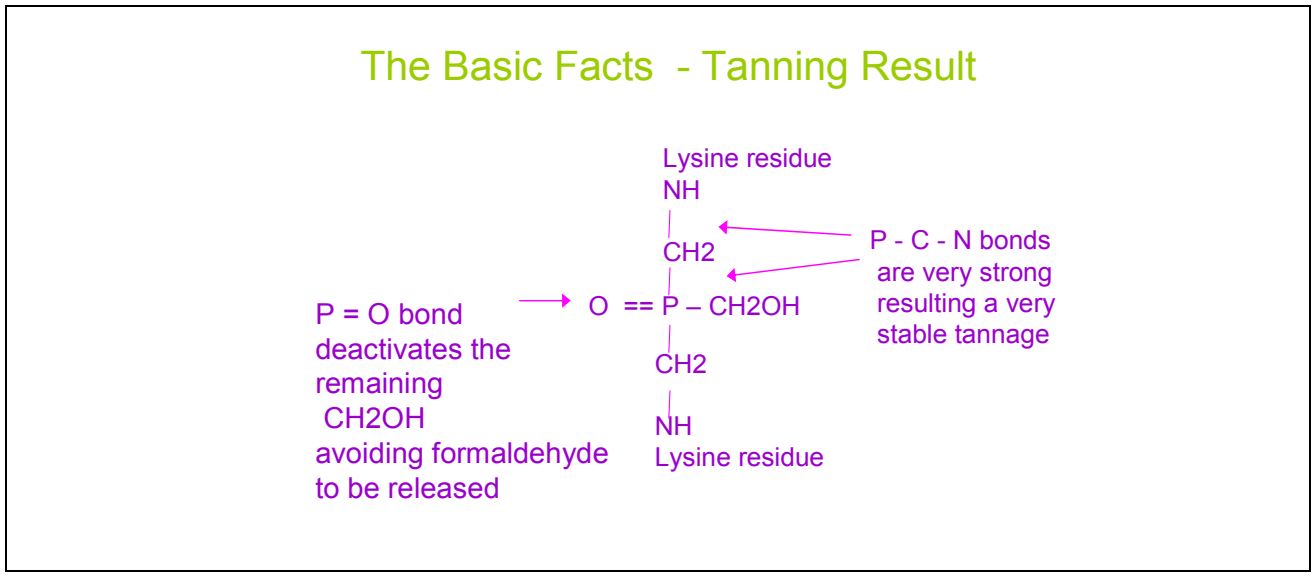
Its tanning mechanism is allowed to penetrate into the pelt substrate in the unreactive form of THPS. Once the penetration is complete, THPS is converted into its active crosslinking form, usually by raising the pH of the system. The reactivity of **Vandotan PH** is dependant upon pH, concentration and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





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 allowedwhen 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 Glutaraldheyde	**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

VANDONI SPA

VANDONI SPA

VI A PINTURICCHIO 1, 20133 MILANO

Ph 02 89304998

FAX 02 89305127

WWW.VANDONI.COM

VANDONI@VANDONI.IT

FREE METAL TANNING	2.2. TECHNOLOGIES FROM PICKEL TO WET-BLUE

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**	***Pickled calf***
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**	***N.1 Wet white leather***
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 CH2CL2 (%)	11,60	8,1
TANNING DEGREE	22,10	25,70

For further information

KLF TECNOKIMICA SRL

via Walter Tobagi, 25/27

56022 - Castelfranco di Sotto (PI), Italy

Ph: +39 0571 471090

Fax: +39 0571 471089

info@klftecnokimica.it

http://www.klftecnokimica.it

SHAVING MACHINE: AUTOMATIC THICKNESS RECOVERY	2.2. TECHNOLOGIES FROM PICKEL TO WET-BLUE
	2.3 TECHNOLOGIES FROM WET BLUE TO CRUST

DESCRIPTION

What does it mean?

As you know, on shavers the thickness got on the processed hide, is due to the mechanical distance between the chrome roller and blade roller.

The quality of a lot of shaved hides is given to the thickness uniformity on all hides and for all hides of the lot.

The variation tolerance of the thickness has not to be different 0,5 mm (more or less) than to required value .

To have these results guaranteed, the tanners must check the result by the gauge each 5/6 shaved hides, have to adjust the thickness and blade grinding with experience (this is to avoid the continuous increasing of the distance between the blade edge blade and chrome roller) Obviously this causes a slowdown in the production

The thickness problem becomes the most care (like an incubus) for the tanners who are consequently under stress.

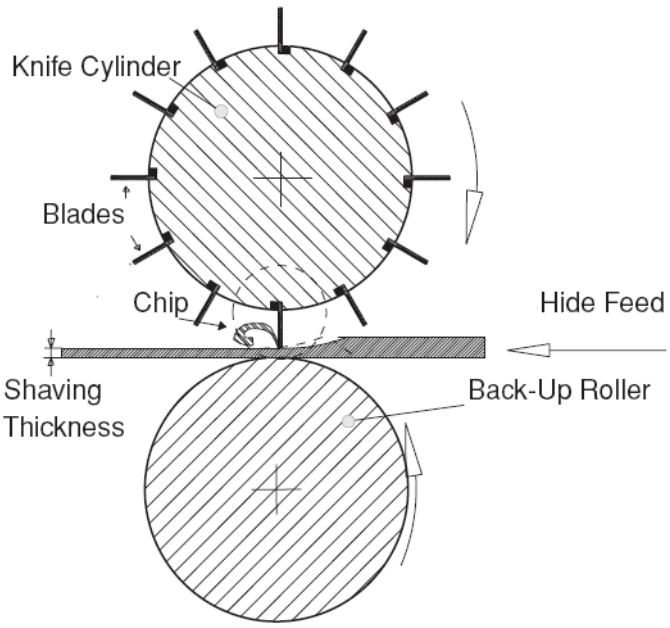
The device for automatic thickness recovery helps the operator during the adjusting, since he has to do less check operations,

In fact each time that the grinding wheel , by grinding the blade, reduces the blade high 0.03 mm., the device acts and re-sets the mechanical distance between the blade cylinder and chrome roller in accordance to the difference.

By this are granted:

- constant thickness
- more productivity (few controls from the operator)

In addition by this system, the operator has not to be skilled for the shaving process.



Blade cylinder and back up roller

FUNCTIONNING PURPOSE OF THE DEVICE

The length of the blade edge is continuously checked by a sensor placed in a very stable position.

As you know the blades need a continuous grinder by a grinding wheel, which wears the blades and consequently varies the distance between the blade edge and chrome roller.

When the blade wear is 0.03 mm the sensor starts the movement of the chrome roller to recover the difference. The movement of the recovery is active till the sensor is closed.

For further information

RIZZI spa
Via Finlandia 81
41100 - Modena (Mo), Italy
Telefono: +39 059 3162911
Fax: +39 059 3162953
rizzi@rizzi.it
http://www.rizzi.it/

MEMBER
assomac

JUST IN TIME	2.3 TECHNOLOGIES FROM WET BLUE TO CRUST

ABSTRACT

We are very pleased to introduce you some technical information about ***our latest technology***.

Why should you buy our drying conditioning and staking line? Do you know the real advantages to use a low pressure turbo vacuum dryer, a through feed moisture conditioning and a high vibration frequency staking ?

Maybe not !?

For many years the tanneries have missed opportunities to change or improve the production system, thinking that all the machines are more or less the same.

It's only a matter of price.

When you make an investment, normally you calculate: how long it will take to be paid back in terms of reduction costs and the further margin of benefit profit.
This must be the same for tannery machines. **We know how to do it !!.**
There are two working system the old one, and the new Cartigliano drying conditioning and staking system.

TRADITIONAL OLD SYSTEM

Mechanical operation	***Leather square feet***	***Residual humidity***
Traditional setting out	*Leather 50 sq/f*	*50-70% and over*
Wet Toggling	*Leather 52 sq/f*	*no moisture control. Leather over dried*
In alternative high temperature vacuum dryer	*Leather 48 sq/f*	*- Humidity is the same as before - No drying operation - Heating plate effect*
Air chain	*Leather 45 sq/f*	*-depends by the environment humidity conditions -leathers' hanging time -it could take minimum from one to 3/4 days of waiting period*

Disadvantages caused by these drying operations

The system is without control. The production is not constant and Precise. **Toggling** open mainly on **belly sides**, and these parts are **getting loose.** Backbone, neck, **fat wrinkles are less open**, **thickness is not constant** from the central Parts till the perimetric area. Percentage of **cuttable area is reduced**. The hanging system of the leathers gives a **dramatic shrinkage**, with a corrugate area and **no flat surface** at all. The leather must be rewetting and treated with different operations to keep it back to an acceptable crust ready to be finished.

Cartigliano "Just in Time" drying conditioning and staking system.

Mechanical operation	***Leather square feet***	***residual humidity***
sammying setting out through feet	*50 sq/f*	*45- 50%*
cartigliano wet stretching	*55 sq/f*	*45-50%*
automatic feeder	*55 sq/f*	*45-50%*
cartigliano new turbo vacuum dryer	*53sq/f*	*accordingly to the article 25-32%*
cartigliano wet stretching	*56 sq/f*	*25-32%*
conditioning machine taic	*54 sq/f*	*accordingly to the article 10- 14%*
cartigliano staking machine	*57 sq/f*	*10-14%*

Advantages by using this system !!!

Leathers from re-tanning drums are processed through **a continuous production flow**, and with precise standard parameters. **The sammying setting out:** Remove around 50% of water and enlarges and flattens the leathers. **The wet stretching:** Gives to the leather the same **equal opening** in all its points. The **thickness is more uniform all over**. **The fat wrinkles are completely flat, and legs are open too**. The fibres are ready to get a quicker and more even drying with the low temperature vacuum dryer.

The automatic feeder: Conveys the leathers on the vacuum dryer's tables immediately. No time to shrink. The fibres are thermofixed with the previous flatness. No **manual operation is necessary**. **The new turbo low pressure vacuum dryer:** The new pumps with higher capacity extraction allows to obtain a **evaporation that can start at extremely low temperature**.

The leather's temperature never exceeds the normal body temperature of the animal when alive.

Minimum loss of area 5% less than conventional vacuum. Rounder and softer touch. Uniformity drying on the whole surface**, much higher cuttable area.**

The new conditioner machine model TAIC: a through feed modular plant for conditioning leathers **to the final desired humidity percentage**. The leathers are conveyed in between two high speed air belts blowing on both sides. **The temperature and moisture are controlled and gives the most reliable constancy to the product**. The air effect against the leathers ensure **a perfect flatness** and homogeneous drying at low temperature. The shrinkage thanks to this drying system is reduced to the minimum around 5% less than a conventional hanging chain system. **Cartigliano high performance Staking Machines with 3 or 4 heads:** the new models achieve **the highest vibration speed** of the beating jaw compare the traditional ones. **The leathers receive the best opening effect** that can naturally Maintain itself without compromise the fibres. Quality, **softness, and roundness are the ones that we desire**, the article has been upgrade to the prefixed target.

This new combination of machines and technology method allows to reproduce an optimization of the product continuously during the year, eliminating stocks of leathers hanging around.

The whole cycle from re-tanning drums to the leathers ready to be finishing will last 45/50 minutes and will employ 4/5 operators, with an output of around 110 hides or 220 sides per hour.

We summarize here below some advantages
of this new combination of machines and technology system

1. *Reduction of manpower cost*
2. *Reduction of energetic consumption*
3. *Any type of leather can be processed*
4. *Constant production*
5. *Constant quality of leather*
6. *Reduction of the time cycle of the leathers*
7. *Increase of cash flow and reduction of investment for buying raw or blue leathers*
8. *Reduction of machines' amortization time*
9. *We can say that "just in time" gives a power to be competitive in the market, with a further margin of profit.*

NEW CARTIGLIANO R&D DEPARTMENT FOR

PRODUCTION/TESTING TRIALS WITH YOUR LEATHERS.

For further information

OFFICINE DI CARTIGLIANO spa

Via S. Giuseppe, 2

36050 - Cartigliano (VI), Italy

Telefono: +39 0424 592526

Fax: +39 0424 829429 / 598035

odc@cartigliano.com

http://www.cartigliano.com

MEMBER

assomac

MILLING DRUMS	2.4 TECHNOLOGIES FROM CRUST TO FINISHED

ABSTRACT

Erretre milling drums allows to finish and upgrade leathers directly in the milling phase.
Therefore is more than a simple milling drum; it is a complete machine to mill, upgrade the leather, to finish with special effects. These are dry and sometimes wet & dry operations carried out by an effective mechanical action in perfectly air-conditioned environment. It is like having several machines in one, with the advantage of skipping some production steps and noticeable save in time and chemicals. Summarizing :

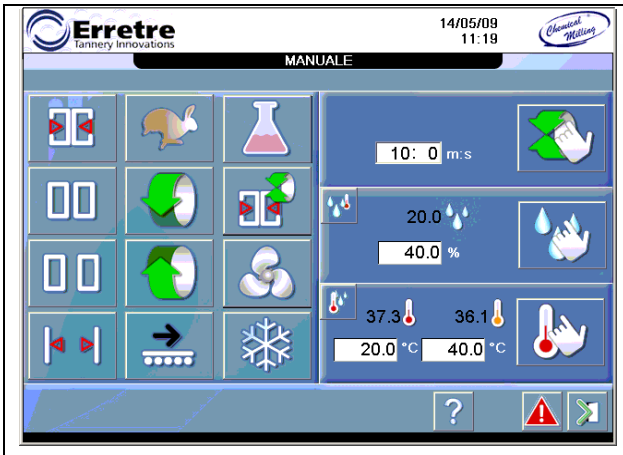
ERRETRE's technology today makes possible to :

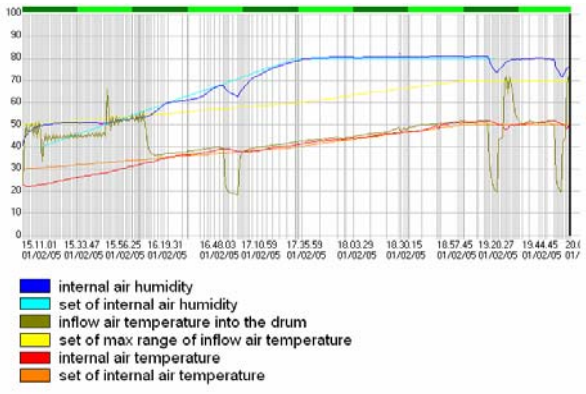
- Enhance or diminish the pebbling or grain in the same batch (control the area)
- Guarantee complete dedusting of leathers and splits
- Make specific batches more uniform and also between batches
- Work independently from the environmental conditions guaranteeing consistency of
- results and quality
- Program, control and record all the working parameters ensuring repeatability to the process
- and full data feedback
- Take full advantage from the Chemical Milling® technology by adding special chemicals like colour enhancers, touch modifiers, waterproofing agents ecc. in the dry stage
- Successfully perform the wet milling operations with subsequent drying in the drum in order to achieve a controlled shrinkage followed by final dry milling

DESCRIPTION

ERRETRE MILLING DRUMS

New generation of dry milling drums featuring full insulation of air circuit and deduster. As options Auto-unloading units with optimized geometry to increase load limits and cut on maintenace, built-in touch screen interface with specific software to optimize the milling process and ease the production management thru host computer placed at the milling room. These machines are technologically advanced for the milling and upgrading of the leather during both the dry and wet milling process of leather in both semi-finished and finished conditions no mention the treatment of finished goods like handbags and leather jackets to obtain the vintage look. The milling of the leather is done inside an area enclosed in stainless steel, with an extremely high loading capacity. Inside this “climatized” zone, the air is continuosly exchanged and filtered and the combination of the mechanical action with controlled temperature and humidity enables one to give the leather the desired characteristics (uniform pebbling, softness, moisture, etc.). Moreover the Chemical Milling technology allows the processing of leather to become easier and more flexible enabling the production of leather of differentiated characteristics in a repeatable and consistent manner.





RESULTS

Wet milling from Erretre

Erretre has upgraded their wet milling INOX range of machines. New types of leather finish and grain effects can be achieved by tumbling wet leathers. The higher moisture content, heat and the mechanical action allows the tanner to achieve special effects such as grain pebbling and other surface effects through a controlled shrinkage. Following the retanning steps in the drum leathers can be milled directly using Erretre's INOX drums for various effects such as "vintage". However, depending on the effect required wet milling may also take place after sammying and setting out or after vacuum drying. Erretre have upgraded the drainage system on the smaller models and improved the sealing/insulation while the machine is in operation across the whole size range.The INOX drums for vintage have a more powerful heating system than the traditional dry milling machines and has more electronic controls to avoid any unwanted shrinkage of the leathers during processing. The computerised system is necessary to optimise the wet milling and subsequent drying phase, avoiding loss of heat while the machine is periodically vented to reduce the excess of moisture.Erretre say that tanners have used their wet milling equipment at temperatures between 35°-60ºC depending on the final effect and the tannage used. The machines have also been used to provide a 'used' and natural look to finished leather products such as leathergoods and garments to enhance the seams, the edges and surface which are exposed to a rubbing action to create a warn look.The equipment has been used on chrome or vegetable tanned leathers in cow, calf and goat and is ideal for tanners that wish to create the 'tuffato' or dipped leather effects. In the end the finished good will not be seen and regarded just as, for instance, an ordinary leather jacket but rather a unique charming piece of craftmanship with a vaguely reminiscence of the past with its soul and history.

For further information

ERRETRE spa

Sede legale:

Via Ferraretta nr.1

36071 Arzignano (VI) Italy

Tel. +39 0444 478312

Fax +39 0444 478308

e-mail: info@erretre.com

www.erretre.com

“TES” DRYING TUNNEL	2.4 TECHNOLOGIES FROM CRUST TO FINISHED

ABSTRACT

Several advantages are offered by this solution and can be summerized as follows:

Tunnel internal part is dust free because there is no air recirculation fans (the tunnel just fits exhausting fans for extraction of humid air).

Even the lightest skins can lay steadily on the conveyor because of no ventilation.

Low power consumption thanks to the minimum loss of heat.

Easy assembly. Without steam or other thermal fluid and respective boilers only electrical fittings are required.

Complete operating independence from the rest of the tannery.

Wide temperatures regulation in any single zone of the tunnel, choosing the heating curve from feed in to feed out.

Quick start running (5/10 min. max) allowing to switch off the whole plant for short breaks too.

Improvements on leather quality which keeps a softer “feel” because the heat is concentrated on the pigmented surface only.

Cleaning and maintenance of the plant reduced to the minimum because of the air filters absence.

The tunnel is suitable to work both after the spray booth and roller coating machines.

Standard working widths: 1800, 2200, 2600, 3000, 3400 mm.

Possibility of making a “two layers” drying tunnel: in a space of an 8 mt conventional tunnel it is possible to have a double drier corresponding to a 16 mt drying tunnel. Huge space saving!

DESCRIPTION

DRYING TUNNEL TYPE "TES"

A new, revolutionary drying tunnel for finishing lines, working by radiancy produced by electrical current.

Radiancy is the most natural and straight form of heating, because it allows to transfer thermic power from a hot source to a cold body without conveying means: **it is the principle by which the sun heats!**

A set of electric panels (covered by international patent) - thanks to a special construction and to appropriate materials - can radiate preferably in a single direction, concentrating their action only on the leather and limit at its most the loss of heat.

RESULTS

	BX	PT	LP	LP	CA	CA	HE	GI	GI
WORKING WIDTH mm	3000	3000	3400	3400	3400	3400	3400	3400	3400
CONVEYOR SPEED mt/min	11	16	12,5	12,5	13	13	11,5	12	11
LENGHT OF TUNNEL Mt	12	12	10	8	12	12	12	10 (+2)	10 (+2)
QUANTITY OF PRODUCT gr/ftq	2/2,5	2/2,5	5/6	3/4	2,5/3,5	2/2,5	1,6	2,2	1,5/1,6
TEMPERATURE	300/300	300°C	300°C	300°C	200/220	200/220	200/250	300/300	330/330
HEATING	300/300				220/250	220/250	250/200	300/300	330/330
PANELS °C	300/270				250/250	250/250	200/100	300	330
TEMPERATURE LEATHER SURFACE	83/88°C	65/68°C	76°C	73°C	45/50°C	45/50°C	45/46°C	71°C	85°C
(after tunnel)									
POWER INSTALLED Kw	208	233					216	195	195
POWER CONSUMPTION Kw	88	77					56	69	96

For further information

FRATELLI CARLESSI by Carlessi srl

via Ferraretta 48

36071 Arzignano – Italy

ph. +39 035 891210

fax +39 035 891067

info@carlessi.it – www.carlessi.it

MEMBER assomac

LOW DENSITY AND TOXICITY FUME DEVELOPMENT FIRE PROOFING PRODUCTS	2.4. TECHNOLOGIES FROM CRUST TO FINISHED

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

STEFANI CHIMIS SRL CENTROCAMPIONATURA

Via Vigazzolo, 82

36054 - Montebello Vicentino (VI), Italy

Telefono: +39 0444 440066

Fax: +39.0444.440056

info@stefanichimis.com

http://www.stefanichimis.com

Nano-Fixing agents for abrasion-resistant finishes	2.4. TECHNOLOGIES FROM CRUST TO FINISHED

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.

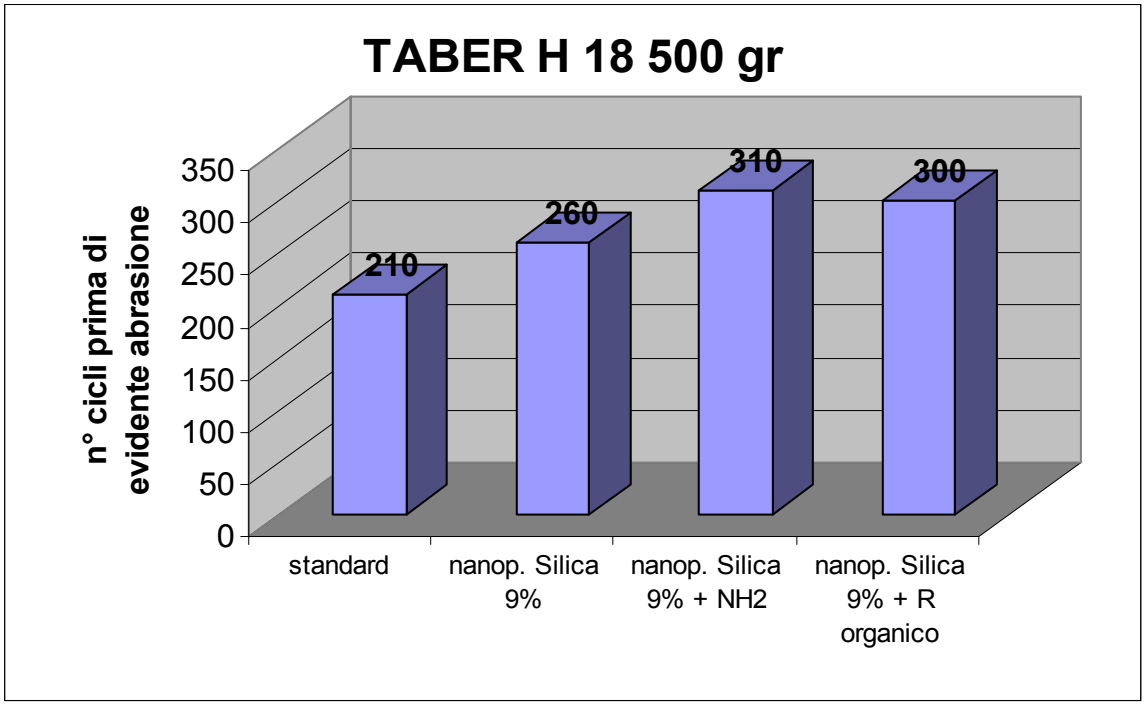
Taber tests demonstrated the effectiveness of a blend of differently sized nanoparticles compared with the effectiveness of a single type (Blend 1:1 Particles T + S).

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 SiO_2 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

STEFANI CHIMIS SRL CENTROCAMPIONATURA

Via Vigazzolo, 82

36054 - Montebello Vicentino (VI), Italy

Telefono: +39 0444 440066

Fax: +39.0444.440056

info@stefanichimis.com

http://www.stefanichimis.com

SPRAYING FUMES CLEANING	2.6. ENVIRONMENTAL SOSTENIBILITY

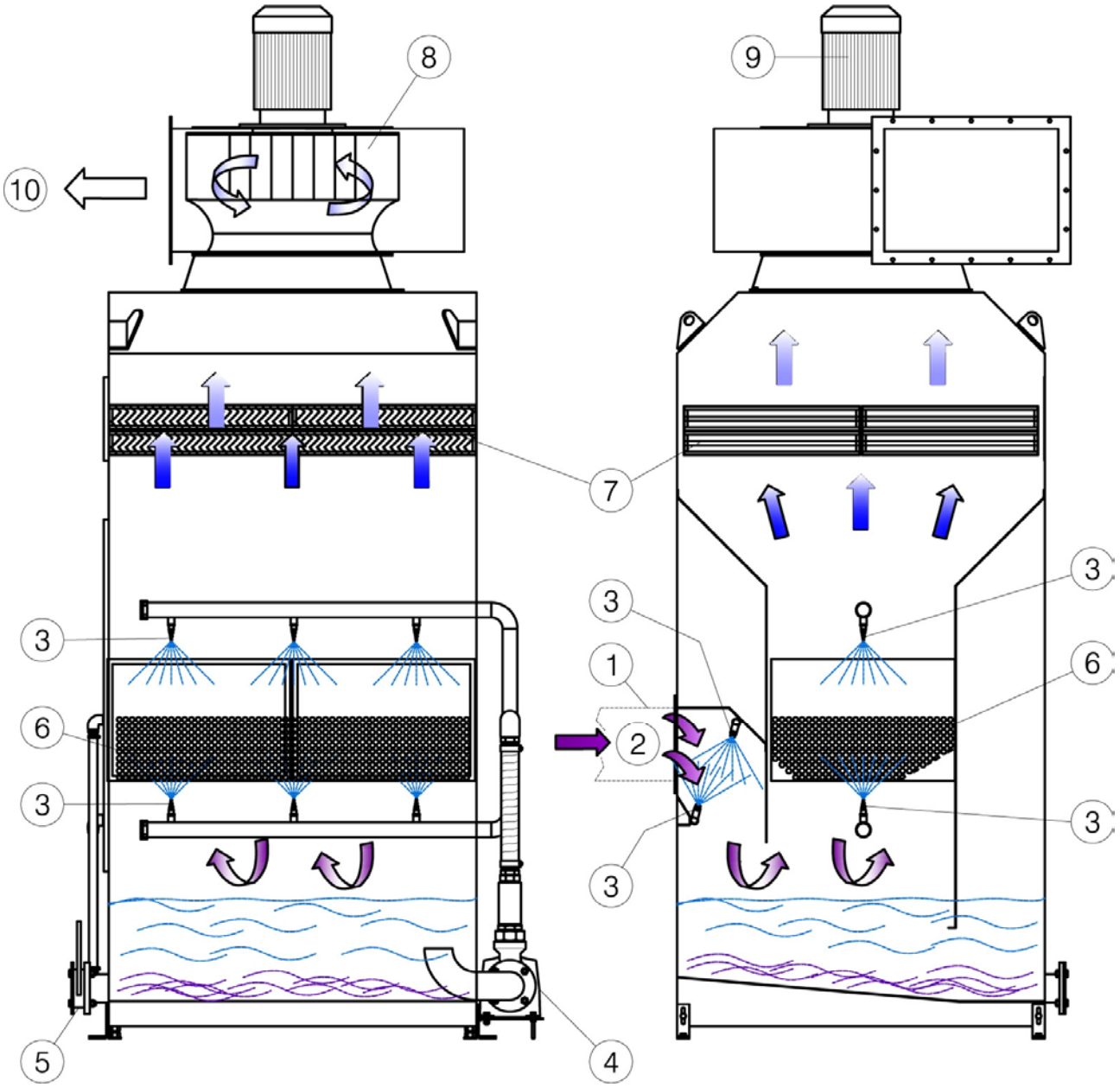
ABSTRACT

During the finishing process, precisely the spraying operation, spray guns produce an over spray that is exhausted through the ventilation system. Despite the use of special spraying guns like Airless (High Pressure) guns and HVLP (High Volume Low Pressure) guns, mainly during the colour coat and top coat operations, the quantity of chemicals nebulized in the air is very high. This over spray is composed of a mix of chemical products, including the **Volatile Organic Compounds** (VOC) and it is highly polluting. In order to help worldwide tanneries to reduce pollution and keep the environment "GREEN", **POLETTO STA** has designed two models of fumes cleaning devices that reduce the quantity of VOC exhausted in the air to less than **90%** of those created by the spraying machine, so they keep this quantity within the limit requested by the International Regulation and Standards.

DESCRIPTION

POLETTO STA fumes scrubbers are called **TURBO CLEAN** and **ECO CLEAN**. Both units have a double combined water/air filtering cleaning system. The fumes coming from the spraying booth are washed by high pressure water nozzles. Then, according to the model, they are centrifuged by an impeller made in spark-proof material, or collected by a huge number of special plastic balls inside a net box. Finally, in both models of fumes purifier, before being exhausted, air is filtered by a few sets of stainless steel drop separators. The washing water and the VOC are collected in a tank equipped with a discharge valve. In order to save water, both models use a pump for recycling the water sent to washing nozzles. The structure of these fumes scrubbers is completely made in heavy stainless steel, which allows an easy cleaning. When fumes scrubbers were designed, **POLETTO STA** engineers had a high consideration for the maintenance problem: all the parts that wear out quickly can be easily replaced from outside and through big doors. The fumes cleaning devices **TURBO CLEAN** and **ECO CLEAN** can be used with any brand and model of spraying machines, and they can be installed any time the VOC pollution control is requested, without difficulty.

FUMES CLEANING SYSTEM:



1	Sucking hood		6	Special balls filter
2	Fumes entrance		7	Drops separators
3	Nozzles for the water		8	Exhausting fan
4	Recycling pump		9	Fan motor
5	Discharge valve		10	Depurated air exit

RESULTS

POLETTO STA fumes scrubbers **TURBO CLEAN** and **ECO CLEAN** have been tested several times by specialized Agencies in order to check the quantity of VOC exhausted in the air. The total VOC were always within the limit imposed by the International Regulation and Standards. Here below, there are the results of an emission test done on a **POLETTO STA** spraying plant mod. **SMP 3400** equipped with a fumes scrubber mod. **ECO CLEAN** during the colour coat operation.

Test done on the fumes before the scrubber mod. ECO CLEAN:	Test done on the fumes after the scrubber mod. ECO CLEAN:
Medium air delivery: 17,000 Ncm/hour Medium temperature: 26.0C° Medium speed: 13.8 m/s Composition: Nitrogen: 77.50% Oxygen: 20.76% Carbon dioxide: 0.03% Argon: 0.92% Carbon monoxide: n.c. Nitrogen oxide: n.c. Sulphur oxide: n.c. **Volatile Organic Compounds** **(VOC): 13.6 mg/Ncm** **Mass of flow measured : 231.200 grs/hour**	Medium air delivery: 17,000 Ncm/hour Medium temperature: 22.0C° Medium speed: 13.3 m/s Composition: Nitrogen: 76.81% Oxygen: 20.58% Carbon dioxide: 0.03% Argon: 0.91% Carbon monoxide: n.c. Nitrogen oxide: n.c. Sulphur oxide: n.c. **Volatile Organic Compounds** **(VOC): 1.2 mg/Ncm** **Mass of flow measured: 20.400 grs/hour**

By using the fumes scrubber **POLETTO STA** mod. **ECO CLEAN**, the emission of **VOC** in the air was only **1.2 mg/Ncm,** this means less that 90% of the initial emission of **13.6 mg/Ncm**

For further information

POLETTO STA

Via Arzignano, 126/a bis – 36072 CHIAMPO (VI) – ITALY

Ph +39 0444 421450

Fax +39 0444 421557

e-mail: info@statannerymachine.com

Web site: www.polettosta.com

SUMMARY