

# SWIM and Horizon 2020 Support Mechanism

Working for a Sustainable Mediterranean, Caring for our Future

## **Process and product environmental performance for tanneries of excellence: the requirements imposed to EU tanneries by luxury brands**

**Tiberio Daddi**



Scuola Superiore  
Sant'Anna

This Project is funded by the European Union



umweltbundesamt<sup>®</sup>

ATKINS

# **Fashion brands requirements: introduction**

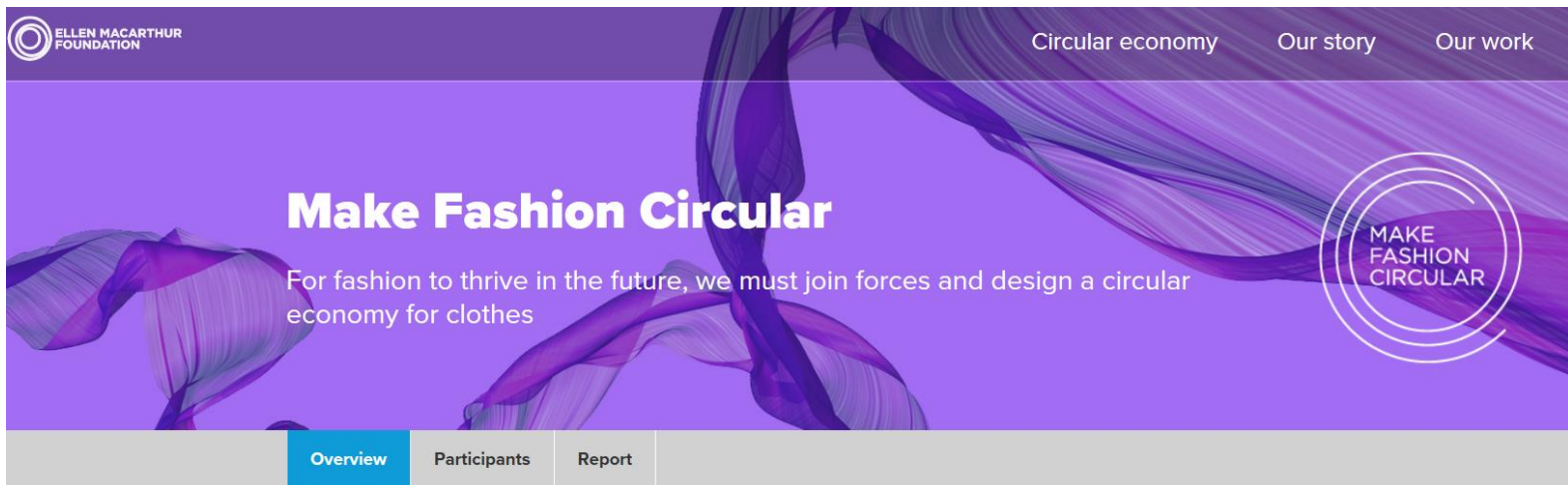
Italy is the most important producer of finished leather and sole leather in Europe.

Fashion brands are customers very important for Italian tanneries.

The economic crisis have impacted on tannery sector, but the tanneries that work for luxury brands have increased their business.

# Fashion brands requirements: introduction

Luxury fashion brands are pressed by media and other stakeholders to be more sustainable, in many cases their environmental commitment is high, and it is reversed on environmental requirements imposed to suppliers (e.g. tanneries)



# Fashion brands requirements: aim of the study

LOUIS VUITTON



The aim of the study we are about to present in the next slides was the identification of all the requirements imposed by different luxury brands to Italian tanneries and resume them in an unique document.

VALENTINO

D&G  
DOLCE & GABBANA

GUCCI

# Fashion brands requirements: method

Working group:



# **Fashion brands requirements: method**

The requirements have been identified through a systematic analysis of the the “supplier sustainability requirements” i.e. documents distributed by all luxury to tanneries and that describe the environmental requirements imposed.

These documents have been collected by the tanneries by the members of the working group.

Then a unique document has been drafted where there have been included the identified requirements from multiple sources (i.e. different luxury brands)

# Fashion brands requirements: list of luxury brands considered for the identification of requirements

- **Bottega Veneta** - Revisione 03/07/2015 – Sezione Test fisici fondamentali
- **Céline Production** – Regole di accettabilità delle pelli Celine - Rev. 0, 26/06/2013
- **Chanel** – Requisiti minimi: pellami per calzatura (Tomaio) – Vers. 5 – 08/01/2016
- **Dolce & Gabbana** RLS “*Restricted Substances List*” -
- **Giorgio Armani**, Restricted Substances List – RSL
- **Gucci** – Requisiti di qualità eco-tossicologici – Revisione Marzo 2015
- **Hermès**, Cahier Des Charges Chaussures: Matières Premières, Vers. 18/04/2013
- **Hugo Boss** - Restricted Substances List & Product Compliance Guideline – November 2014
- **Jimmy Choo** – Requisiti minimi per: Pellami per calzatura (Tomaio) – Vers. 6 – 09/09/2015
- **Kering** Product Compliance Advisory Department – Restricted Substance List (RSL) –.
- **Longchamp** (SCRL) - Substances Chimiques Reglementées 02/03/2011.
- **Louis Vuitton** Manufacture de Souliers – RSL 2015
- **Max Mara** – Requisiti minimi – destinazione d’uso: Calzatura – 28/01/2016.
- **MCM**. Handbags, Accessories and Luggage, Quality Assurance, Version 2, 23/11/2015.
- **Mont Blanc**, Quality Management. Technical specification, Leather. PTS 001, Rev. 5.
- **Salvatore Ferragamo** – Capitolato Pellami – Requisiti minimi prestazionali del 13/11/2014
- **Valentino Spa** Capitolato tecnico di conformità agli standard (Vers. 30/04/2015).
- **Versace** per: pellami per pelletteria – Vers. 2, 05/12/2013

# Results: kind of requirements

<i>Section 1: Full legislative compliance .....</i>	<i>6</i>
<i>Section 2: Process requirements and environmental footprint.....</i>	<i>7</i>
<i>Section 3. Chemical quality requirements of the product.....</i>	<i>17</i>
3.1 Chemical requirements for the skin and scores to be associated with each class.....	17
3.2 Chemical requirements for sole leather and scores to be associated with each class.....	23
<i>Section 4. Physical quality requirements of the footwear product .....</i>	<i>30</i>
4.1 Physical requirements color fastness for the shoe .....	30
4.2 Mechanical physical requirements for footwear.....	36
4.3 Scores physical requirements for footwear .....	40
<i>Section 5. Physical quality requirements of the product for leather goods.....</i>	<i>43</i>
5.1 Physical requirements color fastness for leather goods.....	43
5.2 Mechanical physical requirements for leather goods .....	49
5.3 Scoring physical requirements for the leather goods industry .....	53
<i>Section 6. Physical quality requirements of the product for leather from sole insole, midsole, welt, heel.....</i>	<i>56</i>
6.1 Mechanical physical requirements for sole leather .....	56
6.2 Mechanical physical requirements for insole leathers.....	57
6.3 Physical requirements color fastness for the leather for insole .....	58
6.4 Mechanical physical requirements for midsole, welt, heel.....	58
<i>Section 7 Management system requirements.....</i>	<i>59</i>
<i>Section 8. Ethical requirements .....</i>	<i>64</i>

# Requirements: full environmental legislation compliance

## Section 1: Full legislative compliance

Tanneries can't be supplier if the organization does not comply with environmental legislation, health and safety and social responsibility.

The audit to verify this requirement will have to sample the environmental requirements applicable to the plant in which the product is produced.

If the company is not completely compliant the verifier will have to interrupt the visit and the tannery will be not a supplier

<b>Section 1: Full legislative compliance .....</b>	<b>6</b>
<b>Section 2: Process requirements and environmental footprint.....</b>	<b>7</b>
<b>Section 3. Chemical quality requirements of the product.....</b>	<b>17</b>
3.1 Chemical requirements for the skin and scores to be associated with each class.....	17
3.2 Chemical requirements for sole leather and scores to be associated with each class.....	23
<b>Section 4. Physical quality requirements of the footwear product .....</b>	<b>30</b>
4.1 Physical requirements color fastness for the shoe .....	30
4.2 Mechanical physical requirements for footwear.....	36
4.3 Scores physical requirements for footwear .....	40
<b>Section 5. Physical quality requirements of the product for leather goods.....</b>	<b>43</b>
5.1 Physical requirements color fastness for leather goods.....	43
5.2 Mechanical physical requirements for leather goods .....	49
5.3 Scoring physical requirements for the leather goods industry .....	53
<b>Section 6. Physical quality requirements of the product for leather from sole insole, midsole, welt, heel.....</b>	<b>56</b>
6.1 Mechanical physical requirements for sole leather .....	56
6.2 Mechanical physical requirements for insole leathers.....	57
6.3 Physical requirements color fastness for the leather for insole .....	58
6.4 Mechanical physical requirements for midsole, welt, heel.....	58
<b>Section 7 Management system requirements.....</b>	<b>59</b>
<b>Section 8. Ethical requirements .....</b>	<b>64</b>

# Process requirements

This section establishes quantitative thresholds to be compliant to become a supplier.

The tanneries should have performance lower than these thresholds otherwise cannot become supplier.

All the criteria are classified in 3 categories: A, B, C.

# Process requirements

## Energy consumption

	Total energy consumption (MJ/m <sup>2</sup> )					
Class	Process: from raw to tanned	Process: from raw to crust	Process: from raw to finished product	Process: from tanned to finished product	Process: from crust to finished product	Process: from tanned to crust
A	Up to 11,9	Up to 25,9	Up to 46,9	Up to 39,2	Up to 21	Up to 19,6
B	Between 11,9 and 23,8	Between 25,9 and 51,8	Between 46,9 and 93,8	Between 39,2 and 78,4	Between 21 and 42	Between 19,6 and 39,2
C	Between 23,8 and 47,6	Between 51,8 and 103,6	Between 93,8 and 187,6	Between 78,4 and 156,8	Between 42 and 84	Between 39,2 and 78,4

# Process requirements

## Energy consumption

Due to the different energy consumption requirements associated with the various raw materials included in the production process, the mass of the processed raw material or the area of leather produced must be converted into "equivalent bovine". In the event that the tannery uses other types of skin, the respective "bovine equivalent" of this skin must therefore be calculated using the following conversion coefficients:

- sheep and goat are calculated on the basis of 0.87 bovine equivalent
- pig skins and crusts must be evaluated on the basis of 0.975 bovine equivalent

# Process requirements

## Water consumption

	Total water consumption (dm <sup>3</sup> /m <sup>2</sup> )					
Class	Process: from raw to tanned	Process: from raw to crust	Process: from raw to finished product	Process: from tanned to finished product	Process: from crust to finished product	Process: from tanned to crust
A	Up to 90	Up to 150	Up to 165	Up to 74,5	Up to 6	Up to 35
B	Between 90 and 198	Between 150 and 330	Between 165 and 363	Between 74,5 and 163,9	Between 6 and 13,2	Between 35 and 77
C	Over 198	Over 330	Over 363	Over 163,9	Over 13,2	Over 77

# Process requirements

## Water consumption

Due to the different water consumption requirements associated with the various raw materials included in the production process, the mass of the processed raw material or the area of leather produced must be converted into "equivalent bovine ". In the event that the tannery uses other types of skin, the respective "bovine equivalent" of this skin must therefore be calculated using the following conversion coefficients:

- sheep and goats are calculated on the basis of 1,12 b ovine equivalent;
- pig skins and crusts must be evaluated on the basis of 0.91 bovine equivalent

# Process requirements

## Air emissions

1. Process requirements related to emissions into the atmosphere are based on comparisons with the limits applicable to concentrations.
2. For the identification of the limits to be compared, all the listed pollutants must be taken into consideration, referring to all the emission points and subjected to monitoring in authorization.
3. The concentrations should refer to the results of the last analysis available. The frequency of this availability is established by the authorization (or based on analyzes conducted independently by the company). The methods of analysis used must comply with those required by law.

Pollutant (example)	Class A	Class B	Class C
<i>DUST</i>	Concentration <50% of the limit	Concentration <75% of the limit	Concentration complying with the limit
<i>H2S</i>	Concentration <50% of the limit	Concentration <75% of the limit	Concentration complies with silts you

# Process requirements

## Raw material

1. The companies submitted for certification can demonstrate the traceability of the origin of the raw hides supplied up to the identification of the slaughterhouse that produced the hides. Traceability is not applicable in the case of semi-finished products (ex. wet blue).
2. In order to consider a lot of leather received, it must be present in the company documentation that allows to go back to the slaughterhouse that worked the leather. The verification will be made sample and referred to the deliveries of the last 12 months at the date of the audit.
3. The organization must be equipped with an internal procedure that regulates the methods by which the traceability of incoming leathers is ensured.

The assignment of classes A, B, C takes place on the basis of the following table of traceability from the slaughterhouse:

Tracciabilità	Class
Over 90% of the hides supplied are traceable to the slaughterhouse	A
Over 50% of the hides supplied are traceable to the slaughterhouse	B
Less than 50% of approved skin can be traced to the slaughterhouse	C

4. In the event that the hides come from Brazil, the organization must demonstrate the traceability of all these supplies up to the breeding of the cattle worked in the slaughterhouse. It will also have to show that the farmer has not contributed to the Amazon deforestation, this can be done through a declaration signed by the breeding company.

# Process requirements

## Waste management

Practices
Temporary storage is correctly identified
All hazardous waste they are sheltered from atmospheric agents
The production of hazardous waste has in the last 2 years a decreasing trend (using a performance indicator on m <sup>2</sup> of leather produced or kg of leather produced)
The production of non-hazardous waste has in the last 2 years a decreasing trend (using performance indicator on m <sup>2</sup> of leather produced or kg of leather produced)
The production of waste destined for recovery has increased over the last 2 years (in% terms of total waste)
The person who follows the management and handling of waste has received training of at least 4 hours in the last 36 months on the topic
In the company there is a documented procedure for the management of waste produced
The company has a database of all permits of transporters and recipients of waste produced
The majority of transporters or recipients of waste used in the last year are ISO14001 or EMAS certified
The company carried out at least 1 part II audit at the suppliers of the transport and / or disposal service or at a contractor
In order to reduce waste from trimming of finished product, the company performs trimming in pile or trimming in blue
The company has received a report from the competent authority on environmental inspections for discrepancies related to waste management in the last 24 months

# Process requirements

## Chromium recovery

Indicator	Class
The exhausted baths have a concentration between 2,000 mg/l and 3,000 mg/l are sent to chromium recovery and the chromium salt is reused in the process	A
The exhausted baths have a concentration higher than 3000 mg/l and are sent for chromium recovery and the chromium salt is reused in the process	B
The exhausted baths have a concentration higher than 2,000 mg/l but are not sent for recovery , or are sent but the chromium salt is not reused in the process	C

# Process requirements

## Shavings recovery

Indicator	Class
The shavings are recovered over 80 % of the total	A
The shavings are recovered over 40% of the total	B
The shavings are recovered for less than 40% of the total	C

# Environmental product footprint requirements

Indicator	Class
The company has carried out a product life cycle study according to the PEF - Product Environmental Footprint according to the requirements of Recommendation 2013/179 / EU	A
The company has carried out a study on the product life cycle aimed at calculating the value of one or more environmental impact indicators (eg: carbon footprint, water footprint, etc.) in accordance with an internationally recognized methodology (ex: ISO 14044, ISO 14067, International EPD ® System , etc.) or contributed to a study aimed at calculating the impacts of the product life cycle or the aggregate footprint (ex. LCA of sector / district, LCA group, etc.) making available their environmental data	B
The company has not carried out a product life cycle study aimed at calculating the value of one or more environmental impact indicators, or has it realized but not following any internationally recognized methodology	C

<b>Section 1: Full legislative compliance .....</b>	<b>6</b>
<b>Section 2: Process requirements and environmental footprint.....</b>	<b>7</b>
<b>Section 3. Chemical quality requirements of the product.....</b>	<b>17</b>
3.1 Chemical requirements for the skin and scores to be associated with each class.....	17
3.2 Chemical requirements for sole leather and scores to be associated with each class.....	23
<b>Section 4. Physical quality requirements of the footwear product .....</b>	<b>30</b>
4.1 Physical requirements color fastness for the shoe .....	30
4.2 Mechanical physical requirements for footwear.....	36
4.3 Scores physical requirements for footwear .....	40
<b>Section 5. Physical quality requirements of the product for leather goods.....</b>	<b>43</b>
5.1 Physical requirements color fastness for leather goods.....	43
5.2 Mechanical physical requirements for leather goods .....	49
5.3 Scoring physical requirements for the leather goods industry .....	53
<b>Section 6. Physical quality requirements of the product for leather from sole insole, midsole, welt, heel.....</b>	<b>56</b>
6.1 Mechanical physical requirements for sole leather .....	56
6.2 Mechanical physical requirements for insole leathers.....	57
6.3 Physical requirements color fastness for the leather for insole .....	58
6.4 Mechanical physical requirements for midsole, welt, heel.....	58
<b>Section 7 Management system requirements.....</b>	<b>59</b>
<b>Section 8. Ethical requirements .....</b>	<b>64</b>

# Chemical requirements for finished leather

	TEST METHOD	REQUIREMENTS		
		<i>Class A</i>	<i>Class B</i>	<i>Class C</i>
Aromatic amines and azo dyes (for details of the various substances see attachment)	EN ISO 17234-1 and 2; GB/T 19942	10 mg/kg	20 mg/kg	30 mg/kg
Carcinogenic dyes	DIN 54231	Not detectable ( $\leq 20$ mg / kg each colorant)	Not detectable ( $\leq 40$ mg / kg each colorant)	Not detectable ( $\leq 50$ mg / kg each colorant)
Disperse allergen dyes	DIN 54231	Not detectable ( $\leq 20$ mg / kg for each colorant)	Not detectable ( $\leq 40$ mg / kg for each colony)	Not detectable ( $\leq 50$ mg / kg for each color)
<u>Organostannic compounds</u>	ISO/TS 16179	0,1 mg/kg	0,5 mg/kg	1 mg/kg
<u>Dimethylfumarate</u>	ISO/TS 16186	0,1 mg/kg	0,1 mg/kg	0,1 mg/kg
Formaldehyde without contact	ISO 17226-1 e 2; GB/T 19941	50 mg/kg	75 mg/kg	150 mg/kg
Formaldehyde with contact persons $\geq 12$ years		20 mg/kg	30 mg/kg	75 mg/kg
Formaldehyde with contact persons $\leq 12$ years		16 mg/kg	16 mg/kg	16 mg/kg

# Chemical requirements for finished leather (examples)

<i>Total heavy metals</i>				
Cadmium	ISO 17072-2	10 mg/kg	40 mg/kg	75 mg/kg
Lead	ISO 17072-2	20 mg/kg	40 mg/kg	90 mg/kg
Chrome III	ISO 17072-2	N.A.	N.A.	N.A.
<i>Removable heavy metals</i>				
Antimony	EN ISO 17072-1	30 mg/kg	40 mg/kg	50 mg/kg
Arsenic	EN ISO 17072-1	0,2 mg/kg	0,5 mg/kg	1 mg/kg
Cadmium	EN ISO 17072-1	0,1 mg/kg	0,2 mg/kg	0,5 mg/kg
Cobalt	EN ISO 17072-1	1 mg/kg	2 mg/kg	4 mg/kg
Chromium VI	EN ISO 17075	3 mg/kg	3 mg/kg	3 mg/kg
Mercury	EN ISO 17072-1	0,02 mg/kg	0,04 mg/kg	0,05 mg/kg
Nickel	EN ISO 17072-1	1 mg/kg	3 mg/kg	4 mg/kg
Lead	EN ISO 17072-1	0,8 mg/kg	18 mg/kg	2 mg/kg
Chrome III	EN ISO 17072-1	250 mg/kg	300 mg/kg	500 mg/kg
Copper	EN ISO 17072-1	20 mg/kg	25 mg/kg	40 mg/kg

# Chemical requirements for finished leather (examples)

<i>Chlorinated phenols</i>				
Pentachlorophenol	EN ISO 17070	0,1 mg/kg	0,5 mg/kg	1 mg/kg
Tetrachlorophenol	EN ISO 17070	0,05 mg/kg	0,5 mg/kg	1 mg/kg
Trichlorophenol	EN ISO 17070	0,05 mg/kg	0,5 mg/kg	1 mg/kg
Pesticides - total amount (for the details of the various substances see attachment)	U.S. EPA 8081B /8151°; EPA 8081-8141 and 8151	Total sum 1 mg / kg and in any case for each pesticide the limit is $\leq 0.2$ mg / kg	Total sum 1 mg / kg and in any case for each pesticide the limit is $\leq 0,4$ mg / kg	Total sum 1 mg / kg and however for each pesticide the limit is $\leq 0.5$ mg / kg
Perfluorooctane sulphonate (PFOS)	CEN/TS 15968	1 $\mu\text{g}/\text{m}^2$	1 $\mu\text{g}/\text{m}^2$	1 $\mu\text{g}/\text{m}^2$
Pefluorooctanoic acid (PFOA)	CEN/TS 15968	1 $\mu\text{g}/\text{m}^2$	1 $\mu\text{g}/\text{m}^2$	1 $\mu\text{g}/\text{m}^2$

<i>Section 1: Full legislative compliance .....</i>	<i>6</i>
<i>Section 2: Process requirements and environmental footprint.....</i>	<i>7</i>
<i>Section 3. Chemical quality requirements of the product.....</i>	<i>17</i>
3.1 Chemical requirements for the skin and scores to be associated with each class.....	17
3.2 Chemical requirements for sole leather and scores to be associated with each class.....	23
<del><i>Section 4. Physical quality requirements of the footwear product .....</i></del>	<del><i>30</i></del>
4.1 Physical requirements color fastness for the shoe .....	30
4.2 Mechanical physical requirements for footwear.....	36
4.3 Scores physical requirements for footwear .....	40
<i>Section 5. Physical quality requirements of the product for leather goods.....</i>	<i>43</i>
5.1 Physical requirements color fastness for leather goods.....	43
5.2 Mechanical physical requirements for leather goods .....	49
5.3 Scoring physical requirements for the leather goods industry .....	53
<i>Section 6. Physical quality requirements of the product for leather from sole insole, midsole, welt, heel.....</i>	<i>56</i>
6.1 Mechanical physical requirements for sole leather .....	56
6.2 Mechanical physical requirements for insole leathers.....	57
6.3 Physical requirements color fastness for the leather for insole .....	58
6.4 Mechanical physical requirements for midsole, welt, heel.....	58
<i>Section 7 Management system requirements.....</i>	<i>59</i>
<i>Section 8. Ethical requirements .....</i>	<i>64</i>

# Physical requirements

TYPE OF TEST	TEST METHOD <sup>1,2</sup>	REQUIREMENTS		
		<i>Class A</i>	<i>Class B</i>	<i>Class C</i>
Solidity of colors to the sweat	UNI EN ISO 11641: 2013	Aniline: $\geq 3/4$ GRS	$\geq 3$ GRS	$\geq 3$ GRS
		Semi-aniline: $\geq 3/4$ GRS	$\geq 3$ GRS	$\geq 3$ GRS
		Pigmented: $\geq 4$ GRS	$\geq 3/4$ GRS	$\geq 3$ GRS
		Laminate: $\geq 3/4$ GRS	$\geq 3$ GRS	$\geq 3$ GRS
		Painted: $\geq 4$ GRS	$\geq 3/4$ GRS	$\geq 3$ GRS
		Abrasive: $\geq 4$ GRS	$\geq 3/4$ GRS	$\geq 3$ GRS
		Nubuck / crust / suedes: $\geq 3/4$ GRS	$\geq 3$ GRS	$\geq 3$ GRS

# Physical requirements

<b>Solidity with artificial light</b>	UNI EN ISO 105-B02: 2014	Aniline: after 48 h: $\geq 4$ BWS3	$\geq 3$ BWS	$\geq 3$ BWS
		Semi-aniline: Dopo 48 h: $\geq 5$ BWS	$\geq 4$ BWS	$\geq 3$ BWS
		Pigmented: After 48 h: $\geq 5$ BWS	$\geq 4$ BWS	$\geq 3$ BWS
		Laminate <sup>3</sup> : After 48 h: $\geq 4$ BWS	$\geq 3$ BWS	$\geq 3$ BWS
		Painted: After 48 h: $\geq 4$ BWS	$\geq 3$ BWS	$\geq 3$ BWS
		Abrasived: After 48 h: $\geq 5$ BWS	$\geq 4$ BWS	$\geq 3$ BWS
		Nabuck / split / suede: After 48 h: $\geq 4$ BWS	$\geq 3$ BWS	$\geq 3$ BWS

# Mechanical requirements

TYPE OF TEST	TEST METHOD <sup>5,6</sup>	REQUIREMENTS		
		<i>Class A</i>	<i>Class B</i>	<i>Class C</i>
<b>Phenolic yellowing potential of materials</b>	UNI EN ISO 105-X18: 2008	This test applies only to white, light or pastel colored leathers $\geq 4/5$ GRS <sup>8</sup>	$\geq 4$ GRS	$\geq 3/4$ GRS
<b>Tensile strength and percentage elongation</b>	UNI EN ISO 3376: 2012	Sheep and Goat 15 N / mm <sup>2</sup> , percentage extension 20 ÷ 70%	13 N / mm <sup>2</sup> , percentage extension 20 ÷ 70%	10 N / mm <sup>2</sup> , percentage extension 20 ÷ 70%
		Cattle $\geq 25$ N / mm <sup>2</sup> lengthening percentage 20 ÷ 70%	$\geq 20$ N / mm <sup>2</sup> lengthening percentage 20 ÷ 70%	$\geq 15$ N / mm <sup>2</sup> lengthening percentage 20 ÷ 70%

# **Environmental Management System requirements**



# Ethical requirements



# The whole document

