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Leather — Environmental footprint — Product Category Rules (PCR) — Carbon footprints

National foreword

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European foreword

This document (EN 16887:2017) has been prepared by Technical Committee CEN/TC 289 “Leather”, the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2017, and conflicting national standards shall be withdrawn at the latest by September 2017.

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Introduction

In order to satisfy market expectations, the Product Carbon Footprint (PCF) referred to a defined product needs to be prepared in compliance with specific methods and precise requirements, in order to allow a correct comparison among similar products.

This aim can be achieved only if rules of calculation are defined, so that every organization can follow them in preparing a PCF for a specific product.

These rules are called “product category rules” (or PCR), that are a complementary part of most general PCF programmes, but are fundamental both during the phase of LCA (Life Cycle Assessment) studies evaluation and the related declarations.

As PCRs are internationally recognized, it is crucial that they are defined in a document discussed, shared and approved in an official international context as CEN is, and that they are included in a standard.

In this way they will be applied by the organizations in all interested countries.

1 Scope

This European Standard provides a system for calculation of the carbon footprint of leather as defined in EN 15987 and sold in the semi-processed state or ready to be shipped for use in consumer articles manufacturing processes.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 15987:2015, *Leather — Terminology — Key definitions for the leather trade*

EN ISO 2589, *Leather — Physical and mechanical tests — Determination of thickness (ISO 2589)*

EN ISO 14021:2016, *Environmental labels and declarations — Self-declared environmental claims (Type II environmental labelling) (ISO 14021:2016)*

EN ISO 14025, *Environmental labels and declarations — Type III environmental declarations — Principles and procedures (ISO 14025)*

CEN ISO/TS 14067, *Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification and communication (ISO/TS 14067)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15987 and CEN ISO/TS 14067 and the following apply.

3.1
leather
hide or skin with its original fibrous structure more or less intact, tanned to be imputrescible, where the hair or wool may or may not have been removed, whether or not the hide or skin has been split into layers or segmented either before or after tanning and where any surface coating or surface layer, however applied, is not thicker than 0,15 mm

Note 1 to entry: If the tanned hide or skin is disintegrated mechanically and/or chemically into fibrous particles, small pieces or powders and then, with or without the combination of a binding agent, is made into sheets or other forms, such sheets or forms are not leather.

Note 2 to entry: If the grain layer has been completely removed, the term leather will not be used without further qualification, e.g. split leather, suede leather.

[SOURCE: EN 15987:2015, 4.1.1, modified — Note 2 to entry was slightly modified]

3.2
sole leather, vegetable tanned
leather tanned with vegetable tannins and finished for the outsoles of footwear

3.3
crust
leather which is tanned, fatliquored and dried, before finishing

[SOURCE: EN 15987:2015, 4.1.3]

3.4
split leather
layer from a hide or skin made from a flesh split or a middle split, without any grain structure, tanned to be imputrescible

Note 1 to entry: A split is a layer of hide or skin obtained by dividing it horizontally (splitting) to obtain at least two separate layers; the top layer is called grain split, and the bottom layer is called flesh split; for heavy hides also a middle split can be obtained.

Note 2 to entry: If the name of the animal whence it originates, or the part of the animal whence it comes, is included in the description, the term "split leather" will be used as a noun, e.g. pig split leather.

[SOURCE: EN 15987:2015, 4.1.2]

3.5
fleshings
small pieces of connective and adipose tissues cut from the inner surface of hides and skins in the fleshing operation

3.6
by-product
substance or object resulting from a production process, the primary aim of which is not the production of that item

Note 1 to entry: By-product is a production residue that is not waste.

3.7
Product Category Rules
PCR
documents that define requirements that are compulsory for the environmental declarations of a certain category of products according to EN ISO 14025 and that enable transparency and comparability between different environmental footprint studies of these products of a same category

3.8
semi-processed leather
intermediates of leather production, like wet blue, wet-white, crust, pickled pelt, etc

3.9
upstream process
process occurring along the supply chain of purchased goods/services prior to entering the core process

3.10
product system (core process)
collection of unit processes with elementary and product flows, performing one or more defined functions, and which models the life cycle of a product

[SOURCE: EN ISO 14040:2006, 3.28]

3.11
downstream process
process occurring along a product supply chain after entering the core process

3.12
primary data
quantified value of a unit process or an activity obtained from a direct measurement or a calculation based on direct measurements at its original source

Note1 to entry: Primary data need not necessarily originate from the product system under study because primary data relate to a different but comparable product system to that being studied.

Note 2 to entry: Primary data include Green House Gases (GHG) emission factors and/or GHG activity data (defined in EN ISO 14064-1:2012, 2.11).

3.13
site-specific data
data obtained from a direct measurement or a calculation based on direct measurement at its original source within the product system

Note 1 to entry: All site-specific data are primary data but not all primary data are site-specific data because they also relate to a different product system.

3.14
secondary data
data obtained from sources other than a direct measurement or a calculation based on direct measurements at the original source

Note 1 to entry: Such sources include databases and published literature validated by stakeholders.

3.15
product
result of activities or processes; a product can be tangible or intangible, or a combination of both

Note 1 to entry: The product is categorized as follows:

— services (e.g. transport, subcontractors activity);

— processed materials (e.g. hides).

Note 2 to entry: Services have tangible and intangible elements. Provision of a service involves, for example, the following:

— an activity performed on a customer-supplied tangible product (e.g. hide to be fleshed).

Processed materials are generally tangible and their amount is a continuous characteristic.

Note 3 to entry: Adapted from EN ISO 14021:2016 and EN ISO 9000:2015.

3.16
chemicals
substance or mixture of substances having a constant chemical composition and characteristic properties

4 PCR elements

4.1 General

The following subclauses define the data to be collected for each PCR item, in order to prepare a leather Product Carbon Footprint (PCF).

4.2 Definition of the product group

4.2.1 General

The product group includes all kind of leather as defined in 3.1, from animals bred for purposes different from leather production (e.g. meat, milk, etc.).

This PCF is applicable to any intended use, that shall be specified. Articles with the same functional unit shall be grouped in categories characterized by a similar intended use, as appropriate.

4.2.2 Identification of manufacturing company

The information about the manufacturing/producing company to be included in a leather PCF shall be at least:

— company name;

— tannery production site(s) included in the system boundary;

— issuer and contacts;

— specification of the process phases carried out in the production site(s).

Other voluntary information (e.g.):

— information on environmental management system;

— specific aspects regarding production;

— environmental policy;

— manufacturers logotype.

4.2.3 Specification of the product

The product under consideration in this standard is “Leather” (3.1), intended as a semi-processed or finished product to either be further processed in the tanning sector or, after completion of all processing steps, in various consumer articles’ manufacturing sectors.

Finished or semi-processed leather shall be characterized through the minimum elements included in Table 1:

Table 1 — Elements for product specification

Product characteristic	Example
Animal type	Bovine
Leather type	Full grain, flesh split, grain split etc.
Thickness ranges (EN ISO 2589)	0,9 – 1,1 mm
Process stage	Wet blue/crust/finished
Type of tanning	Synthetic or vegetable or other kind of tanning
Intended use(s)	Footwear, leather goods etc.

If different ranges of thickness are used, all of them shall be reported.

To fill in the table, the EN 15987 terms shall be used for describing “leather type”, “process stage” and “type of tanning”.

For semi-processed products, the intended use shall be leather.

4.3 Functional unit

The functional unit shall be 1 m^2 of leather.

For the particular case of sole leather (3.2), the functional unit is 1 kg.

NOTE It is however usual that semi-finished products are measured in kilograms till they are transformed in crust; only after the subsequent processing the measuring unit usually passes to squared meters. LCI (Life Cycle Inventory) study specifies where this passage occurs relatively to the different process phases.

4.4 Bill of materials

The finished leather is composed by stabilized collagen and chemical residuals.

Depending on the type of tanning carried out during the process the percentage of the total weight of collagen can vary from 50 % (vegetable sole leather) up to 85 % (chrome tanned leather).

The chemicals used during the process can be considered in two main families: those whose intended function is to treat the substrate but do not remain in the finished leather (example: surfactants, acids, bases, etc.) and those whose function is to remain inside the leather.

For leather carbon footprint calculation all chemicals shall be included.

The bill of materials shall include only the last ones, whose families are listed below:

— tannins;

— dyes;

— pigments;

— fatliquors;

— resins;

— salts.

As it is impossible to analytically quantify the concentration of the chemicals considered, the materials shall be listed reporting the percentage ranges (e.g. 0,2 - 0,5 %) used in the process.

4.5 Units and quantities

"SI units" shall be used in all notations, it is recommended to provide rounded data in respect of their scientific significance.

A maximum of three value numbers shall be used when reporting LCA results (e.g.: 1,12; 11,2; 112 unit).

4.6 General system boundaries

4.6.1 General

For the leather PCF calculation, the following system boundaries shall be considered (see Figure 1):

— collection of hides and skins from the slaughterhouse floor;

— ending at the exit gate of the tannery, but including waste water treatment, waste and by-product management, as appropriate.

NOTE 1 All operations up to and including flaying are excluded from this PCR because they are an integral part of the meat production.

NOTE 2 All transportations to third parties are included in core processes. Each core process produces different wastes, emissions and waste waters.

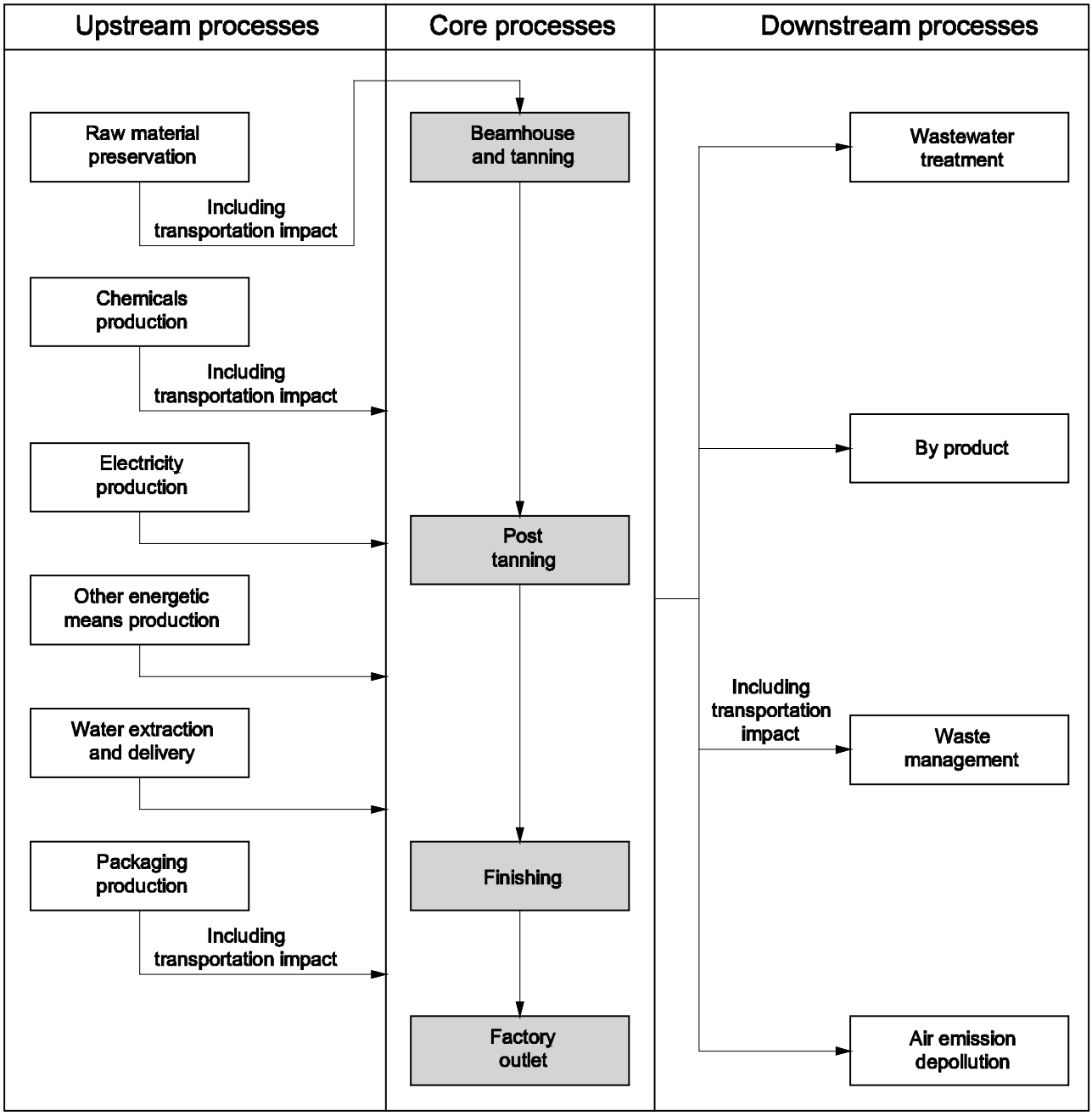

Figure 1 — Leather production processes - System boundaries

4.6.2 Upstream processes

All transportations from suppliers shall be included:

— raw material collection;

— raw material preservation;

— chemicals production;

— electricity production;

— other energy means production;

— water extraction and delivery;

— packaging production.

4.6.3 Core processes

All transportations to and from all outsourced processes shall be included.

The processes to be considered are:

— beamhouse and tanning;

— post tanning operations;

— finishing operations;

— mechanical operations (internal);

— all transportation processes inside the tannery shall be taken into account only by considering energy and fuel consumption.

4.6.4 Downstream process

The processes to be considered are:

— waste/by-products management including transportation to final disposal/material recycling;

— air emission abatement;

— wastewater treatments (inside the tannery and also outside, if the final treatment is not done inside the tannery).

Wastes and possible by-products shall be clearly identified.

4.6.5 Split leather production process

Split leather shall be considered by products when they are going out of the leather value chain, otherwise they are considered products.

4.7 Data quality rules

4.7.1 General

All data used for the calculation of PCF shall be verifiable and auditable.

Hides are usually bought in weight, processed on the weight basis and sold as surface or weight in case of sole leather.

A correlation of the weight change along the tanning process shall be produced and related to the final unit measure (m^2 or kg in case of sole leather).

If the data used for the PCF calculation are collected from a specific database, the database name as well as the specific data sets shall be reported in the PCF declaration.

4.7.2 Primary site specific data

Primary data (3.12) shall be used whenever possible.

Primary data are gathered from the sites where specific processes are carried out.

The requirement for primary data also include actual product weights, amounts of raw materials used and amounts of waste, etc.

Primary data for the generation of electricity bought shall be used where possible, including the energy mix of the provider.

The data shall be verifiable by invoice or similar.

If primary data are not available or if the electricity bought is not specified for parts of the Core Module, the electricity mix used in those parts shall be approximated as the National official electricity mix or the European official electricity mix.

The mix of energy shall be documented.

When the location or term of data collection shall be limited to a certain range, provide a justification for this and show that the collected data will serve as sufficient samples.

4.7.3 Primary data

Primary data (3.12) shall be used if primary site specific data are unavailable, e.g. data from commonly available data sources such as commercial databases and free databases, describing specific raw materials or processes usually referring to the system under study or to other systems equivalent from a technical point of view.

For allowing the use of primary site specific data, a number of pre-set characteristics shall be fulfilled and demonstrated:

— Representativeness of the geographical area should adhere to “Data deriving from areas with the same legislative framework and the same energetic mix”;

— Technological equivalence adhere to “Data deriving from the same chemical and physical processes or at least the same technology coverage (nature of the technology mix, e.g. weighted average of the actual process mix, best available technology or worst operating unit)”;

— Boundaries towards nature adhere to “Data shall report all the quantitative information (resources, solid, liquid, gaseous emissions; etc.) necessary for the PCF”, and

— Boundaries towards technical systems adhere to “The boundaries of the considered life cycle stage shall be equivalent”.

4.7.4 Secondary data

If primary data sources do not supply the necessary data, other secondary data (3.14) may be used and documented. The environmental impact of the processes where the other secondary data are used shall not exceed 10 % of the overall environmental impact from the product system.

Data calculated with system expansion shall be used.

The PCR shall contain a list of alternative substances for the bill of materials (BoM).

Potential gaps and a related guidance for their filling shall be specified; this guidance shall use sectorial conservative default values to fill the gaps.

NOTE If secondary data and primary are used for tanned materials entering the process (e.g. crust, tanned leather) it is clearly stated when producing the results (to be putted in communication section).

4.8 Allocation rules

4.8.1 Allocation between products and by-products

Allocation between different products and by-products (e.g. fleshings) shall be based on weight in proportion to the different products and co-products.

4.8.2 Allocation between products and co-products

Allocation between different products and co-products (e.g. splits) shall be based on surface area in proportion to the different products and co-products.

4.9 Core module

4.9.1 Technical system

The processes listed in Table 2 for the production of the final product, including primary and secondary packaging, shall be included. Manufacturing process materials not listed may be included.

The production of the process materials used for production shall be included.

Manufacturing processes, which are mandatory to include, depend on the product for which the PCF is realized: tanned leather, crust and finished leather. All of them need to go through beamhouse and tanning processes (and other phases as transportation and wastes and emission treatments); finished leather requires also post tanning operations (necessary also for crusts) and finishing ones.

A minimum of 99 % of the total weight of the declared product (1 % cut off rule) including packaging shall be included.

The manufacturing of production equipment, buildings and other capital goods shall not be included.

Maintenance activities are included in the impact calculation of the general management of the process and shall be proportionally allocated to the product.

Business travel of personnel shall not be included. Travel to and from work by personnel shall not be included.

4.9.2 Geographical boundaries

The data for the core module shall be representative for the actual production processes and representative for the site/region where the respective process is taking place.

4.9.3 Time boundaries

The data shall be representative for the year/time frame for which the PCF is valid (maximum three years).

4.9.4 Boundaries to nature

Boundaries to nature are defined as flows of material and energy resources from nature into the system. Emissions to air, water and soil cross the system boundary when they are emitted from or leaving the product system.

4.9.5 Boundaries to other product life cycles

If there is an inflow of recycled material to the production system in the production/manufacturing phase, the recycling process and the transportation from the recycling process to where the material is used shall be included.

If in the production system there is an outflow of material to recycling, the transportation of the material to the recycling process shall be included.

For further details see Annex C.

4.10 Upstream module — System boundaries

All elementary flows at resource extraction shall be included, except for the flows that fall under the general 1 % cut off rule. Production of all raw materials shall be included.

Table 2 indicates, for each upstream process considered, the boundaries to be taken into account.

Table 2 — Boundaries considered for each upstream process

Process	System boundaries
Raw material preservation	Fresh hide after flaying up to preserved hide
Chemicals production	Raw materials extraction to supplier factory gate
Electricity production	
Other energy means production	
Water extraction and delivery	
Transports	In site transports shall be included, if available
Packaging production	Raw materials extraction to supplier factory gate

4.11 Downstream module

4.11.1 General

The downstream processes within the system boundaries shall always be identified and calculated.

4.11.2 Use phase scenario

Use phase is omitted from PCR because system boundaries have been chosen from “cradle to gate”.

4.11.3 Recycling declaration and waste treatment

Recommendations for recycling of packaging materials shall be given, as well as recommendations for other waste treatment if relevant.

The potential environmental impact and benefit of recycling and waste treatment shall be presented in the PCF.

In case a wastewater treatment plant is outside the production site, the associated impact shall be included in the PCF calculation, taking into consideration the amount and the quality of the effluent.

Table 3 illustrates the impact of downstream processes:

Table 3 — Impact of downstream processes

Process	Parameters
Air emissions production	Concentration at the discharge point of the following parameters: VOC[a] and dust from finishing phase
Air emissions abatement	Untreated air emissions to end of pipe (energy, chemicals, waste, water consumption, wastewater)
Wastewater production	Concentration at the discharge point of the following parameters: SS[b], COD[c], Cr III, Cl, SO4, TKN[d], Titanium, Aluminium, Sulphide and fatty substances
Wastewater treatments	Untreated wastewater to end of pipe (energy, chemicals, waste)
a VOC (Volatile Organic Compounds) b SS (Suspended Solids) c COD (Chemical Oxygen Demand) d TKN (Total Kjeldhal Nitrogen)	

4.12 Requirements for transportation

Transportation to and from outsourced processes and from suppliers shall be included. Different transportation scenarios shall be specified on the basis of:

1) Means of transportation:
    a) train,
    b) truck,
    c) ship (inland or overseas),
    d) aircraft.
2) Origin of each material:
    a) slaughterhouse (raw hides),
    b) producers distribution centre (chemicals),
    c) third parties production plant (intermediate products).

If no data are available for outsourced processes, the worst transportation scenario shall be considered from the declared origin and from the farthermost port to the recipient.

For each transportation scenario, tonne-kilometre (tkm) shall be defined.

An example of necessary data are given in Table 4.

Table 4 — Data necessary for each transportation scenario

Type of transport	Means of transport	Payload (nominal capacity) [kg]	Payload (actual capacity) [%]	Empty returns [%]	Origin	Distance [km]
Truck	Truck	20 000	85	50	Slaughterhouse	1 000
Ship	Container	26 500	90	0	Slaughterhouse	3 000
…						

4.13 Cut off rules

Life Cycle Inventory data for a minimum of 99 % of total inflows to the core module shall be included. Inflows not included in the LCA shall be documented in the PCF.

Data that fulfil the following cut-off criteria shall be included in the core module.

4.14 Requirements for the product declaration

The products shall be pertinent for their scope, satisfying the demands of health, safety and performance for the consumer made by international, national or regional standards regarding the products.

The product declaration shall contain at least the following information:

— Reference to this document and to CEN ISO/TS 14067,

— reference to certifications (if any),

— if it is a self-declaration then reference to EN ISO 14021,

— the results shall be expressed in kilograms of CO_2 equivalent per square meter or per kg for sole leather,

— the name of the product,

— the name of the manufacturer,

— the year of reference.

Annex A
(normative)

Chemicals

The following rules for calculation of chemicals shall be applied:

1) If the supplier provided specific data of the chemical or chemical family, that data need to be used.

2) If the chemical supplier does not provide specific data,

   a) the SDS (Safety Data Sheet) needs to be used, to calculate the impact data of the specific substances; all substances, known from the SDS should be calculated. Minimum 75 % of the total chemical content (including water) should be known for calculation;

   b) if the SDS does not define 75 % of the chemical content, the supplier needs to be contacted;

   c) if the supplier does not provide data, a representative similar substance shall be used.

Common LCA databases for the calculation of PCFs can be used. Reference to the used database shall be provided.

A complete inventory of products consumed in production during the reference year shall be generated, listing each product by:

— chemical family or specific chemical name,

— commercial name,

— factory department in which it is used,

— quantity used (kg/y).

Examples of common used chemical families are summarized in Table A.1.

Table A.1 — Common used chemical families

Department	Chemical family
Hide conservation to pickling	Lime auxillary
	Deliming agent (liquid)
	Wetting agent/surfactants
	Bating agent
Tanning	Mineral tanning agent
	Aldehyde tanning agent
	Polymer retaining agent
	Syntan (liquid)
	Syntan (powder)
	Vegetable tanning agent
	Resins
Wet-end	Fat liquor (natural; sulphated; sulphited)
	Fat liquor (synthetic; Phosphated)
	Waterproofing fat-liquor (paraffin)
	Waterproofing fat-liquor (polymer)
	Natural fat and oil
	Modificated natural fat and oil
Dyestuff	Dyestuff (liquid)
	Dyestuff (powder)
	Pigment
Finishing	Acrylic binder
	Binder (casein)
	Polyurethane binder
	Wax
	Filler = Finish-Auxiliary
	Nitrocellulose lacquer

Other chemical groups like biocides, fungicides, enzymes or others can be defined by the representative substances.

Also a lot of common specific chemicals are used in tanneries (see Table A.2).

Table A.2 — Specific chemicals used in tanneries

Acetic acid	Magnesia oxid
Ammoniak liquid	Mangansulphate
Ammoniumhydrogencarbonat	1-Methoxy-2-propanol
Ammonium Sulfate	Mercapto… (Thio compounds)
Ammonium bicarbonate	Methyl alcohol
Al-sulfate	Sulphuric acid
Aceton	Sodium carbonate
Butylglykol	Sodium bicarbonate
Butylglykolacetate	Sodiumchloride (Salt)
Boric acid (powder)	Sodium sulphide
n-butyl alcohol	Sodium hydrosulphide
Caustic soda (alcali)	Sodium hydroxide
CO_2	Sodium hypochlorite
Calcium hydroxyd (Lime)	Sodiumsulfite
Calcium cloride	Sodiumpyrosulfit
Calcium formate	Sodium tetraborat (borax)
Ethyl alcohol	Sodium formate
Formic acid	Sodium acetate
Fe-III-chlorid	Silicon products
H_2O_2	Polyphosphate
Isopropanol	n-Propylalcohol

The following rule for calculations of chemicals shall be applied: a complete inventory of products consumed in production during the reference year shall be generated, listing each product by:

— commercial name,

— quantity (total weight in kg),

— factory department in which it is used.

In the absence of specific impact data provided by the supplier, the following approximation procedure shall apply.

Annex B
(informative)

Central Product Classification (CPC) codes

Some codes describing leather and leather products according to central product classification are reported in Table B.1.

Table B.1 — Example of central product classification codes for leather and leather products

GROUP	CLASS	SUBCLASS	DESCRIPTION	CORRESPONDING	
				HS 2007	ISIC Rev. 4
Division 29			**Leather and leather products; footwear**		
291			**Tanned or dressed leather; composition leather**		
	2911	29110	Chamois leather; patent leather and patent laminated leather; metallized leather	4114	1511
	2912	29120	Other leather, of bovine or equine animals, without hair on	4104, 4107	1511
	2913	29130	Other leather, without hair on (including sheep, lamb, goat or kid skin leather); composition leather with a basis of leather or leather fibre	4105, 4106, 4112, 4113, 4115.10	1511

Annex C
(informative)

Resource use and emissions profile formula - Waste and by-product treatment - Allocation rules

C.1 Material recovery

Examples of material recovery for the production of a new product, which can only be produced by using that waste or by-product are reported in Table C.1.

Table C.1 — Examples of material recovery and related waste or by-product to be used

Waste/by-product	Material recycling
Fleshings, trimmings	Gelatine
Shavings	Bonded leather
Shavings, tanned trimmings	Protein (cosmetic, fillers)

Allocation rule: No CO_2-emission is allocated or credited to the tannery.

Examples of material recovery for the production of a new product, which is normally produced by other raw material components are reported in Table C.2 and Table C.3. The other new material components are replaced by the waste or by-product.

Table C.2 — Examples of material recovery and related other raw materials to be used

Waste/by-product	Material recycling by replacing new components
Used paper, cardboards	Paper
Used plastic	Plastic
Used wood	Paper, wood
Used metal, electronics	Metal
Finished leather trimmings	Small leathergoods
Sludge from wwtp	Substitute building material for landfill

Table C.3 — Examples of material recovery and related thermal recycling or co-generation

Waste/by-product	Thermal recycling /Co-generation
Sludge, fleshings, waste, shavings	Biogas
Fleshings	Biodiesel
Waste, shavings, sludge	Incinerated for heat-recovery in co-generation treatments
Sludge from wwtp	Filling material in mines
Sludge from wwtp	Compost /fertilizer in agriculture
Sludge, waste	Cement

Allocation rule: CO_2-emission is credited to the tannery; the difference between the CO_2-emission for the production process by using new materials and the waste/by-products is credited to the tannery (numbers can be find for different countries of the EU).

C.2 Thermal utilization

For „Waste to fuel“ or „Waste for heat-recovery“ the following allocation rule is applied:

Allocation rule: CO_2-emission is credited to the tannery; the CO_2-equivalents from the heating value of the net-produced biogas or biodiesel is credited. In case of incineration in co-generation plants, the heating values from the incinerated material (net) should be credited. The CO_2-emission produced by the thermal utilization is allocated to the tannery. The credit from the production of biodiesel or biogas is allocated 50 % - 50 % to the tannery and the thermal valorization plant.

C.3 Disposal

For „Waste“ or „By-products“, which are sent to landfills (above or underground) or other comparable disposal-treatments, the following allocation rule is applied:

Allocation rule: CO_2-emission from landfilling is allocated to the tannery.

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[6] EN ISO 14064-1, *Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals (ISO 14064-1)*

[7] ISO 21930, *Sustainability in building construction — Environmental declaration of building products*

[8] See “By-products”, European Commission, DG ENVI, at http://ec.europa.eu/environment/waste/framework/by_products.htm. The Code of Federal Regulations (CFR) of the United States Environmental Protection Agency provides for the same definition of by-product and co-product in section 261.1(c)(3): “A 'by-product' is a material that is not one of the primary products of a production process and is not solely or separately produced by the production process. Examples are process residues such as slags or distillation column bottoms. The term does not include a co-product that is produced for the general public’s use and is ordinarily used in the form it is produced by the process” (available at: http://www.gpo.gov/fdsys/pkg/CFR-2003-title40-vol23/pdf/CFR-2003-title40-vol23-chapI-subchapI.pdf)

[9] “Corrigendum to Regulation (EC) No 853/2004 of the European Parliament and of the Council of 29 April 2004 laying down specific hygiene rules for food of animal origin”

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