



PRODUCT-CATEGORY RULES (PCR)

for preparing an environmental product
declaration (EPD) for

Finished bovine leather

PCR 2007:03

The Swedish Environmental Management Council

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This PCR-document is in compliance with *Requirements for Environmental Product Declarations, MSR 1999:2*, published by the Swedish Environmental Management Council 2000-03-27, as a part of the EPD[®] system.

In case of discrepancy between English and Italian version, the English official one will be considered as valid.

Information about the EPD[®] system and registered EPD's: www.environdec.com

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1. General information

This PCR document, “Finished bovine leather”, is in compliance with “Requirements for Environmental Product Declarations – MSR 1999:2” , published by the Swedish Environmental Management Council and with the indications contained in ISO TR 14025.

The PCR draft has been prepared by Aequilibria di Pernigotti Daniele, in cooperation with 2B Consulenza, for Giada Agency of Provincia di Vicenza.

The PCR is valid for four years.

2. Product description

The product under study in this PCR document is “Finished bovine leather” from full-grown bovine and it can have many uses. It can be used for example for furniture, clothing, automotive, footwear etc. Since the application of finished bovine leather in final consumer products varies substantially, no specific function has been defined for the product “Finished bovine leather”.

Changes in finished product quality (as thickness, colour, suppleness, stretch....) are possible as a function of specific customer requirements; in any case these changes has not to modify the LCA for this kind of finished products in order to differ for not more than 5% from the reference one.

For the leather defined in this PCR the vegetable tanning is compatible.
Finished product complies with the following qualitative standards:

2003/36/CE European directive;

2002/45/CE European Directive;

2003/53/CE European directive;

2002/61/CE European Directive;

ISO 14931:2004 “Leather– Guide for selection of leather for apparel (excluding furs)”;

ISO/TS 17226:2003 “Leather – Chemical tests – Determination of formaldehyde content”;

ISO/TS 17234:2003 “Leather – Chemical tests – Determination of certain azo-colourants in dyed leathers”;

EN 13336:2004 “Leather – Upholstery leather Characteristics – Guide for selection of leather for furniture”;

CEN/TS 14494:2003 “Leather – Chemical tests – Determination of content of pentachlorophenol in leather”;

CEN/TS 14495:2003 Leather – Chemical tests – Determination of chromium VI content;

CEN/TS 14906:2004 “Leather – Upholstery leather Characteristics – Guide for selection of leather for automotive”;

UNI SPERIMENTALE 3616:1955 “Broccame da scarpe”;
 UNI 9431:1989 “Mobili imbottiti. Rivestimenti di pelle. Requisiti e metodi di prova”;
 UNI 10594:1999, “Caratteristiche e requisiti dei cuoi destinati all’industria calzaturiera”;
 UNI 10740:1999 “Cuoio – Scamosciato per pulizia – Classificazione e requisiti”;
 UNI 10826:2000 “Caratteristiche e requisiti dei cuoi destinati all’industria della pelletteria e degli accessori”;
 UNI 10885:2000 “Pelle conciata al vegetale – Definizione, caratteristiche e requisiti”;
 UNI 10886:2000 “Caratteristiche e requisiti dei cuoi destinati alla manifattura di guanti”;
 UNI 11077:2004 “Cuoio - Caratteristiche e requisiti dei cuoi idonei al lavaggio domestico destinati all’industria calzaturiera”;
 UNI 11125:2004 “Etichettatura di mobili con rivestimento di cuoio – Requisiti”;
 UNI 11129:2004 “Cuoio - Caratteristiche e requisiti dei cuoi per pellicceria”;
 DGM RAL ;

3. Materials and chemical substances to be considered in the LCA study

LCA study has to consider:

- all chemical substances $\geq 0,5$ weight %¹ referred to total weight of used chemical substances;
- all materials/substances that are submitted to legal requirements and customer demands (in particular Cr and formaldehyde);
- all materials/substances that are hazardous to health and the environment, being allergenic, carcinogenic, mutagenic or toxic to reproduction if present in such a concentration in the product that it meets requirements for being subject to labelling according to the Substance and Preparations Directives. (i.e. aziridine)

All tanning processes have to be included in the study.

4. Declared unit

The declared unit is the production of 1 m² finished bovine leather, misured according to ISO 11646.

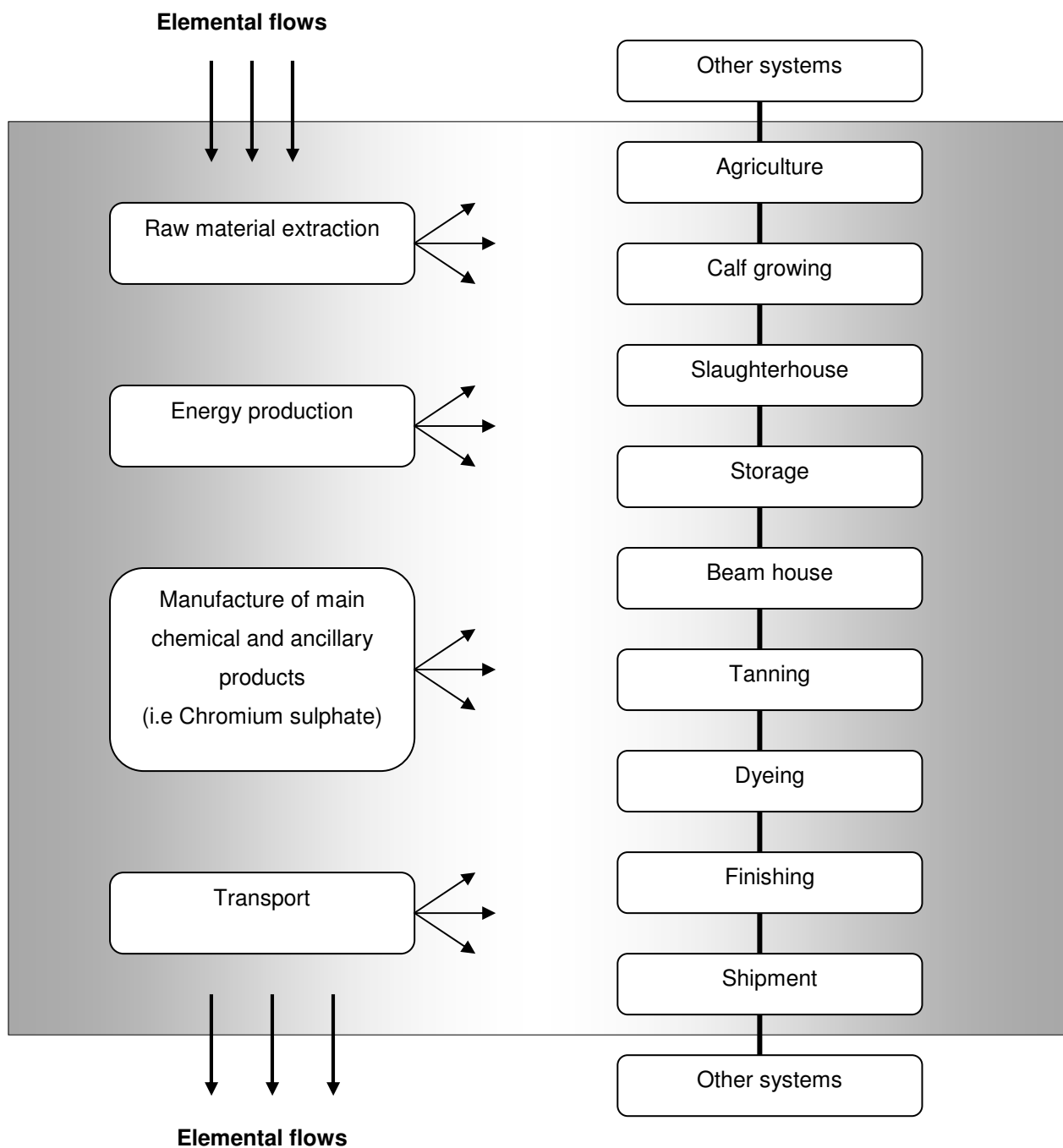
¹ Materials should be considered as the aggregated amount of similar substances for use or chemical characteristics.

5. System boundaries

The system boundaries determine the unit processes to be included in the LCA study and what type of “upstream” and/or “downstream” data could be omitted.

System boundary setting reduce the number of LCA data, thereby facilitating the provided calculation that no significant information is lost.

The life cycle for “Finished leather bovine” for furniture, clothing and footwear are chosen from “cradle to gate”, including the bovine farming phase, as reported in fig 1.



5.1 Boundaries in time

A time perspective of 1 year has to be considered.

Because of continuous process innovation and technological development, the EPD need to be revised each 4 years.

5.2 Boundaries towards nature

The boundaries towards nature shall describe the flow of material and energy resources from nature into the system and emissions from the system to air and water and waste.

5.3 Boundaries towards other technical systems

If there is an inflow of recycled material to the product 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 there is an outflow of material to recycling, the transportation to the recycling process shall be included. The material going to recycling is then an outflow from the product system.

For the manufacturing phase the inflow of recycled material and the outflow of materials for recycling, heat recovery, landfill and waste treatment shall be incorporated in the environmental impact of the system or declared without assigning the environmental impact of the system².

5.4 Boundaries in the life cycle

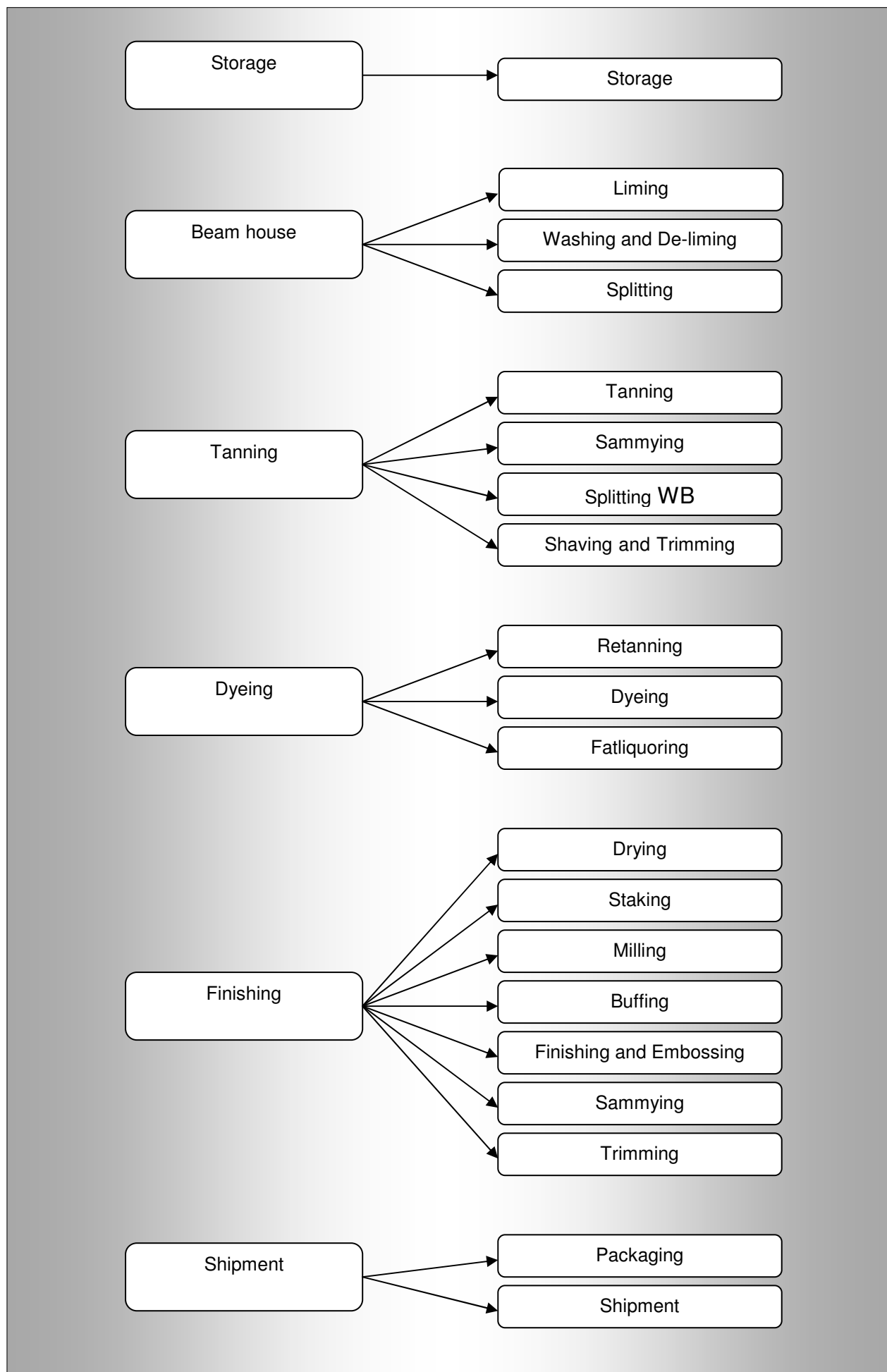
The boundaries in the life cycle are illustrated in the flow chart in Fig 1.

As shown in the figure 1, the life cycle of bovine leather for furniture, clothing and footwear include the following phases :

- Raw material extraction;
- Energy production and delivery;
- Chemical and ancillary production;
- Agriculture;
- Bovine growing;
- Slaughterhouse;
- Beam house;
- Tanning;
- Dyeing
- Finishing;
- Waste and water management;
- Transport.

Fig. 2 gives the more detailed description of tanning process.

² Further considerations will be proposed according to the LCA study results.



Additional trimming on the part of customer and final product realization as well as use phase and the product final disposal are excluded from the system boundaries.

Emissions, resources and energy consumption related to production of raw materials as well as main ancillary materials shall be included.

Bovine growing, feedstuff industry and fertiliser and pesticide production shall be included. Due to the difficulties in the collection of primary information about this matter, the use of data originating from specific LCA database from the agriculture sector listed at point 9 (or others appropriated sources), could be considered as specific data.

Energy and electricity used at the manufacturing site, the emissions to air and the amount of waste generated is included.

When electricity is used at the manufacturing plant and there are not primary LCA data available, country appropriated data shall be used and considered as specific data.

In case a waste water treatment plant is present outside the system boundaries of the production site, the associated emission reductions shall be included in the LCA study, taking in consideration the amount and the quality of the effluent.

The packaging material used for finished leather transport to other systems shall be included; packaging material for components and materials from suppliers to the factory may be included

Building of site, infrastructure, production of manufacturing equipment and personnel activities shall not be included.

6. Cut-off rules

Processes/activities that altogether do not contribute to more than 0,1% of the total environmental impact for any impact category are allowed to be omitted from the inventory analysis. Parts and materials not included in the LCA shall be documented.

The product use and disposal phases are omitted from the LCA since no specific function has been defined for production of finished bovine leather and the LCA boundaries has been chosen from “cradle to gate”.

7. Allocation rules

Whenever it would be necessary to partitioning the system inputs and outputs, mass criteria will be used.

Related to the splitting activities, it is used a surface criteria, so the environmental impact, until this cycle phase, is equally allocated between crust hide (50%) and nap leather (50%).

It is possible to apply economic allocation criteria for the allocation of the impact of bovine farming.

It is specified that the flow of energy and materials and the associated release of substances and energy into the environment are directly related to the finished leather declared unit.

8. Units

The following units shall be used:

SI units.

Preferred power and energy units:

- kW (MW) for power

- kWh (MWh) for energy

9 Source of data

Data quality requirements for the manufacturing phase

Site-specific data shall be used for the tanning process.

The mix of electricity used during the manufacturing phase can be approximated as the official one in the country of manufacture if site-specific data can not be obtained. The mix of electricity shall be documented.

Hazardous waste is defined by EU Directives 91/689/EEC and 75/442/EEC.

Use of generic data

The following sources of generic data shall be used for the European market, except what specified at point 5.4

The table assigns data sources for selected generic data describing material flows connected to a number of input materials. When applying data for these materials these sources shall be used. If these data sources do not supply the necessary data, other generic data may be used and documented. The environmental impact associated to other generic data must not exceed 10% of the overall environmental impact from the product system.

Material	Database	Published
Electricity	Ecoinvent	2006
Plastics	APME (Association of Plastics Manufacturers in Europe)	1993-1998
Chemicals	APME (Association of Plastics Manufacturers in Europe)	1993-1998
Materials	I-LCA (Apat)	2000
Agriculture and bovine growing	LCAFOOD (Danish Institute of Agricultural Sciences)	2002-2003

10. Information to be included in the EPD

The following parameters shall be declared for the manufacturing phase.

Leather thickness

Different set of leather thickness produced in the year shall be reported and referred to the total m².

Resource use

Use of non-renewable resources

- without energy content
- with energy content

Use of renewable resources

- without energy content
- with energy content

Electricity consumption

List of materials and chemical substances to be declared

At least, the following information shall be reported:

- List of all chemical substances ≥ 2 weight %³ referred to total weight of used chemical substances;
- List of all materials/substances that are submitted to legal requirements and customer demands (in particular Cr and formaldehyde);
- List of all materials/substances that are hazardous to health and the environment, being allergenic, carcinogenic, mutagenic or toxic to reproduction if present in such a concentration in the product that it meets requirements for being subject to labelling according to the Substance and Preparations Directives. (i.e. aziridine)

The lists can be separated for category of materials and shall be referred per declared unit.

Pollutant emissions expressed as potential environmental impact

- | | |
|-----------------------------------|--------------------------------|
| - Global warming | kg CO ₂ equivalents |
| - Acidification | kmol H ⁺ |
| - Ozone depletion | kg CFC-11 equivalents |
| - Photochemical oxidant formation | kg ethene-equivalents |
| - Eutrophication | kg O ₂ |
| - Human toxicity | kg 1-4 DCB air equivalents |
| - Aquatic toxicity | kg 1-4 DCB water equivalents |
| - Terrestrial toxicity | kg 1-4 DCB soil equivalents |

³ The definitive threshold shall be defined according to LCA study results

The impact categories which need to be declared include the 5 default impact categories as defined in MSR 1999:2 and three additional toxicity impact categories, due to the use of chemicals substances (e.g. sodium dichromate) in the tanning processes and their significant impact on the toxicity themes. The characterization factors to use for converting data from the life cycle inventory analysis into impact categories are listed in:

- global warming (MSR 1999:2);
- acidification (MSR 1999:2);
- stratospheric ozone depletion (MSR 1999:2);
- photochemical oxidant emissions (MSR 1999:2);
- eutrophication (MSR 1999:2);
- human toxicity (CML 2001);
- aquatic toxicity (CML 2001);
- terrestrial toxicity (CML 2001).

Additional information

Waste

- Hazardous waste
- Other waste

describing the different recovery or disposal destinations.

(Note: Waste to declare includes solid and semi-solid waste.)

Information on the producer related to the application of Environmental Management Systems (EMAS, ISO 14001,...) as well as the adoption of processes or use of substances to reduce environmental impact, can be reported.

Use of recycled materials as well as energy from renewable sources can be reported, according to law.

11. References

References:

The EPD shall refer to:

- Requirements for Environmental Product Declarations, EPD, (MSR 1999:2) published by the Swedish Environmental Management Council at www.environdec.com
- The relevant PCR document
- The underlying LCA report