DECISIONS

COMMISSION IMPLEMENTING DECISION

of 11 February 2013

establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for the tanning of hides and skins

(notified under document C(2013) 618)

(Text with EEA relevance)

(2013/84/EU)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) [1], and in particular Article 13(5) thereof,

Whereas:

(1) Article 13(1) of Directive 2010/75/EU requires the Commission to organise an exchange of information on industrial emissions between it and Member States, the industries concerned and non-governmental organisations promoting environmental protection in order to facilitate the drawing up of best available techniques (BAT) reference documents as defined in Article 3(11) of that Directive.

(2) In accordance with Article 13(2) of Directive 2010/75/EU, the exchange of information is to address the performance of installations and techniques in terms of emissions, expressed as short- and long-term averages, where appropriate, and the associated reference conditions, consumption and nature of raw materials, water consumption, use of energy and generation of waste and the techniques used, associated monitoring, cross-media effects, economic and technical viability and developments therein and best available techniques and emerging techniques identified after considering the issues mentioned in points (a) and (b) of Article 13(2) of that Directive.

(3) 'BAT conclusions' as defined in Article 3(12) of Directive 2010/75/EU are the key element of BAT reference documents and lay down the conclusions on best available techniques, their description, information to assess their applicability, the emission levels associated with the best available techniques, associated monitoring, associated consumption levels and, where appropriate, relevant site remediation measures.

(4) In accordance with Article 14(3) of Directive 2010/75/EU, BAT conclusions are to be the reference for setting permit conditions for installations covered by Chapter II of that Directive.

(5) Article 15(3) of Directive 2010/75/EU requires the competent authority to set emission limit values that ensure that, under normal operating conditions, emissions do not exceed the emission levels associated with the best available techniques as laid down in the decisions on BAT conclusions referred to in Article 13(5) of Directive 2010/75/EU.

(6) Article 15(4) of Directive 2010/75/EU provides for derogations from the requirement laid down in Article 15(3) only where the costs associated with the achievement of the emission levels associated with the BAT disproportionately outweigh the environmental benefits due to the geographical location, the local environmental conditions or the technical characteristics of the installation concerned.

(7) Article 16(1) of Directive 2010/75/EU provides that the monitoring requirements in the permit referred to in point (c) of Article 14(1) of the Directive are to be based on the conclusions on monitoring as described in the BAT conclusions.

(8) In accordance with Article 21(3) of Directive 2010/75/EU, within four years of publication of decisions on BAT conclusions, the competent authority is to reconsider and, if necessary, update all the permit conditions and ensure that the installation complies with those permit conditions.

[1] OJ L 334, 17.12.2010, p. 17.

(9) Commission Decision of 16 May 2011 establishing a forum for the exchange of information pursuant to Article 13 of Directive 2010/75/EU on industrial emissions [1] established a forum composed of representatives of Member States, the industries concerned and non-governmental organisations promoting environmental protection.

(10) In accordance with Article 13(4) of Directive 2010/75/EU, the Commission obtained the opinion [2] of that forum on the proposed content of the BAT reference document for the tanning of hides and skins on 13 September 2012 and made it publicly available.

(11) The measures provided for in this Decision are in accordance with the opinion of the Committee established by Article 75(1) of Directive 2010/75/EU,

HAS ADOPTED THIS DECISION:

Article 1

The BAT conclusions for the tanning of hides and skins are set out in the Annex to this Decision.

Article 2

This Decision is addressed to the Member States.

Done at Brussels, 11 February 2013.

For the Commission
Janez POTOČNIK
Member of the Commission

[1] OJ C 146, 17.5.2011, p. 3.
[2] http://circa.europa.eu/Public/irc/env/ied/library?l=/ied_art_13_forum/opinions_article

ANNEX

BAT CONCLUSIONS FOR THE TANNING OF HIDES AND SKINS

SCOPE

These BAT conclusions concern the following activities specified in Annex I to Directive 2010/75/EU, namely:

— 6.3 *Tanning of hides and skins where the treatment capacity exceeds 12 tonnes of finished products per day,*

— 6.11 *Independently operated treatment of waste water not covered by Council Directive 91/271/EEC* [1] *and discharged by an installation* undertaking activities covered under 6.3 above.

Unless stated otherwise the BAT conclusions presented can be applied to all installations subject to these BAT conclusions.

Other reference documents which are relevant for the activities covered by these BAT conclusions are the following:

Reference document	Subject
Energy Efficiency (ENE)	General energy efficiency
Economics and Cross-Media Effects (ECM)	Economics and cross-media effects of techniques
General Principles of Monitoring (MON)	Emissions and consumption monitoring
Emissions from storage (EFS)	Emissions from tanks, pipework and stored chemicals
Waste Incineration (WI)	Waste incineration
Waste Treatments Industries (WT)	Waste treatment

The techniques listed and described in these BAT conclusions are neither prescriptive nor exhaustive. Other techniques may be used that ensure at least an equivalent level of environmental protection.

DEFINITIONS

For the purposes of these BAT conclusions, the following definitions apply:

Beamhouse/Limeyard	That portion of the tannery where the hides are soaked, limed, fleshed, and unhaired, when necessary, prior to the tanning process.
By-product	Object or substance meeting the requirements of Article 5 of Directive 2008/98/EC of the European Parliament and of the Council [1].
Existing plant	A plant that is not a new plant.
Existing processing vessel	A processing vessel that is not a new processing vessel.
New plant	A plant first operated at the installation following the publication of these BAT conclusions or a complete replacement of a plant on the existing foundations of the installation following the publication of these BAT conclusions.
New processing vessel	A processing vessel first operated at the plant following the publication of these BAT conclusions or a complete rebuild of a processing vessel following the publication of these BAT conclusions.
Tannery	An installation that carries out the activity 'Tanning of hides and skins where the treatment capacity exceeds 12 tonnes of finished products per day' (Activity 6.3 of Annex I to Directive 2010/75/EU).
Tanyard	The part of the tannery where the processes of pickling and tanning are carried out.
Urban waste water treatment plant	A plant subject to Directive 91/271/EEC.

[1] OJ L 312, 22.11.2008, p. 3.

[1] OJ L 135, 30.5.1991, p. 40.

1.1. *General BAT conclusions for the tanning of hides and skins*

1.1.1. Environmental management systems

1. In order to improve the overall environmental performance of a tannery, BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the following features:

(i) commitment of the management, including senior management;

(ii) definition of an environmental policy that includes the continuous improvement of the installation by the management;

(iii) planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment;

(iv) implementation of procedures paying particular attention to:

(a) structure and responsibility;

(b) training, awareness and competence;

(c) communication;

(d) employee involvement;

(e) documentation;

(f) efficient process control;

(g) maintenance programmes;

(h) emergency preparedness and response;

(i) safeguarding compliance with environmental legislation;

(v) checking performance and taking corrective action, paying particular attention to:

(a) monitoring and measurement (see also the reference document on the general principles of monitoring);

(b) corrective and preventive action;

(c) maintenance of records;

(d) independent (where practicable) internal and external auditing in order to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained;

(vi) review of the EMS and its continuing suitability, adequacy and effectiveness by senior management;

(vii) following the development of cleaner technologies;

(viii) consideration for the environmental impacts from the eventual decommissioning of the installation at the stage of designing a new plant, and throughout its operating life;

(ix) application of sectoral benchmarking on a regular basis.

Specifically for the tanning of hides and skins, it is also important to consider the following potential features of the EMS:

(x) to facilitate decommissioning, the maintenance of records of the locations on the site where particular process steps are carried out;

(xi) other items listed under BAT conclusion 2.

Applicability

The scope (e.g. level of details) and nature of the EMS (e.g. standardised or non-standardised) will generally be related to the nature, scale and complexity of the installation, and the range of environmental impacts it may have.

1.1.2. Good housekeeping

2. In order to minimise the environmental impact of the production process, BAT is to apply the principles of good housekeeping by applying the following techniques in combination:

(i) careful selection and control of substances and raw materials (e.g. quality of hides, quality of chemicals);

(ii) input-output analysis with a chemical inventory, including quantities and toxicological properties;

(iii) minimisation of the use of chemicals to the minimum level required by the quality specifications of the final product;

(iv) careful handling and storage of raw materials and finished products in order to reduce spills, accidents and water wastage;

(v) segregation of waste streams, where practicable, in order to allow for the recycling of certain waste streams;

(vi) monitoring of critical process parameters to ensure stability of the production process;

(vii) regular maintenance of the systems for the treatment of effluents;

(viii) review of options for the reuse of process/washing water;

(ix) review of waste disposal options.

1.2. *Monitoring*

3. BAT is to monitor emissions and other relevant process parameters, including those indicated below, with the given associated frequency and to monitor emissions according to EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

	Parameter	Frequency	Applicability
a	**Measurement of water consumption in the two process stages: up to tanning and post-tanning, and recording of production in the same period.**	At least monthly.	Applicable to plants carrying out wet processing.
b	**Recording of the quantities of process chemicals used in each process step and recording of production in the same period.**	At least yearly.	Generally applicable.
c	**Monitoring of the sulphide concentration and total chromium concentration in the final effluent after treatment for direct discharge to receiving water, by using flow proportional 24-hour composite samples.** **Monitoring of the sulphide concentration and total chromium concentration after chromium precipitation for indirect discharge, by using flow proportional 24-hour composite samples.**	On a weekly or monthly basis.	The monitoring of chromium concentration is applicable to on-site or off-site plants which undertake chromium precipitation. Where economically viable, the monitoring of sulphide concentration is applicable to plants carrying out some part of effluent treatment on site or off site for treating waste waters from tanneries.
d	**Monitoring of chemical oxygen demand (COD), biochemical oxygen demand (BOD) and ammoniacal nitrogen after on-site or off-site effluent treatment for direct discharges to receiving water, by using flow-proportional 24-hour composite samples.** **Monitoring of total suspended solids after on-site or off-site effluent treatment for direct discharges to receiving water.**	On a weekly or monthly basis. More frequent measurements in case process changes are needed.	Applicable to plants carrying out some part of effluent treatment on-site or off-site for treating waste waters from tanneries.

	Parameter	Frequency	Applicability
e	**Monitoring of halogenated organic compounds after on-site or off-site effluent treatment for direct discharges to receiving water.**	On a regular basis.	Applicable to plants where halogenated organic compounds are used in the production process and are susceptible to being released into receiving water.
f	**Measurement of pH or redox potential at the liquid outlet of wet scrubbers.**	Continuously.	Applicable to plants using wet scrubbing to abate hydrogen sulphide or ammonia emissions to the air.
g	**The keeping of a solvent inventory on an annual basis, and recording of production in the same period.**	On an annual basis.	Applicable to plants carrying out finishing using solvents and using water-borne coatings or similar materials to limit the solvent input.
h	**Monitoring of volatile organic compound emissions at the outlet of abatement equipment, and recording of production.**	Continuously or periodically.	Applicable to plants carrying out finishing using solvents and employing abatement.
i	**Indicative monitoring of the pressure drop across bag filters.**	On a regular basis.	Applicable to plants using bag filters to abate particulate matter emissions, where there is a direct discharge to the atmosphere.
j	**Testing of the capture efficiency of wet scrubbing systems.**	Annually.	Applicable to plants using wet scrubbing to abate particulate matter emissions, where there is a direct discharge to the atmosphere.
k	**Recording of the quantities of process residues sent for recovery, reuse, recycling, and disposal.**	On a regular basis.	Generally applicable.
l	**Recording of all forms of energy use and of production in the same period.**	On a regular basis.	Generally applicable.

1.3. *Minimising water consumption*

4. In order to minimise water consumption, BAT is to use one or both of the techniques given below.

	Technique	Description	Applicability
a	**The optimisation of water use in all wet process steps, including the use of batch washing instead of running water washes**	Optimisation of water use is achieved by determining the optimum quantity required for each process step and introducing the correct quantity using measuring equipment. Batch washing involves washing of hides and skins during processing by introducing the required quantity of clean water into the processing vessel and using the action of the vessel to achieve the required agitation, as opposed to running water washes which use the inflow and outflow of large quantities of water.	Applies to all plants carrying out wet processing.
b	**The use of short floats**	Short floats are reduced amounts of process water in proportion to the amount of hides or skins being processed as compared to traditional practices. There is a lower limit to this reduction because the water also functions as a lubricant and coolant for the hides or skins during processing. The rotation of process vessels containing a limited amount of water requires more robust geared drives because the mass being rotated is uneven.	This technique cannot be applied in the dyeing process step and for the processing of calfskins. Applicability is also limited to: — new processing vessels, — existing processing vessels that allow the use of, or can be modified to use, short floats.

The review of options for the reuse of process/washing water is part of an Environmental Management System (see BAT 1) and of the principles of good housekeeping (see BAT 2).

The BAT-associated consumption levels for water

See Table 1 (for bovine hides) and Table 2 (for sheepskins).

Table 1

BAT-associated consumption levels for water for the processing of bovine hides

Process stages	Water consumption per tonne of raw hide [1] (m^3/t)	
	Unsalted hides	Salted hides
Raw to wet blue/white	10 to 15	13 to 18
Post-tanning processes and finishing	6 to 10	6 to 10
Total consumption.	16 to 25	19 to 28

[1] Monthly average values. Processing of calfskins and vegetable tanning may require a higher water

Table 2

BAT-associated consumption levels for water for the processing of sheepskins

Process stages	Specific water consumption [1]
	litres per skin
Raw to pickle	65 to 80
Pickle to wet blue	30 to 55
Post-tanning processes and finishing	15 to 45
Total	110 to 180

[1] Monthly average values. Wool-on sheepskins may require a higher water consumption.

1.4. *Reduction of emissions in waste water*

1.4.1. Reduction of emissions in waste water from beamhouse process steps

5. In order to reduce the pollutant load in the waste water before effluent treatment arising from the beamhouse process steps, BAT is to use an appropriate combination of the techniques given below.

	Technique	Description	Applicability
a	**The use of short floats**	Short floats are reduced amounts of process water. When less water is present, the quantity of process chemicals which are discarded unreacted, is reduced.	The technique cannot be applied for the processing of calfskins. Applicability is also limited to: — new processing vessels, — existing processing vessels that allow the use of, or can be modified to use, short floats.

	Technique	Description	Applicability
b	**The use of clean hides or skins**	Use of hides or skins which have less manure adhering to the exterior, possibly through a formal 'clean hides scheme'.	Applicable subject to the constraints of the availability of clean hides.
c	**Processing fresh hides or skins**	Unsalted hides or skins are used. Rapid post-mortem cooling combined with either short delivery times or temperature-controlled transport and storage are used to prevent their deterioration.	Applicability is limited by the availability of fresh hides or skins. Cannot be applied when a supply chain longer than two days is involved.
d	**Shaking off loose salt from hides by mechanical means**	Salted hides are opened out for processing in a manner which shakes or tumbles them, so that loose salt crystals fall off and are not taken into the soaking process.	Applicability is limited to tanneries processing salted hides.
e	**Hair-save unhairing**	Unhairing is carried out by dissolving the hair root rather than the whole hair. The remaining hair is filtered out of the effluent. The concentration of hair breakdown products in the effluent is reduced.	The technique is not applicable where facilities for the processing of hair for use are not available within a reasonable transport distance or when the hair use is not possible. Applicability is also limited to: — new processing vessels, — existing processing vessels that allow the use of, or can be modified to use, the technique.
f	**Using organic sulphur compounds or enzymes in the unhairing of bovine hides**	The amount of inorganic sulphide used in unhairing is reduced by partially replacing it by organic sulphur compounds or by additional use of appropriate enzymes.	Additional use of enzymes is not applicable to tanneries producing leather with a visible grain (e.g. aniline leather).
g	**Reduced ammonium use during deliming**	The use of ammonium compounds in deliming is partially or completely replaced by the injection of carbon dioxide gas and/or the use of other substitute deliming agents.	The complete replacement of ammonium compounds by CO_2 during deliming cannot be applied to the processing of materials whose thickness is over 1,5 mm. The applicability of partial or complete replacement of ammonium compounds by CO_2 during deliming is also limited to: — new processing vessels, — existing processing vessels that allow the use of, or can be modified to use, CO_2 during deliming.

1.4.2. Reduction of emissions in waste water from tanyard process steps

6. In order to reduce the pollutant load in the waste water before effluent treatment arising from the tanyard process steps, BAT is to use an appropriate combination of the techniques given below.

	Technique	Description	Applicability
a	**The use of short floats**	Short floats are reduced amounts of process water. When less water is present, the quantity of process chemicals which is discarded unreacted is reduced.	This technique cannot be applied for the processing of calfskins. Applicability is also limited to: — new processing vessels, — existing processing vessels that allow the use of, or can be modified to use, short floats.
b	**Maximising the uptake of chromium tanning agents**	Optimisation of the operating parameters (e.g. pH, float, temperature, time, and drum speed) and the use of chemicals to increase the proportion of the chromium-tanning agent taken up by the hides or skins.	Generally applicable.
c	**Optimised vegetable-tanning methods**	Use of drum tanning for part of the process. Use of pretanning agents to aid penetration of vegetable tannins.	Cannot be applied in the production of vegetable-tanned sole leather.

1.4.3. Reduction of emissions in waste water from post-tanning process steps

7. In order to reduce the pollutant load in the waste water before effluent treatment arising from the post-tanning process steps, BAT is to use an appropriate combination of the techniques given below.

	Technique	Description	Applicability
a	**The use of short floats**	Short floats are reduced amounts of process water. When less water is present, the quantity of process chemicals which is discarded unreacted is reduced.	This technique cannot be applied in the dyeing process step and for the processing of calfskins. Applicability is also limited to: — new processing vessels, — existing processing vessels that allow the use of, or can be modified to use, short floats.
b	**Optimisation of retanning, dyeing, and fatliquoring**	Optimisation of process parameters to ensure the maximum uptake of process chemicals.	Generally applicable.

1.4.4. Other reductions of emissions in waste water

8. In order to prevent the emission of specific pesticides in waste water, BAT is to only process hides or skins which have not been treated with those materials.

Description

The technique consists in the specification in supply contracts of materials free from pesticides that are:

— listed in Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy [1],

— listed in Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants [2],

— classified as carcinogen, mutagen or reprotoxic according to Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures [3].

Examples include DDT, cyclodiene pesticides (aldrin, dieldrin, endrin, isodrin), and HCH including lindane.

Applicability

Generally applicable to tanneries within the constraints of controlling the specifications given to non-EU hides and skins suppliers.

9. In order to minimise the emissions of biocides in waste water, BAT is to process hides or skins only with biocidal products approved in accordance with the dispositions given by Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products [4].

1.5. *Treatment of emissions to water*

10. In order to reduce emissions to receiving waters, BAT is to apply waste water treatment comprising an appropriate on-site and/or off-site combination of the following techniques:

(i) mechanical treatment;

(ii) physico-chemical treatment;

(iii) biological treatment;

(iv) biological nitrogen elimination.

Description

The application of an appropriate combination of the techniques described below. The combination of techniques can be implemented on site and/or off site, in two or three stages.

Technique		Description	Applicability
a	**Mechanical treatment**	Screening of gross solids, skimming of fats, oils, and greases and removal of solids by sedimentation.	Generally applicable for on-site and/or off-site treatment.
b	**Physico-chemical treatment**	Sulphide oxidation and/or precipitation, COD and suspended solids removal by, e.g., coagulation and flocculation. Chromium precipitation by increasing pH to 8 or above using an alkali (e.g. calcium hydroxide, magnesium oxide, sodium carbonate, sodium hydroxide, sodium aluminate).	Generally applicable for on-site and/or off-site treatment.
c	**Biological treatment**	Aerobic biological waste water treatment using aeration, including the removal of suspended solids by, e.g., sedimentation, secondary flotation.	Generally applicable for on-site and/or off-site treatment.
d	**Biological nitrogen elimination**	Nitrification of ammoniacal nitrogen compounds to nitrates, followed by the reduction of nitrates to gaseous nitrogen.	Applicable to plants with direct discharge to receiving water. Difficult implementation into existing plants where there are space limitations.

[1] OJ L 348, 24.12.2008, p. 84.
[2] OJ L 158, 30.4.2004, p. 7.
[3] OJ L 353, 31.12.2008, p. 1.
[4] OJ L 167, 27.6.2012, p. 1.

BAT-associated emission levels

See Table 3. BAT-AELs apply for:

(i) direct waste water discharges from tanneries on-site waste water treatment plants;

(ii) direct waste water discharges from independently operated waste water treatment plants covered under Section 6.11 in Annex I to Directive 2010/75/EU treating waste water mostly from tanneries.

Table 3

BAT-AELs for direct discharges of waste water after treatment

Parameter	BAT-AELs
	mg/l (monthly average values based on the average of the 24-hour representative composite samples taken over a month)
COD	200-500 ([1])
BOD_5	15-25
Suspended solids	< 35
Ammoniacal nitrogen NH_4-N (as N)	< 10
Total chromium (as Cr)	< 0,3-1
Sulphide (as S)	< 1

([1]) The upper level is associated with COD inlet concentrations of ≥ 8 000 mg/l.

11. In order to reduce the chromium content of waste water discharges, BAT is to apply on-site or off-site chromium precipitation.

Description

See BAT 10, technique b.

The efficiency of chromium precipitation is higher in the case of segregated, concentrated chromium-bearing streams.

Applicability

Generally applicable for on-site and/or off-site treatment of waste water effluents of tanneries carrying out chromium tanning and/or retanning.

BAT-associated emission levels

See Table 3 for chromium BAT-AELs for direct discharges to receiving water, and Table 4 for chromium BAT-AELs for indirect discharges into urban waste water treatment plants.

12. In order to reduce total chromium and sulphide emissions through indirect discharges of waste water from tanneries into urban waste water treatment plants, BAT is to apply chromium precipitation and sulphide oxidation.

Description

See BAT 10, technique b.

The removal efficiency is higher in the case of segregated, concentrated chromium/sulphide-bearing streams.

Sulphide oxidation consists of a catalytic oxidation (aeration in the presence of manganese salts).

Applicability

Chromium precipitation is generally applicable for on-site and/or off-site treatment of waste water effluents of tanneries carrying out chromium tanning and/or retanning.

BAT-associated emissions levels

See Table 4 for chromium and sulphide BAT-AELs for indirect discharges into urban waste water treatment plants.

Table 4

BAT-AELs for total chromium and sulphide emissions through indirect discharges of waste water from tanneries into urban waste water treatment plants

Parameter	BAT-AELs
	mg/l (monthly average values based on the average of the 24-hour representative composite samples taken over a month)
Total chromium (as Cr)	< 0,3-1
Sulphide (as S)	< 1

1.6. *Airborne emissions*

1.6.1. Odour

13. In order to reduce the generation of ammonia odours from processing, BAT is to partially or completely replace ammonium compounds in deliming.

Applicability

The complete replacement of ammonium compounds by CO_2 during deliming cannot be applied to the processing of materials whose thickness is over 1,5 mm.

The applicability of partial or complete replacement of ammonium compounds by CO_2 during deliming is also limited to both new and existing processing vessels that allow the use of, or can be modified to use, CO_2 during deliming.

14. In order to reduce the emission of odours from process steps and effluent treatment, BAT is to abate ammonia and hydrogen sulphide by the scrubbing and/or biofiltration of extracted air in which odour of these gases are noticeable.

15. In order to prevent the production of odours from the decomposition of raw hides or skins, BAT is to use curing and storage designed to prevent decomposition, and rigorous stock rotation.

Description

Correct salt curing or temperature control, both combined with rigorous stock rotation to eliminate decomposition odours.

16. In order to reduce the emission of odours from waste, BAT is to use handling and storage procedures designed to reduce waste decomposition.

Description

Control of waste storage and methodical removal of putrescible waste from the installation before its decomposition causes odour problems.

Applicability

Applies only to plants which produce putrescible wastes.

17. In order to reduce the emission of odours from the beamhouse effluent, BAT is to use pH control followed by treatments to remove the sulphide content.

Description

Maintaining the pH of effluents containing sulphide from the beamhouse above 9,5 until the sulphide has been treated (on or off site) by one of the following techniques:

(i) catalytic oxidation (using manganese salts as a catalyst);

(ii) biological oxidation;

(iii) precipitation; or

(iv) by mixing in an enclosed vessel system fitted with an exhaust scrubber or a carbon filter.

Applicability

Applies only to plants carrying out sulphide unhairing.

1.6.2. Volatile organic compounds

18. In order to reduce the airborne emissions of halogenated volatile organic compounds, BAT is to replace halogenated volatile organic compounds used in the process with substances that are not halogenated.

Description

Replacement of halogenated solvents by non-halogenated solvents.

Applicability

Does not apply to the dry degreasing of sheepskins carried out in closed cycle machines.

19. In order to reduce airborne emissions of volatile organic compounds (VOC) from finishing, BAT is to use one or a combination of the techniques given below, priority being given to the first one.

Technique		Description
a	**The use of water-borne coatings in combination with an efficient application system**	Limiting emissions of volatile organic compounds by the use of water-borne coatings, with each coat applied by one of the following: curtain coating or roller coating or improved spraying techniques.
b	**The use of extraction ventilation and an abatement system**	Treating the exhaust air by the use of an extraction system fitted with one or more of the following: wet scrubbing, adsorption, bio-filtration or incineration.

BAT-associated solvent use levels and BAT-associated emission levels for VOC

Both the solvent use rates associated with the use of water-borne coatings in combination with an efficient application system and the BAT-AEL range for specific VOC emissions where an extraction ventilation and abatement system is used as an alternative to the use of water-borne finishing materials are given in Table 5.

Table 5

BAT-associated solvent use levels and BAT-AELs for VOC emissions

Parameter	Type of production		BAT-associated levels
			g/m^2 (annual average values per unit of finished leather)
Solvent use levels	Where water-borne coatings are used in combination with an efficient application system	Upholstery and automotive leather	10-25
		Footwear, garment, and leathergoods leathers	40-85
		Coated leathers (coating thickness > 0,15 mm)	115-150

Parameter	Type of production	BAT-associated levels
		g/m^2 (annual average values per unit of finished leather)
VOC emissions	Where an extraction ventilation and abatement system is used as an alternative to the use of water-borne finishing materials	9-23 ([1])

([1]) BAT-AEL range expressed as total carbon.

1.6.3. Particulate matter

20. In order to reduce the airborne particulate matter emissions from the dry finishing stages of production, BAT is to use an extraction ventilation system fitted with bag filters or wet scrubbers.

BAT-associated emission levels

The BAT-AEL for particulate matter is 3 to 6 mg per normal m^3 of exhausted air expressed as a 30-minute mean.

1.7. *Waste management*

21. In order to limit the quantities of wastes sent for disposal, BAT is to organise operations on the site so as to maximise the proportion of process residues, which arise as by-products, including the following:

Process residue	Uses as a by-product
Hair and wool	— Filling material — Wool textiles
Limed trimmings	— Collagen production
Untanned splits	— Processed to leather — Production of sausage casings — Collagen production — Dog chews
Tanned splits and trimmings	— Finished for use in patchwork, small leather goods, etc. — Collagen production

22. In order to limit the quantities of wastes sent for disposal, BAT is to organise operations on the site so as to facilitate waste reuse, or failing that, waste recycling, or failing that, 'other recovery', including the following:

Waste	Reuse after preparation	Recycling as	Other recovery
Hair and Wool	— Manufacture of protein hydrolysate	— Fertiliser	— Energy recovery
Raw trimmings		— Hide glue	— Energy recovery
Limed trimmings	— Tallow — Manufacture of technical gelatine	— Hide glue	
Fleshings	— Manufacture of protein hydrolysate — Tallow	— Hide glue	— Production of substitute fuel — Energy recovery

Waste	Reuse after preparation	Recycling as	Other recovery
Untanned splits	— Manufacture of technical gelatine — Manufacture of protein hydrolysate	— Hide glue	— Energy recovery
Tanned splits and trimmings	— Leather fibreboard production from non-finished trimmings — Manufacture of protein hydrolysate		— Energy recovery
Tanned shavings	— Leather fibreboard production — Manufacture of protein hydrolysate		— Energy recovery
Sludges from waste water treatment			— Energy recovery

23. In order to reduce the chemical consumption and reduce the amount of leather waste containing chromium-tanning agents sent for disposal, BAT is to use lime splitting.

Description

Carrying out the splitting operation at an earlier stage of processing, so as to produce an untanned by-product.

Applicability

Applies only to plants using chromium tanning.

Not applicable:

— when hides or skins are being processed for full substance (i.e. unsplit) products,

— when a firmer leather has to be produced (e.g. shoe leather),

— when a more uniform thickness is needed in the final product,

— where tanned splits are produced as a product or co-product.

24. In order to reduce the amount of chromium in sludge sent for disposal, BAT is to use one or a combination of the techniques given below.

	Technique	Description	Applicability
a	**Recovery of chromium for reuse in the tannery**	Re-solution of the chromium precipitated from the tanning float, using sulphuric acid for use as a partial substitute for fresh chromium salts.	Applicability is restricted by the need to produce leather properties which meet customers specification, in particular related to dyeing (reduced fastness and less brightness of colours) and fogging.
b	**Recovery of chromium for reuse in another industry**	Use of the chromium sludge as a raw material by another industry.	Applies only where an industrial user for the recovered waste can be found.

25. In order to reduce energy, chemical and handling capacity requirements of sludge for its subsequent treatment, BAT is to reduce the water content of sludges by using sludge dewatering.

Applicability

Applies to all plants carrying out wet processing.

1.8. *Energy*

26. In order to reduce energy consumed in drying, BAT is to optimise the preparation for drying by samming or any other mechanical dewatering.

27. In order to reduce energy consumption for wet processes, BAT is to use short floats.

Description

Reducing the energy used to heat water by reducing hot water use.

Applicability

The technique cannot be applied in the dyeing process step and for the processing of calfskins.

Applicability is also limited to:

— new processing vessels,

— existing processing vessels that allow the use of, or can be modified to use, short floats.

BAT-associated energy consumption rates

See Table 6.

Table 6

Specific energy consumption associated with BAT

Activity stages	Specific energy consumption per unit of raw material [1]
	GJ/t
Processing bovine hides from raw to wet blue or wet white	< 3
Processing bovine hides from raw to finished leather	< 14
Processing sheepskins from raw to finished leather	< 6

[1] The energy consumption values (expressed as an annual average not corrected to primary energy) cover the energy use in the production process including electricity and the total heating for indoor spaces, but excluding the energy use for waste water treatment.