
**Leather — Raw hides — Guidelines for
preservation of hides**

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 120, *Leather*, Subcommittee SC 1, *Raw hides and skins, including pickled pelts*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document has been developed to define processes of preservation that lead to higher quality of preserved hides. Such preserved hides are subsequently subjected to further treatments for manufacturing of leather and eventually for production of leather goods.

This document has indicated preservation procedures that should be followed to prevent either of the following situations:

- conditions occurring through the preservation treatments which affect the processability of hides;
- various defects that can form on hides due to inadequate preservation conditions and during the period of storage and delivery to users.

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Leather — Raw hides — Guidelines for preservation of hides

1 Scope

This document defines various preservation methods for raw hides. These preservation methods are intended to suppress microbiological activity and to maintain the quality and commercial value of the hides during storage.

This document applies to all raw hides of cattle and horses.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 hide

raw outer covering of a mature or fully grown animal of the larger kind

4 Characteristics of salt and auxiliary substances used in preservation processes

4.1 Characteristics of salt

For preservation by salting, clean salt should be used. Halophilic bacteria get acclimatised to salt media and can grow even in the presence of high salt concentrations. During bacterial growth, they produce pink, red or violet pigments on salted hides, known as red-heat. Sea or lake salt tends to be more susceptible to contamination risk and development of red-heat. Hence, using rock salt is advantageous as it is free from chemical impurities.

Salt used in preservation processes should preferably contain 98 % sodium chloride (NaCl) of total dry weight and should not contain clumped particles. The impurities should not exceed the limits indicated below, otherwise the salt could negatively affect the quality of the finished product:

- Total calcium (Ca) and magnesium (Mg) compounds in salt: 2 %.
- Total iron (Fe) compounds: 0,01 %.

Particle size of salt is also important for achieving effective preservation. If salt particles are very fine, salt tends to form pasty patches with uneven coverage. However, if salt particles are very coarse, they could immediately fall off the hide while handling. Particle size also affects speed of dissolution. Therefore, to ensure an appropriate dissolution, the particle size of salt should be between 2 mm and 3 mm.

4.2 Quantity of salt

To ensure proper dehydration of raw hides, the quantity of salt should be 25 % to 30 % of the fresh weight.

4.3 Auxiliary chemicals and preservation mixtures

Improvement in preservation can be achieved by the use of additional substances along with common salt.

The addition of sodium carbonate (Na_2CO_3) to the salt mixture prevents the formation of iron stains on skins, which can form due to existing impurities in salt. If iron impurities exceed 0,01 % of the total mass, iron stains will occur in limed pelt and thereby cause inferior quality.

Restricted pesticides or other toxic substances, such as pentachlorophenol (PCP), should not be used in preservation mixtures.

5 Preservation methods of hides

5.1 General

When an animal is alive, the hide serves as an anatomical barrier between external physical, chemical and biological agents and the internal organs. After the death of the animal, the hide becomes susceptible to microbiological spoilage because of its natural structure and excess water content. Preservation is necessary to maintain the quality and commercial value of the hide.

Before the preservation process, hides are conditioned by carrying out certain basic operations such as cleaning, draining and trimming in order to ensure effective preservation. Subsequently, hides are cured, which can take 4 h to 5 h depending on environmental conditions. There are several ways to preserve hides to inhibit micro-organic putrefaction and autolysis.

Microorganisms need humid conditions to survive. Hence, the most important step for the preservation of hides is decreasing the water content of fresh hides, which prohibits bacterial growth and activity.

5.2 Drying

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Drying is one of the oldest and simplest forms of preservation in which the water content is lowered to a certain level where microorganisms are inactive and unable to spoil hides. Although dry conditions are hostile for many microorganisms, some could stay dormant until the environment becomes favourable again.

In this method, dehydration of raw hides is carried out by natural airflow at ambient temperature in the shade. Extreme conditions and irregular foldings should be avoided. Direct sunlight and high temperatures can cause flash drying of outer layers but the inner layers still retain moisture. Hence, the drying is not homogeneous. Cross-sectional transfer of water can take place in such cases, thereby leading to decay during storage.

Dry cured hides should not contain the following defects or formations, which negatively affect the quality:

- overdried and crusted areas and irregular foldings;
- discolorations and livid areas;
- small or large tears caused by autolysis;
- insect infestations and digested areas;
- wetted areas or skin masses caused by improper storage;
- partial gelatinisation due to high temperature while drying.

If hides have one or more of these defects they might be degraded until castoff depending on the degree of existing defects.

5.3 Wet salting

Wet salting is the most common curing method for hides all over the world. Wet salting is carried out by treating hides with common salt. After skinning, hides are salted at slaughterhouses to prevent decay. Wet salting reduces the water content of the hide mass by 55 %. Hides are kept for 3 d to 6 d in piles to drain excess water content.

The amount of salt used should be 25 % to 30 % of the total raw hide mass. Salt or salt mixture is applied on both sides of the hide and the salt particles should diffuse in between the fibres of the hide. Properly salted hides should have a water content lower than 48 % and the salt saturation should be at least 85 % for long-term preservation to be possible under convenient conditions. In terms of quality, water content of salted hides should be 40 % to 45 % and salt particles should penetrate throughout the cross section.

5.4 Dry salting

Dry salting is an effective preservation process to provide additional hindrance to microbial activity. The flayed hide is salted by either or both of the wet-salting and brining methods and is then hung up to dry. This procedure reduces the weight and volume and thereby the cost of transport of skins. The moisture content of dry-salted hides is reduced to approximately 10 % to 14 %. Hence, they can be stored for longer periods than hides that have been treated only by wet salting or brining. Reduced weight along with homogeneously distributed humidity ensures easier transportation of the hides. However, special attempts should be made to rehydrate them at the early stages of leather processing.

5.5 Brining

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Brining is one of the most successful curing methods. Hides are submerged into brine solution of 22 Be' to 24 Be' for 12 h to 24 h. During the process salt penetrates throughout the cross section of hides and thus ensures long-term preservation with a minimum amount of dirt and organic deposits. After brining, hides are kept in piles to drain and left in that condition for 20 d to 30 d. Antiseptic additives may be also incorporated in the brine solution.

Brined hides should not contain the following defects, which negatively affect the quality:

- salt stains and hardening of fibrous structure;
- salt crystallization inside the hides leading to coarsening;
- salt stipples;
- red and violet discolorations.

5.6 Chilling

This method is an alternative method of preservation for short periods. Chilling is carried out by blowing cool air onto the hides to reduce their temperature to as low as 2 °C to 3 °C. Moist air should be used for chilling because overdried parts can occur in the flank portions of hides, leading to problems in quality and further processability of the hides. As the curing temperature approaches freezing, lack of moisture can lead to partial freezing of hides throughout the cross section.

This method ensures transportation of the hides without any decay or quality loss.

Frozen hides should not contain the following defects, which negatively affect the quality:

- partially dried sides and folded flanks;
- cracks in fibre bundles due to freezing;
- decay due to prolonged storage at higher temperatures without any precautions.