

TANNING PROCESS

THE ABATTOIR

To properly understand leather we need to know a little bit about the tanning process.

A hide must be tanned before it can be known as leather.

After the hide is taken from the animal the first operation is to cure the hide, in preparation, for its journey to the tannery. Which is normally quite a distance from the abattoir? This can be done by either soaking the hides in brine, or rubbing salt into the flesh side of the hide, which helps to absorb excess moisture and helps to prevent bacterial growth during its journey to the abattoir.

PRE-TANNING

At the tannery the hides undergo several operations to remove unwanted materials before tanning can begin. This is referred to as beam house operations.

BEAM HOUSE OPERATIONS

SALT RECLAMATION

The salt which was rubbed into the hides at abattoir must be removed first, the hides are put into large drums which are spun to loosen and remove most of the salt.

SOAKING

The hides are then soaked in water, held at a constant temperature, to remove any salts which are still present and to re-hydrate them. A detergent or chemical may be added at this stage, to help the hides absorb the water more readily. This process also removes any blood and dirt from the hides. Usually takes around 24hrs to complete.

DE-HAIRING OR LIMING

The hides are then put straight into tanks of a high alkaline solution of Lime and Sodium Sulphide to remove the hair, which is loosened from the roots. This process also removes fats and proteins as well as swells the collagen fibre of the hide to enable it to absorb dyes more easily.

FLESHING

Any flesh and fats that remain are removed in the fleshing machine, which scrapes the flesh side of the hides with sharp blades.

DE-LIMING

The hides are still quite alkaline at this stage so they must be neutralized using sulphates and/or acid salts, to bring the ph level to neutral.

BATING

This process uses enzymes to break down the proteins within the fibres. This also softens the hides and smoothes the grain. Care must be taken because the fibres can become damaged if over bating occurs, this can result in low strength leather!

TANNING

The purpose of tanning is to convert the collagen protein of the hide into a state that won't putrefy and will tolerate conditions of heat and moisture.

There are several different methods of tanning, but we will only concentrate on chromium tanning as this the main one used in the furniture industry.

CHROMIUM TANNING

Over 90% of leather (probably 99%) used in the manufacture of furniture is chrome tanned. This is done using large drums (these drums can hold hundreds of hides at any one time). These drums contain chrome liquor, where the hides will soak and remain for up to 8 hours. The chromium in the tanning solution is a blue colour and as it binds to fibres in the hide it tends to give the hide a blue tinge. When the hides are removed from the drums they are referred to as a wet-blue's. The benefits of chrome tanning are: the process is quick; and the resulting leather has a good tensile strength which is quite resilient to shrinkage when exposed to heat and water.

VEGETABLE TANNING

Another traditional method of tanning, which is used very rarely these days, is called vegetable tanning and is one of the oldest methods of tanning leather. It uses the bark from the oak, hemlock and chestnut trees, which contain natural tanning properties. The hides are soaked in vats of water containing this tanning mixture for a period of one month to a year depending on the hide's thickness.

POST TANNING

The hide is first dried by being passed through a machine with felt rollers which removes most of the moisture.

SPLITTING

The average thickness of a cow hide is 5mm and the minimum thickness of leather for upholstery use is 0.9 thick (some leather used for upholstery is quite thicker than this).

The hide is passed through a machine to split the hide into two or three layers. The full grain (top layer) and two splits (lower layers). The strength of the fibres varies within the hide. The fibres in the full grain being the strongest and the further into the hide you go are the weaker fibres.

Top grain must be used on all contact areas of upholstered leather furniture in the UK. The split layers can be used on non contact areas, such as, outside arms and backs.

SHAVING

Excess moisture is first removed then the split hides are shaved on the flesh side to a uniform thickness.

GRADING

All hides are different in size, thickness, grain pattern etc, so they need to be sorted to determine the application which they will eventually be used for.

Leather comes from cattle that's been bred all over the world, but the cattle bred in Scandinavia, Southern Germany, Austria and Switzerland are some of the largest and considered some of the best quality for leather.

Other European countries and North American cattle are smaller and the hides are considered to be of lesser quality.

Australia, South America, Africa and Asian hides are generally the poorest quality.

DYEING

The leather that has been selected for dyeing is placed into large drums and submerged in Aniline dye to give a deep rich colour.

FAT LIQUORING

Fats and oils are introduced into the leather to coat all of the fibres making the leather soft and flexible, also giving it that wonderful smell of new leather.

DRYING

The leather must now be dried, one method of doing this is to stretch the hides out, and place in a tunnel, where the heat and humidity is carefully controlled. This ensures that the leather is dried evenly, which gives it a consistent colour and also helps to fix the dye.

FINISHING

The leather is first conditioned with liquor to gain uniform moisture content, it is then passed through a machine to massage and soften the leather further.

Different grades of leather will require slightly different finishes.

When cattle are reared, they will be subjected to insect bites, cuts, scratches, warts etc and all kinds of other things that will eventually determine the final quality of the leather, we will talk more on this in the next chapter.

Leather finishing can involve some or all of these:

- Imperfections repaired
- Leather surface buffed to removing scarring
- Pigment coating applied
- Clear leather finish applied
- Wax/oil coating applied
- Grain corrected

After finishing, the leather is milled in a drum and sometimes ironed afterwards to further enhance its feel and gloss.

TANNING STAGES

To re-cap the stages involved in tanning are:

Pre-Tanning:

- *Curing,
- *Salt-Reclamation,
- *Soaking,
- *De-Hairing,
- *Fleshing,
- *De-Liming,
- *Bating.

Tanning:

- *Chromium Tanning

Post Tanning:

- *Splitting.
- *Shaving.
- *Grading.
- *Fat-Liquoring.
- *Drying.
- *Finishing.