



History and Process of Leather

The story of leather is long and colourful. Many years before recorded history people wrapped themselves in dried animal pelts. The fact that the skins turned stiff and rotted was a problem, but ways of softening and preserving the hides were discovered. This was the beginning of leather processing. At first the hides or skins were probably dried in air and sunlight. Later they may have been soaked in water and dried over a fire. Still later it was discovered that certain twigs, barks and leaves soaked with the hides in water helped to preserve them.

Through archeologist's findings, we know that primitive man used the skins of hunted animals for food as well as clothing. Nomadic tribes made shelters from the hides of larger animals, such as bison.

As civilization advanced, preserving hides and tanning them into leather became an important industry. In the 18th century tanning was an old and respectable trade and a tedious one. Nearly a year was spent manipulating a hide before it was delivered as leather to the saddle maker, harness maker or other craftsmen.

Modern Manufacturing

The hides and skins of animals are the source of leather. The skins of large animals such as cattle and horses are referred to as hides. Those of smaller animals such as sheep, goats and calves are called skins.

After the hide has been removed it is "fleshed" removing any remaining meat tissue or fat. Freshly fleshed hides are shipped in refrigerated trucks to a tannery for immediate processing into leather. If this is not possible, the fleshed hides are "cured" or preserved by immersion in agitated salty water or brine for 12 hours. After curing, the hides can be stored for several months without rotting and can be shipped to tanneries throughout the world.

Cured hides arriving at a tannery are re-hydrated, or re-soaked and washed in large rotating drums. The hair is removed by chemical digestion using a solution of lime and sodium sulphide with occasional rotation. After the hair has been removed the hides are neutralized with acids and treated with enzymes to remove any deposits and to increase softness. The next operation is called "pickling" which involves soaking the hides in a solution of water, salt and hydrochloric or sulphuric acid.

Tanning is the final process in turning hides and skins into leather. There are several methods of tanning but the most common are Chrome and Vegetable Tanning. Chrome is used most often. Most upholstery, shoe uppers, garments and bag leathers are chrome tanned. The process begins in rotating drums with a bath in a chemical containing trivalent chrome. It usually takes eight hours for the chrome to penetrate all the way into the hide. Once this has been achieved the chrome is “fixed” by adding an alkaline chemical such as sodium carbonate or bicarbonate. After this treatment the hide is considered tanned.

Vegetable tanning is used for such various products as shoe soles, luggage, saddlery, belt leathers and some upholstery. The process is slower than chrome tanning and involves the chemical substance tannin, or tannic acid, which is extracted from the barks of trees. This process is normally performed in drums taking two to four days.

Wringing, splitting and shaving follow tanning. Wringing lowers the moisture content of the hide in preparation for splitting. Depending on the end use of the leather product, the hides are split into sheets of the required thickness and processed further through a shaving machine for added quality. After shaving, chrome tanned hides are again placed in rotating drums with hot water, dyes and synthetic tanning materials to obtain the desired colour. They are then lubricated with natural fat or synthetic fatty type chemicals, or a combination of both to obtain the softness required by the final product.

The next process is **setting**, which is the removal of excess water and spreading the hide out prior to drying. There are several methods of drying depending on the type of leather being produced. Upholstery leather is normally toggle dried (spreading the leather over expanding frames held by “toggles” or clips) hence the clip marks around the entire hide.

Staking is the mechanical softening of the leather after drying. The hides may also be softened by milling which is dry tumbling with atomized moisture injected into the tumbler.

Finishing consists of placing a series of coatings on the surface of the leather. These coatings are designed to protect the leather and produce surface effects pleasing to the eye and hand. Finishing today reflects the latest technology in the use of coating materials. Some finishing processes apply plastics such as acrylic and urethane resins. Others coat with vinyl, wax, nitrocellulose, dye or many other materials. Various mechanical operations are necessary to obtain the desired effect. Hydraulic presses, printing, embossing machines, automatic spray applicators and vacuum driers are a few of the machines used in the finishing process.

The end use of the leather determines the type of finish process to be applied. Each type requires different physical properties in the finish. Flexibility and resistance to water and wear are a few of the required properties in the finish.