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ABOUT LEATHER
or
Why Leather Goes Bad
and
What to do about it!

GENUINE LEATHER . . . words that conjure up imagery and fantasies: “King of Fabrics — Mark of Luxury” — the unmistakable smell, the suppleness, the strength, the sensuousness, stiffness, brittleness, cracking, wearing, unsightliness — the need to reupholster! That’s leather! But, even with all of these impending deterioration processes, genuine leather cannot be imitated and has no substitute.

Predating recorded history, cavemen were running around clubbing animals and covering themselves with the skins. It is not certain how the “tanning” process actually began, but we do know that generally, the same techniques used then are still used today — thousands of years later.

ABOUT LEATHER

In the Boston Art Museum there is a beautiful coat of white antelope that was made in Egypt about 3000 B.C. Scholars have learned from tomb paintings that tannin liquors were used by the Egyptian craftsmen to transform animal skins into leather. Other methods were used by the ancients to process and preserve skins and hides. They include the use of grease or oil, minerals, alum and even smoke. But that 5,000-year-old vegetable tannin method, at least in principle, is used to this day.

It is based on the fact that tannin, a bitter ingredient found in vegetation, will combine with the proteins of the skin, forming a chemical compound that resists decay. Hemlock and oak liquors and extracts are used more than any other tanning preparations.

During the Middle Ages workers in leather formed powerful trade guilds, and the craftsmen produced many useful and ornamental articles. Since the equipment required was relatively simple, tanning was essentially a home industry and methods of preparing leather changed little for centuries. Toward the end of the 18th century, however, the Industrial Revolution brought about great changes. Ingenious machines were invented and new techniques were developed; large factories gradually replaced small establishments.

Today leather is an important industrial material. Yet, curiously enough, it is a byproduct of another important industry — meat packing — because most leather is derived from the skins of animals such as cattle and sheep that are used for food.

Because the ancient vegetable tanning method is so time consuming (it takes several months), modern tanners use chromium salts to produce the same results in less than 24 hours. This chrome tanning method was known as early as 1856, but it was not practical until it was perfected by the American inventor August Schultz in 1884.

To prepare the skins for tanning, they are sprinkled with salt or immersed in brine within a short time after the animals are killed. This process preserves the skins by partially dehydrating them and by killing certain bacteria. The salting process, however, does not preserve the skins indefinitely, so they are tied into bundles and shipped to the tanneries.

The tanner begins by cleaning the skins thoroughly. They are put in soaking vats of cold, clean water for from one to seven days, so that the salt is dissolved, the dirt is loosened and the skin is restored to a soft condition.

After the skins are rinsed to remove the loosened dirt, they are put into the “fleshing machine,” consisting of spiral knives set in a

revolving cylinder, to remove any flesh or fat that might be adhering to the flesh-side of the hide. This machine leaves a comparatively smooth surface; any flesh still remaining is removed with a knife.

Next, to remove the hair, the skins are again placed into vats, this time containing chemicals to loosen the outer layer of skin in which the roots are embedded so that the hair may be easily removed.

From two to seven days later the skins are fed into the “unhairing machine,” which is similar in construction to the fleshing machine except the knife edges are dull. The squeezing action of the dull knives removes practically all the hair and its roots. Any hair remaining is pulled out by hand.

In order to remove the chemicals used in the unhairing process, the skins are subjected to yet another bath called the “bating bath,” containing an extract of pancreatic glands and an ammonia compound. This also dissolves certain proteins, making the skin soft and pliable.

SPLITTING AND COLORING THE SKINS

Before the skins are dyed to the desired color, they are usually split by machine into several layers and thicknesses. “Top Grain” is so called because it is the original surface — or first layer, as the name implies. “Split Grain” or “flesh splits” are the subsequent layers. These other layers are resurfaced through various means of embossing and finishing and made to resemble the original surface pattern or sometimes even to imitate the grain pattern of other animals.

Thicker top grain leathers are used for upholstery (particularly automobile) and thinner leathers are used for furniture and wearing apparel where a softer “hand” (draping ability) is desired.

If the skins are to be colored throughout, the preliminary coloring operation is carried out in drums or with rollers. The hides are impregnated with either natural or synthetic dyes. When a hide is colored throughout its entire thickness, it is known as "vat dyed" — although it is not necessarily soaked in a vat. Usually it is passed through a series of rollers which apply an aniline (alcohol base) dye. These colors are somewhat limited, though, and usually these "vat dyed" hides are eventually surface coated.

When the dripping -wet skins are removed from the drums or rollers, they are first put into machines that wring out most of the moisture, and then they are placed in dryers. Most modern tanneries employ conveyers that carry the skins through drying chambers in which the temperature and humidity are carefully regulated. When they are dry they become stiff once again and must be flexed and softened with oils in a machine which accomplishes this. The process is called "fatliquoring." It strengthens and softens the fibers of the leather and enables it to be stretched and dried without becoming stiff once again and thus unmanageable.

SURFACE COLORING THE LEATHER

Not all leathers are vat dyed, but nearly all leathers are surface coated.

Solutions containing casein or synthetic resins are applied to the leather surface by means of spray guns or seasoning machines, in which a rotating brush applies the finishing solution to the surface of the leather.

Polishing is done with lustering or burnishing machines in which cylinders of glass or metal rub or compress the surface.

Ironing machines, like those found in laundries, are sometimes used for this purpose; in other cases machines operated by hydraulic pressure give the desired luster.

This lengthy and complicated process turns animal skins into one of the world's most durable materials. Endless uses, including luggage, clothing, upholstery and automobile interiors — to mention just a few, are all enhanced in both value and appearance by the words "Genuine Leather." But to maintain both its beauty and durability, leather requires regular cleaning and conditioning.

A little more about surface colorants...

Prior to World War II, leathers produced were solely vat dyed. Colors were dark and limited in number. Usually these colors faded quickly and developed into strange shades of greens or browns after exposure to the sun. Although the surfaces did not crack and chip as badly, the leather still became dry and stiff.

After the war, new technology created new demands and brighter colors quickly became popular with the availability of nitrocellulose lacquers. Leather finishes were limited in color only by imagination and taste (or lack thereof). Leathers that were vat dyed were now surface coated as well. In the early 1980's nitrocellulose lacquers gave way to the resin-base dyes in use today.

If your vehicle predates the 1980's and nitrocellulose lacquers were used in dying the leather, here is what's happening to the surface: Nitrocellulose lacquers were brittle surface colorants generally used on the exterior metal surface of the automobile body. Flexing agents or plasticizers were added to keep them from cracking. The coloring of leather required additional plasticizers for added flexibility. There was a delicate balance which had to be maintained. Although the addition of plasticizers increased the flexibility of the lacquer, the durability decreased. The surface became more subject to wear and abrasion, and the actual adhesion of the lacquer to the leather diminished. It loosened where flexed and chipped away.

Additionally, since these colors were generally sprayed on the surface, they were further reduced with thinners for even application. The actual thickness of the lacquer finish was extremely thin. Thicker applications would create a loss of suppleness and inhibit the leather's ability to "breathe."

Plasticizers were also unstable; they underwent a chemical change and migrated into the atmosphere — or, quite simply, disappeared. What remained on the leather surface was a stiff, brittle, non-porous coating, which in itself is bad enough. However, it further restricted the ability of the leather to flex and breathe, and actually accelerated the deterioration process. Once begun, this aging process progressed more and more rapidly. So ends the story of nitrocellulose lacquer colorants.

If old leather is not used for long periods of time, a sudden flexing will sometimes result in actual cracking like folding old, dry cardboard. Old seats have actually been known to "shatter" when pressed or sat upon.

Other things are also happening to the leather. Recall those oils that were added during the fatliquoring finishing process? Well, they migrate as well! The omnidirectional fibers which were once plump and flexible are becoming thinner and more rigid. Instead of flexing and stretching with use, the fibers are getting tight and compact and tend to tear when stretched. Like bending a piece of metal repeatedly in the same place, the structure weakens and the metal breaks. This same process is happening in these "wear creases" in the color finish of leather; the leather eventually weakens in these flexed areas and separates. Instead of a surface crack, there is now an actual split in the leather.

Depending on climate, storage and use, this deterioration process can happen in as little as two years.

QUALITY OF LEATHERS
American Leather vs. European Leather

Simply stated, America is cattle country; Europe is not. In the United States we have millions of head of cattle roaming the open plains. And contrary to the popular cowboy song, the skies DO get cloudy at times. In fact, in the dead heat of the summer sun and the freezing winds of winter, the cattle are exposed to the elements. They aren't harmed by it, they just develop a "thicker hide." Exposed to barbed wire, shrubs, brush, insect bites, gored with cattle horns, our American leather comes out tougher indeed, with what we like to describe as "characteristic markings" (scars).

European cows are pampered. Farmers do not have grazing lands and consequently have fewer head of cattle. More often than not, these cows are kept sheltered in barns during inclement weather and at night. As a result, the hides are finer, thinner and unblemished in comparison. European leather is finer in quality but not as durable as American leathers.

In this country, we have developed and used polymer coatings for leather and vinyl which never become stiff and brittle and wear extremely well. But we do not produce very many automobiles with leather interiors. Most of our leathers are used for furniture and wearing apparel. Some American leathers are colored with polymer coatings when durability and wear are important. But even with these coatings, the leather beneath will eventually dry out if not cleaned and conditioned periodically.

WHY LEATHER GOES BAD

So far we know that leather is an animal skin, treated to stop decomposition, soaked, rolled, dried, oiled, stretched, split, dyed, dried again, softened and colored.

The fiber structure is omnidirectional — which simply means that it has no particular

direction or pattern — like a tangled mass of spaghetti. It will stretch in all directions with no particular grain pattern or stress. The surface coating does not withstand this much abuse, however, and when leather is flexed or stretched continuously in the same spot, the surface coating develops minute cracks — not yet visible to the naked eye.

Repeated flexing and stretching eventually causes the color surface coating to chip away in certain areas and eventually the natural leather color beneath becomes visible. Usually this appears to be a crack in the leather. It is not a "crack," though; it is merely the absence of surface colorant running in a patterned direction (*wear creases*).

Darker colors usually show the light color of the natural leather beneath, and light leathers do the same, except that having lost the protection of a resistant color coating, the exposed leather attracts dirt and oils and soon gets dirty and looks like a dark "crack." Here is where the vat dyed leathers have a little advantage: the color beneath the surface coating, although usually not exactly the same color, is close enough that these creases or "cracks" are less obvious — but still detrimental.

In a frivolous little sports coupe or a favorite old army jacket or handbag, we tend to view this as "character." Furniture or an expensive automobile eventually begins to show "wear." A meticulously restored classic automobile requires REUPHOLSTERING! (*But NOT necessarily!*)

GOOD LEATHER OR BAD LEATHER

What to do about it

Knowing what we do about the process of producing and coloring leather, we now have a better understanding of the care required to preserve it and some of the reasons for its deterioration.

The preservation of leather is a relatively simple matter. Keeping it clean and supple require no special abilities. Periodic cleaning with soap and water will remove most abrasive surface dirt and regular applications of beneficial oils will help to preserve its suppleness.

MAINTENANACE OF LEATHER

OLD AND NEW

The most rapid deterioration of leather occurs in automobile upholstery. Subjected to freezer-to-oven-like temperature extremes, it is recommended that this leather be treated with an oil conditioner at least every three or four months. New leather should be treated after the first six months, and regularly thereafter. The flexibility and durability can be prolonged by many years with proper maintenance.

Not all conditioners are alike. In fact, one of the leading brands on the market contains about 90% water! When applied to the leather surface, it appears to "soak in" rapidly, but in fact it is the water on the surface that is evaporating leaving only a thin film of oil to benefit the leather.

What should you use to condition leather? Only the best! Our own leather conditioner, of course — **SOFFENER**!

CLEANING & CONDITIONING LEATHER

To clean new or aging leather...

Lightly soiled leather surfaces can be cleaned with pure soap (our bar soap) and water. For removal of heavy soil use our **SUPER CLEANER**. It is advisable to apply any cleaner to a damp cloth rather than directly to the leather surface. (Some liquid cleaners are very strong and tend to streak if applied in uneven concentration.)

Apply bar soap or **SUPER CLEANER** to terry type cloth that has been dampened in warm

water and then wrung out. Briskly rub the leather surface. Repeat this process until all the soil is removed from the surface of the leather. Frequent rinsing of the cloth in clean, warm water will promote quick removal of dirt and minimal wetting of the leather. When the leather is exceptionally dirty and the cloth doesn't seem to be doing the job well enough, use a soft bristle brush (such as a fingernail brush) to scrub in the direction of the dirt creases or in a circular pattern.

A final wiping with a clean, damp cloth (rinsing frequently in clean, warm water and wringing it out well) will remove any soap or cleaner from the surface. If any cleaning agent is left on the surface and not rinsed off well enough, the leather will more readily attract dirt in the future.

Allow cleaned leather to dry THOROUGHLY (at least 24 hours) before proceeding to the next step. DO NOT apply the conditioner (or the surface colorant)unless the leather is thoroughly dry. To remove all surface residue, wipe over leather with a tack cloth or similar product.

To condition new or aging leather . . .

After the first six months of use, upholstery leather begins to lose its natural oils. This occurs particularly in perforated areas or places where the leather is joined together with stitching. These "punctures" in the surface coating are natural "release" areas where the leather begins to lose its preservatives and softeners. It is also the precise spot which will absorb the conditioner.

Apply **SOFFENER Leather Conditioner** with a clean brush to these areas first, then lightly on the entire surface. Since **SOFFENER** is a high concentration of natural oils, it will require a few hours to penetrate the surface completely. Preferably this conditioning procedure should be carried out at room temperature or in a warm area. If conditioning auto upholstery, it is recommended that **SOFFENER** be applied to the seats

while the car is parked in the sun. After the oil is applied, close the windows and allow the car to sit and "bake-in" the beneficial oils. The penetration is considerably accelerated in this manner.

In any event, the **SOFFENER** is most beneficial when allowed to absorb for about 24 hours. After this time, merely buff off any excess oil remaining on the surface with a clean, soft, dry cloth. This not only removes any residual oil, but also brings up a nice natural sheen.

COMPLETE LEATHER REFINISHING AND RECOLORING

Remember this . . . C-C-R-R

CLEAN — Bar soap or Super Cleaner
CONDITION — Soffener Original Formula
REPAIR — Flex-Fill Filling Compound
RECOLOR — Surflex Leather and Vinyl Dye

When leather has become worn to the point that it needs replacement, consider refinishing. For just a fraction of the cost of new leather, you can achieve a "like new" appearance. The process is similar to refinishing furniture — with the added advantage that not only can you completely refinish leathers, but you can also re-soften and even change color if desired.

Generally, leather surface colorants deteriorate faster than the actual leather. If the leather appears to show wear and is not split or torn, it can be conditioned with **SOFFENER Leather Conditioner** and recolored with **SURFLEX Flexible Surface Colorant**.

STEP ONE: CLEANING AND/OR COLOR REMOVAL

The brittle surface color is responsible for at least 50% of the stiffness of old leather. By simply removing this color coating, the flexibility of the leather will be increased by that much.

Use a quick-dry lacquer thinner. Apply the quick-dry lacquer thinner according to the manufacturer's directions, working on a small area at a time. Use a dull-edge kitchen knife (with a rounded tip to prevent accidental gouging), medium-course steel wool, or anything that facilitates the removal of the color. Remember, it is only a thin coating and comes off easily. Stubborn spots can be helped with sandpaper or steel wool. Be careful when working around stitching so that you do not weaken the threads. Also be careful not to roughen up the surface and create a "suede" appearance.

Not all of the color will come off. Removing about 80% is sufficient. When as much of the color that can be easily removed has been removed, allow the leather to dry out thoroughly to give the solvents in the cleaner a chance to evaporate. Let the leather dry at least 24 hours.

When dry, lightly sand any rough areas and any creases that are too prominent. Sand these creases lightly in the direction of the crease with a piece of fine (320) sandpaper folded over your fingers. Then very lightly and quickly, sand the entire surface. This all-over sanding opens the pores in the surface of the leather and allows it to absorb the **SOFFENER Leather Conditioner**.

STEP TWO:
CONDITIONING AND SOFTENING

This step merely requires an application of one or two coats of **SOFFENER Leather Conditioner** and a waiting period of 24 hours. Apply **SOFFENER Leather Conditioner** with a brush to the clean and dry surface. If absorption of the **SOFFENER Leather Conditioner** seems rapid in some areas, apply another coat in these areas. Allow to absorb in the leather for 24 hours. For best results, the temperature in which you work should be 70°F or higher. After 24 hours, remove any surface residue with a damp cloth.

Working with a bucket of warm water, rinse out a turkish towel and wring it tightly to

remove most of the water. Wipe the surface of the leather briskly to remove any oil still remaining on the surface. Repeat this process (changing water if necessary) until the entire surface has been wiped down. **IMPORTANT: ALLOW THE DAMP LEATHER TO DRY COMPLETELY — AT LEAST 24 HOURS — BEFORE PROCEEDING TO THE NEXT STEP.**

If the leather needs sewing, the application of **SOFFENER Leather Conditioner** first will enable the leather to be restretched easily and sewn with less fear of further tearing.

STEP THREE:
MAKING REPAIRS OR FILLING CRACKS

If the leather appears to be in good condition, now that the color has been removed, it may not even be necessary to fill cracks. The cracks that were in the surface color have now disappeared and the **SURFLEX Flexible Surface Colorant** will recreate a new finish. If there are deep creases which require attention, they should be filled with **FLEX-FILL Crack Eliminator.** Apply the **FLEX-FILL Crack Eliminator** according to the directions on the label. Apply only in the creased area. **FLEX-FILL** should be applied sparingly — only to the crack area — and allowed to dry. When thoroughly dry, sand smooth with fine (320) sandpaper. Continue the restoration process with the application of the **SURFLEX Flexible Surface Colorant**.

If the leather is split, or if a crack is deep enough and it appears as though it will split through eventually, it is best to reinforce this with a patch from behind. The easiest way to accomplish this is to remove the covering from the seat and glue a piece of leather or canvas to the back with a good leather (contact) cement.

If the back of the leather is not easy to reach, the crack must then be slit with a razor blade and a piece of reinforcing material can be worked beneath the leather with a knife. Glue one side (again with leather glue or contact cement),

allow it to dry, and then work some glue beneath the other side. Hold the split closed with tape as best as possible and allow this to dry. Once the repair is made, use **FLEX-FILL Crack Eliminator** in the resulting "scar" and when dry, sand smooth. If the cut is deep enough, it might require a few layers of **FLEX-FILL** to build up the surface before sanding.

STEP FOUR:
RECOLORING THE LEATHER

It is important to stress the fact that the leather must not be damp because the **SURFLEX Flexible Surface Colorant** must penetrate into the leather in order to form a good bond. If the leather is not dry, the moisture in the leather will prevent the **SURFLEX** from adhering properly. Allow the leather the dry throughly — at least 24 hours before the application of the **SURFLEX**.

Before applying the **SURFLEX**, it is recommended that you wipe the surface of the leather with a cloth dampened with quick-dry lacquer thinner. Do not saturate the leather. This is a "quick wipe over" and will remove any traces of residue that may be left on the surface from the application of the **SOFFENER Leather Conditioner** and/or from the **FLEX-FILL** repair(s).

APPLICATION OF SURFLEX DYE —
BRUSH, SPRAY, WIPE

With a clean, soft-bristle brush, begin to apply **SURFLEX Flexible Surface Colorant** to the back (or an inconspicuous area) of a seat or cushion first. You will quickly get a "feel" for it and develop a good "technique."

Apply only a thin first coat, not attempting to achieve good color coverage. Avoid rebrushing partially dry areas. This will eliminate brush marks. Vary the pattern of application (use cross-hatch strokes or short half-circles). This will also minimize any brush mark pattern.

Once the first coat has dried to the touch, (about 15-20 minutes), a second coat can be applied. If necessary, apply a third coat or touch up spots where the color seems to be uneven. You will notice that the color changes when dry and the subsequent coats will appear to be a different shade. This will all blend in when completed.

The second (or third) light coat will give excellent color coverage and will result in a minimal amount of surface colorant. This will avoid that painted look that most other solvent-base "dyes" seem to leave.

When spraying, use a narrow "fan" and air pressure of about 25 p.s.i. Apply a full wet coat first to allow for penetration into the leather. Follow up with subsequent lighter coats for good color coverage. Avoid the application of a "dry" first coat. This will create a "bridging" effect where the **SURFLEX**, instead of penetrating into the leather, dries on the surface in a thin film. This will result in cracking and peeling.

NOTE: If spraying a red color, you will need to spray your first coat "dry," and build up color coverage with subsequent dry coats. This is because most bright red colors are more viscous than other colors and may require more coats for complete color coverage.

Another method of application that has become "popular" recently is to "wipe" the **SURFLEX** over the surface of the leather with cheesecloth or a terry type cloth. This application uses friction to work the **SURFLEX** into the surface of the leather. If you feel the need for additional coats, it is advisable to spray the subsequent coats.

FINISHING AND CURING

When thoroughly dry, buff lightly with a soft dry cloth to remove any surface pigment and to bring out the natural low-luster sheen of your new leather finish. **SURFLEX** contains a special wax that buffs up to a dirt-resistant surface.

The **SURFLEX** dries completely in about 20 minutes and is durable for use in approximately 24 hours. The complete curing process will be achieved in about 6 weeks. After this time it can be cleaned with soap and water and cared for as any other durable surface.

Any newly colored surface is not immediately penetrable. There is no need to apply a conditioner in less than six months if the leather was conditioned before refinishing with **SURFLEX**. After this time, condition regularly every three or four months, again concentrating on perforated and stitched areas first. **SOFFENER Quick Formula** is recommended for this purpose.

REFINISHING VINYL
and other leather imitations

Unlike leather, which is a natural organic product, vinyl and other imitations are of chemical composition. Impregnated with plasticizers, they generally remain supple for quite a long time. When the plasticizers eventually migrate into the atmosphere, there is nothing that can be done to re-soften these materials. Surface blemishes such as rips or tears and holes can be repaired in the same manner as with leather, and they can be refinished.

For best results when recoloring vinyl, use the same color as on the original finish.

Use our **SUPER CLEANER** to clean the vinyl surface before applying **SURFLEX Flexible Surface Colorant**. Wash and rinse thoroughly per label instructions. Let the surface dry thoroughly before proceeding with the coloring. (The use of laquer thinner or any strong solvent to clean vinyl IS NOT recommended. These cleaners have a tendency to dissolve or "melt" the vinyl surface, leaving it sticky and unworkable.)

After the vinyl surface is clean and dry, sand lightly with either very fine sandpaper or steel wool. Remove all residue from the surface with

a Tack Cloth or similar product. Since vinyl is nonporous, it is imperative that no residue is left on the surface when you apply **SURFLEX**. Once prepared in this manner, the recoloring procedure is the same as for leather. Begin in an inconspicuous area such as a seat back or bottom and apply a thin coat of **SURFLEX Flexible Surface Colorant**, concentrating on even application rather than good coverage. To avoid leaving brush marks, do not re-stroke partially dried areas. As soon as the first coat is dry to the touch, a second coat can be applied. If necessary, touch up with a third coat. Use varied brush strokes (half-circles, cross-hatches, etc.) to eliminate any brush-mark patterns.

When spraying, use about 25 p.s.i. air pressure, a narrow fan, and apply a full wet first coat; avoid runs or puddles. If necessary, when dry apply subsequent coat(s) for good color coverage. Clean equipment with warm, soapy water.

SURFLEX Flexible Surface Colorant dries for use within 24 hours and cures competely in about 6 weeks, after which time the new **SURFLEX** finished surface can be cleaned with soap and water or cleaning preparations intended for such use.

FURTHER INFORMATION

If you have any questions, comments, or special applications which require more information, please contact the manufacturer by either writing to:

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