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Retanning, Dyeing and Softening

It is not possible to build the exact properties required into the leathers during the tanning operation. This applies in particular to chrome leathers, so it is common practice to develop the leather character by further wet processing of the shaved goods.

Neutralisation

This treatment prepares the leather for dyeing, retanning, and softening. In this first stage of often complex processing, mild alkalis are added to the leather to reduce the moderate acidity (pH) of the leather. This is to enable deep penetration of reactive chemicals and agents into the leather structure in subsequent processes. The reactivity of the leather can also be modified by masking agents such as formates, and specialised products of low molecular size known as auxiliary syntans.

The dyeing process

There are many types of dyestuffs but anionic dyes are the most frequently used. Acid and direct dyes are used for penetration, surface dyeings and selected fastness properties, and 1:2 premetallised dyes mainly for lightfastness.

Whole ranges of colour are covered by these dyestuffs and thus the tanner is able to dye accurately to a pattern. The dye can be added to the processing vessel either pre-dissolved or as a dry powder. The dyeing process can be on neutralised leather, or after a suitable retannage. Several additions can be made according to the intensity of colour required or dye penetration into the leather. The dyes are usually fixed by acidification or the use of specialised fixatives. Sometimes specialised pigments are included, mainly for black and white leathers.

Special dyestuffs are available for dyeing wool-sheepskins and furs.

The retanning process

Selected materials are applied to the neutralised leather to combine with and modify the leather structure. Normally these products are vegetable tanning materials, synthetic tanning agents, acrylic resins and fillers. These provide very specific properties to the final leather and it is normal to apply several different retanning agents together. Their combined effects can make the leather feel softer, and fuller - especially in the more empty belly areas - to level and improve embossability. The products can also selectively fill the junction between the grain and corium to improve the leather break. The characteristic colour of the tannage is changed by these products, and the leather grain made more uniform in preparation for finishing operations.

Leather softening

A variety of products are used for fibre lubrication and softening by preventing the leather fibres sticking together on drying.

THE FATLIQUORING PROCESS

A fatliquor is an oil chemically treated so that it will emulsify with water to penetrate and lubricate the leather fibre structure. The deeper this penetration the softer the leather, but the greater the tendency for a coarse break. However, these leather making properties are strongly dependent upon the raw oils used -

synthetic, fish, vegetable, animal, tallow and even greases. These oils are generally sulfonated or sulfited to ensure good self-emulsification.

A leather with a soft, plump chrome tannage will not require as much fatliquor as leather produced by a firm tannage. Vegetable tanned leathers need little fatliquor for softening when compared with chrome leathers.

POLYMERIC SOFTENING

Water soluble acrylic polymers of high molecular weight can be modified for leather softening. These products can be made chemically active so as to combine with collagen, providing good light fastness, heat resistance and improved physical properties. In practice they are used in combination with reduced offers of fatliquors.

WATERPROOFING

Modified acrylic polymers with long molecular side chains can be used to soften and develop waterproofing properties in suitably prepared leathers. These products often incorporate silicon oils in their structure, but under carefully controlled conditions can form an emulsion in water and penetrate the leather structure. Acidification deactivates the emulsion, and the water repellent properties normally substantiated by chrome fixation.

Special effects and process variations

Specific properties can be introduced. For heavy duty walking boots hot waxes and grease can be drummed into the leather. Complete dye penetration, or two tone effects can be managed. Very level dyeings are possible by processing the leather to the dry state, then after sorting and grading, re-wetting and re-dyeing.

The sequence given can also be broken. Fatliquors can be added both with and before retannage. Sometimes neutralisation and dyeing are performed together, and can include retanning agents. Different floats can be used with each process stage, or multi-addition processes used. ●

Panel 8

Processing pre-tanned hides & skins

After being shaved to substance, the processing of pre-tanned hides and skins (*Part 5*) can be completed by a combination tannage process that includes dyeing and softening. For chrome free automotive leathers high levels of specialised syntans and acrylic resins are often used, together with vegetable tanning materials, fatliquors and polymeric softening agents. Chemical offers tend to be high, but the processing time is shorter than required for normal tanning as the skin structure is relatively thin and enables rapid chemical penetration.

High offers of vegetable tanning extracts and lower levels of the other components can produce leathers showing typical vegetable tanned characteristics.

Full chrome leathers can be produced by a rapid chrome tannage, followed by conventional retanning and softening.

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