



Variations within hides and skins

PART 3: FOLDING/BREAK CHARACTERISTICS

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Part three in a four-part series. Previously published in World Leather:

PART 1: The influence of the fibre structure (October/November 2009)

PART 2: The effects of leather processing (February/March 2010).

In order for leather to flex and perform during prolonged use whilst still maintaining its good appearance, the fibre structure of the leather has to allow adequate movement of the fibres without being them permanently disrupted. It is leather's natural three dimensional structure that enables the orientation of the fibres to change as the leather is flexed thus accommodating the curvature of the surface without disfigurement This is shown in Panels 3/1a and 3/1b.

leather by adhesives or lining materials that are less flexible than the leather to which they are applied.

- Variation in flexibility through the thickness of the leather.
- Restriction of the movement of the grain surface by applying an excessively hard finish to the leather.
- Use of too hard an impregnant in the leather which would cause the grain to become stiff.

Panel 3/1a: Section of leather marked before bending



The markings indicate how the grain surface compresses on bending the grain inwards, and the expansion of the suede surface to accommodate the curvature.

Panel 3/1b: Section of leather after bending



If this movement of the fibres is restricted or disruption of the fibre structure does occur then the leather will soon present a coarsely creased effect on the grain surface. This is commonly known as poor break, and examples of a tight and poor break are shown respectively in Panels 3/2a and 3/2b.

Some possible factors that can lead to poor grain break are:

- Over opening up of the fibre structure.
- Looseness of the fibre structure.

Other factors include:

- Restriction of the movement of fibres on the back of the

Over opening-up and looseness

It is often incorrectly assumed that looseness is the same as over opening-up but in fact over opening-up is only one of the possible causes of looseness. Not all loose leather will be over opened-up and not all over opened-up leather will be loose.

The term “opening-up” or “splitting” of the fibre structure refers to the amount of separation between the fibres within the fibre bundles. Examples of poor opening-up and a well opened-up structure are shown in Panels 3/3a and 3/3b respectively.

On the other hand the term “looseness” is associated with visible spaces between the fibre bundles, and comparative examples are shown in Panels 3/4a and 3/4b of ‘tight and loose’



structure respectively.

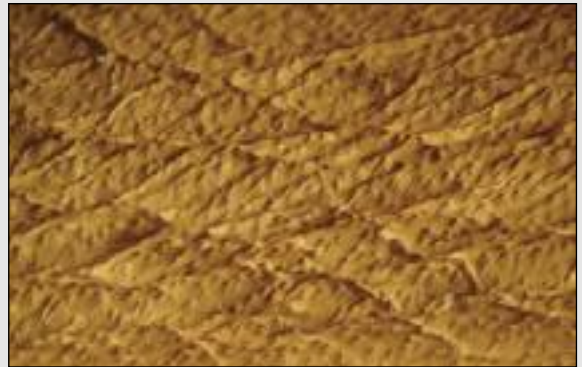
Looseness often occurs at the junction of the grain and corium because there is a difference in flexibility and response to processing between the two layers. Looseness at the junction of the grain and corium is usually a result of:

- Too much mechanical action e.g. too fast a drum speed.
- Excessive swelling during liming.
- Excessive enzyme treatment.
- Hard or inflexible grain layer due to poor hair removal.
- Too hard a finish or too much impregnation of the grain layer.
- Lack of fatliquor penetration into the grain layer.
- Staking or dry drumming (milling) when the leather is too dry.
- Uneven opening up of the fibre structure resulting in a harder, less flexible layer inside the leather. This is usually a result of uneven liming action due to inadequate soaking or insufficient time in lime.

Panel 3/2a: Grain surface showing good grain break (aniline calf)



Panel 3/2b: Grain surface showing poor grain break (aniline calf)

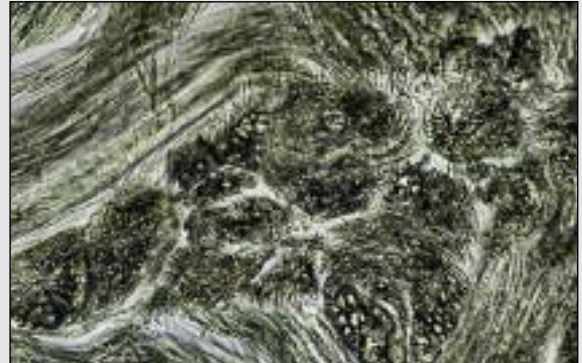


Panel 3/3a: Shows a poor opening-up of the fibre structure



Shows a lack of spaces between the fibres within the fibre bundles.

Panel 3/3b: Shows a well opened-up fibre structure



Shows splitting and separation between the fibres within the fibre bundles

Panel 3/4a: Shows a good tight fibre structure



Shows an absence of gaps between the fibre bundles.

Panel 3/4b: Shows a loose fibre structure



Shows gaps between the fibre bundles.