

White Paper:

Challenges with Leather Work Gloves: Introducing the Limitless Leather Solution

Eric Jaeger

Ironclad Performance Wear

9/22/2017

Table of Contents

Abstract..... 2

Introduction..... 3

Background..... 3

Challenges of Leather..... 4

The Limitless Leather Solution..... 5

Conclusion..... 8

Abstract

Leather is a desirable material to use for many applications including work gloves. However, production of leather presents challenges which hinder the consistency of leathers. The Limitless Leather solution combines consistent hide origin, consistent tannery processes and tight quality control to provide consistent leather hand safety solutions.

Keywords: leather, gloves, industry, durability, consistency

Introduction

Leather – this ubiquitous material has been a mainstay of human culture for thousands of years. It has been used throughout the ages for clothing, shoes, belts, furniture covering, book binding, etc. Modern uses of leather also include equestrian gear, premium automotive and aircraft interiors, wallets purses and briefcases, gun holsters and watch bands, baseball mitts and footballs, and of course sport, fashion and work gloves.

Leather is almost universally considered a premium option: we upgrade to leather seats in our automobiles, pay extra for leather couches, and spend twice as much for a leather jacket. Why is this? What draws us to leather so much that we're willing to pay twice the price for 'genuine leather'? The fact is, no fabric can match the superior feel of leather, the soft touch - even the smell of leather sets it apart from any other fabric. Indeed, no material can match the natural advantages of leather, and as humans we gravitate towards leather surfaces that we touch or feel on our skin.

Background

When it comes to work gloves, it is no secret that leather is the universally desired choice of materials. This phenomenon is most likely tied to the main purpose of a work glove, to enhance the hand's characteristics, with minimal hindrance to its natural abilities. A glove needs to act and perform similar to a hand with the addition of specific enhanced functions such as, heat protection, abrasion resistance, flexibility, moisture management and feel. Leather is still to this day the best material at achieving these characteristics and allowing a glove to function like a 'second skin'. Leather breathes, leather stretches, leather feels good on your hand – well, at least *good* leather can do all this, and still provide superior protection. So what makes some

leather good, while other leather can be somewhere between ‘tolerable’ and outright awful?

First we need to understand what, exactly, is leather:

Leather can be defined as ‘a durable and flexible material created by tanning animal hides’. The quality and characteristics of leather are affected by two main ingredients that go into creating it, the animal hide and the tanning process.

Challenges of Leather

Animal hides can of course originate from many different species of animal. The most common ones for gloves are cow, pig, goat and deer. What most people don’t realize is that these hides are sourced from many geographic areas, spanning the entire globe. While different species of animals will result in different leather characteristics, an animal skin will also differ depending on the habitat and environment that animal came from. For example, animal skins originating in hot/insect infested areas will differ greatly from those in cold/wet environments. Their eventual leather characteristics will also be different.

Tanning is the process of treating hides of animals to produce leather. This consists of specific chemicals and techniques. Every tannery has its own unique formula for treating hides to produce leather. The tanning process can simply be understood in two steps. Step 1, physically and chemically prepping a rawhide and stripping it down to become a barebones usable hide. Step 2, through use of chemicals and process rebuild the hide into a useable form called leather. Informal and varying classification – in order to help professionals analyze leather quality, leather skins are often classified and grouped into different categories depending on species, type, grade and thickness. Species is defined by the animal but does not account for geographic variations. Type is the specific cut of leather (split, full grain, top-grain, etc.) The grading scale is broken down into many tiers with a purpose of differentiating overall “quality” of a skin through

aesthetic analysis. Visual defects such as scratches, scars, wrinkles, color consistency and holes are all considered when determining a piece of leather's grade. The grading scale from highest quality to lowest is (A, AB, B, C, D, etc.) This grading system is not definitive and is open to wide interpretation. Thickness of a hide is defined by a thickness range usually deviating +/- 0.1mm.

Leather tanning is often described as a mix of art and science. The result is a wide range of characteristics and performance when leather is used in a work glove or protective apparel. For example, goat skin gloves will vary greatly from brand to brand, and even from batch to batch. This is a result of the wide levels of inconsistency in animal hide procurement and processing.

Animal hides sourced by tanneries commonly come from all different parts of the world. Even the same batch of hides can consist of skins from different geographic areas such as Africa, North America and Asia. This results in skins that have different physical properties. Tanning processes and chemicals vary from tannery to tannery. Additionally, factories that produce finished goods often source the same leather species from multiple tanneries. These variations have a compounding effect that again, result in a wide variation of physical properties.

The Limitless Leather Solution

At Ironclad Performance Wear, we have been making performance work gloves for nearly twenty years. Historically our gloves have mostly used synthetic leather for base palm fabrics, due to its quality, consistency and comfort. However, we are keenly aware of the benefits of natural leather, and we do have several high quality goatskin leather gloves in our line-up. Still, we recognized the inherent variability in leather quality, and the pitfalls associated with sourcing and supplying leather gloves. We set out several years ago to improve our leather

quality. We learned a lot along the way, encountered many roadblocks, and overcame inherent problems associated with the typical leather supply chain process. The result of this journey is Ironclad's new Limitless Leather technology, which delivers the best performing leather in the work glove industry.

How do we accomplish this? What do we do differently from everyone else? It starts with controlling every single step of the leather sourcing and production process, and utilizing the best quality animal hides from tightly controlled regions of the world.

Consistent Animal Hide + Consistent Tanning Process + Tightly Regulated Inspection =
Reliable, Superior Leather

1. Superior Fiber Structure: Limitless leather has a tightly intertwined fiber structure which creates superior durability, both in terms of abrasion resistance and tear resistance. Yet maintains a soft and comfortable touch on skin.
2. Hide Selection: Limitless Leather hides are specifically procured from animals living in only a select few regions of the world within a similar ecosystem, resulting with a more consistent and uniform selection of animal hide material.
3. Tannery Selection: Limitless Leather hides are processed in tanneries utilizing the same proprietary chemicals, proprietary processes and techniques to create a consistent high performance piece of leather.
4. Regulation: Limitless Leather hides undergo a stringent inspection upon departing the tannery and again upon arrival at our factories.

These factors combine to provide excellent performance characteristics for the personal protection industry:

1. **High Durability:** Abrasion Resistance directly correlates to the durability of the leather, and thus the longevity of the glove. One layer of 0.8mm Ironclad Limitless Leather is rated at ANSI Level 4 (grain) and ANSI Level 5 (suede). Compared to typical work glove leather, Limitless Leather has 5 times the abrasion resistance, resulting a longer lasting glove with less layers on the palm.
2. **Dimensional Stability:** As a result of Ironclad's proprietary tanning process, Limitless Leather will not shrink or deform after exposure to water or sweat. In fact, it is even machine washable. Limitless Leather is not susceptible to the same dimensional warpage and hardening as traditional leather.
3. **Moisture Management:** Limitless Leather delivers superior moisture management and is cool to the touch. Our proprietary tanning process enhances the hide's physical properties, while not interfering with its natural fiber structure.
4. **Enhanced Capabilities:** Additional performance features can be added during the tanning process, such as water and oil repellency, flame resistance, conductivity, etc.

Prior to Ironclad's Limitless technology development, these characteristics had never been combined into one leather package. Trade-offs had to be made between comfort and performance. With limitless leather, that is no longer the case. A glove can be durable AND comfortable – and as we all know, if a glove is not comfortable, it will never get worn.

Conclusion

Ironclad has integrated Limitless Leather into several new gloves, adding specific performance enhancements to the overall glove design such as 360° cut resistance, patented impact protection, and high visibility. Multiple glove styles are slated to be released over the next six months, incorporated this revolutionary leather technology. Ironclad Limitless Leather means no more compromises in your hand safety program. To learn more, contact Ron Broussard at ron.broussard@ironclad.com.