

**JOINT INDUSTRIES
STANDARDS AND GUIDELINES
FOR
UPHOLSTERY LEATHER
December 18th, 2006
Revision Level A**

**DEVELOPED BY:
THE JOINT INDUSTRIES LEATHER
STANDARDS & GUIDELINES COMMITTEE**

**SPONSORED BY
THE AMERICAN HOME
FURNISHINGS ALLIANCE**

INTRODUCTION

Joint Industry Leather Standards and Guidelines Committee
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Since 1973, the American Home Furnishings Alliance (formerly AFMA) has sponsored a technical committee to develop and maintain standards and guidelines for upholstery fabrics. In the mid-1980's, the industry asked AHFA to form a committee to develop standards and guidelines for polyurethane foams used by the upholstery industry. The polyurethane foam committee was formed, and a set of standards and guidelines were developed and published. In the mid-1990's the upholstery industry asked the AHFA to develop standards and guidelines for upholstery leathers. The leather technical committee was formed, and published in this booklet are the standards and guidelines developed.

The AHFA technical committee on leather operates by consensus of the members participating. The leather technical committee is made-up of members from the furniture industry, the leather tanning industry, leather testing facilities, leather service companies, and leather care and cleaning industries. The utilization of such a group provides the widest range of technology, knowledge, and experience possible.

The committee begins by prioritizing problems, and then task groups are formed to address the problems. When a task group develops a proposed solution to a problem, the proposed solution is balloted upon by the full membership, one vote per participating company. All negative ballots must be accompanied by a written, technical reason for the negative vote. Attempts are made to reconcile negative ballots such that all issues are as near 100% affirmative as possible. Otherwise a plurality of ballots will carry an issue if the voter's written opinion is deemed non-persuasive by committee ballot.

The complexities of using leather gave rise to the need for education for everyone in the leather equation from the consumer to the tannery. The joint industry committee will address ways and means to develop usable educational tools.

The AHFA would like to thank each participating member for their corporation, efforts, and dedication to the process.

The Joint Industries Leather Standards and Guidelines Committee

Participating Companies and Institutions:

Atlas Material Testing

Berkline / BenchCraft Corporation

Conneaut Leather

Diversified Testing Lab

Flexsteel Industries

Friitala / Branna Leather

Hugh Talley Companies

IICRC / Leather Pro

La-Z-Boy Incorporated

Lane Home Furnishings

Leather Research Lab / University of Cincinnati

Mitchell Gold & Bob Williams

Multimaster North America

Norwalk Furniture

Thomasville Furniture Industries

Universal Leather

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Standard 1.0
Measurement of Billable Area

Revised 02/02

The variation of billable area between the supplier of hides & the furniture manufacture (the user of the hides) shall not exceed plus or minus 2.0%.

Standard 2.0 Color and Shade Variation

2.0 Leather Color and Shade Variation

Revised 9-11-06

2.1 Purpose:

To set guidelines for color and shade ranges on Leather. Shade ranges will be agreed on between the Buyer and Seller

2.2.1 Color & Shade Variation on (P) Pigment Dyed Leather from hide to hide.

- a. The shade variation on solid pigment dyed leathers should be minimal and will conform to tolerances previously decided between the Buyer & Seller. Such tolerances do not imply a perfect match, but one, which is based on the established production capability of the supplier coupled with the “fitness for use” of the buyer. The leather manufacturer should communicate inordinate difficulties or characteristics in shade control to the leather purchaser.
- b. The shade variation on Special Effect leathers such as sauvage, double tone or multi-toned is added to the surface of the pigment dyed leathers. This effect will create a color on a color requiring a buyer seller to establish the tolerances of shades and colors through a visual inspection.

2.3 Color and Shade Variation between (P) Pigment Dyed Leather & Vinyl

The shade variation on pigment dyed leathers and vinyl will conform to tolerances previously decided between the Buyer and Seller. It is suggested that a shade variance tolerance be established by choosing a leather & vinyl matched standard by visual or instruments.

2.4 Color & Shade Variation on (A) Aniline Dyed Leather

Color variations are to be expected throughout the hide. A rich patina develops with time, enhancing the appearance of the leather. The tolerance on the shade of aniline dyed leather will conform to the tolerances previously decided between the Buyer & Seller. It is suggested that a shade variance tolerance be established by choosing a shade range between two hides by visual or instrumental means.

2.0 VISUAL COLOR AND SHADE EVALUATION

2.5 Color & Shade Variation on (N) Nubuck Aniline Dyed Leather

Color variations are to be expected throughout the hide. The slight nap on nubuck will show a shade variation. The tolerances on the shade of nubuck aniline dyed leathers will conform to the tolerances previously decided between the Buyer and Seller. It is suggested that a shade variance tolerance be established by choosing a shade range between two hides by visual or instrumental means

2.6 The following items are critical when conducting visual observations.

1. Observer

It is strongly recommended that the person making shade judgment have a normal color vision. This can be determined by taking the Farnsworth / Munsell 100 Hue Test. (1) or the HVC test (4). The observer must have a passing score on the Farnsworth / Munsell or HVC test.

2. Light

Although there are numerous light sources available, when comparing standards to production it is best that the light source be consistent. However, in resolving issues of color difference between Buyer & Seller, it is recommended that both parties use the same light source such as a Gretag Macbeth or equivalent light booth. It is important that the quality of light be sufficient & agreed upon by the Buyer & Seller. It is important that the bulbs be changed as recommended by the manufacturer of the Light Booth.

3. Sample Size

No less than one-half hide, which has been cut, down the backbone is to be used.

4. Viewing Area

The viewing area and surroundings will influence the apparent color difference between standards and sample. The viewing

area and surrounding area should be painted a medium gray color to have the least amount of influence on the leather being reviewed. The undesirable effects of extraneous light and/or color from other fabrics or clothing should be avoided.

5. Standards and Specimens

- **Standards - All standards should be kept in a controlled location free from contamination such as gas fumes, light & dust.**
- **Specimens – The area of the specimen being compared should be representative of that same area in the standard.**
- **It is recommended that the color and shade hide and vinyl masters be replaced every six months.**

2.7 In spite of the techniques above, the visual method is still very subjective. Many are using instrumental measurement of color difference to supplement the visual evaluation.

Standard 3.0

Classification System for Leather

Revised 10-2-06

It is generally felt that a classification system for leather is a required prerequisite for the Color and Shade Variation, Leather Education, Leather Care, and Leather Cleaning Standards and Guidelines for Leather Upholstery. Terminology in this standard will be consistent with other terminology in other Joint Industry Leather Standards.

Standard

Type A – aniline

- **Crust leather that has received only aniline dyes for color, then dried, softened and milled.**
- **No protective finish.**
- **Shades may vary from hide to hide and within a single hide.**
- **Requires a high degree of preventative maintenance.**
- **Susceptible to surface scratches.**
- **Absorbent**
- **May have special effects such as, but not limited, to wax, oil, etc.**

Type P – protected

- **Crust leather that has received additional aniline dyes, pigmentation for color consistency, and/or a protective top coat finish, then dried, softened and milled.**
- **May be partially or fully corrected.**
- **Requires a low degree of preventative maintenance.**
- **Surface is more difficult to scratch.**
- **Least absorbent.**
- **May have special effects, such as, but not limited to, hand antiquing, sauvage, etc.**

Standard 3.0 (continued)
Classification System for Leather

Revised 10-2-06

Type N – nubuck

- **Crust leather that has received only aniline dyes for color, then dried, softened, sanded or buffed, and milled.**
- **Surface has a visible nap.**
- **Shades may vary from hide to hide and within a single hide.**
- **Requires a high degree of preventative maintenance.**
- **Susceptible to surface scratches.**
- **May have special effects, such as, but not limited, to wax, oil, etc.**

Section 4.0 Flaws & Defects on Finished Leathers

Flaws & Defects on Finished Leathers

Revised 9-11-06

Section 4.0

VISIBLE NATURAL MARKINGS ACCEPTABLE IN THE STANDARD THREE 28" X 28" SQUARES

MARKING	Pigmented	Aniline	Nubuck
Brands	Not acceptable	Not acceptable	Not acceptable
Stretch marks	Not acceptable	Acceptable	Acceptable
Healed scars*	Acceptable	Acceptable	Acceptable
Single insect bites	Acceptable	Acceptable	Acceptable
Cluster (>3 in 4" x 4" square) of healed insect bites	Not acceptable	Not acceptable	Not acceptable
Wrinkles	Not acceptable	Acceptable	Acceptable
Backbone	Not acceptable	Not acceptable	Not acceptable
Urine/manure burns	Not acceptable	Not acceptable	Not acceptable
Inconsistent graining	Acceptable (except in embossed leather)	Acceptable	Acceptable

*The length & width will be determined by buyer/seller agreement

Section 4.1

The above matrix represents the "natural markings" that are acceptable when evaluating leather to determine if it passes or fails inspection standards for a first quality hide. Any "defects" that are created after the hide is harvested and processed are not included. Also please note that these natural markings can occur on an acceptable hide, but are limited by the above matrix to occurring outside the three 28" x 28" squares required to constitute an acceptable hide.

Standard 5.0 Leather Care & Cleaning

Leather Care and Leather Cleaning Instructions

Cleaning: Types and How to Clean

1. **Pigmented:** Type P-as per 3.0 Classification System Crust Leather
Defined as:

Crust leather that has received additional aniline dyes, pigmentation for color consistency and/or a protective topcoat finish, then dried, softened and milled.

What to Use:

Water-based Products-Leather Cleaning Agent: A professionally formulated gentle, water-based, leather friendly pH balanced cleaning product that effectively removes day-to-day dust and soil from the surface of leather without affecting the leather's finish composition

How to Clean:

- Test for colorfastness and or finish stability in an inconspicuous area.
- Vacuum to remove loose soils.
- Used distilled water or a Leather Cleaning agent that meets the "What to Use requirement section description" with a soft white cotton cloth slightly dampened. Gently wipe area in a circular motion seam to seam to remove soils.

2. **Aniline:** Type A-as per 3.0 Classification System for Leather
Defined as:

Crust leather that has received only aniline dyes for color, then dried, soften & milled.

What to Use:

Water-based Products-Leather Cleaning Agent: A professionally formulated gentle, water-based, leather friendly pH balanced cleaning product that effectively removes day-to-day dust and soil from the surface of leather without affecting the leather's finish composition.

How to Clean:

- Test for colorfastness and stability in an inconspicuous area.

- Vacuum to remove loose soils.
- Used distilled water or a Leather Cleaning agent that meets the “What to Use requirement section description” with a soft white cotton cloth slightly dampened. Gently wipe area in a circular motion seam to seam to remove soils.

3. **Nubuck**: Type N - As per 3.0 Classification System for Leather
Defined as:

Crust leather that has received only aniline dyes for color, then dried, softened, sanded or buffed, and milled.

What to Use:

1. Tack cloth 2. Water-based Products-Leather Cleaning Agent:
 A professionally formulated gentle, water-based, leather friendly pH balanced cleaning product that effectively removes day-to-day dust and soil from the surface of leather without affecting the leather’s finish composition.

How to Clean:

- Test for colorfastness and stability in an inconspicuous area.
- Vacuum to remove loose soils.
- Wrap Nubuck-specific tack cloth around a sponge and gently clean seam to seam in four directions. (If not totally successful proceed to next step.)
- Used distilled water or a Leather Cleaning agent that meets the “What to Use requirement section description" with a soft white cotton cloth slightly dampened. Gently wipe area in a circular motion seam to seam to remove soils.
- Reset nap with a Nubuck-specific tack cloth wrapped around a sponge and gently agitates seam to seam in four directions.

Standard 6.0

Leather Test Methods & Standards

Revised 10-10-06

Revised 10-10-06 .

The EN ISO and the ISO test methods have been adopted by the International Union of Leather Technologists and Chemists Societies. Table “A” below gives the International Union of Leather Technologists and Chemists Societies or IULTC code description and IU# that correspond to the EN ISO and ISO test methods. Several of the test methods are applied to the different types of leather and some have the same minimum standards and some do not. I have listed under the heading Test # the No. of the tests that are the same and have high lighted in red those that have the same minimum standard.

Table “1-A” Recommended Test for Upholstery Leathers

Test #	IU CODE	IU #	ISO #	DESCRIPTION OF TEST
3-9-16	IUC	11	EN ISO 4045	Determine Ph & Δ pH (difference Figure)
2-7-13	IUF	402	ISO 105/A02	Color Fastness of Leather to Light: Xenon Lamp
20	IUF	420	EN ISO 15700	Color Fastness to Water Spotting
1-6-12	IUF	426	ISO 11641	Color Fastness of Leather to Perspiration
1-6-12	IUF	450	EN ISO 11640	Color Fastness of leather to rubbing
8-14	IUF	470	EN ISO 11644	Finish Adhesion
5-11-18	IUP	6	EN ISO 3376	Measure of Tensile Strength and % Elongation
15	IUP	20	EN ISO 5402	Flexing Endurance (Flexometer Method)
21	IUP	29	EN ISO 17233	Cold Crack Resistance of finish
4-10-17	IUP	40	EN ISO 3377-1	Tear Strength (Single Edge Tear)

Table “1 - B”: Aniline, Suede and Nubuck

Leather characteristics	Recommended values	Test methods
<p>Colour fastness (Veslic) to-and-fro Rubbing. (1)</p>	<p>Change of leather colour and pad staining - Evaluated using: “Grey Scale for Staining (ISO International Standard 105/A03)”</p> <p align="center">Grey scale \geq 3 (50 Cycles Dry)</p> <p align="center">Grey scale \geq 3 (20 Cycles Wet)</p> <p align="center">Grey scale \geq 3 (20 Cycles Artificial Perspiration)</p>	<p align="center">EN ISO 11640 EN ISO 11641</p>
<p>Colour fastness to light (2)</p>	<p>Evaluated using: “Grey Scale for Evaluating Change in Colour (ISO International Standard 105/A02</p> <p align="center">Minimum ISO Blue Wool Standard #3</p> <p align="center">(Grey scale \geq 3 on specimen and Grey scale = 3 on Reference Blue wool #3)</p> <p>See Note #1 below for procedure and test conditions.</p>	<p align="center">EN ISO 105 B02</p> <p align="center">See Note #1 below for procedure and test conditions.</p>
<p>PH and ΔPh (3)</p>	<p align="center">Min 3.2 If the pH value is below 4, Δ pH \leq 0,7</p>	<p align="center">EN ISO 4045</p>
<p>Tear strength (4)</p>	<p align="center">\geq 20 N Minimum.</p> <p align="center">Thickness of hide should be considered when testing tear strength.</p>	<p align="center">EN ISO 3377-1</p>

Tensile strength & percentage elongation (5)	<p style="text-align: center;">Tensile Strength ≥ 8 MPa</p> <p style="text-align: center;">Or</p> <p style="text-align: center;">≥1160 PSI</p> <p style="text-align: center;">% Elongation < 80%</p>	<p style="text-align: center;">EN ISO 3376</p> <p style="text-align: center;">1 MPa (Megapascal) = 1 Newton per Sq. Millimeter which = 145.04 Pound per Sq. Inches (PSI)</p>
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Table “1-C”: Semi aniline

Leather characteristics	Recommended values	Test methods
Colour fastness (Veslic) to-and-fro Rubbing. (6)	<p style="text-align: center;">Change of leather colour and pad staining - Evaluated using: “Grey Scale for Staining (ISO International Standard 105/A03)”</p> <p style="text-align: center;">Grey scale ≥ 4 (500 Cycles Dry)</p> <p style="text-align: center;">Grey scale ≥ 3.5 (80 Cycles Wet)</p> <p style="text-align: center;">Grey scale ≥ 3.5 (50 Cycles Artificial Perspiration)</p>	<p style="text-align: center;">EN ISO 11640 EN ISO 11641</p>

<p>Colour fastness to light (7)</p>	<p>Evaluated using: "Grey Scale for Evaluating Change in Colour (ISO International Standard 105/A02</p> <p>Minimum ISO Blue Wool Standard #4</p> <p>(Grey scale ≥ 3 on specimen and Grey scale = 3 on Reference Blue wool #4)</p> <p>See Note #1 below for procedure and test conditions.</p>	<p>EN ISO 105 B02</p> <p>See Note #1 below for procedure and test conditions.</p>
<p>Finish adhesion (8)</p>	<p>Min 2 N/10 mm</p>	<p>ISO 11644 Dry adhesion</p>
<p>pH and ΔPh (9)</p>	<p>Min 3,2 If the pH value is below 4, Δ pH ≤ 0,7</p>	<p>EN ISO 4045</p>
<p>Tear strength (10)</p>	<p>≥ 20 N Minimum.</p> <p>Thickness of hide should be considered when testing tear strength.</p>	<p>EN ISO 3377-1</p>
<p>Tensile strength & percentage elongation (11)</p>	<p>Tensile Strength ≥ 8 MPa</p> <p>Or</p> <p>≥1160 PSI</p> <p>% Elongation < 80%</p>	<p>EN ISO 3376</p> <p>1 MPa (Megapascal) = 1 Newton per Sq. Millimeter which = 145.04 Pound per Sq. Inches (PSI)</p>

Table “1 - D”: Pigmented

Leather characteristics	Recommended values	Test methods
<p>Colour fastness (Veslic) to-and-fro Rubbing. (12)</p>	<p>Change of leather colour and pad staining - Evaluated using: “Grey Scale for Staining (ISO International Standard 105/A03)”</p> <p style="text-align: center;">Grey scale ≥ 4 (500 Cycles Dry)</p> <p style="text-align: center;">Grey scale ≥ 3.5 (250 Cycles Wet)</p> <p style="text-align: center;">Grey scale ≥ 3.5 (80 Artificial Cycles Perspiration)</p>	<p style="text-align: center;">EN ISO 11640 EN ISO 11641</p>
<p>Colour fastness to light (13)</p>	<p>Evaluated using: “Grey Scale for Evaluating Change in Colour (ISO International Standard 105/A02</p> <p style="text-align: center;">Minimum ISO Blue Wool Standard #5</p> <p style="text-align: center;">(Grey scale ≥ 3 on specimen and Grey scale = 3 on Reference Blue wool #5)</p> <p>See Note #1 below for procedure and test conditions.</p>	<p style="text-align: center;">EN ISO 105 B02</p> <p style="text-align: center;">See Note #1 below for procedure and test conditions.</p>
<p>Finish adhesion (14)</p>	<p style="text-align: center;">Min 2 N/10 mm</p>	<p style="text-align: center;">ISO 11644 Dry adhesion</p>
<p>Flexing endurance (15)</p>	<p style="text-align: center;">50,000 cycles (no finish damage cracks)</p>	<p style="text-align: center;">EN ISO 5402</p>
<p>pH and ΔpH (16)</p>	<p style="text-align: center;">Min 3,2 If the pH value is below 4, Δ pH ≤ 0,7</p>	<p style="text-align: center;">EN ISO 4045</p>

Tear strength (17)	<p>≥ 20 N Minimum.</p> <p>Thickness of hide should be considered when testing tear strength.</p>	EN ISO 3377-1
Tensile strength & percentage elongation (18)	<p>Tensile Strength ≥ 8 MPa</p> <p>Or</p> <p>≥1160 PSI</p> <p>% Elongation < 80%</p>	<p>EN ISO 3376</p> <p>1 MPa (Megapascal) = 1 Newton per Sq. Millimeter which = 145.04 Pound per Sq. Inches (PSI)</p>

Subsidiary characteristics, recommended values and Test methods for upholstery leather for furniture

Table "1 - E"

Leather characteristics	Recommended values	Test methods
Colour fastness to water spotting (20)	<p>Evaluated using: "Grey Scale for Evaluating Change in Colour (ISO International Standard R105/1, part 2)"</p> <p>(No permanent swelling) Grey scale ≥ 3</p>	ISO 105/E07
Cold crack resistance of finish (21)	- 15 °C (no finish cracks)	EN ISO 17233

Deviation from these standards should be address in the buy / seller agreement.

Note #1:

The procedure uses a to blue wool standard references alongside the test sample, European references 1 to 8 (or U.S. references L2 to L9). Each of these blue wool standards possesses a standardized, reproducible degree of fading resistance, each higher-numbered reference possessing about twice the light fastness of the previous standard (e.g. reference #4 is twice as fast to light as reference #3). Test using EN ISO 105 B02, Method 3 is used, whereby exposure is controlled & monitored by inspecting the blue wool reference standards at regular intervals. Once a color change corresponding to Grey scale 3 can be perceived on the minimum blue wool reference, the sample has met that numerical rating provided the sample has not faded beyond Grey scale 3.

For instrument setup, configure the instrument per EN ISO 105 B02, clause 6.2 – Conditions preferable for use in America and Annex B – Apparatus for determining colour fastness with water-cooled xenon arc lamps.

Deviation from these standards should be address in the buy / seller agreement.