

United States Saddle Standard

Voluntary Product Standard

Draft v.1.0

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Voluntary Product Standard Draft v1.0

United States Saddle Standard

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in Part 10, Title 15, of the Code of Federal Regulations

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UNITED STATES SADDLE STANDARD VPS DRAFT v 1.0

PREFACE

A 1998 audit of the horse market by KMPG Peat/Marwick for the American Horse Council estimated that there were 7,000,000 horses in the U.S. If one subtracts the 1,000,000 young horses and 1,000,000 older and breeding stock horses, there are about 5,000,000 horses that require saddles. If one conservatively estimates that a saddle can be used on one horse for ten years, it can be estimated that at least 500,000 saddles are sold in the U.S. every year.

For centuries, saddles were made by individual saddlemakers fit to individual horses. After WWII, many saddles began to be made on production lines and sold through distributors to retail stores. Somewhere along the line the convention evolved to label the underside of the saddle, in contact with the horse, with the terms "**narrow**", "**regular**" or "**wide**". **This convention cause confusion because one cannot "objectively" describe a three dimensional shape by using one "relative" term.**

The current saddle labeling convention prevents the saddle customer from making "value comparisons." The top of the saddle seat is measured in inches from pommel to cantle (front to back) but English saddles are measured differently than Western Saddles. English saddles seats are measured in inches diagonally from the pommel button to the center of the cantle whereas Western saddle seats are measured down the center from the back of the forks to the center of the cantle. However, some English saddle companies in Germany and Italy measure the saddletrees between the points on the front of the saddletree in centimeters. This causes even more confusion because the angle of the front of the saddle will be different depending on the length of the points. So there is no consistent correlation between the measurement and angle of the front of the saddle.

The labeling of Western Saddles is equally confusing. There are terms for the shapes of the saddletree called "full Quarter Horse tree" and there is a term "3/4 Arab tree", and a variety of other names as well, but no standard has been established to determine what any of these shapes actually are, so each Treemaker is free to "creatively interpret" those shapes. Since there is no standard of measurement, there is also no quality control to determine consistency from saddle to saddle. To make matters even worse, some Western treemakers measure the distance between the bars both top and bottom and front and back, but they completely overlook the "ARC" of the saddle which is the critical factor in fitting the saddle to the "arc" of the horse's back. **As amazing as it may be, the fact is the saddle industry has absolutely no measurement, whatsoever for the most important determination of saddle fit - the "Arc" of the horse's back.**

The United States Saddle Standard draft v. 1.0 was written to initiate the process of establishing a Saddle Standard for the United States. This SADDLE STANDARD will be developed in accordance with the Procedures for the Development of Voluntary Product Standards of the U.S. Department of Commerce. The United States Saddle Standard Committee (USSSC) membership will be by appointment by the Secretary of Commerce to constitute a proper balance among producers, distributors, and consumers of saddles

Pursuant to an U.S. District Court order, the USSSC and its Board of Review (Board) operate as independent bodies with defined functions with regard to maintaining, implementing, and enforcing this Standard. Through a consensus process, the USSSC maintains the Standard and establishes policies and adopts other standards by which the Board certifies grading rules, approves design values, accredits agencies to grade and inspect under those rules and monitors agencies' performance.

The purpose of this standardization program is to provide treemakers, saddlemakers, saddle distributors, saddle retailers and saddle consumers a method to measure saddles that permits "value comparisons." This Saddle Standard provides a means to grade the quality of leather, wood and steel or other materials that may be used in saddles, a method to measure and label the three dimensional shape of the underside of the saddle, a method to relate that shape of the saddle to the shape of the horse's back and an "objective method" do determine the saddle fit of a particular saddle to an individual horse. Any design values assigned to saddles are required to be in accordance with criteria determined appropriate by the National Institute of Standards and Technology. A separate consensus body, the National Grading Rule Committee, will be established to develop and maintain nomenclature and descriptions of grades of materials used in saddle construction that conform to this Standard.

ABSTRACT

This Standard pertains to saddles. It establishes a "scientific" understanding of the physiological effects of the saddle on the horse. It establishes a standard to determine saddle seat sizes as well as a method of three dimensional saddle measurement of the underside of the side of the saddle. It establishes a method to "objectively" fit a saddle to a horse. It establishes methods to "calibrate" measurement instruments. It establishes requirements for development and coordination, the assignment of design values when called for, and the preparation of grading rules applicable to saddles. It provides for implementation of the Standard through an accreditation and certification program to assure uniform industry-wide labeling and inspection. It defines principal trade terms and procedures to provide a basis for the use of uniform methods in the measurement, grading, labeling, inspection, and description of saddles. It includes the organization and functions of the United States Saddle Standard Committee, the Board of Review, and the National Grading Rule Committee. Commercial names of the principal types of saddles, definitions of terms used in describing saddles and commonly used industry abbreviations. The United States Saddle Standard draft v.1.0 was written to initiate the development of this standard by the United States Saddle Standard Committee in accordance with procedures of the U.S. Department of Commerce.

KEY WORDS

Saddle, western saddle, English saddle, Australian saddle, saddle measurements, saddle fit, saddle sores, accreditation agency, certification agency, grade mark (stamp), grading rules, voluntary standard.

1. SCOPE

1.1 This Voluntary Product Standard establishes and maintains, through a consensus process and in the public interest, methods of saddle measurement that determine shape, quality and fit that permit "value comparison". It is implemented through an internationally recognized consensus accreditation and certification program, the purpose of which is to provide for uniform, industry-wide labeling and inspection of saddles.

1.2 This Standard also provides a basis for the coordination of the grades of the various species of softwood lumber used in the construction of saddle trees, the assignment of design values to lumber when called for, and the preparation of grading rules applicable to each species.

1.3 This Standard also provides a basis for the coordination of the grades of the various types of leather used in the construction of saddles, the assignment of design values to leather when called for, and the preparation of grading rules applicable to each type of leather.

1.4 This Standard also provides a basis for the coordination of the grades of the steel used in the construction of saddle trees, the assignment of design values to steel when called for, and the preparation of grading rules applicable to each grade of steel.

1.5 This Standard also includes the following:

- 1) organization and functions of the United States Saddle Standard Committee (USSS), the Board of review, and the National Saddle Grading Rule Committee (NSGRC);
- 2) commercial names of the principal types of saddles (Appendix A);
- 3) definitions of terms used in describing standard grades of lumber (Appendix B);
- 4) commonly used saddle industry abbreviations (Appendix C); and

2.0 TERMINOLOGY

- 2.1 **"A" fork** — A narrow saddle fork with no swell, shaped like the letter A, peaking at the base of the horn.
- 2.2 **Back, horse's** — The flat back bone area of a horse between the withers and the loin. Technically, the area from the ninth to the eighteenth dorsal vertebra..
- 2.3 **Barrel** — A cross section of the horse about the middle of the back, below the backbone and behind the withers.
- 2.4 **Bars, saddletree** — Two long horizontal tree bars that rest of the back of the horse, one on each side of the spine, supporting and anchoring the fork and cantle.
- 2.5 **Blanket** — Any padding or blanket placed between the horse and the saddle to ease the pressure of the saddletree bars on the horse and also to absorb perspiration and prevent it from getting on the saddle.
- 2.6 **Breast collar** — a leather strap going around the shoulder point of the horse, attaching at each end to the rigging rings of the saddle.
- 2.7 **Cantle** — the up-curved back of the saddle. The rear, scooped out section of the saddletree, separate form ant attached to the bars.
- 2.8 **Channel** — The long, narrow area between the bars of the saddletree.
- 2.9 **Certification** —Procedure by which a third party gives written assurance that a product, process or service conforms to specified requirements..
- 2.10 **Characteristics** —Distinguishing features which by their extent, location, and number determine the quality of a saddle. The limiting characteristics of any saddle described in certified grading rules shall be expressed within the terms of the definitions in Appendix B.
- 2.11 **Cinch** — A wide band, usually more than 22 inches long, made of parallel strands of cotton, mohair, or tough webbing material, and in some case of folded leather, that goes underneath the horse from the off side to the near side. Its purpose is to hold the saddle firmly on the horse.
- 2.12 **Crupper** — A leather strap attached to the rear of the saddle, extending to the horse's tail
- 2.13 **Dressage** — the French term for the training of horses.
- 2.14 **English Saddle** — A Saddle distinguished from a western saddle by its small, flat shape, absence of skirt and horn: and large, rounded fenders, or flaps.
- 2.15 **Equus Caballus** — The scientific name of the horse
- 2.16 **Fender** — The part of the saddle attached on each side to the stirrup leathers that protects the legs of the rider.
- 2.17 **Flap** — A large, flat piece of leather placed under the riders legs t increase grip and prevent the horse's sweat from getting on the rider. It corresponds to the fender on a western saddle.
- 2.18 **Fork** — The front, vertical portion of the saddletree that is dovetailed and grooved into connection wit the two bars.

- 2.19 Girth** — The measure of the circumference of a horse's body behind the withers.
- 2.20 Gullet** — The opening through the fork and above the bars that sits over the horse's withers, including underneath, the curved portion of the underside of the fork.
- 2.21 Grade marked (grade stamped)**—Lumber that displays the official grading mark of an agency that is made by rubber stamps, ink jet sprayers, tags and/or other methods when found acceptable by that agency. A grade mark is owned by the grading agency and is applied to lumber that conforms to the requirements of a designated grading rule.
- 2.22 Grading agency**—An organization accredited by the Board that engages in the grading of lumber or that licenses and supervises facilities that employ graders to grade and/or to place grade marks upon lumber products.
- 2.23 Grading rules**—Requirements and specifications for the manufacture, inspection and grading of designated species of lumber. Lumber manufactured and graded according to the provisions of this Standard and the grading rules for the species in question shall be regarded as ALS lumber.
- 2.24 Green lumber**—Lumber of less than nominal 5- inch thickness which has a moisture content in excess of 19 percent. For lumber of nominal 5-inch or greater thickness (timbers), green shall be defined in accordance with the provisions of the applicable lumber grading rules certified by the Board
- 2.25 Hand** — A unit of measure used in giving the height of the horse. One hand equals four inches. The horse's height is measured vertically from the ground to the highest point (sixth vertebra) of the withers.
- 2.26 Hollow back** — A horse whose back has a pronounced curvature. (*sway back*)
- 2.27 Horn (pommel)** — the knob on the upper side in the middle of the western saddle. The name was probably derived from antlers or horns used by Indians and mountain men for the of their home made saddles.
- 2.28 Kiln dried (KD)**—Lumber that has been seasoned in a chamber to a predetermined moisture content by applying heat.
- 2.29 Latigo** — A cinch strap
- 2.30 Lumber grades**—Manufacturing categories of lumber that provide the extent and limitations of the characteristics permitted in the particular grade.
- 2.31 Martingale** — A "Y" shaped strap with rings on the ends through which the reins pass.
- 2.32 Mutton-withered** — Said of a horse with very low, round withers; a horse with very little bone definition.
- 2.33 Narrow fork** — A fork whose sides do not extend outward beyond the outside attachment point to the bar.
- 2.34 Nominal size**—The size designation for lumber that does not reflect the actual dimensions.
- 2.35 Numnah (cavalry)** — A thick woolen or felt pad used under the saddle.
- 2.36 Panels (cavalry)** — Heavy covering for the underneath side of the bars, made of felt, horsehair, etc.

- 2.37 **Panels (English)** — A cushion on the underneath surface of the saddletree. It gives clearance to the horse's back bone, between the horse's back and the saddletree.
- 2.38 **Points (English)** — the part of the pommel arch on the English saddle that extends below the bars.
- 2.39 **Points (Western)** — The long, pointed lower parts of the tapadero
- 2.40 **Pommel** — 1. The reinforced upper forward arch of the saddle, that covers the withers of the horse. 2. The horn structure of a western saddle, a term often incorrectly use to refer to the fork on a western saddle. 3. The leg horns on a side saddle.
- 2.41 **Rawhide** — Material much like parchent but made from split cattle hide that has been dehaired and mimed but not taned.
- 2.42 **Rigging** — A leather yoke containing a metal ring, that attaches the saddle to the cinch.
- 2.43 **Roach Back** — A horse with a prominent spinal column. The opposite of hollow back.
- 2.44 **Saddle** — A leather seat, mounted on a framework (tree) which is secured to the horse's back by the rigging (saddle rigging and cinch) to which is attached a pair of stirrups.
- 2.45 **Seam (blind stitched)** — A seam sewed as follows: the leather to be stitched is slit on the edge just below the grain surface, approximately 1/4 inch deep, The smooth-finished surface is lifted back, and the rough underpart is stitched to the other leather. The smooth-finished surface leather is flattened in its original position and glued down.
- 2.46 **Seam (gusset)** — A triangular piece inserted in a cut or seam to give more width, strength, or flexibility.
- 2.47 **Seam (laced)** — A seam in which leather thongs are used to lace together two pieces of leather.
- 2.48 **Seam (split)** — A seam formed when two pieces of leather are stitched together with a third piece between the two outside pieces.
- 2.49 **Seat**— The part of the saddle on which the rider sits between the fork and cantle
- 2.50 **Sella equestris** — A Roman saddle dating after the fourth century B.C., first mentioned in the Theodosian Code.
- 2.51 **Sheepskin**— The lining on the underneath side of the skirt used to cushion the weight of the saddle on the horse's back, but primarily used to prevent slipping.
- 2.52 **Sideboards** — See bars and saddletree
- 2.53 **Sidesaddle** — A saddle on which the rider sits facing forward wit both legs on one side.
- 2.54 **Slick Fork** — See "A" fork
- 2.55 **Species**—The commercial names contained in Appendix A for lumber cut from the principal botanical species of softwoods that shall be used in the formulation of lumber grading rules and in the terms of purchase and sale of ALS lumber.

- 2.56 Split hide** — The outer, or grain, layer of a hide for which the under, or flesh, side has been removed
- 2.57 Steele Fork** — 1. A cast steel fork with a steel horn on the top. 2. A wooden fork reinforced with a steel strap countesunk in the gullet and a steel horn on top in the steel strap.
- 2.58 Stirrup** — A foot support on each side, hanging down from the saddletree, used to support the rider laterally.
- 2.59 Stirrup Leathers**— Long leather straps that support the stirrup. At the upper end each stirrup leather usually circle a notch in the tree bar.
- 2.60 Stock Saddle** — See western saddle
- 2.61 Surcingle** — A broad strap completely encircling the horse to hold the blanket or saddle in place. It goes over the saddle seat, not under it.
- 2.62 Swell** — The portion of the fork that bulges on each side from a line perpendicular to the point where the fork attaches to the bars of the tree. Sometimes used interchangeably, but incorrectly with fork.
- 2.63 Tack** — Items of saddlery and horse equipment
- 2.64 Tapadero** — A leather hoodlike cover over the front a side of the stirrup
- 2.65 Throat (twist)** — The portion of the saddle seat under and just in front of the rider's crotch.
- 2.66 Tree (saddletree)** — 1. The wooden, plastic, or fiber-glass structure forming the foundation of the saddle. It is the form on which the saddle is built, consisting of a fork, two bars, and a cantle. Wooden trees are usually covered with wet rawhide sewed tightly, which shrinks as it dries.
- 2.67 Welt** — A piece of leather stitched into the outer seam in the leather covering of swell forks, up the sided of the swells. This seam is necessary to make the leather fork covering conform to the shape of the fork.
- 2.68 Western saddle** — The saddle distinguished by a large, noticeable fork on which is some form of horn, a high cantle, and large skirts.
- 2.69 Withers** — The convex prominence at the front of a horse's back above the rear part of the horse's shoulder blades.

3.0 PHYSIOLOGICAL EFFECT OF THE SADDLE ON THE HORSE

3.1 THE EFFECT OF THE SADDLE

Saddles effect horses with a multifaceted biomechanical problem in which many different factors converge, including:

1. The weight of the rider, affecting the
2. Tree of the saddle, affecting the
3. Panels of the saddle, affecting the
4. Saddle pad or (pads), affecting the
5. Capillaries in the skin of the horse, affecting the
6. Capillaries in the longissimus dorsi muscle, affecting the
7. Curvature of the spine of the horse, affecting the
8. Horse's range of motion, affecting the
9. Performance of the horse, affecting the
10. Behavior of the horse, affecting
11. Attitude and performance of the rider

3.2 WHAT IS THE PROBLEM?

SADDLE FIT IS THE MANAGEMENT OF PRESSURE. There is no way to eliminate the pressure under the saddle, nor is there any need to. **There is only a need to understand what the horse's tissues need to remain healthy.** With that knowledge we can learn how to intelligently administer pressure to the horse's back.

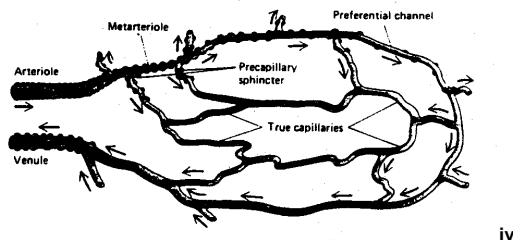
As a practical matter, if we do not see any damage to the horse we assume that the saddle fits, but is that an accurate assumption? A rider and tack usually represent 15% to 20% of the weight of the horse when standing, in motion the rider's downward force (moment) can represent 25% to 50% of the weight of the horse - which is a significant force applied perpendicularly to the spine of the animal. ***The question remains: what is the physiological effect of the saddle and rider on the horse?***

3.3 PHYSIOLOGY

To understand what might be a good saddle fit, we need to understand the "**Issue**" with saddle fit in the first place. While there is little scientific research applied directly to the problem of saddle fitting, there has been extensive research on the effect of external pressure on blood flow in mammalian tissue. This research was undertaken because of the devastating problem of bedsores, which traumatize over 2,000,000 Americans every year. **Bedsores are caused by the pressure from the weight of the patient cutting off the blood flow to the skin.¹ Bed sores and saddle sores have many similar physiological factors.** Most of this tissue research has been applied to a variety of mammals, providing a scientific perspective of saddle fitting.

3.4 CAPILLARY CLOSING PRESSURE

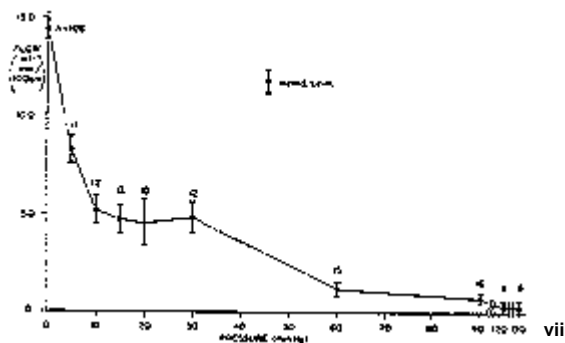
Skin and muscle tissue require a constant intermittent flow of blood to remain healthy.ⁱⁱ In strenuous exercise the muscles require significantly more blood flow to maintain a healthy metabolism. This exchange of oxygen and waste products occurs in the capillary bed.ⁱⁱⁱ



The saddle fitting problems occur when the saddle causes continuous excessive pressure on the capillaries that exceeds the blood pressure and structural strength of those vessels and the capillary vessels collapse. This collapse leads to the deprivation of oxygen and nutrients brought by fresh blood and the removal of waste products.^v **CAPILLARY CLOSING PRESSURE IS THE CRITICAL ISSUE IN PREVENTING SADDLE-RELATED TRAUMA AND IMPROVING THE PERFORMANCE OF THE HORSE'S MUSCLES UNDER SADDLE.**

3.5 IT DOES NOT TAKE MUCH TO STOP THE SHOW

The following experiment was made to determine the relationship of external pressure on blood flow by using a radioactive isotope ^{133}Xe . The amount of radioactivity was measured as external pressure was applied. One can observe that as external pressure increases the blood flow reduces. What is most notable is that pressures as low as .25 P.S.I. or 4 ounces can reduce flow by as much as 60%.^{vi} This is a significant point when related to saddle fit, especially with a bridging saddle that does significantly increase pressures.

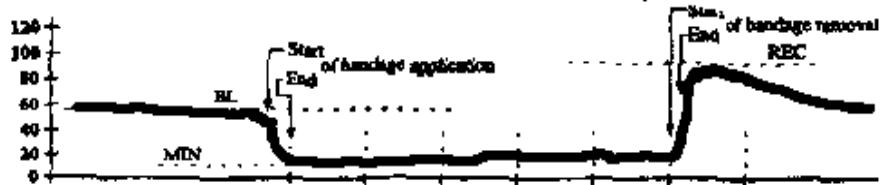


Serious saddle fitting problems develop particularly on "bridging" saddles in a relatively short amount of time because pressures can easily reach 4 P.S.I or 64 ounces. This excessive pressure not only cuts off the blood supply but can additionally traumatize the muscle tissue itself.

3.6 IN GOES THE GOOD BLOOD OUT GOES THE BAD BLOOD

In all cases pressure release is followed by reactive hyperemia and the parts originally starved of arterial blood are instantly flooded with oxygen. The extent and duration of the blood in flow is proportional to the needs of the tissues.^{viii}

Below is a study performed at University of Georgia on a horse using a compression bandage. One can observe that the blood flow decreases significantly with the application of pressure, however, when released the blood flow increases beyond the original base flow.^{ix} This is a clinical verification of reactive hyperemia and reveals what happens to the tissue when the saddle is removed i.e. heat bump.

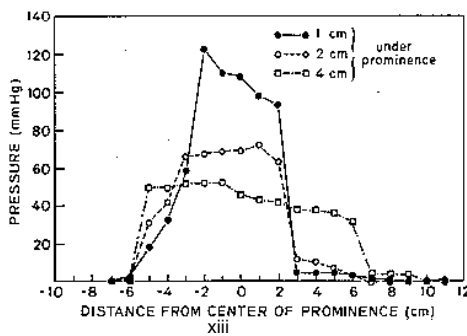


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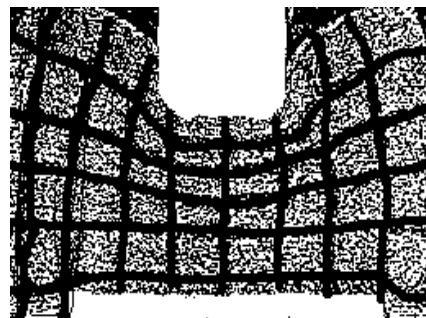
3.7 INTERNAL EFFECT OF SADDLE PRESSURE

For a given pressure applied to the surface of the skin (interface pressure) capillary closure pressure will vary from horse to horse, as well as location to location on the horse, depending on the amount of fat, location of adjacent bone, status of the vascular system, systemic blood pressure and general health of the animal.^{xi} As the animal ages its physiology also changes, compounding this significant issue.

A critical discovery in tissue research was that in a given location, pressure is not even throughout the tissue. Clinical studies have established that the internal pressure close to bones is three to five times higher than on the surface.^{xii}



xiii



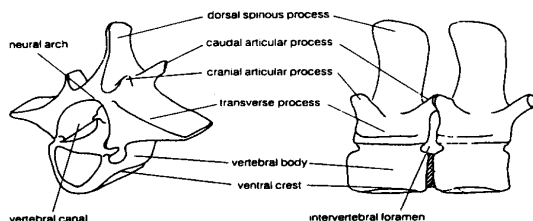
xiv

This principle is easily demonstrated with a simple sponge as illustrated above. One can observe that when two different size areas are pressed towards each other, the smaller area w

create higher pressures. **Weight divided by surface area equals interface pressure.** This is shown by the lines moving closer together nearest the smaller surface.

3.8 SHARP POINTS

This is an important issue for horses because the longissimus dorsi muscle, one of the major muscles used in locomotion, lies adjacent to the spinal column and is directly affected by saddle pressure. Each vertebrae of the spinal column has bony prominences with small surfaces that concentrate points of pressure down the length of the longissimus dorsi muscle.

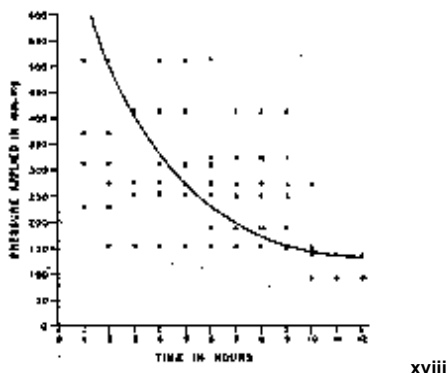


It is critically important to understand that muscles are far more susceptible to the effects of pressure than skin.^{xv} The internal damage to the tissue caused by the surface pressure only becomes obvious at the surface over an extended time. **Many serious pressure sores first occur internally adjacent to the bone and then radiate to the surface.^{xvi}**

This fact makes it very difficult to use apparent trauma to the horse's back as an indicator of saddle fit, because during the time interval that the horse is not being ridden, the horse begins to heal the internal trauma. **This makes it virtually impossible to develop a cause and effect relationship between saddle fit using observable external trauma to the horse as the standard.** Therefore, just because we do not see obvious damage to the skin of the horse does not mean that damage has not occurred internally.

3.9 PRESSURE OVER TIME

The most important issue to remember with tissue trauma is that higher pressures do damage in shorter periods of time, however, even low pressure for long periods of time can do damage.^{xvii} the following graphs illustrates the point



This is significant to saddle fit because the fit of the saddle relates to how much time one can ride before causing trauma to the horse. Obviously if the saddle fits one can ride the horse longer without sustaining damage than a saddle the bridges and causes high pressures.

3.10 THE CRITICAL ISSUES

Tissues do not need a constant flow of blood, but tissues do need a CONSTANT INTERMITTENT FLOW OF BLOOD.^{xi} This is the reason a healthy individual does not get bedsores. By tossing and turning in our sleep we provide our tissues a constant intermittent flow of blood.

It is also important to understand that tissue damage is variable from very slight damage to extremely debilitating damage. As an example, human bedsores are graded in Stages I, II, III, IV, from a slightly red skin to an open sore. The following is a simple scale of increasing severity of trauma caused by an ill-fitting saddle:

- ❖ **Decline in performance**
- ❖ **Discomfort - indicated by attitude change in the horse**
- ❖ **Inhibited Gait - noted by the horse being a little "off"**
- ❖ **Lameness - secondary lameness due to pain or excessive pressure**
- ❖ **Swelling - slight swelling under the saddle panels**
- ❖ **Bruising - significant inflammation indicating capillary damage**
- ❖ **White hair - due to damaged follicles**
- ❖ **Hair loss - obvious trauma to the skin and internal muscles**
- ❖ **Ulcerous condition - an open, oozing wound with swelling**

3.11 WHAT DO WE "REALLY" KNOW ABOUT PHYSIOLOGY?

The clinical research on a variety of mammals has established the following factors to give us a better understanding of the issues relating to saddle fit.

- ❖ **Tissue damage is a function of pressure over time.**^{xx}
- ❖ **Pressure is not distributed evenly throughout tissue.**^{xxi}
- ❖ **Pressure on the surface of the skin increases 3 - 5 X close to bones.**^{xxii}
- ❖ **Muscle is more susceptible to pressure damage than skin.**^{xxiii}
- ❖ **Low pressure for long periods of time is more damaging than high pressure for short periods of time.**^{xxiv}

3.12 SO WHAT IS GOAL HERE?

IN PRACTICE THE GOAL IS TO ACHIEVE THE MOST EVEN PRESSURE THROUGHOUT THE SADDLE CONTACT AREA WITH A RIDER MOUNTED AND TO REMOVE THE SADDLE EVERY FEW HOURS FOR A SHORT PERIOD OF TIME TO PERMIT BLOOD TO FLOW TO THE TISSUES.

4. THREE DIMENSIONAL SADDLE MEASUREMENT

4.1 THE PROBLEM

Equestrians have no reason to purchase saddles that do not fit their horses. The problems arise because the equestrian has no way to determine for themselves that the saddle does or does not fit. Since the horse cannot speak, not only is the customer buying a product that does not perform as claimed, but the horse can be injured.

Equestrians cannot protect themselves from purchasing poorly fitting saddles, because once you place the saddle on the horse you cannot see under the saddle to determine fit. Some saddlemakers suggest that the equestrian can check for saddle fit by placing the saddle on the horse and then lifting the saddle skirts and looking under the saddle to be sure that the saddle panels fit evenly. **This advice completely ignores the effect of the weight of the rider on the shape of the horse's back.** Thus if the saddle did fit the horse without the rider, as soon as the rider steps into the saddle, the back of the horse will flex to some degree under the weight of the rider, therefore, **the heavier the rider the worse the saddle will fit.**

Some saddlers suggest that the equestrian can determine saddle fit by riding the horse and looking for any obvious trauma to the horse's back after the ride. Analogous to humans trying on shoes, if you scuff the soles you cannot return the shoes. Therefore, the rider can only use the saddle for a short ride or the saddle may appear used and cannot be returned. Unfortunately an **equestrian cannot determine fit by obvious trauma to the horse on a short ride.** Physiologically, it takes a few hours for the animal's tissue to show any noticeable trauma from the pressure from a poorly fitting saddle. Thus an equestrian can only discover that the saddle does not fit after riding the saddle for a number of hours, and have seriously injured the horse, at which point the saddle is scuffed and cannot be returned. **Catch 22.**

4.2 WHAT IS SADDLE FIT?

"FIT" means that the shape of the saddle panel that is in contact with the horse's back is the same as the shape of the MOUNTED horse's back. If the shape of the panel is FLATTER than the shape of the horse's back, the saddle will "bridge", touching only in the front and the back on both sides of the spine. If the shape of the panel is MORE CURVED than the shape of the horse's back, the saddle will "rock", touching only in the middle, on either side of the spine. If the saddle only touches front and back on either side of the horse it is "twisted."

4.2 FIT, BRIDGE, ROCK & TWIST



Fit



Bridge



Rock



Twist

4.4 WHICH IS WHICH?

Some saddles fit and some do not. The question is, **how do you know which saddle fits which horse?** Many people view saddle fit as a black and white issue: either the saddle fits or it does not. If the horse doesn't get white hairs on its back the saddle appears to fit, but is that truly the case?

5.0 "OBJECTIVE" SADDLE MEASUREMENT

6.0 CALIBRATING SADDLE SHAPE FOR BREED & DISCIPLINE

7.0 INSTRUMENT CALIBRATION

8.0 WESTERN SADDLE STANDARDS

9.0 ENGLISH SADDLE STANDARDS

10.0 SADDLETREE WOOD QUALITY STANDARDS

11.0 SADDLETREE LEATHER QUALITY STANDARDS

12.0 SADDLETREE STEEL QUALITY STANDARDS

13.0 GRADE MARKING

14.0 INSPECTION & REINSPECTION

15.0 UNITED STATES SADDLE STANDARD COMMITTEE

16.0 BOARD OF REVIEW

17.0 NATIONAL GRADING RULE COMMITTEE

18.0 IMPLEMENTATION, MAINTAINENCE, AND HISTORY OF STANDARD

19.0 REFERENCES

20.0

APPENDIX A

APPENDIX B

20. WOOD QUALITY

5.1 Rough size—The minimum rough thickness of dry or unseasoned lumber 1 or more inches in nominal thickness shall be not less than 1/8 inch (3 mm) thicker than the corresponding minimum dressed thickness, except that 20 percent of a shipment shall be not less than 3/32 inch (2 mm) thicker than the corresponding minimum dressed thickness. The minimum rough widths shall not be less than 1/8 inch (3 mm) wider than the corresponding minimum dressed width.

5.2 Dressed sizes—Dressed sizes of lumber shall equal or exceed the minimum sizes shown in tables 1, 2, 3, 4, and 5. [Refer also to 5.3.1 covering length and 7.3 for grade marking nonstandard sizes.]

5.3 Lengths

5.3.1 Standard—Standard lengths of lumber shall be in multiples of 1 (0.3048 m) or 2 feet (0.6096 m) as specified in the certified grading rules.

5.3.2 Trimmed—Unless otherwise stated in the contract of purchase, lumber shall be trimmed for the removal of splintered ends, and if 2 inches or less in nominal thickness (except lath), shall be double-end-rimmed to a length that is not less than the nominal length and that is not more than 3 inches (76 mm) in excess of nominal length. The overlength tolerance in nominal 2-inch dimension over 12-inches (305 mm) wide or over 20 feet (6.1 m) in length is 12-inches (305 mm).

Advisory note: The marketing practice covering lengths of lumber should permit the buyer to obtain specified lengths or specified assortments of lengths.

6. REQUIREMENTS FOR GRADING RULES

6.1 General concepts

6.1.1 Grading parameters—To the extent to which differences in the characteristics of species, in the quality of logs, in conditions of manufacture and in the uses to which the product is put will permit, the basic provisions for the grading of lumber shall be uniform. The grading of lumber cannot be considered an exact science because it is based on either a visual inspection of each piece and the judgment of the grader or on the results of a method of mechanically determining the strength characteristics of structural lumber [see 6.3.2.2]. Grading rules shall establish a maximum of 5 percent below grade as an allowable variation between graders. If any grading rules indicate that a grade qualifies under two use classifications, the grade provisions shall satisfy the requirements for both classifications.

6.1.2 Minimum grade requirements—The method of determining the extent and limitations of the characteristics permitted in the poorest pieces admissible in each grade of lumber shall be stated in a certified rule, except in the lowest grade of each classification. Since lumber grades are broad manufacturing categories, grades overlap and pieces are selected from a grade to comprise another grade outside of that grade category. A specific shipment shall not be made up of only pieces containing characteristics of the maximum number or size permitted in the grade.

6.1.3 Grade characteristics—Characteristics permitted and limitations for rough lumber shall be the same as those prescribed in grading rules for dressed lumber of the same grade and, in addition, such others as will disappear in standard dressing shall be allowed. If characteristics other than those described in certified grading rules are encountered, they shall be evaluated in relation to the characteristics permitted or limitations prescribed for the grade under consideration and shall be allowed if regarded as equivalent or less damaging in effect on the strength, appearance, or other utility value of the piece. In all grades, the size of allowable characteristics shall not exceed that specified in the respective grading rules.

Advisory note: In many grades, the size of permitted characteristics varies in proportion to the size of a face or the area of a cross section of the piece.

6.1.4 Special provisions—When heartwood, sapwood, grain classifications, and other optional provisions are specified, and the lumber conforms to the requirements of such special provisions as well as to the regular grade designated, it shall be regarded as of standard quality.

6.1.5 Mixed grades—Mixed grades other than the two highest established grades for each grading rule category shall not be included in certified grading rules.

6.1.6 Nonstandard grades—When nonstandard grades, sizes, or patterns are specified, or when particular provisions of a standard grade are waived or changed, inspection shall be made accordingly, but all of the other provisions of the certified grading rules shall apply.

6.2 Seasoning provisions

6.2.1 General—The grading rules shall include provisions regulating lumber seasoning and moisture content. The provisions shall be developed by each geographical region for each species based on its own conditions and the requirements of the users of its products subject to the other provisions of Section 6. Provisions shall be expressed in terms of maximum moisture content allowed in each piece of lumber and determined in accordance with ASTM D 4444 Standard Test Methods for Use and Calibration of Hand-Held Moisture Meters. The restrictions on the moisture content of seasoned lumber shall apply at the time of shipment, at the time of dressing (if dressed lumber is involved), and at the time of any reinspection (if moisture content is involved in the reinspection), as provided in the applicable grading rules.

6.2.2 Definitions—The grading rules for each species or region shall include clear definitions for dry lumber under nominal 5-inch thickness [see 2.7]. The definitions shall be based on a maximum moisture content of 19 percent or less. The choice to grade and grade mark any item as green ALS lumber or dry ALS lumber shall be determined by each rules publishing agency in accordance with its own conditions [see 2.7, 2.11, and 2.12].

6.2.3 Dry size requirements—The grading rules shall require all lumber under nominal 5-inch thickness sold as dry to be 19 percent or less in moisture content at the time of dressing, and to be not less than ALS minimum dry dressed thickness and width at 19 percent moisture content, or at such lower maximum-moisture content when applicable to the lumber at the time of dressing. The minimum-dressed dry sizes are shown in tables 1, 2, 3, 4, and 5. Shrinkage that occurs after dressing to standard dry size shall be recognized through the allowance of a tolerance below minimum ALS dry sizes on the basis of 1 percent shrinkage for each four percentage points of moisture content reduction below the applicable maximum or 0.7 percent shrinkage for each four percentage points of moisture content reduction for Redwood, Western Red Cedar, and Northern White Cedar.

6.2.4 Size differentials—When the grading rules in any region permit lumber less than nominal 5-inch thickness to be dressed green, the rules shall require that the lumber be dressed to sizes specifically stated according to both thickness and width, as set forth in tables 3, 4, and 5.

6.2.5 Green size requirements—The green sizes specifically stated in the rules shall be not less than the green sizes shown in tables 3, 4, and 5, except for Redwood, Western Red Cedar, and Northern White Cedar. For these three species, the following minimum dressed thicknesses shall apply: 21/32 inch (17 mm) for corresponding nominal 5/8 inch dry, 25/32 inch (20 mm) for nominal 1-inch, 1-9/16 inch (39mm) for nominal 2-inch, 2-1/16 inch (52 mm) for nominal 2-1/2 inch, 2-9/16 inch (65 mm) for nominal 3-inch, 3-1/16 inch (78 mm) for nominal 3-1/2 inch, 3-9/16 inch (90 mm) for nominal 4-inch, and 4-1/16 inch (103 mm) for nominal 4-1/2 inch. The following minimum green dressed widths shall apply: 2-9/16 (65 mm) and 3-9/16 inch (90 mm) for nominal 3-inch and 4-inch, 4-9/16 (116 mm), 5-9/16 (141 mm), and 6-9/16 inch (167 mm) for nominal 5-inch, 6-inch, and 7-inch, 7-3/8 (187 mm), 9-3/8 (238 mm), 11-3/8 inch (289 mm) for nominal 8-inch, 10-inch, and 12-inch, 13-7/16 (341 mm) and 15-7/16 (392 mm) for nominal 14-inch and 16-inch.

⁴ The minimum green sizes are based on shrinkage factors of 2.35 percent in thickness and 2.80 percent in width from the fiber saturation point to a 19 percent maximum moisture content with recognition given to manufacturing practices and the differences in shrinkage characteristics between species of lumber or species groups of lumber.

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Shrinkage that occurs after dressing to standard green size shall be recognized through the allowance of a tolerance below minimum ALS green sizes on the basis of 1 percent shrinkage for each four percentage points of moisture content below 30 percent, or 0.7 percent shrinkage for each four percentage points of moisture content below 30 percent for Redwood, Western Red Cedar, and Northern White Cedar.

6.2.6 Grade marking (grade stamping)—Grading rules that provide for grade marking of lumber less than nominal 5-inch thickness shall contain a provision for standardized marking so as to indicate whether the lumber was green or dry at time of dressing. The standardized mark shall be S-GRN if surfaced green, S-DRY if surfaced dry, or KD if kiln dried to a maximum moisture content of 19 percent at time of surfacing. Moisture-content limits of less than 19 percent maximum moisture-content for dry or kiln dried shall only be specified if included in rules certified by the Board. For lumber of nominal 5-inch or greater thickness, other moisture-content limits shall be specified only if included in rules certified by the Board.

6.3 Use classification provisions

6.3.1 Yard lumber

6.3.1.1 Grade classifications—The grading of surfaced yard lumber is based upon the uses for which the particular grade is designed and is applied to each kind with reference to its size and length when graded without consideration to further manufacture. On the basis of quality, the basic grade classifications of yard lumber shall be as follows:

- (a) Select: Lumber for natural and paint finishes.
- (b) Common: Lumber for general construction and utility purposes.

6.3.1.2 Yard lumber sizes—The dressed thicknesses and widths of yard lumber as specified in 3.4, 5.1 and 5.2 shall be considered as minimum standards for the corresponding nominal sizes as shown. Advisory note: Lumber of standard size, rough or dressed, may be described by its nominal dimension providing actual sizes are shown on invoices and other documents.

6.3.1.3 Bundled lumber—Each length of bundled lumber, except end-matched lumber, beveled siding, and bungalow siding shall be bundled separately unless otherwise specified.

6.3.1.4 Finish and boards—In shipments of rough finish/selects and boards, pieces 1/2 inch (13 mm) or greater than the nominal inch-unit thickness, such as are produced by uneven sawing, shall, at the option of the buyer, be rejected or be accepted as of the next lower grade.

6.3.1.5 Grading faces—Yard lumber other than timbers and dimension [see 6.3.2.3] shall be graded from the face or best side only unless otherwise specified.

6.3.2 Structural lumber

6.3.2.1 Development of design values—Design values contained in grading rules shall be developed in accordance with appropriate ASTM standards and other technically sound criteria. The National Institute of Standards and Technology, with the advice and counsel of the U.S. Forest Products Laboratory, shall be the final authority as to the appropriateness of such standards or criteria. The Board shall seek the assistance of the U.S. Forest Products Laboratory in reviewing design values set forth in grading rules and, in the case of each set of grading rules submitted for certification, the Board shall obtain a report from the Laboratory to verify that the procedures used in developing the claimed values are in accordance with the standards and criteria described herein. Rules-writing agencies shall make available upon request an explanation of the means by which the claimed values were derived. When more than one rules-writing agency has responsibility for writing grading rules for a given species, a group of species, or a geo-graphical subdivision of a species or of a group of species, a common set of strength and stiffness values shall be used by the agencies involved for that species, subdivision, or group of species in the interest of uniformity and standardization.

6.3.2.2 Grading—mechanical—The grading of structural lumber by mechanical means is recognized as an acceptable method of grading. When graded by mechanical means all such grading equipment and methods shall be subject to approval and certification by the Board.

6.3.2.3 Grading faces—Timbers and dimension shall be graded from all four faces.

6.3.3 Factory and shop lumber

6.3.3.1 Grade classification—The grade classifications of factory and shop lumber shall be those promulgated by the agencies which formulate and publish grading rules and which have been certified by the Board.¹¹

6.3.3.2 Grade characteristics—Factory and shop lumber shall be graded with reference to its use for doors and sash, or on the basis of characteristics affecting its use for general cutup purposes, or on the basis of size of cutting. Its grade shall be determined by the percentage of the area of each board or plank available in cuttings of specified or of given minimum size and qualities and shall be determined from the poor face based on the quality of both sides of each cutting.

6.3.3.3 Grade sizes—The ALS grade sizes for factory and shop lumber shall be those promulgated by the agencies which formulate and publish grading rules and which have been certified by the Board.

6.3.3.4 Warped lumber—The cuttings in warped lumber shall be so laid out as to surface two sides to standard thickness and have straight edges parallel to the edges of the board or plank.

7. GRADE MARKING (GRADE STAMPING)

7.1 Agency procedures—Each accredited agency shall submit procedures with respect to grade marking to the Board for approval.

7.2 Agency symbol—Each accredited agency shall maintain a bona fide supervisory inspection service under which each mill authorized to use the registered symbol of the accredited agency⁵ in conjunction with the grade mark will be inspected regularly as to grading efficiency and conformity to all the agency established rules for grade marking

7.3 The Grade mark (grade stamp)—When ALS lumber is grade marked, the grade marking shall be subject to the following provisions:

7.3.1 The grade mark shall signify that the lumber conforms to the size, grade and seasoning provisions of the rules under which it is graded. When green lumber of less than nominal 5-inch thickness is graded and grade marked under the applicable grading rules [see also 6.2.6], it shall comply with the green size requirements of such rules. If lumber is dressed to a size below the minimum ALS requirements or below the minimum sizes set forth in the applicable grading rules, the mark shall show that size, and if less than of nominal 5-inch thickness, shall state whether the lumber was dry or green when dressed. If lumber is dressed to less than the standard for nominal 1-inch thickness, the mark shall show the dressed thickness and whether the lumber was green or dry when dressed.

⁵ Facsimiles of the grade marks of the grading and inspection agencies that are accredited by the Board of the USSS shall be available to purchasers, consumers, and specifiers from the USSS, P.O. Box 210, Germantown, MD 20875-0210, Telephone (301)972-1700, FAX 301-540-8004.

7.3.2 A distinguishable mark or insignia, registered and symbolizing grading supervision by an accredited agency, shall be used in conjunction with the grade mark for each agency.⁵

7.3.3 All pieces and/or bundles of a given grade shall be grade marked.

7.3.4 Mixed grades, other than the two highest recognized grades for each grading rule category, shall not be grade marked with a combination grade designation. If grade marking is required, each piece of a grade shall be marked as of its actual grade.

7.3.5 The grade mark for lumber shall include an identification or designation of the commercial name of the species [see Appendix A] from which the lumber was produced. The identification of species shall not be required when the agency symbol also indicates the species from which the lumber was produced. Where grading rules contain provisions for the grouping of species, each individual species included in a group shall be identified in the rules, and the grade stamp shall include the designation assigned to the group.

7.3.6 These provisions are not intended to preclude the inclusion of additional regulations by an agency regarding the use of its grade mark provided the basic provisions of this section are observed.

8. INSPECTION AND REINSPECTION

8.1 Inspection

8.1.1 Agency accreditation and supervision—When ALS lumber is grade marked, the grade marking shall be under the direction, including regular grading supervision at mills, of an agency accredited by the Board as being competent and having adequate facilities¹²

8.1.2 Delegation of grading authority—Permission to grade mark shall be delegated only by an agency accredited by the Board to operate a mill supervisory service to those mills which have demonstrated and proven their ability to conform to and are currently in conformance with the grading rules for the species and grades which they manufacture. The mill shall also agree to maintain the established standards of size and grade and to submit its lumber to inspection by the supervisory agency both at the mill and upon complaint at destination.

8.1.3 Payment—certificate costs—When an accredited agency issues a certificate on a shipment, the party requesting the certificate shall pay for the cost thereof.

8.1.4 Service—Inspection service shall be required for the inspection of grades not described in the rules only when written detailed specifications accompany the request for such inspection. For the inspection of standard grades in nonstandard sizes, inspection service shall be required based on 6.1.6 unless otherwise prescribed in the contract of purchase and sale.

8.2 Reinspection

8.2.1 General—Subject to freedom of agreement between buyer and seller as to the settlement of complaints, the purchase, sale, or shipment of ALS grades of lumber shall be construed as involving agreement to submit lumber to reinspection by an accredited inspection agency under published rules by which the lumber was graded [see 8.2.4]. Grading rules shall include provisions for reinspection in case of complaint, and reinspection shall be available to anyone at reasonable cost.

8.2.2 Complaints—Grade complaints on lumber shall be recognized only when the lumber is in the form in which it was shipped. Any subsequent change in manufacture, working, or through kiln-drying shall relieve the seller of responsibility for any grade complaints.

8.2.3 Buyer's responsibilities—In case of a complaint, the buyer shall accept that portion of the shipment that is of the grade, size, and moisture content specified and shall hold intact that portion which is disputed for inspection or reinspection. Any action on the part of the buyer in accepting and using such portion of the shipment that is of the grade, size, and moisture content specified shall not be construed as the acceptance of the entire shipment. The buyer shall hold the disputed lumber intact, properly protected, for not more than 30 days after the date of the request for inspection or reinspection. The buyer shall file a complaint with the seller within the time specified in 8.2.6 and 8.2.7. The buyer shall pay in accordance with the terms of the sale for that portion accepted, but acceptance of a part of a shipment does not prejudice the buyer's just claims that any unused lumber does not meet the specifications of the grade, size, or moisture content.

8.2.4 Seller's responsibilities—Upon receipt of a complaint from the purchaser, the seller shall immediately request the agency under whose rules shipment has been made, or such other agency that was agreed upon, to provide inspection, reinspection or retally as required according to the grading rules in effect at the time of execution of the contract.

8.2.5 Cost and assistance—The expense of such inspection, reinspection, or retally shall be borne in accordance with the inspection provisions of the applicable grading rules, but the person calling for the reinspection shall be responsible to the agency for the costs thereof. The purchaser shall lend all reasonable assistance to facilitate the inspection, reinspection or retally.

8.2.6 Tally, grade, and size complaints—In case of a complaint involving tally, the entire item shall be held intact for retally. In case of a complaint regarding grade or size, but not involving tally, the buyer shall hold intact that portion of the item that is of the grade or size which is in dispute for inspection and shall file complaint with the seller within 10 days of date of receipt of the shipment.

8.2.7 Moisture content complaints—In case of a complaint involving moisture content, the buyer shall inform the seller of the complaint within 72 hours after the lumber is unloaded. In such cases, the seller shall answer such complaint within 72 hours from receipt of complaint. A reinspection involving a complaint on moisture content shall be made in accordance with the provisions of the applicable grading rules. Each piece shall be tested for moisture content, and separation shall be made of all pieces conforming to the maximum allowable moisture content from any portion exceeding such maximum.

8.2.8 Reinspection results—Each item of a shipment shall be considered as of the grade invoiced if, upon reinspection under the grading rules under which the lumber was graded and sold, 95 percent or more thereof is found to be of said grade or better. When degrades in grade or moisture content or both are in excess of 5 percent of the board footage of each item, or when they are more than one grade lower than the grade invoice, such degrades shall be kept separate and shall be the property of the seller unless otherwise agreed. These provisions shall not apply in the case of specially worked lumber.

21. AMERICAN LUMBER STANDARD COMMITTEE

9.1 Functions of Committee—The functions of the USSSC shall be:

9.1.1 To act as the Standing Committee for the purpose of considering proposals for future revisions of or amendments to this Standard. When acting as the Standing Committee, the procedures for the development of Voluntary Products Standards of the US Department of Commerce shall be applicable. The Department of Commerce shall provide the secretariat and appoint a chairman for the Standing Committee.

9.1.2 To cooperate with the U.S. Department of Commerce in establishing and making continuously available basic standards for lumber size, pattern, quality, inspection, and reinspection for use by industry and trade.

9.1.3 To determine the criteria by which the Board shall adjudge and approve the following as being in conformance with this Standard:

9.1.3.1 Any published rules.

9.1.3.2 The competency, reliability, and adequacy of the facilities provided by agencies publishing grading rules for the purpose of lumber certification, inspection, reinspection, and supervision of grade marking.

9.1.3.3 The competency, reliability, and adequacy of the facilities provided by lumber inspection agencies participating in this program that do not publish grading rules.

9.1.4 To advise the Board with respect to the interpretation or application of this Standard and the detailed requirements defined and established by the USSSC

9.1.5 To fix, after consultation with the agencies participating in the use of its facilities, such charges and fees as the Committee finds to be necessary to cover the actual cost, including reserves and provisions for contingencies, of carrying out its functions, those of the Board, and the NGRC. Such charges and fees shall be assessed at a uniform proportionate rate against the agencies participating in the use of the facilities of the Committee. The accreditation of any agency not paying its assessment within 60 days after notification by the Secretary of the USSSC shall be revoked by the Board.

9.2 Appointment of members—The principal and alternate members shall be appointed by the Secretary of Commerce for terms of not less than two nor more than five years.

9.3 Composition of Committee—The following procedures shall apply in making appointments to the Committee.

9.3.1 Each agency which participates in this program and which formulates, publishes, and maintains grading rules and maintains inspection facilities covering the various lumber species may nominate a principal and an alternate for each member allotted to that agency. Principal members and their alternates shall be appointed from the nominees furnished by each agency as follows:

Agencies Members Allotted
Southern Pine Inspection Bureau 2
Western Wood Products Association 2
West Coast Lumber Inspection Bureau 2
Redwood Inspection Service 1
Northeastern Lumber Manufacturers Association 1
Northern Softwood Lumber Bureau 1
Each other agency qualifying under this category 1

9.3.2 Each lumber inspection agency which participates in this program and which does not publish grading rules may nominate a principal and an alternate member. Three principal members and their alternates shall be appointed from among the nominees so furnished.

9.3.3 Firms or organizations within lumber specifying, distributing, and consuming groups, at the request of the Secretary of Commerce, may nominate a principal and an alternate for each member allotted. Members and their alternates shall be appointed from those groups as follows:14

Groups Members Allotted
Lumber Distributors & Wholesalers 2
Lumber Retailers 2
Intermediate Manufacturers (formerly millworkmanufacturers) 1
Wood Using Industries 1
General Contractors 1
Home Builders 1
Architects and Engineers 2

9.3.4 The Secretary of Commerce may appoint consumer- at-large principal members and their alternates to represent the general public.

9.3.5 Each nomination shall be submitted to the Secretary of Commerce by the appropriate agency, firm, or organization upon request or whenever a vacancy occurs in the segment represented. Each nomination shall contain the following:

9.3.5.1 A summary of the qualifications of the nominee.

9.3.5.2 A statement of the method or procedure by which the nominee was selected and the procedures under which the nominee will exercise the responsibility of membership for the agency or industry segment represented.

9.3.5.3 A statement of any interests, financial or otherwise, which the nominee has in agencies or segments of the industry other than the one the nominee represents.

9.3.5.4 For agencies submitting more than one nominee, a listing in the order of priority for appointment.

9.3.6 Ex officio, non-voting principal and alternate members may be appointed by the Secretary of Commerce from the following Federal agencies:

Department of Defense
Department of Agriculture
Department of Interior
General Services Administration
Federal Housing Administration
National Institute of Standards and Technology

9.3.7 Balance of representation—The Secretary of Commerce may make such changes in the constitution of the Committee or make additional appointments as the Secretary deems necessary to ensure that the Committee has a balance of interest and is not dominated by a single interest category.

9.4 Committee secretary—Except as provided in 9.1.1, the manager or executive officer of the Board, employed as provided in 10.5, shall serve as the Secretary of the USSSC.

9.5 Transaction of business

9.5.1 Meetings—A majority of the members of the USSSC representing agencies which formulate, publish, and maintain grading rules and maintain inspection facilities, together with a majority of the other members, shall constitute a quorum for the transaction of business. A vote of the majority of those present shall decide any question that comes before a meeting; but if at any meeting of the Committee there shall be less than a quorum present, a majority of those present shall adjourn the meeting or act on the subjects before it, subject to ratification in writing by the respective majorities which constitute a quorum.

9.5.2 Correspondence—Business that has not been previously presented at a meeting of the Committee shall be held until the next meeting or transacted by correspondence in accordance with rules to be established by the Committee.

10. BOARD OF REVIEW

10.1 Autonomy of Board—The Board shall be an autonomous body functioning under by-laws approved by the USSSC and consistent with Section 10.

10.2 Certification functions—Upon application, the Board shall examine and certify the following as conforming to the requirements of this Standard and to additional detailed requirements established by the USSSC: Grade strength ratios, nomenclature, descriptions of grades published by the NGRC and grading rules published by accredited, competent and reliable agencies having adequate facilities for mill inspection and for reinspection of lumber (provided that no such rules for any species in any region shall be certified if certified published rules and service applicable thereto are adequate and already fully and fairly available to all manufacturers, distributors, and consumers of such lumber, on equal terms and conditions without discrimination). Certification shall be subject to these conditions:

10.2.1 Rules conform to the basic requirements of this Standard.

10.2.2 Published rules carry specific references to such certification.

10.2.3 The originating agency permits the publication of the rules without charge in whole or in part, including all applicable provisions and with all quoted parts clearly so indicated by anyone desiring to do so. Any such publication shall carry reference to the source of the rules and their effective date, and shall be revised to conform with any subsequent changes in the rules, giving the effective dates thereof.

10.2.4 Subsequent revisions made by the promulgating agency to grading rules that have been certified by the Board shall be acted upon within 90 days after submission to the Board.

10.2.5 Grading rules of an agency shall not be certified as conforming to this Standard if the Board determines the dimension lumber rules therein fail to conform to the provisions of the National Grading Rule for dimension lumber established pursuant to Section 11 of this Standard.

10.3 Accreditation functions—Upon application, the Board shall examine and accredit rules-writing agencies and non-rules-writing lumber inspection agencies as conforming to the requirements of this Standard and to additional requirements established by the USSS. Accreditation shall be subject to these conditions:

10.3.1 The competency, reliability, and adequacy of the facilities provided by agencies participating in this program for the purposes of lumber certification, inspection, reinspection, or supervision of grade marking.

10.3.2 The adequacy of the procedure followed in authorizing mills to grade mark when providing adequate supervisory service.

21.3.3 The continuing conformance of grading rules to this Standard.

10.3.4 The continuing competency and adequacy of performance of lumber inspection and grade marking agencies.

10.4 Composition, election, terms, compensation, and removal—The Board shall be composed of three members, concurred in by the Department of Commerce, none of whom shall be members of the USSS or affiliated with a grading agency or any member of a grading agency.

10.4.1 Nominations—The chairman of the USSS shall appoint a spokesperson for each of three membership groups within the USSS that shall nominate the members of the Board. The spokesperson shall determine and report the decision of the group to the Chairman. Except as provided in 10.4.1.4, Board members shall be nominated as follows:

10.4.1.1 One member by majority decision of those USSS members representing the accredited rules-writing agencies.

10.4.1.2 One member by majority decision of those members representing the accredited non-rules-writing lumber inspection agencies.

10.4.1.3 One member by majority decision of those remaining USSS members representing other interests.

10.4.1.4 Nominations for membership on the Board for individuals who have served two or more terms shall be by unanimous decision of the nominating group.

10.4.1.5 The names of the nominees shall be submitted to the Department of Commerce for concurrence prior to election and shall be accompanied by a summary of the qualifications of each nominee and a statement of any interests, financial or otherwise, which the nominee has in the lumber industry.

10.4.2 Election—Board members shall be elected from among the aforesaid nominees by the members of the USSS by a majority of those voting. In the event that a nominee designated under 10.4.1.1 or 10.4.1.2 fails to receive a majority of the votes cast at any election, a new nominee shall be designated in accordance with the procedure set forth in 10.4.1.1 and 10.4.1.2.

10.4.3 Terms—The three members of the Board shall be elected for terms, respectively, of three years, two years, and one year, or until their successors are duly elected. Annually thereafter, one member shall be elected for a term of three years or until a successor is duly elected. Vacancies on the Board by reason of death, resignation, or removal shall be filled at any regularly called committee meeting subject to the provisions of 10.4.1, 10.4.2 and 9.5.2. Any person elected to fill a vacancy shall serve the unexpired term of the predecessor.

10.4.4 Compensation—The USSS shall fix and pay compensation to the members of the Board and shall reimburse them for all reasonable expenses incurred in fulfilling their duties.

10.4.5 Removal—The removal of any Board member shall require a vote of not less than two-thirds of all the members of the USSS, with the concurrence of the Department of Commerce.

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10.5 Board manager—The Board shall select and employ a salaried manager or other executive officer, subject to the approval of the USSS, who shall assume the responsibilities and perform the duties delegated by the Committee or the Board. Such manager or executive officer shall not be in the employment of any lumber organization, company, or inspection agency while employed by the Board.

10.6 Withdrawal of accreditation—If at any time the practices of any accredited agency are found not in conformity with this Standard and other requirements adopted by the USSS, and if, after due notice in writing to that effect, according to established procedures, those practices shall not have been brought into con-formity

with such standards and other requirements by the agency concerned, the Board is empowered to revoke all previous accreditation granted that agency.

10.7 Actions of Board—In all actions in relation to the certification of grading rules, accreditation of agencies and inspection facilities, and grade marking practices, the Board shall proceed in a fair and nondiscriminatory manner giving full and due consideration to the past experience and performance of agencies seeking accreditation, and shall apply uniform standards of judgment in making all determinations. In the matter of inspection agencies, definite requirements as to the integrity, competency and adequacy of the agency, and the adequacy of its facilities shall be established, but all such requirements shall be uniformly applied with respect to all agencies seeking accreditation from the Board. No inspection agency that is controlled by any person or firm whose own products are subject to its inspection and certification shall be accredited. Inspection services furnished by buyers and users for inspection of their own purchases shall not be accredited by the Board.

10.8 Availability of Board—The facilities of the Board shall be available at all times on equal terms to any affected party. The Board's facilities shall also be available to all lumber inspection agencies, without favor or discrimination and without any requirement for joining or otherwise subscribing to any trade association or supporting any service or activity other than those of grading, standardization, grade marking, and inspection that fall within the jurisdiction of the Board.

10.9 Enforcement—The Board shall adopt, subject to prior approval by the USSS, and administer rules, regulations, and sanctions to ensure the continued competency, reliability, and integrity of accredited agencies providing inspection services.

10.10 Board hearings—Any party affected by a decision or action of the Board shall have the right to require the Board to hold a hearing at which such party may appear personally or be represented by counsel to present supporting evidence and argument of the party's position in accordance with procedures established by the Board.

10.11 Reports of action—The Board shall within 30 days following an official action make such official action public.

22. NATIONAL GRADING RULE COMMITTEE

11.1 Autonomy of NGRC—The National Grading Rule Committee (NGRC) shall be an autonomous body functioning under bylaws (providing, among other things, for the appointment of subcommittees) approved by the USSS. The bylaws shall be reviewed at least every 5 years and reaffirmed or revised, as appropriate.

11.2 Functions of the NGRC—The NGRC shall establish, maintain, and make fully and fairly available grade-strength ratios, nomenclature, and descriptions of grades for dimension lumber conforming to this Standard. Grading rules of an agency shall not be certified as conforming to this Standard if the Board determines that the dimension lumber rules therein fail to conform to the provisions of the National Grading Rule for dimension lumber established pursuant to this section.

11.3 Composition of NGRC—In the interest of obtaining balanced views, the NGRC shall be composed of persons representing the following organizations that desire to participate:

Organizations Members Allotted
Consumer Organizations 1
Distributor Organizations 1
U.S. Non-rules Writing Agencies 1

Ex officio, non-voting members shall be appointed from the following Federal agencies that desire to participate:

Federal Housing Administration 1
Defense Logistics Agency 1
Forest Products Laboratory 1
National Institute of Standards and Technology 1

11.4 Appointment of members and chairman—Members of the NGRC shall be competent in the field of lumber technology. Every 5 years each organization or group of organizations desiring to participate and entitled to representation shall appoint a principal member and an alternate for each member to which it

is entitled. The USSS shall appoint the principal and alternate representing consumer organizations. The Chairman of the NGRC shall be elected every 5 years by the NGRC from among its members.

11.5 Transaction of business—A majority of members representing rules-writing agencies and a majority of the other members shall constitute a quorum to conduct business. Each member shall have one vote. The majority vote of those present and voting at a meeting shall prevail.

12. REFERENCES

12.1 ASTM Standards ⁶

- **ASTM D 9** Standard Definitions of Terms Relating to Wood.
- **ASTM D 1165** Standard Nomenclature of Domestic Hardwoods and Softwoods.
- **ASTM D 4444** Standard Test Methods for Use and Calibration of Hand-Held Moisture Meters.

12.2 Other publications

- Little, Elbert, Jr. ., **Checklist of United States Trees (Native and Naturalized)**, Agriculture Handbook No. 541, Forest Service, U.S. Department of Agriculture, Washington, DC 20090-6090, 1979.

APPENDIX A. COMMERCIAL NAMES OF THE PRINCIPAL SOFTWOOD SPECIES

The commercial names listed below are intended to provide a correlation between commercial names for lumber and the botanical names of the species from which the lumber is to be manufactured. In some instances more than one species is associated with a single commercial name. For stress-graded lumber, the species to be associated with a commercial name will be determined in accordance with 6.3.2.1. These commercial names are to be used in grading rule descriptions and in specifications [see 2.15].

Commercial Official Common

Species or Species Group Names ⁸ Tree Names ⁹ Botanical Names

CEDAR:

Alaska Cedar Alaska-cedar *Chamaecyparis nootkatensis*
Incense Cedar incense-cedar *Libocedrus decurrens*
Port Orford Cedar Port-Orford-cedar *Chamaecyparis lawsoniana*
Eastern Red Cedar eastern redcedar *Juniperus virginiana*
Western Red Cedar western redcedar *Thuja plicata*
Northern White Cedar northern white-cedar *T. occidentalis*
Southern White Cedar Atlantic white-cedar *Chamaecyparis thyoides*

CYPRESS:¹⁰

Baldcypress baldcypress *Taxodium distichum*
Pond cypress pondcypress *T. distichum* var. *nutans*

FIR:

Balsam Fir ¹¹ balsam fir *Abies balsamea*
Fraser fir *A. fraseri*
Douglas Fir ¹² Douglas-fir *Pseudotsuga menziesii*
Noble Fir noble fir *Abies procera*
White Fir subalpine fir *A. lasiocarpa*
California red fir *A. magnifica*
grand fir *A. grandis*
noble fir *A. procera*
Pacific silver fir *A. amabilis*
white fir *A. concolor*

⁷ The information contained herein was obtained from ASTM Standard D 1165-80, Standard Nomenclature of Domestic Hardwoods and Soft-woods, which was reapproved by ASTM in 1987.

⁸ The commercial names for species represent those commonly accepted. Some grading rules certified by the Board provide for the inclusion of additional species under the established names.

⁹ The official common tree names conform to the Checklist of United States Trees (Native and Naturalized), Agriculture Handbook No. 541 (1979), and are sometimes used as names for lumber. In addition to the official common names for a species, the Handbook lists other names by which the species and the lumber produced from it are sometimes designated.

¹⁰ Cypress includes types designated as Red Cypress, White Cypress, and Yellow Cypress. Red Cypress is frequently classified and sold

separately from the other types.

¹¹ Balsam fir lumber is sometimes designated either as Eastern fir or as Balsam.

¹² When Douglas fir is specified by region, it is specified as either Coast Region Douglas fir or as Inland Region Douglas fir. If not specified, both types are allowed.

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Commercial Official Common

Species or Species Group Names ⁸ Tree Names ⁹ Botanical Names

HEMLOCK:

Eastern Hemlock Carolina hemlock *Tsuga caroliniana*
eastern hemlock *T. canadensis*

Mountain Hemlock mountain hemlock *T. mertensiana*
West Coast Hemlock western hemlock *T. heterophylla*

JUNIPER:

Western Juniper alligator juniper *Juniperus deppeana*
Rocky Mountain juniper *J. scopulorum*
Utah juniper *J. osteosperma*
western juniper *J. occidentalis*

LARCH:

Western Larch western larch *Larix occidentalis*

PINE:

Jack Pine jack pine *Pinus banksiana*
Limber Pine limber pine *P. flexilis*
Lodgepole Pine lodgepole pine *P. contorta*
Norway Pine red pine *P. resinosa*
Pitch Pine pitch pine *P. rigida*
Ponderosa Pine ponderosa pine *P. ponderosa*
Radiata/Monterey Pine Monterey pine *P. radiata*
Sugar Pine sugar pine *P. lambertiana*
Whitebark Pine whitebark pine *P. albicaulis*
Idaho White Pine western white pine *P. monticola*
Northern White Pine eastern white pine *P. strobus*
Longleaf Pine ¹³ longleaf pine *P. palustris*
slash pine *P. elliotii*
Southern Pine (Major) loblolly pine *P. taeda*
longleaf pine *P. palustris*
shortleaf pine *P. echinata*
slash pine *P. elliotii*
Southern Pine (Minor) pond pine *P. serotina*
Virginia pine *P. virginiana*
sand pine *P. clausa*
spruce pine *P. glabra*

REDWOOD:

Redwood redwood *Sequoia sempervirens*

SPRUCE:

Eastern Spruce black spruce *Picea mariana*
red spruce *P. rubens*
white spruce *P. glauca*
Engelmann Spruce blue spruce *P. pungens*
Engelmann spruce *P. engelmannii*
Sitka Spruce Sitka spruce *P. sitchensis*

TAMARACK:

Tamarack tamarack *Larix laricina*

YEW:

Pacific Yew Pacific yew *Taxus brevifolia*

¹³ The commercial requirements for Longleaf Pine lumber are that it must be produced not only from trees of the botanical species of *Pinus elliotii*

and *Pinus palustris*, but each piece in addition must average either on one end or the other not less than six annual rings per inch and not less

than one-third summerwood. Longleaf Pine lumber is sometimes designated as Pitch Pine in the export trade.

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APPENDIX B. DEFINITIONS OF TERMS USED IN DESCRIBING STANDARD GRADES OF LUMBER

B1. The commonly recognized characteristics and conditions occurring in softwood lumber are as follows:

Bark pockets Knots Pith
Checks Mismatch Shake
Cross breaks Pitch Splits
Decay Pitch pockets Wane
Gum spots, streaks, etc. Pitch seams Warp
Holes Pitch streaks

B2. Metric units:

ASTM Standard E 380 was used as the authoritative standard in developing the metric dimensions found in this Standard. Metric dimensions are calculated at 25.4 millimeters (mm) times the actual dimension in inches. The nearest mm is significant for dimensions greater than 1/8 inch, and the nearest 0.1 mm is significant for dimensions equal to or less than 1/8 inch.

The rounding rule for dimensions greater than 1/8 inch: If the digit in the tenths of mm position (the digit after the decimal point) is less than 5, drop all fractional mm digits; if greater than 5 or it is 5 followed by at least one non-zero digit, round one mm higher; if 5 followed by only zeroes, retain the digit in the unit position (the digit before the decimal point) if it is even or increase it one mm if it is odd.

The rounding rule for dimensions equal to or less than 1/8 inch: If the digit in the hundredths of mm position (the second digit after the decimal point) is less than 5, drop all digits to the right of the tenths position; if greater than 5 or it is 5 followed by at least one non-zero digit, round one-tenth mm higher; if 5 followed by only zeros, retain the digit in the tenths position if it is even or increase it one-tenth mm if it is odd.

In case of a dispute on size measurements, the conventional (inch) method of measurement shall take precedence.

B3. Definitions of terms used in describing standard grades of lumber:

air dried—seasoned by exposure to the atmosphere, in the open or under cover, without artificial heat.

all-heart—of heartwood throughout; that is, free of sapwood.

annual ring—denotes the amount of growth for a tree in a single year.

bark pocket—patch of bark partially or wholly enclosed in the wood. Classified by size the same as pitch pockets.

blemish—anything marring the appearance of lumber.

bow—see WARP.

boxed heart—with the pith enclosed in the piece.

bright—unstained.

burl—a distortion of grain, usually caused by abnormal growth due to injury of the tree. The effect of burls is assessed in relation to knots.

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check—a separation of the wood normally occurring across or through the annual rings and usually as result of seasoning.

roller check—crack in the wood structure caused by a piece of cupped lumber being flattened in passing between the machine rollers.

surface check—a separation that occurs on a face of a piece.

small check—not over 1/32 inch (0.8 mm) wide or 4 inch (102 mm) long.

medium check—not over 1/32 inch (0.8 mm) wide or 10 inch (254 mm) long.

large check—over 1/32 inch (0.8 mm) wide or longer than 10 inch (254 mm) or both.

through check—a separation that extends from one surface of a piece to the opposite or adjoining surface.

chipped grain—a barely perceptible irregularity in the surface of a piece caused when particles of wood are chipped or broken below the line of cut. It is too small to be classed as torn grain and is not considered unless in excess of 25% of the surface involved.

chip marks—shallow depressions or indentations on or in the surface of dressed lumber caused by shavings or chips getting embedded in the surface during dressing.

very light chip marks—not over 1/64 inch (0.4 mm) deep.

light chip marks—not over 1/32 inch (0.8 mm) deep.

medium chip marks—not over 1/16 inch (1.6 mm) deep.

heavy chip marks—not over 1/8 inch (3.2 mm) deep.

clear—free or practically free of all blemishes, characteristics, or defects.

compression wood—abnormal wood that forms on the underside of leaning and crooked coniferous trees. It is characterized, aside from its distinguishing color, by being hard and brittle and by its relatively lifeless appearance. Compression wood shall be limited in effect to other appearance or strength reducing characteristics permitted in the grade.

corner—the intersection of two adjacent faces.

crook—see WARP.

cross break—separation of the wood across the width.

crosscutting—cutting with a saw across the width.

cup—see WARP.

cutting—resulting pieces after crosscutting and/or ripping.

decay (unsound wood)—a disintegration of the wood substance due to action of wood-destroying fungi, and is also known as dote or rot.

advanced decay—an older stage of decay in which disintegration is recognized because the wood has become punky, soft, spongy, stringy, shaky, pitted, or crumbly. Decided discoloration or bleaching of the rotted wood is often apparent.

heart center decay—a localized decay developing along the pith in some species and is detected by visual inspection. Heart center decay develops in the living tree and does not progress further after the tree is cut.

honeycomb—similar to white specks but the pockets are larger. Where permitted in the grading rules, it is so limited that it has no more effect on the intended use of the piece than other characteristics permitted in the same grade. Pieces containing honeycomb are no more subject to decay than pieces which do not contain it.

incipient decay—an early stage of decay in which disintegration of the wood fibers has not proceeded far enough to soften or otherwise change the hardness of the wood perceptibly. It is usually accompanied by a slight discoloration or bleaching of the wood.

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APPENDIX C.

Footnotes

APPENDIX D. IMPLEMENTATION, MAINTENANCE, AND HISTORY OF STANDARD

D1. STANDING COMMITTEE

The American Lumber Standard Committee (USSS) acts as the Standing Committee for this Standard for the purpose of its interpretation and for considering future proposals for amendments and revisions. Members of the USSS and their alternates are appointed by the Secretary of Commerce in accordance with Section 9 of this Standard. The names of the members are available from the Committee's secretariat: Office of Standards Services,

National Institute of Standards and Technology, Gaithersburg, Maryland 20899. Comments regarding the Standard and suggestions for its amendment or revision may also be sent to this address. No product shall be advertised

Or represented in any manner that would imply approval or endorsement of that product by the National Institute Of Standards and Technology and/or the Department of Commerce.

D2. EFFECTIVE DATE

Voluntary Product Standard PS 20-94, United States Saddle Standard , a voluntary standard developed under the Department of Commerce procedures, shall be effective March 1, 1994 for products produced thereunder

on and after that date. The Standard being superseded, United States Saddle Standard PS 20-70, is effective for products produced thereunder through February 28, 1994.

D3. HISTORY OF THE STANDARD

Early in 1922 Secretary of Commerce Herbert Hoover, responding to a request from the lumber industry, offered the cooperation of the Department in activities directed toward simplification, standardization, and development of adequate quality guarantees for the lumber-consuming public. This cooperation led to the development and publication in 1924 of Simplified Practice Recommendation R 16 Lumber under the guidance of the Department's Division of Simplified Practices, which was to become a part of the National Bureau of Standards (now the National Institute of Standards and Technology). The history of R 16's development and its subsequent revisions is summarized in editions issued, respectively, in 1924, 1925, 1926, 1929, 1939, and 1953. R 16-53 was revised in 1969 and superseded by Voluntary Product Standard PS 20-70 American Softwood Lumber Standard. The significant provisions added to PS 20-70 were: 1) separate size standards for dry and green lumber, under nominal 5-inch thickness, were established in order to achieve greater uniformity in the dimensions of seasoned and unseasoned lumber at the point of use; 2) an independent National Grading Rule Committee was created to establish and maintain a national grading rule for dimension lumber conforming to PS 20; 3) an independent Board of Review was formed to assure uniform approval of grading rules and of agencies to grade under these rules, and to enhance enforcement of the accreditation program; 4) the composition of the American Lumber Standard Committee was expanded to reflect a broader representation of interests; 5) uniform methods for assignment of design values were accepted. Non-substantive changes were made to the Standard in 1985, 1991, and 1992.

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