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Standard Guide for Center Serving Diameter Dimensions for Archery Bow Strings[1]

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1. Scope

1.1 This guide covers the formulation of preliminary guidelines for the outside diameter dimensions of the center servings for the shooting strings for archery bows.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

2. Terminology

2.1 *Definitions of Terms Specific to This Standard:*

2.1.1 *bow string, n*—special multi-strand cord that spans an archery bow from end to end and is used to engage the rear end of an arrow in order to launch it into flight.

2.1.2 *bow string material, n*—strands of various materials, both natural and synthetic, from which bow strings are made.

2.1.2.1 *Discussion*—Most bow strings today are manufactured from synthetic materials that have superior strength and resistance to wear and atmospheric conditions. Difference in the tensile strength of the materials is responsible for a difference in the size and number of the strands in a bowstring. In addition, difference in the force necessary to draw various bows may dictate varying numbers of strands of a given material to provide adequate strength for satisfactory service. The material used for wrapping to create a center serving is available in several sizes or diameters. This, combined with variation in the number of strands used to make the main string, permits adjustment of the outside diameter of the center serving within reasonable limits so that standardization is practical.

2.1.3 *center serving, n*—wrapping of twisted or braided line, or monofilament material, that is placed on the bow string near its center.

2.1.3.1 *Discussion*—This wrapping covers the area where the nock of the arrow engages the bow string. It is used to resist the abrasive wear of repeated shots and also to provide a proper fit with the slot of the nock.

2.1.4 *draw weight of the bow, n*—peak or maximum force required to draw the bow string of a bow from its position at rest (brace height) to the full draw position.

2.1.5 *nock, n*—slot, or a special fitting that contains a slot, that is positioned at the rear end of an arrow to engage the bow string.

2.1.5.1 *Discussion*—The slot maintains secure contact with the bow string while the bow is being drawn, and also during the release of the string and the return of the string to its original position before being drawn.

2.1.6 *string groove width or slot throat dimension, n*—narrowest portion of the slot opening in the nock, usually located near the open end of the slot.

2.1.7 *string hole size, n*—dimension at the bottom or base of the nock slot.

2.1.7.1 *Discussion*—This is the area where the bow string sits when it is seated in the slot.

3. Significance and Use

3.1 This guide is not meant to be all inclusive since there are, and will continue to be, special circumstances that will dictate the use of nonconforming dimensions. These special circumstances and the requirements that they establish cannot be totally anticipated and therefore must be treated individually.

3.2 These guidelines are based on an analysis of presently used materials for the manufacture of bow strings and the strength requirements dictated by archery bows falling within a draw weight range of 0 to 100 lb (0 to 444.8 N).

3.3 These guidelines also address the desirability of proper fit of the arrow nock to the center serving.

4. Fit of the Nock on the Center Serving

4.1 *Preferable Fit*—While there are some instances where the practice is not followed, the majority of archers prefer that the nock of the arrow be retained on the bow string with a slight "snap-fit." This is mandatory when the archer uses a mechanical device to hook onto the string to draw the bow, and to aid in releasing the string to launch the arrow. The alternative technique allows only the use of the fingers to draw and release the string and provide action on the nock to retain

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the arrow in position on the string. However, there are specific methods of using the fingers, such as positioning all fingers under the nock, that also require "snap-fit" action of the nock. In general, whether using a mechanical device or exclusive finger release technique, most archers desire some "snap-fit" of the nock on the string.

4.1.1 Too much snap-fit or pinch of the nock on the string is not desirable, since it can cause shooting inaccuracies as well as reduction in the velocity of the arrow in flight. Extreme interference fit can result in failure of the nock as a result of shock loading when the bow string is released. For these reasons, it is important to be able to control nock-to-string fit within reasonable limits. Some snap-fit is desirable; too much is undesirable.

4.2 *Influence of the Design and Manufacture of Nocks*—Most of the separate nocks in use today are injection molded plastic. Various designs take different approaches to obtain the desired fit of the nock to the string. It is most common to provide a throat at the opening of the slot that is smaller than the diameter of the center serving and then enlarge the bottom of the slot to accept the serving diameter with a slightly loose or slight interference fit. The tangs of the nock have sufficient resilience to spring open to permit the nock to slip over the serving and then recover to retain the nock on the string. To some degree, the design of the nock and the amount of resilience influences the dimension of the opening in the throat of the nock.

4.3 *Importance of Controlling Center Serving Diameter*—In order to provide nock manufacturers with basic dimensions and tolerances on which to base their nock designs for the sizes used in greatest volume, it is necessary to establish standardized dimensions and tolerances for the outside diameter of the center servings on bow strings.

5. Recommended Dimensions and Tolerances

5.1 *Center Serving Diameter*—Analysis has determined that two sizes of center serving diameter can permit sufficient latitude to cover appropriate bow strings for bows ranging in draw weight from 0 to 80 lb (0 to 355.8 N). This is made possible by varying the type of material used, the number of strands employed to form the string, and the type and diameter or size of the material used to form the center serving. The amount of tension used to apply the center serving will affect or influence the diameter of the center serving. Experience has revealed that it is practical to hold the tolerance on the diameter to ±0.004 in. (0.10 mm). Therefore, the recommended diameters for the center servings of bow strings with the bow string under 100 lb tension are as follows:

5.1.1 A serving size of 0.102 ± 0.004 in. (2.591 ± 0.10 mm) for bows under 30 lb, and is to be used for nocks with small throat sizes.

5.1.2 A serving size of 0.112 ± 0.004 in. (2.845 ± 0.10 mm) for bows ranging from 30 to 80 lb, and is to be used for nocks with large throat sizes.

6. Keywords

6.1 bow string; center serving; nock; slot; string hole