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KAYAK SKIN MATERIALS, January 2010

Over the past 26 years, we have sold over 20 miles of kayak skin material—one boat-length at a time. This listing makes no attempt to explain how (or why) to cover kayaks with these materials; it is just to help you select which of the available materials you may want to use. Before discussing specific fabrics, there are three general questions—closely related and without definite answers—to be discussed first:

1) Nylon vs. Polyester. About 2/3 of the material used so far has been nylon (polyamide); but use of polyester (Dacron) has been growing in the past few years. There are two reasons for this: a) we are selling more material to builders of traditional wood-skeleton kayaks, and dimensionally-stable polyester is less likely to distort lightly-constructed wooden frameworks by shrinking up too tight, and b) more builders are using one-part or water-based polyurethane coatings, whose lesser elasticity and adhesion is better matched to polyester than to nylon. (The coating should be more elastic than the fabric to which it is expected to adhere). If you use an elastomeric, solvent-based coating like Hypalon (chlorosulfonated polyethylene), Neoprene, or one of the elastic (and expensive) 2-part polyurethanes, however, nylon will produce a tougher, more damage-resistant skin. Nylon's greater elasticity makes it easier to cover complex curves, but the looser-weave polyester fabrics drape pretty well and can (usually) be shrunk to fit. Bottom line: each is different, but neither is better.

2) Shrinkage. An essential characteristic of (almost) all the fabrics we sell is that they will shrink. The question is how much! Shrinkage usually ranges somewhere between 1% and 5%. Getting the tension right requires careful tuning—see what happens if you loosen or tighten a guitar string by a quarter of an inch. Nylon's behavior is especially complicated because it tends to loosen (even when coated) by absorbing ambient moisture and then tightens as it dries out. So you are aiming for middle ground: the skin (before coating) should fit snugly, but not drum-tight. As one builder describes it, "If you drop a quarter on it, it shouldn't bounce." From the point of view of the boat's structure and performance, it is better for the skin to be too loose than too tight, but from the point of view of the builder, too loose (suggesting sloppy workmanship) is worse. You shrink nylon by applying moist heat (wetting it and going over it with an iron so that you are steaming it without drying it out). The moisture relaxes the skin while the heat shrinks it, so that when it dries out it will be taut—hopefully not too tight. If you attempt to shrink nylon with dry heat—either with an iron or a heat gun—the combined drying and heat will tighten it up so much that the fibers are permanently stretched, and when it returns to room temperature and absorbs ambient moisture, it will be *looser* than when you started out. Polyester, however, which does not absorb moisture, can be shrunk with a dry iron (safer than a heat gun) and the resulting tension remains stable: "what-you-see-is-what-you-get." Some people view nylon's idiosyncrasies in response to moisture as a disadvantage; some people view it as an acceptable part of a craft whose relationship to water should be that of a living thing.

3) Coatings. No coating we know of is ideal. In general, more poisonous solvent-based coatings perform better—especially in sticking to nylon—but water-based coatings can be toxic too. The main reason to favor polyurethane over Hypalon is that it is more widely available (as floor coatings, concrete coatings, etc.) and results in a translucent skin. If you are not concerned with translucency, the evidence favors Hypalon—for long-term durability, both because of UV resistance and because the surface can be easily replenished over the years. As for which coating to use on the lighter fabrics: Hypalon is definitely more robust. But if you use translucent urethane, the kayak *is* slightly lighter, *looks* a lot lighter, and tends to get treated much more carefully, and so may last as long or longer in the end.

As a very rough rule of thumb, for an average single kayak of about 18 feet in length the finished, coated skin in N-ounce (per square yard) material will add about N pounds to the boat. We generally ship UPS ground or Priority Mail to USA destinations, and USPS International Priority Mail to Canada and overseas. Shipping is at (or often below) cost, estimates on request, currently an average single kayak skin is about $10 within the USA, $25 to Canada, and $40 overseas. Now the specific fabrics (weights in ounces per square yard, and **prices in US Dollars per lineal FOOT**):

7N63: 7-ounce Nylon, plain weave, 61-inch width. Nearly identical to the 8-ounce nylon we sell large amounts of, below, but this batch is slightly lighter and narrower, so we are selling it for less. **$2.00**

8N67: 8-ounce Nylon, plain weave, 67-inch width. Just about right—loose enough to drape acceptably and tight enough to hold a seam. Shrinkage is moderate, and well suited to lightly-framed wooden boats. [CURRENTLY OUT OF STOCK] **$2.50**

8PE70/76: 8-ounce Polyester, plain weave, 70 or 76-inch width. Our lightest polyester—and still more than twice the weight of the 3.7-ounce Dacron commonly used for covering aircraft. Drapes and shrinks well, weave is a bit loose and has to be sewn carefully, but easier to work with than the 9-ounce polyester twill we carried for a few years. **$2.00 for 70 / $2.50 for 76-inch width.**

12NB63: 12-ounce Nylon, 2x2 basket weave, 63-inch width. This is classic "ballistic nylon"—now popularized in sporting goods and luggage, if no longer used in bulletproof vests. Basket weave (symmetrical over-and-under, but with two bundles of fibers at a time) makes for a less-smooth but pleasantly textured surface. Weave is about right, and shrinkage is moderate. **$4.00**

12NO54: 12-ounce Nylon, oxford weave, 54-inch width. Dense, tightly-woven material, will hold a seam exceptionally well, in a narrower width with less waste for covering narrower hulls. **$3.00**

13PE79: 13-ounce Polyester, oxford weave, 79-inch width. This was the first polyester fabric we distributed, and it has developed a small but loyal following over the years, led by custom kayak-builder Bill Low. This material has been almost fully pre-shrunk, so the weave is exceptionally tight—making it somewhat stiff and difficult to use. Because of the dense structure, it takes very little coating to saturate, but there is very little porosity for the coating to mechanically adhere. Due to UPS length restrictions, it is much more economical to ship small quantities of fabric folded than rolled, but if you receive this material folded, unfold it and roll it up smoothly as quickly as possible, since like permanent press polyester trousers, it tends to hold a crease. **$6.00**

14PE60 & 14PE72: With occasional minor flaws but at a great price. A basket weave polyester, somewhat looser weave than the 16PE82 we have been selling for 10 years. Limited supply. **$3.00 for 60-in / $4.00 for 72-in.**

15N72: 15-ounce Nylon, twill weave, 72-inch width. We have been supplying this material (and the discontinued 12-ounce version) to builders since 1982, and it has proved its worth on many hundreds of boats—ranging from short retrieval kayaks and surf boats to 25-foot aluminum-framed triples and smaller umiaks and skiffs. The twill weave drapes easily, and holds coatings well. **$6.00**

16PE82: 16-ounce Polyester, 2x2 basket weave, 82-inch width. We acquired a large run of this material several years ago, and it has been well received but supply is running out. Weave is a bit loose, but it will still hold a seam and of the three polyester fabrics available it is the easiest to use. Shrinkage is moderate and easily controlled. The price width is enough for two narrow kayaks side by side, or you can stagger wider boats. **$8.00**

26N68: 26-ounce Nylon, double weave, 68-inch width. An amazing fabric, which we discovered in 1980 and which has withstood decades of severe abuse on many large, heavy boats. It is the heaviest material we sell, but it is also one of the easiest to use. The thick, interlocking structure makes it behave more like real sea-mammal skin than anything else we have seen. Coatings penetrate and bond well, and because of the layered structure the surface can suffer serious abrasion and the skin will still not leak. Unfortunately its manufacture has been discontinued, but we bought up the last production run of this material and should have it on hand for many years. Available only in 68-inch width, so wider doubles and triples require a small patch on deck where the two sides of the fabric don't quite meet. Well-suited to covering large, hard-working baidarkas—and umiaks, too. **$12.00**

29PE84: 29-ounce Polyester, double weave, 84-inch width. This ultra heavy-duty fabric is made as substrate for conveyer belting. It has a very dense 3-dimensional weave and a flat, smooth surface. Well-suited for umiaks or other large skin boats. **$12.00**

459: 1.5-in Nylon webbing. For keel reinforcement, Mil-T-5038 spec. This is a thin nylon tape with a good balance between smoothness and texture, and a very clean shuttle loom edge. **$0.30/foot**

PTW & BTB: Braided polyester twine (in White or Black). Ideal for sewing skin material (& lashing skeletons). Approx 60-lb test high-tenacity polyester, holds knots well and lays flat, hollow core and very fine braid. Approx 75 yards per ounce, made up in assorted size spools. **$2.00/ounce**

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