How to Pick a Polyester Bag

What's your bag? Revisited.

by Nelson Packer

When I moved East I brought a measure of Rocky Mountain arrogance with me. I had an idea that eastern mountains weren't worth any enthusiasm. As I was used to thin, cold, Colorado air and stunning verticals, there'd be nothing challenging in the three to five-thousand-foot nubbins they call mountains.

Pride, as the man said, goeth before a sleepless night. I had walked up Panther Mountain one late December afternoon in the company of a local hiker. Near the summit we made camp in a lean-to. We were traveling light. I had an excellent down bag and bivouac sack, Jack had an old and atmospheric wool bag. I smiled condescendingly and unrolled my foam pad upwind from him.

The night was clear, cold and humid. Condensation formed on everything. Half an hour after we'd settled in, I was soaked and shivering. Jack snored, wrapped in wool and the sleep of the profoundly hypocritical. I put on all my woolens, munched my gorp and chocolate, and swore a lot. The low flame of resentment kept me alive until early morning. I lit the stove well before dawn and was huddling over a hot cup when Jack woke, surveyed my wringing state and wisely refrained from comment.

Until that night I had regarded polyester sleeping bags with thinly disguised disdain. On the one hand they were for hunters and autocampers and on the other for National Outdoor Leadership School graduates who needed to show off.

But back in town I bought one.

Weight.

The typical polyester backpacking sleeping bag—the one a conscientious and knowledgeable salesman would probably show you—weighs between four and five pounds; maybe a bit more. That's probably half again as heavy as an equivalent down bag, but it's certainly not outrageous.

Loft.

The warmth of any sleeping bag is a function of how much dead air it puts between you and the elements. Most of the equipment catalogs quote loft figures on the order of 4 to 6 inches for polyester bags. Those figures are a bit deceptive; they're almost all measured from the floor to the top surface of the bag. A more accurate measurement (since, when you're inside the bag, you've got just one layer around you) is half that figure. A well-made 4½-pound polyester bag should give you about 2½ inches of loft, measured from the inside of the bag outward. Most responsible manufacturers would rate such a bag as comfortable at 20 to 30 degrees.

For the sake of comparison, a typical 2-pound duck down bag has about the same loft and totals out at just over 4 pounds. If you're comfortable in an old and thoroughly used 2-pound goose bag, you're probably sleeping with 2½ to 3 inches of loft. A good 1½-pound goose down bag has, again, about the same loft and totals just over 3 pounds. The down bags are much more expensive, much harder to clean and tend to lose their loft in the long haul.

Construction.

The most important thing to look for is that the loft be maintained evenly throughout the bag. Most polyester insulation comes in rolls of batting which the manufacturer then cuts and sews between layers of nylon. The batting has to be secured somehow to keep it from gradually curling at one end of the bag. It doesn't need to be contained in baffles like a down bag (which partially offsets the weight penalty) but it does need to be stitched across and along the edges. There are various ways to stabilize the stuff (see the following article) but they all should preserve the loft. The cheapest bags—those to be avoided—are sewn-through: one layer of nylon, one layer of batting, another layer of nylon and stabilizing seams which squeeze the batting to zero thickness and let all the heat out. Such bags are mainly suitable for warm weather, station wagon and indoor camping.

Most good bags use two layers of batting with alternating stabilizing seams, forming a double quilt. From outside, such a bag may look very much like an inexpensive down bag with baffles sewn 10 to 12 inches apart.

Several manufacturers use unique, unorthodox or patented stabilizing systems. I don't know that they're worth paying extra for. As long as the loft is even along the length and breadth of the bag, around the foot and up the seam opposite the zipper, and as long as the batting is well secured, you can expect the bag to be warm and stay warm.

Fabric.

Fabric is of less critical importance in a polyester bag than in down gear—another reason the bags are cheaper. The stuff doesn't have to be down proofed since polyester fibers interlock and won't work through the shell as feathers quills tend to do, though it should be of a fairly tight weave. If it rips the insulation won't cascade out, so it's not absolutely vital to have a ripstop fabric. In fact, a good, gutsy, light and uncoated nylon taffeta is what you'll encounter most often among the best bags. If you insist on ripstop, that's your privilege. But taffetas of looser weave often drape better and are more comfortable to sleep with. I've heard some talk that *coated* fabrics may be the right choice for sleeping bags. That idea comes from the same people who recommend coated tents—the ones who don't know anything but the dry air of southern California.

Detailing.

Construction details should be of the same quality you expect in a good down bag.

Stitching.

The best way to evaluate the workmanship of a bag is to check its stitching. It should be even and close and bar tacked at points of stress—zipper ends and drawstring exits.

Eight stitches per inch is a good figure. Five per inch is poor. Check stitching inside the bag as well as out; the most challenging and therefore most telling area is inside the foot of the bag. If you turn that inside out and hum over it importantly, the salesman will be impressed.

Zipper.

The zipper should run, ideally, from the top of the bag to the bottom. A two-way zipper, opening from foot as well as head, allows for flexible ventilation and, usually, permits mummy bags of opposite sexes to zip together. Some bags still use metal zippers. Not many backpackers buy them; the plastic and nylon zippers are so much smoother, safer and jam free.

Zipper draft tube.

The zipper is the thermal weak point on any bag. A fat draft tube should run the entire length of the zipper and, preferably, some inches beyond at the pedal end.

Zippers jam most often because draft tubes get caught in them. Polyester batting has greater mechanical stiffness than down and so tends to keep folds of fabric away from the zipper, but the problem remains. Many manufacturers now sew a strip of stiffening material into the draft tube to keep it from fouling the zipper. It's a good idea as long as the stiffener doesn't hold the tube away from the zipper when it's closed. That would defeat the whole purpose of the tube.

Size.

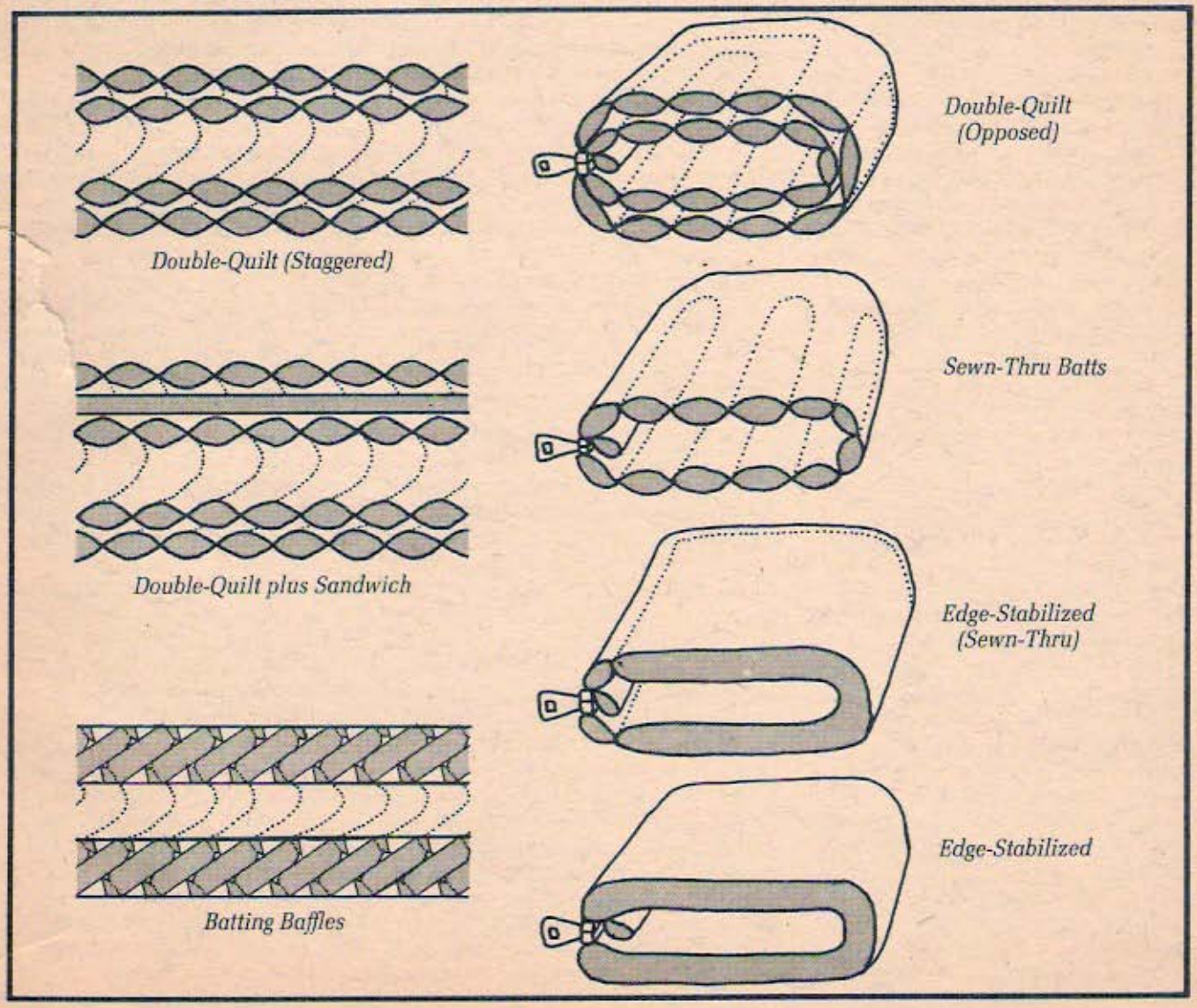
In general, you belong in the smallest bag that fits you. It will be lighter and warmer than larger bags. But don't bind yourself into a constricting bag; take the next size up over a bag that *just* fits. Your feet shouldn't press against the foot. A test I like to make is to zip up inside and then try to scratch my back. If I can do that comfortably, I figure the girth is about right.

Hood.

The bag should have a hood that can be drawn around the head and securely closed. Without it body heat will escape through the top. And, obviously, the hood should work easily from inside the bag.

Shape.

Polyester bags come in all the same shapes as down bags: mummies, modified mummies, barrels, semirectangulars, rectangulars, doublebags, layered bags and so on. In terms of weight and warmth, the mummy is still the best bet for the backpacker. The barrels and semi-rectangulars rank just behind the varieties of mummy in efficiency. Many people much prefer them for the additional room they provide.



Design and Construction: Polyester Bags

Baffled by Batting?

by Seth Masia

Polyester batting needs to be stabilized —without adding sewn-through seams.

First, to basics: A sleeping bag is intended to preserve body heat. The ideal sleeping bag would—

1. allow no heat to escape from its interior.
2. allow body moisture to escape.
3. weigh little or nothing and compress into a package of insignificant size.

Those are three mutually contradictory requirements, for reasons which will be made clear below. Certain modern aluminized fabrics developed for NASA do a great job of containing heat.

Unhappily, they're impervious to moisture, so most people would feel drowned in their own perspiration if wrapped in these fabrics overnight. We still have to rely on thickness for insulation—the thickness of dead air.

Dead air.

If air is not allowed to convect, it can't carry heat away from the body. Dead air is as close to absolutely still as it is possible to be. If we intercept air movement by breaking it up with millions of fibers, into tiny air pockets, cutting convection to insignificance, we have good thermal insulation. Gerry Cunningham once wrote that you could get decent insulation by intercepting air at quarter-inch intervals, but the people who install building insulation will tell you that four inches of tightly packed glass fibers insulate better than four inches of loosely packed glass fibers. The finer the insulator, the closer the fibers, the deader the air and the more efficiently convection is killed.

Loft.

More important than deader air is thickness of dead air. The Quartermaster Corps has developed a guide for rating the insulation value of clothing and sleeping bags. Simplified, the relevant figures run like this:

Temp.:	40	30	20	10	0	-10	-20	-30	degrees F.
Insul.:	1½	1¾	2	2¼	2½	2¾	3	3¼	inches

But that's for the army, and the army has never been famous for caring about the comfort of its minions. I'd treat those figures as the minimum necessary for survival in still air. For comfort, I'd double them.

Most sleeping bag manufacturers measure loft by zipping up their bags, laying them out and measuring from the floor to the top surface of the bag. But when you're inside a bag, you have only the top half of the bag above you, or about half the loft that the manufacturer claims. If he says the bag lofts to eight inches, that's only four inches of insulation, and the average healthy adult would probably be comfortable in it, on a still, dry night, down to 20 or 15 degrees Fahrenheit.

As a rule of thumb, add half an inch of insulation for each 10 degrees of temperature drop. If, for instance, you're comfortable with less than one inch of insulation at 60 degrees, you'll want two inches at 40 degrees, three inches at 20 degrees and so on.

Down.

The backpacker needs efficiency. He needs the most warmth per ounce of filler, and that's where down has the advantage over all other insulating materials, natural or synthetic. Good goose down used to loft in the neighborhood of 750 cubic inches per ounce. Nowadays, the reputable sleeping bag manufacturers guarantee the loft of their goose down to only about 550 cubic inches per ounce and are turning increasingly to duck down. The best duck down may loft to 525 cubic inches per ounce and is much cheaper.

Wet down.

It used to be that there was no such thing as a plastic-coated sleeping bag because the human body generates about a pint of moisture during the night and that's got to evaporate through the bag. Some heat is lost via this evaporation, but, on the other hand, soggy down makes worthless insulation. Now Jack Stephenson in southern California makes sleeping bags out of plastic-coated fabric. He claims that the "vapor barrier" maintains the humidity needed for comfort and keeps the down dry. Maybe that's so; maybe not. If so, it must be because of the low humidity in southern California.

There are stitch-holes in every sleeping bag. In moderately humid climates some moisture will inevitably get in with the down. When you pull a plastic-coated sleeping bag from its stuff sack and fluff it up, air has to enter the down channels somehow. If the air is normally humid, the moisture gets into the down channels along with the air. Common sense tells you that if the night is chilly, the outer surface of the bag cools, and moisture in the down channels will condense on the inside of the plastic coating and wet the down.

Humidity becomes most troublesome in still air. In forests and sheltered meadows—anyplace where there is dew—down sleeping bags will get wet. In the mountains, at least above tree line, wind tends to reduce condensation. But no place is as humid as the inside of a snow cave or the inside of a tent when soup is boiling. Specifically to cope with these two situations, mountaineers began some years ago looking for alternatives to down that would hold their loft in moist air.

Polyester fiberfill.

Polyester fiberfill lofts about 350 cubic inches per ounce. It doesn't compress as tightly as down but dries quickly and retains a significant insulation value even when wet. Several years ago Paul Petzoldt of the National Outdoor Leadership School began touting polyester's virtues; since the price of down went out of sight most of the premium bag makers have added polyester-filled bags to their catalogs.

Polyester batts.

Du Pont sells Dacron fiberfill II in batts of varying thicknesses composed of fine springy fibers—stiffer and coarser than down cilia, of course, but nonporous so they don't hold water long. The Du Pont fibers average two inches in length and are distributed randomly through the batt so that they'll spring back to full loft.

The competitive Celanese material, Polarguard, has longer fibers, each measuring 100 inches or more. The batts don't need to be confined in channels but do need to be stabilized, or the fill will withdraw from the corners of the shell, creating gaps in the insulation.

There are some significant differences between Dacron II and Polarguard. Skip Shoutis, who is in charge of research and development for Paul Petzoldt Wilderness Equipment, says: "We're using fiberfill II in our sleeping bags, but we're also experimenting with Polarguard. Fiberfill II lofts better because of the shorter fibers, but the loft of Polarguard appears to increase after a couple of washings. However both fibers, like down, tend to lose some loft after extensive usage. Most of our clothing line is insulated with Polarguard because it holds up better where constant manipulation occurs (such as in the palm of a mitten). If we quilted our products, Dacron II would work equally well. We feel we've got the best of both worlds in our applications of the two fibers."

Sewn-through batts.

The cheapest bags use a single layer of batting stabilized by sewn-through seams which pinch the two sides of the nylon shell together through the batt. The seams may run longitudinally or laterally in relation to the length of the bag, but the result inevitably is a bag suitable only for use in relatively mild weather.

A variation is the edge-stabilized sewn-through bag. The batting is secured only around its edges, with a sewn-through seam. The total sewn-through area is much reduced, making a warmer bag. But this construction method involves an absolute minimum of sewing, and the buyer would be justified in suspecting that the manufacturer may have cut corners on construction and quality of material.

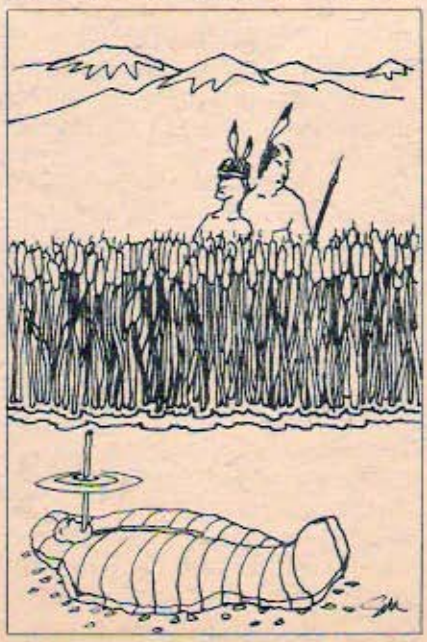
Edge-stabilized batts.

A construction method now used in a large number of medium-priced bags is edge-stabilization without sewn-through seams. Polarguard, because of its longer, continuous filaments, lends itself particularly well to this construction since it's less likely to pull apart. The batting is sewn around its edges to the shell material, usually at the zipper seam and drawstring tube.

Double-quilt batts.

The most common construction in high-quality polyester bags is one variety or another of double-quilt bag. Very simply, double-quilt construction consists of two layers of sewn-through batting backed up against one another. There are a few bags around in which the sewn-through seams of each layer lie directly against each other—"opposed seam" double quilting—but the more efficient construction method staggers the seams so that the thin spot on one batt is blocked by the thick spot on the other.

Snow Lion, in its best Polarguard bags, has gone double quilting one better by sandwiching a third edge-stabilized batt between the two quilted layers on the top side of the bag. Bill Simon of Snow Lion says, "The top comes out about 33 percent thicker than the bottom. In order to achieve the bottle mummy shape of the bag, we found it necessary to cut the top and bottom pieces separately, creating an inner and outer side seam. These two side seams were a source of potential cold spots. We solved the problem by extending the top middle layer of Polarguard around the side, insuring uniform insulation at the side."



Batting baffles.

The North Face has the most efficient system we've seen. It's the "batting baffle" system, whereby the batts are sewn the way slant baffles would be on a down bag, overlapping one another over half their length. That provides at least two thicknesses of batting at any given point. A glance at our specifications chart will show that this construction method has yielded best loft-for-weight of the bags in our sample.

Foot construction.

The foot of any sleeping bag is likely to give a manufacturer headaches. If the bag is to have a proper box toe, a separate flat sole piece must be cut and sewn to the main batts without adding sewn-through seams. Another awkward area is the seam from the end of the zipper south to the foot. The two main batts come together here without the zipper to separate them, and must, again, be sewn together without adding a sewn-through seam. Many manufacturers solve these problems by continuing the zipper draft tube down to the foot to cover this seam and insulating the edges of the sole piece with a second layer of batting. Some leave a couple of inches of sewn-through seam below the zipper. Two or three inches of it probably doesn't make a very big difference unless you tend toward cold feet. But a sewn-through seam around the box toe, or the lack of a draft tube across the zipper of a flat toe, guarantees that you'll sleep with cold feet. Careful attention to even lofting in the foot area is one sign of a well thought-out, well-built bag.

Averages.

That's the basics. As you read our evaluations or examine polyester bags in the stores, it may be helpful to remember the following average figures for all the bags in our sample: Loft: two inches. Weight: four pounds 12 ounces. Price: $50. Any bag that gives much better than two inches of loft at that weight is probably carefully designed and worth a little more money; so is any bag that weighs much less and yet gives two inches of loft.