Keeping the Heat in - A Guide to Insulation

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Winter has arrived and with predictable fury. Everyone is reaching into their closets and dragging out the heavy clothes. Some of you find great joy when the white stuff starts falling. Others will live through the entire winter shivering with dread. Now, there is no reason to fear the onslaught of winter as long as you are properly dressed. But that's the problem - many of you won't be. I am going to list the five ways body heat is lost and some of the more popular insulators on the market today.

Radiation - This is a type of invisible energy which is emitted by all objects and can be reflected back to the body by a shiny or light-colored surface.

Convection - Convective heat loss occurs when the warm air layer next to the skin is carried away, usually by wind. Clothing must be dense enough to keep the wind from reaching the skin as well as contain the warm air.

Conduction - This is the transfer of heat from molecule to molecule. For example, touching your warm hand to a cold piece of metal. Insulation containing a lot of dead air space and thickness of material are the two things which will minimize this type of loss.

Respiration - We inhale cold air, exhale warm air. Not much you can do about that.

Evaporation - Trapped perspiration evaporates and cools the layer of air next to the skin. Proper ventilation *before* you start to sweat will alleviate this problem.

Natural Insulation

Down - It comes from the undercoat of waterfowl and is an outstanding insulator, but it does have one major drawback. When it gets wet it mats up and will lose up to 95% of its insulating value. It also takes a long time to dry. Wearing down clothing is something you may regret if placed in a survival situation. My advice is to leave it at home.

Wool - You can't go wrong with wool. It is warm, long wearing, and will retain up to 95% of its warmth when wet. Wool clothing can be purchased inexpensively from Army surplus stores, and flea markets.

Synthetic Insulation

Fiber Pile - This was invented for use by Scandinavian fishermen over 20 years ago. It is as warm as wool but will absorb less water and thus dry out more quickly than wool. It is, however, not as durable as wool.

Polarguard and Quallofil - These were designed to compete more closely with down for warmth yet retain most of that warmth when wet. Quallofil is the lighter and warmer of the two.

Thinsulate and Softique - These are warmer than any other materials of comparable thickness, including down. However, it is expensive and used mostly in skiwear.

Tex-O-Lite - This is an aluminum-coated Mylar film which can reflect up to 80% of your radiant body heat. One problem is that it is also a vapour barrier and does not allow perspiration to escape. The manufacturer has partially solved this problem by punching thousands of tiny holes in the Mylar film.

Comments on Clothing

These are the most used materials and all of them, except for wool and fiberpile, need to be encased in some type of shell. Usually this shell is made of nylon or some other synthetic, which you all know from your Standard Class to be noisy in the woods. This is why wool and fiberpile are so good.

Here are some tips on clothing:

- If your clothes do get wet, be sure to wring them out as soon as possible. Not only will your clothes dry quicker, but all that water will conduct heat away from your body.
- Always wear several layers of clothing. Two light sweaters are warmer than one heavy layer because of the layer of air trapped between them.
- When you start to sweat, remove a couple layers of clothing. Trapped perspiration will evaporate and cool the skin.
- Don’t forget to wear a hat. Up to 50% of your heat can be lost out the top of your head.
- Cotton is a terrible insulator. It is cold and clammy when wet.
- Never wear clothes which are tight fitting or constrict your freedom of movement. Fashion never kept anybody warm.

If You Are Caught Out

Now, let's say you do get caught in bad weather without enough protection. Stuff your pant legs into your socks and tuck your shirt in. Fill your pants and shirt with debris. You are looking for anything that will create a lot of dead air space. Cattail fluff, thistle down, leaves, pine needles, and grass all work well. If you have any paper with you, wad it up too. Forget how it looks or feels. Did you hear about the pantyhose salesman a couple of years ago who was trapped in his car in a snowdrift? He put on as many layers of pantyhose as he could and survived. The idea is to use anything within reach.

You don't have to wait until a survival situation to use natural materials. Save some money by sewing two shirts, pants, socks, hats, or blankets together and filling them with cattail fluff, grasses, feathers, or even hair. Try to use only dry materials and replace them each year.