Updated 2/2020

**Instructions for Hot Plate Tests at KSU**

Every time you send a set of products for testing, please email the **KSU Submission Form for Fabrics** file to [merediths@ksu.edu](mailto:merediths@ksu.edu). Please send the file in Word format – not PDF. Once you fill out the form, the only thing that should change is the product list. Only one form is needed for a set of fabrics; we will prepare one report and invoice.

**1. Company Information.** Please enter your contact information on the form.

**2. Purchase Order, Invoice, and Payment.** Please enter your purchase order number on the form (if you have one) or indicate that a PO will be sent. We will put the PO number on the invoice that is sent to you. Companies may pay by check, wire transfer, or credit card. Instructions are given on the invoice. If you want the invoice sent to someone other than the company contact, please indicate this on the form.

**3. Select a test type on the form.**

* ASTM D 1518 – Option #1: The insulation (clo value) for battings and sleeping pads is determined using still air conditions.
* ASTM D 1518 – Option #2: The insulation (clo value) for battings and sleeping pads is determined with an air velocity over the plate of 1.0 m/s. The same protocol and environmental conditions are used in ASTM F 1868 Part A.
* ISO 11092: The insulation value for fabrics is determined under specific environmental conditions. It is not appropriate for thick fabrics because an ambient air temperature is used.
* ASTM F 1868 Part B and ISO 11092: The evaporative resistance of textiles is determined using an isothermal sweating hot plate test. The protocols are identicalin each test.
* ASTM F 1868 Part C - NFPA non-isothermal protocol for insulation, apparent evaporative resistance, and total heat loss values. (*Not currently available.)*
* Fabric weight: Fabric weight per unit area and insulation per unit weight are calculated.

**4. Sizing, labeling, and sending samples.**

**Samples.** One sample consists of three specimens of a fabric or batting, **cut 20 x 20 inches square**. If a fabric assembly is to be tested (i.e., a set of two fabric layers, a set of three fabric layers, or a set of a fabric/batting/fabric), layer the components in the orientation that they would be placed on the body. Staple the layers together in one corner. (We have to trim 0.5 inch from two sides of the samples when we do the sweating test to prevent water from wicking from the corners of the plate.) If only one specimen is available instead of three, we will test the same specimen three times.

**The size of the specimen must be 20 x 20 inches square** or we cannot run the test. If you do not have enough fabric, you may piece a specimen together by using abutted, zigzagged seams in the guard section only. The center 10 x 10 inch square must be perfect – with no seams or defects.

**Loose filling materials** like down have to be encased in a “pillow” construction the way they would be used in the finished product. Please note that you must cut the fabric much bigger than 20 x 20 inches if you are going to prepare a quilted pillow construction. The finished size must be at least 20 x 20 inches square.

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**Label** the first sample fabric or fabric assembly A-1, A-2, A-3. Write the code in the corner with a black permanent marker. **Write the code number on the side of the fabric or assembly that faces away from the plate (body).** This is usually the outer shell layer. In this way, we orient the fabric correctly on the plate, and we can see its code number. If the fabric is black or if it is a batting, write the code number on a small white label and staple it in the corner. Repeat the previous steps with the rest of the samples (B-1, B-2, B-3, etc.).

**List the fabric letter or number codes** on the submission form, along with a description for each fabric or assembly. You can also attach a chart identifying each fabric or assembly relative to its code. Please do not write this information all over the fabrics. These descriptions will be used in the report.

Example of a fire fighter fabric assembly:

A. Outer Shell: 7.5 oz./yd.2 50% PBI, 50% Nomex

                 Moisture Barrier: Crosstech PJ

                 Thermal Liner: Aralite

 Example of a shell fabric:

B. eVent PTFE film laminated to woven nylon taffeta

**Please do not fold the samples – particularly in fourths.** Creases cannot be ironed out of the fabrics (because the heat and pressure may change the properties of the fabric). In addition, the creases will cause a tenting effect, raising the fabric off the plate and trapping air under the sample. **You will get higher resistance values and lower total heat loss values if the fabrics do not lie flat on the plate.** If you fold the samples over some bubble paper or stuffing before putting them in a box for shipping, hard creases will probably not form. If you have to fold the fabric specimens, please avoid any creases in the center section (10 x 10 inch square). That is the section of the specimen where data are collected. The outside 5 inches of the specimen cover the guard section.

**Fiberfill battings:** Battings must be packed flat and not compressed during shipping. Compressed battings will have lower insulation values.

Please indicate whether you want a **shell fabric placed on either side of the batting** during testing (e.g., ripstop nylon, cotton percale, etc.). We have these materials or you may send your own – cut 20 x 20 inches square and labeled.

**Send the fabrics or battings to:**

Meredith Schlabach  
Institute for Environmental Research  
Kansas State University Phone: 785-532-2284  
0056 Seaton Hall

Manhattan, KS 66506 email: [merediths@ksu.edu](mailto:merediths@ksu.edu)

**Timing.** We test products in the order they are received at KSU. During holiday times and campus vacation breaks, this will not be possible.

**Test report.** A test report will be prepared and saved as an electronic PDF file with the company’s name and technical report number as the file name (example: NorthFace16-64 fabric report).

**5. Return of materials.** Please provide us with your company’s preferred shipping company and account number for return shipping (e.g., Federal Express, UPS, DHL) on the form. Let us know if you need overnight shipping. If you want us to discard the materials, indicate that on the form.

**6. Export Controls Compliance.** Please indicate if you are contracting, working, or acting for or on behalf of a national government. Include information about the agency or the branch of a national government that you are associated with.