

Electric Utility – Definitions Used in Performance Testing of Fabrics

Stoll Curve – a standard curve, based on heat and time, used by the ASTM to predict the onset of second degree burn injury. Energies above the Stoll curve would normally produce a second degree burn. Those below the Stoll curve would not normally produce a second degree burn.

Calorimeter – an instrument which measures total heat. The calorimeter is calculated to measure temperature rise in degrees C which is then converted into calories per square centimeter (cal/cm²) reaching its surface.

Incident Exposure Energy (E_i)- the amount of energy (total heat, cal/cm²) received at a surface, as a direct result of an electric arc, as measured by the temperature rise on the copper calorimeters.

“Pass through” Energy – The amount of energy (total heat, cal/cm²) which passed through the material on the panel as measured by the temperature rise on copper calorimeters which are located behind the material on the panel.

Arc Thermal Protective Value (ATPV) – the E_i value where the garment is predicted to have a 50% probability of preventing a second degree burn under the test conditions. It could also be defined as the minimum energy causing the predicted onset of second degree burns.

Heat Attenuation Factor (HAF) – The percentage of total incident energy striking the panel which is prevented from reaching the panel sensors by a single or multi-layer fabric specimen under the test conditions at the ATPV level. The haf point for any given panel is expressed by the following equation;

$$(1 - \frac{\text{Average “Pass through” Energy}}{\text{Average Incident Energy}}) \times 100 = \text{haf point}$$

The HAF is calculated by plotting the haf points from each panel and determining through linear regression analysis the point at which the ATPV passes through that line.

Breakthrough – a material response evidenced by the formation of a hole, in the material, of one-half square inch in any direction.