



Grace Industries, Inc.

Heat Alarm Response Description

The temperature alarm feature, when selected as an option on Grace Industries' PASS Alarms, is designed to alert the wearer that he or she is in a potentially dangerous thermal environment. The time-temperature (environment temperature & alarm response time) is based on a correlation between the temperature of the environment and the approximate time in that thermal environment when the protective clothing ensemble begins to lose its ability to protect the wearer from thermal injury.

The temperature alarm operates on a 'thermistor' principle. The device **DOES NOT** measure rapidly fluctuating ambient temperature in the same way that a thermometer would. The curve is based on the thermal inertia of heat transferred to the case of the PASS Alarm. In other words, the case of the PASS Alarm must become heated to the temperatures listed in the time-temperature curve, which then "starts the clock" on exposure time.

A good way to envision the operation can be described by considering a PASS Alarm operating in an environment that is 300° F. It will take a brief time for the case to absorb enough heat to become heated to that temperature. Once it reaches 300° F, and retains that temperature for 8 minutes, the distinctive ringing audible tone will begin to sound. Since the case has become heated, it will take time to cool to a temperature below the thresholds listed in the curve. This can be demonstrated by immediately removing a PASS Alarm with the temperature alarm sounding to an outside atmosphere of 70° F, and observing that the temperature alarm will continue sounding until the PASS case has cooled sufficiently to bring it to a temperature below the threshold.

The devices **DO NOT** indicate rate of rise, and in the case of a sudden increase in temperature the temperature alarm will not sound until the thermal inertia of the case reaches one of the threshold levels for the times indicated in the curve. For instance, in a flashover where the temperature can rise from 300° F to 1,500° F or more, the temperature alarm would not react until the case temperature had exceeded the one of the threshold limits for a total time equivalent to the Alarm Response Time in the curve. To further expand on this example, if the wearer's PASS Alarm had been heated to 250° F for 9 minutes, a sudden rise in

temperature would cause the temperature alarm to activate one minute later (for a total of 10 minutes).

For illustrative purposes, the Time Temperature Curve is listed below:

HEAT OPTION TYPICAL RESPONSE	
Environment Temperature	Alarm Response Time
350° F	6 minutes
300° F	8 minutes
250° F	10 minutes
200° F	12 minutes

Response times listed are approximate due to the variance of environmental factors and the thermal inertia of the heat sensing system.