

T-FIT[®]

Unique Insulation Technology

Avoiding contact burn injuries from heated surfaces using T-FIT insulation

Through internal testing, T-FIT insulation materials have been shown to provide protection against contact burn injuries from heated surfaces. This document provides a brief summary of the testing and results.



According to ASTM C 1055: Standard guide for heated system surface conditions that produce contact burn injuries, the maximum level of injury recommended on the average person is first degree burns after 5 s contact time for industrial processes. Second degree burns are more serious than first degree because tissue is permanently damaged, so they are not deemed acceptable in most cases.

To measure the skin contact temperature from the surface of T-FIT insulation, covering a hot pipe, a thermesthesiometer

device was used in accordance with ASTM C 1057.

The thermesthesiometer provides an electrical analogue of the finger's thermal response when touching a heated surface. The calibrated sensor probe is placed against the heated surface for the designated contact time and the maximum temperature is measured.

The graph in Figure 1, based on that found in the ASTM C 1055 standard, can be used to determine the potential user injury at the measured contact temperature over a specified contact time.

Temperature - time relationship for burns

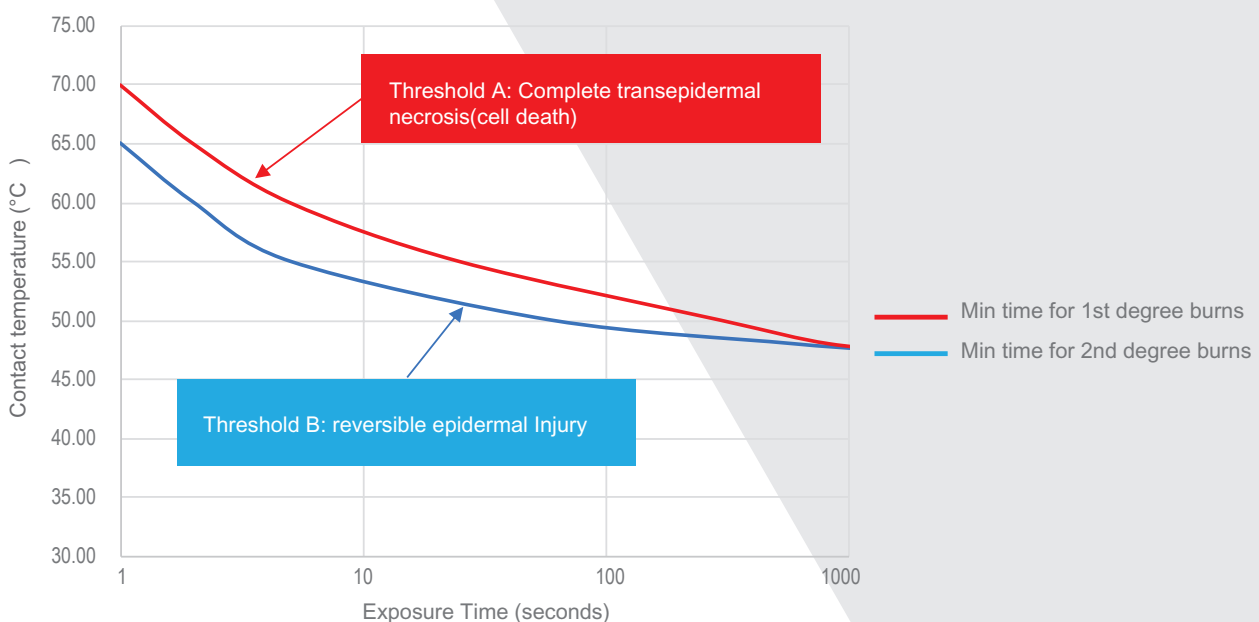


Figure 1: Graph showing threshold for burn injuries for various contact temperatures and exposure times

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No burn injuries are expected to occur below the limit represented by the Threshold B curve and, in the region between Threshold A and B, the maximum injury that is expected to occur is first degree burns. This is an estimation as to what injuries the 'average' individual may obtain from contact with the heated system, and unusual conditions or physical health variations may

modify the results. Evaluation of the maximum operating surface temperature must be made under worst case conditions, so the T-FIT products were tested at their highest operating temperatures and lowest insulation thickness.

Product (all 6.35 mm thick)	Maximum operating temperature stated on data sheet (°C)	Actual temperature of mandrel (°C)	Maximum 5 s contact temperature recorded (°C)
T-FIT Process unclad	200	204	36
T-FIT Process clad	200	189	40
T-FIT Clean	160	159	33
T-FIT Hygiene	145	147	35

Table 1: Maximum contact temperatures recorded by thermesthesiometer

The graph in Figure 2. compares the contact temperatures recorded by the thermesthesiometer to the thresholds in Figure 1. When using a contact time of 5 s, the results show that no burn injuries are expected to be suffered by an average individual, as the maximum contact temperatures fall well below Threshold B.

Maximum recorded contact temperatures for T-FIT products

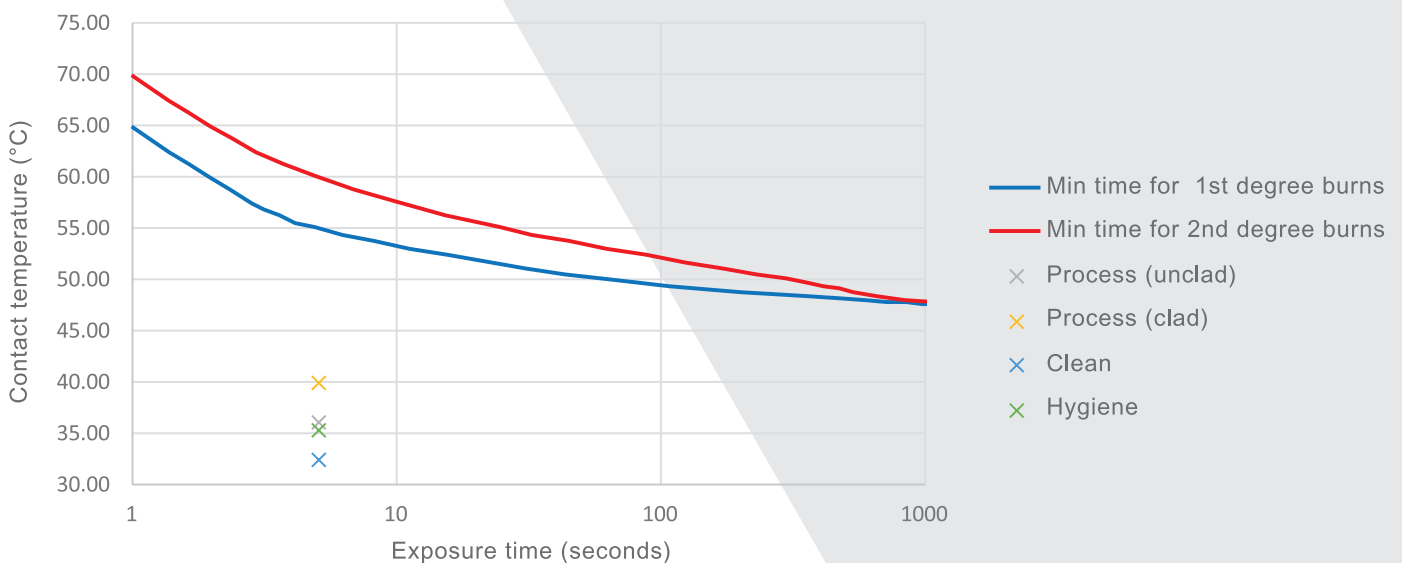


Figure 2: Graph showing the maximum contact temperatures for T-FIT products compared to the threshold for burn injuries

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Issue 2 Revision 3
June 2020

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