



Determining if a product can be used to protect personnel from hot pipe and hose contact burns

Under OSHA requirements, there is no specific temperature that a pipe or hose or other hot item must be at or below to consider it safe for contact. The OSHA regulations state that steam and hot water pipes shall be covered with insulation or be guarded.

It has generally been accepted by workplace health and safety professionals that metallic items that are above 140°F / 60°C should be protected in a manner so that accidental contact will not produce a burn. Therefore, a target temperature of 140°F / 60°C and below is desirable for metallic objects. Therefore, one can also think that any insulation system on a hot pipe or hose should therefore also have a maximum surface temperature of 140°F / 60°C.

There is a standard, UL2200, which does provide some specific temperature numbers for use with engine driven generators, and of interest they differentiate metallic from non-metallic items. It is important to remember that metals conduct heat, and most thermal protection systems (insulation, fabrics, tapes, etc.), do not. This means that the insulation system surface can be “hotter” than a metal surface and still be “touch safe”.

In conclusion, the maximum temperature that the surface of an insulation system can be at should be below 203°F / 95°C for accidental or casual brush-by contact.

Location	Composition of surface ^a	
	Metal	Nonmetallic
Handles or knobs that are grasped for holding	50•C (122•F)	60•C (140•F)
Handles or knobs that are contacted and do not involve holding; and other surfaces subject to contact and user maintenance	60•C (140•F)	85•C (185•F)
Surfaces subject to casual contact ^a	70•C (158•F)	95•C (203•F)

^a A handle, knob, or similar device, made of a material other than metal that is plated or clad with metal having a thickness of 0.005 inch (0.127 mm) or less is judged as a nonmetallic part.

^b See the Exception to 38.3.

The information on the next page provides more information to help determine what thickness of insulation may result in a pipe wrap that will provide the desired temperature drop from the surface of the pipe to the surface of the pipe wrap.

The ½” thick insulation can provide, for example, a suitable drop for pipes operating up to 500°F / 260°C and that the standard nylon hook and loop is suitable at the surface temperature of 203°F / 95°C.

Thinner ¼” insulation would provide less of a temperature differential while the ¾” insulation would provide more differential. This information should only be used as a guideline and every installation will be different. The information presented should help you to determine if you are on the correct path to determining the best solution to meet your needs.

Custom insulation products can be fabricated with insulation thickness up to 2” in a variety of materials providing protection and insulation value up to 2000°F / 1100°C.