In a daring demonstration, a professor dips her wetted fingers into molten lead (327°C) and withdraws them quickly without getting burned. How is this possible?

Step 1:

Liquid Lead is one of the metals that is employed as a quenchant most frequently in molten form. The common temperature range for using lead is between 343 and 927 °C (650 and 1700 °F), with a melting point of 327 °C (620.6 °F).

Step 2:

The fingertips don't absorb the heat as quickly as the cold water. It doesn't last very long. When manufacturing different candies, dessert chefs follow a pretty similar process. They put their hands in water, then take a small amount of the molten sugar between their two fingers to determine what stage the sugar is at (softball, hardball, soft crack, hard crack, etc.). To obtain a feel for the sugar, they quickly take the molten sugar and submerge it once more in water. Even though the molten sugar is typically well over 300 degrees, it doesn't burn you.

To create a shield of protection, the water vaporises.