

**Un-shaded, Out-of-doors, Surface Temperatures Survey**

**OPEN-FILE REPORT**

**South Carolina Department of Natural Resources  
Land, Water and Conservation Division  
South Carolina State Climatology Office**

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# SC State Climatology Office

## Un-shaded, Out-of-doors, Surface Temperatures Survey

Images below were taken Wednesday, July 22, 2015 between 2:00 and 3:30 PM EDT within the Forest Acres, SC area of momentary un-shaded surface temperatures. A Gilson Model MA-372 infrared thermometer was used to obtain temperature values.

This temperature sampling is intended to serve as an improved reference within our office's hot weather related discussions and to bring awareness to the dangers of mid-afternoon full sun, un-shaded environments found in many common outdoor activities and the attending threat to children and adults.

Published studies indicate human contact with a surface temperature of 111° results in pain. Contact temperatures at or above 118°, present a burn danger. Contact with surface temperatures of 140° for three seconds may result in a 2<sup>nd</sup> degree burn.

### Image 1:

AC Flora High School baseball field.. clay/sand.."shortstop" position..124.7°





**Image 2:**  
AC Flora High School baseball field..aluminum  
seating..115.7°



**Image 3:**  
AC Flora High School walkway between practice football/soccer  
fields..concrete..120.4°

**Image 4:**

Volvo rooftop..dark gray in color/steel..174.5°



**Image 5:**

Forest Lake Golf Course #1 green..moist sand base/Bermuda grass..99.0°



**Image 6:**

Forest Drive/I-77 Walmart parking lot..138.5°





**Image 7:**  
Forest Drive Columbia transit bus stop bench..wooden planks over cement base..143.6°



**Image 8:**  
Trenholm Park tennis courts..”medium blue” hard surface..131.1°

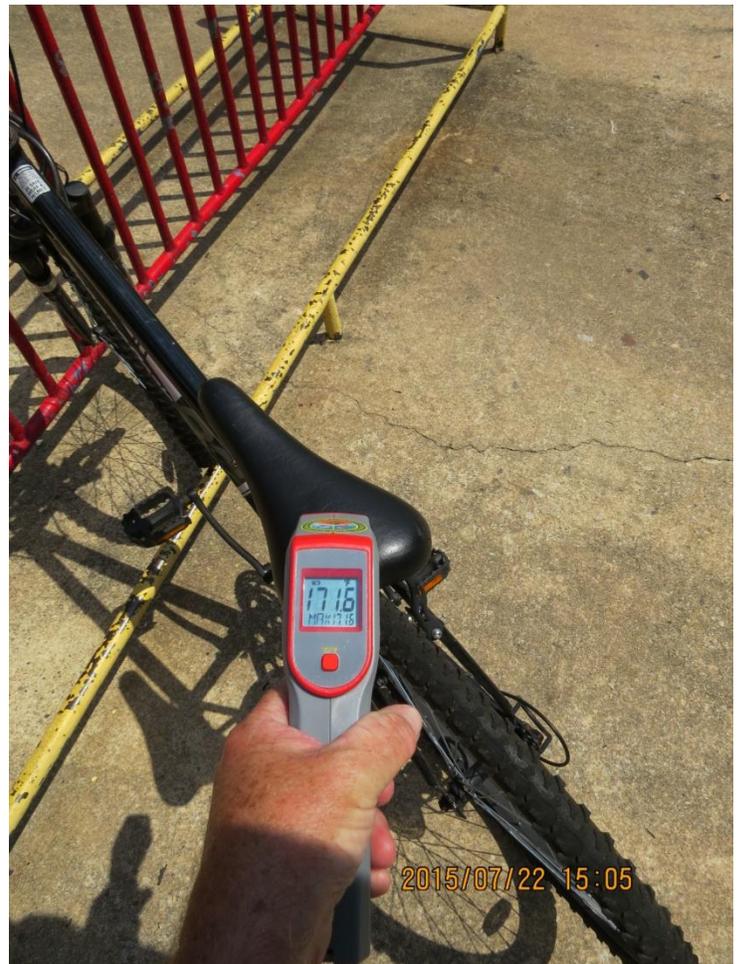
**Image 9:**

Trenholm Park children's playground ..blue plastic "hippo" ..123.8°



**Image 10:**

Trenholm Park children's playground..wood chips ground covering..135.5°



**Image 11:**

Trenholm Park bike rack..black bicycle seat..171.6°

## Preliminary findings:

Although the author would have liked to have replicated the full sun heating and triple digit heat of July 21 here in the Columbia metropolitan area, this brief investigation into un-shaded surface temperatures was performed on July 22 at measured shade temperatures of 95° taken at nearby Columbia Hamilton-Owens AP. Skies were mostly sunny with broken clouds and light and variable winds.

To my surprise, the aluminum seat surfaces at AC Flora baseball field were much “cooler” (only 115.7°) than many of the other exposed materials. Jeff Boyer, SCDNR Engineering explained to me that aluminum is used quite extensively in many of the agencies field projects (docks/landings) due to its resistance to corrosion and limited heat retaining properties when warm weather recreational boating is highest. Another surprise was that the temperature of my steel , car rooftop was a blistering 174.5°.

Most surface weather forecast and observations address “shade” temperatures. Heat Index or the newest “real feel” temperature values take into account relative humidity (percentage of water vapor in the air at a specified temperature) and the discomfort caused by the restricted evaporation (cooling process) of perspiration from skin/clothing. Heat index values are not reliable in wind. The real truth is that persons within daily outside summertime activities are subjected to ground/street temperatures quite often in the 120°-140° range.

In addition, and as a helpful reminder, the first symptoms of heat exhaustion are:

Excessive thirst..Profuse sweating/Fatigue..Dizziness/Confusion..Rapid heartbeat/Panting..

Take immediate action with fluids..shade..loosening of clothing..wetting..fanning..

**If any uncertainty exist in a person’s condition, seek emergency medical help.**

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