



## Comments on Turf Surface Temperature

The temperature of the infill or the turf fiber on a sunny day is a function of the emissivity of the material. The emissivity is a measure of the amount of radiation that is absorbed by a material. The temperature of turf fibers is primarily determined by the absorption of infrared radiation by the pigments used to color the fibers. The darker colors typically absorb more infrared energy and become hotter. On a hot day, the temperature of colored turf without infill was 182 °F for black turf, 164 °F for green turf, and 123 °F for white turf.

The green color of plants comes from the chlorophyll in the living plants. The mechanism of energy absorption for chlorophyll is very different from inorganic and organic pigments and these two different systems can not be compared.

The infill is similarly pigmented and darker colors become hotter than lighter colors. One way to reduce the temperature of turf and infill is to use pigments that absorb less infrared energy. Carbon black, the pigment that colors SBR used in automobile tires has a very high emissivity. Small amounts of carbon black are used in many colors to provide a tool to adjust the darkness and lightness when making the color masterbatch. Replacing the carbon black with other pigments or using pigments that absorb less IR are ways that infill producers and yarn producers are lowering the surface temperatures of these turf components.

The surface of a synthetic turf field will be a composite of the turf fiber and infill. The infill that is shielded by the fiber is not exposed to the infrared radiation and does not contribute to the surface heat. Fields made with monofilament fibers that stand more erect or recently groomed fields will have more infill exposed than slit tape fibers that tend to cover more of the surface. The surface with more infill exposed will have more or less impact from the infill temperature.