

**EFFECT OF SUN LIGHT ON SURFACE TEMPERATURE OF ARTIFICIAL SPORT SURFACES**

Toyoaki Aoki  
 Biwako Seikei Sport College,  
 Kita-hira, Shiga-cho, Shiga 520-0503 , Japan , e-mail : [aoki@bss.ac.jp](mailto:aoki@bss.ac.jp)

**INTRODUCTION**

Introductions of artificial sport surfaces such as artificial turf and all-weather track, have been increasing year by year. We have studied the comparisons of surface temperatures of sport surfaces, and reported the results regarding to the seasonal change in the surface temperatures of artificial and natural turfs (1).

In this paper, I would like to report the relationship between the surface temperatures of sport surfaces and illuminance of sun light.

**METHODS**

The artificial and natural turfs were long-pile type (65mm in depth, sand-rubber infill system) and sand based type (warm season turf), respectively. The all-weather and sand tracks were urethane polymer type (13mm in depth) and soil covered with sand type (100mm in depth), respectively.

The surface temperatures were measured with a infrared thermometer (type UT-02F, Horiba Co., Japan). The illuminances on the surface from the sun were measured with a photo recorder (type PHR-51, T and D Co., Japan).

The measurements of temperatures and illuminances were performed on sunny days from February 2004 to December 2004 and at 2 hour intervals from 9:00 to 17:00 on each day.

**RESULTS AND DISCUSSION**

Monthly change in surface temperatures of the artificial turf with time is shown in Fig.1. The surface temperature increased with day from Feb.(winter) to Aug.(summer). The maximum temperature was 67.5°C at 13:00 on Aug.11.

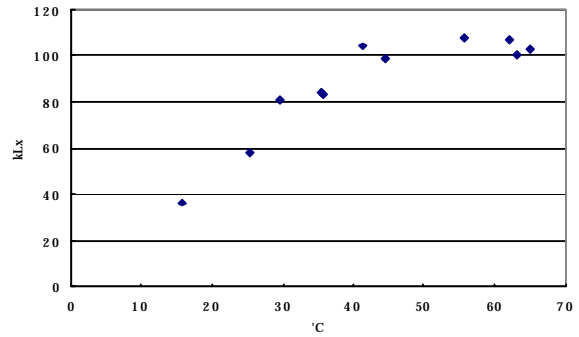


Fig.2 Relationship between surface temp. of artificial turf and illuminance of sun light.

Figure 2 shows relationship between the surface temperature of artificial turf and illuminance of sun light at 11:00 shown in Fig.1. The surface temperature increased with illuminance up to 100 kLx and after that, became a leveling off. In summer, ground temperature had an impact on the surface temperatures.

The other surface temperatures of sport surfaces investigated in this study resulted in the same pattern as shown in Fig.1 and Fig.2.

Details of this study will be presented in the conference.

**REFERENCE**

1. Aoki T., et al. *Bulletin of Biwako Seikei Sport College*, Vol.2, 2005. in press.

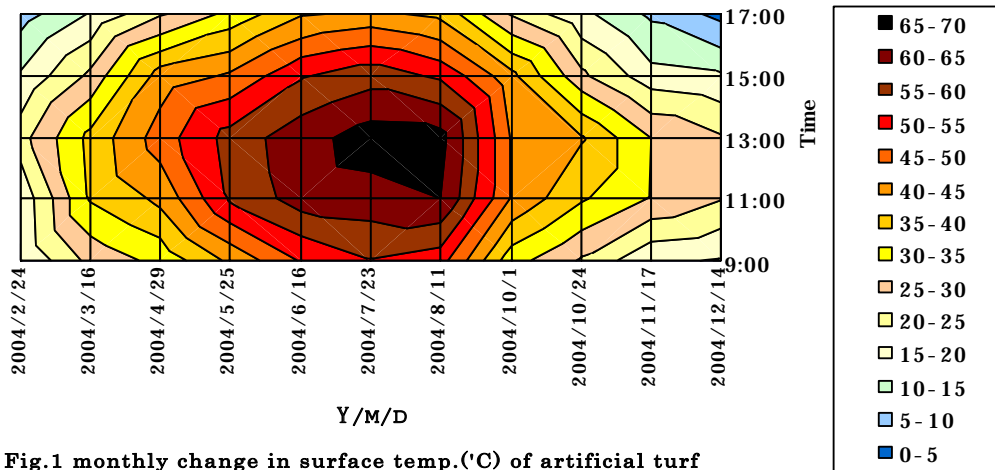


Fig.1 monthly change in surface temp.(°C) of artificial turf