

# Quality Control of Wicking Characteristics for Sodium-Selective Wearable Fabric Sensors

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## What is SweatID?

SweatID, formerly Roosense, is a start-up company founded in Akron, Ohio specializing in a

## ABSTRACT

The SweatID system includes a sodium-selective fabric-based sensor that consists of a functionalized electrospun nylon sensor attached to a piece of fabric using technical embroidery with conductive thread. The WFS attaches to a wearable electronics device to continuously monitor sweat sodium concentration during exercise. The sodium concentration is calculated by measuring the change in resistance across the WFS. Many factors can affect this resistance reading; one of the most important being the wicking characteristics of the fabric material used to assemble the WFS. Therefore, a standard wicking experiment was needed to compare the standard WFS fabric to potential replacement fabrics. A vertical wicking experiment was designed to determine the wicking speed and water absorbance capacity (WAC) of the standard and four alternative fabrics. The wicking of the WFS must be fast enough to keep the sweat moving through the sensor but also have a low enough absorbance capacity that there is no sodium accumulation in the fabric. From the data collected, changes can be made to the WFS to ensure that the most accurate and desirable readings are measured during field trials when the WFS is worn for 90 minutes of exercise. The collected wicking data, individual sensor calibrations, and sensor response while worn during indoor cycling trials were used to determine the optimal fabric to be used in the WFS.

## OBJECTIVES

**Measure wicking speed of the five different fabrics**

**Measure absorbance of the fabrics**

**Comparison to current standard sensor during field trials**

## FUTURE WORKS

More trials need to be done involving the black fabric now that it is seen as an alternative toward our standard fabric selection. From these current trials, more variations within the ratio of the polyester-spandex blend will be explored to determine what is the threshold of variation that is allowable before the accuracy of the data readings become skewed.

## DISCLAIMER

All data, graphs, tables and images are property of SweatID/ Roosense LLC. Omission of certain information is necessary to keep anonymity within both manufacturing and field-testing processes.

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