

GRAPHENE TEMPERATURE SENSING TEXTILE

**Instantaneous response
time and scalable
manufacturing process**

BACKGROUND

Smart fabric technologies with the ability to detect environmental changes have been interesting scientists and industry for many years. The wearable technology market is gaining popularity quickly, with products such as smart watches common place in daily lives.

Companies are starting to develop apparel, accessories and fitness wear that can perform complex tasks such as monitoring heart rate and charging smart phones. A specific area of interest in this growing market is temperature sensing fabrics.

These fabrics are based on yarns that are interwoven with 'smart' materials that respond to changes in the temperature. Materials with the ability to detect changes in temperature, or an increase in humidity could have huge implications in the world of healthcare and safety equipment.

THE TECHNOLOGY

This technology is a radio frequency temperature sensor with the sensing element being specifically made from a yarn dyed with conductive graphene ink. As the temperature of the yarn increases, the resistivity decreases.

This difference in resistivity is detected by the radio frequency reader, providing the basis for temperature sensing. Graphene alone cannot act as a temperature sensor; the interaction between the graphene and the yarn enables this sensing to occur.

The technology response time is almost instantaneous, giving it advantage over conventional thermometers and thermocouples which take time to operate. This dyeing method can be applied to natural or synthetic materials.

KEY BENEFITS

- Instantaneous response time
- Simple and scalable manufacturing process

APPLICATIONS

This technology can be used in/adapted into:

- Temperature sensing fabrics
- Baby monitoring clothing or blankets
- Military armour packs, helping soldiers avoid overheating
- PPE for firemen or other servicemen for careful analysis of body temperature
- Body suits for applications in the sports and training industry
- Shoes for diabetic ulcer detection
- Bandages for monitoring wound temperature and infection
- Woven/melted into plastic containers, enabling accurate temperature analysis of contained liquid
- Rope technology to prevent rope overheating
- Radio frequency laser tag applications
- Tyre temperature sensing for the motor racing industry

INTELLECTUAL PROPERTY

A patent application has been filed to protect this technology.

OPPORTUNITY

The technology presents an excellent licensing and development opportunity for companies working in the e-textile space.

UMIP REFERENCE

20160095.

UMIP

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