TECH OFFER

Ultra-Fine Nanofibers for Various Applications

KEY INFORMATION

TECHNOLOGY CATEGORY:
Manufacturing - Chemical Processes
Materials - Nano Materials
Materials - Plastics & Elastomers

TECHNOLOGY READINESS LEVEL (TRL): TRL7
COUNTRY: JAPAN
ID NUMBER: TO175138

OVERVIEW

Nanofibers are fiber-like structures with diverse functionalities. With their high aspect ratio and large surface area, these materials exhibit unique characteristics that have potential for several applications, including medicine, environmental science, construction, agriculture, and apparel. Typically produced using polymers, nanofiber production has been limited to small-scale production due to difficulties in scaling up of the manufacturing process. This technology aims to address the constraints of large-scale nanofiber production to produce nanofibers continuously.

By means of unique equipment and melting of raw materials or dissolution in solvents, uniform nanofibers are produced through the control of processing parameters to enable large-scale production. This patented technology also allows the formation of three-dimensional (3D) layered fiber structures at point of production. Nanofibers produced through this technology have been utilised for oil-absorbent products with high absorption and retention capacity. The properties of nanofiber can also be tuned for other functionalities such as hydrophobicity, increased water retention and low thermal conductivity to name a few.

The technology owner is interested in co-development collaborations to develop new nanofiber applications and looking for partners to license the nanofiber production method and establish new joint venture entities.

TECHNOLOGY FEATURES & SPECIFICATIONS

This technology produces nanofibers through a patented manufacturing process that controls the heat of air during the melting of the material.

Features of the nanofibers produced include:

- Nano-sized fibers with varying diameters from sub-100nm to 1000nm
- Lightweight
- Strong absorption and holding capacity of organic compounds e.g., oil, blood
- Water repellent
- Low thermal conductivity
- Excellent sound absorption
- Able to be used in fabrication of 3D structures for effective permeability and porosity control

POTENTIAL APPLICATIONS

The unique properties of nanofibers make them ideal for a wide range of applications including (but not limited to):

- Consumer products e.g., oil absorbing sheets, female sanitary products
- Sound and heat insulation for buildings and automotives
- Filters e.g., air and water
- Textiles and fabric
- Agriculture
- Medical e.g., scaffolding materials, wound care

UNIQUE VALUE PROPOSITION

- Enables large-scale production of nanofibers
- Versatile material - properties of nanofibers produced can be customised for a wide range of applications