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Smart garments - Terminology and definitions

智能服装 术语和定义

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1 Scope

The document defines the terms related to smart garments.

It applies to the design, the production, the technology, the teaching and the trade of smart garments and to the fields related to them.

2 Normative references

The document has no normative references.

3.1 Basic terms

3.1.1 environment; surroundings: the external conditions that have an effect on the garment worn.

3.1.2 response: the behaviour of spontaneously carrying out some action after a change of the environment (3.1.1) has been sensed.

3.1.3 device: a physical element, or a combination of such elements, that achieves the required function. A device may be a constituent part of a larger device. Source: GB/T 2900.1-2008, 3.3.18.

3.1.4 component: a constituent part of a device that cannot be divided into smaller parts without losing its particular function. Source: GB/T 2900.1-2008, 3.3.19.

3.1.5 smart textile materials; intelligent textile materials: functional textile materials that can interact reversibly with the environment (3.1.1), or that can respond and adapt to changes of the environment. Examples given are phase-change materials and shape memory materials.

3.1.6 smart garments; intelligent garments: functional garments that can interact reversibly with the environment (3.1.1), or that can sense and adapt to changes of the environment and make a response (3.1.2).

3.1.6.1 smart textile material based garments; intelligent textile material based garments: smart garments (3.1.6) that achieve a particular function solely through smart textile materials (3.1.5).

3.1.6.2 electronic smart garments; electronic intelligent garments: smart garments (3.1.6) that contain at least one device (3.1.3) or component (3.1.4). The document notes that devices and components may be contained in the fibre, the yarn, the fabric or the garment.

3.2 Product terms

3.2.1 smart monitoring garments; intelligent monitoring garments: smart garments (3.1.6) able to monitor the wearer or the environment.

3.2.1.1 smart physiological monitoring garments; intelligent physiological monitoring garments: smart garments (3.1.6) able to monitor the physiological state of the wearer. The document notes that these include garments monitoring the electrocardiogram, the heart rate, respiration, the electroencephalogram, blood pressure, blood glucose and blood oxygen.

3.2.1.2 smart posture monitoring garments; intelligent posture monitoring garments: smart garments (3.1.6) able to monitor the posture of the wearer. The document notes that these include garments monitoring pressure and attitude.

3.2.1.3 smart environment monitoring garments; intelligent environment monitoring garments: smart garments (3.1.6) able to monitor the environment. The document notes that these include garments monitoring temperature, humidity and gases.

3.2.2 smart chromic garments; intelligent chromic garments: smart garments (3.1.6) whose colour changes when they are stimulated.

3.2.2.1 smart photochromic garments; intelligent photochromic garments: smart garments (3.1.6) whose colour changes when they are stimulated by light.

3.2.2.2 smart thermochromic garments; intelligent thermochromic garments: smart garments (3.1.6) whose colour changes when they are stimulated by temperature.

3.2.2.3 smart electrochromic garments; intelligent electrochromic garments: smart garments (3.1.6) whose colour changes when they are stimulated electrically.

3.2.2.4 smart ionochromic garments; intelligent ionochromic garments: smart garments (3.1.6) whose colour changes when they are stimulated by particular ions.

3.2.2.5 smart mechanochromic garments; intelligent mechanochromic garments: smart

garments (3.1.6) whose colour changes when they are stimulated by an external mechanical force such as squeezing or impact.

3.2.3 smart luminous garments; intelligent luminous garments: smart garments (3.1.6) that give a luminescent effect when they are stimulated.

3.2.3.1 smart electroluminescent garments; intelligent electroluminescent garments: smart garments (3.1.6) that give a luminescent effect when they are stimulated electrically.

3.2.3.2 smart thermoluminescent garments; intelligent thermoluminescent garments: smart garments (3.1.6) that give a luminescent effect when they are stimulated by heat.

3.2.3.3 smart mechanoluminescent garments; intelligent mechanoluminescent garments: smart garments (3.1.6) that give a luminescent effect when they are stimulated by a mechanical force such as squeezing or impact.

3.2.3.4 smart photoluminescent garments; intelligent photoluminescent garments: smart garments (3.1.6) that give a luminescent effect when they are stimulated by light.

3.2.4 smart electricity generating garments; intelligent electricity generating garments: smart garments (3.1.6) able to convert the energy of the wearer and of the surrounding environment into usable electrical energy.

3.2.4.1 smart triboelectric garments; intelligent triboelectric garments: smart garments (3.1.6) that produce usable electrical energy through two materials of opposite triboelectric polarity.

3.2.4.2 smart piezoelectric garments; intelligent piezoelectric garments: smart garments (3.1.6) that produce usable electrical energy from a piezoelectric material excited by a mechanical force such as squeezing or impact.

3.2.4.3 smart thermoelectric generating garments; intelligent thermoelectric generating garments: smart garments (3.1.6) that produce usable electrical energy from a thermoelectric material excited by a temperature difference.

3.2.4.4 smart photovoltaic garments; intelligent photovoltaic garments: smart garments (3.1.6) that produce usable electrical energy from a photovoltaic material excited by illumination.

3.2.5 smart thermoregulatory garments; intelligent thermoregulatory garments: smart garments (3.1.6) able to lower the temperature, to heat, or to regulate the temperature in both directions in a controllable way.

3.2.5.1 smart electrically thermoregulation garments; intelligent electrically thermoregulation garments: smart garments (3.1.6) able to convert electrical energy into heat and to give the wearer a controllable heating or cooling effect.

3.2.5.2 phase-change thermoregulation garments: smart garments (3.1.6) that achieve a

two-way temperature regulating function by means of a phase-change process.

3.2.5.3 smart structure thermoregulation garments; intelligent structure thermoregulation garments: smart garments (3.1.6) that achieve a two-way temperature regulating function by means of a change in the structure of the textile material.

3.2.5.4 smart fluid temperature regulating garments; intelligent fluid temperature regulating garments: smart garments (3.1.6) that give the wearer a controllable heating or cooling effect by means of a fluid device embedded inside the garment.

3.2.6 transformable garments: smart garments (3.1.6) that, under a particular stimulus, change their shape, their size or their internal structure, and that can return to the initial state when the stimulus is removed.

3.2.6.1 shape memory garments: smart garments (3.1.6) that, under a particular stimulus, change their shape, their size or their internal structure and can return to the initial shape. The document notes that shape memory materials include shape memory polymers and shape memory alloys.

3.2.6.2 negative Poisson's ratio garments: smart garments (3.1.6) that have the property of expanding transversely when stretched and contracting transversely when compressed.

3.2.6.3 tactile deformation garments: smart garments (3.1.6) in which a sudden change of fluid viscosity is produced after stimulation by a mechanical force.

3.2.6.4 falling prevention garments: smart garments (3.1.6) that monitor the posture of the wearer and can trigger a protective device automatically when the wearer falls.

3.2.7 smart electrical stimulating garments; intelligent electrical stimulating garments: smart garments (3.1.6) able to apply a series of safe and controllable electrical pulses to the wearer.

3.3 Manufacturing technology

3.3.1 electronic smart garments manufacturing technology; electronic intelligent garments manufacturing technology: the technology that gives a textile or a garment an electronic function by embedding a device (3.1.3) or a component (3.1.4), and/or by blending, modification processing or finishing of the material.

3.3.1.1 fiber-based manufacturing technology: the technology that merges a device (3.1.3) or a component (3.1.4) into the spinning or the yarn making process, and achieves the electronic function of the garment by means of the fibres and yarns so prepared, or directly by means of electronically functional fibres and yarns.

3.3.1.2 fabric-based manufacturing technology: the technology that achieves the electronic function of the garment by encapsulating a device (3.1.3) or a component (3.1.4) and integrating it into the fabric.