

## KAN position statement

### Standardisation of exoskeletons

July 2026

#### Background

Exoskeletons can be used in the work environment to support workers in the performance of physical work. Standards addressing exoskeletons are important, as they ensure that all exoskeletons placed on the market are safe. The first standards in this area are currently being developed, and the KAN stakeholders have formulated a collective position on them.

Examples of definitions of exoskeletons:

- Exoskeletons are engineered systems that are worn on the body, and are coupled to it mechanically and thereby act upon it. They are used in the workplace to support the functions of the human musculoskeletal system during the performance of physical work. ([DGUV Information 208-062](#))
- An exoskeleton is an engineered system worn on the human body. By virtue of being coupled mechanically with the body and interacting with it, an exoskeleton permits, reinforces, facilitates, stabilises and/or supplements defined movements and postures. (Working document DIN/TS 33442)

#### KAN's position

**1. KAN's position is that a product standard for exoskeletons must include and address the following aspects:**

- Product requirements, taking account of variation in human body measurements
- Description of the exoskeleton's mechanical properties (its function)
- Methods for testing the exoskeleton's mechanical properties and required performance
- Instructions for use:
  - Manufacturer's instructions concerning emergencies, such as an exoskeleton catching fire

- Measures to be taken in the event of an emergency arising whilst a worker is wearing an exoskeleton (e.g. deactivation of the exoskeleton system or taking it off in the event of a fire in the work environment)
  - Whether vehicles can be driven by a worker wearing the exoskeleton
  - Whether the exoskeleton can be used outdoors
  - Information enabling users to compare different exoskeleton brands and to select the exoskeleton best suited to their particular work situation
- 2. KAN emphasises that standards addressing exoskeletons must not govern aspects of the safety and health of workers at work.**
- 3. Exoskeletons are used in widely diverse sectors. The results of long-term studies into their effectiveness are always limited to the specific situations considered. KAN therefore takes the view that the following aspects must not be addressed by standards, unless this is justified by new, validated research results:**
- Generalised methods for testing exoskeletons' effectiveness in relieving the body of physical stress (effectiveness for prevention purposes)
  - Assessments of stress and demonstration of the exoskeleton's effectiveness (its protective effect for the individual wearer) that are independent of the manner in which the exoskeleton is used
  - Blanket statements regarding freedom from harm to the musculoskeletal system or, for example, concerning mental stress
- 4. Exoskeletons may satisfy the definitions set out in the relevant legislation on machinery, medical devices and personal protective equipment (PPE). For the event that an exoskeleton is to be placed on the market in the European Union (EU) as PPE, KAN states that:**
- The manufacturer must define the risks against which the exoskeleton is intended to provide protection.
  - Demonstration of the protective effect is mandatory if an exoskeleton is to be placed on the EU market.
  - No exoskeleton is currently known to be certified as PPE. In all individual cases assessed to date by the Expert Group for the European PPE Regulation, it has been ruled that the exoskeletons concerned did not constitute PPE. However, the European Commission does not rule out exoskeletons potentially serving as PPE, and is therefore awaiting further developments in research and the field.

- With regard to standardisation, this gives rise to the following implications:
  - In the absence of scientifically validated findings, standards must not contain requirements specific to PPE, so as not to give the false impression that they could serve as a basis for the certification of products as such.
  - As long as no exoskeletons exist that are recognised by the Expert Group as PPE, or until a standardisation mandate is issued by the European Commission for exoskeletons serving as PPE, the need for corresponding standardisation should be challenged.

## About KAN

In the Commission for Occupational Health and Safety and Standardization (KAN), the German representatives of employers, employees, the federal and state governments and the German Social Accident Insurance Institutions channel their interests and discuss them with DIN (German Institute for Standardization). KAN analyses standards and other outcomes of the work of standards organisations, and where applicable other bodies developing standards, that have a direct or indirect impact upon safety and health at work.

KAN's activities therefore include the monitoring of standardisation activity where it impacts upon occupational safety and health, and also the associated legislative activity in Europe, and drawing attention to needs for action. It is in KAN's interests that regulations and directives set out suitable and coherent statutory provisions and lead to corresponding standardisation mandates.

KAN is registered in the EU Transparency Register with the number **90520343621-73**.

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