

KAN position paper

Safety of highly automated, driverless mobile agricultural machinery

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Background

Agriculture is undergoing a process of change. New technologies such as highly automated, driverless mobile machinery¹ are increasingly being used in farming. OSH experts view equipment of this kind as potentially beneficial to safety and health. For example, it should lead to a reduction in hazards presented by dust, heat, hazardous substances (pesticides) and vibration. It should also reduce stress reactions triggered by mental stress among operators of agricultural machinery. Furthermore, it could significantly reduce the primary cause of accidents on manually operated agricultural machinery, namely climbing onto and off the machine: these accidents currently account for at least 50% of the total. However, the new technology may also present hazards of its own. The aim is to reduce the risks presented by these machines to workers and third parties.

KAN's position

KAN takes the view that highly automated, driverless mobile agricultural machinery must be subject to the following underlying safety criteria when used on farmland:

- The **danger zones** of highly automated, driverless mobile agricultural machinery must be defined comprehensively. At the same time, it must be considered that these danger zones are generally accessible to the public. Furthermore, dynamic factors must be taken into account in the hazard

¹In this position paper, the term "highly automated, driverless mobile agricultural machinery" refers to autonomous mobile machinery as defined in Annex III, 3.1.1. (c) of Regulation (EU) 2023/1230. "Highly automated, driverless mobile agricultural machinery" may also include AI.

scenario, for example when a further mobile machine moves into the area occupied by a driverless machine.

- **Human beings must be detected** sufficiently reliably and in consideration of all hazards. This detection applies to workers, but must also cover third parties, particularly children, persons with impaired ability, etc. Safety-related sensor functions and applications must adhere to recognized good practice. Detection of human beings forms a part of the protective measures required for compliance with European machine safety legislation. The safety level attained by current assistance systems² is not sufficient for this purpose.
- These general criteria apply to both the standalone machine and the **combination of tractor and implement**. The term "implement" covers all trailed, semi-mounted or mounted equipment. Since technical measures take precedence over organizational measures, the implement must be detected sufficiently reliably by the tractor's safety system. If necessary, the implement must be equipped with additional systems that are then integrated into the tractor's safety system. For example, the tractor's safety system can be responsible for monitoring the implement; should it determine that the combination is unsafe, it should prevent the tractor from moving off.
- The **test dummies** used for testing the detection of human beings must be suitable for modelling adults and children, in both cases wearing everyday clothing and in various body postures including standing, lying and kneeling.

² EU machinery legislation does not make provision for assistance systems. They do not constitute protective devices in the sense of this legislation, but systems employed optionally, for example to assist the operator of a mobile machine to detect the presence of persons in the vicinity.

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 pool their interests and discuss them with DIN (German Institute for Standardization). KAN analyses standards and other outcomes of the work of the standards bodies, and where applicable other organizations developing standards, that have a direct or indirect impact upon safety and health at work.

KAN's activities therefore include the monitoring of standardization 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 standardization mandates.

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

Contact: Dr. Michael Thierbach
Commission for Occupational Health and Safety and
Standardization (KAN)
– Secretariat –
Alte Heerstraße 111, 53757 Sankt Augustin, Germany
Email: info@kan.de
Internet: www.kan.de

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