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Success Story

Milestone in occupational safety: Altendorf HAND GUARD

HAND GUARD is the name of the globally unique safety system from Altendorf Maschinenbau GmbH that has been awarded the “German Occupational Safety Award 2021“. And the name says exactly what HAND GUARD does: protect hands when working on circular saws. As a partner, Lauer CE Safety GmbH, a company within the Jagenberg Group, actively supported the development of this milestone in occupational safety.

Karl-Friedrich Schröder and Julia Pohle, Manager Research and Development, received the award from Anne Janz, State Secretary in the Ministry of for Social Affairs and Integration of the State of Hesse, on behalf of the on behalf of the entire project team.

Protective technology

The patented system from the workshops in Minden, Westphalia, effectively protects the hands when working on the manufacturer‘s sliding table saws. The technical solution behind HAND GUARD is absolutely innovative. For the first time, Altendorf is using artificial intelligence (AI) in the field of work safety, as it is used in vehicle construction for the contactless control of operating elements. Whereas there navigation or audio systems are operated by gesture, the Altendorf system uses it to recognize the potential danger to the hands.

Two cameras - one of which is redundant for safety reasons - detect the position of the hands on the new Altendorf F 45 sliding table saw when workpieces are brought up to the saw blade. If the hand enters a potentially dangerous area, HAND GUARD‘s artificial intelligence detects this and the safety system lowers the sawing unit below the processing table at lightning speed and brakes it. With this reaction within a quarter of a second, HAND GUARD reliably prevents injuries before a hazard occurs - thus ensuring an enormously high level of occupational safety.

SAFETY FOR PEOPLE AND COMPANIES

Statistically speaking, one industrial accident occurs at a circular saw every day in Germany. This is accompanied by costs due to machine downtime, medical treatment and delays in customer orders. HAND GUARD prevents this from happening in the first place – and can be restarted within 10 seconds. As a result, downtime is a thing of the past. Altendorf was awarded the “German Occupational Safety Award 2021” for this innovation in the field of occupational safety.

AUSGEZEICHNET

Der Deutsche Arbeitsschutzpreis
2021

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Lauer CE-Safety: development partner from the very beginning

Lauer CE-Safety was involved in the development of HAND GUARD from the very beginning. The company of the Jagenberg Group stood by Altendorf as an advisory and supportive partner for questions regarding CE marking. “The competence in the assessment of risks and in the development of specifications for the control system was enormously important for us,” knows Karl-Friedrich Schröder, Head of Research and Development at Altendorf Maschinenbau. “With Lauer CE-Safety, we had an

experienced and reliable partner at our side, with whom we have been working since 2019,” he emphasises. For example, the company supervised the implementation of the functional safety requirements for the system that controls the machine.

In addition, Lauer CE-Safety worked out the programming guidelines for the application software of the system in close coordination with the developers of the saw manufacturer. The basis for this was the EN ISO 13849 standard. The software itself was programmed by specialists from the Swedish software company ManoMotion.

When used on the machine, this software controls specially developed hardware. This custom-fit, self-developed solution is not only highly effective, but also more cost-effective than commercially available safety technology. So-called single-channel circuit structures with separate test channels meet the high requirements for issuing the necessary CE certificates and ensure maximum safety. Lauer CE-Safety also supported the Westphalian company in setting up the standard-compliant specification and creating the necessary verification and validation documents to obtain the CE mark.

The EN ISO 13849 standard

The safety standard DIN EN ISO 13849 describes requirements for safety-related machine controls. Since its revision in 2007, it has taken electronics and software into account in addition to the controls.

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Strictly systematic development
A central function in the development of the optical system is the artificial intelligence for hand recognition. It is used to calculate and recognise potential dangers in advance in order to activate the lowering mechanism if necessary. Since this is a safety-related system, a comprehensive, consistent and comprehensible specification of the software was necessary. It was important to proceed methodically from the very first development step.

"The V-model, which methodically maps all phases from development to quality assurance," explains Josef Winkelmann head of department for functional safety, "offered itself as the perfect system to keep the complex interrelationships transparent and also to master the challenges of certifying such a new system." Lauer worked with the Institute for Occupational Safety IFA and the Employer's Liability Insurance Association for the CE certification.

"We are proud to be part of such a pioneering technology as HAND GUARD," Winkelmann explains, "and are pleased that we were able to make our contribution to greater occupational safety here as well."

Josef Winkelmann, Head of Functional Safety

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