



TÜV SÜD Safety Tested

7 September 2022

First electric exoskeleton receives certification mark from TÜV SÜD

Munich. TÜV SÜD has issued the first certification mark for an electric exoskeleton. After undergoing testing based on the ISO 13482 standard, the Cray X power suit, produced by Augsburg-based robotics manufacturer German Bionic, was awarded “TÜV SÜD Safety Tested” certification. This certificate provides confirmation that the AI-based active exoskeleton complies with the fundamental technical safety requirements set out in the standard. By doing so, it thus enhances the product’s market acceptance.

Exoskeleton suits are devices composed of mechanical and electronic components, designed to support the human locomotor system by improving its performance and robustness. These products are enormously significant for the health of their users, and are required to comply with accordingly high standards of quality and stability. TÜV SÜD issued its first certificate for an electric exoskeleton in July 2022, when the Cray X power suit from Augsburg-based manufacturer German Bionic was awarded the “TÜV SÜD Safety Tested” certification mark. The voluntary certification documents that TÜV SÜD has conducted independent third-party testing of the AI-based active exoskeleton and confirms the device’s conformity with fundamental technical safety requirements. It serves as an additional quality feature and enhances the product’s market appeal.

“As the testing procedures we performed on the exoskeleton showed, our in-depth knowledge of applicable standards and our expert eye for flawless execution enable us to deliver rapid and reliable testing even of highly innovative products and market newcomers. The customer confidence generated by this process is particularly vital in the case of new products that are still seeking to enter the market”, explains Benedikt Pulver, Team Leader Smart Automation at TÜV SÜD.

Exoskeleton boosts strength – with certified safety

Exoskeletons can provide support in a variety of situations and applications. They reduce stresses on the physical skeleton during high-load or high-impact activities, such as heavy lifting or carrying, and thus mitigate the negative effects of strenuous physical labour. The legal basis for testing the first

power-assisted exoskeleton was provided by ISO 13482:2014, a Type C standard. Under the provisions of this standard, the Cray X power suit from German Bionic is classified as a physical assistant robot. The fifth-generation Cray X is primarily used in manual workplaces in the logistics industry, where it provides support for two areas of the body: the lower back, by providing 30 kg of assistance per lifting movement, and the legs, by delivering active walking assistance. In the latter, the exoskeleton supplies cooperative control for the user's thighs, allowing for a comfortable gait while also "carrying" part of the user's weight to reduce the load exerted on legs, hips, knees and ankles during standing or walking. Physical support during lifting or walking is provided by direct interaction using a system of harnesses, e.g. belts or clamps which attach the individual parts of the exoskeleton to the user's body. Artificial intelligence (AI) is used to analyse the user's movements and control the device electronically to enhance strength or stability when and where it is needed.

Components comply with safety requirements and high standards

During testing, the experts at TÜV SÜD verified that all components and elements of the Cray X exoskeleton complied with the fundamental safety requirements set out in the corresponding standard. They further attested the product's high standards in terms of performance, user-friendliness and technical features. The TÜV SÜD experts have been commissioned by German Bionic, the Cray X manufacturer, to perform continuing manufacturing quality testing for the product in future.

Further information:

- <https://www.tuvsud.com/en/services/testing/electrical-safety-testing>
- <https://www.tuvsud.com/en/services/testing/mechanical-testing>
- <https://www.tuvsud.com/en/industries/manufacturing/machinery-and-robotics/robotic-safety>
- <https://www.germanbionic.com/en/>

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