



ERGONOMIC ASSEMBLY 4.0

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Challenges

Loss of production due to work related disease of the muscular skeletal system cause enormous economic costs (1).

For example tennis elbow (epicondylitis) occurs at up to 30 % of all assembly workers (2) and causes an average absence of work of 29 days. Ergonomic aids und tools are seldom used and accepted during every day work due to lack of time and usability. Furthermore ergonomic solutions are insufficiently focused on the individual work load and motion patterns.

Solution

An assembly workbench that is capable to adapt automatically to the individual worker servers all requirements for an ergonomic solution.

Assembly workplace

In collaboration with Rose + Krieger (Minden, Germany) an existing height adjustable workbench was modified to allow for adjustable 3d assembly areas. Thus working space is adapted in optimal height and depth automatically.

Worker adjusted setup

The individual anthropometry of the worker is captured with sensors and transferred by a secure cloud connection (Virtual Fort Knox) as a basic starting setup of the work bench. Operation of the table occurs after registration with a smart phone via an NFC tag.

Ergonomic guidance

In coherence of linked processes within industry 4.0 companies the worker is guided through the assembly process by a digital assistance system (Armbruster engineering ELAM) for efficient production thanks to a pick-2-light system coupled with driven axis. Thus the build space height is adjusted during assembly.

Cooperation with



Result

Consequently industry 4.0 allows for optimized ergonomic workplaces that can reduce risks of overloading situations in combination with production optimization.

Our Infrastructure

- Biomechanical laboratory (quantifiable ergonomics)
- Application Center Industrie 4.0 (practical test in real life scenario as well as training sessions)
- Camera based algorithm development

¹ Bundesanstalt für Arbeitsschutz und Arbeitsmedizin BAuA (2014): *Sicherheit und Gesundheit bei der Arbeit 2013*.

² Barmer GEK (Hg.) (2012): *Heil- und Hilfsmittelreport 2012*.