Tomasz MACHOCZEK[1], Paweł JURECZKO[1], Małgorzata SZYMICZEK[1], Sara SARRAJ[1]

[1] *Silesian University of Technology, Gliwice*

IDENTIFICATION OF THE HUMAN BODY PHYSICAL MODEL FOR EXOSKELETON DESIGNING IN SELECTED INDUSTRIAL APPLICATION

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Due to the adopted design assumptions and ongoing market observations in the field of competitively created exoskeleton design solutions intended for the implementation of industrial tasks, significant development of these devices has been noticed in terms of minimizing weight through geometric optimization based on an increasingly wider range of available materials. In addition, exoskeletons with lower energy consumption parameters are developed due to the introduction of increasingly efficient electric drives to the market and more efficient power sources. The production of passive exoskeletons is also increasing, based on elastic damping elements that effectively support the user's movements, especially of the upper limbs. This influences the development of the prospects for future sales of the product as the project's final result. In many workplaces, employees are exposed to unfavorable influences that affect their subsequent health conditions.

For this purpose, the authors attempted to determine the value of loads occurring in places exposed to injuries or degenerative diseases. As part of the work, joint moments were determined in various body positions of an employee working on an assembly line in the automotive industry. Five critical positions were selected that put significant load on individual human body segments. Modeling and experimental studies were performed based on these established positions. This will be used to develop and produce an exoskeleton that relieves humans while performing job duties in the abovementioned positions, improving working conditions.