



CONNECT

Myoelectric prostheses

Background

With the goal of giving people with handicaps a better quality of life and optimizing their limited freedom of movement, Pohlig GmbH has been gathering experience in the field of orthopaedic technology for 100 years now. Meanwhile, the Bavarian company is established and respected on an international level. The company, which has been a part of the Ottobock Group since 2018, continues to focus on being close to patients. Its broad product portfolio ranges from orthopaedic technology and orthopaedic shoe technology to rehabilitation technology and medical supply store products. Pohlig also focuses specifically on children's orthopaedics and wants to enable the youngest members of society to explore the world actively and as unrestrictedly as possible.

Myoelectric prostheses - from the idea of the future to everyday reality

The human body consists of 650 muscles. Around 400 muscles fall into the category of skeletal muscles and, together with joints, cartilage, and tendons, are responsible for the targeted execution of movements. They protect us and keep us mobile and powerful from birth to an advanced old age. But what happens when a link is missing? Congenital malformations, accidents, the consequences of severe illnesses, infections, or significant circulatory disorders - these are just some of the reasons why some people are dependent on prostheses.

In Germany, there are between 60,000 and 80,000 amputations per year, and the tendency is rising. In a European comparison, Germany is at the top of the list. According to documentation, amputations occur about four times more often with men than with women. The most common amputations are hand and finger amputations, followed by forearm and lower leg amputations. Only about 10% are considered macroamputations, which involve severing the entire leg or arm.

When people think of prostheses, many still have direct associations with wooden stumps and iron hooks in their minds. The reality, however, corresponds to highly complex high-tech devices that are able to reproduce human movements and functions by means of advanced technology. The most modern technology is represented by myoelectric prostheses, which give users back a high degree of mobility and aesthetics. In contrast to habitus prostheses, which look realistic due to the silicone production but do not have integrated joints and are therefore limited in their movement functionality, myoelectrically controlled prostheses offer a lot of functionality and application possibilities in active everyday situations.

Myoelectric or external power prostheses are based on the principle of muscular control and electronic assistance in the execution of movement. During targeted muscle movements, light electrical impulses are released on the skin, which are detected by electrodes integrated in the



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socket and processed as control signals. The prosthesis converts these signals electrically into hand movements and enables targeted grasping and positioning. Nevertheless, precision, speed control and sensitivity to the applied force require continuous and ambitious training of the patient.

A myoelectric prosthesis from Pohlig consists of an individually manufactured socket that acts as a medium between the person and the prosthetic technology. The interior of the socket is made of HTV silicone, which ensures flexibility, comfort, and easy cleaning of the prosthesis. Depending on the functional requirements, there are three different integration systems: Targeted Muscle Reinnervation (TMR), Pattern Recognition System and a conventional two-electrode control system. The most modern technique is the combination of TMR and multi-articulating hands. This allows the patient to control and simultaneously move the various prosthetic parts and joints through targeted training. Multi-articulating hands, which have an individual motor in each finger, enable the user to grasp and hold objects naturally and precisely.

In addition to the individual development and fitting of the third-party prostheses, Pohlig also offers a comprehensive service for all aspects of the prostheses. Patients who receive a new prosthesis undergo a Myo test, which determines the ideal position of the electrodes in order to be able to control the prosthesis in the best possible way later on. Users are trained in the operation and specific functions of their new everyday companion.

The costs of a myoelectric prosthesis cannot be generalized, as they depend on various factors such as the amputation level, the exact type of prosthesis, the materials used, and the patient's expectations of the functionalities. Coverage by statutory or private health insurance companies must also be checked on a case-by-case basis.

You find the field of prosthetics exciting and would like to learn more about it? We would be happy to support you with getting in touch with the company. arcoro CONNECT links innovations, companies and people - personally and directly.



COMPANY	LOCATION	WEBSITE	FIELD OF EXPERTISE
Pohlig GmbH	Germany	https://www.pohlig.net/de	Prosthetics
Ottobock Holding GmbH & Co. KG	Germany	https://openbionics.com/	Prosthetics
Open Bionics	UK	https://openbionics.com/	Prosthetics
Ortho-Reha Neuhof GmbH	Germany	https://www.ortho-reha-neuhof.de/	Prosthetics
College Park Industries	USA (MI)	https://www.college-park.com/	Prosthetics
Deka Research and Development Corporation	USA (NH)	http://www.dekaresearch.com/	Prosthetics
Exiii Inc	Japan	https://exiii.jp/	Prosthetics
Brain Robotics	USA (CA)	https://brainrobotics.com/	Prosthetics
Protunix	France	http://protunix.com/	Prosthetics
Naked Prosthetics	USA (WA)	https://www.npdevices.com/	Prosthetics

We would also be glad to put you in personal contact with an industry expert in the field of prosthetics. Remarkable developments, inspiring companies, and future-changing visions - we have identified some international opinion leaders for you:

INDUSTRY EXPERT	JOB POSITION	FIELD OF EXPERTISE
Keith Violette	Lead Mechanical at Deka Research	Prosthetics
Vikram Choudhary	President at Quantum Prosthetics & Orthotics	Prosthetics & Orthotics
Arlene Gillis	International Institute of Orthotics & Prosthetics	Prosthetics & Orthotics

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