

## Impulse Technology's **Goralign PSA** Ankle Prosthesis



**Impulse Technology** has developed a 6 DOF ankle prosthesis that can be mounted on most commercially available prosthetic feet. The Goralign Ankle is a passive structure that offers adaptability with variable stiffness in all three planes of motion. Goralign 'extends' the optimal range of the dynamic alignment performed by the prosthetist, mitigating the negative effects of misalignment. This enhances mobility of the user by adapting to the changes in gait or terrain. The Goralign PSA adds a second component, Goralisa, for vertical shock absorption and improved patient comfort.

The **patented** technology behind Goralign is a series of springs and stiffeners that are variably engaged across the stance phase, providing variable stiffness during different phases of gait.

The additional vertical shock absorber unit, Goralisa, is a durable polymer casing filled with shock absorbing materials. The casing and filler absorb shock during heel strike while the coronal and transverse compliance accommodates twisting and bending that may occur during late stance. The product is mounted using an industry standard 4-hole pattern. Once mounted, an initial dynamic alignment will suffice. Goralign PSA (Goralign + Goralisa) is completely passive and user-friendly with little to no maintenance or weather restrictions.

### **FUNCTIONAL**

Mitigates the effects of any deviation from optimal dynamic alignment due to user gait changes and/or uneven terrain with variable adaptability in all three planes of motion as well as vertical shock absorption. The resulting effect is biomimicry of a natural ankle and sustainable comfort.

### **RELIABLE**

Has passed the static and cycle testing requirements of the ISO 10328 standard at P6 (<275 lbs.) level.

### **COMPACT**

Size: 85x54x60 mm  
Weight: 520 grams  
Fits most of the commercially available prosthetic feet and foot shells.

## Performance and Reliability



A study of unilateral transtibial amputees using both Impulse Technology's Goralign ankle and a fixed control ankle, both with induced misalignments, were conducted. Gait and force data indicated an improvement when using Impulse Technology's Goralign Ankle.

Study participant comments: "more like a natural foot", "less stiff", "more stability" during hill walking, and "smoother rollover."

The Goralign ankle has passed static and cyclic loading tests according to ISO 10328 at the P6 level ( $\leq 275$  lbs).

VR Rajula, L Springgate, A Haque, M Kamrunnahar, SJ Piazza, B Kaluf. A Biomimetic Adapter for Passive Self-alignment of Prosthetic Feet. Military Medicine, Volume 186, Issue Supplement\_1, January-February 2021, Pages 665-673.

### PASSIVE

Consists of a parallel series of springs and stiffeners without any hydraulics, sensors, actuators or electronics.

### WEATHER-PROOF

Completely passive design allows full-functionality, rain or shine, with little to no product maintenance.

### EFFICIENT

Assists in improving the gait quality while walking on slopes and uneven terrains. Minimizes costs and efforts through less frequent prosthetist care.

Recommended L-code:  
**L5986+L5988**

Sponsor:  
US DoD (DHA) SBIR  
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