

Terminal Devices – Mechanical Hands



Description

Mechanical hands use linkages and pivots to reproduce one of the two most common types of grasp; the precision pinch grip (thumb tip and index finger tip) or the tri-digit pinch grip (thumb tip and first two fingertips).

Mechanical hands are designed to be either voluntary opening or voluntary closing. The difference is in how the hand operates when the user operates them:

- Voluntary opening hands require a conscious effort to open and close under spring pressure. Maximum grip pressure is preset.
- Voluntary closing hands spring open in their relaxed state and require effort to close. The amount of grip force is able to be varied by the user.

All mechanical hands require an external force to operate them. This is generally provided by a Bowden cable system (in the case of body powered prostheses) or by electrical power (Myoelectrics).

The mechanical joints and linkages are usually, but not always, covered by a soft glove.

Advantages

- Improved dexterity and opposition grasp compared to passive hands and gloves.
- Myoelectrics can provide multiple grip options.
- Quite durable.
- Simple linkage types are lighter than Myoelectric options.
- Can be self-suspending or require additional suspension straps.

Disadvantages

- Less aesthetically pleasing than passive options.
- No variation in grip type (unless Myoelectric).
- Heavier than passive hands.
- Myoelectric types can be quite heavy.
- Myoelectrics require frequent charging.
- Myoelectrics are prone to break down.
- More expensive than passive options.
- Soft outer gloves are prone to wear and discoloration, especially when exposed to heat, ink and chemicals.
- Harness for Bowden cables may be uncomfortable.