

4SN1

Four Systems In One

4SN1

- Multi-purpose 4-Hole Prosthetic Socket Adapter



Life is like a pyramid. Build a strong base and you will peak high.

The practice of Prosthetics is like the 4SN1. Build a strong base so that you can peak high.

- A good prosthetist recommends the most appropriate socket design and components
 - Strong evaluation skills
 - Experience
- Skills before and after delivery
 - Modifications (bag of tricks/repertoire)
- The 4SN1 Prosthetic Socket Adapter is a tool to assist the prosthetist in the fitting and to keep a good relationship with the technician

Clinical and Technical Need

- At the time of development there were few choices for thermoplastic 3S systems
 1. PDI
 2. Grace Fabrication – dummy for thermoplastic socket
 - Allowed use of Fillauer Regular Shuttle Lock
 3. Fillauer
 - Now produces several

Lanyards vs Pin/locking

- Pin is difficult to engage on transfemorals
- Geriatrics transfemoral patients prefer lanyards
- Otto Bock 4R41 laminated with piece of pelite to create channel for dacron lanyard strap
 - Great for long transfemoral patients
 - Lamination only, transfer is needed, lay-up and finishing is time consuming
 - Room for improvement

Increase in expulsion valve use

- TEC system encouraged suction BK sockets
- Gel suspension sleeves and expulsion valves allowed prosthetist to fit below knee amputees differently
- The suction socket has less pistoning and makes the socket feel more a part of the patient
- Harmony System

Ossur 600 Lock Series

- Similar Features as the 4SN1
- Ability to switch socket systems

The Four Socket Systems

- Conventional
- Pin/Locking
- Valve Suction
- Lanyard

Conventional

- Transtibial - Patellar Tendon Bearing
 - Hard socket
 - Pelite Liner
- Transfemoral Sock Fit

Pin/Locking

- Ratchet Type Locking Mechanism
 - Fillauer Regular Shuttle Lock
- Requires the use of Silicone Suction Suspension (3S) Locking Liner

Valve Suction

- Requires airtight socket with an expulsion valve
- Usually but not always used with gel or rubber suspension sleeve
- Requires 3S Locking Liner if switching to another system
- Cushion Liner OK for Valve Suction Only

Lanyard

- Dacron Strap attaches to socket with chafe and velcro
- Requires the use of 3S Locking Liner

4SN1 Design

- Universal – only adapter needed on your bench
- Nondiscriminatory
 - Four-Hole Pattern fits and any Euro 4-hole components
 - Compatible to Fillauer Regular Shuttle Lock and Seattle Systems (USMC) expulsion valve
 - Four Holes on Side for Lanyard Exit

Compatible to Fillauer Regular Shuttle Lock and Seattle Systems (USMC) Expulsion Valve



Now compatible with Centri Expulsion Valve



Four Holes for Lanyard Exit



4SN1 Components



Valve Insert Components



Lanyard Components



Fabrication Kit



Fabrication/Technical Application

- 1. Thermoplastic
 - Test Socket (PETG, Durrplex, etc)
 - Copolymer or Polypropylene
 - Flexible Inner Socket (Proflex, etc)
- 2. Lamination
- 3. CAD/CAM Models

Thermoplastic Test Sockets



Lamination



Lamination Continued



CAD/CAM Foam Models

- Adapter 22mm length X 39mm diameter



Clinical Applications

Convert Conventional Prosthetic Socket to Pin/Locking, Lanyard or Valve Suction

- Convert Conventional Preparatory BK or AK
- Preparatory Prosthesis Can Be Used For Backup with New System

Conventional PTB with Pelite Liner

- Many Prosthetist use Expulsion Valves
- Fit with 3mm Locking Liner = 5 ply Sock
 - Hole for Pin or Lanyard and Air Expulsion in Bottom of Pelite Liner
 - Can Wear all Systems in One Socket

Determine Socket System in the
Test Socket

Geriatric Tranfemoral can choose
between Lanyard or Pin/Locking

A Transtibial patient with Pin/Locking can be converted to Valve Suction to solve rotation problems, distal discomfort with pin, achieve more positive suspension, or personal preference.

A Transtibial patient with adhered scar tissue or delicate skin at suture site can be fit with expulsion valve system and converted to a pin system after the scar tissue is loosened and skin is stable. This usually coincides with the suspension sleeve tearing and the patient complaining about the cost of a new one.

Trans tibial in Lanyard System to Pull
Bulbous Distal End into Socket May
Convert to Pin/Locking or Valve
Suction After Some Volume
Reduction Occurs

Other Possible Applications

- Upper Extremity
- Double Wall Sockets
- Immediate or Delayed Post-Op Prosthesis

Disadvantages

- Requires Clearance
- Need to heat or beat out of test socket
- No Clutch Lock



Advantages

- Ease of Fabrication
- Thermoform or Laminate
- One-Stage Fabrication
 - 4-Hole pattern and new endoskeletal componentry allow for alignment after finishing
- Reduces Remakes by Switching Systems

On the Horizon

- New Low Profile 4SN1 for long transfemoral patients and accommodate a 4-Hole Clutch Lock
- Adapt for more locks especially combination Pin/Expulsion Valve locks



4SN1 Has a Twin

The 4SN1 Low Profile



4SN1 Low Profile Lanyard System for Long Transfemorals



Spacer Plates



Diagonal Offset Plates

