The lower-limb prosthetic market is growing and changing, as well as receiving increased visibility. To compete effectively in this evolving environment, ankle-foot prosthetics manufacturers must develop a deeper understanding of their product’s performance and durability characteristics. The best way to gain this insight is to test to the demanding requirements of ISO 22675. The new Bionix Prosthetic Ankle-Foot Testing System is specifically designed to fully address ISO 22675 static and dynamic test requirements. It simulates the realistic, synchronized loading of walking to deliver ISO 22675 test profiles that are far more accurate and consistent than any other test solution currently on the market.

More accurate and reliable than current market offerings
Specifically designed to fully address ISO 22675 static and dynamic test requirements
Versatile enough to accommodate most ISO 10328 tests and a variety of other applications
Flexible enough to test wide range of prosthetic ankle/foot designs and sizes
Capable of exceeding ISO 22675 requirements to deliver P6-P8 loading
Supported by expert MTS consulting, systems integration and installation services

Comprised of a versatile Bionix Tabletop (370.02) Servohydraulic Test System, a precision Bionix Prosthetic Ankle-Foot Subsystem, and advanced Profile Iteration Software, this solution meets and exceeds ISO 22675 requirements for a wide range of designs and sizes over a full range of prescribed loading levels. Additionally, the system can be easily adapted to address most ISO 10328 standards and many other static and dynamic biomedical testing needs.

Bionix® Prosthetic Ankle-Foot Testing Capability
A complete solution for performing accurate and reliable–lower limb prosthetics testing to ISO 10328 and 22675 requirements
Competitive lower–limb prosthetics manufacturers understand the advantages of fully testing to the requirements of ISO 22675. The range of realistic, synchronized loading levels required by ISO 22675 can be used to generate test profiles that are far more predictive of prosthetic ankle-foot performance and durability than the more basic testing requirements of ISO 10328. The data gleaned from this testing is critical to optimizing prosthetic designs and establishing more accurate and sustainable maintenance and warranty programs.

Prosthetic Ankle-Foot Subsystem

The Bionix Prosthetic Ankle-Foot Subsystem features the precision hardware and advanced software needed to accurately meet the full spectrum of ISO 22675 static and dynamic requirements.

Precision Tilt Table

The durable, high–stiffness tilt table is engineered to meet the full range of positions and synchronized loading levels required by ISO 22675. It accommodates a wide range of prosthetic designs and foot sizes (20 to 32 cm), and can exceed ISO 22675 requirements to deliver the P6-8 static and dynamic loading levels needed to test prosthetics for heavier and more active patients.

Compact and modular, the subsystem is easily installed and removed from versatile 370.02 load frames. It features a complete set of blocking fixtures for both static and dynamic test configurations and a setup fixture for accurately establishing initial zero positions.

The subsystem features a low friction Load Application Point (PT) Pivot with a universal mounting to accommodate a wide variety of specimen interfaces. Additionally, the ability to interchange tread plates expands the range of possible positions and tread surfaces.

Tilt Table Specifications

<table>
<thead>
<tr>
<th>Dynamic Ratings</th>
<th>Static Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic Loading</td>
<td>Toe Test (Y2 = +20°) 8.1 kN</td>
</tr>
<tr>
<td>Range of Motion (+Y/-Y) + 40°/-20°</td>
<td>Heel Test (Y1 = -15°) 8.2 kN</td>
</tr>
<tr>
<td>Static Ratings</td>
<td>Foot Sizes Accommodated</td>
</tr>
<tr>
<td></td>
<td>Length</td>
</tr>
<tr>
<td></td>
<td>20-32 cm</td>
</tr>
<tr>
<td></td>
<td>Toe Out (±T)</td>
</tr>
<tr>
<td></td>
<td>0 to 7°</td>
</tr>
</tbody>
</table>

A. Application Point Pivot: High performance lubricated roller bearing with flexible mounting plate
B. Tilt Table Pivot
C. Tilt Table: High Stiffness, lightweight design and construction
D. Sub-Assembly “Home” location features with Index marks for In-Out adjustment reference
E. Return and Catch Mechanisms include:
   1. Elastomeric covered, rolling element stops
   2. Pivot and Slot rotational adjustment
   3. Large range of travel slotted vertical stop adjustment
F. High performance, fatigue-rated, MTS actuator mounted to tilt table with lubricated roller and thrust bearings
G. Grease Zerks included at all critical bearings for easy maintenance
H. High quality roller bearings housed in oil bath for extended life
I. Easy-to-grasp, robust handles for lifting and moving sub system
J. Distribution Manifold for tilt table with hydraulic quick disconnects for clean quick removal of subsystem
Advanced Profile Iteration Software

Designed to greatly improve test accuracy and speed, advanced Profile Iteration Software delivers ISO 22675 test profiles that are far more accurate and consistent than any other test solution currently on the market.

Complete ISO 22675 Fixture Set

The Bionix Prosthetic Ankle-Foot Subsystem features a complete set of blocking fixtures for meeting the full range of static and dynamic ISO 22675 test configuration requirements.

Static Test Configurations

Static Heel Test Support

Static Heel Test

Static Toe Test Support

Static Toe Test

Dynamic Test Configurations

Toe Off Setup Support

Toe Off Support

Flat Foot Setup Support

Flat Foot Support

Heel Down Setup Support

Heel Down Support
Versatile 370.02 Base Load Frame System

The modular subsystem is integrated into a versatile Bionix axial servohydraulic test system. Combining the latest in MTS servohydraulic technology, versatile FlexTest® controls, industry-leading MTS application software and reliable MTS accessories, this compact tabletop system delivers all the dynamic and static testing capabilities needed to fully address ISO 22675 requirements, meet most ISO 10328 needs and perform a host of other biomedical testing needs.

Base System Specifications

- Axial Force ± 25 kN
- Axial Travel (stroke) 150 mm

A 2-channel FlexTest 40 digital controller synchronizes axial and tilt table forces and motions, and features an ergonomic handset for convenient specimen setup.

Clean and very quiet, an optional SilentFlo™ Hydraulic Power Unit can be deployed directly in the test lab, eliminating the need for special pump housing facilities and reducing supply line length and space requirements.

Basic and Multipurpose TestWare® Software provides Windows-based system setup and control, command and data acquisition for static and cyclic testing, and an easy-to-use “drag and drop” environment for building both standard and nonstandard tests.

A host of additional subsystems and an array of durable MTS grips, fixtures, platens and environmental baths extend the utility of the base load frame system to ISO 10328 testing and beyond.

Unparalleled Global Support

Testing to the demands of ISO 22675 is challenging. It requires a thorough understanding of the standard as well as a working knowledge of servo-controlled test systems and test techniques. The global MTS service and support organization is available to help you meet these challenges with test consulting, systems integration/installation expertise and classroom or on-site training.