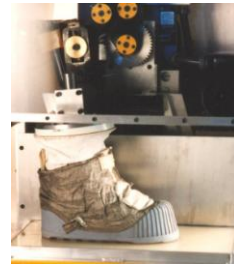


Testing from A to Z

By Michael J. Maloney

The Bjorksten | bit 7 staff has had an opportunity to test every thing from astronaut boots to zippers, and thought they would have a little fun matching tests to letters. Some of the projects have been very enlightening and a few have been dangerous, but they all have been interesting.

Astronaut Boots – A footwear tester that was originally developed for testing the water resistance of footwear (see Combat Boots) was modified to simulate conditions on the Moon (0.17 G) and on Mars (0.37 G) and used to test the durability of footwear that the astronauts will wear when they return to the Moon and eventually go to Mars



Baseball Gloves – An air cannon capable of shooting baseballs at over 100 mph, was built and then used to test ability of different glove designs to absorb impact and reduce the “sting” when a player catches the ball.



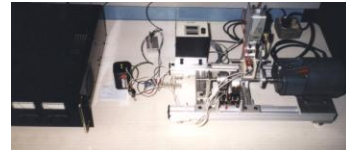
Combat Boots – Designed and built a footwear testing apparatus for the U.S. Army. The device simulates the human walking motion and has a prosthetic foot that is equipped with sensors that determine when and where water infiltrates the boots.



Dumpster Lids – Performed tests to determine how lids made from different materials will perform when they are used and abused. Tests included supporting heavy weights, being folded in half, having heavy objects dropped on them.



Elevator Door Switches – Switches were subjected to a test protocol of 960,000 cycles @ 50 cycles per minute, using a non-inductive electrical circuit, with a constant resistance, and a 1.5 amp, 115 VDC current.



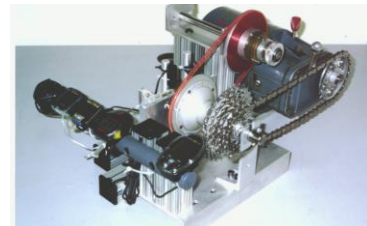
Fire Retardants – Fabric and plywood that had been treated with flame retardant chemicals, were tested in under carefully controlled conditions that are specified in ASTM test methods.



Gaskets – Performed evaluations of experimental gaskets, using a pair of Ford 4-cylinder engines mounted on dynamometers.



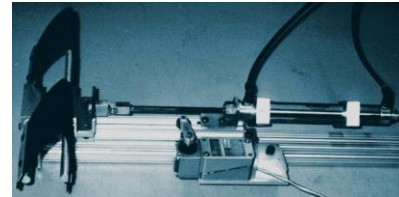
Hubs for Bicycles – Devised test fixtures and performed a variety of tests to assess the performance of bicycle hubs that contain electronic components.



Inside Out Puncture of a Medical Device – the device contains a glass ampoule located inside a plastic tube. The medical technician is required to squeeze the tube and break the ampoule. Developed a test to measure the force required to puncture the tubes, from the inside, using a simulated glass shard.



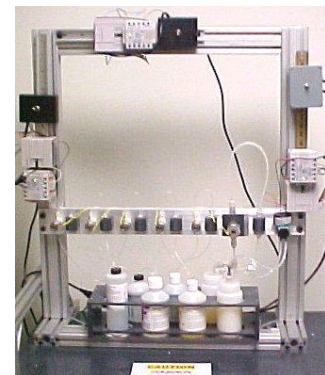
Joints - Measured the “Life Expectancy” of living hinge joints in many different sizes and shapes and made from different types of plastic materials.



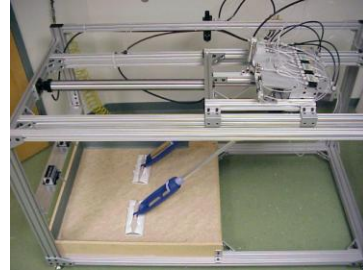
Knife Blades for Paper Cutter – Measured the force required to cut paper using different types of blades.



Lifecycle Evaluation of Components for Automated Chemical Analysis System – Subjected the pumps, valves, fittings, and tubing to the equivalent of 5 years of service using the actual chemicals that they will be exposed to.



Mop Handles – Designed and built apparatus for determining durability of plastic mop handles. Device places mops on floor, performs forward and back mopping motions, strikes the front and side of the mop head against the baseboard, and catches the edge of the head on simulated table legs.



Nozzles for Marina Gas Pumps – Performed tests to determine if power boat owners filling their tanks at a marina were creating a potentially hazardous situation because the boat tank was not electrically grounded to the dispensing pump.



O-Rings – Designed and fabricated a fixture that tests 15 valves simultaneously. The device opens and closes the valves, with gas flowing through them and simulates a 10 year “life cycle” of use.



Plastic Pipe Fittings – Designed and fabricated a fully automated device for testing plastic pipe fittings up to 48” in diameter. The fittings are immersed in water in a 9,000 gallon tank and pressurized at up to 1,750 psi.



Quilting cutter – Using our force glove and force platform for hand tools, we are able to evaluate both user comfort information, to help guide development, and engineering data, to help verify progress and ultimate success.



Rotary Bits – Testing involved cutting hundreds of feet of drywall, plywood, MDF board, and ceramic tile and comparing the performance of different types of rotary bits in a high speed cutting tool.



Sweat Socks – Devised a test fixture that simulates the way that the heel area of a sock wears due to friction when the heel of the foot moves up and down inside the shoe.



Truck, Bedliners – Developed test fixtures and test protocols for comparing resistance to impact and sliding abrasion for “drop in” and “spray in” bedliners from different manufactures.



Under the Eye Glare, Prevention Devices – Developed a test procedure for determining the effectiveness of No Glare Strips that are used by athletes to reduce the distractions caused by reflected light entering the peripheral areas of the eye.



Venetian Blinds – Performed tests to compare the durability of different brands of motorized blinds.



Walk-Off Mats – Developed test fixtures for comparing the durability of mats from different manufacturers when subjected to repeated passes by shopping cart wheels.



X – Railroad crossing (well, everyone else uses this for “X”!) – Developed fixtures and tests (and chemistry) for decay prevention pads that are placed on rail ties under the rails.



Y – yield strength of everything from finger nails, to casters, to aluminum handles.



Zippers for Tonneau Covers – Developed a device to exercise a “zip on – zip off” Tonneau cover for pickup trucks.

