BIO-ARC TECHNOLOGY SG

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BIO-ARC TECHNOLOGY

– user's entire body moves along a linear arc trajectory with each machine to optimize muscle recruitment.

R&D

TuffStuff is proud to introduce the Bio-Arc strength series, the first resistance machines to incorporate multiplanar movement of each machine's seat, along a linear arc trajectory. The seat movement allows the user to move along the arc path in conjunction with the machine helping to maintain more optimal muscle length and improving the force of contraction and training stimulus. Three years in the making, from concepts and engineering to prototype, testing and refinements. Each of the Bio-Arc line's machines were tested, following initial design positioning, by an independent exercise consulting company. Pilot research studies combining joint positioning – using goniometry testing, along with muscle recruitment and activity measurements – through electromyographic (EMG) testing were performed to determine the optimal dimensions of each unit for final production. Every detail and design modifications were executed to exact specifications and re-tested. The end results, a patented Bio-Arc Technology that allows full body linear arc trajectory motion during execution of the exercise!

In memory of Mr. Sherman P. Grider, Founder, who had been a part of the R&D lending his expertise in design concepts and refinements; attributing to the birth of Bio-Arc Technology.

46 years of experience in manufacturing combined with state-of-the-art biomechanical testing for optimal design specifications.

Telescoping tubing allowed for positioning of select segments of each machine for testing and design modifications.

Optimal design testing for positioning of hip-low back and seat position on Bio-Arc Leg Press machine.

Bio-Arc's unique linear arc movement patterns were research tested during design development to optimize user position and muscle recruitment on each machine in the Bio-Arc line.

TESTING

EMG and goniometer testing were performed by an independent exercise research company. Four subjects (3 male and 1 female) were selected for the testing with height ranging from 5' 1/4" to 6' 1". Subject selection was limited to individuals with sufficiently low subcutaneous adipose tissue to permit accurate electromyographic measurements. EMG activity was recorded for the primary and accessory muscle(s) that target the upper and lower body musculature; furthermore, contributions from accessory and antagonistic muscle groups were also evaluated. Measurements, testing, data collection and analysis by the independent researcher group on the Bio-Arc series, provided TuffStuff engineers with the necessary design modifications to optimize muscle recruitment of primary movers specific to each machine.

Bio-Arc design optimization testing recorded from agonist and antagonist muscle groups through surface electromyography.

Sample recording of raw muscle activity data during EMG testing on one subject.

Multiple muscles undergoing EMG testing to maximize agonist muscle recruitment during Bio-Arc development.

INNOVATIVE:

Bio-Arc Technology designed to maintain user's optimal body position throughout the entire range of motion (ROM).

INTUITIVE:

Bio-Arc Technology safely places users of all sizes and physical abilities in the optimal position to perform each exercise with minimal adjustments necessary.

PROPRIOCEPTIVE:

Bio-Arc Technology helps position the novice user's body, throughout each exercise movement, optimizing muscle recruitment and helping them learning how to feel and connect their mind & muscle (proprioception) during each exercise.

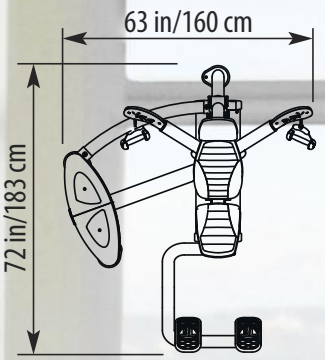
IMPORTANT FACTS TO KNOW:

User's entire body moves along a linear arc trajectory, with each machine to optimize muscle recruitment.

US PATENT NO. 9,533,188 B2; 9,539,462 B2 AND OTHER PATENTS PENDING.

BIO-ARC TECHNOLOGY:

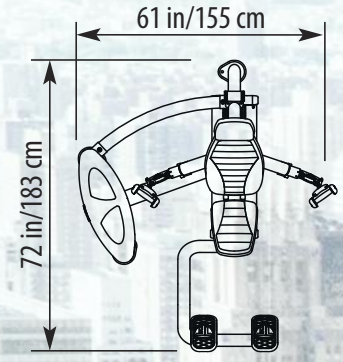
- Head, back and seat pads designed and positioned to maintain neutral head, neck, hip & low back positions – limiting possibility of cervical or lumbar hyperextension and injury.
- Optimized position for muscle activation through full range of motion.
- The user's entire body moves along a linear arc trajectory with the machine.
- **245 lbs. weight stack: weight lifted is the approximate combined user's weight and weight selected (see Weight Guide label).**



Ht: 58 in/147 cm
Wt: 620 lb/281 kg

BIO-ARC TECHNOLOGY:

- Head pad position helps prevent hyperextension of users neck.
- Independent individual handles allows natural arc pattern and movement of joints, limiting joint stress.
- The user's entire body moves along a linear arc trajectory with the machine.
- **245 lbs. weight stack: weight lifted is the approximate combined user's weight and weight selected (see Weight Guide label).**



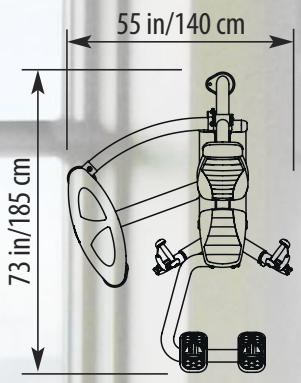
Ht: 58 in/147 cm
Wt: 610 lb/277 kg

BIO-ARC TECHNOLOGY:

- Design position of head pad and foot support allows you to be in a neutral position allowing users to optimize muscle activation during Bio-Arc motion.

- The user's entire body moves along a linear arc trajectory with the machine.

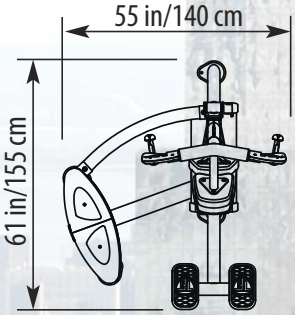
- **295 lbs. weight stack: weight lifted is the approximate combined user's weight and weight selected. (see Weight Guide label)**



Ht: 58 in/147 cm
Wt: 630 lb/286 kg

BIO-ARC TECHNOLOGY:

- Modified seat position and head pad to limit hyperextension of users neck.
- Independent, individual handles and body position minimizes shoulder stress, while allowing complete elbow extension and triceps recruitment during dip movement.
- The user's entire body moves along a linear arc trajectory with the machine.
- **200 lbs. weight stack: weight lifted is the approximate combined user's weight and weight selected (see Weight Guide label).**



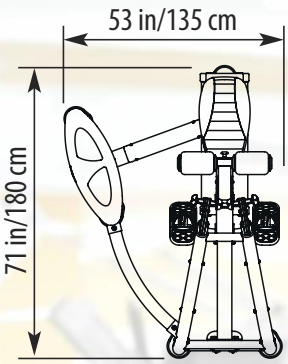
Ht: 58 in/147 cm
Wt: 535 lb/243 kg

BIO-ARC TECHNOLOGY:

- Design execution of the seat relative to the pulley-handle and the line-of-travel for the Bio-Arc motion increases Latissimus activation throughout the range of motion.

- The user's entire body moves along a linear arc trajectory with the machine.

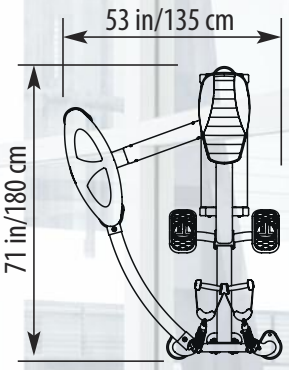
- **295 lbs. weight stack: weight lifted is the approximate combined user's weight and weight selected (see Weight Guide label).**



Ht: 86 in/147 cm
Wt: 710 lb/322 kg

BIO-ARC TECHNOLOGY:

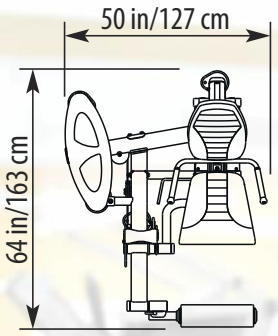
- Desired body position and foot support stabilizes and positions user to target lower & middle trapezius and rhomboid muscles.
- Optimal upper body angle throughout the range of motion.
- The user's entire body moves along a linear arc trajectory with the machine.
- **295 lbs. weight stack: weight lifted is the approximate combined user's weight and weight selected (see Weight Guide label).**



Ht: 58 in/147 cm
Wt: 640 lb/290 kg

BIO-ARC TECHNOLOGY:

- Allows for full range of motion and greater muscle contraction during full extension outperforming traditional fixed position.
- Maintains hip angle/pelvic tilt to optimize muscle length throughout the entire range of leg extension movement.
- The user's entire body moves along a linear arc trajectory with the machine.
- **200 lbs. weight stack: weight lifted is the approximate combined user's weight and weight selected (see Weight Guide label).**



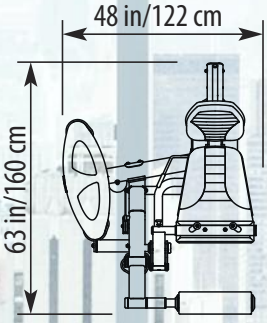
Ht: 58 in/147 cm
Wt: 550 lb/249 kg

BIO-ARC TECHNOLOGY:

- Maintains hip angle/pelvic tilt to optimize full contraction of the hamstring muscles, while limiting joint stress.

- The user's entire body moves along a linear arc trajectory with the machine.

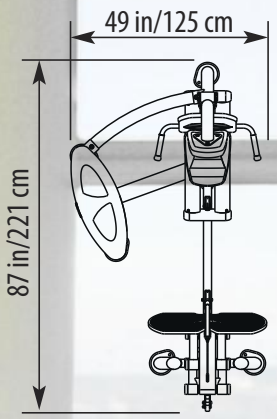
- **200 lbs. weight stack: weight lifted is the approximate combined user's weight and weight selected (see Weight Guide label).**



Ht: 58 in/147 cm
Wt: 555 lb/252 kg

BIO-ARC TECHNOLOGY:

- Large foot pad allows users to position feet in a wider stance to increase adductor recruitment when desired.
- Trigger release allows for easy adjustment of foot pad to desired starting position and range of motion.
- The user's entire body moves along a linear arc trajectory with the machine.
- **400 lbs. weight stack: weight lifted is the approximate combined user's weight and weight selected (see Weight Guide label).**



Ht: 58 in/147 cm
Wt: 815 lb/370 kg

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SPECIFICATIONS:

Frame Materials: 3″ and 4 ½″ 11-gauge 120 wall round tubular steel with a combination of 2 X 4″ 11 gauge 120 wall oval tubular steel.

Welds: All welded construction by inert-gas MIG welding conforming with all Structural Welding Code-Steel Standards and Specifications.

Padding: Molded PU foam glued to 1″ industrial plywood backing combined with double-stitched premium upholstery

Cables: 3/16″ USA-Made Certified EXERFLEX PRO high performance fitness cable.

Guide Rods: 3/4 solid steel 1045 (tgp) highly polished hard chrome finish.

Adjustment Pins: 1/2 push-pull spring loaded solid steel adjustment pins with ultimate load of 9040 lbs. and 46042 sheer strength.

Linear Shafts: 1″ precision Rockwell C60 grade solid shaft.

Bearings: 2″ High precision linear sealed ball bearing (load rating of 1900lb).

Pulleys: 4 ½″, 3 ½″ and 2″ fiberglass reinforced nylon pulley.

Fasteners: All frame bolts and nuts are 3/8″ and 1/2″ zinc plated grade 8. Meets ANSI specifications.

Custom Stabilizer Feet: Heavy grade molded rubber base feet insures stability, prevents equipment movement, and may be bolted to the floor.

Selector Weight Pins: Weight pins are solid steel, magnetic with ball-end to ensure a tight connection and secure fit.

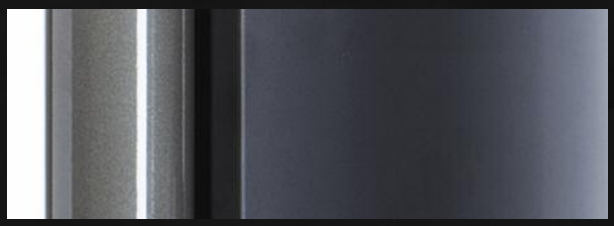
Weights: 3/4 " black solid steel plates offering reduced noise and self-aligning low friction sleeves.

Finish: Electrostatically applied powder coat finish baked at 400ºF and carefully monitored to ensure complete curing.

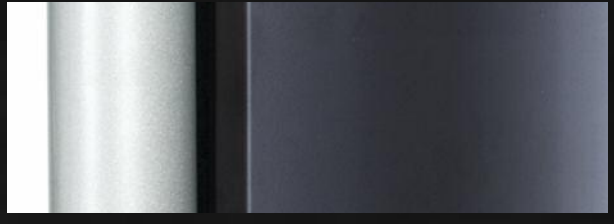
Frame Colors: Choice of two primary colors:

(1) Gloss Charcoal with Matte Black accent.
(2) Platinum Sparkle with Matte Black accent.

Custom colors available – please inquire with your sales representative for additional cost and availability.



(1) Gloss Charcoal with Matte Black accent.



(2) Platinum Sparkle with Matte Black accent.

Upholstery: Premium Bolta Sport vinyl with PreFixx, formulated to resist bacteria, stains, mildew, oil and UV stabilized pigments. Meets most flammability test requirements. All upholsteries are double-stitched with "hidden" borders. Bolta Sport color swatches are available upon request. Custom colors are available – please inquire with your sales representative. **Standard colors:**

MPORTANT NOTE: Color samples as shown are close representation of the actual vinyl colors, and must not be used for an exact match of the color. Always request for the actual vinyl samples from your dealer or TuffStuff Sales Representatives.

COMMERCIAL WARRANTY

10 YEARS:	Frames, welds, linear shafts and weight plates.
5 YEARS:	Pivot bearings, pulleys, bushings, gas shocks and guide rods.
3 YEARS:	TrakHandles
1 YEAR:	Linear bearings and pull-pin components.
6 MONTHS:	Upholstery, cables, finish,and rubber grips.

ALL OTHER PARTS not mentioned, one year from the date of delivery to the original purchaser.

NOTICE: TuffStuff continually engages in research related to product improvement. As a result, the product received by the customer may differ slightly from its published description. Improvements in materials, production techniques and design refinement may at any time be introduced into our products. TuffStuff reserves the right to make changes in its product without notice.

TUFFSTUFF FITNESS INTERNATIONAL HQ & MANUFACTURING FACILITY

Since its inception nearly five decades ago, TuffStuff Fitness International has become recognized worldwide as a leading manufacturer of high quality consumer and commercial strength products.

From our humble beginnings as a small family owned company, to our current state-of-the-art manufacturing facility located in Chino, California. TuffStuff maintains one of the largest American production lines in the fitness industry and remains the only fitness company in the United States with the capability to manufacture any product it sells. This capability is remarkable in an industry where most equipment suppliers do not design or manufacture anything they sell.

TuffStuff products have been challenged and prevailed over the most unforgiving competitor a company can face…TIME. In an industry where most equipment suppliers have been in business for less than ten years, and have never owned a manufacturing facility, TuffStuff's long-term success has proven conclusively that our dedication to precision, quality and service is indeed genuine.

Our complete line of products embodies more than four decades of detailed research and experience that our customers can trust. When you buy a TuffStuff product you can be assured that you are getting the latest design technology in the most durable and dependable fitness equipment on the market.

The continued success of TuffStuff products in both the institutional and consumer markets can be attributed to a team of dedicated staff, focused on making design improvements and meeting market place demands, while delivering unparalleled customer service and support. At TuffStuff we are committed to improving the lives of our customers by providing quality fitness products and solutions that earn their trust and build lifetime relationships.

We welcome you to our family of satisfied customers and look forward to serving your fitness needs now, and in the future.

TUFFSTUFF® FITNESS INTERNATIONAL

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