

ADARACT

Lighter, Stronger, Smaller
motion solutions



Adaract Artificial Muscle Actuators

Force-to-Weight ratio up to 20,000:1

Actuator OD as small as 3.5 mm

Leak-free, ingress-proof, corrosion resistant

Compliant, stiction-free motion

Actuator Overview

Adaract's Artificial Muscle Actuators provide unprecedented actuation performance in lightweight, compact packages while also enabling compliant, zero-stiction motion. Unlike traditional hydraulic actuators, our actuators operate completely leak free and are extremely durable, as they are dustproof, waterproof, and corrosion resistant.

With a force-to-weight ratio up to 20,000:1, Our actuators are 3-10 times stronger relative to their weight than even industry-leading comparables.



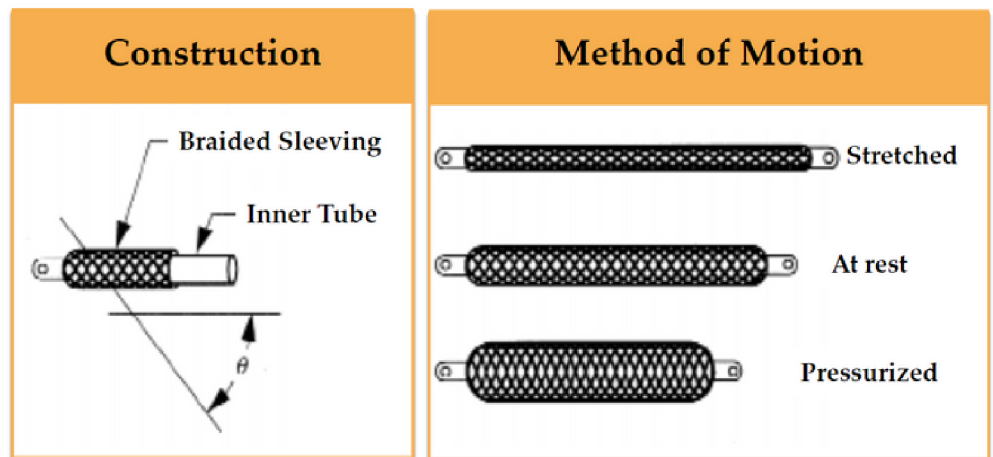
Actuator Bundles

Bundles of Adaract's actuators may be designed to move hundreds to tens-of-thousands of pounds. As these bundles of actuators utilize shared hydraulic connections and mounting points, they have even higher strength-to-weight ratios than single-fiber actuators. This actuator configuration also allows for Adaract's patented Variable Recruitment Systems.

Operation

Adaract's actuators are comprised of a rubber bladder surrounded by a braided sleeve (and other complexities that will not be divulged) capped with end-holders for connection to a hydraulic supply and some

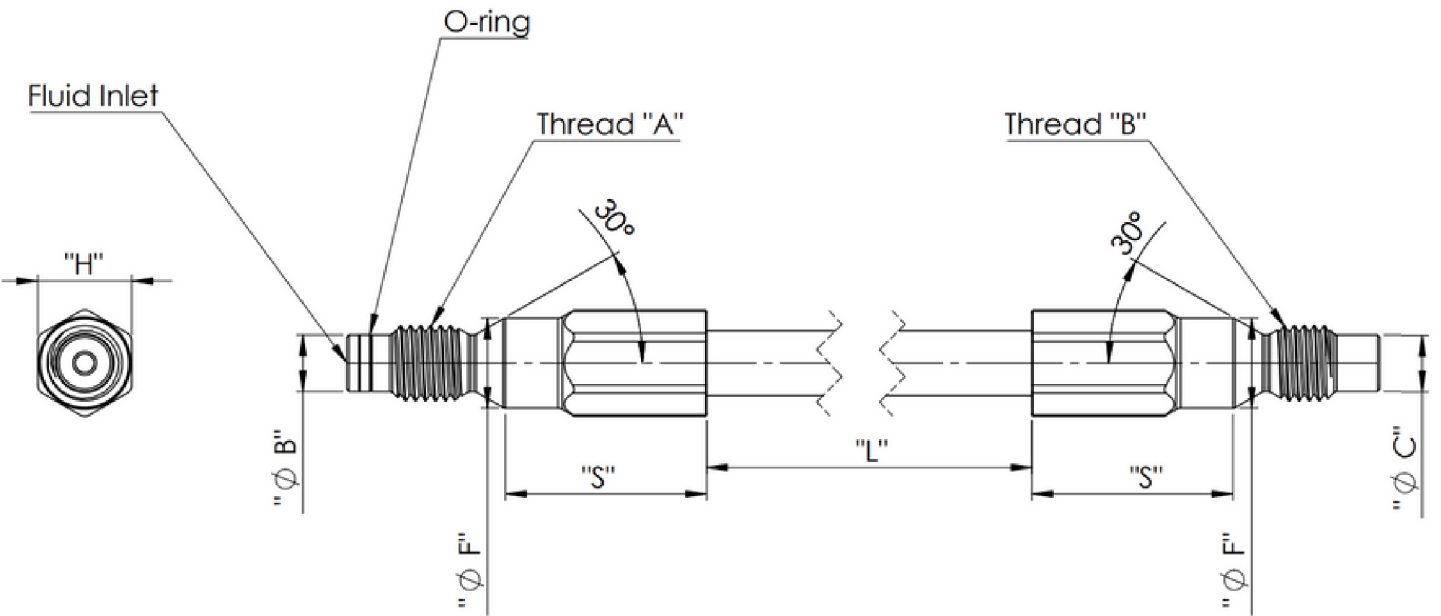
other anchor point. To make this actuator contract, pressurized fluid is pumped into the internal rubber bladder, causing the rubber bladder to expand radially and contract axially, providing linear motion. As the pressure and/or flow are adjusted, we can control the amount of contraction and thus the amount of linear motion provided; position is controllable with precision of 1/10,000 of an inch.



Adaract Artificial Muscle Actuator

Contractile Linear Actuator

Hydraulic/mounting end connections are customizable. Bundle-style multifiber actuators are available upon request.



TECHNICAL SPECIFICATIONS	MODEL		
	AM70	AM280	AM1120
Width across flats, H (inches)	0.25	0.438	0.75
ØB (inches)	0.118 -0.001 / +0	0.235 -0.001 / +0	0.432 -0.001 / +0
ØF (inches)	0.225	0.375	0.725
ØC (inches)	0.116 ± 0.001	0.235 ± 0.001	0.432 ± 0.001
S (inches)	0.400	0.840	0.930
Actuator Contracted Diameter (inches [mm])	0.138 [3.5]	0.276 [7]	0.551 [14]
Peak Contractile Force (lbf)	70	280	1120
Displacement (mL per 8" length)	0.4	1.6	6.4
Min. Weight - single fiber (grams, 8" length)	2	8	32
Min. Weight - bundles (grams per fiber, 8" length)	1.3	5.2	21

GENERAL SPECIFICATIONS

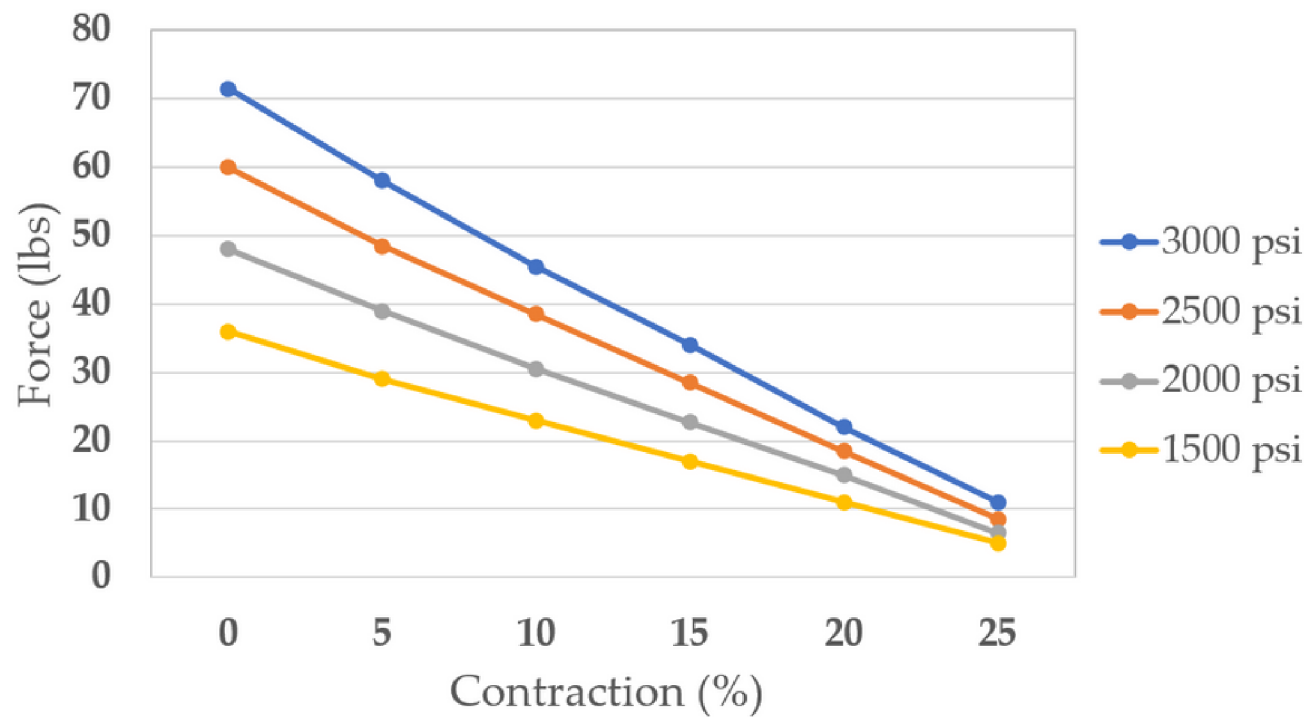
Working Pressure (psi)	150 - 3,000
Burst Pressure (psi)	> 10,000 (AM 70) > 9,000 (AM 280 & AM 1120)
Min. Contraction Pressure (psi)	150
Max. Recommended Cycle Rate (Hz)	20
Max. Stroke (% of Length)	30
Cycles to Failure	~ 1.5 million *
Length (inches)	4 - 48 **
Compatible Working Fluids	Skydrol™, Water-glycol, Water, Silicone Oil **
Example Hydraulic Connections	<i>Single Muscle:</i> O-ring rod, piston, & face seals <i>Bundles:</i> NPT, Flare, ORB, Flanges
Example Mounting Options	Eyelets, Ball Joints Rod Ends, ID & OD Threads

*Specified only for AM70 models. Tested @ pressure of 2,750 psi, dynamic contraction of 20%, and frequency of 4 Hz. Life is strongly dependent on test conditions. Please contact Adaract for additional information.

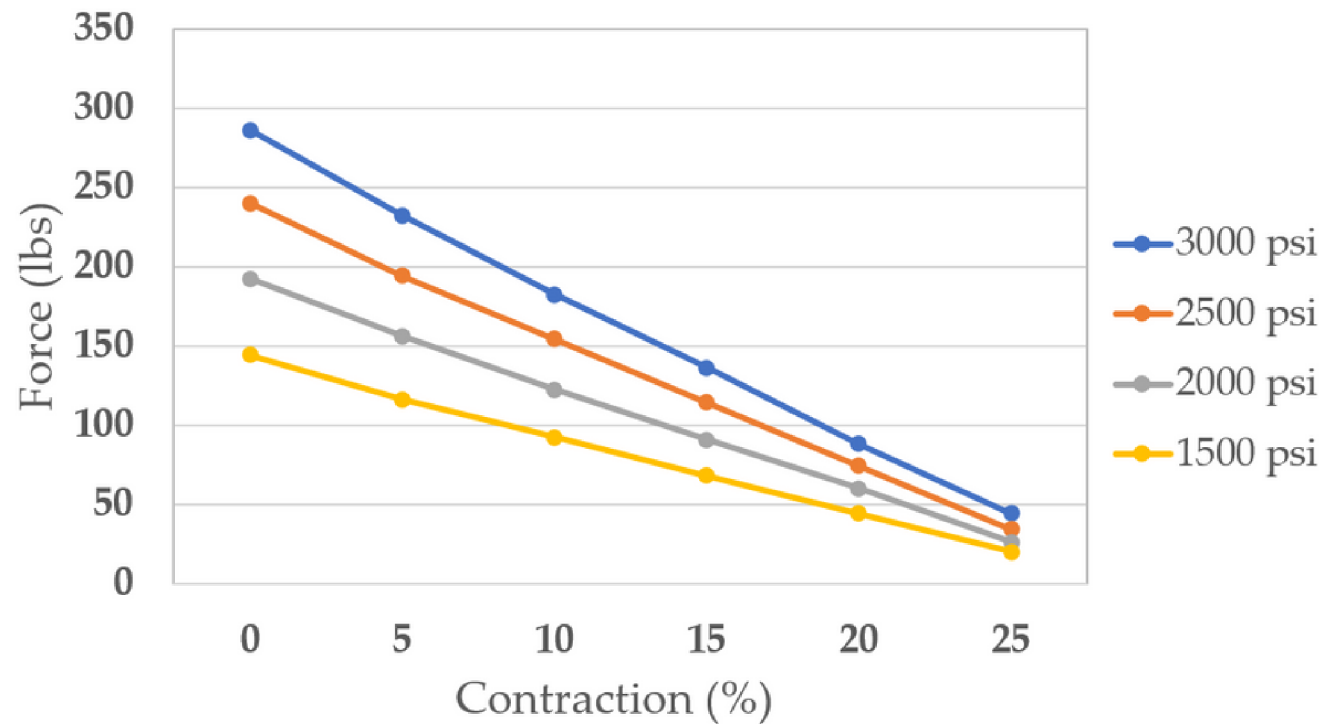
**Please contact Adaract if you require longer lengths, alternative working fluids, or any other customizations

Force vs. Contraction Curves

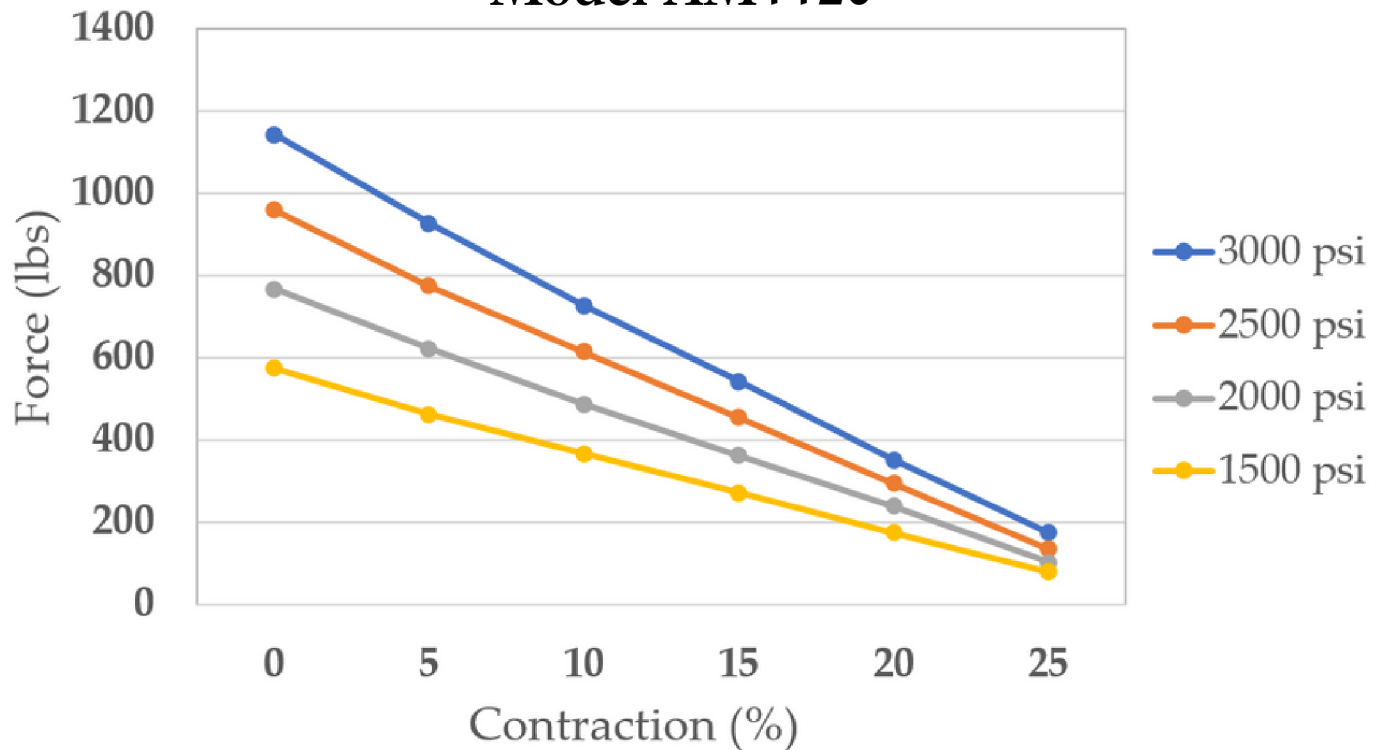
Model AM70



Model AM280



Model AM1120



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Please contact us for any technical or purchasing inquiries.

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