

2714-040 Series | Pneumatic Cord and Yarn Grips

Pneumatic cord and yarn grips are designed to have interchangeable clamping blocks that accommodate fiber or yarns made from conventional fibers to newly developed high-performance fibers. A specially designed horn with a smooth, highly-polished or controlled surface roughness finish and a contoured surface with a graduated cam allows for easy loading and a stress-reduced clamping area on the specimen. The clamping mechanism can be activated either automatically or through a footswitch to allow hands-free grip operation; this enables the operator to hold the specimen with both hands for easy loading.

Pneumatic cord and yarn grips provide selectable clamping force to accommodate different materials and excellent follow up action that compensates for decay of the holding force due to specimen creep.

Principle of Operation

Where the gripping area of monofilaments, cord, and yarn is small in relation to the strength, normal techniques using standard grip faces usually result in specimen failures adjacent to the jaw faces. The pneumatic cord and yarn grips are designed specifically to overcome the problem of specimen failure by incorporating a capstan design that evenly distributes the gripping force over the surface of a curved half capstan through friction. In addition, the pneumatically cushioned gripping force applied to the ends of the specimen compensates for the decay of force due to specimen creep.

The pneumatics activate a moveable face, which acts upon a contoured fixed gripping face. This serves as a capstan and provides support for the specimen, making the transition from the free-stressed length of specimen to the rigidly clamped portion gradually rather than abruptly, thus minimizing breakage of the specimen adjacent to the jaw face. The capstan also incorporates a polished guide horn, which assists in rapid specimen loading and prevents damage to individual fibers during specimen insertion. The specimen is placed over the top of the horn and slides down to the proper gripping position on the contoured clamp. The grips may be closed or opened by a pneumatic footswitch for hands-free operation. An automatic air kit is also available for hands-free, automated, and pretension testing via software or system default settings.

Features

- Rated capacity: 2 kN (200 kgf, 450 lbf)
- Pneumatic clamping of the specimen with follow-up clamping action
- Selection of clamping surfaces for conventional, aramid, or UHMWPE materials
- Adjustable gripping force to reduce breakage at the clamping point
- Guide horn allows for easy loading with minimal specimen damage
- Suitable for a wide range of linear densities (denier and tex)
- Follow-up action to reduce slippage
- Quick grip release for increased productivity
- Optional automatic air kit with pretension and remote control for easy loading and improved efficiency

Application Range

- Type of loading: Tension not suitable for through zero/reverse stress or fatigue testing
- Specimen material: Aramid fibers and ultra-high molecular weight polyethylene fibers may also be suitable for other types of cords, yarns, monofilaments, and fine wires
- Specimen shapes: Round



Specifications

2714-040

Maximum Capacity	kN	2
	kgf	200
	lbf	450

Mechanical Connection

Upper Fitting		0.5 in Clevis Pin (Type Dm)
Lower Fitting		0.5 in Clevis Pin (Type Dm)
Overall Width (A)	mm	226
	in	8.9

Effective Length (B)

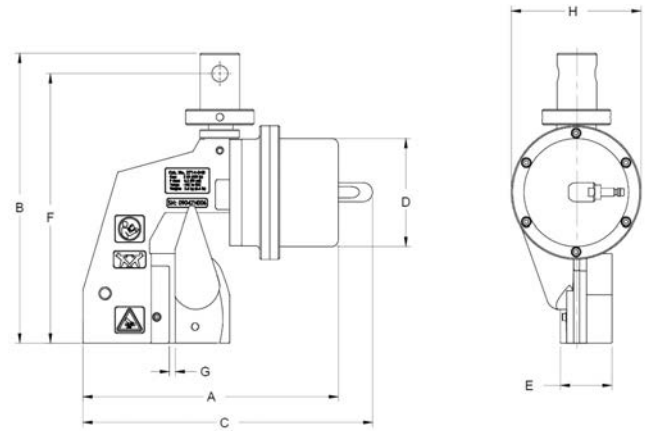
Upper Grip	mm	210
	in	8.3
Lower Grip	mm	210
	in	8.3
Weight (Upper Grip)	kg	2.36
	lb	5.2
Temperature Range	°C	-10 to +80
	°F	+14 to +176
Working Principle		Pneumatic Single Moving Face Clamping
Maximum Gripping Force	kN	7.1
	kgf	724
	lbf	1,596
Moving Face Length	mm	57
	in	2.24
Gripping Surface		Smooth
Maximum Air Pressure	bar	6.2
	PSI	90
Specimen Length at Zero Grip Separation	mm	390
	in	15.35
Maximum Specimen Diameter	mm	4.8
	in	0.19

Notes:

1. Grip catalog provides two grips. Clamping blocks are ordered separately.
2. Grips may require mechanical attachment coupling to connect to the load cell or machine base.
3. Automatic air control kit or pneumatic footswitch will be required for operation of these grips.

Accessories

2714-042	General Purpose Clamping Blocks
2714-043	Clamping Blocks for Aramid Fibers
2714-044	Clamping Blocks for UHMWPE Fibers
2714-045	Clamping Blocks for Aramid Fibers (High Denier)
2810-018	Air compressor, portable 115 V AC
2810-060	Air compressor, portable 230 V AC
2701-004	Pneumatic footswitch
2701-065	Automatic air control kit for 4400, 5500 (excluding 4411) and upgrade (excluding 1130, 6000, 4500 and TTs)
2701-067	Automatic air control kit for 4411 and upgrades on 1130s



Grip Dimensions



Automatic Air Control Kit



Pneumatic Footswitch



Close-up of Horn and Clamping Block

www.instron.com/accessories



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