

Materials List for:

How to Build a Vacuum Spring-transport Package for Spinning Rotor Gauges

James A. Fedchak¹, Julia Scherschligt¹, Makfir Sefa¹

¹Sensor Science Division, Thermodynamic Metrology Group, National Institute of Science and Technology

Correspondence to: James A. Fedchak at james.fedchak@nist.gov

URL: <https://www.jove.com/video/53937>

DOI: [doi:10.3791/53937](https://doi.org/10.3791/53937)

Materials

Name	Company	Catalog Number	Comments
Spring, 3 N/m	Lee Spring (www.leespring.com)	LC 042C 18 S316	Outside diameter 0.240 in, Wire Diameter 0.042 in, Rate 17.1 lb/in, Free Length 2.25 in, Number of Coils 29.3
8-32 threaded rod, 316 stainless steel	McMaster-Carr (www.mcmaster.com)	90575A260	Type 316 Stainless Steel Fully Threaded Stud 8-32 Thread, 3" Length. Cut to length specified in protocol
standoffs, 8-32 Screw Size	McMaster-Carr (www.mcmaster.com)	91125A140	18-8 Stainless Steel Female Threaded Round Standoff, 1/4" OD, 1/4" Length, 8-32 Screw Size
nuts, 8-32	McMaster-Carr (www.mcmaster.com)	90205A309	316 SS Undersized Machine Screw Hex Nut 8-32 Thread Size, 1/4" Width, 3/32" Height
Split Lock-Washers, 316 Stainless Steel	McMaster-Carr (www.mcmaster.com)	92147A425	Type 316 Stainless Steel Split Lock Washer NO. 8 Screw Size, .3" OD, .04" min Thick
Steel Rotor	McMaster-Carr (www.mcmaster.com)	9292K38	Bearing-Quality E52100 Alloy Steel, Hardened Ball, 4.5 mm Diameter
Right-Angle Valve	VAT Valve (www.vatvalve.com)	54132-GE02-0001	Easy-close all-metal angle valve, DN 40 (1.5")
Shipping Container	Allcases, Reekstin & Associates (www.allcases.com)	REAL1616-1205	Zinc Hardware w/Zinc Handles, Rotationally Molded, light-weight, high-impact, Polyethylene Case with protected recessed hardware. 15.75" x 15.88" x 16.45"
Ester Foam	Carry Cases Plus (www.carrycasesplus.com)	ES-PAD 3" Thick	3" Thick, 2 lb Charcoal Ester Foam Pad, 24" x 27".
Ester Foam	Carry Cases Plus (www.carrycasesplus.com)	ES-PAD 1" Thick	1" Thick, 2 lb Charcoal Ester Foam Pad, 24" x 27".
Egg-carton ester foam	Carry Cases Plus (www.carrycasesplus.com)	ES-CONV	ES-CONV, 2 lb, 24" x 27" x 1 1/2". "egg-crate" ester foam.
Foam Cutout, PE foam	Willard Packaging Co. (www.willardpackaging.com)		Custom Foam Cutout.
Spinning Rotor Gauge	MKS Instruments (www.mks.com)	SRG-3	Controller, head, and thimble. Custom thimble must be used for the spring-transport mechanism
Custom thimble	MDC vacuum Inc. (www.mdcvacuum.com)		drawing must be submitted for custom part
Detergent	Fisher Scientific Co (www.fischersci.com)	04-320-4	Sparkleen 1 Detergent
Acetone	Fisher Scientific Co (www.fischersci.com)	A18-S4	Acetone (Certified ACS)

Ethanol	Warner-Graham Company (www.warnergraham.com)	190 proof USP	190 Proof USP ethyl alcohol
Bolt set for valve	Kurt J. Lesker (www.lesker.com)	TBS25028125P	B,N&W set, 12 point, (25)1/4-28 x 1.25", for 2.75" thru, silver plat
Silver-plated copper gaskets	Kurt J. Lesker (www.lesker.com)	GA-0275LBNSP	
Spring Assembly (welding)	Omley Industries, Inc. (www.omley.com)	N/A	The machine work and welding were done in NIST's shop. However, Omley industries was used as an alternative for welding the spring assembly.