HAUG
QUALITY EQUIPMENT

Instruction Manual
Pack-Vac™ Leak Detector

CAUTION

Filling the Pack-Vac with water warmer than ambient temperatures may cause thermal expansion of the plastic and the tank may crack.
This is not covered under warranty.

HAUG
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18443 Technology Drive, Morgan Hill, CA 95037 • www.haugquality.com

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2 Introduction

How do you guarantee to your customers that your packaging system is dependable once it leaves your facility? That's a complex question. Issues such as packaging material compatibility, sealing machine set-up, and seal reliability in high altitude trucking and airfreight (see section 5.2) are just some of the production variables that need to be taken into account. The manufacturing considerations are countless. Fortunately, the Pack-Vac™ Leak Detector is a simple answer.
A systematic package testing system that incorporates the Pack-Vac Leak Detector will allow you to quickly and reliably set-up packaging lines. The result: less downtime for machinery adjustments. Additionally, continual process monitoring with the Pack-Vac Leak Detector will detect sealing problems before they snowball, thus improving production yield. Above all, the Pack-Vac Leak Detector will catch defects before they get to your customers.

3 Setup

The Pack-Vac is very easy to assemble and operate, just attach a compressed air line to the ball valve on the right side of the base 86 P.S.I. (6 bar) minimum. For electric units, plug into appropriate power source.

Caution !
The Pack-Vac is extremely heavy when filled with water. Be sure the table or cart is stable and rated for the appropriate weight.

Caution !
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4 General test method

The most common way to use the Pack-Vac™ is the bubble emission test.

- Fill unit with enough water to submerge package when expanded. Water level will rise as package is expanded under vacuum.
- Place product to be tested in the chamber and close the lid.
- **Compressed Air Model-** Open ball valve on right side of tank to generate vacuum.
- **Electric Model-** Push red slide valve on top of tank in towards fitting, switch on vacuum pump.
- Adjust vacuum level with brass bleed off screw on side of base. Clockwise to increase, counter clockwise to decrease.
- Increase vacuum until the package is expanded, see section 6. Bubbles will rise from a leak.
- **Compressed Air Model-** When testing is complete, close ball valve and vacuum will be relieved.
- **Electric Model-** When testing is complete, switch off pump and slide red valve out to relieve vacuum.

☞ ***Note!***
When testing a new package, always start with bleed screw at the lowest vacuum setting. Slowly raise vacuum level to prevent sudden bursting, see section 6.

5 Alternative Testing Methods

5.1 Dry chamber testing

The unit can be used dry for simple burst strength and altitude testing. Also, a package containing liquid with some headspace can be checked using the following method:

- Place the product on a paper towel in the dry chamber.
- Close lid and start the vacuum.
- Increase vacuum to fully expand package and put pressure on the seals.
- When finished, examine for leakage on the package or paper towel.

5.2 Empty bag test method

Empty bags should be sealed with some air in them to test properly. It is recommended that a block of foam be placed in the bag to give a consistent volume for testing. This insures that all operators will achieve the same results.

5.3 Rigid tray, tub, or cup test method

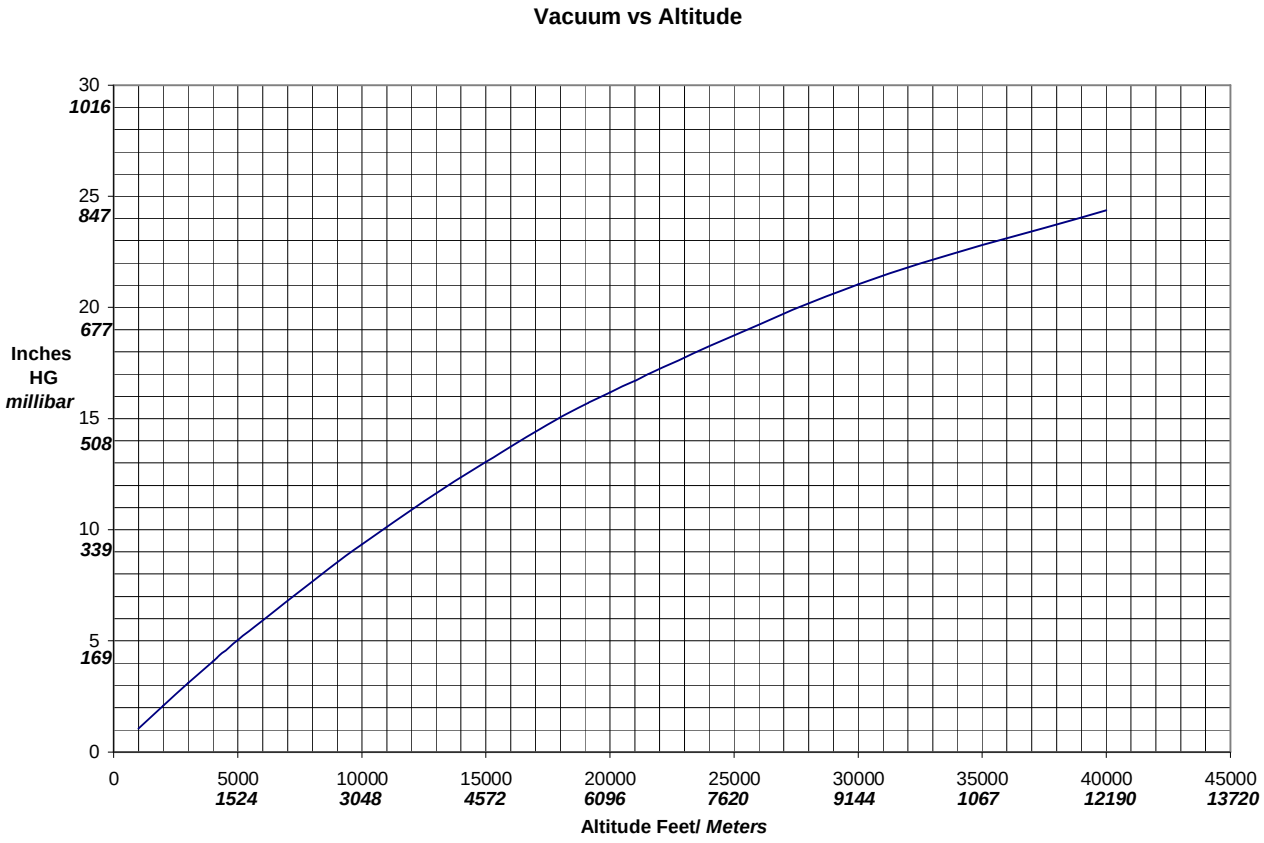
Rigid packaging sealed with lid film can be tested with the lid film down if there is no product. It is recommended that the test is performed with the lid film up if there is product. This allows the gas in the headspace to escape if there are any leaks. Gases are much more easily seen than liquid product.

Some products can be tested with lid film down using the dry chamber method, looking for product (see page 4).

5.4 Altitude simulation test method

Many shipping methods subject packaging to stress from changes in altitude. High altitude truck routes can cause package expansion and failures. Air cargo holds are typically pressurized to only 9,000 feet (2,743 meters). The Pack-Vac™ can reveal potential weaknesses in the package before shipping.

Altitude simulation can be done wet or dry. Vacuum levels can be converted to altitude with chart. Altitude reading will be a differential from current altitude. For absolute altitude, add the local altitude of the testing facility.



5.5 Vac-Pack™ attachment test method for vacuum packed products

The Vac-Pack™ attachment is used for vacuum packed product or product with very little headspace. A true internal pressure can be calculated when using this device (see 5.6). Set up the test as follows:

- Setup Vac-Pack™ attachment as shown (figure 1).
- Apply septa to clean dry portion of package (figure 2)
- Insert needle through septa into package. Avoid clogging needle with product.
- Close lid and start the vacuum at a very low level. It may be necessary to lower incoming air pressure with the regulator on CA units. Package expansion is slower with the Vac-Pack™ attachment in use.

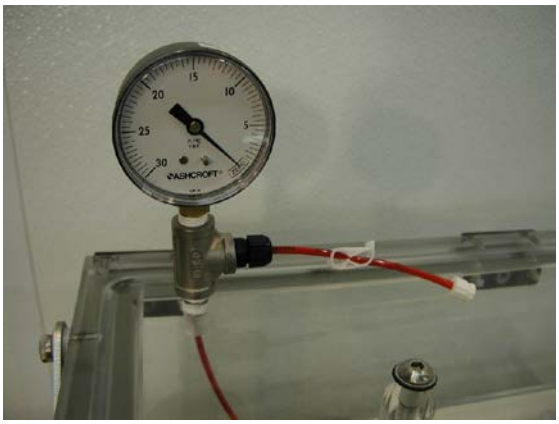


Figure 1.

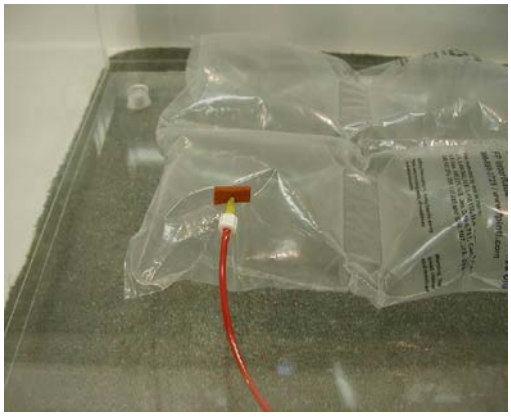


Figure 2.

5.6 Vac-Pack™ attachment testing for true internal package pressure

The Vac-Pack™ attachment can be utilized to test the package to a true internal pressure. Internal pressure can be calculated by the following chart:

Vacuum Level on Gauge					**Internal Package Pressure**	
In. Hg	-mbar	Torr	-mm Hg	% Vacuum	**psi**	**mbar**
0	0.00	760.0	0.0	0.0	**0.00**	**0.00**
1	33.86	734.6	25.4	3.3	**0.49**	**33.86**
2	67.72	709.2	50.8	6.6	**0.98**	**67.72**
3	101.58	683.8	76.2	9.9	**1.47**	**101.58**
4	135.44	658.4	101.6	13.2	**1.96**	**135.44**
5	169.30	633.0	127.0	16.5	**2.45**	**169.30**
6	203.16	607.6	152.4	19.8	**2.95**	**203.16**
7	237.02	582.2	177.8	23.1	**3.44**	**237.02**
8	270.88	556.8	203.2	26.4	**3.93**	**270.88**
9	304.74	531.4	228.6	29.7	**4.42**	**304.74**
10	338.60	506.0	254.0	33.0	**4.91**	**338.60**
11	372.46	480.6	279.4	36.3	**5.40**	**372.46**
12	406.32	455.2	304.8	39.6	**5.89**	**406.32**
13	440.18	429.8	330.2	42.9	**6.38**	**440.18**
14	474.04	404.4	355.6	46.2	**6.87**	**474.04**
15	507.90	379.0	381.0	49.5	**7.36**	**507.90**
16	541.76	353.6	406.4	52.8	**7.86**	**541.76**
17	575.62	328.2	431.8	56.1	**8.35**	**575.62**
18	609.48	302.8	457.2	59.4	**8.84**	**609.48**
19	643.34	277.4	482.6	62.7	**9.33**	**643.34**
20	677.20	252.0	508.0	66.0	**9.82**	**677.20**
21	711.06	226.6	533.4	69.3	**10.31**	**711.06**
22	744.92	201.2	558.8	72.6	**10.80**	**744.92**
23	778.78	175.8	584.2	75.9	**11.29**	**778.78**
24	812.64	150.4	609.6	79.2	**11.78**	**812.64**
25	846.50	125.0	635.0	82.5	**12.27**	**846.50**
26	880.36	99.6	660.4	85.8	**12.76**	**880.36**
27	914.22	74.2	685.8	89.1	**13.26**	**914.22**
28	948.08	48.8	711.2	92.4	**13.75**	**948.08**
29	981.94	23.4	736.6	95.7	**14.24**	**981.94**
29.92	1013.00	0.0	760.0	100.0	**14.70**	**1013.00**

6 Suggestions for setting test parameters

Testing parameters must be set for each size and type of package. Frequency of testing, vacuum level, water level (if any), and length of test are all variables that must be researched. Parameters can change due to variances in package headspace. In some cases, operators should have an understanding of the "look" of the expanded package more than trying to maintain a certain vacuum level. With some research and training, the Pack-Vac will become an integral part of your quality control program. General test parameters can be set up as follows:

- Slowly apply vacuum pressure to package in a dry chamber (to prevent excessive clean up). Raise vacuum level until the package fails, note vacuum level.
- Repeat until a consistant failure point is found
- Vacuum level should be set at approximately 70% of the failure point for future testing on the production line as long as this level meets

☞ ***Note !***
The consistency of any test is dependant on the consistency of the package being tested.

☞ ***Note !***
It may be found that the package cannot meet minimum requirements for integrity. The Pack-Vac™ is useful for testing new materials, machinery, and products before they are released to production.

☞ ***Note !***
Haug Quality also offers a differential pressure meter that is useful for determining the internal pressure of the package under vacuum. Please contact us for more information.

7 Maintenance

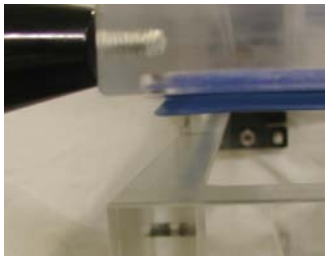
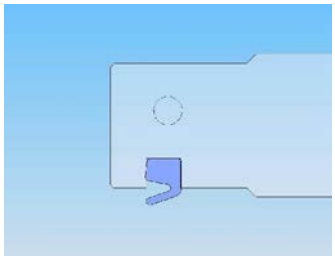
The Pack-Vac™ requires little maintenance. The following guidelines will ensure years of service from your Pack-Vac™

7.1 Cleaning

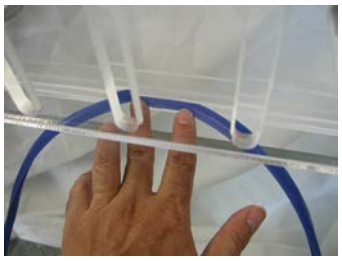
The Pack-Vac™ tank should be cleaned on a regular basis with mild soap and water to remove mineral deposits before they degrade the clarity of the plastic. Using water with lower mineral content will delay mineral build-up. Commercially available plastic polishers and cleaners by Novus can be used. Available from www.mcmaster.com

7.2 Gasket installation

- Remove old gasket.
- The lip of the gasket faces out!

- Start at the back center and press the ends together into the groove.

- Next, press each corner into the groove. Do not stretch the gasket.



- Press the remaining portions of the gasket into the groove.

- Close the lid. Loosen and retighten hinge screws to set lid height.

8 Parts List

Haug P/N	Title	Detail	Vendor	VendP/N
114827	Tank & Lid Assy. 110808	110808	Haug	
114826	Tank & Lid Assy. 181210	181210	Haug	
114828	Tank & Lid Assy. 201413	201413	Haug	
114829	Tank & Lid Assy. 242015	242015	Haug	
114710	Tank & Lid Assy. 302015	302015	Haug	
114709	Lid Assy (complete w/ hardware)	Pack Vac, 11x08	Haug	
114703	Lid Assy (complete w/ hardware)	Pack Vac, 18x12	Haug	
114706	Lid Assy (complete w/ hardware)	Pack Vac, 20x14	Haug	
114834	Lid Assy (complete w/ hardware)	Pack Vac, 24x20	Haug	
114711	Lid Assy (complete w/ hardware)	Pack Vac, 30x20	Haug	
174700	Lid Plate (with o-ring only)	Pack Vac, 18x12	Haug	
174709	Lid Plate (with o-ring only)	Pack Vac, 20x14	Haug	
176225	Lid Plate (with o-ring only)	Pack Vac, 24x20	Haug	
174852	Lid Plate (with o-ring only)	Pack Vac, 30x20	Haug	
194710	Hold Down Assy (bolt on)	Pack Vac, 18x12	Haug	
194855	Hold Down Assy (bolt on)	Pack Vac, 20x14	Haug	
194865	Hold Down Assy (bolt on)	Pack Vac, 24x20	Haug	
174599	Gasket	Pack Vac, 11x8 lid	Haug	
174600	Gasket	Pack Vac, 18x12 Lid	Haug	
174601	Gasket	Pack Vac, 20x14 lid	Haug	
174602	Gasket	Pack Vac, 24x20 lid	Haug	
176499	Gasket	Pack Vac, 30x20 lid	Haug	
	General PV hardware			
114996	Vacuum Assy.- side mount	single venturi (retrofit for Pisco venturi system)	haug	
851019	Gauge, vacuum	30 IN HG bottom mnt. 2-1/2"	Any	
851100	Gauge, vacuum	30 IN HG bottom mnt. 3-1/2"- Certified	Any	
851024	Vacuum Relief Valve, Brass	3/8 NPT thd.	McMaster-Carr Supply Co.	48935K35
851007	Regulator	1/4" Mini	Motion Industries	R162G
851012	Filter	1/4" Mini w/ overnight drain	Motion Industries	F300-02J
851147	Vacuum venturi	Black alum. block style	Haug	
851021	Vacuum Generator	VHH 15-3/8N2U	Pisco USA, Inc.	VHH 15-3/8N2U
851023	Filter (10 Pack)	Vacuum Generator Filter Element, 10 Pieces	Pisco USA, Inc.	SEO2
234362	Knob, tapered	5/16-18 stud	Reid Tool Supply Company	BD-40
234374	Latch catch	Adjustable Draw	Moore Industrial Hardware	702-L-C-SS
234429	Latch strike, (attaches to lid)		Moore Industrial Hardware	31-C-SS
234417	Lid Strap	Pack Vac, 1812, 2014,1108	Haug	
910033	Hinge, black friction		McMaster-Carr Supply Co.	1791A48
910059	Bumper, rubber (foot)	7/8" Base Dia, 13/32" Proj w/ washer	McMaster-Carr Supply Co.	9540K48
115092	Vac-Pack Attachment	test attachment for vacuum packed product	Haug	
910052	Needle, Dispensing, SS	20 Gauge, 1/2" Long,Yellow, Luer Lock, 50 pcs.	McMaster-Carr Supply Co.	75165A677
	Electric PV specific parts			
801094	Vacuum Pump	1/4HP Gast	Grainger	4F740A
801093	Vacuum Pump	3/4HP Gast	Grainger	4F742A
801097	Light bulb 110V	Coated, vibration resistant	McMaster-Carr Supply Co.	1532K41
801361	Fuse- Class CC (3/4 HP Pump)	20A time delay	McMaster-Carr Supply Co.	7706K99
801184	Fuse- Class CC (1/4 HP Pump)	12A time delay	McMaster-Carr Supply Co.	7706K31
801189	Cord, GFCI	14/3, right angle	Belkin	STA143-06-G
801269	Contact block assy.	rotary switch, PVEL	Haug	
801270	Operator handle	rotary switch, PVEL	Haug	
851020	Check valve	1/4 female npt, 3" H2O	Smart Products, Inc.	204PPB-3"
851025	T-Strainer, Low Profile	#40 Mesh	McMaster-Carr Supply Co.	98775K12-40
851039	Valve, slide	Red 1/4" Female NPT	McMaster-Carr Supply Co.	4622K33
851044	Gauge, vacuum	0-30 HG back mnt.	Any	
851089	Ball, Racquet		Any	
851038	T-Strainer	Nylon T-Strainer Clear Bowl, 1" Pipe	McMaster-Carr Supply Co.	9875K56
851035	Ball Valve, Air Inlet, Brass	1/4 x 1/4 ball valve,brass	Any	
851106	Ball valve, Drain, Brass	1/2 male x 1/2 female ball valve brass	Any	

Parts and suppliers are subject to change without notice. Common parts such as gauges and regulators are available from numerous sources.