

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
QUALITY EQUIPMENT

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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.



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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 to the right, 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 to the left 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.

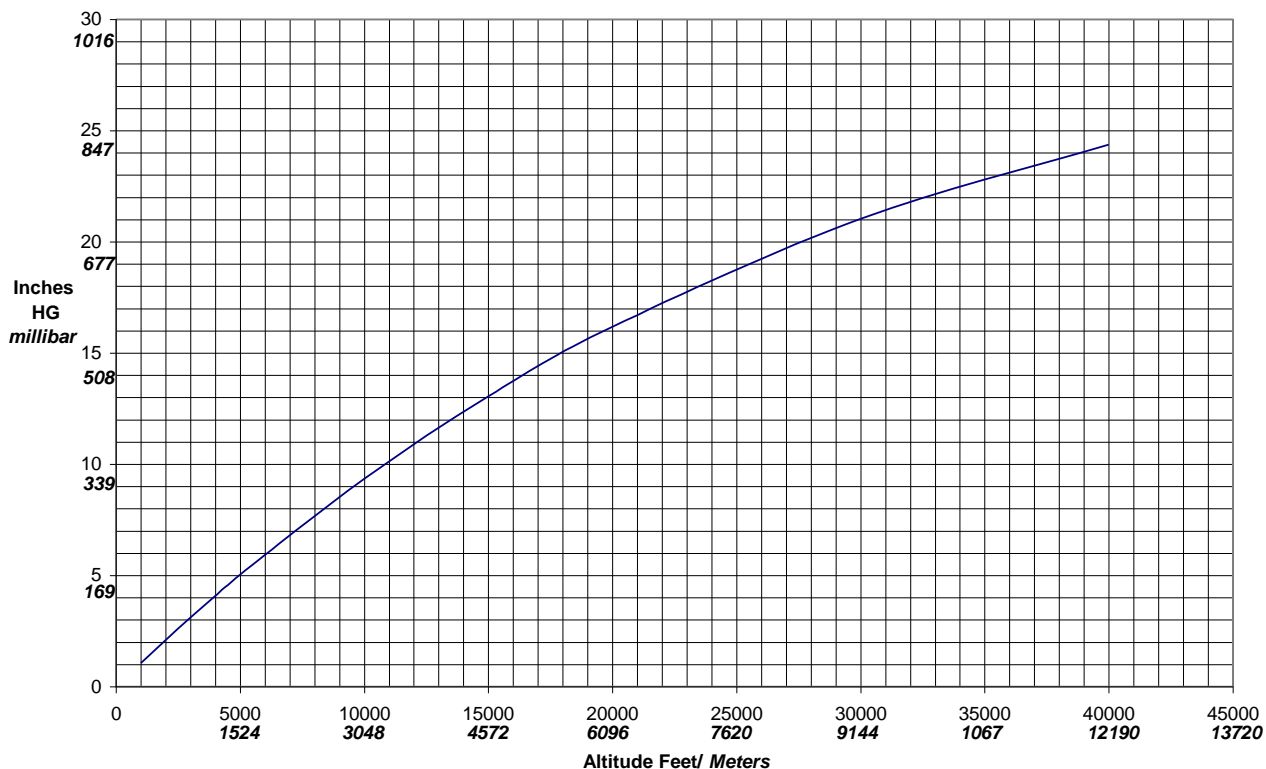
Some products can be tested with lid film down using the dry chamber method, looking for product seepage.

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.

Vacuum vs Altitude



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, page 6).
- Apply septa to clean dry portion of package (figure 2, page 6)
- 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.

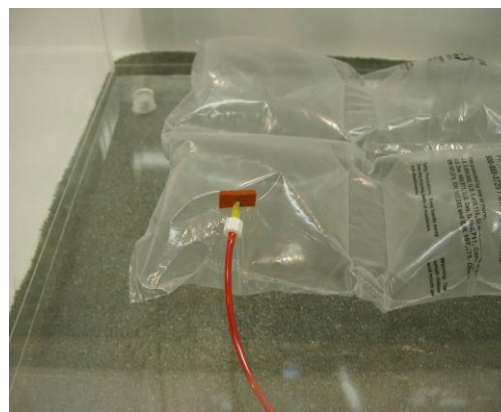


Figure 2.

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 consistent 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 shipping tests.



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 Hinge adjustment- for black O-ring only

Periodically the hinges may need to be adjusted as follows:

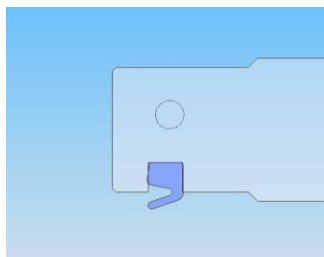
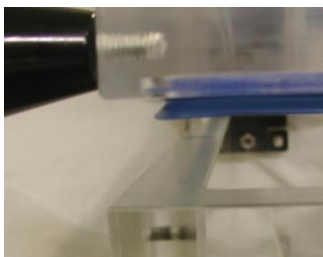
- Close lid and set vacuum level at 10" HG (-.338 Bar)
- Loosen all hinge screws.
- Retighten while lid is under vacuum.
- Release vacuum and return to normal use.

7.3 O-ring replacement

See section 7.4 Blue gasket installation. All replacement gaskets will be this style.

7.4 Blue gasket installation

- Remove as much old material as possible.
- 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.

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