

## DRY VACUUM TESTER FOR DETERMINATING PACKAGE SEAL INTEGRITY

VALENDOR's Dry Vacuum Tester can be used for different methods of testing the package seal integrity in male condom packages. For example, by wrapping the packages in absorbent paper and observing stains on the paper and/or by using Valendor Dye Test method (attached below).



The tester consists of one or more interchangeable clamp shelf units and a minimum size vacuum container. The clamp shelf unit with integrated lid and handle is tightly fitting in the fully (360°) transparent vacuum container.

Each clamp shelf unit can be loaded with 12 square type or 24 rectangular type of individual containers.

The container is equipped with vacuum gauge, release valve and connector to vacuum pump.



Delivered with Valendor's pneumatic vacuum pump.  
Evacuation time to -80% is approximately 5 seconds.

### Specifications

#### Vacuum Container:

Diameter:	90 mm
Length:	350 mm
Height:	100 mm
Material:	Transparent acrylic plastic

#### Clamp Shelf:

Capacity of rectangular condoms:	24
Capacity of square condoms:	12
No of slots:	4
Material:	Transparent acrylic plastic

#### Vacuum Pump

Maximum vacuum:	-86kPa (14kPa absolute)
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*VALENDOR reserves the right to modify this specification in part or as a whole.*



## VALENDOR DYE TEST FOR DETERMINATION OF SEAL INTEGRITY ON INDIVIDUAL CONDOM PACKAGES

### Introduction

The most common method to detect leaks in individual condom packages is the wet vacuum method, based on the estimation that air will leak out from a defective package when the package is put in a vacuum.

The problem with this method is that smaller leaks cannot be detected because the package is allowed freely to change its shape and thereby also its internal volume. Therefore, the difference in pressure between inside and outside of the package might not be challenging enough and many holes may not be detected because they are too small or filled by lubricant. The consequence is that consumers receive packages stained with lubricant, especially if the condoms are stored at higher altitudes with lower atmospheric pressure.

### DYE-TEST

The Valendor Dye Test is a more sensitive and reliable method to detect leaks. The method, which is a common method within the packaging industry, is able to detect holes of all sizes which might lead to leakage of lubricant. The Valendor Dye Test is also able to detect tiny channels that are filled with lubricant.

### Principle

Injecting a dye solution in the individual condom package and inspecting the package for visible signs of leaks after vacuum treatment.

### Materials

- A syringe or a repeater with 0,6 mm needle for injecting 1-2 ml of dye solution into the individual condom packages.
- A sloping support to hold the package in position during injection and sealing.
- Super Glue and transparent tape.
- Dye solution consisting of 0,5% Rhodamine and 99,5% Isopropanol.
- VALENDOR DRY VACUUM TESTER FOR PACKAGE SEAL INTEGRITY

or

a fixture consisting of two parallel plates to prevent the packages from expanding in the vacuum and a vacuum chamber capable to create -50 to -80 kPa (50 to 20kPa absolute) vacuum.



### Procedure

Place a strip of condoms on the support. Inject 1-2 ml of dye solution in each individual package avoiding the solution to wet the outside of the package. The sloping platform make it easier to puncture the package and assists in transporting the injected solution from the hole area.

Seal the injection hole with type Super Glue and let it dry for one minute. Put a transparent tape over the holes.

Place the strip in the clamp shelf unit/fixture and place it in the vacuum chamber.

After 30 - 120 seconds in vacuum (-50kPa), examine each individual package for visible signs of leaks. If any discoloration is observed outside the package, the package is deemed to leak.

The sensitivity of the test can be adjusted by varying the time and extent of the vacuum.

To test 32 individual male condom packages using this method and VALENDOR's Dry Vacuum Tester, takes less than 20 minutes.