



The “SST-3 Secure Seal Tester” is used to test the seal integrity on the glass or plastic containers and cans.

The SST-3 has been designed to address the special needs of sealing cans and bottles that use aluminium roll-on, twist crowns, or plastic caps. The SST-3 operates with compressed air, nitrogen, or carbon dioxide. By detecting gas leakage, rather than liquid, the Secure Seal Tester gives more sensitive and accurate readings.

SST-3 is made from anodized aluminium, stainless steel, and plastic materials. The tester’s rugged construction withstands production line abuse yet is accurate enough for laboratory use.



PET bottled beverage
(With gas)



PET bottled beverage
(Without gas)



Glass-crown cap



Bottle Can-crown cap



Beverage cans



Glass bottle- metallic Screw cap

Standards of Qualified Sealing Integrity

PET bottled beverage without gas, such as mineral water or tea beverage	0.2 Mpa
PET bottled beverage with gas, such as Cola	1.0 Mpa
Glass bottle-Crown cap, such as beer	1.0 Mpa
Glass bottle-Plastic cap and Aluminium twist-off cap, such as sauce and spirit	0.2 Mpa
Canned food or Canned beverage	0.2 Mpa



Features:

- 1) Adopts compressed air or CO2 to pressurize.
- 2) Measures with Positive Pressure Method, avoiding the deficiency when the measuring pressure is less than 1bar with Negative Pressure Method.
- 3) Measuring pressure range: 0-16bar (1.6Mpa)
- 4) Made from anodized aluminium, stainless steel, and plastic materials, solid and durable.
- 5) Equipped with Pressure Reducing Valve inside the machine, setting the max. testing pressure easily.
- 6) Some of these safety features are the series safety valve, the aligning hole arrangement in the lid, and the rapid venting characteristic. Others include the secure lid latch, the regulator relief valve and the concept that the test container is submerged in water surrounded by a cylindrically shaped tank.
- 7) Accurate flow control, adjustable rising speed. Adjustment range: the time to pressurize to 1Mpa can be adjusted to any time in the range of 5-60 seconds.
- 8) High sensitivity and high accuracy.
- 9) Pressure meter resolution: 0.05Mpa
- 10) Measuring pressure range: 0-16 bar (1.6 Mpa).



Dimensions

The max. dimension of the measuring samples	330 x 150mm (height x diameter)
Dimensions	L320mm x W380mm x H720mm
Net weight	15kg

Applications

1. Pressurizing Test: the seal integrity of PET bottle cap

The seal integrity of PET bottle cap is very important for the quality of PET bottles. Many manufacturers tend to buy "SST-3 Secure Seal Tester" to test the seal integrity of PET bottles, to effectively control the seal integrity of the products, avoiding gas leakage. Thus, SST-3 is widely used in beverage industry. Here are the inspection indicators and inspection methods:





Indicators of Qualified Sealing Integrity of PET Bottle Cap:

	100psi	125psi	150psi	175psi	
	<100psi				>175psi
Leakage	<u>Unacceptable</u> (correct)	<u>Acceptable</u> (But may indicate trend. Look for cause and correct)*		<u>Acceptable</u> (typical value)	

*100psi=0.69Mpa

Some inspectors may change the above inspection indicators based on their needs.

Inspection Methods:

- 1) Fill the water tank to approximately 10cm from top of tank. This level assures the closure will be covered with water.
- 2) Regarding to PET bottles, cut off the bottle cap together with the bottle mouth at the position of bottle neck. Then, seal it with a special clamp provided.
- 3) Connect the sample with the measuring head. Put the sample into the water tank, and then close the machine cover. Please check whether the cover is locked well.
- 4) Regarding to glass bottles and 2-pc cans, pierce a hole on the bottle caps with the special-made piercing device of SST-3, then run "VENT" to ensure the seal integrity between of piercing and bottle caps.
- 5) Put the sample into the water tank, close the machine cover, and then press "START".
- 6) The pressure inside the sample will be increased according to the preset rate until it is up to the first preset upper limit (SP-1).
- 7) The timer will do the pressure-holding for the pressure inside the samples. When the pressure-holding is over, the pressure will continue to increase to the max. measuring pressure according to the preset rate.
- 8) If there are bubbles during the test process, press "STOP". Meanwhile, the it will display the current max. pressure value.



- 9) The data can be output via RS port.
- 10) When the test is over, decrease the pressure inside the sample to ZERO. Loosen the machine cover and take the samples out of the water tank.
- 11) Disconnect the gas pipe from the pressurizing fixture, screw out the pressurizing fixture and take the sample out.

The frequency of testing filled product with the SST-3 needs to be developed by each individual bottler. Factors which could affect the frequency of testing are condition of the roll-on capper, line speed, number of different vendors used for closures and containers, and the frequency of preventative maintenance of the capper.

Suggested Testing Frequency and Methods:

- 1) Remove three containers from each capper head at the beginning of each shift. Observe all three samples from each head for visual thread definition. Test on sample from each head in the SST-3 and record the results. If any of the containers fail the SST-3, test the remaining two containers from specific capper head which failed the SST-3. If either of the remaining two containers fails the SST-3, corrective action should be taken.
- 2) Containers should be tested after each capper head adjustment.
- 3) Containers should be checked in the SST-3 when changing to a new lot of containers or closures, or when switching to a different vendor of either closures or containers.
- 4) Containers should be checked after any “jam-ups” in the capper.
- 5) Routine testing frequency on the SST-3, when neither 3 or 4 above has occurred, needs to be developed by the individual bottler; however, we recommend a test frequency of every other hour as outlined in #1 above.
- 6) Note: These values have been established by many users as sufficient to provide assurance of a secure seal with above containers and closures. Individual bottlers may choose to modify the test procedures outlined according to their needs. Examine all defects and retest packages as required to determine the causes for lack of a secure seal. Corrective action should be taken immediately when leakage is observed on the SST-3.



Theory of Operation:

SST-3 Secure Seal Tester is a set of equipment used to evaluate the seal of an aluminium roll-on type closure to either glass, plastic containers and cans. The test is performed by inducing gas, at a controlled rate, into the headspace of a bottle which is submerged in water bath. The internal pressure build-up is meant to exceed normal conditions present in a carbonated beverage container. This excess pressure tests the security of the container finish-to-closure relationships, i.e., thread definition. Containers which are securely sealed will accept the excess pressure and show no signs of gas leakage. Containers which are not securely sealed will be revealed by the emission of small bubbles coming from the closure area.

These bubbles can be easily seen by the operator. The ability to observe gas leakage rather than liquid leakage provides for a maximum degree of test sensitivity.

The gas pressure which is produced in a test container is controlled by a regulator and flow control valve. The ability to regulate the pressure permits the user to determine the maximum pressure a closure or container can withstand before gas leakage occurs. By controlling to flow rate a more accurate simulation of container pressure build-up is given.

Many safety features have been built into the SST-3 Secure Seal Tester. Some of these safety features are the series safety valve, the aligning hole arrangement in the lid, and the rapid venting characteristic. Others include the secure lid latch, the regulator relief valve and the concept that the test container is submerged in water surrounded by a cylindrically shaped tank. However, some cautionary measures should be taken to ensure the complete safety of the user.

SST-3 Secure Seal Tester is a statistical quality control tool and does not guarantee defect-free package leaving the filling lines. It is a useful part of capping quality control system, but it is not a substitute for other elements of such a system, as recommended by the manufacturers and suppliers of cappers, containers and closures. Interpretation of the SST-3 results is at the discretion of the user.