Air Leak Tester for Packaging

This is a leak tester for checking the seal of medical, cosmetic and foodstuffs packaging.

- Ideally suited for sample testing of packaging/containers
- As leak rates are quantified, quality management can be carried out scientifically
- A broad range of testers to cater to your product size
- Compatible with GMP/Validation

MSP series

MSP-0100
MSP-0200
MSP-0300

*Laptop PC is not included.
Automated, quantified and dry packaging seal testing

Leak testing of packaging

Medical products, cosmetic products and foodstuffs are increasing seal-packaged in order to prevent deformation and other unwanted changes to the product. However, flaws to the packaging, such as pin hole or bad seal, may compromise the quality of the product, leading to serious issues. Leak testing is imperative for controlling the quality of the packaging in order to prevent such compromise in product quality.

MSP is a device allows leak testing to be carried out easily, quickly and accurately.

Example: Testing Stick Coffee Packaging
- Testing Condition: 4 sachets tested simultaneously
- Measurement Time: 23 seconds (approx. 6 seconds per sachet)
- Test Pressure: -30 kPa
- Testing Standards: Detection of φ100μm

Merits to carrying out leak testing using MSP

Comparison Test pressure: -40 kPa Target sample: PTP packaging

Differential pressure type leak testing

<table>
<thead>
<tr>
<th>JIS Z 2332</th>
<th>Test method for leaks using the pressure change measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chamber</td>
<td>Work (test product)</td>
</tr>
<tr>
<td>Master tank</td>
<td>Differential pressure sensor</td>
</tr>
</tbody>
</table>

Submergence (visual) Test

<table>
<thead>
<tr>
<th>JIS Z 0238</th>
<th>Testing methods for heat sealed flexible packages</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP</td>
<td>Vacuum Pump</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Approx. 14 sec</th>
<th>Testing time is shortened</th>
<th>Approx. 120 sec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum hole diameter: φ5μm</td>
<td>Testing accuracy is improved</td>
<td>Minimum pore diameter: φ10μm</td>
</tr>
<tr>
<td>Data analysis feedback is possible</td>
<td>Test figures are managed</td>
<td>Not manageable as it is a sensory test</td>
</tr>
<tr>
<td>No variations to results due to human factors</td>
<td>Human error</td>
<td>There are variations to results due to human factors</td>
</tr>
<tr>
<td>Damage to the sample minimized (reduction in disposal costs)</td>
<td>Nondestructive inspection (Disposals due to testing)</td>
<td>Not manageable as it is a sensory test</td>
</tr>
<tr>
<td>Testing is traceable</td>
<td>Computer management of the process</td>
<td>All samples must be disposed of Process is managed by people</td>
</tr>
</tbody>
</table>
Leak testing is carried out by measuring the pressure difference between products that are known to be without leaks and products that are being tested for leaks.

**Leak testing of packaging using MSP**

Place the work inside the chamber. Pressurize (negative/positive pressure) the chamber.

Leak testing is carried out by comparing the pressure changes between the work chamber and the master (reference) side tank.

- **Testing for small leaks and large leaks is carried out.**

  Small leaks are measured by checking the pressure difference after the chamber is pressurized; large leaks are detected by carrying out volume measurement.

  There are 2 different types to large leak measurement method (tank partial pressure type, tank pressurization type).

  In order to select the measurement method appropriate to the work, various factors, such as the shape and internal volume of the work, as well as the test pressure and chamber residual volume must be checked by experiments in advance.

  For this reason, please feel free to contact us for further details.

**Tank pressurization type**

- If the internal volume of the work is 5cc or below

**Large leak measurement limit**

Measurement is possible if the work's internal volume is 1/150 or more of the chamber residual volume.

Pressure inside the tank is reduced in advance, then the valves of the work side chamber and the master tank are opened, and the difference in pressure is measured.

As compared to the tank partial pressure type, it has higher sensitivity when measuring large leaks. Therefore, it is suited for testing work with smaller internal volume.

- **Example of applicable test parts**
  - PTP
  - Suppository, etc.

**Tank partial pressure type**

- If the internal volume of the work is 5cc or more

**Large leak measurement limit**

Measurement is possible if the work's internal volume is 1/8 or more of the chamber residual volume.

Small leaks are measured by inserting work inside the chamber and reducing the chamber pressure using a vacuum pump.

Large leaks are measured by releasing the air inside the work side chamber and the master tank side to their respective small tanks, and the generated differential pressure is measured.

- **Example of applicable test parts**
  - Packed rice
  - Pillow packaging
  - Stick coffee, etc.
Packaging leak tester products by Fukuda

These products are designed to leak test medical, cosmetic and foodstuffs packaging.

**Lineup to cater to various product sizes**

**MSP-0100**
(for miniature products)

Chamber size (mm)
80(W) × 150(D) × 25(H) or below

![MSP-0100](image)

**Example of applicable test parts**
- PTP
- Pillow packaging
- Suppository
- Granule
- Stick coffee
- Packed rice
- Retort pouch
- Confectionery packaging
- Paper pack
- Eyeliner
- Liquid medicine bag
- Resin/glass bottle
- Syringe
- Skin lotion container etc.

**MSP-0200**
(for medium-sized products)

Chamber size (mm)
210(W) × 170(D) × 75(H) or below

![MSP-0200](image)

**Multiple measurements can be carried out simultaneously.**

Multiple measurements can be carried out simultaneously. Jigs will be custom designed to fit the work. If multiple measurements are to be carried out simultaneously, the design will be similar to that is shown in Fig. 1.

**Fig. 1: In the case of stick coffee**

**MSP-0300**
(for large-sized products)

Chamber size (mm)
320(W) × 230(D) × 75(H) or below

![MSP-0300](image)

* Laptop PC is not included.

**Validation compatibility**

GMP/Validation is compatible with validations that conform to PIC/S, GMP and CSV

<table>
<thead>
<tr>
<th>Preparation of Eligibility Evaluation Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ (during installation)</td>
</tr>
<tr>
<td>OQ (when in operation)</td>
</tr>
</tbody>
</table>

- IQ planning sheet  - IQ outline records  - IQ report
- OQ planning sheet  - OQ outline records  - OQ report

* *GMP/validation support: Ease Limited*  [http://www.easejp.com/]
Function

- Graphic display of the measurement status
  Measurement status, settings evaluation during startup, as well as troubleshooting can be carried out using the waveform data.
- Self check function
  Operational malfunction of the valves, sensor disconnection or sensor deterioration can also be diagnosed.
- Group settings function
  Changes of works and conditions settings can be saved under different conditions which can be divided into groups 0 to 15 (16 different types).
- Serial connection output
  Measurement results, pressure values, and settings values are output. Measurement results and other data can be displayed or saved onto the PC by connecting the unit via a RS-232C connector or a USB function connector. Please contact us if you require this feature as a special software is required for your PC to enable it.
- Calibration function
  Work volume measurements and sensor sensitivity calibration can be carried out using the equipped manual calibrator.
- USB connector
  Using the special USB (sold separately), measurement results can be saved easily. driver is required for communication.

Fully-automated leak tester

The MSP series is designed for sample testing. We also have fully-automated testing systems available. Please feel free to contact us for details.

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>MSP-0100</th>
<th>MSP-0200</th>
<th>MSP-0300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method</td>
<td>Work/master differential pressure comparison method (tank partial pressure type, tank pressurization type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test Pressure</td>
<td>-90kPa ~ -5kPa tank partial pressure type</td>
<td>-50kPa ~ -5kPa tank pressurization type</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>5.7in, LCD (320 x RGB) x 240 dots, color TFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group Setting</td>
<td>0 - 15 groups 16 types</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timer Setting</td>
<td>0.0 - 999.9 (in 0.1sec divisions, however, the minimum/maximum duration is dependent on each process)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display Unit</td>
<td>Pa, kPa, mL/min, mL/sec, Pa · m³/sec</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compatible Temperature Humidity Range</td>
<td>0 ~ 40 °C 45 ~ 85%RH (w/out condensation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td>AC100 ~ 240V 50/60Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Consumption</td>
<td>100VA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>External Input/Output</td>
<td>RS-232C</td>
<td>USB Host</td>
<td>USB Function</td>
</tr>
<tr>
<td></td>
<td>9P non-procedure asynchronous (data input/output signal)</td>
<td>A type storage device (using a specified USB memory)</td>
<td>B type USB 1.1 (a specified driver is required for communication)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>432(W) × 620(D) × 440(H) mm</td>
<td>530(W) × 680(D) × 440(H) mm</td>
<td>640(W) × 795(D) × 440(H) mm</td>
</tr>
<tr>
<td>Weight</td>
<td>40kg</td>
<td>80kg</td>
<td>90kg</td>
</tr>
<tr>
<td>Chamber Size</td>
<td>80(W) × 150(D) × 25(H) mm or below</td>
<td>210(W) × 170(D) × 75(H) mm or below</td>
<td>320(W) × 230(D) × 75(H) mm or below</td>
</tr>
<tr>
<td>Air Pressure Source</td>
<td>Pneumatic Pressure Source 0.4MPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>※ Please supply clean, stable, and dry air.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Recommended conditions according to JISB8392-1 : 2000

<table>
<thead>
<tr>
<th>Class</th>
<th>Item</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Maximum particle diameter</td>
<td>0.1 μm</td>
</tr>
<tr>
<td>3</td>
<td>Minimum pressure dew point</td>
<td>-20°C</td>
</tr>
<tr>
<td>1</td>
<td>Maximum oil concentration</td>
<td>0.01mg/m³</td>
</tr>
</tbody>
</table>

Exterior Material

Stainless (SUS304)
For small products

**MSP-0100-**

For medium products

**MSP-0200-**

For large products

**MSP-0300-**

<table>
<thead>
<tr>
<th>Model</th>
<th>Item</th>
<th>Sign</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>System Method</td>
<td>2</td>
<td>Capsule automatic carrying in/out</td>
</tr>
<tr>
<td>②</td>
<td>Number of Channels</td>
<td>1</td>
<td>1CH</td>
</tr>
<tr>
<td>③</td>
<td>Air Leak Tester (Testing Method)</td>
<td>2</td>
<td>FL-512 Tank Partial pressure Type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>MSL-0101 Tank Pressurization Type</td>
</tr>
<tr>
<td>④</td>
<td>Display</td>
<td>3</td>
<td>FLZ-0700 Tank Partial pressure Type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>FLZ-0800 Tank Pressurization Type</td>
</tr>
<tr>
<td>⑤</td>
<td>Pressure Range</td>
<td>4</td>
<td>−90 ~ −5kPa Tank Partial pressure Type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>−50 ~ −5kPa Tank Pressurization Type</td>
</tr>
<tr>
<td>⑥</td>
<td>Power Source</td>
<td>2</td>
<td>100 ~ 240V</td>
</tr>
<tr>
<td>⑦</td>
<td>Kind of test piece</td>
<td>X</td>
<td>No selection</td>
</tr>
<tr>
<td>⑧</td>
<td>X</td>
<td>X</td>
<td>No selection</td>
</tr>
<tr>
<td>⑨</td>
<td>Safety system</td>
<td>1</td>
<td>Acrylic Cover (Standard)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>Safety Light Curtain</td>
</tr>
<tr>
<td>⑩</td>
<td>Calibrator</td>
<td>0</td>
<td>Not</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>CAL-0.1 MSP-0100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>CAL-1.0 MSP-0100, MSP-0200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>CAL-5.0 MSP-0300</td>
</tr>
<tr>
<td>⑪</td>
<td>Additional tank (MSP-0200) (MSP-0300)</td>
<td>X</td>
<td>Not</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>30mL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>100mL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>200mL</td>
</tr>
</tbody>
</table>

*1: ALT model (measurement method) is selected by the work’s internal volume and test pressure. Please inquire regarding the selection process.

*2: The additional tank is required when the chamber residual volume is large. Please inquire regarding the selection process.
### External dimensions (Unit: mm)

#### MSP-0100 series

![MSP-0100 diagram]

#### MSP-0200 series

![MSP-0200 diagram]

#### MSP-0300 series

![MSP-0300 diagram]
フクダは計測器の販売と共に、お客様に安全かつ正確に測定していただくため、測定環境の保全・改善をご提案致します。

In addition to sales of measurement devices, we therefore propose maintenance and improvement of measurement environment together with each measurement device to measure safely and accurately for Customers.

株式会社 フクダ

http://www.fukuda-jp.com

東北営業所 〒989-0217 宮城県白石市大平森合字清水田39-1 TEL.(0224) 24-2672 FAX.(0224) 24-2673
東京営業所 〒176-0021 東京都練馬区貫井3-16-5 TEL.(050) 3540-3396 FAX.(03) 3970-7218
厚木営業所 〒243-0815 神奈川県厚木市妻田西1-15-12 TEL.(046) 222-3166 FAX.(046) 222-0144
静岡営業所 〒421-0404 静岡県牧之原市新谷2543-1 TEL.(0548) 27-3111 FAX.(0548) 27-2228
中部営業所 〒448-0003 愛知県刈谷市ーヌ木町2-9-2 TEL.(0566) 21-2266 FAX.(0566) 21-2181
近畿営業所 〒591-8008 大阪府摂津市北泉町14-1003 TEL.(072) 259-0016 FAX.(072) 259-0033
広島営業所 〒735-0006 広島県安芸郡那珂町2-9-3-101 TEL.(082) 286-0472 FAX.(082) 286-0597
九州営業所 〒862-0941 熊本県熊本市中央区出水1-3-26 TEL.(050) 3614-7762 FAX.(096) 372-4220
海外営業部 〒176-0021 東京都練馬区貫井3-16-5 TEL.(050) 3540-3406 FAX.(03) 3970-7218

東北工場・東北分工場・静岡工場・新座事業所

FUKUDA CO., LTD.  Head Office: 3-16-5, Nukui, Nerima-ku, Tokyo, 176-0021 Japan TEL. (81) 50-3540-3406 FAX. (81) 3-3970-7218

※China: NAGANO FUKUDA (TIANJIN) INSTRUMENTS CO., LTD. (TIANJIN HEADQUARTERS) http://www.fukuda-tj.com.cn No.7 Factory, Fenghua Industrial Park, No.80, 9th Street TEDA Tianjin, China TEL. (86) 22-5891-0966 FAX. (86) 22-5891-0963


※Taiwan: LI AN INDUSTRY MEASUREMENT CORP. http://www.lian.com.tw 6F., No.48, Juysian Rd., Cicu Dist., Keelung, City 20653, Taiwan. R.O.C. TEL. (886) 2-2456-6663 FAX. (886) 2-2455-2129

※India: SYSCON INSTRUMENTS PRIVATE LTD. http://www.sysconinstruments.com Plot No.66, Electronics City, Hosur Road, Bangalore-560 100, India TEL. (91) 80-2852-0772 FAX. (91) 80-2852-0775


※USA: FUKUDA USA INC. http://www.fukuda-usa.com 2721 Pioneer Drive, Bowling Green, KY 42101, USA Toll Free Line:1-888-859-9898 TEL. (1) 270-745-7300 FAX. (1) 270-745-9959

※Germany: ADZ NAGANO GmbH http://www.adz.de Bergener Ring 43 D-01458 Ottendorf-Okrilla Germany TEL. (49) 35205-59-6930 FAX. (49) 35205-59-6959


※Vietnam: PHUONG THANH PRODUCING-TRADING IMPORT EXPORT CORP. http://www.lian-vn.com/vietnam 60 Duong 53, KDC Tan Quy Dong, P.Tan Phong, Q7, TP.HCM, HOM City, Vietnam TEL. (84) 8-3771-0873 FAX. (84) 8-3771-0990


代理店 Contact