



DuPont Personal Protection Instructions For Use Universal Pressure Test Kit No. 990810 UV

BE SURE TO READ AND UNDERSTAND
THESE INSTRUCTIONS BEFORE ATTEMPTING
TO PERFORM AN INFLATION TEST. CUSTOMER
SERVICE CONTACTS ARE LISTED ON BACK
OF THIS MANUAL IF YOU HAVE QUESTIONS.

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Kit Overview

The DuPont™ Tychem® Universal Pressure Test Kit is designed for testing DuPont™ Tychem® Level A (type 1) ensembles according to ASTM F 1052; or the method described in 29CFR1910.120, Hazardous Waste Operations and Emergency Response (HAZWOPER) *Standard Test Method for Pressure Testing Vapor Protective Ensembles*; and ISO 17491-1, *Determination of Resistance to Outward Leakage of Gases* (internal pressure test).

The Universal Pressure Test Kit is contained in a molded case which includes the following:



2.1

1. Self-contained blower unit with faceplate that includes:

- A. Pressure gauge (magnehelic) calibrated to 10 inch water gauge pressure (dual scale calibration to 2.5 kPa pressure)
- B. Timer
- C. Attachment points for large diameter hose and small diameter hose
- D. Air flow valve

E. Toggle electrical switch

F. Fuser drawer and spare fuse

- 2. Two metal bayonet-style twist connectors
- 3. Large diameter reinforced hose
- 4. Small diameter clear plastic hose
- 5. Power cord
- 6. Self Test Device

Garment Inspection & Pressure Testing

Level A (type 1) garments should be visually inspected and inflation tested as described in the DuPont User Manual for DuPont™ Tychem® Encapsulated Suits or the IFU for Tychem® Type 1 suits. Download a current Tychem® User Manual at safespec.dupont.com, download the IFU at safespec.dupont.co.uk, or reach out to Customer Service at the contact details listed on the back of this manual.

DuPont Personal Protection recommends inspection and pressure testing of Level A ensembles at the following times:

- Upon receipt from supplier
- At least once per year
- After the garment is worn and before the garment is worn again; note that contaminated, damaged or altered garments should not be re-used

Operation of the test kit can be verified with the Self Test Device (DuPont Part No. 999800). Self Test Device instructions for use are provided on page 14 of this manual.



3.1

Air Pressure Testing Instruction



3.2

Remove jewelry and watches from tester's hands and wrists before testing. Provide a large enough testing area to allow garment to be fully inflated with arms extended and to allow placement and operation of pressure test kit. This area should be clean and free of abrasive or sharp objects that may damage or tear the garment. It is recommended that you cover the testing location

with a clean cloth. Testing area should not be in the direct path of heating or air-conditioning outlets; a change in temperature during testing may change the internal pressure of the suit.

Unfold garment face-down on a smooth, clean testing surface. Remember how garment is folded and stored; you will refold and store tested garment in same manner.

If garment is equipped with air-line pass-thrus, make sure these are capped or blocked. Most air-line pass-thrus seal with internal one-way valves; these may not need capping.



Pass-thru 3.3

For exhaust valve preparation, test kit can be used to test to standards mentioned if garments are fitted with Pirelli exhaust valves.



Pirelli Valve 3.4

Preparation of DuPont™ Tychem® Gas-tight Suits Fitted with Pirelli Exhaust Valves



4.1

Working from outside of garment, unsnap perforated, round outer covers from all exhaust valves. Set these aside to be re-installed after testing.



4.2

Carefully remove rubber diaphragm from each exhaust valve by rolling edge of diaphragm towards center and gently pulling stem of diaphragm out from center of valve body.



4.3

Examine diaphragms for cracks or deterioration with a magnifying glass. Damaged or deteriorated diaphragms should be replaced.



4.4

Some Level A garments are fitted with more than two Pirelli exhaust valves. Carefully remove diaphragm from outside of additional exhaust valves and re-install them on inside of additional exhaust valve bodies.



4.5

Choose correct metal bayonet-style connectors to fit valves of garment being tested. Adapters engraved with "P" fit Pirelli exhaust valves installed in Tychem® 10000, Tychem® 10000 FR and Tychem® 9000 garments.



4.6

From outside of garment, firmly push each connector into an exhaust valve from which diaphragm has been removed. Twist adaptor clockwise approximately one-eighth (1/8) turn to lock in place. If adapter is not locked in place, a seal will not occur and garment will not hold pressure. See **WARNING**. Note that inflation hose connector for Pirelli valves has a 90° angle. Sensing hose connector for Pirelli valves is straight.



4.7

Connect large diameter reinforced inflation hose to appropriate exhaust valve connector on garment.



4.8

Connect small diameter, clear sensing hose to other exhaust valve connector on garment.



5.1

Align closure teeth and pull garment closed. Hold garment closure near slider while firmly pulling garment slide. Pull in direction of open portion of closure. Lubricate slider if necessary according to instructions in **Closure Lubrication** section of Tychem® User Manual.



5.2

Place the test kit molded case near the garment and plug test kit into electrical outlet.*



5.3

Toggle blower switch on (green light) once to test blower operation. Toggle blower switch off (to "O") to shut off blower.

* Blower power supply is designed for universal (110-240V, 50/60 Hz) electrical service. Outlet adapter (not included) may be required to plug power cord into local outlet. **USE STANDARD ADAPTERS ONLY.**



5.4

Attach larger diameter inflation hose to black air outlet on test kit. This outlet is located above red button on test kit.



5.5

Lock in place by folding up two silver levers on either side of air hose end.



5.6

Connect clear sensing hose to sensing fitting on test kit. Check that connector clicks in place and hose cannot be easily pulled off connector.



WARNING



DO NOT FORCE. FORCING CONNECTORS CAN PERMANENTLY DAMAGE EXHAUST VALVE.

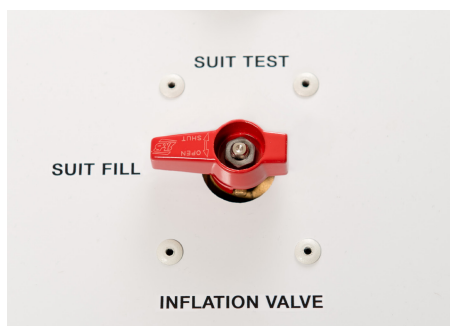
Inflation Testing per ASTM F 1052

The following briefly describes the inflation test method defined in ASTM F 1052. You may purchase a copy of the complete method at astm.org or by calling ASTM at 1.800.262.1373 (USA and Canada) or 610.832.9578. The method described in ASTM F 1052 exceeds requirements specified in 29CFR1910.120. ASTM F 1052 is not a substitute for procedure found in standards for other regions.



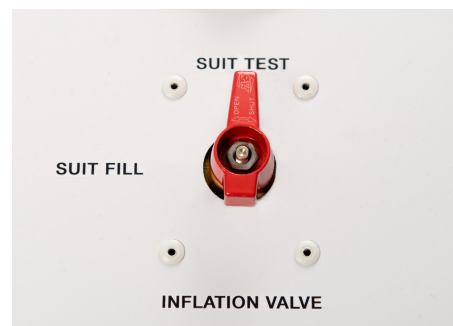
6.1

Turn blower on by toggling blower switch on (green light).



6.2

Turn valve one-quarter (1/4) turn counter-clockwise to **SUIT FILL** position for garment inflation. Gauges must be dual scale and must be 10 inches of water at full scale.



6.3

When pressure gauge is between 5 and 6 inches of water, turn valve one-quarter (1/4) turn clockwise to **SUIT TEST** position.

NOTE : PRESSURE GAUGE WILL NOT START TO REGISTER PRESSURE UNTIL GARMENT IS NEARLY INFLATED.



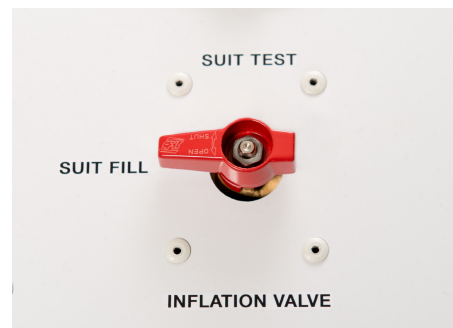
6.4

Turn blower off by toggling blower switch off (to "O"). See **WARNING**.



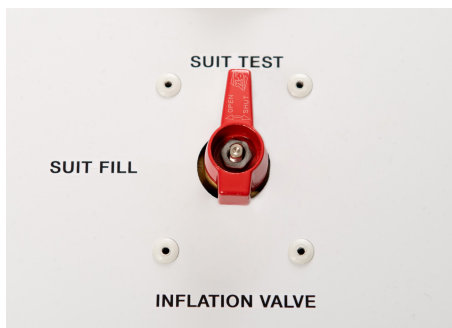
6.5

Let suit remain at pressure of greater than 5 inches water gauge pressure for at least 1 minute, adding air if necessary.



6.6

Set timer on test kit for 4 minutes. Reduce air pressure in suit to 4 inches of water by partially turning valve counter-clockwise towards **SUIT FILL** position.



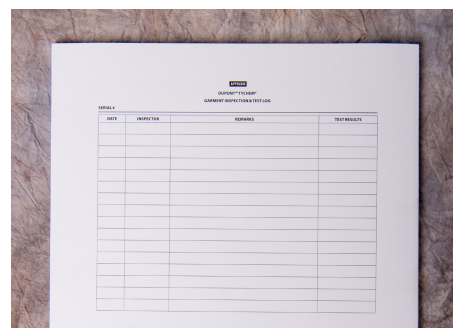
7.1

Return valve to **SUIT TEST** position and start timer. See **WARNING**.



7.2

At end of 4 minutes, read pressure gauge. Garment is considered to “pass” if pressure remains at or above 3.2 inches (80%) after 4 minutes. If final pressure is below 3.2 inches, follow **Instructions for Locating Leaks**.



7.3

Record final pressure reading. Complete a visual inspection as described in **Garment Inspection** section of Tychem® User Manual before deflating suit.



7.4

Complete garment inspection log form. Record standard (ASTM F 1052), ending pressure and any observations on suit test log sheet found in user manual that accompanied garment. Include date, time, inspector’s name and results of inspection and testing.

⚠

WARNING

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DO NOT OVER INFLATE GARMENT. EXCESSIVE INTERNAL POSITIVE PRESSURE CAN DAMAGE GARMENT.

DO NOT TOUCH OR MOVE SUIT DURING TEST PERIOD.

Inflation Testing per ISO 17491-1, Method 1, Minimum Procedure

The following briefly describes the inflation test method in ISO 17491-1, Method 1, Minimum Procedure:



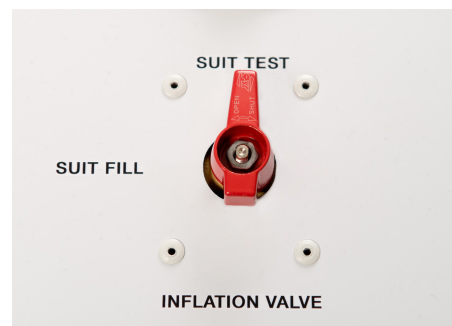
8.1

Record room temperature during testing. Turn blower on by toggling blower switch on (green light).



8.2

Turn valve one-quarter (1/4) turn counter-clockwise to **SUIT FILL** position for garment inflation. Gauges must be dual scale and must be 2.5 kPa at full scale.



8.3

When pressure gauge indicates between 1.25 and 1.30 kPa, turn valve one-quarter (1/4) turn clockwise to **SUIT TEST** position.

NOTE : PRESSURE GAUGE WILL NOT START TO REGISTER PRESSURE UNTIL GARMENT IS NEARLY INFLATED.



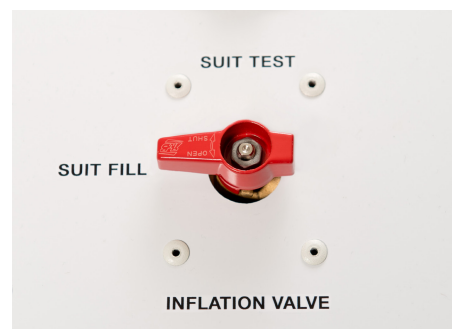
8.4

Turn blower off by toggling blower switch off (to "O"). See **WARNING**.



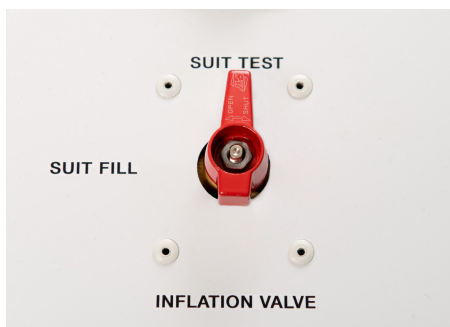
8.5

Let suit remain at a pressure of greater than 1.25 (+/- .05) kPa for at least 1 minute, adding air if necessary.



8.6

Set timer on test kit for 4 minutes. Reduce air pressure in suit to 1.0 (+/-0.05) kPa by partially turning valve counter-clockwise towards **SUIT FILL** position.



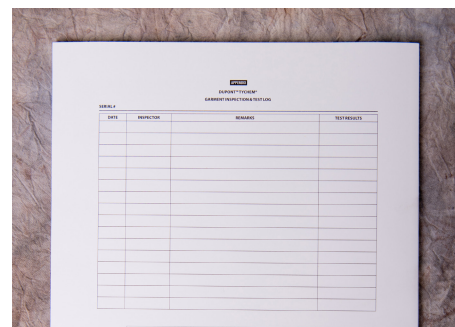
9.1

Return valve to **SUIT TEST** position and start timer. See **WARNING**.



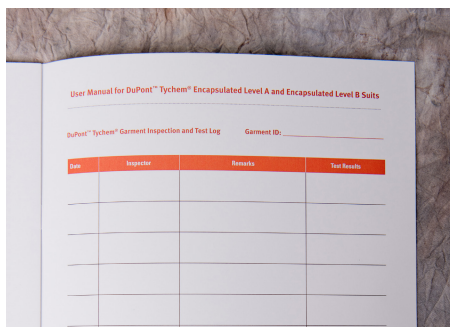
9.2

At end of 4 minutes, read pressure gauge. Suit is considered to “pass” if pressure drop is not higher or equal to 20%. If suit shows 20% or more drop in pressure, follow **Instructions for Locating Leaks**.



9.3

Record final pressure reading. Complete a visual inspection as described in **Garment Inspection** section of Tychem® User Manual before deflating suit.



9.4

Complete garment inspection log form. Record standard (ISO 17491-1), method used (Method 1), ending pressure, room temperature, and any observations on suit test log sheet found in user manual that accompanied garment. Include date, time, inspector’s name and results of inspection and testing.

⚠

WARNING

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DO NOT OVER INFLATE GARMENT. EXCESSIVE INTERNAL POSITIVE PRESSURE CAN DAMAGE GARMENT.

DO NOT TOUCH OR MOVE SUIT DURING TEST PERIOD.

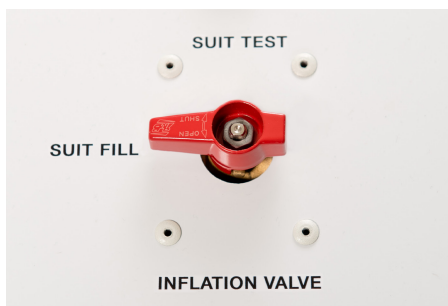
Inflation Testing per ISO 17491-1, Method 2, Rigorous Procedure

The following briefly describes the inflation test method in ISO 17491-1, Method 2, Rigorous Procedure:
Record room temperature during



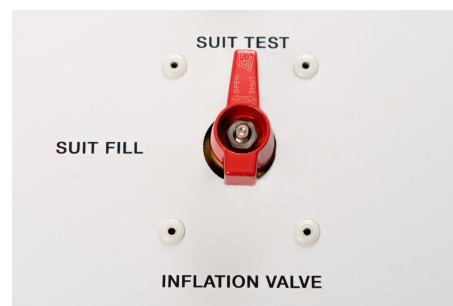
10.1

testing. Turn blower on by toggling blower switch on (green light). Turn valve one-quarter (1/4) turn



10.2

counter-clockwise to **SUIT FILL** position for garment inflation. When pressure gauge indicates



10.3

between 1.75 and 1.80 kPa, turn valve one-quarter (1/4) turn clockwise to **SUIT TEST** position. Turn blower off by toggling blower

NOTE : PRESSURE GAUGE WILL NOT START TO REGISTER PRESSURE UNTIL GARMENT IS NEARLY INFLATED.



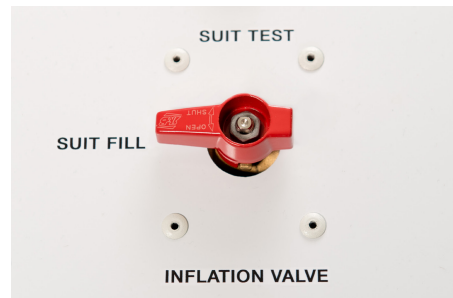
10.4

switch off (to "O"). See **WARNING**. Let suit remain at a pressure of



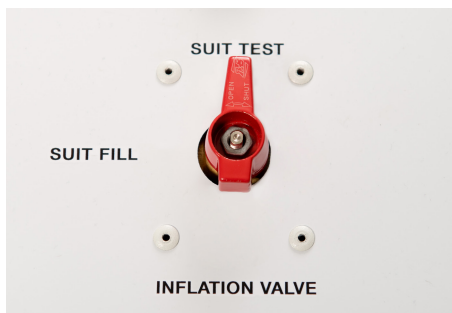
10.5

greater than 1.75 (+/- .05) kPa for 10 minutes, adding air if necessary. Set timer on test kit for 6 minutes.



10.6

Reduce air pressure in suit to 1.65 (+/- 0.05) kPa by partially turning valve lever handle counter-clockwise towards **SUIT FILL** position. Then return valve to **SUIT TEST**



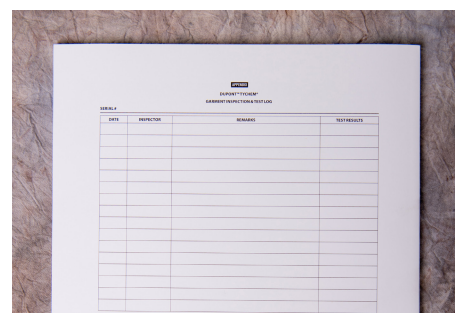
11.1

position. Start timer. See **WARNING**.
At end of 6 minutes, read pressure



11.2

gauge. Suit is considered “pass” if pressure drop is not higher than or equal to 20%. If suit shows 20% or more drop in pressure, follow **Instructions for Locating Leaks**. Record final pressure reading.



11.3

Complete a visual inspection as described in **Garment Inspection** section of Tychem® User Manual before deflating suit. Complete garment inspection log



11.4

form. Record standard (ISO 17491-1), method used (Method 2), ending pressure, room temperature, and any observations on suit test log sheet found in user manual that accompanied garment. Include date, time, inspector’s name and results of inspection and testing.

⚠

WARNING

⚠

DO NOT OVER INFLATE GARMENT. EXCESSIVE INTERNAL POSITIVE PRESSURE CAN DAMAGE GARMENT.

DO NOT TOUCH OR MOVE SUIT DURING TEST PERIOD.

Instructions for Locating Leaks

If the garment does not pass the inflation test:



12.1

Check installation of connectors inserted in exhaust valves;
DO NOT FORCE.



12.2

Check that inflation and sensing hoses are securely connected.



12.3

Visually check closure for mis-aligned teeth and that closure is fully closed.



12.4

Check that pass-thru's are adequately blocked. If there are extra Pirelli exhaust valves, check that flappers are in place and sealed.



12.5

Verify test kit is operating properly with Self Test Device (DuPont number 999800); see instructions on page 14 of this manual.



12.6

Inflate garment to a pressure of between 5 and 6 inches water gauge pressure (Inflate to $1.75 \pm .5$ kPa for ISO 17491-1, Method 2, Rigorous Procedure).



12.7

Check for leaks using equal parts water and bubble solution. Apply solution to garment in suggested locations. Look for formation and growth of bubbles to pinpoint leak.



12.8

Pinhole leak purposely created at edge of seam tape shows bubbles for demonstration purposes.



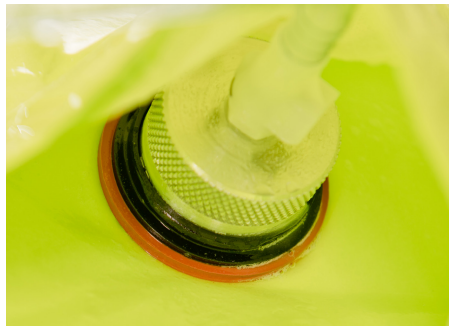
12.9

Check on soles and seams of garment socks.



13.1

Check at end of sleeve and interface with attached glove.



13.2

Leakage around exhaust valve connection loosened for demonstration purposes.



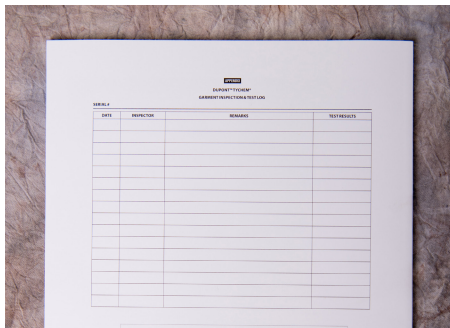
13.3

Check closure, starting with area around slide.



13.4

Check along seams, starting from head and systematically moving down garment to sock then other seam or fabric locations that show signs of wear or abrasion.



13.5

Tychem® garments are intended for a limited number of wears and must be replaced when damaged, altered, or contaminated. Uncontaminated garments that fail inflation test can be marked with a permanent marker and used for training garments. If source of pressure test failure is resolved, repeat appropriate pressure test and record results. If source of pressure test failure is not resolved, suit warranty should be reviewed.



WARNING



PULLING HARD ON FLAPPER STEM CAN DAMAGE PIRELLI DIAPHRAGM. FAILURE TO PROPERLY REINSTALL EXHAUST VALVE DIAPHRAGMS CAN LEAD TO CHEMICAL VAPOR EXPOSURE AND POTENTIAL INJURY.

Returning the Inspected Garment to Service



14.1

Disconnect inflation and sensing air hoses from garment and test kit.



14.2

Coil hoses for storage in test kit case.



14.3

Open garment closure completely. Hold garment closure near slider while firmly pulling garment slide. Lubricate slider if necessary according to instructions in **Closure Lubrication** section of Tychem® User Manual.



14.4

Remove bayonet connectors from exhaust valve bodies and place in appropriate location on test kit face.



14.5

From outside of garment, replace all exhaust valve diaphragms.



14.6

Replace perforated, round outer covers onto all exhaust valves.



14.7

Visually inspect diaphragms for cracks and deterioration with a magnifying glass for each suit inspection.



14.8

If diaphragms were installed on inside of exhaust valves, remove diaphragms from inside of exhaust valves, install diaphragms on outside of exhaust valves and re-install exhaust valve covers. See **WARNING**.



14.9

To replace Pirelli valve diaphragms, insert stem of new diaphragm into valve body center. Gently pull on diaphragm stem from inside garment while gently pushing in on center of diaphragm until it clicks in place. See **WARNING**.



15.1

Fold garment in same fashion as it was originally folded.



15.2

Place user manual and garment in storage bag or container.



15.3

Fill out inspection tag with date and name of person who tested and inspected garment. Use anti-tamper seal or string on storage bag or container after inspection.



15.4

Unplug test kit. Coil power cord. Store IFU for pressure test kit, cord, hoses and extra caps in kit lid.



15.5

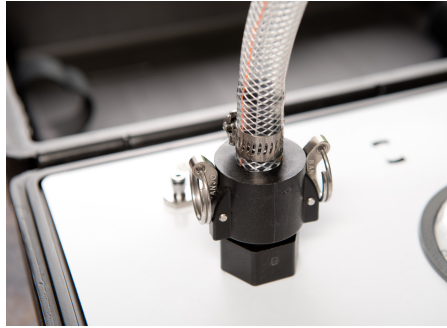
Close kit lid and secure latches.

Self Test Device Instructions: Self Test Device DuPont Part No. 999800



16.1

Plug test kit into electrical outlet.* Turn blower on by toggling blower switch on (green light) to test blower operation. Turn blower off by toggling blower switch off (to "O").



16.2

Attach larger diameter inflation hose to black air outlet on test kit. Outlet is located above red button on test kit.



16.3

Lock it into place by folding up two silver levers on either side of air hose end.

* Blower power supply is designed for universal (110-240V, 50/60 Hz) electrical service. Outlet adapter (not included) may be required to plug power cord into local outlet. **USE STANDARD ADAPTERS ONLY.**



16.4

Connect clear sensing hose to sensing fitting on test kit. Check that connector clicks in place and hose cannot be easily pulled off connector.



16.5

Connect inflation hose to Self Test Device.



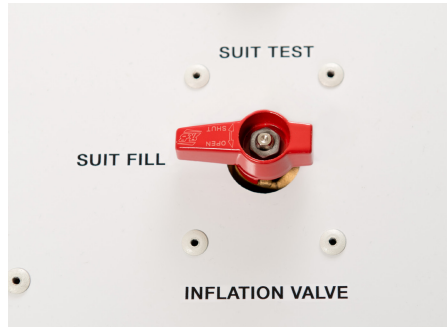
16.6

Connect sensing hose to Self Test Device.



17.1

Set timer for 6 minutes.



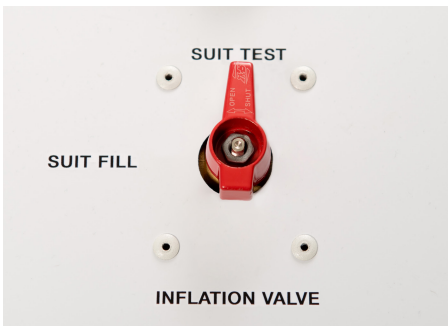
17.2

Turn valve one-quarter (1/4) turn counter-clockwise to **SUIT FILL** position.



17.3

Turn blower on by toggling blower switch on (green light). Magnehelic will gauge register a pressure in excess of 1.80 kPa.



17.4

Immediately turn valve one-quarter (1/4) turn clockwise to **SUIT TEST** position.



17.5

Turn blower off by toggling blower switch off (to "O") and adjust pressure to 1.65 kPa by partially opening inflation valve.



17.6

Start timer. Pressure should hold at 1.65 kPa or higher after 6 minutes. If after 6 minutes, pressure reading has fallen, contact Customer Service to discuss repair or replacement options.

Level A Inflation Test Kit Gauge Calibration



18.1

The pressure gauge installed in the DuPont Inflation Test Kit (DuPont Part 990810) is calibrated by the manufacturer, Dwyer Instruments, before shipment and installation. According to Dwyer Instruments, under normal operating conditions, no periodic servicing or lubrication is necessary to ensure proper function of the gauge.

Occasionally the gauge may require re-zero adjustment. This requires setting the pointer exactly on the zero mark by way of adjusting the external zero adjust screw on the cover at the bottom. This must be done while the gauge diaphragm is in the horizontal position (as installed in the kit).

In order to check calibration, a second gauge or manometer of known accuracy and range would be required and connected “in-line” with this gauge and pressurized. Readings of both would be compared for acceptability. If the accuracy is unacceptable, contact DuPont Personal Protection Customer Service to discuss repair or replacement options.

Level A Inflation Test Kit Fuse Replacement



WARNING



ENSURE POWER CORD IS REMOVED FROM FACEPLATE PLUG BEFORE REPLACING FUSE.



19.1

Locate fuser drawer at center of plug/switch module.



19.2

Insert small screwdriver or paperclip behind the arrows on the fuser drawer to release the fuse drawer.



19.3

Remove the fuser drawer.



19.4

Remove replacement fuse from spare fuse slot in plug/switch module (or replace with purchased fuse: 5mm x 20mm 250V 3A Cartridge Fuse).



19.5

Install replacement fuse into metal holders on fuse drawer.



19.6

Reinsert fuse drawer into plug/switch module. Test operation by testing blower. Refer to page five, step 5.3.



DuPont Personal Protection

Customer Service

dpp.dupont.com

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