Tester for Otoplastics

With "Classic" Bluetooth® Control

Hardware Manual

User instructions

using the 'classic' app for Windows

2025

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1 GENERAL

1.1 Terms

A number of **terms** are used in these instructions that are briefly explained here.

Leak tester: the device to which the adapter and the otoplastic, by means of a tiny hose, are connected, [also: (leakage) tester, device, unit]
System: the physical whole consisting of the leak tester, air hose, adapter, otoplastic and auditory duct
Platform: desktop, laptop, smartphone or tablet that will make a connection to the leak tester and on which the control application (app) runs
Software: the software running on the platform that controls the leak tester [also: app, program, controlling software, user interface]
Bluetooth®: the wireless protocol in use between the platform and the leakage tester.

The leakage tester, platform, software and Bluetooth® together, form the "graphical tester for otoplastics".

Below, a photo of the tester showing the on/off switch and air hose connection.

Photo 1.1.1: the "Classic" Bluetooth® leakage tester with standard adapter

1.2 Bringing into operation

1.2.1 Installing batteries

Ensure that the on/off switch is in the off position. The battery compartment can be found at the bottom of the tester, a small (crosshead) screwdriver must be used to release the screw holding the cover after which the cover can be opened. Install the correct batteries [4 pcs. type AA 1.5V] in the battery holder ensuring the correct polarity. For devices purchased since 2017 also NiMH (1.2V) rechargeable batteries can be applied. The photo below shows the compartment with the batteries in the correct position. Click the battery cover back and, for safety's sake, retighten the crosshead screw.

Photo 1.2.1.1: the leak tester, battery compartment

1.2.2 The leakage tester

Connect an air hose (PVC or silicon) of about 1.2 meters long to the intended connector at the front.
Before use, check the air hose for damage, dirt, kinks, discolouration, etc.
Only use the prescribed air hose and adapter.

1.2.3 The control

The leak tester is being controlled by a software application (app) running on a platform that can establish Bluetooth® connections. Bluetooth® facilities are almost standard available on laptops, smartphones and tablets, but on a desktop often not. With respect to maintaining a built-in Bluetooth® system or installing an external (e.g. USB) version (dongle), reference is made to the individual installation instructions. Also you can consult our installation guides on the website.

Currently there are apps available for the following operating systems / platforms:

- Windows (for 32-bit and 64-bit) desktop, laptops and tablet
- Android from OS 6.0 (Marshmallow, API 23)
- Windows UWP, desktop, laptop and tablet

Ideally the maximum distance between the platform and the leak tester is approximately10m, but can be limited by obstacles in the environment or between tester and platform.

1.2.3.1 installing in Windows: desktop, laptop and tablet

A manual is available for using Bluetooth and installing the so-called *Classic App*.
This can be found on our site on the 'Bluetooth Classic Documentation' page, under the heading 'User manuals “Classic” Bluetooth testers'. The document is called OTOmanBLTclassic_EE, the URL reads: https://www.cursorengineering.nl/en/documentation-bluetooth/
It is assumed that the user can use a PC with a suitable Operating System and that the user can find and start the software. It is also assumed that the user can configure a Bluetooth® environment.

1.2.3.2 installing in Android: tablet and smartphone

For installing in Android platforms there is a special (additional) user guide that also discusses installation. You can find this document on our website, page "Documentation" under section "User manuals Bluetooth testers".
The URL reads: https://www.cursorengineering.nl/en/documentation-bluetooth/

1.2.3.3 installing in Windows Universal Platform (UWP)

For installing Universal Windows Platform apps (exclusively Windows 10/11) and including Windows Mobile (smartphones) there is a special (additional) user guide that also discusses installation.
This document also can be found on our website, page "Documentation" under section "Installation manuals Bluetooth testers".
The URL reads: https://www.cursorengineering.nl/en/documentation-bluetooth/

1.3 Environment

The leak tester is made of precision components and therefore must be handled with care and not exposed to extreme or sudden changes in temperature, moisture and/or air pressure. The space in which the tester will be used must meet the following requirements:

- Normal air humidity (30...75%RH)
- Constant temperature (+10^{o}C...+35^{o}C)
- Stable environmental pressure (e.g. do not open/close doors while measuring)
- No direct sunlight (on the tester), relatively dust free and of course smoke free

Ensure that if the conditions in the room change that the tester is given some time to acclimatise. The work surface should be flat and solid. Maintain space around the tester, so that the air hose does not become kinked or trapped. If the air does not have free access, measurement errors can occur. During the measurements, do not press or deform the housing or hose.

1.4 Maintenance

The tester requires no specific maintenance. The housing can be cleaned with a soft, if required, slightly moistened cloth. The housing is made of PMMA (acrylic) therefore do not use solvents to clean it. Prior to every measurement, check that end of the air hose is free from obstruction and that the hose is free of kinks or constrictions. Regularly check the air hose for permanent kinks and damage. If considered necessary, replace the air hose with one of the prescribed type.
Occasionally take a measurement with the end of the air hose closed to check that the tester itself is still airtight. Do not lose the rubber feet and store the leak tester whenever possible, and certainly when it is being transported, in the supplied storage system.

1.5 Batteries

The tester operates on four batteries, type AA [IEC: LR6], preferably Alkaline. Rechargeable batteries, e.g. NiMH (1.2V), can be applied in testers since 2017; NiZn batteries (1.6V) are also applicable. Discharged or almost discharged batteries can leak and damage the tester, therefore, remove the batteries if the tester will not be used for a long time (e.g. a few months). When storing the tester, turn the on/off switch to the off position.
The batteries should always be removed before the tester is sent by post, for instance for service. Discharged batteries should not be discarded as normal waste, but as chemical waste.
When the unit will no longer be used, you are free to return the unit to the supplier or manufacturer for proper disposal and recycling.

2 MEASUREMENTS

2.1 Getting started

Switch on the tester and wait until the LED indicator in the power-switch turns to green; the leakage tester also should produce an audible beep**. In this example we assume a standard W10 app** (e.g. OtoTestBLT, v3.25). Now activate the software program and when the software is used for the first time and it asks you to enter a COM number you can or should consult the installation guide (§1.2.3.1) first. The following window will be displayed: the measurement window.

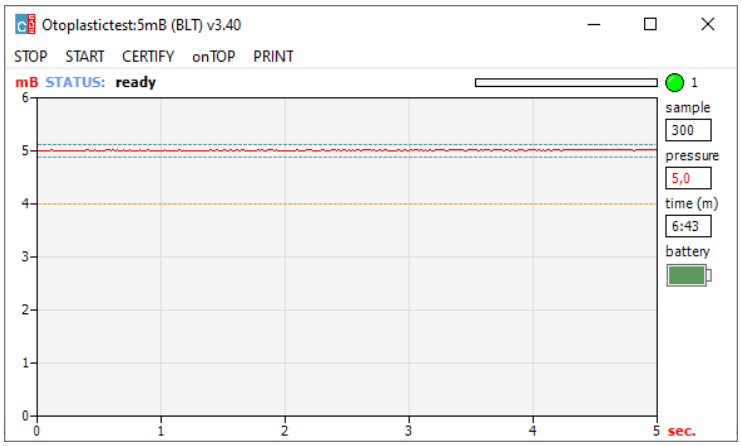

Figure 2.1.1: the measurement window

2.2 Standard measurement

Measurements can start when the measurement window is visible and when both adapter and otoplastic are correctly connected. Use the mouse to click START, the air pump in the tester will raise the pressure within seconds to 5mB. The actual leakage measurement will take five seconds. In this period, ideally the pressure must remain at 5mB, but a slightly lower value is often allowed. The 4mB lower limit is depicted as an orange line. The figure below shows a possible result of a measurement.

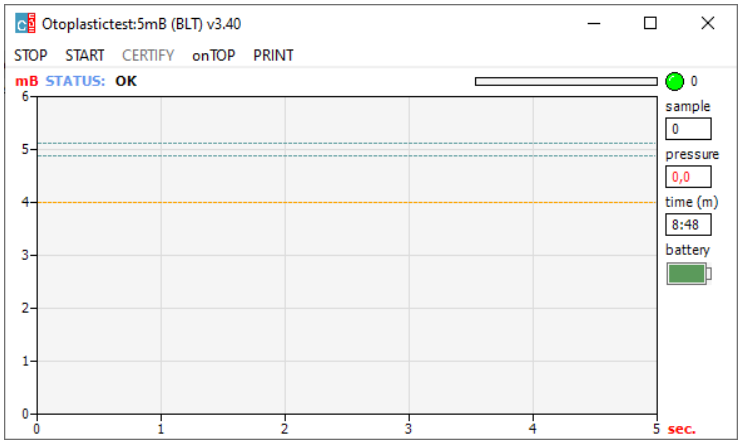

Figure 2.2.1: a measurement result

2.3 Screen legend

2.3.1 Menu

- **STOP or [F4]:** a measurement that is in progress will be interrupted, if no measurement is being taken the program will be terminated
- **START or [F5]:** a new measurement will start
- **CERTIFY or [F6]:** if the result of the measurement is within the norm, a certificate can be generated. Only available on PC platforms
- **onTOP or [F7]:** when onTOP is clicked, the measurement window will always be displayed on top of all of the other windows, this can be handy when filling in spreadsheets etc., onTOP will be replaced by offTOP!
- **PRINT or [F8]:** generate a hardcopy of the measurement result with a date/time stamp.

2.3.2 Graph

- **mB:** the y-axis shows the relative pressure in millibar [mB] with respect to the ambient air pressure, in the example, the measurement is will be made at a pressure of 5mB. The dashed lines above and below the measured value show the upper and lower extreme limits within which a perfect measurement result is or will be achieved (5mB ± 0.1mB). SI unit for pressure: Pascal [Pa] (5mB ≡ 500Pa).
- **sec.:** the x-axis shows the total measurement time in seconds. The measurement time can only start when the initial pressure (5mB) has been reached.

2.3.3 Status

The status of the leakage tester is shown to the right of 'STATUS' on the status line (which is displayed immediately above the graph). Further to the right is a status bar that shows the duration (a maximum of five seconds) for a changed status, therefore, at the transition to another status.
The leak tester has a number of **states**, the most important of which are shown below.

- **ok:** the leak tester is ready for the first measurement
- **air in:** the air pump will try to pressurise the system
- **pressure low:** the system pressure cannot be reached*
- **stabilizing:** the pressure has been reached and the system will check for a short time whether it is stable enough
- **measuring:** the actual measurement starts, the graph will be drawn
- **ok, air out:** the measurement has been taken and the system will be depressurised
- **blocked?:** the air cannot leave or only with difficulty leave the system*
- **terminate!:** displayed if STOP is clicked during the measurement
- **connecting:** the software is trying to establish a connection with the leak tester
- **ready:** the test has been completed, the tester is ready to take a new measurement
- **battery low: th**e batteries in the tester are exhausted and need to be replaced

* condition is discussed in more detail in chapter 3, "Additional information and error messages"

2.3.4 Information panel

Details are displayed to the right of the graph that provide information about the progress of a measurement:

- **LED lamp with number:**
  [green]: last measurement completed, result within specification
  [orange]: last measurement completed, but result does not meet specification
  [red]: measurement started, but not completed
  [number]: number of completed measurements since the program was started
- **sample:** the number of measurement moments during the entire measuring time
- **pressure:** the measured pressure, or the last measured pressure (in mB)
- **time (m):** the time (m:ss) remaining until the automatic stand-by mode will be entered (nine minutes)
- **battery:** the charge indicator of the batteries ***in*** the leakage tester*

* as the name suggests, this is just an indication. Consider that a transitional situation can occur where the tester will start normally, but will not have sufficient power to operate the pump or build up sufficient pressure. Newer devices (from 2017) do have voltage indicator (V), whereas somewhat older units have a charge-percentage (%). When indicator turns red: replace batteries.

2.4 After use

It is good practice, once all of the measurements have been taken, to immediately remove the otoplastic and to lay out the air hose.

The software terminates nine minutes after the last measurement, the attached leak tester will automatically enter stand-by mode.
If a leakage tester is powered on, but for some reason not attached to the software, it will enter stand-by mode after ten minutes.

In stand-by mode the on/off switch of the unit, of course, will remain pressed; although the power consumption in stand-by mode is extremely low, make a habit of switching off the unit, this will reduce the power consumed to zero.

The tester can also be switched off immediately, when doing so, it is advisable to first stop the software to ensure that the Bluetooth® connection does not become ‘confused’.

Store the leak tester in a safe place.

3 ADDITIONAL INFORMATION AND ERROR MESSAGES

3.1 Communication

Immediately after activating the software, the platform tries to establish a Bluetooth® connection with the tester. Problems that occur during this phase are shown in a separate window; these problems nearly always lead to the program being terminated after "OK" is clicked. The program must be restarted and/or the tester must be repowered (on/off).

An overview of the most important error messages (standard Windows 7 of 10/11):

1. *Tester not detected on COMxx*
    - The software cannot detect the leak tester on the chosen communication port (x stands for the set port number). Check whether the tester is switched on and that the chosen port number corresponds to the number displayed when trying to establish the Bluetooth® connection. Check whether the tester with the correct name is shown in the list of Bluetooth® devices, consult the installation guide.
2. *Erroneously received settings (COMxx)*
    - The operating settings in the tester have not been correctly received or processed.
3. *Cannot connect to tester (COMxx)*
    - The software has not received a response from the tester within the set time.
4. *Processing error in tester (COMxx)*
    - The status info (§2.3.3) from the tester cannot be received or is received with errors.
5. *Insufficient battery capacity: shut down*
    - The batteries in the leak tester have lost their charge, replace the batteries.
6. *Connection lost*
    - When starting a new measurement, it seems that the connection has been broken: status report: "connecting". Check whether the tester is still on and whether the Bluetooth® connection is still active.

10. *to 12. Errors related to the COMx.ini file*
    - There are problems with locating, reading or writing the COMx.ini file. Check whether the file exists in the same directory (path) as the program. Optionally remove this file and consult the installation guide.

14. *No Bluetooth® SPP on this machine*
    - No Bluetooth® available or the Bluetooth® SPP protocol failed.

15. *No Bluetooth® SPP available*
    - The program tried to find a proper Bluetooth® COM port (xx) to connect to your tester. Repeat the search action and, if necessary, consult the installation guide.

3.2 Leak tester

3.2.1 Switching on

After pressing the on/off switch, the tester becomes active.
The LED in the switch will initially shine red and then become green when the unit is ready for the activation of the operating software; also a short beep will be audible.
Problem indications can be:

1. the red LED does not light or lights very briefly:
    - the batteries do not have enough charge and must be replaced
2. the red LED goes out after approximately ten seconds, the green LED does not light:
    - the pressure in the system does not become stable enough within the set time: check air hose and the environment of the tester (§1.3)
    - also: batteries may almost be exhausted

N.B.: after starting a measurement, the LED light will be red until the unit once more has the "ready" status.

3.2.2 From the stand-by mode

If the unit is not used for ten minutes, it will move to the stand-by mode.
The tester can be reactivated by switching the power switch on and off again

3.2.3 More status messages

§2.3.3 mentions a number of conditions that require more explanation.

1. pressure low:
    - The system looses so much air that the pressure cannot be raised sufficiently. Before drawing any conclusions, the system should always be checked for leaks without an otoplastic. Also check whether the air pump operates and if the otoplastic was placed correctly.
2. blocked?:
    - After every test, the air will be released from the system until the overpressure is more or less 0mB. If the message disappears when the otoplastic is disconnected or the message "stabilizing" remains displayed for a relatively long time, this could indicate a defective valve or a blockage in the internal filters (bear this in mind in dusty, damp conditions). This problem cannot be solved by the user, service is required.