

PACKAGE TESTING AT AMBIENT OR IN AN ENVIRONMENTAL CHAMBER

Instrument/Accessory Setup and Test Procedures

Summary

This Technical Note will provide instruction on how to test package OTR and/or WVTR at ambient condition or inside an environmental Test Chamber with the AMETEK MOCON OX-TRAN® 2/22, 2/12 and PERMATRAN-W® 3/34G.

Equipment and Accessories

1. OX-TRAN® 2/22, 2/12 and PERMATRAN-W® 3/34G
2. Package Adapter Cartridge (P/N: 054-030, Fig. 1): The adapter is used to connect the instrument to a remote test cell for film or package mounting fixture for package testing. The removable cover is for easy interchange between film testing (cover on) and attached package testing (cover off).
3. Environmental Test Chamber: Chamber which generates for precise temperature and precise RH. One independently sourced example is the MEMMERT HPP 260, web link: www.memmert.com/products/climate-chambers



Easy to follow steps help you with setup and test procedures

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Equipment and Accessories, continued

4. Copper tubing, Package Mounting Plates (P/N: 110-559 or 034-285), nuts and ferrules. (Additional quantity could be ordered at the time of the instrument accessory purchase.)
5. Union Bulkhead Fitting (P/N: 310-020): This fitting can avoid using longer tubing each time when connecting the instrument to the sample inside a chamber.

Procedures

- Prepare the package test samples per traditional methods described in OX-TRAN® Model 2/22, 2/12 or PERMATRAN-W® 3/34 Operator's Manual (Fig 2.)
- Alternatively, prepare package sample with special cartridges and PackRack (Fig 2.) if ambient test condition is desired. Call for details about PackRack and related package test cartridges.
- For tests requiring controlled temperature and RH conditions, connect the assembled package samples in a chamber (Fig 3.) with the package adapter cartridge via copper tubing. Tubing will need to be routed through an entry port on the side wall of the chamber.
- Adjust the chamber settings to desired temperature and RH (Example 70°C with 60%RH). Refer to independent Environmental Test Chamber Manual for guidance.
- Test gas for OTR Testing: Room air of 20.9% O₂ with ambient temperature, or ambient air in the chamber with chamber generated RH used as test gas.
- Test Gas for WVTR Testing: 100%RH (water source in a bag to generate 100%RH), or chamber generated RH used as the test gas.
- Example instrument parameter setup
 - Select "Advanced Test"
 - Under "Cell", enter the test "Sample Id", test "Area" select "Package" and leave default for "Thickness". Select "On" for High Purge (High purge time estimation: at least (3 x package volume) divided by 200 cc/min). Select "OFF" for conditioning or "ON" for large packages and enter a few hours.
 - Under "TEST", select "Continuous" for Test Mode, "OFF" for Individual Zero, Exam Time of 60mins or whatever is proper depending on the barrier level.



Figure 1. Package Adapter Cartridge



Figure 2. Samples are testing with ambient air



Figure 3. Connect samples in a chamber

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TECHNICAL NOTE

- Under "Instrument", enter Cell Temperature (your samples' actual temperature is at ambient or controlled by the Chamber. Add notes regarding actual Temperature/RH). Enter "On" for ReZero, Frequency "2" (or other number if your samples have higher TR). Enter "OFF" for Sequential Test. Enter Test Gas RH. Select "100%RH" if 100%RH is used for WVTR testing.

Important Notice:

- Do Not perform Individual Zero when the sample is surrounded by test gas such as ambient air, with generated RH or with 100%RH. Instead, perform a WVTR (or OTR) test for a copper tubing loop separately (Fig 4). Subtract the Loop WVTR (or OTR) value when it is necessary (such as when the sample's TR is very low).
- N2 carrier gas is always dry for above tests.

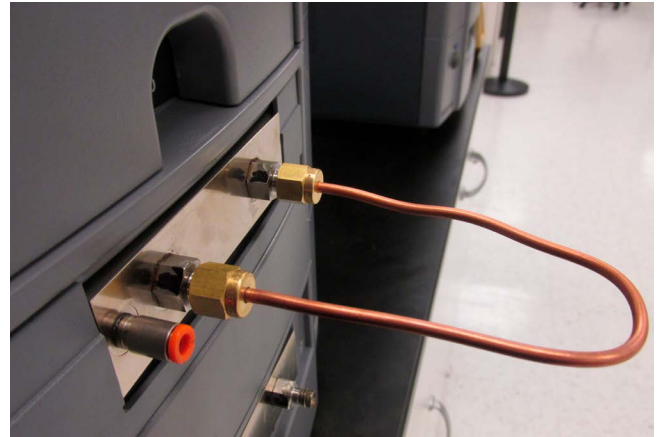


Figure 4. Attach a loop for testing baseline

Questions?

Call MOCON to speak with a certified technical support specialist.

Tel: +1 763.493.6370 or Email: info.mocon@ametek.com

