

INTISARI

KALIBRASI *WATER VAPOR TRANSMISSION RATE TESTER* PADA PARAMETER SUHU MENGGUNAKAN ACUAN AS 2853 DI BALAI BESAR KULIT KARET DAN PLASTIK

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Telah dilakukan penelitian kalibrasi *Water Vapor Transmission Rate* (WVTR) pada parameter suhu menggunakan metode acuan AS 2853 di Balai Besar Kulit Karet dan Plastik. WVTR merupakan alat uji yang digunakan untuk mengetahui *permeability* sebuah bahan. WVTR termasuk dalam golongan *enclosure*, tetapi dalam kasus ini WVTR yang digunakan termasuk dalam kategori *enclosure* unik. WVTR beroperasi pada rentang pengukuran suhu 15°C sampai 55°C. *Enclosure* merupakan sebuah fasilitas teknik yang memungkinkan diwujudkannya nilai-nilai suhu udara yang ditentukan secara selektif dalam sebuah volume tertutup dalam suatu rentang kerja. Kategori unik mengenai *enclosure* ditunjukkan melalui *test chamber* yang didalamnya terdapat *load cell*, sensor penimbangan, dan *test dish* yang berada di tengah ruangan.

Penelitian ini dilakukan untuk mengetahui penerapan AS 2853 pada kalibrasi suhu WVTR dan membandingkan hasil kalibrasi sesuai prosedur AS 2853 dan modifikasi posisi sensor termokopel di sekitar *test dish*. Pengujian WVTR dilakukan sesuai dengan dokumen acuan WVTR yaitu ASTM E96/E96M-14 dengan suhu *chamber* $38^{\circ} \pm 1^{\circ}\text{C}$, sehingga diketahui nilai variasi spasial, variasi temporal, variasi total, dan suhu terukur berdasarkan metode acuan AS 2853-1986. Hasil pengujian diperoleh bahwa kalibrasi WVTR berdasarkan metode acuan AS 2853-1986 memiliki nilai variasi spasial sebesar $0,97 \pm 0,56^{\circ}\text{C}$, variasi temporal $0,9 \pm 0,39^{\circ}\text{C}$, variasi total $1,27 \pm 0,39^{\circ}\text{C}$, dan suhu terukur $38,66 \pm 0,39^{\circ}\text{C}$. Hasil kalibrasi WVTR dengan posisi termokopel disekitar *test dish* memiliki nilai variasi spasial sebesar $0,4 \pm 0,56^{\circ}\text{C}$, variasi temporal sebesar $0,8 \pm 0,39^{\circ}\text{C}$, variasi total sebesar $1 \pm 0,39^{\circ}\text{C}$, dan suhu terukur sebesar $38,7 \pm 0,39^{\circ}\text{C}$. Dari hasil pengujian dapat disimpulkan bahwa AS 2853-1986 dapat digunakan sebagai metode acuan kalibrasi suhu WVTR dan karakteristik kinerja masih dalam batas toleransi yang diizinkan.

Kata kunci: kalibrasi *enclosure*, pengujian WVTR, AS 2853-1986, *chamber* WVTR

ABSTRACT

CALIBRATION OF WATER VAPOR TRANSMISSION RATE TESTER ON TEMPERATURE PARAMETERS USING THE REFERENCE AS 2853 AT CENTER FOR LEATHER RUBBER AND PLASTIC

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WVTR calibration research has been conducted for temperature parameters using AS 2853 as reference method in the Center of Leather, Rubber, and Plastic. WVTR is a measuring instrument for determining the permeability of a material. WVTR is included in the enclosure group, but in this case the WVTR is included in a unique enclosure category. WVTR operates at a temperature measurement range of 15° C to 55° C. Enclosure is a facilities engineering that allows the attainment of the temperature values are determined selectively in an enclosed volume within a working range. The uniqueness of WVTR in this case is shown through a test chamber where there is load cell, weighing sensors, and test dish in the middle of the chamber.

This research was conducted to discover the application of AS 2853 method on WVTR temperature calibration, and compare the calibration result according to AS 2853 method procedure and slightly modification of position of thermocouple sensor around test dish. The test was conducted according to the WVTR reference document, ASTM E96/E96M-14, with chamber temperature of 38°±1°C, to obtain the value of spatial variation, temporal variation, total variation, and measured temperature based on AS 2853-1986 method. Test results obtained that WVTR calibration based on this method has spatial variation of 0.97±0,56°C, temporal variation 0.9±0.39°C, total variation of 1.27±0.39°C, and the measured temperature of 38.66±0.39°C. The result of WVTR calibration with the thermocouple position around the test dish has spatial variation of 0.4± 0.56°C, temporal variation of 0.8±0.39°C, total variation of 1±0.39°C, and measured temperature of 38.7±0.39°C. From the test results it can be concluded that AS 2853-1986 can be used as a WVTR temperature calibration reference method and has performance characteristics within tolerable threshold.

Keywords: *enclosure calibration, WVTR testing, AS 2853-1986, chamber WVTR*