

## **PERMEABILITY LABORATORY TEST REPORT**

Laboratory Report Number: LR2250B

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Prepared For: FIS Products  
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## Sample Identification

Samples of black Combi-Seal Plus membrane from Batch CSP008 in both plain and jointed format were received for testing.

## Equipment used

Versaperm Permeability Meter MK IV, configured to run ISO15105-1 differential pressure method . Versaperm Dynamic WVTR Meter MK V.

## Test Conditions

Sample Conditioning: Samples were stored for 14 days in a desiccator at 23°C.

Temperature: 23°C

Atmospheric Pressure: Tested over several days pressure ranged 990-1015 mbar.

## Test Methods

### *Gas Transmission Rate.*

This test was carried out using the method ISO 15105-1 *Plastics - Film and sheeting - Determination of gas-transmission rate - Part 1: Differential-pressure methods*. After conditioning, each sample was placed in the standard film measuring chamber and controlled temperature environment, evacuating the gas from both sides of the sample, then supplying the test gas upstream of the sample at 1 bar differential pressure. The pressure downstream was monitored as the rate of change is proportional to the permeation rate. Results are expressed as ml/m<sup>2</sup>.day

### *Water Vapour Transmission Rate.*

This test was carried out using the method ISO 15106 *Plastics -- Film and sheeting -- Determination of water vapour transmission rate -- Part 3: Electrolytic detection sensor method*. After 24 hours, the sample was placed in the film-measuring chamber and controlled temperature environment, with distilled water on one side of the sample and dry nitrogen on the other side of the sample. Water vapour passing through the sample was swept to the electrolytic water vapour sensor downstream and the permeation rate calculated. The test was continued until a stable reading was achieved.

## Test Results

| Trade Name/<br>Identification         | Carbon<br>Dioxide<br>Transmission<br>Rate (OTR)/<br>ml/m <sup>2</sup> .day.atm | Methane<br>Transmission<br>Rate (OTR)/<br>ml/m <sup>2</sup> .day.atm | Water Vapour<br>Transmission<br>Rate /<br>g/m <sup>2</sup> .day |
|---------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------------------|
| Black Combi-Seal Plus<br>Batch CSP008 | 23°C / 0%RH                                                                    | 23°C / 0%RH                                                          | 23°C / 100%RH                                                   |
| Plain membrane                        | 25.0                                                                           | 22.7                                                                 | 0.134                                                           |
| Jointed with HCR Butyl<br>Tape        | 29.3                                                                           | 30.1                                                                 |                                                                 |

## Conclusions

The material in plain and jointed form offers excellent barrier to all the gases and vapours tested.

