AUSTRALIAN URETHANE & STYRENE

AUSTRALIAN URETHANE & STYRENE PTY LTD
A.C.N. 094 317 085 A.B.N. 22 094 317 085

Head Office	25 Garling Road Kings Park NSW 2148
Postal	PO Box 986 Kings Langley NSW 2147
P	(02) 9678 9833
F	(02) 9678 9887
E	sales@ausurethane.com
Web	www.ausurethane.com

ISOBOARD® ND

DETERMINATION of CELL GAS COMPOSITION

Date of Test: 26 June 2008

Registration Number: 9817

Test Report Numbers:

AUSTRALIAN URETHANE & STYRENE PTY LTD **www.ausurethane.com** A.C.N. 094 317 085 A.B.N. 22 094 317 085

Sydney Office / Factory	25 Garling Road Kings Park NSW 2148	Phone (02) 9678 9833	Facsimile 1800 887 666
Brisbane Office	Suite 64 / 283 Given Terrace, Paddington QLD 4064	Phone (07) 3876 5300	Facsimile (07) 3876 5311
Melbourne Office / Factory	Factory 32 / 9 Ashley Street West Footscray VIC 3012	Phone (03) 9687 7500	Facsimile (03) 9687 7399

Forschungsinstitut für Wärmeschutz e.V.
München

Determination of the cell gas composition of rigid insulation foam
Test report: Q.2-08-12

Applicant: **ISOFOAM Insulating Materials Plants W.L.L**
P.O.Box : 23053, Safat, 13091 Kuwait

Material Identification: **„Sample no. 1"**
Extruded polystyrene foam board with skins on both sides
Colour: blue
Sample size: 200 mm x 200 mm x 50 mm
Foam density: 33.7 kg/m^3
Order reference: 180/GM/08-II83

Sampling: Sent by applicant in June 2008.
Registration no.: 9817 on 26.06.2008.
Tests are made on 26.06.2008

Procedure:

Five cell gas samples were taken with a gas tight syringe about 20 mm under the surface from the specimen under a helium flow.

With the gas chromatograph the relative cell gas composition of the cell gas sample was determinded by comparing the retention times and measuring the peak areas.

Literature: S. Lohmeyer, G. Müller: "Bestimmung der Porengasmenge und -zusammensetzung in Polyurethanschäumen", Kältetechnik - Klimatisierung, 22. Jahrgang, Heft 3 (1970), S. 291 – 295.

Results:

Sample no.	Cell gas composition in volume-%			
	Air (N_2 + O_2)	CO_2	HFC 134a	HFC 152a
1	20	<1	11	69
2	21	<1	15	64
3	18	<1	15	67
4	19	<1	12	69
5	23	<1	11	66
mean	approx. 20	<1	approx. 13	approx. 67

The accuracy of the described method: approx. 5 volume-%.
Only peaks with a fraction of not less than 0.5 volume-% were determined.

Remarks:
The measured values are only valid for the time of measurement.

Gräfelfing, 26th. June 2008
Department specialist
Dipl.-Ing. (FH) W. Albrecht

Forschungsinstitut für Wärmeschutz München FIW MÜNCHEN 10

Tester
A. Bergler

Forschungsinstitut für Wärmeschutz e. V. München
Lochhamer Schlag 4 · 82166 Gräfelfing
Telefon +49 (0)89 8 58 00 –0 · Telefax +49 (0)89 8 58 00 – 40
info@fiw-muenchen.de · www.fiw-muenchen.de

Forschungsinstitut für Wärmeschutz e.V.
München

Determination of the cell gas composition of rigid insulation foam
Test report: Q.2-08-13

Applicant: **ISOFOAM Insulating Materials Plants W.L.L**
P.O.Box : 23053, Safat, 13091 Kuwait

Material Identification: **„Sample no. 2"**
Extruded polystyrene foam board with skins on both sides
Colour: blue
Sample size: 200 mm x 200 mm x 50 mm
Foam density: 33.7 kg/m^3
Order reference: 180/GM/08-II83

Sampling: Sent by applicant in June 2008.
Registration no.: 9817 on 26.06.2008.
Tests are made on 26.06.2008.

Procedure:

Five cell gas samples were taken with a gas tight syringe about 20 mm under the surface from the specimen under a helium flow.

With the gas chromatograph the relative cell gas composition of the cell gas sample was determinded by comparing the retention times and measuring the peak areas.

Literature: S. Lohmeyer, G. Müller: "Bestimmung der Porengasmenge und -zusammensetzung in Polyurethanschäumen", Kältetechnik - Klimatisierung, 22. Jahrgang, Heft 3 (1970), S. 291 – 295.

Results:

Sample no.	Cell gas composition in volume-%			
	Air (N_2 + O_2)	CO_2	HFC 134a	HFC 152a
1	19	<1	11	70
2	17	<1	16	67
3	22	<1	10	67
4	22	<1	12	66
5	18	<1	12	70
mean	approx. 20	<1	approx. 12	approx. 68

The accuracy of the described method: approx. 5 volume-%.
Only peaks with a fraction of not less than 0.5 volume-% were determined.

Remarks:
The measured values are only valid for the time of measurement.

Gräfelfing, 26th. June 2008
Department specialist
W. Albrecht
Dipl.-Ing. (FH) W. Albrecht

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Tester
A. Bergler

Forschungsinstitut für Wärmeschutz e.V.
München

Determination of the cell gas composition of rigid insulation foam
Test report: Q.2-08-14

Applicant: **ISOFOAM Insulating Materials Plants W.L.L**
P.O.Box : 23053, Safat, 13091 Kuwait

Material Identification: **„Sample no. 3"**
Extruded polystyrene foam board with skins on both sides
Colour: blue
Sample size: 200 mm x 200 mm x 50 mm
Foam density: 34.0 kg/m^3
Order reference: 180/GM/08-II83

Sampling: Sent by applicant in June 2008.
Registration no.: 9817 on 26.06.2008.
Tests are made on 26.06.2008.

Procedure:

Five cell gas samples were taken with a gas tight syringe about 20 mm under the surface from the specimen under a helium flow.

With the gas chromatograph the relative cell gas composition of the cell gas sample was determinded by comparing the retention times and measuring the peak areas.

Literature: S. Lohmeyer, G. Müller: "Bestimmung der Porengasmenge und -zusammensetzung in Polyurethanschäumen", Kältetechnik - Klimatisierung, 22. Jahrgang, Heft 3 (1970), S. 291 – 295.

Results:

Sample no.	Cell gas composition in volume-%			
	Air (N_2 + O_2)	CO_2	HFC 134a	HFC 152a
1	20	<1	14	67
2	21	2	13	63
3	20	<1	16	64
4	20	<1	15	65
5	16	1	13	70
mean	approx. 19	<1	approx. 14	approx. 66

The accuracy of the described method: approx. 5 volume-%.
Only peaks with a fraction of not less than 0.5 volume-% were determined.

Remarks:
The measured values are only valid for the time of measurement.

Gräfelfing, 26th. June 2008
Department specialist

Dipl.-Ing. (FH) W. Albrecht

Forschungsinstitut für Wärmeschutz e.V. FIW München 10

Tester

A. Bergler

Forschungsinstitut für Wärmeschutz e. V. München
Lochhamer Schlag 4 · 82166 Gräfelfing
Telefon +49 (0)89 8 58 00 –0 · Telefax +49 (0)89 8 58 00 – 40
info@fiw-muenchen.de · www.fiw-muenchen.de