RA

RELIABLE ANALYSIS INC.

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PURCHASE ORDER	11000922
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TOTAL PAGE (S) NUMBER	1/6

REPORT FOR

Palziv
3745 Napier Rd.
Plymouth, MI 48170

Attn: Mark Williams

Work Requested

Perform the following tests on materials submitted for testing in accordance with the instructions of the submitting engineer and the indicated laboratory procedures:

1. Fogging (GMW3235-B, B-Y1-T1)
2. Odor (GMW3205, Wet and Dry, 24 H @ 70 °C)
3. TVOC (GMW8081)
4. Mildew (GMW3259, 14d @ 40°C)

WSS-M99P32-B
3.11 Fogging (SAE J1756, 100°C heat, 21°C cool, 1h and 16h post)

Sample Description

Four materials, submitted for testing on August 5, 2011, were identified as:

1. Vizion 2 PCF-V 2.0
2. Vizion 3 PCF-V 3.0
3. Vizion 4 PCF-V 4.0
4. Vizion 2 PCF Soft- V 2.0S, Grey w/ EVA

Work Performed

The specimens were conditioned for a minimum of 24 hours at the standard laboratory conditions of $23 \pm 2\ ^{o}C$ and $50 \pm 5\%$ R.H. prior to testing. The tests were performed in accordance with the above indicated procedures.

Test Results

1. **Fogging** (GMW3235B, Code 3, 18h @ 90°C, 21°C cool, 24h post)
   The specimens were preconditioned in a desiccator filled with silica gel for 1 day. After conditioning, each specimen was put in a beaker, and the beaker was covered with a disk of aluminum foil and a glass plate. The beakers were then heated in a Hart Fog Test Chamber for 18 hours at 90 ºC heating unit temperature and 21 ºC cooling plate temperature. The aluminum foil disk was weighed before the test and 24 hours later after the test. Then the weight of condensate was determined ($W_f - W_0$).
   Requirement: NA

Sample ID	W_0 (mg)	W_f (mg)	Weight of Condensate (mg)
V 2.0			
Specimen 1	307.5	309.4	1.9
Specimen 2	307.3	309.2	1.9
Specimen 3	305.4	307.5	2.1
		Mean:	**2.0**
V 3.0			
Specimen 1	304.9	306.8	1.9
Specimen 2	308.5	310.0	1.5
Specimen 3	306.1	307.5	1.4
		Mean:	**1.6**
V 4.0			
Specimen 1	306.9	308.9	2.0
Specimen 2	309.2	311.0	1.8
Specimen 3	308.3	310.4	2.1
		Mean:	**2.0**

2. **Odor** (GMW3205, Wet and Dry, 24 H @ 70 °C)
   The specimens were tested at 70 °C for 24 hours. A ratio of specimen size to container size of 1:20 was used.
   Requirement: NA

	Panelist						Average
Sample ID	A	B	C	D	E	F	Rating
Coding A- Wet							
V 2.0							
Specimen 1	4	8	9	7	8	7	7.2
Specimen 2	4	8	9	7	8	7	7.2
Specimen 3	4	8	9	7	8	7	7.2

Rating Scale:

10	Odorless
8	Trace
6	Tolerable
4	Annoying
2	Severe

Test Results (continued)

2. Odor (GMW3205, Wet and Dry, 24 H @ 70 °C)

The specimens were tested at 70 °C for 24 hours. A ratio of specimen size to container size of 1:20 was used.

Requirement: NA

	Panelist						Average
Sample ID	**A**	**B**	**C**	**D**	**E**	**F**	**Rating**
Coding A- Wet							
V 3.0							
Specimen 1	5	8	9	8	8	8	7.7
Specimen 2	5	8	9	8	8	8	7.7
Specimen 3	5	8	9	8	8	8	7.7
V 4.0							
Specimen 1	10	7	10	10	7	9	8.8
Specimen 2	10	7	10	10	7	9	8.8
Specimen 3	10	7	10	10	7	9	8.8
Coding B- Dry							
V 2.0							
Specimen 1	3	1	2	1	4	1	2
Specimen 2	3	1	2	1	4	1	2
Specimen 3	3	1	2	1	4	1	2
V 3.0							
Specimen 1	5	4	6	6	8	6	5.8
Specimen 2	5	4	6	6	8	6	5.8
Specimen 3	5	4	6	6	8	6	5.8
V 4.0							
Specimen 1	4	4	5	5	7	5	5
Specimen 2	4	4	4	5	7	5	5
Specimen 3	4	4	6	5	7	5	5

3. TVOC (GMW 8081)

The test conditions were as listed below:

Parameters of headspace feeding flask:

Temperature: 120°C oven, 125°C loop and 135°C transfer line
Time: GC cycle time 60 min
Equilibration Time: 60 min
Pressurize Time: 0.1min
Loop Fill Time: 0.1 min
Loop Equilibration Time: 0.0 min
Inject Time: 1.0 min

Test Results (continued)

3. TVOC (GMW 8081)

Measuring condition:

GC furnace temperature: 4 min isothermal condition at 50°C, heating to 300°C at a rate of 7°C/min and then 300°C for 5 min;

Pressure before entering into the column: 10 psi.

The "Relative Emission" was calculated in accordance with the following formula:

Relative Emission = (Total Area- Air Area) / Air area

Requirement: NA

Sample ID	A_{sum}	A_{air}	$A_{Emission}$	Relative Emission
V 2.0				
Specimen 1	380665182	371261777	9403405	0.0253
Specimen 2	467301033	451566935	15734098	0.0348
Mean				**0.0301**
V 3.0				
Specimen 1	342027922	333286985	8740937	0.0262
Specimen 2	348902261	338479465	10422796	0.0308
Specimen 3	383487056	372801917	10685139	0.0287
Mean				**0.0286**
V 4.0				
Specimen 1	328153232	328153232	0	0.000
Specimen 2	320580356	320580356	0	0.000
Specimen 3	321153972	3211539972	0	0.000
Mean				**0.000**

4. Mildew (GMW3259, 14d @ 40°C)

The 2"X 2" specimens were each placed in a sealed glass container with enough water to last the entire 14 day test period. The specimens were suspended above the water and not in contact with the glass. After 14 days in the incubator @ 40°C the containers were removed and allowed to cool. The odor was evaluated first and then each specimen was visually evaluated for the presence of mildew.

Requirement: NA

Sample ID	Odor	Visual Examination
V 2.0		
Specimen 1	No offensive odor	No noticeable growth
Specimen 2	No offensive odor	No noticeable growth
Specimen 3	No offensive odor	No noticeable growth
V 3.0		
Specimen 1	No offensive odor	No noticeable growth
Specimen 2	No offensive odor	No noticeable growth
Specimen 3	No offensive odor	No noticeable growth

Test Results (continued)

4. Mildew (GMW3259, 14d @ 40°C)

Sample ID	Odor	Visual Examination
V 4.0		
Specimen 1	No offensive odor	No noticeable growth
Specimen 2	No offensive odor	No noticeable growth
Specimen 3	No offensive odor	No noticeable growth

WSS-M99P32-B

3.11 Fogging (SAE J1756, 100°C heat, 21°C cool, 1h and 16h post
Requirement: Minimum fog #70. No formation of clear film, droplets or crystals

Sample ID	R_0	R_f	Fog#	Visual Examination	Evaluation
V 2.0S					
Specimen 1	151.0	-	-	Large, wet droplets. Cannot read	Did not meet requirement
Specimen 2	151.0	-	-	Large, wet droplets. Cannot read	Did not meet requirement
Specimen 3	151.0	-	-	Large, wet droplets. Cannot read	Did not meet requirement
Mean:					
V 2.0S					
Specimen 1	151.0	115.0	76.2	Droplets present	Did not meet requirement
Specimen 2	151.0	117.0	77.5	Droplets present	Did not meet requirement
Specimen 3	151.0	117.0	77.5	Droplets present	Did not meet requirement
Mean:			77.0		

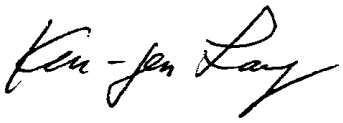
Test Equipment

1. E-070, Precision Scientific Oven (Calibration Due: 1/12)
2. E-103, Denver Analytical Balance (Calibration Due: 4/12)
3. E-005, Hart Scientific Fog-Test Chamber (S/N: 125, Calibration Due: 7/12)
4. E-055, Incubator (Calibration Due: 1/12)
5. E-006, Hart Scientific Fog-Test Chamber (S/N: 140, Calibration Due: 7/12)
6. E-007, Glossmeter (Calibration Due: 8/11)

Sample Disposition

The tested samples are being returned with this report for your further evaluation.

Reliable Analysis, Inc.



Ken-jen Lang
President

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