Singapore Test Services
A company of ST Kinetics

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Title of Report

Temperature Humidity Test

Client:	**Client Ref :**
BA Furnishing Pte. Ltd. 10 Admiralty Street #06-30 North Link Building Singapore 757695	STS Job No: STS-2011-14267
Attn : Mr John Goh	**Date :** 19 Sept 2011

Test Summary:

Temperature humidity tests were performed on Murano Siuakustic medium density fiber board with wood veneer reference to client's test specifications.
(Refer to page 4 of 12)

Visual inspections and measurements were taken on the test samples were by STS staff before and after each phase of the tests.

For results of measurements was taken on page 6, 7 and 8 of the test report.

Work carried out by:	**Approved by:**
Allan Wu Associate Engineer Singapore Test Services	Jeffrey Tan Boon Wee Senior. Engineer Singapore Test Services
Reported by: Allan Wu Associate Engineer Singapore Test Services	

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Report Number: 8450-0911-8QCT05231

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Subject	Temperature Humidity Test

Description of test Samples	Murano Siuakustic medium density fibred board laminated with wood Veneer
Samples size	800mm(L) x 800mm(W) x 18mm(T) each
Quantity of Sample	3 pcs
Test Specification	With reference to client's test specifications (Refer to page 4 of 12)
Date of test	Phase 1 : 25/08/2011 - 31/08/2011 Phase 2 : 01/09/2011 - 07/09/2011 Phase 3 : 07/09/2011 - 17/09/2011
Total time taken for test	23 days

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TEST EQUIPMENT USED

S/no	Description	Model	Serial no.	Date of last calibration	Date of due Calibration
1	Tabai Espec Hand-in Temp Humidity chamber	PR-4KP	14003006	6/5/2011	5/5/2012
2	Vernier caliper	500-171-20	7034001	21/3/2011	20/3/2012
3	AND Weighing scale	HP-30K	13007275	8/9/2011	7/9/2012

TEST PROCEDURE

Steps	Action(s)	Remarks
1	Visual inspection and initial measurements were conducted by STS staff before the test.	No abnormality. Refer to results table on page 6 to 8 of the test report.
2	The test samples were loaded into the chamber and tested with reference to client's specification.	Refer to profile Refer to set up photo Refer to plot
3	Visual inspection and measurements were taken by the STS staff before and after each phase of the tests.	No abnormality. Refer to results table on page 6 to 8 of the test report.

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TEST PROFILE

The tests were conducted into 3 phases as followed below:

1. Temperature Humidity Test (Phase 1)
Test specification : Condition test samples at +40°C with relative humidity at 98% for 144hrs, measurement of bending(mm), weight(kg), thickness(mm) and density(kg/m³) must be taken after this phase.
Test duration : 6 days

Take note : There will be a tolerance of ±2 °C for temperature and ±5 % for relative humidity for the above mentioned tests.

2. Temperature Humidity Test (Phase 2)
Test specification : Condition test samples at +35°C with relative humidity at 95% for 144hrs, measurement of bending(mm), weight(kg), thickness(mm) and density(kg/m³) must be taken after this phase.
Test duration : 6 days

3. Temperature Humidity Test (Phase 3)
Test specification : Condition test samples at +18°C with relative humidity at 50% for 240hrs, measurement of bending(mm), weight(kg), thickness(mm) and density(kg/m³) must be taken after this phase.
Test duration : 10 days

CONCLUSION

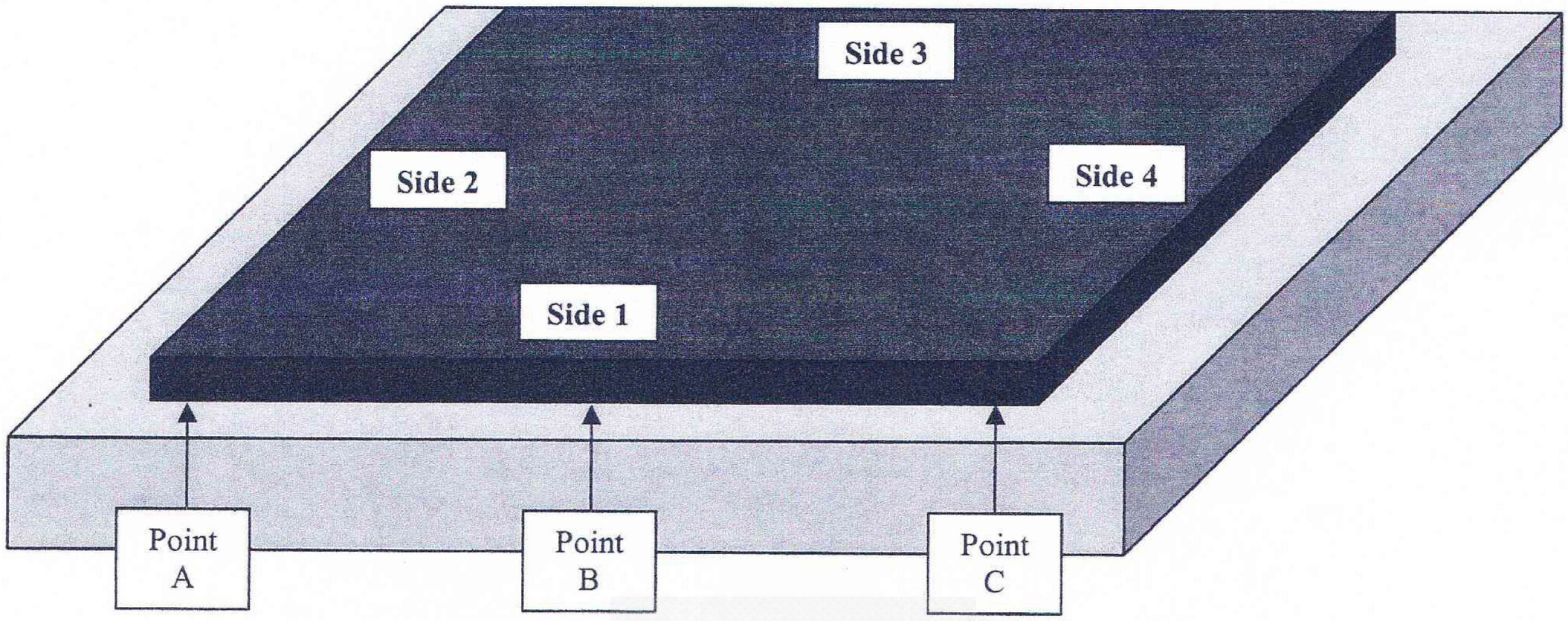
Visual inspections and measurements were conducted before and after each phase of the test.

No abnormality, discoloration and obvious changes were observed on the Murano Siuakustic board.
No mildew or mold was detected before and after the test.

The board bend, thickness and weight increased when was subjected to high humidity and temperature.
The extend of bending, thickness and weight increase as recorded in the table(Refer to page 5,6 &7) are well within the tolerance of ±10% given the 3 different conditions of humidity and temperature.

Subject	Temperature Humidity Test

FIGURE OF THE MEASUREMENT TAKEN



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Subject	Temperature Humidity Test

TEST RESULT

Before test (Initial Stage)

Board no. 1	Bending(mm)			Weight(kg)	Thickness(mm)	Density(kg/m3)
	Point A	Point B	Point C			
Side 1	0.00	0.00	0.00	11.087	17.88	853.04
Side 2	0.00	0.00	0.00		17.91	
Side 3	0.00	0.00	0.00		17.90	
Side 4	0.00	0.00	0.00		17.88	

After 144hrs of conditioning at 40^0C with 98% RH (Phase 1)

Board no. 1	Bending(mm)			Weight(kg)	Thickness(mm)	Density(kg/m3)
	Point A	Point B	Point C			
Side 1	1.26	5.16	0.02	11.484	18.57	851.80
Side 2	0.26	1.25	0.42		18.49	
Side 3	0.17	5.18	1.10		17.72	
Side 4	1.37	0.80	1.02		19.46	

After 144hrs of conditioning at 35^0C with 95% RH (Phase 2)

Board no. 1	Bending(mm)			Weight(kg)	Thickness(mm)	Density(kg/m3)
	Point A	Point B	Point C			
Side 1	1.26	7.50	0.09	11.617	18.58	849.99
Side 2	0.73	0.25	0.57		18.37	
Side 3	0.57	6.81	1.09		18.44	
Side 4	1.25	0.85	1.23		19.87	

After 240hrs of conditioning at 18^0C with 50% RH (Phase 3)

Board no. 1	Bending(mm)			Weight(kg)	Thickness(mm)	Density(kg/m3)
	Point A	Point B	Point C			
Side 1	0.21	3.30	0.01	11.326	18.33	847.16
Side 2	0.27	0.06	0.35		18.31	
Side 3	0.11	3.37	0.42		18.25	
Side 4	0.73	0.18	0.51		18.73	

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Subject	Temperature Humidity Test

Before test (Initial Stage)

Board no. 2	Bending(mm)			Weight(kg)	Thickness(mm)	Density(kg/m3)
	Point A	Point B	Point C			
Side 1	0.00	0.00	0.00	10.808	17.80	829.95
Side 2	0.00	0.00	0.00		18.06	
Side 3	0.00	0.00	0.00		17.95	
Side 4	0.00	0.00	0.00		17.90	

After 144hrs of conditioning at 40^0C with 98% RH (Phase 1)

Board no. 2	Bending(mm)			Weight(kg)	Thickness(mm)	Density(kg/m3)
	Point A	Point B	Point C			
Side 1	0.29	3.35	0.03	11.164	18.55	820.33
Side 2	0.01	1.49	0.19		18.39	
Side 3	0.03	5.16	0.85		18.54	
Side 4	0.66	0.10	0.43		19.46	

After 144hrs of conditioning at 35^0C with 95% RH (Phase 2)

Board no. 2	Bending(mm)			Weight(kg)	Thickness(mm)	Density(kg/m3)
	Point A	Point B	Point C			
Side 1	0.69	5.66	0.07	11.329	18.56	828.04
Side 2	0.19	0.01	0.43		18.40	
Side 3	0.51	6.41	1.37		18.54	
Side 4	1.15	0.05	0.84		19.84	

After 240hrs of conditioning at 18^0C with 50% RH (Phase 3)

Board no. 2	Bending(mm)			Weight(kg)	Thickness(mm)	Density(kg/m3)
	Point A	Point B	Point C			
Side 1	0.32	1.91	0.04	11.047	18.14	831.26
Side 2	0.06	0.19	0.13		18.25	
Side 3	0.04	2.21	0.67		18.14	
Side 4	0.33	0.43	0.08		18.65	

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Subject	Temperature Humidity Test

Before test (Initial Stage)

Board no. 3	Bending(mm)			Weight(kg)	Thickness(mm)	Density(kg/m3)
	Point A	Point B	Point C			
Side 1	0.00	0.00	0.00	10.531	18.21	793.30
Side 2	0.00	0.00	0.00		18.28	
Side 3	0.00	0.00	0.00		18.29	
Side 4	0.00	0.00	0.00		18.32	

After 144hrs of conditioning at 40^0C with 98% RH (Phase 1)

Board no. 3	Bending(mm)			Weight(kg)	Thickness(mm)	Density(kg/m3)
	Point A	Point B	Point C			
Side 1	0.74	4.50	0.46	10.976	19.78	771.81
Side 2	0.53	0.56	0.47		19.53	
Side 3	0.07	4.55	0.04		19.19	
Side 4	0.24	0.23	0.94		19.81	

After 144hrs of conditioning at 35^0C with 95% RH (Phase 2)

Board no. 3	Bending(mm)			Weight(kg)	Thickness(mm)	Density(kg/m3)
	Point A	Point B	Point C			
Side 1	1.39	5.98	0.77	11.134	20.17	768.30
Side 2	0.72	0.04	0.55		19.82	
Side 3	0.63	5.90	0.50		19.60	
Side 4	0.67	0.41	1.51		20.21	

After 240hrs of conditioning at 18^0C with 50% RH (Phase 3)

Board no. 3	Bending(mm)			Weight(kg)	Thickness(mm)	Density(kg/m3)
	Point A	Point B	Point C			
Side 1	0.21	2.77	0.01	10.725	18.92	780.06
Side 2	0.27	0.23	0.02		18.95	
Side 3	0.06	2.39	0.02		18.72	
Side 4	0.06	0.03	0.38		19.12	

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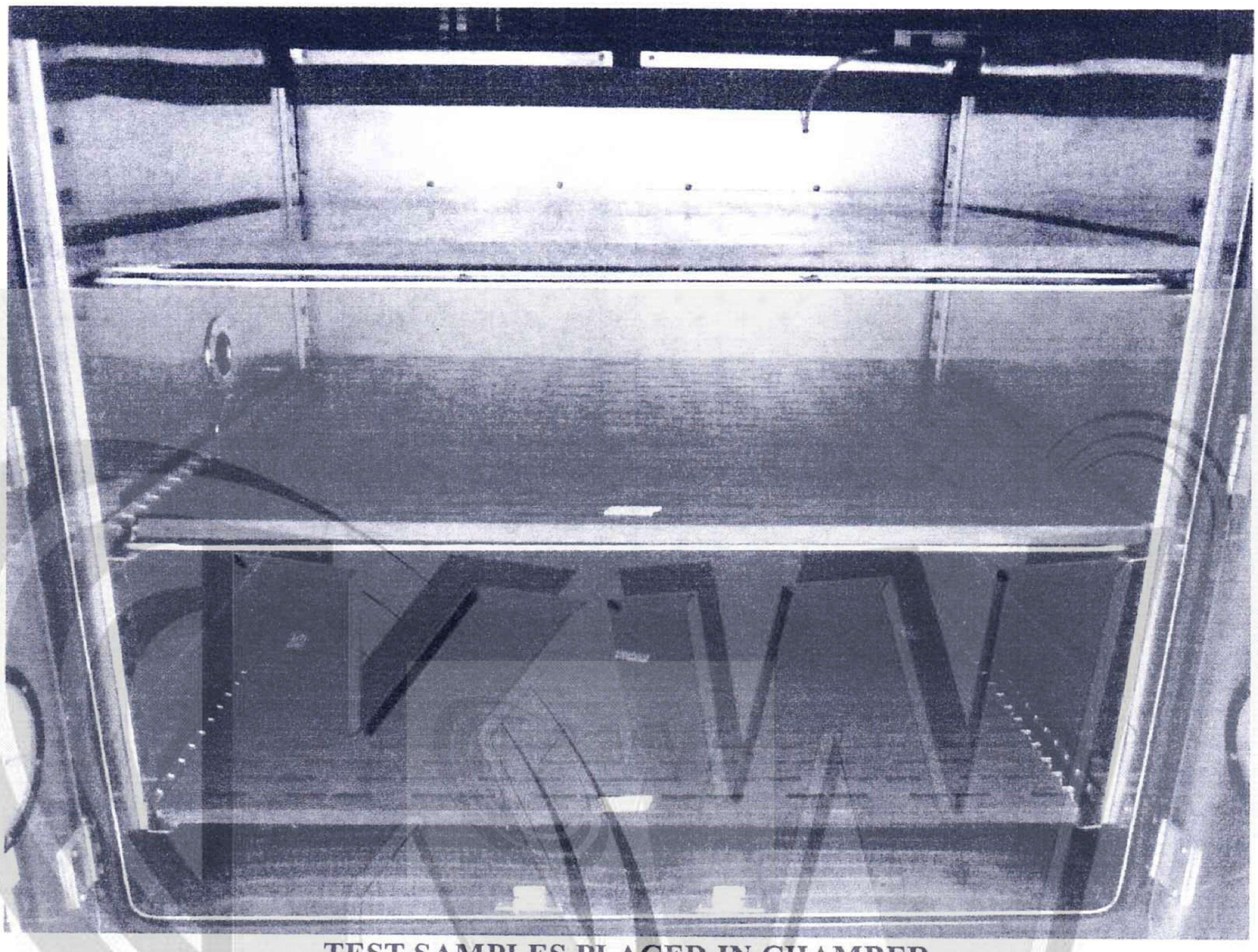
TEST SET UP



TEST SAMPLES PLACED IN CHAMBER

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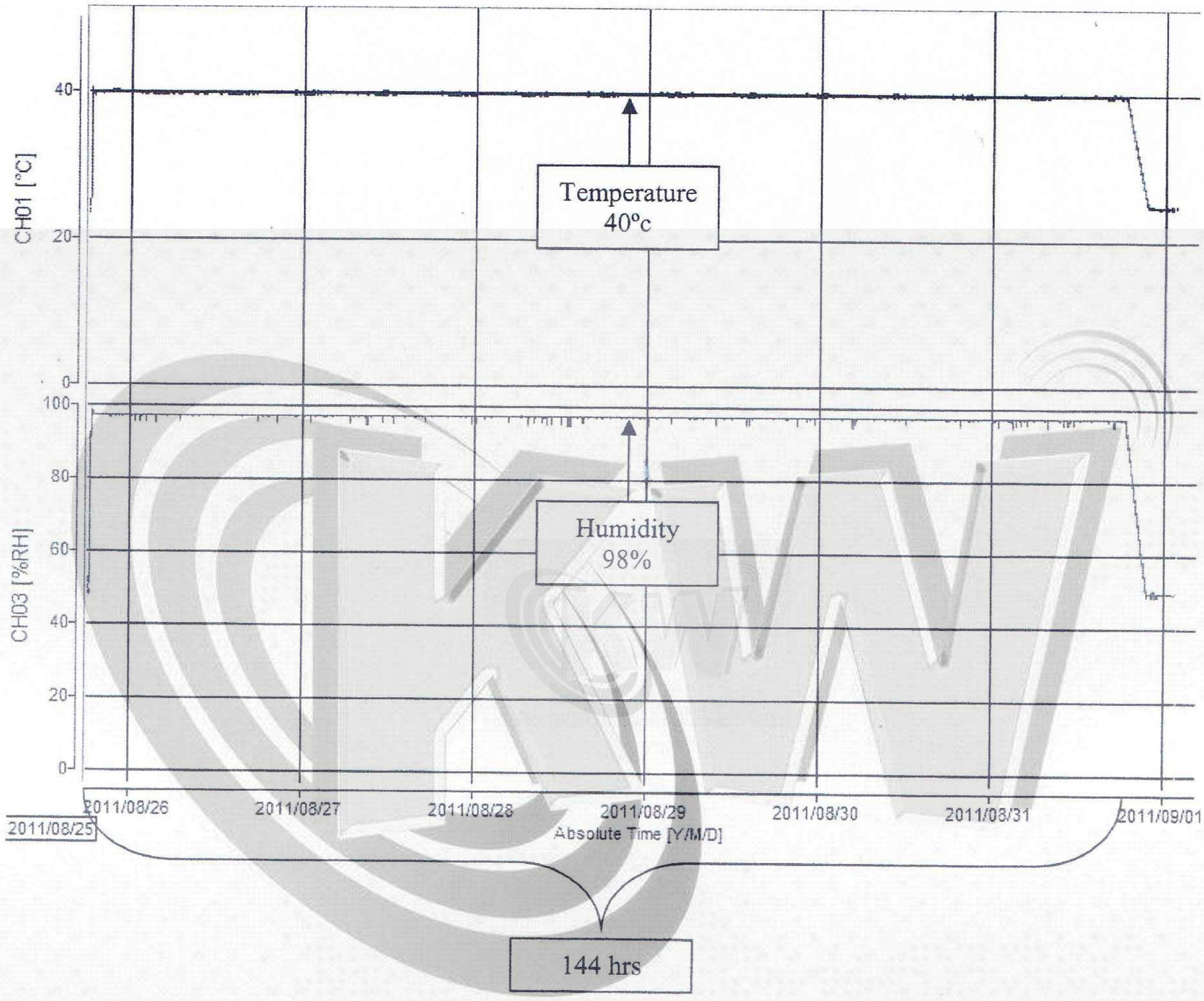
TEST PLOT

144hrs of conditioning at 40^{0}C with 98% RH (Phase 1)



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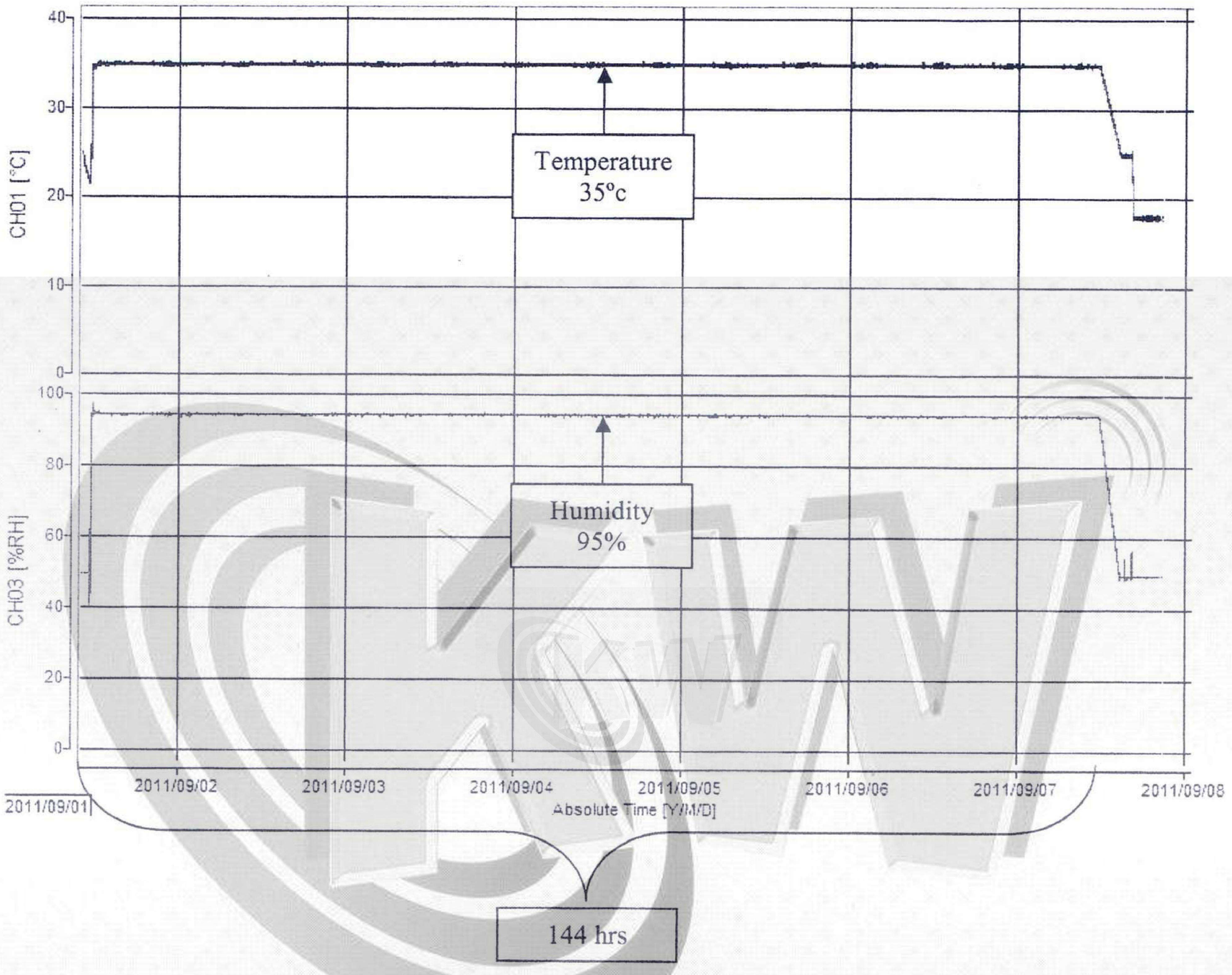
144hrs of conditioning at 35^{0}C with 95% RH (Phase 2)



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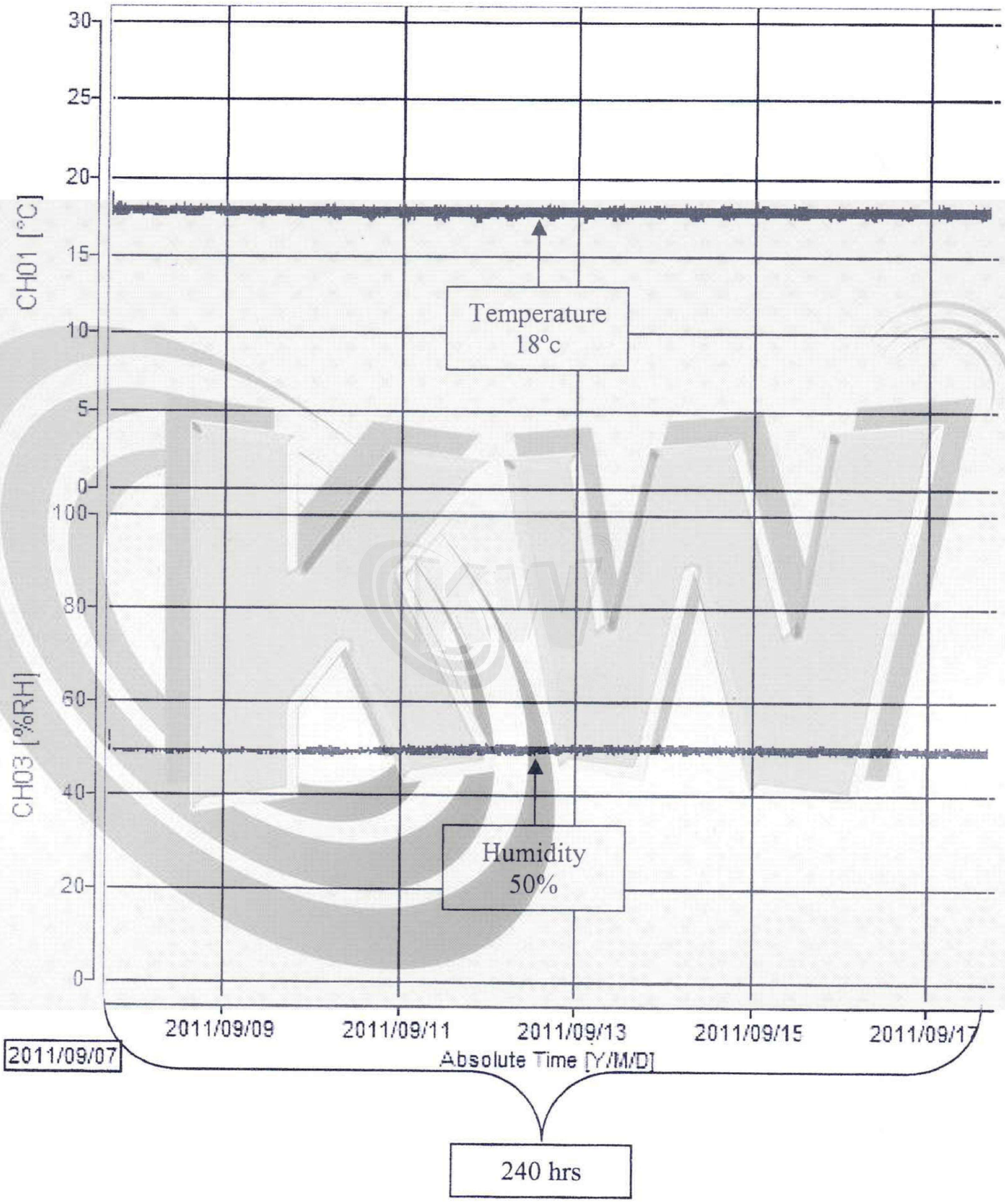
After 240hrs of conditioning at 18^0C with 50% RH (Phase 3)



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