

HYOSUNG CHEMICAL CORPORATION TEST REPORT

SCOPE OF WORK

DBL5430 (2019) testing on Polyketone Plastic, PN M630V

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105334067GRR-001

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TEST REPORT FOR HYOSUNG CHEMICAL CORPORATION

Report No.: 105334067GRR-001

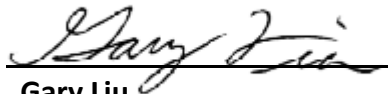
Date: 15-February-2023

P.O.: RC23R-S0012


SECTION 1

CLIENT INFORMATION

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SECTION 2**SUMMARY**

Date of Manufacture:	None Specified
Date of Shipment:	None Specified
Date Received:	24-January-2023
Dates Tested:	09-February-2023 to 09-February-2023

DESCRIPTION OF SAMPLES

Part Description:	Polyketone Plastic, PN M630V
Material Submitted:	10 of 80 mm Diameter Disc and Bag of Pellets
Material Specification:	DBL5430 (2019)
Condition of Samples:	Sample

WORK REQUESTED/APPLICABLE DOCUMENTS

DBL5430 (2019)
Intertek quote Qu-01317148-

SECTION 3

CONCLUSION

TEST	RESULTS
6.4.1 Odor	Report
6.8 Fog	Conforming

SAMPLE DISPOSITION

After testing completed, samples were rendered unusable and then disposed of.

SUBMITTED TEST SAMPLES



Figure 1: Typical samples as received

SECTION 4**6.4.1 ODOR:**

Date of Manufacture: None Specified
Date of Shipment: None Specified
Date Received: 24-January-2023
Date Tested: 10-February-2022
Location Tested: Intertek Kentwood, MI

DESCRIPTION OF SAMPLES:

Part Description: Polyketone Plastic, PN M630V
Material Submitted: 10 of 80 mm Diameter Disc and Bag of Pellets
Material Specification: DBL5430 (2019)
Condition of Samples: Sample

TEST PROCEDURE:

Test Method: Per DBL5430 (2019) section 6.4.1
VDA 270 (June 2018), variant(s) B3 per 02/01/23 client email
Sample Received: In sealed Ziploc bag
Conditioning: 168 hours minimum at 23 ± 2 °C and 50 ± 5 % R.H.
Exposures: Variant 3: 80 ± 2 °C for 2 h \pm 10 min, then cooled down to a test chamber temperature of 60 ± 5 °C before evaluation per 02/01/23 client email.
Jar Size: 1L glass jar
Specimen Size: Variant B, 1-L vessel: 20 ± 2 g / 3-L vessel: 60 ± 6 g, 20 mm thick max. per 02/01/23 client email.
Number of Samples: One (1) per condition

ACCEPTANCE CRITERIA:

Report per 02/01/23 client email.

RESULTS:**Table 1: 6.4.1 Odor Results Table**

VARIANT	PANELIST	EVALUATION SCALE	ODOR DESCRIPTION	DISPOSITION
Variant 3: 80 ± 2 °C for 2 h \pm 10 min, cooled down to 60 ± 5 °C, No water	1	3	Plastic	Report
	2	2.5	Lightly musty	
	3	2.5	Plastic	
	Mean*	2.5		

*Report the mean rounded to the nearest half-step

Evaluation Scale:

Grade 1 Not Perceptible

Grade 2 Perceptible, not disturbing

Grade 3 Clearly perceptible, but not disturbing

Grade 4 Disturbing

Grade 5 Strongly disturbing

Grade 6 Not acceptable

PHOTOGRAPHS:

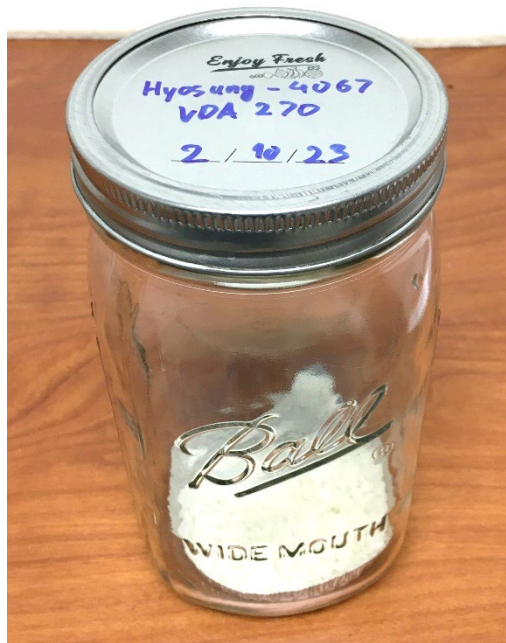


Figure 2: 6.4.1 Odor Set-Up

TEST EQUIPMENT:

ASSET NUMBER	EQUIPMENT	CALIBRATION DATE	CALIBRATION DUE
114229	Temperature and Humidity Recorder	7/13/2022	7/13/2023
117005	OVEN AMB. TO 204 C	REF ONLY	REF ONLY
117627	DIGITAL THERMOMETER	12/20/2022	12/20/2023
114248	Scout Pro Portable Balance 6200g capacity	4/26/2022	4/26/2023

SECTION 5**6.8 FOG:**

Date of Manufacture:	None Specified
Date of Shipment:	None Specified
Date Received:	24-January-2023
Date Tested:	09-February-2023 to 14-February-2023
Location Tested:	Intertek Kentwood, MI

DESCRIPTION OF SAMPLES:

Part Description:	Polyketone Plastic, PN M630V
Material Submitted:	10 of 80 mm Diameter Disc and Bag of Pellets
Material Specification:	DBL5430 (2019)
Condition of Samples:	Sample

TEST PROCEDURE:

Test Method:	Per DBL5430 (2019) section 6.8 DIN 75 201 (November 2011), Method B- Gravimetric
Sample Received:	In sealed Ziploc bag
Sample Preparation:	168 hours minimum at 23 ± 2 °C and 50 ± 5 % R.H.
Test Side (Up in Beaker):	Either side
Pre-Drying Coding:	≥ 1 day in a desiccator
Bath Temperature:	120 ± 0.3 °C (Per 01/31/23 client email)
Cooling Temperature:	21 ± 1 °C
Exposure Duration:	$16 \text{ h} \pm 10$ minutes
Post-Drying Coding:	3.5 – 4.0 hours in a desiccator
Sample Size:	80 mm diameter
Number of Samples:	Four (4); Two (2) Specimens and one DIDP sample in each of two (2) separate analytical runs

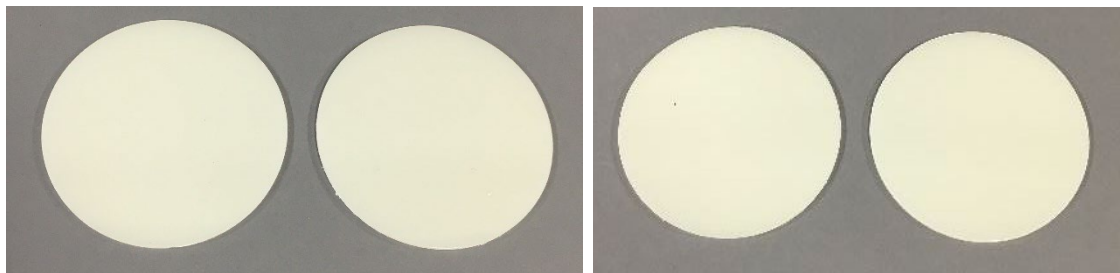
ACCEPTANCE CRITERIA:

Per DBL5430 (2019)

Condensable Constituents:	≤ 5 mg
DIDP Control:	0.65 ± 0.25 mg

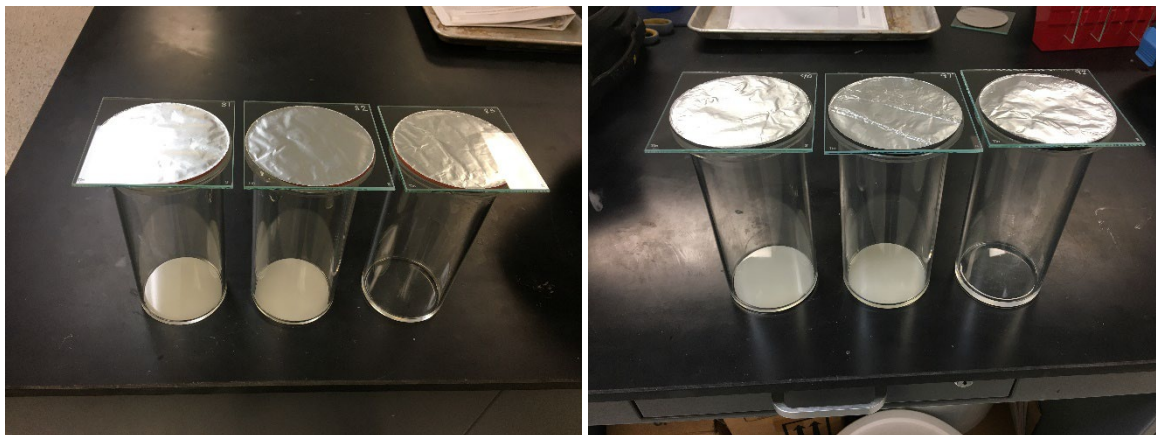
RESULTS:**Table 2: 6.8 Fog Results Table**

Analytical Run	Specimen	Condensing Foil			Description of Fog Residue	Disposition
		Initial Mass (mg)	Final Mass (mg)	Condensable Constituents (mg)		
1	1	732.60	732.75	0.15	Dry uniform	Conforming
1	2	724.04	724.10	0.06	Dry uniform	Conforming
2	3	735.40	735.47	0.07	Dry uniform	Conforming
2	4	736.15	736.23	0.08	Dry uniform	Conforming
Mean				0.09	---	
1	DIDP	718.84	719.55	0.71		In range
2	DIDP	735.39	736.20	0.81		In range

PHOTOGRAPHS:

Run 1

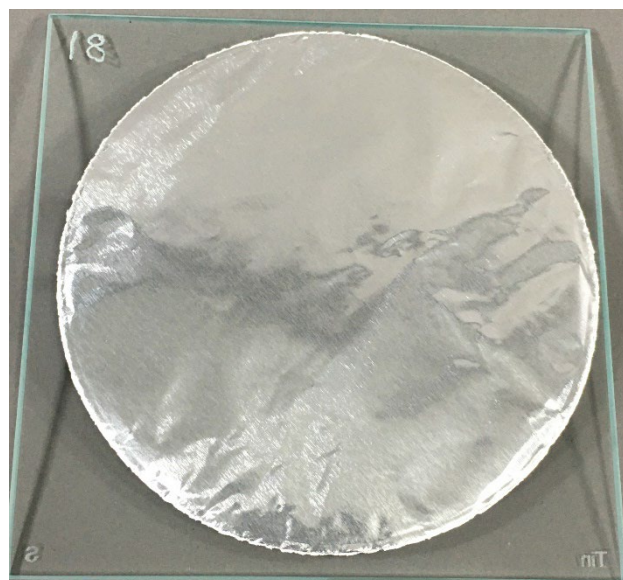
Run 2

Figure 3: 6.8 Fog Specimens before Exposure

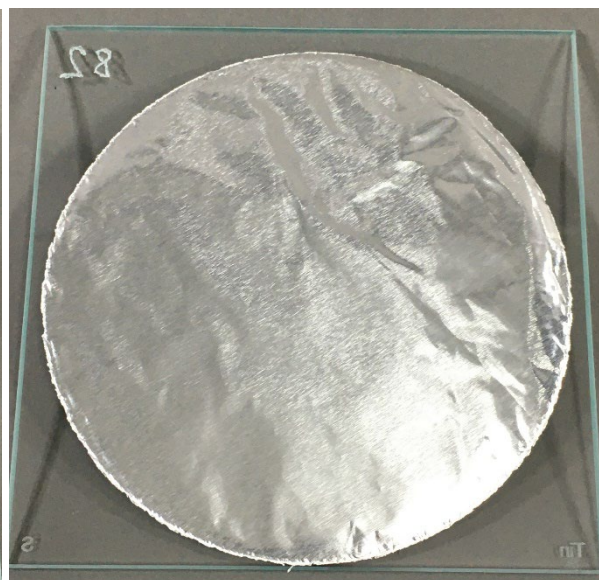
Run 1

Run 2

Figure 4: 6.8 Fog Set-Up



Sample 1

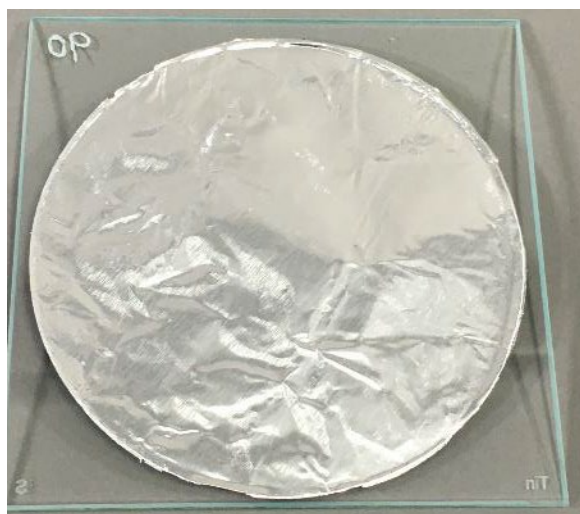


Sample 2



DIDP

Figure 5: 6.8 Fog Run 1 Foil after Exposure



Sample 1



Sample 2



DIDP

Figure 6: 6.8 Fog Run 2 Foil after Exposure

TEST EQUIPMENT:

ASSET NUMBER	EQUIPMENT	CALIBRATION DATE	CALIBRATION DUE
114229	Temperature and Humidity Recorder	7/13/2022	7/13/2023
114248	Scout Pro Portable Balance 6200g capacity	4/26/2022	4/26/2023
117132	FOG DIE 80mm	3/18/2022	3/18/2023
113694	Sartorius scale	11/16/2022	11/16/2023
117602.1	Fog Bath cooling unit	9/7/2022	9/7/2023
117602	Fog Bath heating unit	9/7/2022	9/7/2023
117390	Fogging Unit/Horizon AC-FTS	7/13/2022	7/13/2023
117390.1	Fogging unit/Bath Circulator A10	7/13/2022	7/13/2023