

# HYOSUNG CHEMICAL TEST REPORT

**SCOPE OF WORK**

VDA278 (Oct. 2011) on Polyketone

**REPORT NUMBER**

105334067GRR-002

**ISSUE DATE**

22-February-2023

**PAGES**

10

**DOCUMENT CONTROL NUMBER**

Per GFT-OP-10 (6-March-2017)

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## TEST REPORT FOR HYOSUNG CHEMICAL CORPORATION

Report No.: 105334067GRR-002

Date: 22-February-2023

P.O.: RC23R-S0012

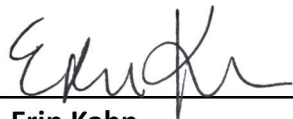
### SECTION 1

#### CLIENT INFORMATION

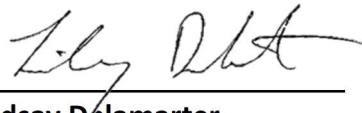
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**SECTION 2****SUMMARY AND CONCLUSION**

Date Received: 24-January-2023  
Dates Tested: 06-February-2023 to 16-February-2023

**DESCRIPTION OF SAMPLES**

Part Name: Polyketone  
Part Number: M630V  
Date of Manufacture: Not Specified  
Material Submitted: Two (2) Plaques  
Material Specification: DBL5430 (2019)  
Condition of Samples: Not Specified  
Shipping Condition: Okay Condition – Sealed in plastic bag

**WORK REQUESTED/APPLICABLE DOCUMENTS**

VOC/FOG Emissions Analysis: VDA278 (Oct. 2011)  
Intertek Quote: Qu-01317148

**TEST RESULTS**

| TEST                  | DISPOSITION |
|-----------------------|-------------|
| VDA278 (OCTOBER 2011) | CONFORMING  |

**SAMPLE DISPOSITION**

At the completion of testing, samples were disposed of in a routine manner.

**SECTION 3****VOC/FOG EMISSIONS ANALYSIS VDA278**

Date Received: 24-January-2023  
Dates Tested: 06-February to 16-February-2023

**DESCRIPTION OF SAMPLES:**

Part Name: Polyketone  
Part Number: M630V  
Date of Manufacture: Not Specified  
Material Submitted: Two (2) Plaques  
Material Specification: DBL5430 (2019)  
Condition of Samples: Not Specified  
Shipping Condition: Okay Condition – Sealed in plastic bag

**TEST PROCEDURE:**

Test Method: VDA278 (October 2011)  
Sample Conditioning: 23°C / 50% RH for 168 hours  
Sample Size: 30 ± 5 mg  
Overall Dimension of Component: Not Specified  
Number of Samples: Two (2) Samples

**ACCEPTANCE CRITERIA:**

Referencing: VDA278 (October 2011), DBL5430 (2019) ME5  
Total VOC: ≤ 250 µg/g  
Total FOG: ≤ 500 µg/g

**TEST NOTES OR DEVIATIONS:**

Relative humidity fell below the acceptable limit of 50 ± 5% for approximately 9% of the conditioning period. This is not expected to have a significant impact on results.

**RESULTS:****Table 1: Sample Information and Results for Polyketone**

|                  |     | SAMPLE 1        | SAMPLE 2        |
|------------------|-----|-----------------|-----------------|
| Dimensions (mm): |     | 3.7 x 3.8 x 2.0 | 6.1 x 2.2 x 1.9 |
| Mass (g):        |     | 0.03025         | 0.03383         |
| RESULTS (µg/g)   | VOC | 17.0            | 15.6            |
|                  | FOG | -               | 58.1            |

**Table 2: Individual VOC Emissions Results (as Toluene Equivalent)**

| RETENTION TIME (min) | SUBSTANCE NAME<br>(WITH OBSERVED MASS FRAGMENTATION) | CAS No.  | AREA % | CONCENTRATION (µg/g) |
|----------------------|--|----------|--------|----------------------|
| 44.709               | Tricosane  | 638-67-5 | 12.0%  | 2                    |
| 45.724               | Tetracosane  | 646-31-1 | 35.7%  | 6                    |
| 46.880               | Pentacosane  | 629-99-2 | 45.2%  | 8                    |

**Table 3: Individual FOG Emissions Results (as Hexadecane Equivalent)**

| RETENTION TIME (min) | SUBSTANCE NAME<br>(WITH OBSERVED MASS FRAGMENTATION) | CAS No.  | AREA % | CONCENTRATION (µg/g) |
|----------------------|--|----------|--------|----------------------|
| 20.217               | Tetracosane  | 646-31-1 | 5.3%   | 3                    |
| 21.373               | Pentacosane  | 629-99-2 | 14.9%  | 9                    |
| 22.731               | Hexacosane   | 630-01-3 | 24.3%  | 14                   |
| 24.358               | Heptacosane  | 593-49-7 | 22.6%  | 13                   |
| 26.334               | Octacosane   | 630-02-4 | 15.4%  | 9                    |
| 27.282               | ? Alkene, alcohol, cycloalkane 95 81 69              | -        | 2.4%   | 1                    |
| 28.756               | Nonacosane   | 630-03-5 | 7.0%   | 4                    |
| 31.753               | Triacontane  | 638-68-6 | 2.1%   | 1                    |

**PHOTOGRAPHS:**

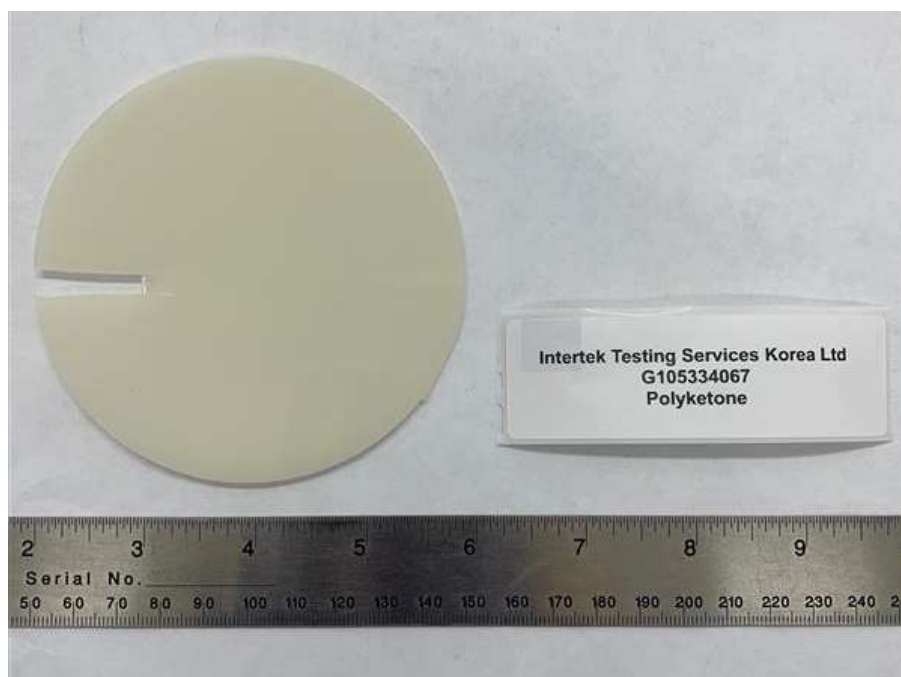


Figure 1: Photograph of Polyketone sample showing the sampling area.



Figure 2: Photograph of Polyketone samples loaded in thermal desorption tubes.

**SECTION 4****FACILITIES AND EQUIPMENT:****VDA278 (OCTOBER 2011)**

INSTRUMENTATION USED:

Markes TD-100 Thermal  
Desorption  
Agilent 7890B GC  
Agilent 5977A MS

COLUMN USED:

Agilent HP-Ultra 2 (GC)

## SECTION 5

### APPENDIX A: CHROMATOGRAMS:

Non-classified peaks are below a calculated concentration of 1.0 µg/g or outside the volatility range specified in VDA278.

File :D:\Intertek GR G105334067 Intertek Polyketone A .D  
Operator : EKK  
Acquired : 16 Feb 2023 00:38 using AcqMethod VDA278 VOC\_V2.M  
Instrument : Agilent 5977  
Sample Name: Intertek GR G105334067 Intertek Polyketone A  
Misc Info :  
Vial Number: 1

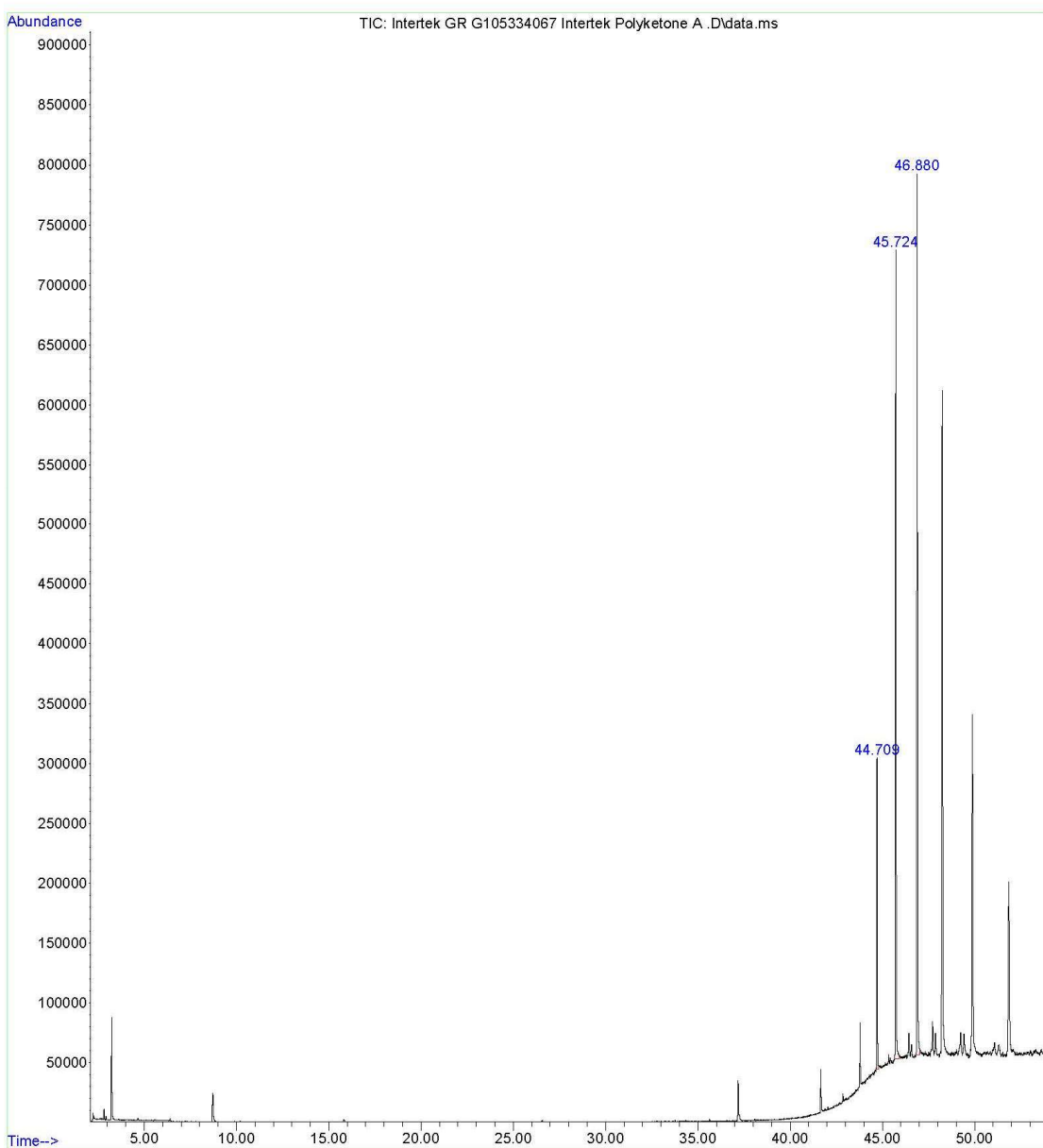


Figure A-1: Chromatogram for VOC analysis of Polyketone, sample 1.



**TEST REPORT FOR HYOSUNG CHEMICAL CORPORATION**

Date: 22-February-2023

Report No.: 105334067GRR-002

P.O.: RC23R-S0012

File :D:\Intertek GR G105334067 Intertek Polyketone B .D  
Operator : EKK  
Acquired : 16 Feb 2023 02:06 using AcqMethod VDA278 VOC\_V2.M  
Instrument : Agilent 5977  
Sample Name: Intertek GR G105334067 Intertek Polyketone B  
Misc Info :  
Vial Number: 1

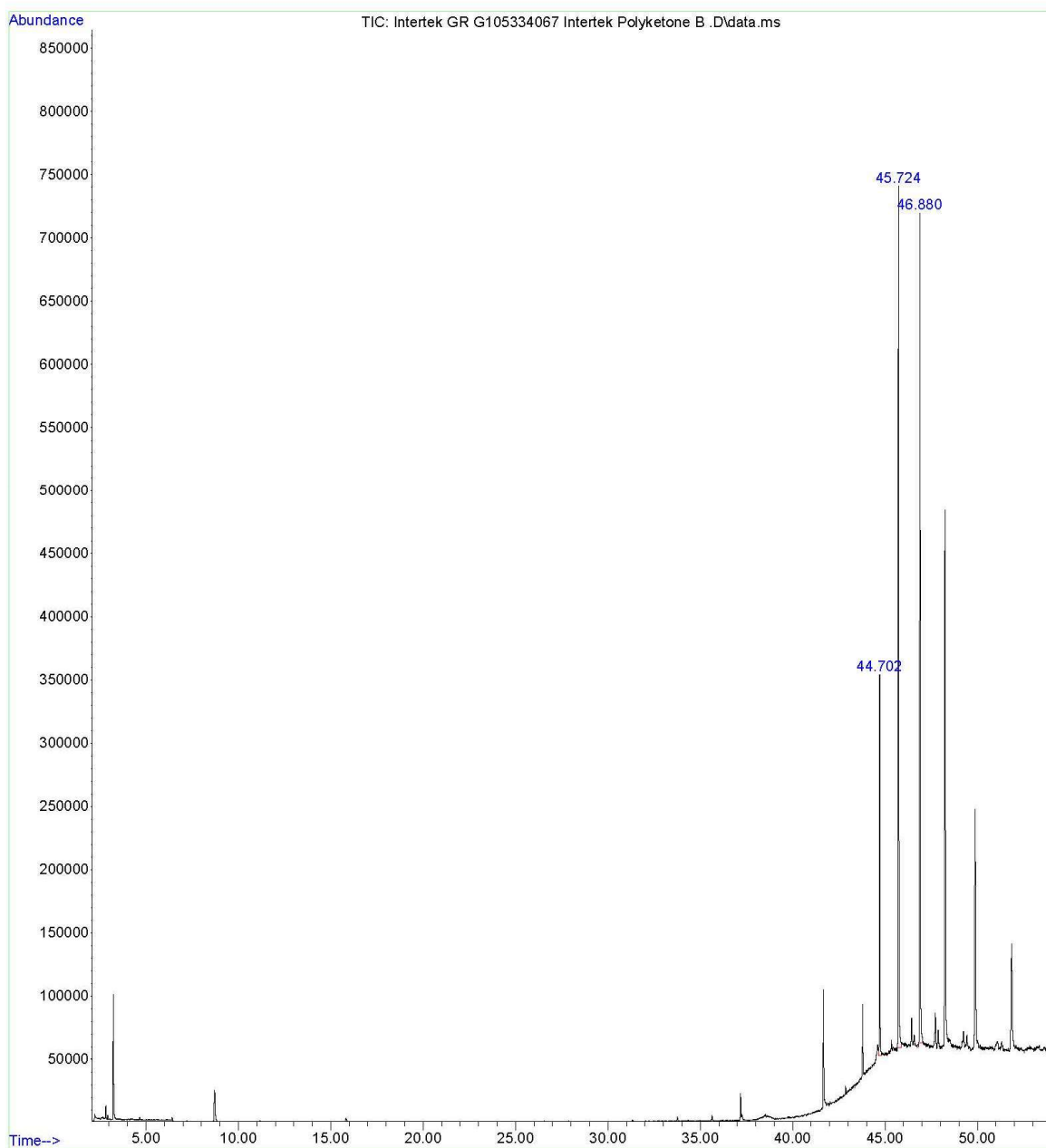


Figure A-2: Chromatogram for VOC analysis of Polyketone, sample 2.

Date: 22-February-2023

P.O.: RC23R-S0012

File :D:\Intertek GR G105334067 Intertek Polyketone F .D  
Operator : EKK  
Acquired : 16 Feb 2023 04:03 using AcqMethod VDA278 FOG\_V2.M  
Instrument : Agilent 5977  
Sample Name: Intertek GR G105334067 Intertek Polyketone F  
Misc Info :  
Vial Number: 1

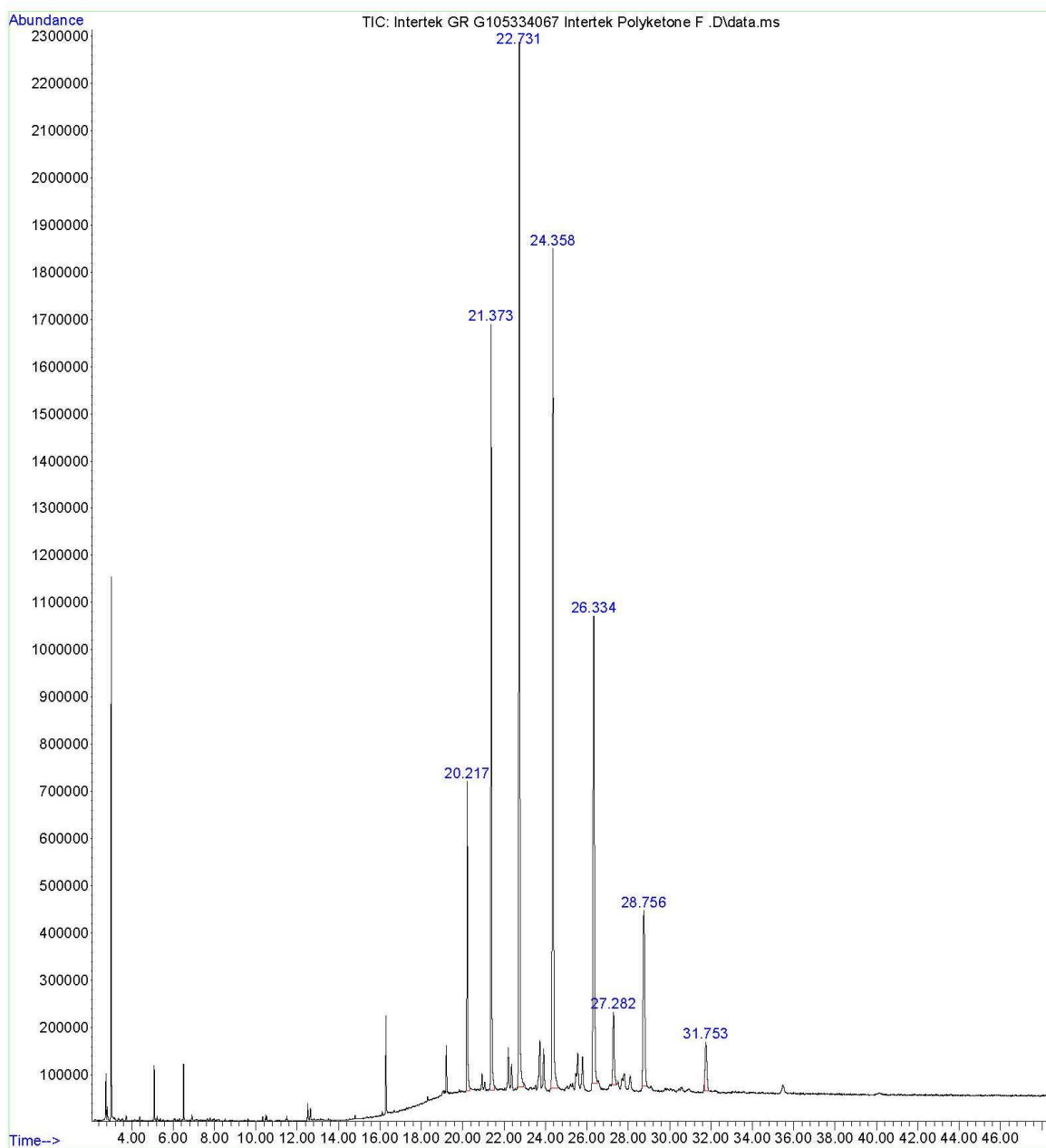


Figure A-3: Chromatogram for FOG analysis of Polyketone, sample 2.