JHG ANALYTICAL SERVICES LIMITED

Unit 9 Airside

Boeing Avenue

Airport Business Park

Killowen

Waterford X91 FX50

Republic of Ireland. Tel: +353 51 364103 Mob: +353 85 1379 880 Fax: +353 51 364039

TEST REPORT **REPORT NO.: 22-07-25663**

CHEMICAL ANALYTICAL REPORT

Type of Product: Thermoplastic Compostable Material sample.

Date of Report: 2nd. August 2022.

Sample Reference: CMC001

Date of Sample: 14/07/2022

CMC HYGEA Limited

Unit 30G IDA Industrial Estate

Northern Extension

Cleaboy Road

Waterford X91 HY58.

For the Attention of: Mr. Michael Malone.

Tel. 087 170 6559

Email: mmalone@cmchygea.com

TEST REPORT **REPORT NO.: 22-07-25663**

Compositional Analysis Data

Compound	Status	Analytical Method	Decomposition in Water/Soil	Decomposition in Compost	Decomposition in Sewage
Starch-Base	Present	FT-IR/ATR	Yes	Yes	Yes
Cellulose-Base	Present	FT-IR/ATR	Yes	Yes	Yes
HD Polyethylene	Present	FT-IR/ATR	Yes	Yes	Yes
PLA	Present	FT-IR/ATR	Yes	Yes	Yes
PGA	Present	FT-IR/ATR	Yes	Yes	Yes
PCL	Present	FT-IR/ATR	Yes	Yes	Yes
PHV	Present	FT-IR/ATR	Yes	Yes	Yes

Abbreviations:

HD : High Density

PLA : Polylactic acid. This is a bio-based Polyester compound.

PGA : Polyglycolic acid. This is a bio-based Polyester compound.

PCL : Poly-e-caprolactone. This is a bio-based Polyester compound.

PHV : Poly (3-hydroxy valerate). This is a bio-based Polyester compound.

FT-IR : Fourier-Transform Infra-Red Spectroscopy

ATR : Attenuated Total Reflectance (Diamond Crystal)

All the above compounds identified in the composition of this sample are completely Biodegradable and compostable in waste sewage systems. No Heavy Metals or any persistent Organic compounds have been identified.

TEST REPORT **REPORT NO.: 22-07-25663**

Instrument Specifications

Spectral Range : 7400- 375 cm^{-1}

Resolution : 1.0 cm^{-1}

Signal to Noise Ratio : > 10000 p/p (> 36000 RMS)

ASTM Linearity : < 0.10% T Deviation

Wavelength Accuracy : Better than 0.01 cm^{-1} at 2000 cm^{-1}

Standards

ASTM E334-01 : Practice for General Techniques of Infra-Red Microanalysis

ASTM E573-01 : Practice for Internal Reflection Spectroscopy

ASTM E1252-98 : Practice for General Techniques for Qualitative Infra-Red Analysis

ASTM E1655-17 : Practice for Infra-Red Multivariate Quantitative Analysis

ASTM E1421-99 : Measurement of performance of Fourier-Transform IR Spectrometry

Analytical Assessor

John Gough B.Sc. M.Sc.

Assessor Credentials

B.Sc (Hons) in Analytical Chemistry with Quality Management.

M.Sc in Environmental Chemistry.

Full Member of Royal Society of Chemistry (RSC).

Research Fellow at Trinity Biomedical Science Institute (Dublin).

Graduate Diploma awards in Food Technology, Industrial Microbiology, Petrochemical Analysis.

J.W. GOUGH

_____

Technical Signatory. **Dated: 2nd. August 2022.**