

# MATERIAL PRODUCT DATA SHEET

## PURIFIED SPHERICAL GRAPHITE (SPG)



Superior & environmentally responsible **HF free** supply

### INTRODUCTION

The EcoGraf processing facility in Western Australia manufactures spherical graphite (SpG) products for export to Asia, Europe and North America using a superior, environmentally responsible purification technology. We provide customers with sustainably produced, high performance SpG products for the e-mobility and energy storage markets.

The EcoGraf™ purification technique effectively purifies a range of flake graphite feedstocks to produce a high purity spherical graphite product to the strict specifications required by anode manufacturers for lithium-ion batteries.

Superior results, indicate their physical and chemical properties were the most suitable for battery performance.



### Chemical

- ✓ Purity of +99.95% carbon.
- ✓ Low levels of specific impurities.
- ✓ HF free with no flourine residue.

### Physical

- ✓ Fine d50 particle size of approximately 10-25µm.
- ✓ Narrow size range with a d90:d10 ratio of up to 2.
- ✓ Low Specific Surface Area (BET) of less than 10m<sup>2</sup>/g.
- ✓ Variable tap density.

### Electrochemical

- ✓ High Specific Delithiation Capacity, approaching the theoretical capacity of 1g of graphite or 372 mAh/g.
- ✓ Specific Lithiation Capacity.
- ✓ Coulombic Capacity of greater than 96%.
- ✓ Low Irreversible Capacity (reducing lithium consumption) of less than 50 mAh/g.

*Commitment to innovation  
and sustainability*

- ✓ **20,000tpa Battery Graphite (SpG)**
- ✓ **Sector leading ESG operating principles**
- ✓ **Superior quality, sustainably produced SpG**
- ✓ **Development to meet growing demand from EV manufacturers**
- ✓ **Application of EcoGraf™ to support recycling of lithium-ion batteries**

### SALES AGENT CONTACT

☎ +61 8 6424 9000  
✉ info@ecograf.com.au

 **EcoGraf™**

Formerly Kibaran Resources Limited

## Building an ethical alternative source of quality battery graphite

Results have confirmed the performance and suitability of EcoGraf™ products as a high quality, cost competitive, new source of responsibly produced anode material. Below is a range of sample options we are offering to customers for R&D and product assessment.



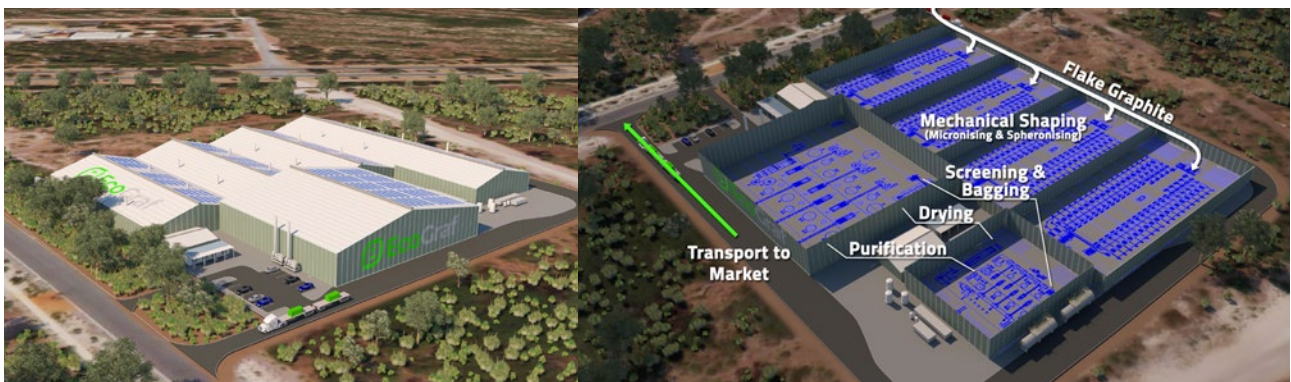
### ORDERING INFORMATION FOR PRODUCT SAMPLES

| Sample Product  | Order No. | Availability  | Distribution |
|-----------------|-----------|---------------|--------------|
| EcoGraf SpG10   | 1000357   | Stock         | Global       |
| EcoGraf SpG15   | 1043525   | Stock         | Global       |
| EcoGraf SpG20   | 1043533   | Stock         | Global       |
| EcoGraf SpG10   | 1000299   | Stock         | Global       |
| EcoGraf SpG15   | 1000370   | Stock         | Global       |
| EcoGraf SpG20   | 1000356   | Stock         | Global       |
| EcoGraf Custom* | 1043531   | Special Order | Global       |
| Customer SpG**  | 1053625   | Special Order | Global       |

\* EcoGraf has the capability to produce customised purified EcoGraf SpG product to customer specifications.

\*\* Alternatively EcoGraf can purify supplied feedstock to customer specifications.

Please contact your sales representative for further information.



EcoGraf Kwinana Processing facility to product products at full scale capability

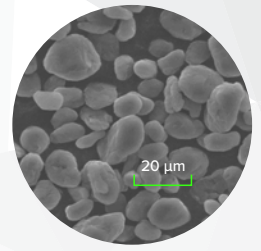
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*EcoGraf can meet variable specifications for high purity battery anode materials*



Photomicrograph showing a typical purified graphite powder

**TECHNICAL SPECIFICATIONS FOR SPG15**

| SpG15          |                       |
|----------------|-----------------------|
| Carbon content | >99.95%               |
| Moisture       | <0.2%                 |
| pH-Value       | 6-8                   |
| d10            | > 9 micron            |
| d50            | 14.5 – 15.5 micron    |
| d90            | < 25 micron           |
| Tap density    | >0.93 g/ml            |
| SSA            | < 7 m <sup>2</sup> /g |
| Fe             | <15 ppm               |
| Ni             | < 6 ppm               |
| Zn             | < 5 ppm               |
| Cr             | < 5 ppm               |
| Al             | < 10 ppm              |
| Ca             | < 10 ppm              |
| Cu             | < 5 ppm               |
| S              | < 20 ppm              |
| Si             | < 20 ppm              |

| Typical ICP analysis result of EcoGraf purified spherical graphite |      |         |      |
|--|------|---------|------|
| Element  | ppm  | Element | ppm  |
| Ag   | >0.1 | Mo      | <0.3 |
| Al   | 6.3  | Ni      | 5    |
| Ba   | 5.2  | P       | >0.8 |
| Bi   | >0.6 | Pb      | >0.6 |
| Ca   | 5.9  | Si      | 12   |
| Cd   | >0.1 | Sn      | <0.5 |
| Co   | >0.2 | Sr      | <0.4 |
| Cr   | 0.3  | Ti      | <0.4 |
| Cu   | 0.3  | V       | <0.1 |
| Fe   | 7.1  | W       | 0.5  |
| K  | 6.6  | Zn      | <0.1 |
| Mg   | 1.5  | Zr      | 0.9  |
| Mn   | 0.2  |         |      |

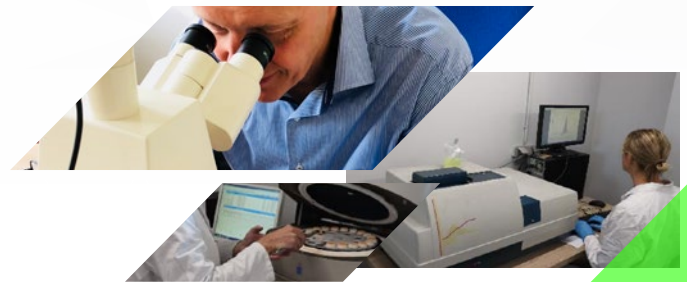
**Typical physical properties**

**Particle size distribution:**

|                 |                        |
|-----------------|------------------------|
| d10 = 10 micron | Tap density: 0.99 g/ml |
| d50 = 15 micron | Carbon content: 99.97% |
| d90 = 23 micron | Moisture: 0.1%         |

**Battery results of EcoGraf purified spherical graphite:**

|                                |           |
|--------------------------------|-----------|
| Discharge Capacity 3rd Cycle   | 367 mAh/g |
| Discharge Efficiency 1st Cycle | 94.5%     |



SpG purification process testing in the EcoGraf German Pilot Plant

**AUSTRALIAN STATE AND FEDERAL GOVERNMENT SUPPORT**



Government of Western Australia  
Department of Jobs, Tourism, Science and Innovation

**MEMBERSHIP AND PARTNERSHIP**



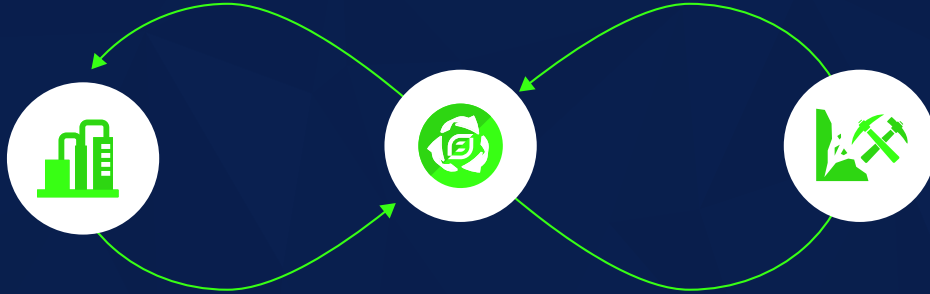
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Vertically integrated **HF free** graphite business positioned to support the global transition to clean energy and e-mobility.



**BATTERY PRODUCTS**

Kwinana Development  
ready 20,000tpa  
processing facility

**RECYCLING**

Recovery of battery  
anode materials from  
lithium-ion batteries

**EPANKO MINE**

Scalable mining projects  
for long-term supply of  
graphite products



**FOR MORE INFORMATION CONTACT**



Formerly Kibaran Resources Limited

Level 2, 18 Richardson Street, West Perth WA 6005

+61 8 6424 9000 / [info@ecograf.com.au](mailto:info@ecograf.com.au)

[www.ecograf.com.au](http://www.ecograf.com.au)

