

Control Laboratories

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Account No:
 10819
 Batch:
 Feb 24 C
 CODE:
 BioChar IBI

Pat Sherren
 Metzler Forest Products (Warriors Mark)
 1588 Ridge Road
 Warriors Mark, PA 16877

Date Received: 2/8/2024
 Sample ID: Metzler pureCHAR micro chip 2024-02-01
 Lab ID. Number: 4020183-01

* Particle distribution is approximate for unscreened material

International BioChar Initiative (IBI) Laboratory Tests for Certification Program

| | Dry Basis Unless Stated: Range | Units | Method |
|------------------------------------|--------------------------------|---------------------|---------------------------|
| Moisture (time of analysis) | 24.0 | % wet wt. | ASTM D1762-84 (105c) |
| Bulk Density | 10.7 | lb/cu ft | |
| Organic Carbon | 90.9 | % of total dry mass | Dry Combust-ASTM D 4373 |
| Hydrogen/Carbon (H:C) | 0.17 0.7 Max | Molar Ratio | H dry combustion/C(above) |
| Total Ash | 3.6 | % of total dry mass | ASTM D-1762-84 |
| Total Nitrogen | 0.62 | % of total dry mass | Dry Combustion |
| pH value | 10.54 | units | 4.11USCC:dil. Rajkovich |
| Electrical Conductivity (EC20 w/w) | 0.500 | dS/m | 4.10USCC:dil. Rajkovich |
| Liming (neut. Value as-CaCO3) | 8.9 | %CaCO3 | AOAC 955.01 |
| Carbonates (as-CaCO3) | 4.0 | %CaCO3 | ASTM D 4373 |
| Butane Act. | 3.5 | g/100g dry | ASTM D 5742-95 |
| Surface Area Correlation | 245 | m2/g dry | G |

| All units mg/kg dry unless stated: | | Range of | | Reporting | | Particle Size Distribution * | | |
|------------------------------------|---------|-------------|-------------|-----------|-----------------------------------|------------------------------|--------|--|
| | Results | Max. Levels | Limit (ppm) | Method | Results | Units | Method | |
| Arsenic (As) | ND | 13 to 100 | 0.42 | J | < 0.5mm | 5.1 percent | F | |
| Cadmium (Cd) | ND | 1.4 to 39 | 0.17 | J | 0.5-1mm | 4.2 percent | F | |
| Chromium (Cr) | 84.6 | 93 to 1200 | 0.42 | J | 1-2mm | 11.1 percent | F | |
| Cobalt (Co) | 3.9 | 34 to 100 | 0.42 | J | 2-4mm | 34.7 percent | F | |
| Copper (Cu) | 5.2 | 143 to 6000 | 0.42 | J | 4-8mm | 38.9 percent | F | |
| Lead (Pb) | 5.8 | 121 to 300 | 0.17 | J | 8-16mm | 6.1 percent | F | |
| Molybdenum (Mo) | 0.76 | 5 to 75 | 0.42 | J | 16-25mm | 0.0 percent | F | |
| Mercury (Hg) | ND | 1 to 17 | 0.001 | EPA 7471 | 25-50mm | 0.0 percent | F | |
| Nickel (Ni) | 35.8 | 47 to 420 | 0.42 | J | >50mm | 0.0 percent | F | |
| Selenium (Se) | ND | 2 to 200 | 0.85 | J | Basic Soil Enhancement Properties | | | |
| Zinc (Zn) | 5.7 | 416 to 7400 | 0.85 | J | Total (Ca) | 6808 mg/kg | E | |
| Boron (B) | 16.0 | Declaration | 4.2 | TMECC | Total (Mg) | 3791 mg/kg | E | |
| Chlorine (Cl) | 233 | Declaration | 20.0 | TMECC | Total (K) | 18373 mg/kg | E | |
| Sodium (Na) | 803 | Declaration | 424 | E | Total (P) | 1108 mg/kg | E | |
| Iron (Fe) | 14186 | Declaration | 21.2 | E | Ammonia (NH4-N) | 22.7 mg/kg | A | |
| Manganese (Mn) | 1357 | Declaration | 0.42 | J | Nitrate (NO3-N) | 2.6 mg/kg | A | |
| | | | | | Organic (Org-N) | 6197 mg/kg | Calc. | |
| | | | | | Volatile Matter | 11.2 percent dw | D | |

* "ND" stands for "not detected" which means the result is below the reporting limit.

| | |
|------------------------------|--|
| Method A Rayment & Higginson | G Butane Activity Surface Area Correlation Based on McLaughlin, Shields, Jagiello, & Thiele's 2012 paper: Analytical Options for Biochar Adsorption and Surface Area |
| D ASTM D1762-84 | J EPA3050B/EPA 6020 |
| E EPA3050B/EPA 6010 | |
| F ASTM D 2862 Granular | |

Analyst: Nik Zumberge

