

Control Laboratories

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Account No:
 10819
 Batch:
 DEC 23 A
 CODE:
 BioChar IBI

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

Date Received: 11/28/2023
 Sample ID: Metzler pureCHAR chip 2023-11
 Lab ID. Number: 3110505-01

* 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)	47.8	% wet wt.	ASTM D1762-84 (105c)
Bulk Density	10.4	lb/cu ft	
Organic Carbon	88.8	% of total dry mass	Dry Combust-ASTM D 4373
Hydrogen/Carbon (H:C)	0.23 0.7 Max	Molar Ratio	H dry combustion/C(above)
Total Ash	3.8	% of total dry mass	ASTM D-1762-84
Total Nitrogen	0.71	% of total dry mass	Dry Combustion
pH value	9.69	units	4.11USCC:dil. Rajkovich
Electrical Conductivity (EC20 w/w)	0.443	dS/m	4.10USCC:dil. Rajkovich
Liming (neut. Value as-CaCO3)	10.7	%CaCO3	AOAC 955.01
Carbonates (as-CaCO3)	4.8	%CaCO3	ASTM D 4373
Butane Act.	6.0	g/100g dry	ASTM D 5742-95
Surface Area Correlation	323	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	0.30	J	< 0.5mm	4.1 percent	F	
Cadmium (Cd)	ND	1.4 to 39	0.12	J	0.5-1mm	2.6 percent	F	
Chromium (Cr)	44.5	93 to 1200	0.30	J	1-2mm	7.6 percent	F	
Cobalt (Co)	0.52	34 to 100	0.30	J	2-4mm	24.6 percent	F	
Copper (Cu)	4.3	143 to 6000	0.30	J	4-8mm	48.7 percent	F	
Lead (Pb)	0.37	121 to 300	0.12	J	8-16mm	12.3 percent	F	
Molybdenum (Mo)	0.48	5 to 75	0.30	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)	19.5	47 to 420	0.30	J	>50mm	0.0 percent	F	
Selenium (Se)	ND	2 to 200	0.60	J	Basic Soil Enhancement Properties			
Zinc (Zn)	2.8	416 to 7400	0.60	J	Total (Ca)	7627 mg/kg	E	
Boron (B)	12.5	Declaration	3.0	TMECC	Total (Mg)	469 mg/kg	E	
Chlorine (Cl)	53.6	Declaration	20.0	TMECC	Total (K)	6639 mg/kg	E	
Sodium (Na)	ND	Declaration	301	E	Total (P)	438 mg/kg	E	
Iron (Fe)	639	Declaration	15.1	E	Ammonia (NH4-N)	8.0 mg/kg	A	
Manganese (Mn)	730	Declaration	0.30	J	Nitrate (NO3-N)	2.1 mg/kg	A	
					Organic (Org-N)	7046 mg/kg	Calc.	
					Volatile Matter	11.5 percent dw	D	

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

Method A Rayment & Higginson
 D ASTM D1762-84
 E EPA3050B/EPA 6010
 F ASTM D 2862 Granular

G Butane Activity Surface Area Correlation Based on McLaughlin, Shields, Jagiello, & Thiele's 2012 paper: Analytical Options for Biochar Adsorption and Surface Area
 J EPA3050B/EPA 6020

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