Integrated Biochar Plant

Energy Utilization, Biochar processing, & Finished Goods Packaging

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Confluence Energy – Walden Organics – EcoPett
Production Method and Materials
Confluence Energy LLC

Confluence Energy LLC – www.confluenceenergy.com

Integrated production style
12 truck per day mill
Primary product is densified wood fiber (PELLETS)
The heat engine for the plant is a wood gasification system
CE – installed a pyrolytic tube in the gasification system and once started the pyrolytic gas can fuel 75% of the gassifier
Production Method and Materials
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• Controllable resonance time
  • Typically operated between 45 and 75 minutes

• Pine chip feedstock—controlled to specific moisture

• HHT of 1260 C – as a maximum outside temp on the surface of a heated tube
  • TGA shows char acting as a 500 degree C material

• Screened to above and below 6mm
Production Method and Materials
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KEY POINTS-
This is an integrated facility
Heat (energy) is used on site
Trucking and packaging is on site
Industrial tooling and staffing are onsite

This is a big step for the development of the biochar industry- an integrated energy and production commercial scale system
Production Method and Materials #1
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Whole log -> Chip -> Drying -> Char -> Screener -> Bagger
# Production Method and Materials #1

Confluence Energy LLC

## Soil Control Lab 3rd party Results

1/27/2015

<table>
<thead>
<tr>
<th></th>
<th>Starting mg/L</th>
<th>Ending mg/L</th>
<th>Unit change</th>
<th>Percent Reduced</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Arsenic</td>
<td>2.07</td>
<td>0.005</td>
<td>2.065</td>
<td>99.8%</td>
</tr>
<tr>
<td>2 Cadmium</td>
<td>1.84</td>
<td>0.01</td>
<td>1.8</td>
<td>99.5%</td>
</tr>
<tr>
<td>3 Chromium</td>
<td>1.77</td>
<td>0.004</td>
<td>1.8</td>
<td>99.8%</td>
</tr>
<tr>
<td>4 Copper</td>
<td>1.45</td>
<td>ND</td>
<td>&lt; MDL Below MDL</td>
<td>&lt; MDL Below MDL</td>
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<tr>
<td>5 Lead</td>
<td>0.123</td>
<td>0.002</td>
<td>0.1</td>
<td>98.4%</td>
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<tr>
<td>6 Zinc</td>
<td>4.28</td>
<td>0.035</td>
<td>4.2</td>
<td>99.2%</td>
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<tr>
<td>7 Nickel</td>
<td>0.019</td>
<td>0.019</td>
<td>0.0</td>
<td>0.0%</td>
</tr>
<tr>
<td>8 Molybdenum</td>
<td>0.65</td>
<td>ND</td>
<td>&lt; MDL Below MDL</td>
<td>&lt; MDL Below MDL</td>
</tr>
<tr>
<td>9 Selenium</td>
<td>2.31</td>
<td>0.011</td>
<td>2.3</td>
<td>99.5%</td>
</tr>
</tbody>
</table>

## General specs

1/27/2015

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Fixed Carbon Content</td>
<td>85%</td>
</tr>
<tr>
<td>Total H</td>
<td>5.20%</td>
</tr>
<tr>
<td>Total N</td>
<td>0.50%</td>
</tr>
<tr>
<td>pH</td>
<td>8-9</td>
</tr>
</tbody>
</table>

Butane 11.5 g/100g

SEM photo by M. Tyler Huggings – University of Colorado – boulder
Production Method and Materials #1
Confluence Energy LLC

Incremental weight loss from stepwise TGA analysis of pine wood chars (dry and ash free basis) (total weight loss normalized to 100%)

TGA reference- Dr. David Rutherford, dwruther@usgs.gov
Key Features

- Agronomical valuable mulch!
- 5 Year Aged Forest Humus
- Screened to 3/8\(^{th}\) inch
- 80:1 C:N Ratio
- Recommended for outdoor use
- To be added each year
- Best for mulching planting areas after planting and as a blanket for garden areas during winter
- Late season sales-biggest months May and June
- Comprised of our aged forest humus
- Sold in 1.5 cubic foot bags/50 bags per pallet
- Suggested retail price-$6.00
- Available in Bulk Tote and Bulk Bag
Key Features

- Recommended for outdoor use
- Best for amending garden soils prior to planting and adding organic matter back to native soils
- Should be added each year to garden
- Early season sales-April/May
- Comprised of our aged forest humus, compost and TrueChar™
- Sold in 1.25 cubic foot bags/60 bags per pallet
- Suggested retail price-$7.00
- Available in bulk tote and bulk bag
Key Features

- Ideal for both indoor and outdoor use
- Used primarily for container gardening
- Year round sales-biggest months April through July
- Quality sensitive category
- Comprised of our aged forest humus, compost, peat moss, perlite, TrueChar™ and a broad spectrum nutrient package
- Our potting soil has good porosity, high CEC, pH balance with 90 day starter nutrients included.
- Sold in 1.25 cubic foot bags/60 bags per pallet
- Suggested retail price-$12.00
After applying the same volume of water to soil and allowed to dry for 14-days, the soil only control contained 39.5% less water than the soil with 5% chipped biochar.

Morgan Williams - Applied Soils LLC

Additional resources working in this direction – Potential Use of Biochar in Growing Media- by M. Reza Nemati Et Al. Vadose Zone Journal, June 2014; Biochar-Induced Changes in Soil Hydraulic Conductivity and Dissolved Nutrient Fluxes Constrained by Laboratory Experiments by R. Barnes Et Al. PLOS One, September 2014.
EcoPett™ Natural Pine Coop Bedding is a high-performing, super absorbent product with powerful odor control. It outperforms and lasts longer than hay, wood shavings and other products on the market. 100% natural, compostable, and environmentally sound – this bedding is the best choice for healthier chickens and small animals.

Chicks Dig It!

OUR COMMITMENT

We are committed to protecting our planet Earth by utilizing local beetle-kill pine and other natural ingredients to produce our products and by using our innovative, patent-pending, sustainable manufacturing process. With this, we are reducing our carbon footprint by 25% through the production of biochar, which sequesters carbon, and by deriving 50% of our energy from renewable, biomass sources.


VISIT confluenceenergy.com/goingcarbonnegative for more of our story.

EcoPett EASY TO USE & CLEAN

100% Organic & Environmentally Friendly

Net WT 35 LBS (15.9 KG)

Manufactured in the USA

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THE ECOPETTM DIFFERENCE
★ SUSTAINABLY PRODUCED
The only cat litter on a path to a carbon-negative manufacturing process.
★ HEALTHIER CAT & HOME
100% organic • Clay-Free (no harmful silica products) • Dust-Free • Fragrance-Free • Toxin-Free
★ ENVIRONMENTALLY FRIENDLY INGREDIENTS
Recycled, beetle-kill pine trees • Activated carbon trapping & eliminating odors • Biodegradable

PACKAGING
20 and 10 lb. BAGS
MADE FROM RECYCLED, BEETLE KILL PINE TREES
MANUFACTURED IN THE USA
State Tax Exempt for Colorado Purchases

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Questions and Comments Please

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