Scalable Plastic to Oil Systems Overview

Jason Tanne
President
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ENergy and Blest Systems

- ENergy has partnered with Blest Co. Ltd to develop and promote scalable plastic to oil conversion systems for military, municipal, non-profit and commercial use.

- Systems are United Nation Endorsed.

- Japanese Award Winning Design.

- Demonstrated cost efficient performance.

- Deployments in Asia, Africa, EU, India and Japan.

- Current systems in use:
  - Gov’t./Municipal (Japan)
  - NPO (Asia/Africa)
  - Commercial (Japan/Africa)
  - Education and Research Intuitions (Japan, EU, India)
International Patent Pending

- Unique Internationally Patented Hybrid Design
- Easy to Operate
- High efficiency pyrolysis process
- Better Quality Synthetic Oil
- Ultra Low Maintenance
- Scalable and Compact
3 Unique Efficient Polymer to Oil Processes

Material Input
- Plastic Waste (PP, PE, PS)
- Polystyrene
- Standard Plastics
- Plastic Film

Pre-Processing
- Extruding/Granulating Unit
- Granulated

Oil and Distillates Production
- Oil Separation
- Oil Conversion
- Mixed Synthetic Oil Produced
- Oil Distillates and Fuel

* Small Distillate Systems (BOR-20 and BOR-50) create Kerosene, Light Diesel and Gasoline Equivalents

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Plastic to Oil Unit Basics

- 5 Scalable System Models
- Desk Top Unit to Large Commercial 1.5 Ton (Plastic Processing Capability) System
- Continuous Processing
- Energy Efficient Cost Performance
- Can be powered by generator, solar or local electricity
- Converts Poly Propylene, Poly Ethylene and Poly Styrene Materials to Oil
## Plastic to Oil Systems

### Be-h Desk Top Unit

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Throughput</strong></td>
<td>2 lbs/ Batch (est. 2-3 Hrs)</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>24”(W) × 13”(D) × 20”(H)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>110 lbs</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>AC120V / 14A</td>
</tr>
<tr>
<td><strong>Running Cost</strong></td>
<td>Est. 1KW / Hr</td>
</tr>
</tbody>
</table>

### B-120 (Continuous System)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td><strong>Throughput</strong></td>
<td>11 lbs/ Hr or 264 lbs/ 24 Hrs</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>98”(W) × 77”(D) × 97”(H)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>3086 lbs</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>3 Phase / AC240V / 60A</td>
</tr>
<tr>
<td><strong>Running Cost</strong></td>
<td>4KW / Hr</td>
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# Plastic to Oil Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Throughput</th>
<th>Size</th>
<th>Weight</th>
<th>Power</th>
<th>Running Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B-240 (Continuous System)</strong></td>
<td>22 lbs/ Hr  or  529 lbs/ 24 Hrs</td>
<td>Varies with Configuration</td>
<td>4188 lbs</td>
<td>3 Phase / AC240V / 60A</td>
<td>Est 7KW / Hr</td>
</tr>
<tr>
<td><strong>B-600 (Continuous System)</strong></td>
<td>55 lbs/ Hr  or  1320 lbs/ 24 Hrs</td>
<td>Varies with Configuration</td>
<td>5500 lbs (may vary)</td>
<td>3 Phase / AC240V</td>
<td>Est. 15KW / Hr</td>
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<tr>
<td><strong>B-1200 (Continuous System)</strong></td>
<td>221 lbs/ Hr  or  2646 lbs/ 24 Hrs</td>
<td>Varies with Configuration</td>
<td>6170 lbs (may vary)</td>
<td>3 Phase / AC240V</td>
<td>Est. 60 KW / Hr</td>
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</table>

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Plastic to Oil System Diagram

- **Stage 1:** Heating
- **Stage 2:** Melting/Liquefying
- **Stage 3:** Gasification/Decomposition/Residue Separation

10mm Granulated Plastic Material

Hopper

Off-gas Filter

Condenser

Decomposed Gas

Oil Tank

Off-gas

Residue

Residue Tank

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Hydrocarbon Distillation Units Basics

- 2 System Models
- Compact 20L (5.3 Gal) and 50L (13.2 Gal) Capacity
- Batch Processing
- Energy Efficient Cost Performance
- Can be powered by generator, solar or local electricity
- Creates petroleum distillates (Gasoline, Kerosene, and Diesel Equivalents) from plastic derived synthetic oil
Hydrocarbon Distillation Units

**BOR-20**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>Capacity</td>
<td>5.3 Gal (20l)/ Batch</td>
</tr>
<tr>
<td>Processing Time</td>
<td>Ave 2 Hrs</td>
</tr>
<tr>
<td>Size</td>
<td>47”(W)x 24”(D)x65”(H)</td>
</tr>
<tr>
<td>Weight</td>
<td>661 lbs</td>
</tr>
<tr>
<td>Power</td>
<td>3 Phase/ 240V/ 11A</td>
</tr>
<tr>
<td>Running Cost</td>
<td>3.6kW/Hr/5.3 Gal</td>
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</table>

**BOR-50**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>Capacity</td>
<td>13.2 Gal (50l)/ Batch</td>
</tr>
<tr>
<td>Processing Time</td>
<td>Ave 2 Hrs</td>
</tr>
<tr>
<td>Size</td>
<td>61”(W)x 30”(D)x79”(H)</td>
</tr>
<tr>
<td>Weight</td>
<td>1102 lbs</td>
</tr>
<tr>
<td>Power</td>
<td>3 Phase/ 240V/ 13A</td>
</tr>
<tr>
<td>Running Cost</td>
<td>6.3kW/Hr/13.2 Gal</td>
</tr>
</tbody>
</table>
High Volume Dedicated Styrene Recycling Systems

- **2 Processes:** Thermal or Solvent Based
- Systems are designed to handling larger volumes of Styrene materials
- Cost Effective means of onsite recycling
- Reduce disposal costs
- Reduce space locally and in landfills
- Produce Styrene monomer rich oil

Creates Styrofoam ingots and then process into Styrene Oil

1 Truckload of Styrofoam dissolves into a 50 Gal solvent drum. 2nd Stage process separates Styrene Oil and Solvent for re-use.
**Plastic to Oil-Recyclables**

System Recyclable Plastics: *Polyethylene, Polypropylene and Polystyrene*

- **High Density Polyethylene (HDPE)**
  - **Examples:** Milk Jugs, water, juice, cosmetic, shampoo, dish and laundry detergent bottles; margarine and yogurt tubs; cereal box liners; grocery, trash and retail bags

- **Low Density Polyethylene (LDPE)**
  - **Examples:** Dry cleaning, bread and frozen food bags, squeezable bottles (like mustard and honey bottles)

- **Polypropylene (PP)**
  - **Examples:** Ketchup bottles, mayonnaise containers, medicine bottles, straws, bottle caps

- **Polystyrene (PS)**
  - **Examples:** Packaging and protective materials, compact disc jackets, food service applications, grocery store meat trays, egg cartons, aspirin bottles, cups, plates, cutlery.

*N*ote: some #7 plastics may be recyclable
English Media Video Links

- English Video Links
  - U.N. Produce Video
    http://ourworld.unu.edu/en/plastic-to-oil-
    fantastic/

  - BBC Video