

eCorect

Waste Food Reduction and
Conversion Systems



Food Recycle Science Corp.

Food Recycle Science

VISION

- Innovator/Leader in Organic Waste Technology
 - ❖ Zero waste mgmt (Onsite & Regionalized)
 - ❖ Organic waste reduction/conversion
 - ❖ Bio-fuel/bio-energy solution
 - ❖ Enrich depleted soil
 - ❖ Save Carbon Footprints



■ Food Waste Issues

- Avg. American 474.5 lbs annually => 65 million tons
 - Total losses up to \$100B annually latest study Dr. Timothy Jones (U of Arizona Study)
 - **ONLY 3%, recycled** by composting or animal feed. Rest disposed in landfills or incinerators.
 - Third-largest component by weight
 - Related high cost of pickup, transfer (& carbon foot print issues) from customer sites to transfer station, to the land fill.
 - Other sanitary issues: **rats, vermin, odor, smell, liquid...**



- Dumping “improperly treated” food waste into the drain/sewer/ocean or rivers will cause:
 - ❖ Total Suspended Solids (TSS) – Pollutants harmful to plants/organisms in rivers and oceans
 - ❖ Plugging water treatment plant filtration systems
 - ❖ Biochemical Oxygen Demand (BOD) - kills oxygen in water



Enzyme based solutions require lots of fresh water + TSS + BOD output

Growing action & resolution in downstream!

New diversion goal set by cities & municipalities

- San Francisco: 75% goal by 2010
- Fresno: 75% by 2012 More to come...

RESOLUTION NO. 2007-232

A RESOLUTION OF THE COUNCIL OF THE CITY OF FRESNO, CALIFORNIA, ADOPTING A 75% WASTE DIVERSION GOAL BY 2012 AND A ZERO WASTE GOAL BY 2025 FOR THE CITY OF FRESNO, IN COORDINATION WITH THE FRESNO GREEN STRATEGIES

WHEREAS,
required that
the year 20
to the maximum
disposal method

AMENDMENT OF THE WHOLE 9/30/02
FILE NO. 021468

RESOLUTION NO. **679-02**

1 [Resolution For 75% Waste Diversion Goal]

2

3 **Resolution adopting a goal of 75% landfill diversion by the year 2010 and a long term**

4 **goal of zero waste, with the date set by the San Francisco Commission on the**

5 **Environment once the 50% diversion goal is met, and adopting a policy of promoting**

6 **the highest and best use of discarded materials and only allowing the use of alternative**

7 **daily cover to be counted as credit toward meeting the diversion goals if there are no**

8 **higher and better uses available, and urging the State of California to adopt similar**

9 **goals.**

New York City Case

- **15,000 tons of municipal waste to distant landfills each day resulting in**
 - \$450M annual disposal costs, Truck traffic - air pollution
 - Millions of tons carbon & methane gases: Green House Gases (GHG)
- **Goals: 70% diversion by 2015 (NYC)**
 - Food waste - top on the list (1100Tons/day)
 - Onsite waste reduction - reduce by 90%
 - Increase recycling rate would reduce GHG emissions by 1.7M tons of Co2 (equivalent to 4M barrels of oil consumption)



Technology: eCorect™

Multi-phase high-speed organic waste conversion system

- Reduce 85~93% weight/volume reduction (onsite)
- Dehydrate, sterilize and convert food waste into “sterile biomass” particles in 4~23 hours.
- Reusable end products - bio-fuels, soil amendment, replacements for charcoal briquettes/firelogs
- Patent-pending technologies



Target recipe & process flow

- Goal: Develop End to End “System” Solution
 - ✓ No special installation (220v & condensate drain)
 - ✓ Minimal energy use
 - ✓ No fresh water
 - ✓ No enzymes
 - ✓ Control odors
 - ✓ Reduce the volume/weight up to 93% or more
 - ✓ Space saving foot print
 - ✓ Reusable end product
 - ✓ Complete the cycle in 4~ 23 hr thru “sterilized” biomass conversion process from food waste



Operation as-easy-as 1-2-3

Insert the waste content



1. Power-On:
Turn the POWER button clockwise
and Push the START button



2. Push DISCHARGE button
with "END" sign



3. Open the output door
to discharge



Technology Costs & Treatable items

■ Fixed Cost:

- Standard models: 17K ~ 75k (MSRP)
- Custom models (larger system): 125k ~ 395K (MSRP)

■ Variable Cost:

- Electricity: 3kwh with innovative energy recycling (ET100)
- Est. Maintenance cost : Less than 1~2% per year.

■ Treatable items:

- Food scraps, organic food waste

■ Untreatable items:

- Metal waste, plastic, glass, petrochemicals, fat & greases

Environmental Impacts (e.g.)

Comparative Feature Matrix	eCorect	Enzyme-based
Require special Installation, venting or plumbing	No	Yes
Require continuous supply of fresh water to decompose waste	No	Yes
Require replenishment of microorganisms	No	Yes
Require continuous replenishment of other additives, e.g. woodchips	No	Yes
Require special storage/treatment of agents/additives	No	Yes
Environmental Impacts		
Negative impact of B.O.D.	No (< 96mg/L)	Yes (~21,000 mg/L)
T.S.S impact on water	No (< 0.4 mg/L)	Yes (14,700 mg/L)
Accumulation of Biofilm in sewer & pipes	No	Yes
Accumulation of residue in sewer	No	Yes
Waste of Water	No	Yes
Possible dumping of the un-treated waste through drain pipe	No	Yes
Foul order from sewer	No	Yes
System maintenance & clogging	Minimal	Frequent
Total Energy Consumption	Low	Low
Compliance to " Green " Initiatives	Yes	No
Compliance of environment code in other countries (Japan,Korea...)	Yes	No
Reuse of byproduct for bio-fuel or soil amendment	Yes	No
System Cost	Med ~High	Low~ Mid

Water Sample Test Result

Certificate of Analysis

■ En-Force Lab, Cork, Ireland

- Drink Water Standard by EPA: 500 CFU / ml => eCorect < 1 cfu /ml

En-Force Laboratories Ltd
Unit G Ballyvolane Business Park
Spring Lane
Ballyvolane
Cork
Phone 353-21-4301103
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E-mail admin@en-force.ie



Certificate of Analysis

Customer Name: Mr. Jimmy Shorten	Date sampled: 16.07.09					
Address: ARC Recycling Equipment Ltd Unit 2, Hobbs Commercial Centre, Waterfall, Co.Cork	Date received: 20.07.09 Date tested: 21.07.09 Date certificate issued: 27.07.09 Rev issue ref (if applicable)					
Sample description	Customer Reference no.	En-Force Reference no.	Test Parameter	Result Units	Action required	Comments
Water	Water Sample Ecorect (Treat like a product)	1ABC0709142	Total plate count	<1 cfu/ml		
			<i>E.coli</i>	<1 cfu/ml		

* Accredited Test

Guidelines and comments are not covered by accreditation

Supplementary to original test report:

Method Reference: [Total bacterial count based on ISO 4833] [*E. coli* ISO 16649-2]

Uncertainty of Measurement: None

QC test results: Positive and Negative NCTC Reference Cultures performed as expected in/on all reference media.

(+C): Denotes where confirmatory tests have taken place

Deviation from the test method: None

Deviations from contract: None

Contract Ref no:

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This report shall not be reproduced except in full and with the approval of En-Force Laboratories Ltd
This report is applicable to the above samples for the tests performed.

Pre & Post-processing Applications to enable Zero Waste Management

- No Pre-processing required
 - Can be used with Pulper for additional volume reduction
- Post-processing choices with by-products
 - Save hauling cost with 90% weight reduction
 - Pickup by Waste Management: total solution
 - Convert byproducts to compost or bio-fuel, e.g. charcoal briquettes and fire logs (for resale.)



■ eCorect System (Volume /Input*)

- ET30 (~120 lbs. 2 cycles per day): ~ Cafe
- ET100w (~250 lbs.): Restaurants
- ET300w (~750 lbs): Grocery Stores..
- eV-1 Volume Reducer

- ET500w (~1200 lbs.): custom built
- ET1000w (~2400 lbs): custom built
- ET1500w (~ 3300 lbs): custom built
-



■ Cycle & throughput: 4 ~ 23 hrs

* Recommended Input Capacity



eCorect Benefit

- ◇ Enables True Zero Waste Management
- ◇ Onsite organic waste reduction/conversion
- ◇ Meet diversion goals for cities & municipalities
- ◇ Reusable end-products
- ◇ Tax savings from amortization/leasing
- ◇ Reduces hauling expense of organic waste
- ◇ Saves Greenhouse Gas (GHG) emissions
 - pick up from site to local transfer stations, landfills
 - save methane gases generated from food waste

Industry First Organic Waste Pilot Site @ WM Transfer Station (Orange)



DOC Grant

- \$400,000.00 Grant to City of Mission Viejo – City of Irvine in conjunction with Waste Management for eCorect system solutions.
- Laguna Beach, Ladera Ranch, Las Flores
- 17 restaurants, grocery stores

Join the eCorect Green Movement

