

ASTA 2009
Annual Meeting and Trade Show

April 26-29, 2009
Loews Ventana Canyon Resort
Tucson, Arizona



REVTECH

BULK SOLIDS HEAT TREATMENT

Continuous Steam Sterilization

Using the Impedance Tube
Heating System

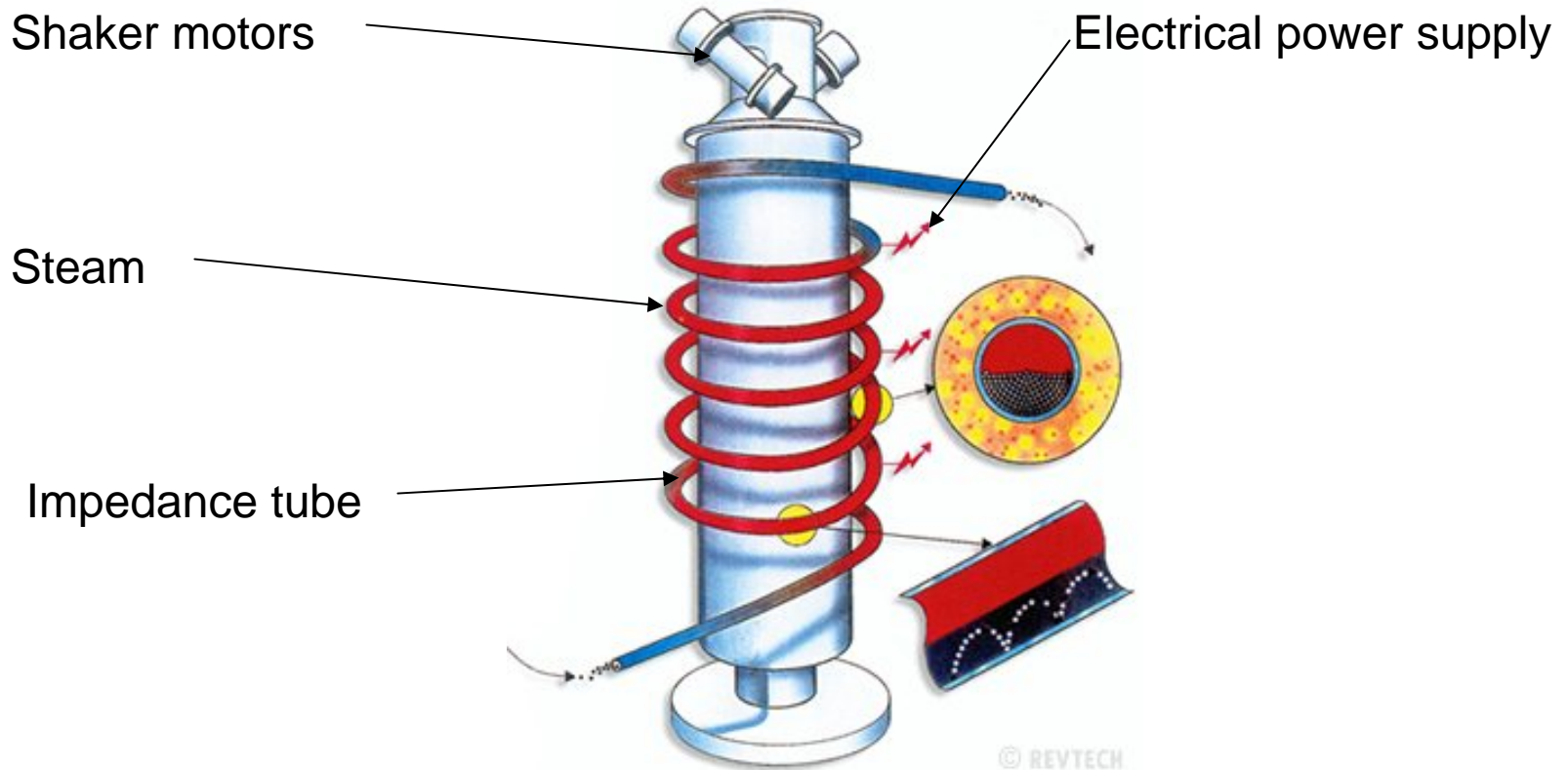


Overview

1. Process description
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3. Process validation
4. Performance
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1) Process description



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1500 kg/h unit

Steam injection

Impedance tube



Exhaust manifold

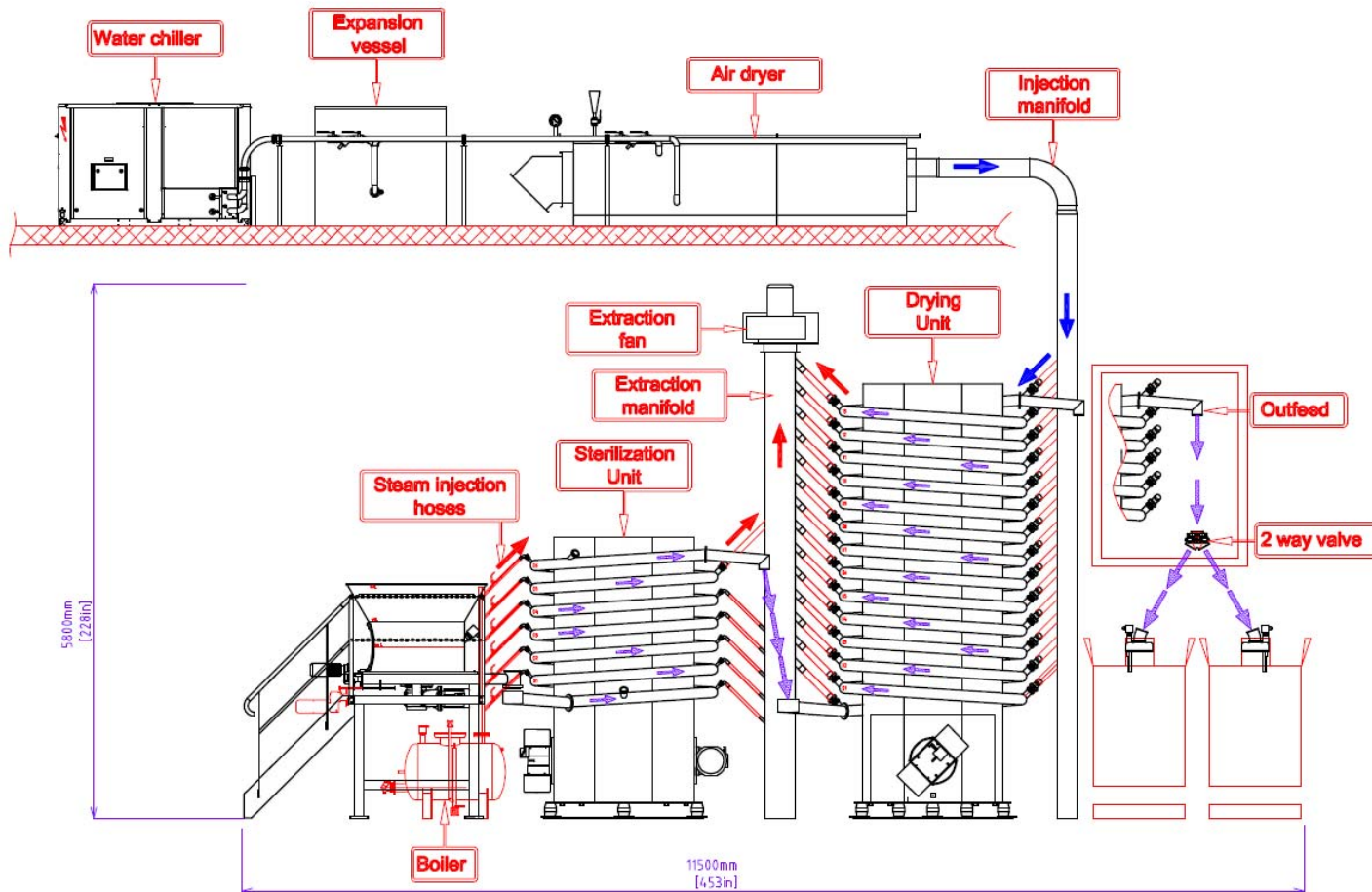
Shaker motors

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Complete sterilization unit





2) Essential operating parameters

- Temperature
- Steam/product ratio
- Residence time

All process parameters are continually monitored, recorded and filed



3) Process validation

Official organisations used:

- Chipping Campden Food Research Association (Great Britain)
- Centre technique de Conservation Produits Alimentaires (France)



4) Performance

4.1 Microbiological

Organisms systematically destroyed whatever initial contamination:

- Yeast and molds: <10/g
- Salmonella: absence/25g
- Coliformes: <10/g
- E coli: <10/g
- Enterobacteria (inc *sagazaki*) < 10/g



4) Performance

4.1 Microbiological

Organisms reduced depending on operating conditions:

- Total plate count: <1000/g, <10000/g, <100000/g
- Sporulated forms: <10/g, <100/g



4) Performance

4.2 Organoleptic

- **Essential oils:**

Aromatic Herbs	Thyme		Thyme		Basil	
	Before	After	Before	After	Before	After
Total plate count	550000	2200	1 100 000	10 000	1 600 000	<1000
Enterobacteria	370000	<10	8800	<10	8800	<10
Yeasts	1000	<10	1200	<10	58000	<10
Moulds	8400	<10	4000	<10	2000	<10
Essential oils	2.1%	1.6%	2.1%	1.8%	1.2%	0.8%



4) Performance

4.2 Organoleptic

- **Humidity: back to initial level after complete process**
- **Color: minimal, process particularly suitable for fragile leaf products**
- **Enzymatic inhibition: total**



5) Operational Criteria

- Process parameters adapted to each product
- Vibrational transport: no damage to product
- Very low steam/product ratio: no leaching
- Easy cleaning using standard pipe pigging systems
- Entirely automated ensuring no product loss on start-up and shut-down
- Totally unaffected by atmospheric conditions
- Running cost: around 80kW/ton



6) Non exhaustive reference list

- Ducros (McCormick France)
- Vremya (Russia)
- Corchos de Merida (Spain)
- Albemarle (USA)
- Trelleborg (USA)
- Arkopharma (France)
- Norgine Pharma (France)
- Fenioux Pharma (France)
- Agrobios (Italy)
- Naturtech (Thailand)
- Lira (Greece)
- Haitoglu (Greece)
- Alpro (Belgium)
- Mane (France)
- Marishkin (Russia)
- Razdole (Russia)



7) Contact

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