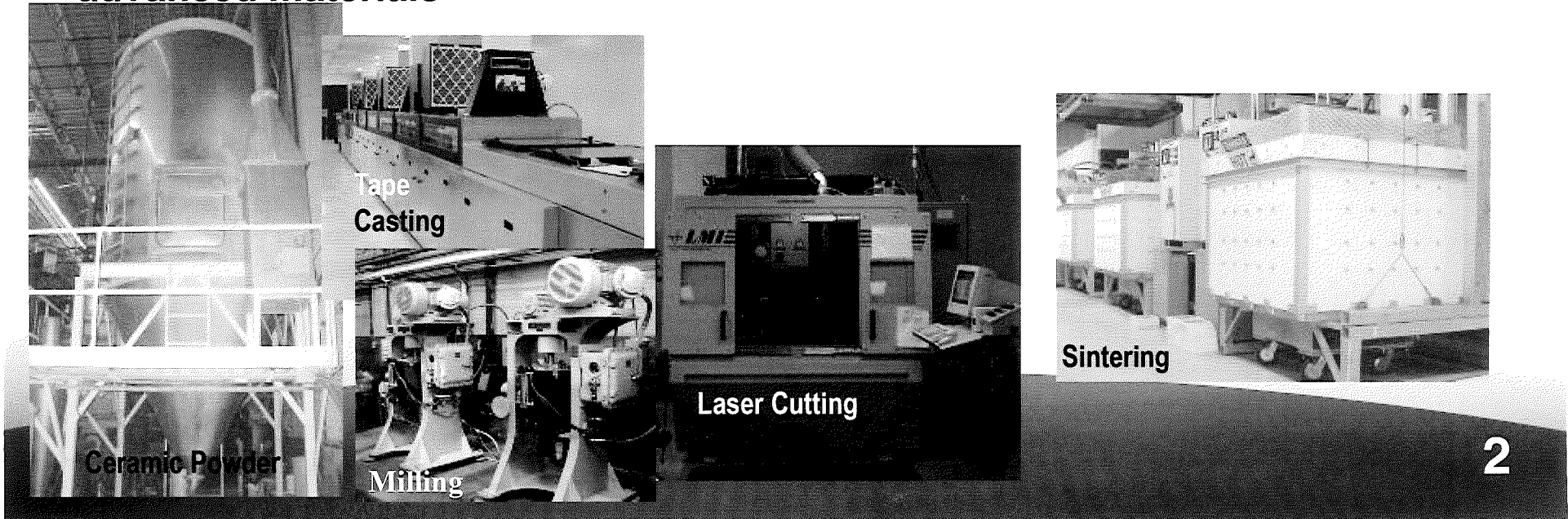
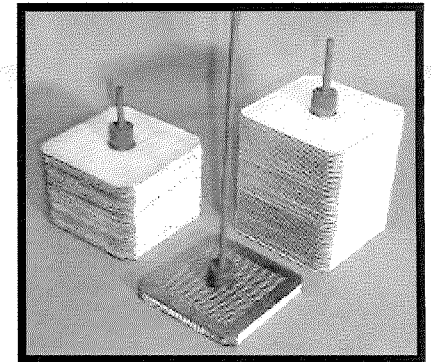


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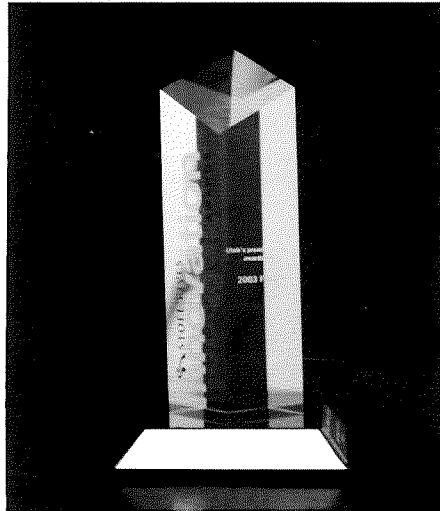
TOMORROW'S CERAMIC SYSTEMS

Ceramatec Overview

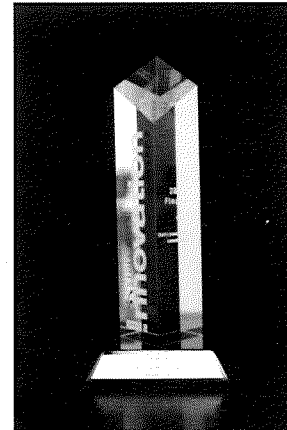
- **Founded 1976, Spin off Univ. of Utah**
- **Advanced Research and Development Company**
- **170 Employees (3x growth in 7 years)**
 - *Large Fraction - Engineers and Scientists*
- **Clean Energy, Sustainable Environment**
- **140,000 ft² R&D and Mfg Facility**
- **Concept to commercialization**
 - **Basic/applied research --> prototype --> pilot scale fabrication -->**
 - **Large scale manufacturing with CoorsTek**
- **Core competencies: electrochemistry, ionic conducting ceramics, & advanced materials**



Recent Utah Innovation Awards



**2003 Finalist
Electrodes**



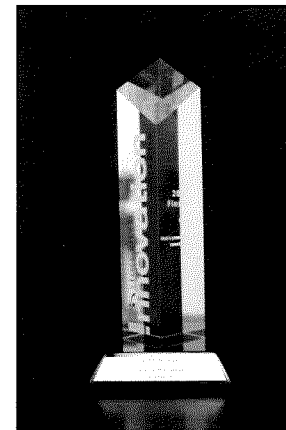
**2006 Finalist
NOx Sensor**



**2008 Winner
NaSICON**



**2007 Finalist
Reformer**



**2009 Finalist
Fly Ash Beneficiation**



Overview

- What we do:
 - Solve difficult technical problems
 - Maintain Ceramatec's R&D culture
 - *Spin technologies out to create new Businesses that will lead to job creation*
- 9 New High Technology Companies have spun out of Ceramatec



Fly Ash containing pervious concrete

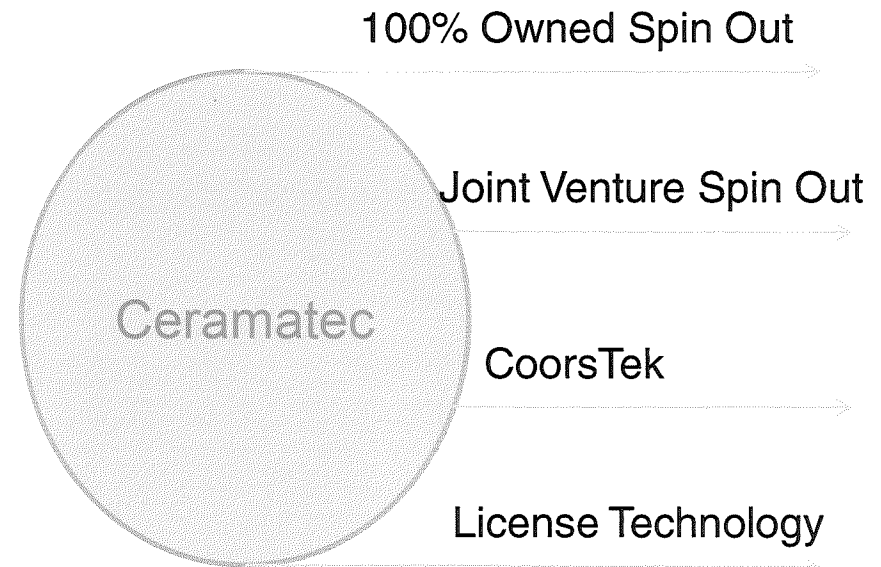


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New Companies Formed

- **LowTek** – smart ceramics
- **MaxTek**- oxygen sensors
- **EmiSense**- NOx, PM sensors
- **Microlin**- micro-pumps
- **Appilon**- medical devices
- **Tech Holding** - batteries
- **SOFCo**- fuel cells
- **Kaylypto Medical**- medical devices
- **Selection** - biodiesel chemicals

Business Model



Successful Track Record of Innovation and Job Creation



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Ceramatec Strategic Areas of Focus

Clean Energy

- High Purity Oxygen Production
- Heavy Oil Upgrading
- Advanced Energy Storage
 - Solid Electrolyte Batteries
 - Fuel Cells
- Highly Efficient Hydrogen Production
- CO₂ to Fuel
- Synfuel and Syngas Production
- Biodiesel Chemicals
- High Temp, Compact Reactors/Heat Exchange

Sustainable Environment

- Nuclear remediation
- CO₂ Processing
- Waste Fly Ash Beneficiation for Building Materials
- Water Disinfection
- Advanced Coatings/Filters

Biotech

- Drug Delivery
- Wound Healing
- Bio-implants

Most Recent Spin off Companies

EmiSense (2008)
(100% owned by Ceramatec)
NO_x, PM and O₂ Sensors

Microlin (2007)
Micro-Pumps
(contract arrangement with Ceramatec)

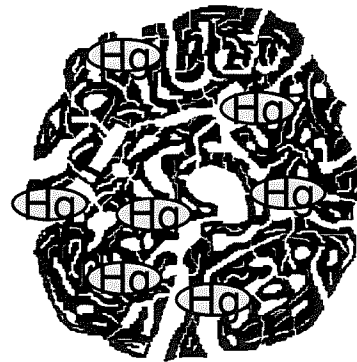


Ceramatec Treatment Process for High-Carbon Ash...

Fly Ash with High-Carbon

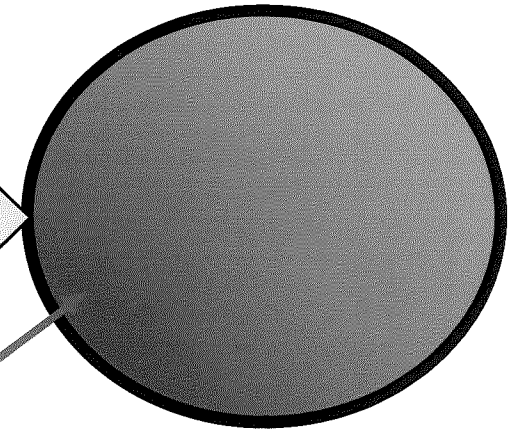


Carbon Particle Before Treatment



Encapsulation

Carbon Particle After Treatment



External barrier layer encapsulates carbon particles in ash

Ceramatec Fly Ash related Patents and Applications:

1. "COAL FIRED FLUE GAS TREATMENT AND PROCESS" Issued Feb 2nd 2010
2. Treatment of Fly Ash for Use in Concrete; Application No. 11/776,892
3. Treatment of Fly Ash for Use in Concrete, Application No. 12/275,437
4. Pervious Concrete Comprising a Geopolymerized Pozzolanic Ash Binder
5. Fly Ash for CO₂ Capture; unpublished.



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TOMORROW'S CERAMIC SYSTEMS

Business Opportunity

- **Successfully Licensed Technology**
 - Make usable fly-ash.. usable for concrete industry
 - Avoid landfill and addition carbon dioxide emissions
 - Create “Green-Collar” Jobs
- Investigating several other market opportunities to use treated fly-ash
- A Hazardous waste ruling (Subtitle C) could adversely affect opportunities and subsequent job creation



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