



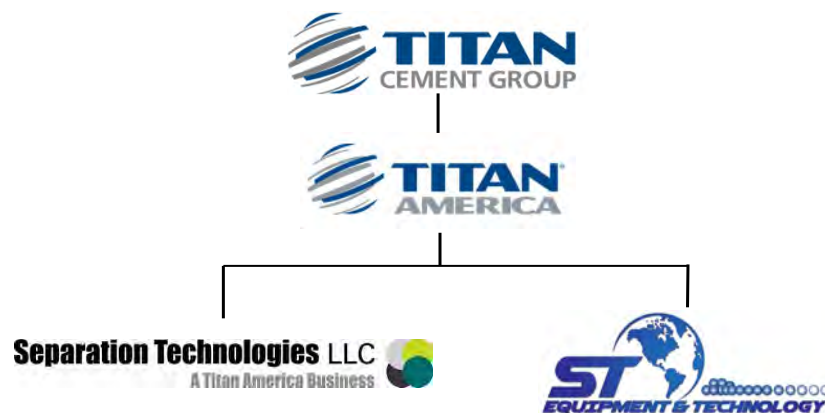
Turning Gray to Green®

Fly Ash Reclamation and Beneficiation Using a Triboelectric Belt Separator

November 30, 2022



Who We Are



Titan CEMENT: Who we are...

Titan Group
 is an international
 cement and
 building materials
 producer

- Safety
- Integrity
- Know-how
- Value to the customer
- Delivering results
- Continuous improvement
- Corporate social responsibility



Founded in 1902

Athens Stock Exchange since 1912

Brussels & Paris Euronext since 2019

14 cement plants in 10 countries

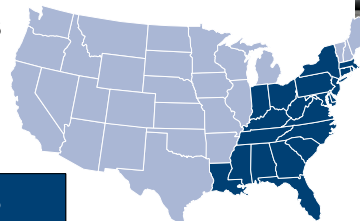
5,400+ employees



Titan America at a glance:

A premier building materials producer with
 business activities in the Eastern US

- ✓ Cement
- ✓ Ready-mixed concrete
- ✓ Block
- ✓ Construction aggregates
- ✓ Import/export and terminals
- ✓ Fly ash



2021

2,250+ employees
 \$1+ Billion Turnover

HQ in Norfolk, VA



Separation Technologies at a glance



Marketer and seller of Fly Ash

- ✓ 6 Plants in the Eastern US, 1 in Maritime Canada
- ✓ Import capacity in Tampa, Norfolk, and Newark
- ✓ Network integrates the most reliable supplier in the market
- ✓ Over 1,300 ship to locations
- ✓ Internal and external customer base

Separation Technologies LLC
 A Titan America Business

ST EQUIPMENT & TECHNOLOGY at a glance:

Dry, combustion-free, single step carbon removal from fly ash



Developer and manufacturer of Tribo-electrostatic Separators for multiple markets including fly ash

A global business, wholly owned by Titan

Technology Licensing




Titan America internal supplier since 2002

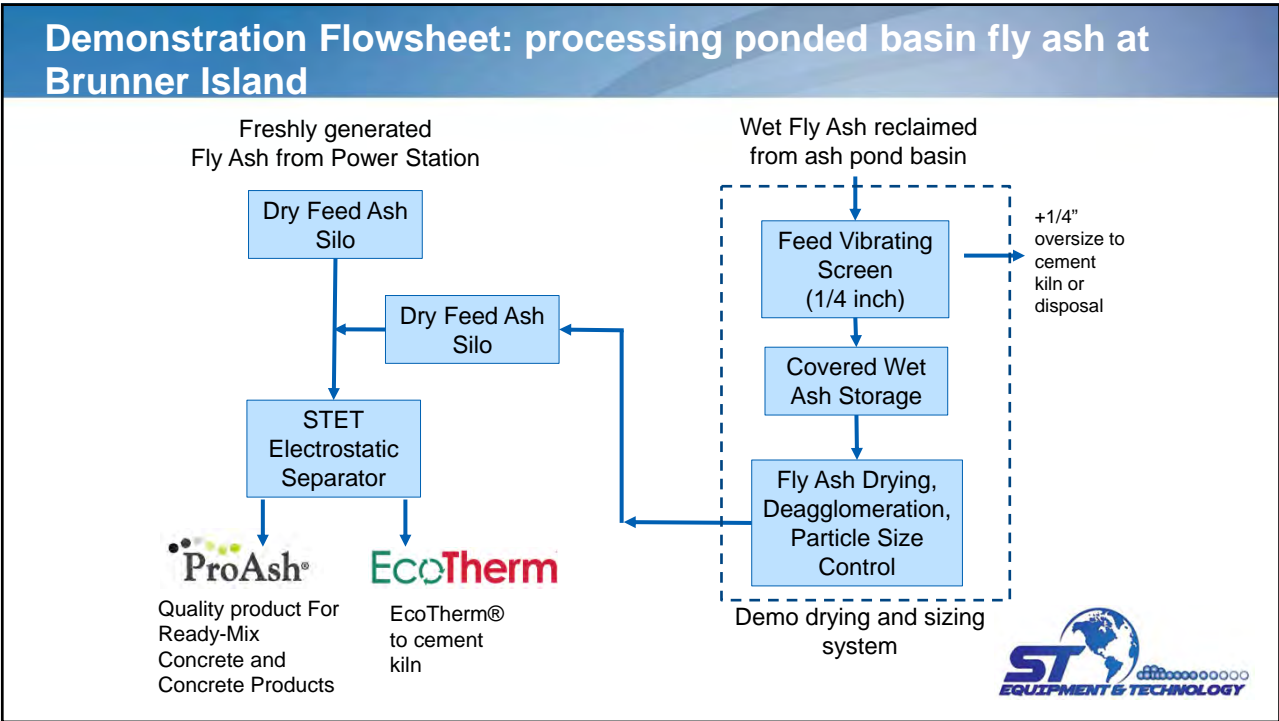
Manufacturing, pilot plant, and lab are located near Boston, MA USA

STET Tribo-Electrostatic Separator

STET Separators

- Proven processing technology
- 26 units deployed worldwide
- 1995 = 1st commercial operation for fly ash
- Over 23 million tons processed
- Environmentally preferred



CO₂ Benefits from Fly Ash Recycling w/ STET's Process

- Fly ash substitutes for up to 40% of Ordinary Portland Cement (OPC) required, on a 1:1 pound-for-pound basis.
- Drying & processing fly ash from a landfill only reduces CO₂ savings by 10% relative to CO₂ emissions from manufacturing new OPC.

	kg CO ₂ / Ton ProAsh®
Portland Cement Displaced	900
Thermal Drying (Nat Gas)	(54)
Electricity for Processing	(37)
Net CO₂ Avoided	810

810 kg CO₂ avoided per ton of ProAsh® product generated.



ST built a Demonstration fly ash reclamation and processing plant at Brunner Island for ponded/basin ash



Feed ash drying at 5 tph
 Separation at 30 tph
 Equivalent to production fly ash processing



Feed stockpile at basin, screened to -1/4"



Project Team



ProAsh® from Basin reclaimed fly ash Harvested, screened, and dried Basin feed fly ash EcoTherm® from reclaimed fly ash



Harvested Fly Ash Processing Plant



Harvested Fly Ash Processing Plant



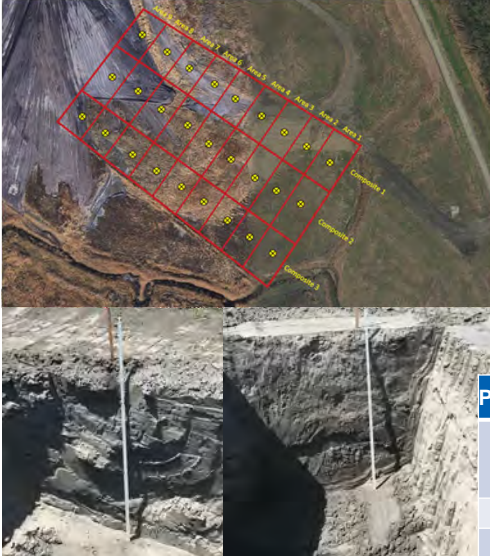
Feed Ash Dryer

STET Electrostatic Separator



Ash reclaimed from dewatered ash basin for processing by ST

Brunner Island Basin Test Sample Grid



Unprocessed Feed Ash from Basin		
	Avg Moisture wt %	Avg LOI wt% dry basis
ASTM C618 spec	3% maximum	6% maximum
Basin Area Number		
1	19.7	9.0
2	20.5	10.0
3	20.6	8.8
4	19.0	11.4
5	21.5	12.0
6	21.6	9.0
7	22.2	8.7
8	20.4	10.9
9	18.5	11.0

Feed basin samples do not meet ASTM C618 before process

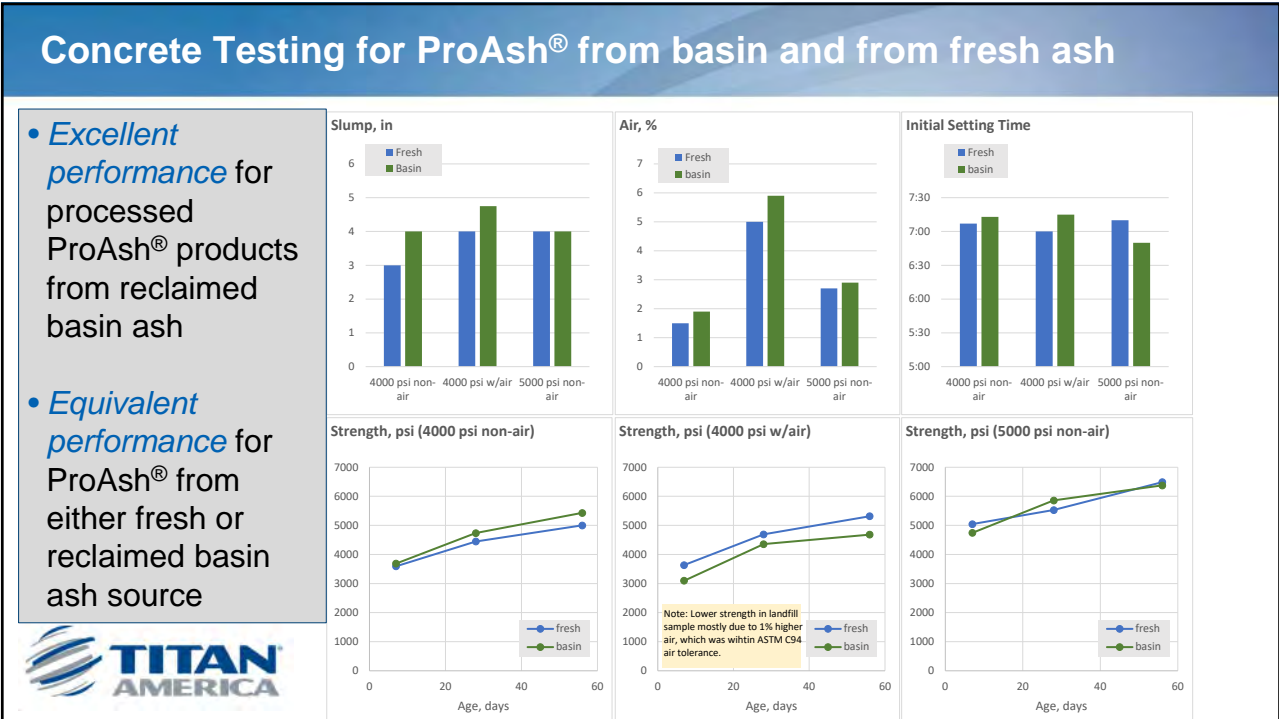
Processed Sample (ProAsh®) Testing Results				
	Avg 28-day strength activity index	Avg Fineness +325M % retained	Avg Moisture wt %	Avg LOI wt% dry basis
ASTM C618	75% minimum	34% maximum	3% maximum	6% maximum
Average	82.4	28.2	0.2	2.9

Concrete Testing for ProAsh produced from basin and from fresh ash



Concrete strength testing indicated **equivalent performance** for ProAsh® generated from fresh feed ash and reclaimed basin ash source





Mobile Landfill Reclaim Testing Capability



Services from Harvesting through End Use



ProAsh® Operation



Excavation

Titan America has extensive experience in hard rock and wet pond mining



Sizing and Drying

Screening
 Drying and deagglomeration



Beneficiation




Carbon separation, LOI reduction
 Maximize beneficial use and minimize tons landfilled
 The most environmentally friendly process available



Sales and Marketing


Internal and external sales
 Extensive market and application knowledge

Flexible Business Models

 Excavation ST operates with Titan America ST contracts with third party Utility provided Civil Contractor	 ProAsh® Operation ST owns, operates and maintains ST design-build (turnkey) ST provides technology and separator Capex: can range from ST funded to Utility funded	 Sales & Marketing ST owns product, ProAsh® ST sells and markets
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Conclusions

- STET's solution is the most widely implemented carbon removal technology
 - More than 23M tons processed to date; over 20M tons CO₂ saved
- Beneficiation of reclaimed fly ash by (1) drying/sizing + (2) STET separation has been demonstrated on continuous scale at a utility site
- Poned ash sourced ProAsh® performance in concrete is equivalent to fresh ash sourced ProAsh® after STET processing
- STET process is significantly lower cost and has significantly lower emissions than combustion-based processes



Thank you !



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