



Powder Processing & Technology Equipment List

PPT provides processing development and custom powder processing services for the leaders in ceramics and inorganic materials technology. For more information or if you have any questions, please contact us at the phone number or email listed above.

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Thermal Processing Equipment

Emission Control System for Thermal Processing

Responding to demand from various industries for processing materials that emit nitrogen oxide (NO_x), Powder Processing & Technology (PPT) has added advanced emission control capability to support its growing client base. The Tri-Mer emissions control unit, based on catalytic ceramic filters, is the state-of-the-art technology for processes that emit NO_x. The unit has been fully commissioned and has demonstrated the ability to handle NO_x emissions in the range of two to fifty pounds per hour with NO_x destruction efficiency adjustable up to 95%. The Tri-Mer unit also captures particulate – PM₁₀, PM_{2.5}, and submicron PM – to over 99% efficiency. The system can be modified to handle SO_x, HCl and VOC's and PPT will add those capabilities as clients' requirements dictate. Thermal processing equipment with emission control noted with **ECS** on #6, #7, #10, #11 and #12 Calciners.

Rotary Calciners:

Indirect Fired Calciner #12 (Gas Fired) (NEW)

- Temperature capability of 1093°C (2000°F)
- Inconel 600 Tube; 1.2 m (48") Ø x 8.8 m (29') (L) with 6 m (20.5') heating zone
- Tube RPM of 0.75 ~ 6
- 4 individually controlled temperature zones
- Powder or formed material feed capability
- Maximum throughput ~ 550 Kg/hr (~ 1,200 lbs/hr)
- Continuous monitoring capability of 3 zones internal bed temperature
- Manufactured by Bartlett-Snow-Pacific
- **ECS** capability

Indirect Fired Calciner #11 (Gas Fired) (NEW)

- Temperature capability of 1000°C (1830°F)
- HT Alloy Tube; 1.1 m (42") Ø x 8.2 m (27') heating zone
- Tube RPM of 0.75 ~ 6
- 3 individually controlled temperature zones
- Powder or formed material feed capability
- Maximum throughput ~ 550 Kg/hr (~ 1,200 lbs/hr)
- Continuous monitoring capability of 4 zones internal bed temperature
- Staggered flights and removable dam at the exit end
- Manufactured by Bartlett-Snow-Pacific
- **ECS** capability

Indirect Fired Calciner #6 (Gas Fired)

- Temperature capability of 1110°C (2025°F)
- Inconel 601 Tube; 1 m (39") Ø x 10 m (33') (L) with 7 m (23') heating zone
- Tube RPM of 0.75 ~ 6
- 3 individually controlled temperature zones
- Powder or formed material feed capability
- Maximum throughput ~ 550 Kg/hr (~ 1,200 lbs/hr)
- Can be retrofitted to run nitrogen atmosphere
- Manufactured by Riedhammer
- **ECS** capability

Rotary Calciners (Continued):

Direct Fired Calciner #5 (Gas Fired)

- Temperature capability of 1260°C (2300°F)
- **Newly Relined** Refractory brick lined tube; 1.2 m (48") Ø x 12 m (40') (L)
- Tube RPM of 0.50 ~ 3
- Slurry or formed material feed capability
- ~ 680 Kg/hr (~ 1,500 lbs/hr) throughput
- Manufactured by Bartlett-Snow

Indirect Fired Calciner #7 (Electric Fired)

- Temperature capability of 1110°C (2025°F)
- Inconel 601 Tube; 36 cm (14") Ø x 8 m (26') (L) with 4.5 m (15') heating zone
- Tube RPM of 0.75 ~ 6
- 4 individually controlled temperature zones
- Powder or formed material feed capability
- ~ 70 Kg/hr (~ 150 lbs/hr) throughput
- Manufactured by Riedhammer
- Nitrogen Atmospheric Control Capability
- **ECS** capability

Indirect Fired Calciner #8 (Gas Fired)

- Temperature capability of 1100°C (2010°F)
- HT Alloy Tube; 0.6 m (24") Ø x 7.3 m (24') (L) with 5.5 m (18') heating zone
- Tube RPM of 0.75 ~ 6
- 3 individually controlled temperature zones
- Powder feed capability
- ~ 250 Kg/hr (~ 550 lbs/hr) throughput

Indirect Fired Calciner #10 (Electric Fired)

- Inconel 601 Tube; Temperature capability of 1110°C (2025°F)
- Tube; 0.6 m (24") Ø x 10 m (33') (L) with 7.3 m (24') heating zone
- Tube RPM of 0.75 ~ 6
- 3 individually controlled temperature zones
- Powder feed capability
- Maximum throughput ~ 250 Kg/hr (~ 550 lbs/hr)
- Nitrogen and Steam Atmosphere Control Capability (#10)
- **ECS** capability

Tunnel Kilns

Calcining / Sintering Tunnel Kilns (Electric)

- Temperature capability of 1480°C (2700°F)
- Powder, formed material and pressed compact materials
- Material loaded into refractory saggars on kiln cars
- Load capacity: 3.5 liter (9" x 8.5" x 2.75")/sagger x 40 or 48 saggars/car (37 cars in kiln)
- Push intervals of 45 minute to 3 hours
- 3 units available and 2 units have nitrogen atmosphere capability
- Manufactured by Harper

Tunnel Kilns (Continued):

Calcining / Sintering Shuttle Kiln (Electric)

- Temperature capability of 1340°C (2445°F)
- Powder, formed material and pressed compact materials
- Material loaded into refractory saggars or on refractory shelves
- Load capacity: 3.5 liter (9" x 8.5" x 2.75")/sagger, ~ 546 saggars/load
- Working dimensions: 38" (W) x 144" (L) x 56" (H) with 2 cars
- Nitrogen atmosphere capability
- Manufactured by Nabertherm

Spray Drying Equipment:

20' Niro Spray Dryer

- Slurry feed to nozzles or wheel atomizer
- 1 ~ 5 nozzles capability of maximum 1,000 psi pump pressure
 - ~ 680 Kg/hr (~ 1,500 lbs/hr) throughput
 - Median granule size of 80 ~ 140 microns
- Wheel atomization capability of maximum 12,500 wheel RPM
 - ~ 1,350 Kg/hr (~ 3,000 lbs/hr) throughput
 - Median granule size of 60 ~ 120 microns

18' Niro Spray Dryer

- Slurry feed to nozzles or wheel atomizer
- 1 ~ 5 nozzles capability of maximum 1,000 psi pump pressure
 - ~ 630 Kg/hr (~ 1,400 lbs/hr) throughput
 - Median granule size of 80 ~ 150 microns
- Wheel atomization capability of maximum 12,500 wheel RPM
 - ~ 900 Kg/hr (~ 2,000 lbs/hr) throughput
 - Median granule size of 60 ~ 120 microns

16' Niro Spray Dryer

- Slurry feed to wheel atomizer
- Wheel atomization capability of maximum 14,000 wheel RPM
 - ~ 900 Kg/hr (~ 2,000 lbs/hr) throughput
 - Median granule size of 60 ~ 120 microns.

9' 6" Anhydro Spray Dryer

- Slurry feed to nozzle
- 1 nozzle capability of maximum 700 psi pump pressure
 - ~ 230 Kg/hr (~ 500 lbs/hr) throughput
 - Median granule size of 80 ~ 150 microns.

13' 6" Anhydro Spray Dryer

- Wheel atomization capability of maximum 18,000 wheel RPM
 - ~ 200 Kg/hr (~ 440 lbs/hr) throughput
 - Median granule size of 30 ~ 80 microns

11' Anhydro Spray Dryer

- Wheel atomization capability of maximum 20,000 wheel RPM
 - ~ 150 Kg/hr (~ 330 lbs/hr) throughput
 - Median granule size of 30 ~ 80 microns

Grinding Equipment:

Ceramic Ball Mills

- High Alumina spherical grinding media
- Six 5' x 6' Ceramic Mills

Steel Ball Mills

- Hardened C-Steel spherical grinding media
- Two 3' x 3' Steel Mills
- One 3½' x 4' Steel Mill
- One 4' x 5' Steel Mill
- Seven 5' x 6' Steel Mills
- One 8' x 10' Steel Mill

Attrition Mills (Union Process Q-50)

- Recirculating batch attrition
- Used for fine grinding
- Chrome Steel spherical grinding media
- Load capacity of 1,000 ~ 3,000 Kg (2,000 ~ 7,000 lbs) solids
- 2,000 liter (500 gallon) Holding Tank for continuous attrition
- 2 Attritors are available

Dry Grinding Mill (Palla Rod Mill)

- Particle size reduction capability down to 1 micron
- ~ 1,000 Kg/hr (~ 2,000 lbs/hr) throughput

Hammer Mill (Prater Mill)

- De-agglomeration
- ~ 500 Kg/hr (~ 1,000 lbs/hr) throughput

Hammer Mill (Jacobson Mill)

- De-agglomeration to finer particles used after Prater milling
- ~ 500 Kg/hr (~ 1,000 lbs/hr) throughput

Vibratory Mills (Sweco Vibratory Mills)

- Cylindrical shaped steel grinding media
- ~ 250 Kg (~ 550 lbs) load capacity

Batching Equipment:

Dry Mixer / Pelletizer - Eirich R-12 Automated batching system

- 4 components dry weighing system
- Dry mixing and pelletizing capabilities
- Pellet size of 5 ~ 10 mm
- 250 liter load capacity
- Calcination option of pellets/powder through Indirect Calciner
- Packaging capabilities to barrels or bulk bags
- **Eirich R-15 Pelletizer is also available**; 500 liter loading capacity

Wet Mixer #1

- Slurry mixing of powders and liquids via Cowles Sheer Mixer
- 1,000 Kg/hr (2,200 lbs/hr) solids throughput
- Currently used to feed Spray Dryer
- Wet calcination option of slurry through Direct Gas Fired Calciner

Wet Mixer #2

- Slurry mixing of powders and liquids via Cowles Shear Mixer
- 1,000 Kg/hr (2,200 lbs/hr) solids throughput
- Currently used to feed Spray Dryer

Intensive Mixer - Henschel Mixer, 250 liter (60 gallons) load capacity

Sheer Mixer - Various sized Cowles Mixers and Rotosolver[®] with variable speed

Powder Classification Equipment:

48" Sweco Screeners (single and double deck)

- 150 ~ 700 Kg/hr (300 ~ 1,500 lbs/hr) throughput
- 4 US Mesh through 325 US Mesh screening capability

30" Sweco Screeners (single deck)

- 50 ~ 700 Kg/hr (100 ~ 1,500 lbs/hr) throughput
- 4 US Mesh through 325 US Mesh screening capability

Magnetic Separator

- Magnetic separation of powders or slurry
- ~ 450 Kg/hr (~ 1,000 lbs/hr) throughput

Dry Blending Equipment:

Double Cone Blender

- 4.4 m³ (155 ft³) load capacity
- 1 MT (2,200 lbs) super sacks packaging capability
- 2 units are available

Nauta Blender

- 3.2 m³ (113 ft³) load capacity

V-Blender

- 1.4 m³ (50 ft³) load capacity

Ribbon Blender

- 3.6 m³ (127 ft³) load capacity

Alternative Drying Equipment:

Pan Drying Ovens

- Various sized Drying Ovens

Innovative Materials Center Equipment:

Batching and Blending Equipment

- Mixer / Pelletizer (Eirich R-7); 50 liter load capacity
- Intensive Mixer (Papenmeier); 5 liter load capacity
- Intensive Mixer (Henschel); 250 liter (60 gallons) load capacity
- V-Blender, Ribbon Blender, Drum Blender, 5 ft³ Double-Cone Blender
- Sheer Mixer, Cowles Mixer and Rotosolver[®]

Calcining and Sintering Equipment

- Electric Fired Rotary Calciner (Bartlett-Snow) capable to 1110°C
 - Inconel 601 Tube; 20 cm Ø x 2.7 m (L)
 - 3 individually controlled temperature zones
 - 3 ~ 6 Kg/hr throughput
- Electric Fired Rotary Calciner (Riedhammer) capable to 1110°C
 - Inconel 601 Tube; 36 cm Ø x 8 m (L) with 4.5 m heat zone
 - 4 individually controlled temperature zones
 - 30 ~ 70 Kg/hr throughput
- Electric Elevator Kilns (Harper) capable to 1450°C
 - Nitrogen atmosphere capable; 2 units are available
 - Maximum load 48 (3.5 liter) saggars
- Electric Shuttle Kiln (Nabertherm) capable to 1340°C
 - 38" (W) x 144" (L) x 56" (H) working dimension;
 - Maximum load 546 (3.5 liter) saggars
- Temperature Gradient Furnaces; 2 units are available

Grinding Equipment

- Batch Attritor (Union Process S-1) with YTZ balls; 5 liter capacity
- Recirculating Attritor (Union Process Q-6) with YTZ balls connected with a 300 liter (80 gallons) Slurry Holding Tank
- Steel Jar Mills and Ceramic Jar Mills with Roller
- Steel Ball Mill (2' x 2½') with Hardened C-Steel grinding media
- Steel Ball Mill (3' x 3') with Hardened C-Steel grinding media
- Ceramic Ball Mill (1,000 liter) with high Alumina grinding media
- Dry Mills - Hammer Mill, Prater Mill, and Sweco Vibratory Mill

Spray Drying Equipment

- Bowen Nozzle Tower™ Dryer; ~ 5 Kg/hr throughput
- 8' Niro Wheel Atomizer with an option of slurry feeding through a Nozzle; ~ 70 Kg/hr throughput

Complementary Equipment

- Blue M Ovens
- De-lumper for breaking up agglomerates
- 24", 30", and 48" Sweco multiple deck Screeners
- Magnetic Separator