



**BARTLETT-SNOW and RAYMOND
GUIDE TO THERMAL PRODUCTS**

Bartlett-Snow™ and Raymond® Thermal Products

Experience Means Performance for You

For over a hundred years, Bartlett-Snow™ and Raymond® products have been successfully providing solutions for thermal process applications involving the chemical, petrochemical, ceramic, magnetic, metals, food, fertilizer, plastic, industrial solid waste, and nuclear industries. We are known for our innovative and dependable equipment that we provide for the changing needs of these process industries.

Our extensive experience includes over 3,500 worldwide installations covering the full spectrum of drying, cooling, calcining, and incinerating applications, as well as resource recovery applications, such as activated carbon regeneration, tire pyrolysis, metal reclamation and soil remediation.

Services

The services that we provide to our customers range from the initial concept and development of the equipment, through testing, design, manufacture, start-up, and commissioning, followed by the capability to provide OEM replacement parts and service.

People

Air Preheater Company personnel are dedicated to providing solutions for our customer requirements. Our application engineers have many years of experience and provide new ideas and cost effective solutions for specialized applications. In many cases our engineers have already encountered your problem and will provide a proven solution or approach.

Testing

Our capabilities include pilot plant and process development test work at our modern 25,000 square foot facility located in Naperville, IL.

At our laboratory, tests are conducted on large material lots in pilot scale equipment to determine the physical



Laboratory Facility

and chemical data for process definition and proper equipment selection.

In addition to yielding more representative results, testing on pilot scale equipment can reveal material handling difficulties and other problems that might be overlooked. The laboratory also includes equipment for pre-process and post-process physical and chemical analysis of materials. Characteristics such as fineness, abrasiveness, moisture content, corrosiveness and density are routinely determined. You will work with our engineers and technicians to simulate the environment of your application as closely as possible. After the test, you will receive a computerized analytical report, as well as recommendations for equipment and system design for processing your product.

Equipment Design

Every Bartlett-Snow™ and Raymond® unit that we provide utilizes computer assisted engineering for unit size selection and pre-engineered components integrated with custom design considerations to provide for optimum performance. We utilize finite element analysis (FEA) for mechanical and thermal stress analysis, as well as computational fluid dynamics (CFD) for understanding and optimizing designs for air flow and heat transfer related problems.

We supply our equipment with process control systems to provide for automatic and precise control. Depending on the application, we may utilize a simple discrete controller or a programmable logic controller (PLC) based system. On a complicated process system, we may provide for a distributed control system (DCS) with computer based logic and controls.

Manufacturing

Air Preheater's primary manufacturing facilities are located in Concordia, KS and Wellsville, NY. These facilities are equipped with modern manufacturing resource planning systems, production equipment, and quality assurance techniques in support of fabrication, welding, machining, assembly, and testing. Continual production improvements and aggressive cost reduction programs are reflective of our manufacturing facilities and personnel, whose broad experience, capability, and commitment assure that our customers will receive high quality, reliable equipment at an economical cost.

Replacement Parts & Service

OEM Bartlett-Snow™ and Raymond® replacement parts are manufactured according to the original specifications. We keep up to date and accurate records of every unit that we supply to our customers. You can feel confident that the part you ordered will fit your existing equipment, thus minimizing downtime considerations.

Our experienced staff of service engineers are available for initial startup and subsequent maintenance over the life of the equipment.

Bartlett-Snow™ Rotary Calciners

Bartlett-Snow™ rotary calciners provide for indirect high temperature processing under oxidizing, reducing, or inert atmospheric conditions.



Indirect Gas-Fired Rotary Calciner

The rotary calciner design consists principally of an inclined rotating cylinder that is enclosed in a furnace along its active length, featuring gas, oil, dual-fuel burners, or electric heating elements, and can be equipped with gas-tight seals that prevent interchange between the internal atmosphere and local ambient conditions.



Indirect Heat Rotary Calciner for Soil Remediation

Applications that are appropriate for indirect heat calciners involve a wide variety of fine powders, granular materials, pellets and extrudates that require retention times ranging from a few minutes up to several hours, non-contact with products of combustion, special purge or reactant gases and bed temperature profiling.

Heat for the process is transferred through the cylinder wall, resulting in low internal process gas flow rates. The resulting low gas velocity within the cylinder provides for low levels of attrition and particulate entrainment when processing fragile and micron-sized products. The low flow rate gas conditions within an indirectly heated calciner also provide for a significantly smaller and more economical off-gas handling system, than that required for a direct-fired kiln.

The following list shows the maximum cylinder temperature for the various materials of construction that we offer. Proper selection of the calciner cylinder material is critical and is determined by process temperature, process compatibility and physical size considerations.

Metallic alloys-	1350°C
Quartz-	1260°C
Ceramic-	1540°C
Graphite-	2200°C

In cases where it is necessary to cool the heated material prior to discharge, an integral indirect water spray cooler section can be added to the calciner by extending the length of the cylinder.

Calciner sizes available:
6" to 120" cylinder diameter

Bartlett-Snow™ Rotary Kilns

Bartlett-Snow™ direct-fired rotary kilns are provided for applications requiring product temperatures to 1650°C and oxidizing or slightly reducing atmospheric conditions. In addition, the process material must tolerate contact with products of combustion and/or the burner flame envelope, as well as reflect a particle size range, specific gravity and shape that allows reasonable gas velocities through the cylinder.



Direct-Fired Rotary Kiln for Calcining Bauxite

The rotary kiln design consists principally of an inclined refractory lined rotating cylinder that features a gas, oil, or dual-fuel burner firing down the longitudinal axis of the cylinder. The operating configuration is primarily countercurrent flow, with the hottest gases in contact with the hottest product.

Kiln sizes available:
24" to 120" cylinder diameter



High Temperature Rotary Kiln for Calcining Catalysts

Drying and Cooling Equipment and Systems

Bartlett-Snow™ Rotary Dryers

Bartlett-Snow™ rotary dryers are offered in two basic designs, reflecting direct and indirect heating.

The direct heat dryer design consists principally of an inclined rotating cylinder with internal flighting. This type of design brings process material into direct contact with the drying medium, either in a cocurrent or countercurrent flow configuration. The drying medium may be products of combustion tempered with air, heated clean air or special gases. Direct heat rotary dryers are most appropriate when product characteristics reflecting particle size range, specific gravity, and shape permit reasonable drying air velocities through the cylinder, as well as for applications involving product temperatures upwards to 500°C.

Direct dryer sizes available:
12" to 180" cylinder diameter



Rotary Dryer System

The indirect heat rotary dryer provides for heating under oxidizing, reducing, or inert atmospheric conditions. The rotary dryer design consists principally of a rotating cylinder that is enclosed in a furnace along its active length. With heat transfer indirect and through the cylinder wall, the gas velocities within an indirect dryer are low as compared to a direct heat dryer, and correspondingly, the off-gas system is smaller and more economical.

Applications that are appropriate for indirect heat rotary dryers involve a wide variety of fine powders, granular materials, pellets and extrudates that require product temperatures to 500°C, bed temperature profiling and special atmospheres.



Indirect Heat Rotary Dryer for Carbon Black

Indirect dryer sizes available:
6" to 120" cylinder diameter

Bartlett-Snow™ Rotary Coolers

Bartlett-Snow™ rotary coolers are provided for direct and indirect cooling applications.

The direct air swept cooler design consists of a rotating cylinder with internal flighting. This cooler design brings hot product into direct contact with the cooling medium, in a countercurrent flow configuration. The cooling medium may be ambient air, cooled air or special gases. The technology is particularly suited for applications involving cooling hot materials from 700°C to temperatures within 5 to 10°C of the ambient air temperature. Specialized cooler designs handling high temperature products to 1600°C can also be provided.

Direct cooler sizes available:
12" to 180" cylinder diameter

The indirect rotary cooler design consists of a rotating cylinder that is enclosed in a cooler jacket featuring water sprays along its active length.



Direct Airswept Rotary Cooler

Applications that are appropriate involve fine powders through granular materials at temperatures as high as 1300°C, requiring cooling to as low as 100°C. Should the process require inert, reducing, or special atmospheric considerations, the cooler can be provided with gas-tight seals.

Indirect cooler sizes available:
6" to 120" cylinder diameter



Indirect Rotary Waterspray Cooler for Alumina

Raymond® Flash Dryers

Raymond® flash dryers provide for the rapid removal of moisture from mesh and micron sized particles that release moisture quickly, primarily as surface water. The major components of a flash dryer system include an air heater, feeder for introduction of the wet process material, drying column, cyclone collector, secondary dust collector, system vent fan, and necessary connective duct work. The wet material is quickly dried by conveying it in the hot, high velocity gas stream in the vertical drying column of the flash dryer.



Flash Drying System for Sawdust

Raymond® flash dryers are simple to operate and can handle tough applications involving a variety of materials that are fine, sticky, low to moderately abrasive and heat sensitive. Flash dryers are particularly effective at handling heat sensitive materials due to the very short drying time and that the material never reaches the wet bulb temperature of the gas.

Four factors that determine the rate of moisture removal in flash drying:

- Particle size range of the material
- Distribution of moisture in the material
- Temperature differential between the hot gases and the material
- Drying column gas velocity

Also available are Raymond® flash coolers and flash calciners for mesh through micron-sized materials. For high temperature calcining and cooling applications multi-staged systems can be provided for maximum thermal efficiency.

System sizes available: evaporative capacity to 36,000 lb/hr.



Flash Drying System for Aragonite

Raymond® Rotary Incinerators

Raymond® rotary incinerators meet the most stringent regulatory requirements worldwide and offer destruction and removal (DRE) of up to 99.9999%.

A wide variety of waste materials in solid, semi-solid, sludge, slurry and



Rotary Incinerator for Hazardous Wastes



Industrial Waste Rotary Incineration System

liquid waste states can be simultaneously incinerated. Some of the applicable categories for these waste materials are as follows: hazardous (RCRA), Toxic (TSCA), pharmaceutical, biological, low level radioactive, contaminated soils, munitions and industrial.

The major components of a typical rotary incineration system consist of the waste preparation system, feed system, rotary kiln, secondary combustion chamber, bottom ash removal conveyor, gas conditioning and air pollution control system, system vent and exhaust stack.

However, every application is unique and each system is specifically designed to best handle the waste feed streams to meet local, state and national environmental emission regulations.

System sizes available: heat release to 200 x 10⁶ Btu/hr.

General Offices

ALSTOM Power, Inc.

Raymond Operations
4525 Weaver Parkway, Suite 250
Warrenville, Illinois 60555 USA
Toll Free: 877.661.5509
Tel: 630.393.1000
Fax: 630.393.1001
E-mail: info-raymond@power.alstom.com
Website: www.raymondpulverizers.com

Raymond Laboratory Facility

2151 Fisher Drive
Naperville, Illinois 60563
Tel: 630.369.3700
Fax: 630.983.6750

Sales Regions

United States

Northeastern Region

Tel: +1.708.330.5029
CT, DE, IN, KY, MA, MD, ME, NH, NJ, NY, OH,
PA, RI, VA, WV

North Central Region

Tel: +1.815.899.8057
IL, IA, MN, MT, ND, NE, SD, WI, WY

Southwest Region

Tel: +1.314.770.1677
AR, AZ, CO, KS, LA, MO, NM, OK, TX

Southeast Region

Tel: +1.770.650.8888
AL, FL, GA, MS, NC, SC, TN, & Canada

Western Region

Tel: +1.925.933.8225 (Rep. Krupa Sales)
AK, CA, HI, ID, NV, OR, UT, WA

Europe (Katowice, Poland)

Tel: +011.4.322.583.583x231
Fax: +011.48.322.599.570

Mexico (Morelia)

Tel: +011.52.443.322.7100 ext. 1049
Fax: +011.52.443.323.0726

Brazil (Vinhedo/Sao Paulo)

Tel/Fax: +011.55.19.3876.3526

Asia

Siam Energy Group Co., Ltd. (Rep.)
Tel/Fax: +662.758.8595