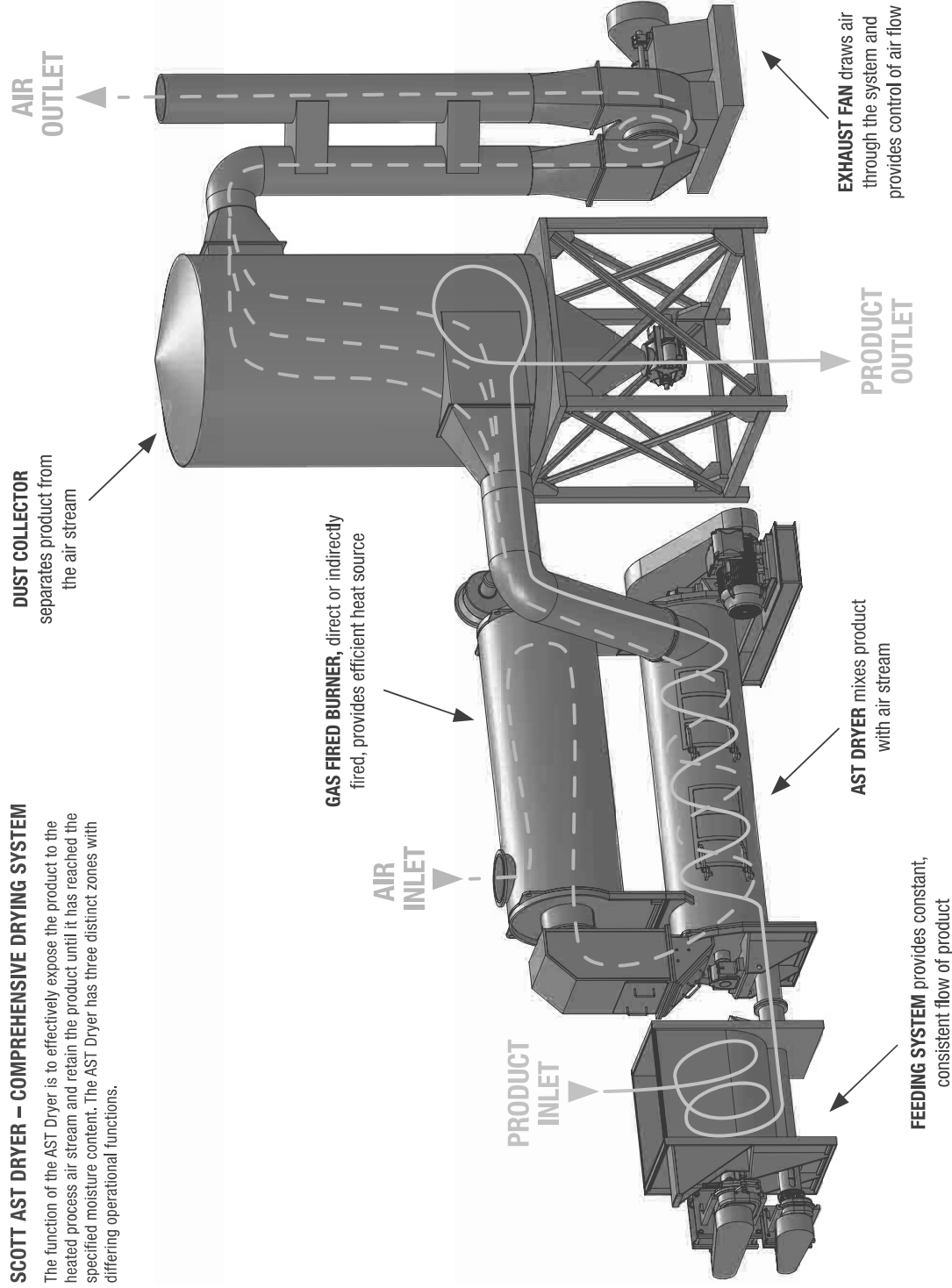




SCOTT AST DRYER – COMPREHENSIVE DRYING SYSTEM

The function of the AST Dryer is to effectively expose the product to the heated process air stream and retain the product until it has reached the specified moisture content. The AST Dryer has three distinct zones with differing operational functions.



FEEDING SYSTEM

The purpose of the Feeding System is to accurately control the flow of product into the dryer. A constant and controlled feed to the dryer is important since a continuous system operates best at stable conditions. During steady-state operations, the feed rate held constant as other parameters are monitored and controlled.

The Feeding System will be the Scott Cake Feeder, Scott Mixer Feeder or a pump (positive displacement or centrifugal), depending on the viscosity of the product to be processed. The feeder is equipped with a variable frequency drive to allow for a ramp up of product flow rate during equipment startup.

GAS-FIRED BURNER

The function of the gas-fired burner is to be the source of heat energy into the AST Dryer. The burner heats the process air to an elevated temperature (400°-1200° F), and is responsible for controlling the energy balance of the system. The energy control is achieved by monitoring the process control thermocouple located at the discharge of the dryer. The drying system utilizes a PID loop (via the PLC) to maintain a set point by controlling the firing rate of the burner.

The burner is typically a direct fired gas burner complete with flame supervision system, fuel train, etc. Other fuel options include: propane vapor, fuel oil, or an indirectly heated system.

INLET ZONE (ZONE 1)

The Inlet Zone achieves size reduction (when applicable) and the majority of moisture evaporation. This is accomplished by a highly turbulent agitator area and efficient mixing area utilizing adjustable paddles.

The agitator plates (with a high concentration of fixed blades) work to reduce the product into small pieces and provide a highly turbulent zone for efficient heat transfer. The smaller particle allows for more efficient heat penetration into the material and also allows the moisture to more readily escape to the surface as a vapor. High velocity achieved in this zone, 11,000-12,000 ft/min, further aids in the efficient transfer of heat to the material. This combination, velocity and agitation, working in concert with a high temperature differential results in efficient and rapid evaporation. This zone of the dryer is sometimes considered the "flash zone" of the unit.

Further downstream in the first zone are a set of adjustable paddles that allow for back-mixing. Product that is still moist and potentially sticky will continue to be agitated and back-mixed via the adjustable paddles until it can be carried into the next zone by the airflow. The back-mix process is continuous with some product being carried over as new product is introduced.

At the division between Zone 1 and Zone 2 is a set of air dams. The purpose of these dams is to classify the product. Material that is dried enough to be free flowing and easily conveyed by the air stream can pass on to the next zone.