

Pneumatic Boiler Feed Systems

Pneumatic Direct Injection and Portable Boiler Feed systems for feeding biomass and alternative fuels, including woody biomass, agricultural or refuse derived fuels into boilers and kilns

Fuel Feed Systems

Jeffrey Rader Boiler Fuel feed Systems are made up of a combination of storage, reclaim, conveying and feeding equipment. Jeffrey Rader works closely with the customer to ensure that the feed systems are designed to meet the storage, metering and feed rate requirements of the boiler whether is feeding 100% biomass or co-firing biomass with coal. Jeffrey Rader Systems are in operation today at fuel feed rates of 3 to over 200 tons per hour.

Typical equipment can include:

- Boiler Front Day Bins, Silos and Hoppers
- Distribution Screws and Conveyors
- Metering Screws
- Robbing Screws
- Expansion Joints
- Isolation Valves
- Feed Chutes
- Rotary Airlocks Feeders
- Fine Grinding Systems for PF Boilers
- Pneumatic Injection Systems
- Gravimetric and Volumetric Feed Controls

Depending on the boiler fuel specifications and design criteria, our system of equipment can be customized to achieve the objectives of the project. Inherent in the designs of Jeffrey Rader Boiler Feed Systems are the capabilities and ability of the system to react quickly to changes in fuel demand. Jeffrey Rader can offer systems for the following types of Utility or Industrial Boilers and Kilns:

- Moving Floor, Stoker or Grate Fired Boilers
- Circulating Fluidized Bed Boilers (CFB)
- Bubbling Fluidized Bed Boilers (BFB)
- Cyclone Boilers
- Cement or Lime Kiln and Pre-Calciners
- Wall Fired Pulverized Coal Utility Boilers
- Thermal Gasifiers

Fuel Storage, Distribution and Metering

The typical boiler or kiln feed system will include fuel storage, distribution and metering to the required number of feed points on the boiler or kiln. Fuel

Storage prior to injection is typically provided with Day Bins (silos, bunkers or bins near the face of the boiler).

Day Bins can be circular screw reclaimers in the bottom of silos, full live bottom screws, stokers or chains.

Fuel from the Day Bins can be discharged directly into the boiler feed spout or to a metering screw conveyor for feeding to a single boiler feed point for mechanical or pneumatic injection. Distribution to multiple feed points can be accomplished with distribution conveyors (screw or chain), robbing screws and metering feed screws. A sophisticated control system utilizing level controls, variable frequency drives and in some cases gravimetric feeders works in concert with the boiler house DCS to optimize the distribution and delivery of fuel to the boiler feed point.

Pneumatic Injection Systems

Jeffrey Rader pneumatic systems can be used to inject fuels into cyclone, fluidized bed or pulverized coal (PC) type boilers or kilns. Pneumatic Injection is generally used where the fuel must be burned in suspension and is commonly used in Cement/Lime Kiln feed systems as well as for pulverized fuel applications as is commonly found in Power Plants. At the discharge point from storage and metering system fuel will be introduced into the



GRUSH. FEED. PROCESS. CONVEY. STORE.

pneumatic system through our standard rotary air lock (ATEX Compliant if necessary). Once in the pneumatic system the material can be discharged directly into the boiler through the pulverized fuel line or into a burner directly. Jeffrey Rader designs the pneumatic system for the application taking into account the fuel characteristics, conveying distances, elevations and pressures to overcome in the pulverized fuel lines or boiler. Using positive displacement blowers and dilute phase conveying technology, Jeffrey Rader can deliver fuel directly to multiple feed points along the face of the boiler consistently and reliably at distances of over 900 feet (300 meters). This capability makes Jeffrey Rader Pneumatic Systems a good choice for retrofit applications where mechanical systems are difficult to integrate.

Fine Grinding for PF Injection

Secondary processing of fuels just prior to pneumatic injection is common in Utility PF boilers where fuel specifications call for finely ground material at low moisture contents. Jeffrey Rader can offer this technology along with the boiler feed system in order to achieve the objectives of the project.

Portable Systems



Our portable boiler feed systems are designed for customers looking to test burn alternative fuels in their

existing boiler. The system is designed to be portable and capable of being put on a standard flat bed truck for moving to different locations. This is a very economical way to get good accuracy when feeding while providing plenty of flexibility in handling a variety of fuels.



Our portable system is skid mounted with a hopper system for loading the material. A twin screw will feed the material either directly into a pneumatic system or on to a weigh belt feeder (when greater accuracy is required). The material is then blown directly into a boiler, kiln or discharged through a cyclone (when mechanical feed is used).



The system comes with an optional control system for "plug and play" capability. Other options include a Walking Floor Trailer System that eliminates the manual loading of the hopper by a front end loader.



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