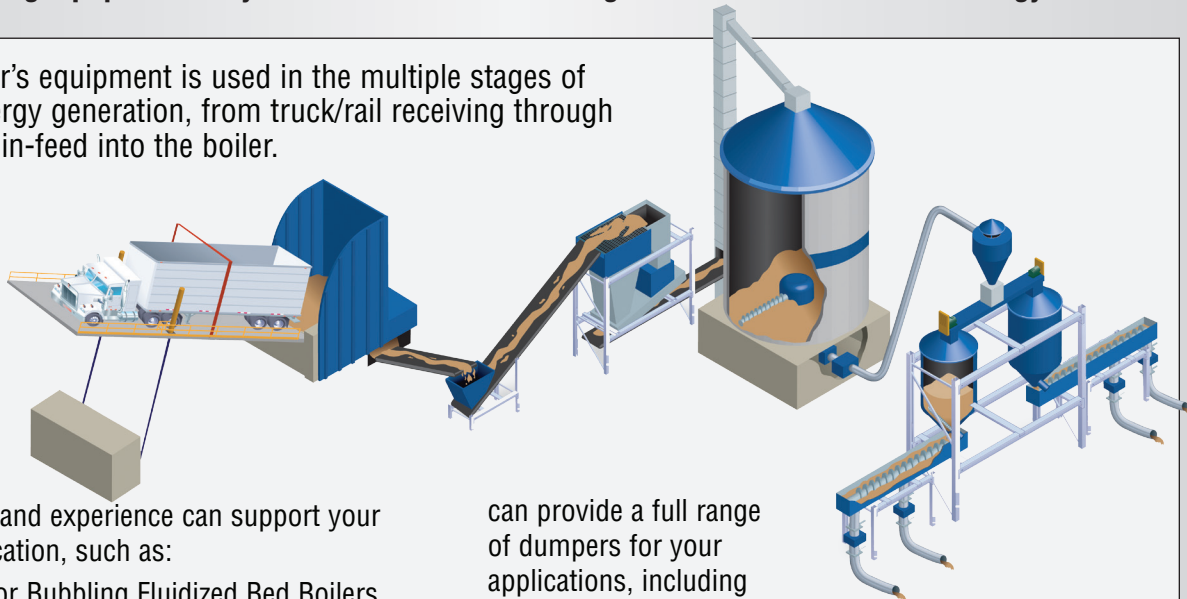


Biomass Material Handling - Systems & Equipment

Material Handling Equipment & Systems for 100% or Co-Firing of Biomass & Alternative Energy Fuels

Jeffrey Rader's equipment is used in the multiple stages of biomass energy generation, from truck/rail receiving through the metered in-feed into the boiler.



Our products and experience can support your specific application, such as:

- ▶ Circulating or Bubbling Fluidized Bed Boilers
- ▶ Stoker or Moving Grate / Floor Boilers
- ▶ Cyclone and Corner Fired Boilers
- ▶ Wall Fired Pulverized Coal Boilers
- ▶ Cement / Lime Kiln Direct Injection
- ▶ Cement Kiln Pre-calciner

Biomass and Alternative Fuels

Jeffrey Rader has experience in the processing and handling of the following biomass and alternative energy fuels, including: wood chips, waste wood / C&D Material, Bark / Hog Fuel, Sawdust, Straw, Miscanthus, DDGS, MSW / RDF, Paper Mill rejects, OCC, sludge, Tire Derived Fuel (TDF), Pellets, Cubes or Briquettes, Coal, Oil Shale and others.

Truck Dumpers and Receiving Bunkers

Jeffrey Rader manufactures truck dumpers as well as stokers, screw hoppers and chain receiving bunkers for self-unloading trucks. Our truck dumpers are designed for dependable operation under tough conditions. Proven on the job, our truck dumpers



have been an industry standard for this type of equipment since 1967. All models feature the advanced engineering and heavy-duty construction that result in fast cycle times, improved productivity and reliable performance. Jeffrey Rader

can provide a full range of dumpers for your applications, including Portables, Back-On, and Drive-Through. Our Chain and Stoker receiving hoppers are designed for reliable operations under the toughest of operating conditions.

Fuel Preparation - Size Reduction & Screening

Jeffrey Rader has over 50 years experience in screening and processing various fuels to optimize boiler operations.

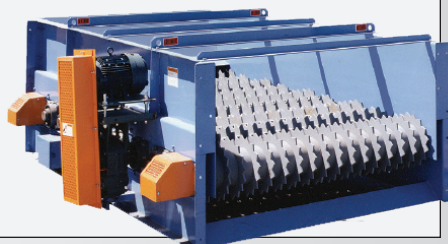


Jeffrey Rader can offer the following equipment and systems:

- ▶ Primary and Secondary Shredding & Crushing Systems
- ▶ Fine Grinding of Fuels for PC Boilers
- ▶ Air Density Separation (ADS) Systems
- ▶ Disc Screens for removal of oversized materials
- ▶ Gyratory Screens & Flexible Deck Screens
- ▶ Metals Separation

Conveying and Material Handling

Jeffrey Rader offers complete material handling systems with Pneumatic and Mechanical Conveying systems.





Jeffrey Rader pneumatic conveying can efficiently move material over a long distances and elevations and can even direct-inject into a boiler or kiln. Pneumatic conveying rates

from 1 to 200 tons per hour can be achieved with these systems.

Jeffrey Rader designs ruggedly built rotary valves, cyclones, wear back elbows, ducting and blowers for tough, high-pressure, high-volume and abrasive pneumatic conveying applications

Mechanical systems include chain conveyors, screw conveyors, bucket elevators and apron conveyors. Jeffrey Rader has over 50 years of experience in handling of biomass fuels and can offer the most reliable solutions for both mechanical and pneumatic material handling.

Storage and Reclaim

Jeffrey Rader manufactures the equipment and designs the systems you need to stack-out, store, and reclaim your wood chips, bark, hog fuel, biomass and RDF products. Jeffrey Rader storage solutions include Open Pile, Metering Bins, A-Frames, and Circular Silos. Complete reclaim systems include traveling linear screws, circular screws, stokers, cone bottom screw reclaimers and top-pile stacker/reclaimers. Whether it's open storage, closed

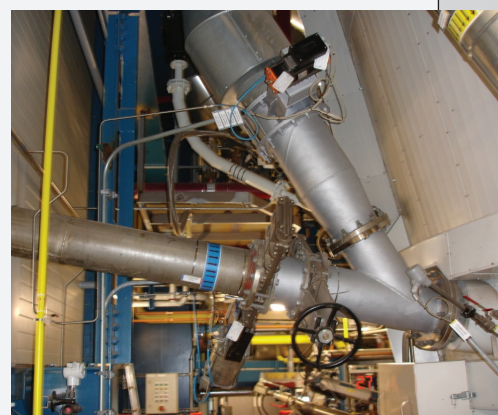


storage, circular or linear storage Jeffrey Rader has the solution. Whatever the number of days' storage you require and the type of plant you are feeding, Jeffrey Rader storage and reclaim systems are designed to keep the facility running with a constant flow of materials.

Mechanical and Pneumatic Boiler 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 it's 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 feed system equipment can include:

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



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