

## APPLICATION REPORT



### WHY GRAVIMETRIC?

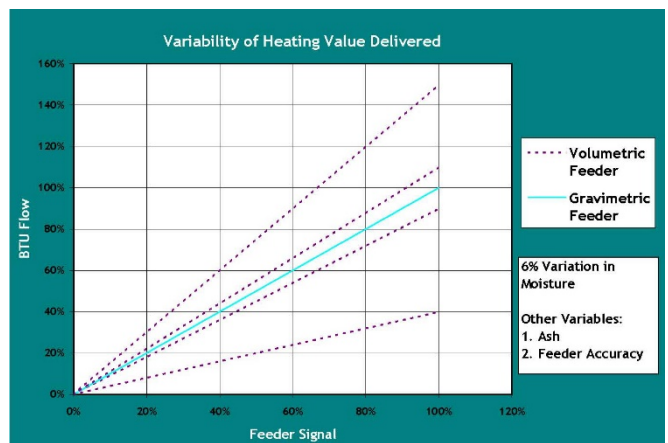
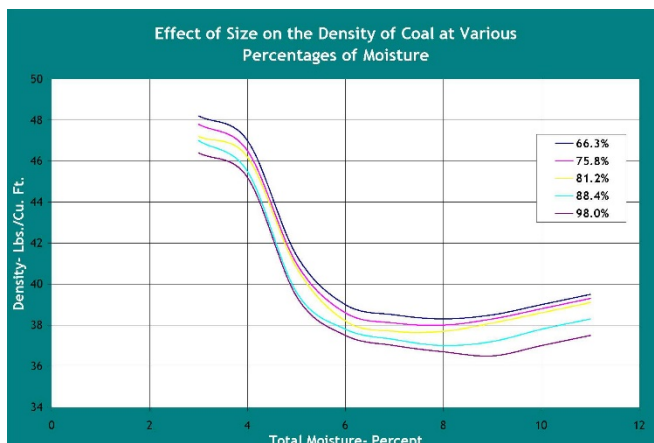
Because of its non-homogenous nature, coal properties constantly vary due to sizing differences and the adverse impact of moisture on heating value, flow characteristics and density. The effect of moisture on coal has been studied for many years by Schenck Process, research institutes and other experts who have published data illustrating how coal density decreases with increasing moisture levels. Since there is currently no effective way to measure BTU flow, this value must be inferred from either volume or weight flow.

The gravimetric feeder compensates for the variation in bulk density by feeding a known weight of coal in response to a BTU demand. This ability to accurately weigh the coal on an “as-fired” basis provides significant improvement over volumetric types in terms of matching the BTU delivered by the feeder to the actual process energy required on coal fired units.

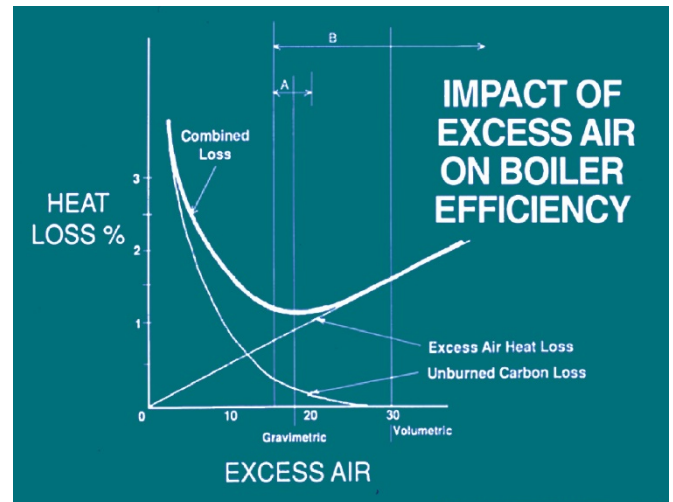
Therefore, in order to optimize boiler performance, achieve lower emissions and realize the resulting cost savings, Stock® gravimetric feeders have become the industry standard in coal fired power plants.

### Summary of Benefits

- Fuel savings through improved boiler efficiency
- Improved combustion efficiency/loss on ignition
- Improved pressure and superheat control
- Less slagging and fouling
- Stability and improved response of combustion controls
- Less NOx through better control of excess air
- Improved pulverizer/cyclone/combustor performance
- Less corrosion
- Reduced O&M costs
- Safety

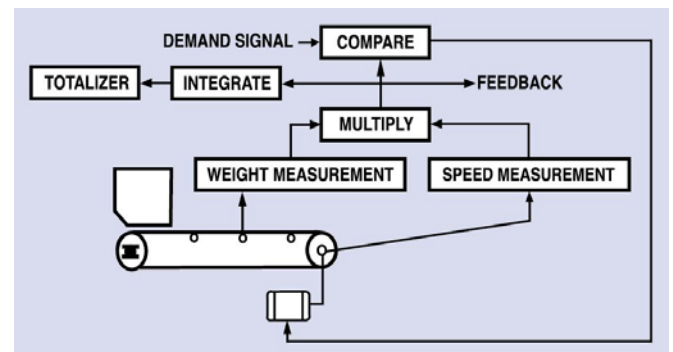


Due to the difficulties in burning coal, it is necessary for excess combustion air to be added to the furnace in order to ensure safe and complete burning of fuel. The excess air is typically 15% to 18% depending upon the volatile content of the fuel. Variations in the amount of fuel delivered to the burners due to density changes and the feeder's accuracy also requires additional air to avoid loss of carbon and unsafe conditions within the furnace. This additional air goes up the stack and represents an efficiency loss for the plant.



### Gravimetric Feeder Principle

- The gravimetric feeder weighs material on a length of belt between two fixed rollers using a weighing roller.
- Belt speed is determined by a tachometer attached to the motor shaft. A microprocessor multiplies the speed and weight signal to arrive at the feeder output.
- The microprocessor matches the feeder output to the demanded output by adjusting the feeder motor speed.



### Features of the Stock Gravimetric Feeder

- Precision "V" guide belt tracking system with automatic tensioning feature
- 50 psi (3.5 barg) body design in compliance with CE, ATEX and NFPA Code 85 Boiler Code requirements for pulverized coal feed systems
- DT-9 Microprocessor control system
- Dual Load Cell weighing system with precision weigh and span rollers
- Integral calibration system using test weights, not "dummy" simulation
- No-leak vertical gear reducers and motor assembly with VFD control
- Head pulley machined flat - no crown - for higher accuracy
- Take-up blocks with thread cleaning mechanism maintains clean screws for ease of operation
- Accuracy verification within  $\pm 1/4$  to 1% - or better - for fuel accountability and actual usage data in most feeder types



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