

RotoFeed® Carbon Injection to EAF

- Gravimetric Flow Control with better than $\pm 1\%$ accuracy
- Injection distance only limited by available air pressure
- Fixed air flow resists plugging irrespective of injection rate
- Up to 10:1 turndown range
- Can be programmed to follow a “recipe” reducing operator input
- Automatic calibration update at each heat
- Easily integrated with existing furnace control
- Multiple injection points from single vessel if required
- May be retrofit to existing carbon injection vessels for cost savings



Application

The RotoFeed® system has been applied in the iron and steel industry worldwide. Originally developed by Clyde Process for coal injection to blast furnaces, and now with many installations on blast furnaces worldwide. RotoFeeds are also used for solids injection on many alternative iron-making processes such as, Corex®, Finex® and Hysmelt®.

Operating Principles

The batch RotoFeed® assembly includes a Spheri Valve® to control vessel filling, a vessel to hold the batch (ASME pressure vessel), a RotoFeed® at the discharge to control injection rate, and valves/instruments to control gas flow and pressure.

The RotoFeed® is a volumetric device driven by an electric motor and gearbox. Using a variable frequency drive, the speed of the RotoFeed® can be varied to provide the required injection feed rate, with predictability and accuracy. Different models are available for feed rate ranges as low as 2-10 lbs per min and as high as 400-2,000 lbs per min (at 50pcf bulk density).

The RotoFeed® is unaffected by the typical operational events that cause other systems to block up or lose feed accuracy:

- Change in material head pressure above the feed control device.
- Change in injection port back pressure.
- Changes (within reason) in material size analysis.
- Material segregation in the injection vessel

The gas flow through the RotoFeed® is fixed, (using orifice plates to avoid tampering) at the level needed to support reliable, efficient carbon transport at the maximum injection rate. Competitors who use pressure differential to control material flow must vary the gas flow rate with material flow change. This also can lead to blockages as well as limiting the turndown capability of the system.

These features make RotoFeed® ideal for carbon injection for slag foaming and chemical energy needs in the EAF. There are currently 20 EAF's in North America operating RotoFeed® carbon systems with additions expected this year.

Features

Feeder components are wear protected with tungsten carbide coatings and use of alloy steels. 3-5 year feeder life is typical between re-builds.

All RotoFeed® assemblies that can be shipped in one piece are fully assembled and functionally tested prior to shipping, for faster installation and start-up.

Pneumatic controls and instrumentation are included on the vessel frame with all connections complete. RotoFeed® can be retrofitted to existing injection vessels, providing much improved control and reliability at lower costs than complete new system supply.

For injection to more than one furnace port, RotoFeed® with two or three discharge ports are available.



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