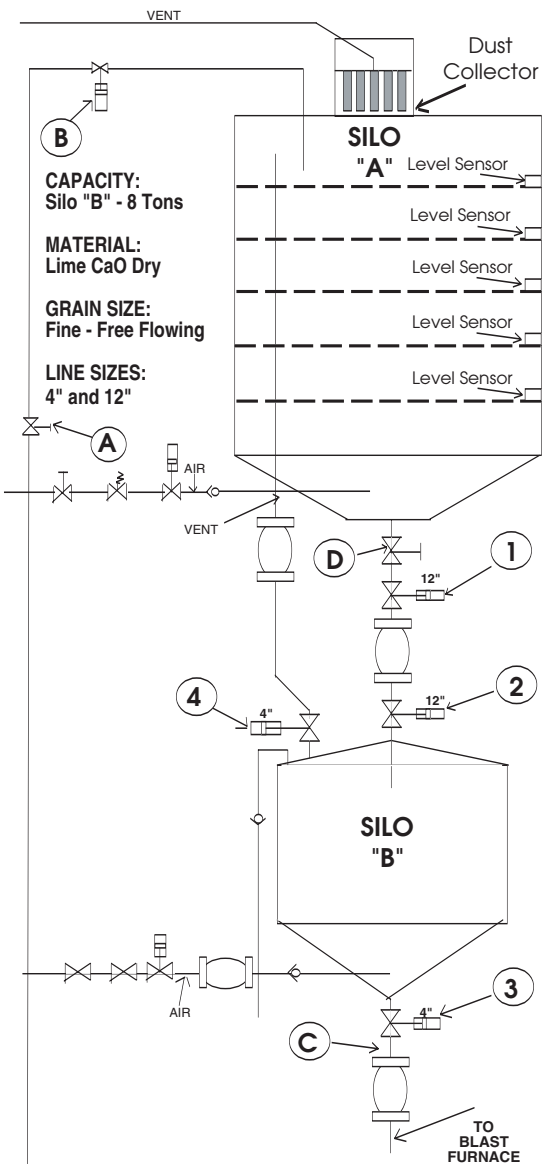
Founded in 1953
Red Valve Company, Inc.

Steel application study

Iron Ore Reduction • Type A Pinch Valve



P_1 = 6 kg/cm² CaO at 90° C (180° F) Max Temp.

A Steel Mill in South America has successfully tested, and uses, Red Valve Type A Pinch Valves on dry Calcium Oxide in fine grain size on their continuous casting steel process. The Calcium Oxide is used to mix oxygen with the molten steel. The Calcium particles combine with impurities in the steel to produce surface slag in the blast furnace. This is the primary reduction of Iron Ore using the HYL: Davy McKee process.

This process ultimately produces steel from iron pellets mixed with scrap iron. When melted, the impurities (combined with the Calcium Oxide), form a surface slag to ease their removal.

In the drawing on this page, valve number 3 was a butterfly valve and was replaced by a Type A Valve. The butterfly valve obstructed the gravity flow of the fine mesh Calcium Oxide grains which increased the discharge time, and also became a maintenance problem due to abrasion from the grains.

Valve (A) is a Type A Pinch Valve applied on a main Pneumatic conveyance transmission line feeding to several storage silos. Valve (B) is a Type A Pinch Valve applied on the main silo inlet pressure of application 6Kg/Cm2 at 90 degrees C. These valves replace 4" Butterfly Valves that were being repaired every three months.

The Red Valve Type A Valves have a service life in this application of at least 12-24 months, being cycled 10-20 timers per day.

Valve (C) is being used as a tank outlet control of dry Calcium Oxide in gravity feed discharge to the blast furnace and is cycled one time every six hours to empty silo (B) in three minutes. Formerly, the butterfly valve in this location caused flow problems during it's rotation. The vane caused Calcium Oxide upstream to compress and then plug the outlet such that the flow would not begin for 15-20 seconds. The Type A valve allows flow to begin immediately, and time is critical at this point of the cycle.

Valve (D) is a Series D Knife Gate Valve for isolation purposes only. Each silo has the potential to use six Type A Valves, one Series D Slurry Knife Gate and three Series 75 Manual Pinch Valves.

There are eight silos in this continuous casting Steel Mill. There are many other continuous casting mills that use a similar process and can benefit from the use Red Valve products similarly.