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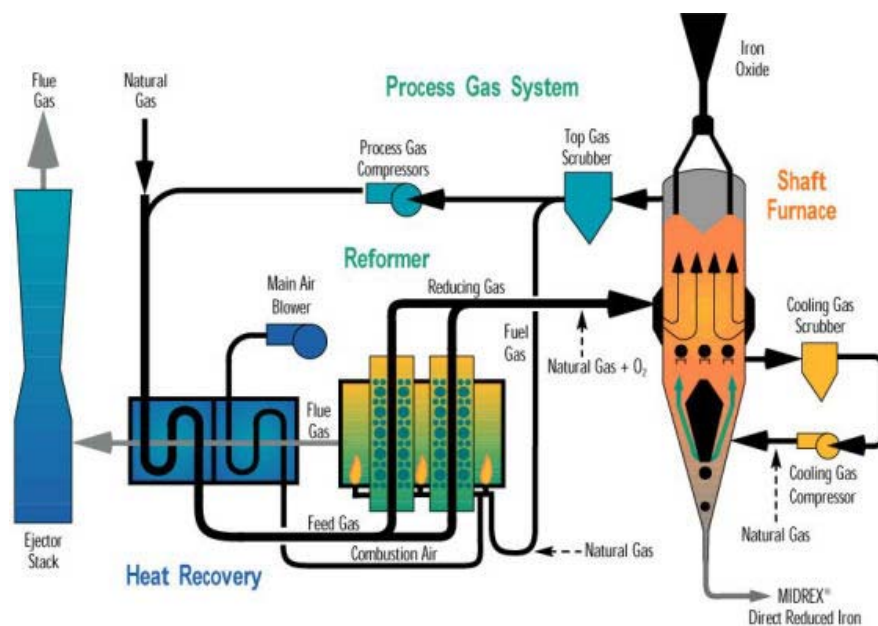
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The MIDREX® Process consists of three major stages: 1) reduction, 2) reforming and 3) heat recovery.

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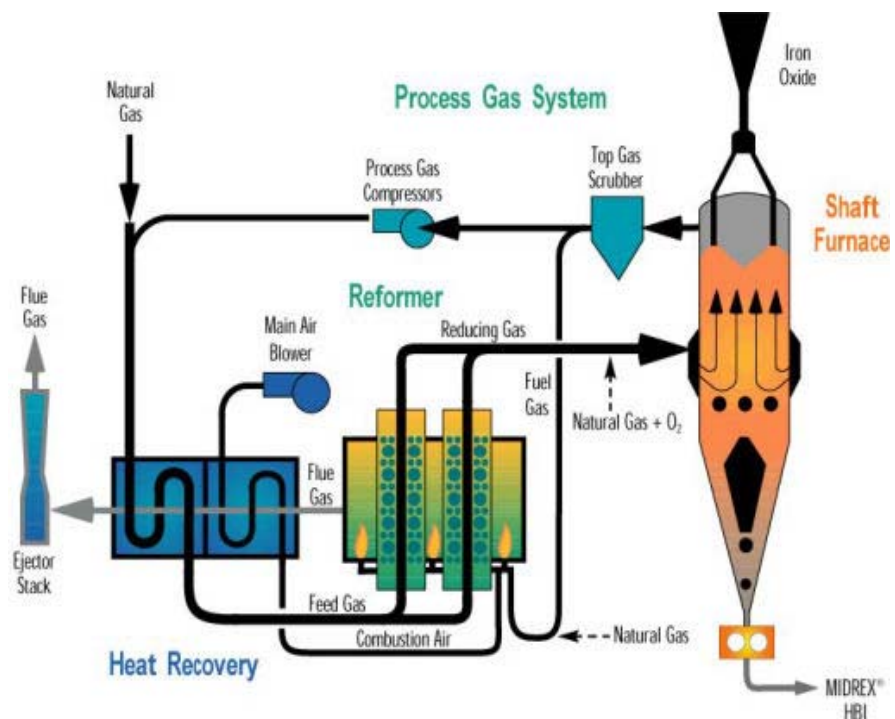
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Reduction

Iron oxide, in pellet or lump form, is introduced through a proportioning hopper at the top of the shaft furnace. As the ore descends through the furnace by gravity flow, it is heated and the oxygen is removed from the iron (reduced) by counterflowing gases which have a high H_2 and CO content. These gases react with the Fe_2O_3 in the iron ore and convert it to metallic iron, leaving H_2O and CO_2 . For production of cold DRI, the reduced iron is cooled and carburized by counterflowing cooling gases in the lower portion of the shaft furnace. The DRI can also be discharged hot and fed to a briquetting machine for production of HBI, or fed hot, as HDRI, directly to an EAF, as in the HOTLINK® System.



Reforming

To maximize the efficiency of reforming, offgas from the shaft furnace is recycled and blended with fresh natural gas. This gas is fed to the reformer, a refractory-lined furnace containing alloy tubes filled with catalyst. The gas is heated and reformed as it passes through the tubes. The newly reformed gas, containing 90-92 percent H₂ and CO, is then fed hot directly to the shaft furnace as reducing gas.

Heat Recovery

The thermal efficiency of the MIDREX® Reformer is greatly enhanced by the heat recovery system. Sensible heat is recovered from the reformer flue gas to preheat the feed gas mixture, the burner combustion air and the natural gas feed. In addition, depending on the economics, the fuel gas may also be preheated.