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Cold Agglomerated Iron Ore Pellets Industrial Trial – High quality manufacturing and their performance in the Blast Furnace

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Binding Solutions Ltd have developed a cold agglomeration technology that considerably reduces the CO2 emissions associated with agglomeration of iron ores for the blast furnace process. Bespoke tests have proven the metallurgical performance of these cold agglomerated pellets at temperatures well above those used in ISO standards.

Using the company's own pilot plant in Middlesbrough, UK, 300 tonnes of pellets was produced using a Canadian concentrate and a binder formulation of less than 3%. A comprehensive monitoring and control system was put in place, consisting of hourly checks on the Cold Compressive Strength (ISO4700:2015), twice daily testing of Tumble and Abrasion Index (ISO3721:2015) and RDI-2 (ISO4696-2:2015) methods. Representative samples were tested for high temperature degradation using Interrupted HOSIM tests at 750℃, and complete HOSIM tests of around 3 hours. The HOSIM tests were undertaken internally using a gas composition profile designed to replicate 190 kg/thm coal injection at 8% oxygen enrichment.

Various physical properties of the pellets were also monitored to ensure process consistency. These included but not limited to Pellet weight, Pellet thickness, Moisture content of both the mix and the cured pellets. A system was developed to provide real time feedback to the operators to allow them to see variations in the pellet properties and therefore make process changes to improve the overall performance of the pellet.

The pellets will be charged into Queen Bess blast furnace, British Steel, at 8% for a day. Their impact on process stability will be closely monitored for signs of gas channelling and poor burden descent. The effect on thermal state will be monitored. Additional sampling from the dust catcher during and after the trial will be implemented.

The purpose of the trial is to ensure no adverse impact on process stability, following which a larger scale trial will be planned.

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