

Technical definition and description

[Linguistics](#), [English](#)



Technical Definition and Technical Definition and Steel refers to alloys made up of a large amount of iron combined with carbon. There may also be additional elements in different quantities. The composition of steel depends on the quantity of elements in the alloy. This will help control the levels of the alloying elements during its manufacture. Steel making occurs after iron ore is transformed into steel through two key processes. One, there is the development of iron ore, and two, the steel manufacturing process. The processes take place in a blast furnace, in a massive manufacturing plant. There are three processes involved in making steel. They include Vanadium recovery, The Klockner Oxygen Blown Maxhutte process, and Ladle treatment (Warren, 2001). The process helps in proper management of the different stages of manufacture and the final product. This paper will look at the processes involved in making steel.

Step 1- Vanadium Recovery

Vanadium is retrieved from the molten iron before it is converted to steel. This is because a large vanadium composition may make the steel extremely hard and there is a high value of the vanadium rich slag that is produced. Oxygen is blown over the surface of a ladle made up of 75 tonnes of molten iron in the vanadium recovery unit. The Oxygen oxidizes vanadium, silicon, manganese and titanium to create a slag that soars on the surface. Also, stirring is done by blowing argon in the molten metal. The slag is removed, chilled and compressed when the constitution of the molten metal has attained the needed vanadium condition. This pretreatment makes the metal to heat, allowing temperature management. In addition, if there is a need, the process can be developed by adding lime to lessen sulfur amounts (Warren, 2001).

Step 2- The Klockner Oxygen Blown Maxhutte process This

process entails blowing oxygen in the molten metal to oxidize molten impurities. The Klockner Oxygen Blown Maxhutte process is remarkable because it blows oxygen through the lance placed on top of the furnace and the lower part of the furnace. This furnace can handle extreme levels of vanadium and titanium fixed with its extremely quick turnaround period. In contrast, this furnace is disadvantageous because it is more complicated than the ones blown by only a lance. The Klockner Oxygen Blown Maxhutte handles almost 6 tonnes of steel fragments. There is an addition of 70 tonnes of molten iron from the vanadium recovery process in the The Klockner Oxygen Blown Maxhutte. Then, Oxygen is blown in the bottom holes of the furnace, at a speed of almost 1500 liters per second. In addition, Oxygen is passed via a lance at the pinnacle of the furnace at a tempo of almost 2500 liters per liter (Warren, 2001). The Oxygen oxidizes the components except iron to form oxides. This process helps to remove contaminants. This is because the oxides create a slag that appears on the top of the molten metal. The process of slag formation is further enhanced by powdered lime, which is blown in the furnace. In particular, this lessens the quantity of phosphorous and sulfur by merging with their acidic oxides. Iron (III) sulfide is hazardous to steel because of its low melting point. This necessitates the reduction of sulfur amounts before advancement of the process. There is an analysis of the molten iron before being inserted in the furnace and temperature is recorded. This has an impact on the composition and quantity of the scrap being added and helps to establish the duration of the Oxygen blown. The CO: CO₂ ratio in the gases contained in the furnace determines the duration of the Oxygen blown. The standard blow time is

fifteen minutes (Warren, 2001). Step 3- Ladle treatment Ladle treatment is the final stage of steel making. This stage entails making suitable adjustments carry the constitution of the molten steel from the furnace in procession with the entailed composition. The large part of the alloying components are inserted in the furnace, then the temperature is determines and a proportion is taken for assessment after stirring, after passing argon in the molten metal to guarantee uniformity. The analysis may be done by optical emission spectrometry. This analysis determines the quantity of fifteen components and lasts for almost five minutes. In addition, the composition is modified by adding alloying materials. Also, scrap metal may be introduced if the metal needs cooling. Aluminum may also be incorporated, and Oxygen blown through if the temperature is too minimal. Argon is blown through for a second time to guarantee mixing, and the ladle carried to the constant casting machine after adjustments are concluded (Warren, 2001). The majority of manufacture is translated to steel coil.

References Warren, K. (2001). Big steel: The first century of the United States steel corporation, 1901–2001. Pennsylvania: University of Pittsburgh Press.