TATA STEEL

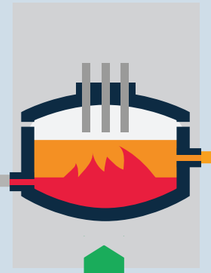
How electric arc furnace (EAF) steelmaking works

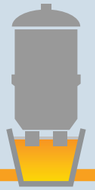
Scrap steel

Scrap is generated by consumers (for example food cans and aerosols) and manufacturers that process steel and make steel products. Scrap can be recycled infinitely. Additional iron may be added in the form of HBI (Hot Briquetted Iron), Pig Iron or Direct Reduced Iron.

Electric arc furnace

An EAF melts scrap steel using a powerful electric arc generated between electrodes and the raw materials. Oxygen is blown into the furnace to purify the steel.



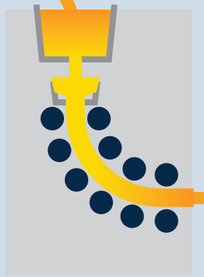


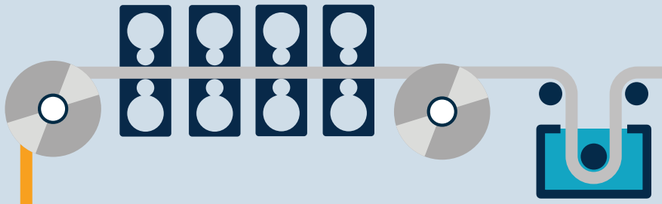
Refining

Impurities are removed through chemical reactions and degassing, to produce for example ultra low carbon steel grades used in formable steels.

Continuous casting

Transforms molten steel into solid rectangular slabs. The water-cooled mould forms a solidifying shell on its surface. This efficient process minimises impurities and improves mechanical properties.





Rolling and downstream processing

The hot slabs pass through a series of rollers. This mechanical pressure shapes and thins the steel, enhancing its strength and altering its dimensions. The process refines the steel's grain structure, boosting its mechanical properties. After this the steel can be pickled, cold-rolled, annealed, coated, painted, formed or made into tubes to suit customer end use applications

Energy

Energy is supplied principally in the form of electricity, which in the future could be supplied from 100% renewable sources including offshore wind.

Applications

EAF steel can be used in a very wide variety of end use applications including construction, automotive, household appliances, heavy vehicles, food packaging and much more.