

FERROUS METALS AND ALLOYS

FOR DETAILED INFORMATION ON MATERIALS GO TO:
http://www.technologystudent.com/despro_fish/materials_main1.html OR <http://www.technologystudent.com/joints/joindex.htm>

FERROUS METALS - IRON

Wrought Iron was used by the Romans. Roman iron weapons were forged, not cast. Iron was forged by heating it to high temperatures (to red heat) and hammering it into shape. Britain had numerous Roman iron ore mines. It also had large forests, which provided the wood required for smelting (extracting the iron from the ore)

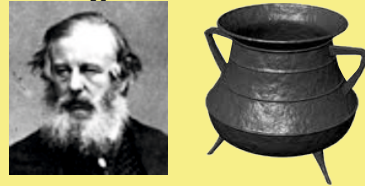


FERROUS METALS - IRON - INDUSTRIAL REVOLUTION

Abraham Darby 1st (1678 –1717)

Developed a technique of producing 'pig iron' in large quantities, through casting molten iron, crucial to the industrial revolution. He developed sand casting techniques, making it possible to produce cast products of a high standard.

Abraham Darby 1st



FERROUS METALS PROPERTIES OF IRON

Cast iron has a carbon content higher than 2.1%. Cast iron is brittle and can snap. Cast iron is likely to break/shatter if dropped or when it receives a 'blow'.

Products include; cast iron garden furniture, house numbers, weathervanes and vices.



METALS- WHAT IS AN ALLOY?

An alloy is a metal (parent metal) combined with other substances (alloying agents), resulting in superior properties such as; strength, hardness, durability, ductility, tensile strength and toughness. The parent metal is the majority of the alloy. For example, mild steel is 0.1 - 0.3% Carbon and 99.9 - 99.7% Iron.



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FERROUS METALS THE ALLOY STEEL

Iron is the most used metal in the world, largely due to it being the main constituent of the alloy steel.

Common steel typically has 0.2 to 2.1% carbon content, with the rest being iron.

Our modern world relies on steel

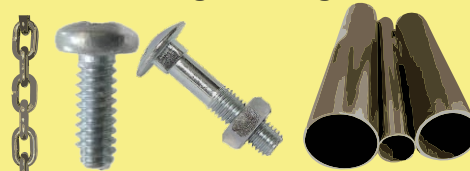


FERROUS METALS - MILD STEEL

Carbon 0.1 - 0.3%
Iron 99.9 - 99.7%

Alloy of carbon and iron. Tough. High tensile strength. Can be case hardened. Rusts very easily, unless the surface is protected from moisture.

Most common metal used in school workshops. Used in general metal products and engineering.



FERROUS METALS CARBON STEEL

Carbon 0.6 - 1.4%
Iron 99.4 - 98.6%

Alloy of iron and carbon. Higher carbon content than mild steel. Tough and strong. Carbon steel can be heat treated e.g. hardening and tempering. Used for cutting tools such as drills and lathe tools.



FERROUS METALS STAINLESS STEEL

Alloy of iron, nickel and 10.5% to 11% chromium.

Tough, resistant to rust and stains. Does not corrode. Cutlery, medical instruments, specialist corrosion resistant products such as pipes. Stainless steel pots and pans. Jewellery and watches.



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