

steel

steel is an alloy of iron and carbon;

iron is a metallic element with symbol fe and atomic number 26;

iron and iron alloys are by far the most common metals in everyday use;

steel with a higher carbon content is harder and stronger but is more brittle;

the 19th century invention of the bessemer process turned steel into a mass produced and relatively inexpensive material;

the most common type of steel in construction is mild steel which contains 0.15-0.29% carbon by weight. it is neither brittle nor ductile and has a low tensile strength but is cheap and malleable;

it is far cheaper to recycle steel than to mine iron ore to make new steel, none of its inherent physical properties are lost and as such the steel industry has been actively recycling since it began;

the earliest known production of steel is a piece of ironware excavated from an archaeological site in anatolia and is about 4,000 years old;

tata steel is india's second-largest company and was also recognized as the world's best steel producer in 2005;

the kalkriese museum and park uses 700 tons of steel which is low in carbon and enriched with phosphor, copper, chromium and nickel. this reacts with the air to form a protective oxide layer on the surface, commonly known as rust.



the pyramids of egypt built in stone masonry have stood since 2000 b.c.

stone aggregates are used to filter water as part of the purification process;

15,000 tons of stone aggregates are required for the construction of an average sized school or hospital;

stone aggregates make up 94% of asphalt and 80% of concrete pavements;

india is the largest producer of stones in the world;

38,000 tons of stone aggregates are necessary to construct one mile of a four lane highway;

riprap and armour stone are materials used to prevent erosion along the rivers and shoreline;

throughout world war 2, airfields in china were constructed by fitting stone to create surfaces suitable for takeoffs and landings.

brick

bricks have been found dating from around 7000 bc;

jetavanaramaya stupa in sri lanka is one of the largest brick structures in the world;

brickwork has little tensile strength and works by everything being kept in compression;

brickwork can be made from clay, shale, soft slate, calcium silicate, concrete, or quarried stone;

the tools of a bricklayer are brick trowel, pointing trowel, spirit level, lines and pins;

clay bricks are formed in one of the processes - soft mud, dry press, or extruded;

the highest brick building is st. martin's church landshut, germany, with a height of 130.5 metres;

in 2007 a new type of brick was invented, based on fly ash, a by-product of coal fired power plants;

brick masonry has a good heat resistance, thus can provide good fire protection;

the manner in which the bricks overlap as they are laid is called the bond;

brickwork arches can span great distances, and carry considerable loads;

glass

glass is an inorganic product of fusion, cooled to a rigid condition without crystallizing;

it is made of sand, soda ash and limestone;

it takes 1,000,000 years to decompose;

the first glass vessels were produced about 1500 b.c. in egypt and mesopotamia;

glass is 100% recyclable and can be endlessly recycled with no loss in quality;

each ton of recycled glass replaces 1.2 tons of raw material;

as of 2007, the world float glass market is dominated by four companies: asahi glass, nsg/pilkington, saint-gobain, and guardian industries;

soda-lime glass is the most common type of glass which appears colourless to the naked eye when it is thin;

manganese dioxide can be added in small amounts to remove the green tint in glass;

75% of the total glass market is for glass use in buildings;

naturally occurring glass, obsidian, has been used by many stone age societies for the production of sharp cutting tools;

large expanses of glass can cause buildings to overheat in the summer months;

tinted glass is available mainly in bronze, grey and green;

fritting is small dots placed on glass windows or skylights to allow light in but limit heat gain.

concrete

the name derives from latin concretus, meaning hardened;

it is made of portland cement, aggregate, water;

it hardens after mixing with water due to hydration;

béton brut is the architectural term for raw concrete;

concrete works well in compression but can be cast around steel bars to improve its tensile strength;

china currently consumes 40% of world's concrete production;

ships were built out of concrete in the 1800s;

it is used more than any other man-made material;

invented by the romans the secret of concrete was then lost for 13 centuries until 1756;

the romans believed adding horse hair made concrete less liable to crack and adding blood made it more frost-resistant;

a layer of concrete can be used for fireproofing steel structures, although concrete can be damaged by fire;

pervious concrete contains a network of holes or voids, to allow air or water to move through it.