Minerals Trivia

The gold medals presented to winners at the 2012 Olympics are not solid gold – they'll be mostly silver (92.5%) and copper (6.16%) with just a pure gold coating (6 grams of gold). It will weigh between 375 and 400 grams and have a diameter of 85mm and is 7mm thick.

One of the first events to be held in the 2012 Olympics will be the cycling road races through the streets of London. The bikes are made of alloys containing iron, magnesium, titanium, chromium, molybdenum, aluminium and manganese that are very lightweight yet very strong.

The new Aquatics Stadium has been designed to look like a wave. The roof will be 160m long and up to 80m wide. This steel structure will be covered with 11,000 square metres of aluminium panels. Steel was chosen because its alloys are tough, resistant to rust and easily shaped into clever designs such as this wave like structure. More pictures of the Aquatics Stadium can be found at www.london2012.com/aquatics-centre

More than 30 bridges have been built at the Olympic Park site to allow visitors easy access to all the venues. Strong durable steel would have been involved in building these structures along with the Olympic Stadium where the opening and closing ceremonies will be held. In fact 10,000 tonnes of steel was used in its construction. More information about how all the venues have been constructed can be found at http://www.london2012.com/venues

The venue for the handball competition known as the "Copper Box" features more than 3,000sq m of external copper cladding – mostly recycled – to give it a distinctive appearance that will develop a rich natural colour as it ages.

The results in the 100 metre sprints can be so close that the naked eye could not pick the winner. Modern electronic equipment, using a vibrating **quartz** crystal, can measure athletes' times to within 1/1000th of a second! Electronic components also contain **silicon** and metals such as **gold, silver, copper** and **platinum.**

Imagine field events such as the shot put, high jump, discus, hammer throw and javelin without metals to make the equipment. A shot put made of wood (instead of heavy **iron, brass** or **stainless steel**) wouldn't test the athletes' strength very much, would it?

Sailing is also an Olympic event and it would be impossible for the yachts to keep upright in strong winds without their very heavy **cast iron, steel** or **lead** keels; or to sail efficiently without their lightweight yet strong and flexible masts, booms and spinnaker poles made from alloys of **aluminium, copper, silicon** and **magnesium.**

It is not only the Olympic events that depend on the amazing properties of metals and minerals in some way! Hundreds of thousands of people will travel to and round London in planes, boats, trains, cars, buses, motorbikes and bikes all made from many sorts of minerals and metals. Every moment everyday people depend on items made from our earthy resources.

Where would the Olympics be without all these metals and minerals!

Olympics 2012 A-Z of Minerals and Metals

Aluminium

Rust-resistant, able to be shaped, lightweight yet strong, aluminium is the basis for many types of sports equipment in the Olympics - from the upright posts of a high-jump crossbar to the frame and pedals of a state-of-the-art racing bike or the masts, booms and spinnaker poles of racing yachts. Aluminium has been used to make the panels for the roof of the new Aquatics Stadium Perhaps its most important and visible use is in the construction of the Olympic torch which will travel from Greece and throughout the United Kingdom before arriving at the Olympic stadium for the lighting of the cauldron!

Copper

Due to its special pink-brown colour, its electrical and heat conductivity and its ability to be shaped, copper is multifunctional, making an appearance in many areas of the Olympics. Copper is found in all the Olympic medals – about 6% in the gold and silver medals and 97% of the bronze medals are copper. Other uses include electronic devices, electrical devices such as lights and heaters and the heater coil inside the torch. The venue for the handball competition known as the "Copper Box" features more than 3,000sq m of external copper cladding – mostly recycled – to give it a distinctive appearance that will develop a rich natural colour as it ages.

Gold

Where would the Olympic Games be without beautiful, shiny medals coated with gold and placed around the necks of the winners? Gold is also used in essential electronic devices such as timing and scoring equipment.

Iron

As a heavy metal, iron is useful to make shot puts, the rims of discus, arrow heads and the keels of Olympic yachts to keep them stable and upright. However iron's main use is to make steel. When alloyed with other metals, steel is tough, rust resistant and easy to shape. It is therefore the main construction material for the various Olympics venues including the new Olympic stadium and the aquatics centre. Steel is also used in sports equipment including bike pedals, the hollow tube of javelins, an archer's bow, weight lifting equipment and the base of high jump bars.

Quartz

A vibrating quartz crystal is used in electronic equipment to measure the times of athletes, swimmers and other competitors to within 1/1000th of a second! Quartz is also used to make glass.

Silver

Silver reflects light very well, and because of its shiny appearance as well as its strength. One use in the Olympics is to make the medals – but not just the silver medals, even the gold medals must contain over 92.5% silver! Silver is also used in electronic devices as it is a very good electrical conductor. Silver is also used in the photographic and film industries ensuring all the highlights of the Olympics are captured.

Magnesium

Even lighter than aluminium, magnesium is also used in many pieces of sports equipment. However, perhaps its most visible use will be in the fireworks display for the opening and closing ceremonies. Magnesium powder burns with a bright white flame.

Titanium

Titanium's amazing strength yet light weight makes it very useful for various sports equipment including bike parts, yacht masts, badminton and tennis racquets. It's most important role in the Olympics, however, will be as titanium dioxide, used as the basis of all paints. So you will 'see' titanium dioxide in the paintwork of the Olympic venues and in the markings on athletic tracks and swimming pools, helping to keep the competitors in their lanes!

Zinc

As the "Great Protector", zinc is used to coat steel (on the Olympic buildings and other metal structures) to protect them from rusting. A tiny amount of zinc is also used in the bronze medal. Perhaps many of the spectators will be using zinc based sunscreens to protect them from the sun's rays.

References

Olympic Minerals 2000, Minerals Council of Australia

Official London Olympic website: www.london2012.com/

Images Courtesy London Olympic Games Organising Committee