



These stainless steel pots contain nickel

Nickel is not as well known as other metals, but it plays an important, if invisible role in modern life. It has some very useful properties, and when it is mixed with other metals it helps create amazing alloys that are strong, won't rust, can withstand high and low temperatures, and can be easily shaped into anything from thin wires to flat sheets. For example, nickel is one of the metals added to iron to make stainless steel - an extremely useful product! And if you have ever wondered why a 20 cent coin is more silver-white in colour than a \$1 coin, it is due to the relative amounts of nickel.

PROPERTIES

- Nickel is a hard silver-white metal.
- Nickel has a high melting point (1453°C).
- Nickel can also withstand very low temperatures.
- Nickel is rarely found in the earth in its pure form.
- Nickel mixes well with other metals to make many useful alloys.
- Nickel is malleable and ductile (can be beaten and drawn out into a wire).
- Nickel is rust-resistant.
- Nickel is magnetic, although not as strongly as iron.
- The word nickel comes from the Saxon term 'Kupfernicker' or Devils' Copper. Fifteenth century miners thought the ore looked red-brown like copper. Also it was difficult to mine and was thought to poison them (actually it was arsenic doing this!).
- Its symbol is Ni.

USES

USE	DESCRIPTION
Alloys	More than 80% of nickel is used to make alloys, as nickel adds toughness, strength, rust resistance and various other electrical, magnetic and heat resistant properties. At least 3000 nickel alloys have been created, including stainless steel. These alloys are used for many purposes in construction, the chemical industry, cars (crank-shafts and axles), household products (kitchen sinks, cooking utensils, washing machines etc), propeller shafts, scientific and surgical equipment, pipelines and aircraft engines.
Batteries	Nickel-cadmium rechargeable batteries, used to power mobile phones, radios, clocks and calculators.
Coins	Nickel was first used for coinage in Belgium in 1860, and has been widely used since then. Australian \$1 and \$2 coins contain 2% nickel (with 92% copper and 6% aluminium), and our 5c, 10c, 20c and 50c coins contain 25% nickel (with 75% copper).
Other	To electroplate steel or brass articles - office furniture, bathroom fittings and motor cycles . It gives a hard, shiny surface which resists tarnishing (usually then covered with a thin chromium topcoat). Production of soaps and margarine (helps convert natural oils to solids). In some jewellery. Artificial hips and knees and kidney dialysis machines. Electrical contacts and components.



These "silver" coins actually contain 75% copper and 25% nickel

AMAZING FACTS

- The Earth's magnetic field is due to the iron and nickel in its core.
- The ancient Chinese used nickel alloys, calling them 'paktong'.
- It was 1751 before nickel was first isolated, by a Swedish chemist, Alex Cronstedt.
- In the 19th century, nickel was popular for making items such as cutlery. However, in 1889 James Riley, in a speech to the Iron and Steel Institute of Great Britain, declared that tests showed that steel containing nickel gave the alloy almost unbelievable strength. From then on, nickel alloy steels became vital materials for a whole range of uses.
- There was an especially big demand for nickel in the two World Wars, to make armour plate for vehicles.
- Lockheed Missiles and Space Company Inc. have made a stainless steel test chamber in California to replicate the cold vacuum (low pressure) and solar heat of outer space. The stainless steel is made from 372 tonnes of nickel.

FOR FURTHER INFORMATION

- Fact Sheet: Nickel, Minerals Council of Australia and Australian Geological Survey Organization, 1999
- Nickel, Minerals of Western Australia Series #9, The Chamber of Minerals and Energy of WA Inc.