71.10 - Platinum, unwrought or in semi-manufactured forms, or in powder form.

- Platinum :

7110.11 - - Unwrought or in powder form

7110.19 - - Other

- Palladium :

7110.21 - - Unwrought or in powder form

7110.29 - - Other

- Rhodium :

7110.31 - - Unwrought or in powder form

7110.39 - - Other

- Iridium, osmium and ruthenium :

7110.41 - - Unwrought or in powder form

7110.49 - - Other

Like headings 71.06 for silver and 71.08 for gold, this heading covers platinum and its alloys as defined in the General Explanatory Note.

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The term " platinum " covers (see Note 4 (B) to Chapter 71) :

(A) **Platinum** which is a greyish-white, soft and ductile metal, not tarnished at room temperature and resistant to acids except aqua regia. It can be fabricated into bars, sheets, strip, tubes, wire and other semi-manufactured forms by forging, rolling or drawing.

In view of their outstanding resistance to corrosion, high melting point and high catalytic activity, platinum and its alloys have many important applications in industry surpassing their use in jewellery or in dentistry, for example, in the electrical industry for the manufacture of thermocouples and resistance thermometers, and as electrical contacts and electrodes for various applications; in the textile industry for spinnerets for man-made fibres; in the glass industry for molten glass equipment such as bushings for glass fibre production, crucibles, stirrers, etc.; in the chemical and petroleum industries as catalysts (e.g., in the ammonia-oxidation process for the manufacture of nitric acid or as a platforming catalyst); as chemical apparatus (e.g., crucibles); in the aircraft industry for electrodes of sparking plugs for spark-ignition internal combustion aero-engines and for ignition devices in gas-turbine aero-engines.

Platinum and its alloys also find a use in the manufacture of surgical instruments (particularly hypodermic needles), in certain gas lighters and for many other applications such as measuring standards, hair lines for optical instruments, etc.

(B) **Palladium** which is a silvery-white metal, soft, very ductile and highly resistant to tarnishing and corrosion. It dissolves in aqua regia and nitric acid and is attacked by hot sulphuric acid. Palladium can be made into bars, sheets, strip, tubes, wire or other semi-manufactured forms by forging, rolling or drawing.

It is mainly used for electrical contacts, in brazing alloys, in hydrogen purification equipment, as a hydrogenation catalyst, in the manufacture of jewellery and as an intermediate contact layer to facilitate the coating of plastics with precious metals.

(C) **Rhodium** which is a silvery-white, hard but ductile metal. It is characterised by its high reflectivity and has the highest electrical and thermal conductivities of all the platinum group metals. It is resistant to corrosion by nearly all aqueous solutions, including mineral acids even at high temperatures.

Rhodium may be made into bars, sheets, strip, wire and other semi-manufactured forms by forging, rolling or drawing.

Its major use is as an alloying addition to platinum and in this form it has several applications in the electrical and glass-making industries. Its low electrical resistance and high resistance to tarnishing make it suitable, in the electrodeposited form, for electrical contacts and for contact surfaces where wear resistance is of importance (e.g., in slip rings). It is also used as a catalyst and for plating silver or silver-plated cutlery and hollow-ware to give a tarnish resistant finish.

(D) **Iridium** which is a greyish-white, hard metal, resistant to the action of acids, including aqua regia, at normal and high temperatures.

It can be made into thin strip or wire by rolling and drawing.

Iridium is used as a constituent of alloys used for thermocouples, crucibles, or electrodes for aircraft-engine sparking plugs.

(E) **Osmium** which is the most refractory of the metals included in this heading. In the compact state it has a bluish-white colour similar to zinc and is resistant to acids. When finely divided, it is an amorphous black powder, and is attacked by nitric acid and aqua regia and is slowly oxidised in the atmosphere.

The metal is mainly used in various, hard, corrosion-resistant alloys used for tipping pen-nibs or instrument pivots. It is also used as a catalyst.

(F) **Ruthenium** which is a brittle, hard, grey metal. It has a high resistance to corrosion. It is unattacked by aqua regia, but is slowly attacked by solutions of sodium hypochlorite. It can be obtained on a small scale in the form of sheets, strip and wire.

It is used as an alloying addition to platinum, palladium, molybdenum, tungsten, etc. (e.g., for the manufacture of pen-nib points and compass pivots). It is also used as a catalyst and, in the electrodeposited form, for electrical contacts and for contact surfaces where wear resistance is of importance.

Under the terms of Note 5 to this Chapter (see General Explanatory Note), the **alloys of platinum** with other metals (gold, silver or base metals) which may fall in this heading, include :

(1) **Platinum-rhodium alloys**, - thermocouple wire; furnace windings; components in the glass industry; catalyst gauzes; spinnerets.

(2) **Platinum-iridium alloys**, - electrical contacts; jewellery; hypodermic needles.

(3) **Platinum-ruthenium alloys**, - electrical contacts.

(4) **Platinum-copper alloys**, (max. 5 % copper), - jewellery.

(5) **Platinum-tungsten alloys**, - valve electrode wires; spark-ignition wires.

(6) **Platinum-cobalt alloys**, - permanent magnets.

(7) **Palladium-ruthenium alloys**, - jewellery.

(8) **Palladium-silver alloys**, - brazing alloys; hydrogen diffusion membranes; electrical contacts.

(9) **Palladium-copper alloys**, - electrical contacts; brazing.

(10) **Palladium-aluminium alloys**, - fuse wire.

(11) **Rhodium-iridium alloys**, - thermocouples.

(12) **Iridium-osmium alloys**, - pen tips.

(13) **Iridium-tungsten alloys**, - high temperature springs.

(14) **Gold-platinum alloys**, - spinnerets.

(15) **Gold-silver-palladium-copper alloys**, - jewellery; electrical contact springs.

(16) **Silver-copper-palladium alloys**, - brazing alloys.

(17) **Osmiridium** (**iridosmine**), a natural alloy containing osmium, iridium, ruthenium and platinum; it is the main source of osmium.