

Platinum Laboratory Apparatus







To be a trusted brand, having a global imprint in its lines of businesses by creating value for all, through innovative and sustainable solutions.



About The Company

Established in 1961, Hindustan Platinum is a leading manufacturer and refiner of precious metal products and services with wide and diverse industrial applications. With experience of more than half a century, Hindustan Platinum has fine-tuned to perfection its various traditional and innovative high-yield technologies to produce high-purity precious metals and industrial products.

The company has built strong partnership with leading international companies resulting in a consistent supply of technologically advanced products that meet global standards. Over the years, we have established a large customer base over 50 countries across 5 continents. With the world as our market, Hindustan Platinum is truly a global player in the precious metal products, processes and service Industry.

At Hindustan Platinum, we understand the responsibility of being a manufacturer's manufacturer. Knowing the criticality of this responsibility, we constantly endeavour to meet our customer's requirement by offering high quality products, pricing advantage, protected technologies and timely deliveries. We serve a plethora of industries that include Cement, Analytical, Pharmaceuticals, Institutes, Research and Development, Food, Rubber, Jewellery, Textile, Watch, Instrumentation, Foundries, Electroplating, Glass Fiber, Glass Wool and Optical Glass industries.

Good Delivery

Hindustan Platinum's Navi Mumbai refinery is on the London Platinum and Palladium Market (LPPM) Good Delivery list for Platinum and Palladium and on the London Bullion Market Association (LBMA) Good Delivery list for Silver. We are amongst a handful of refiners in the world to have obtained this accreditation.







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About Platinum

Platinum is a very ductile white metal that remains bright in air at all temperatures. At room temperature, Platinum resists practically all reagents except aqua regia and possibly bromine. Platinum forms alloys with many metals. The most useful Platinum alloys are made with the addition of other platinum group metals, which hardens platinum without sacrificing its inherent corrosion resistance and ability to withstand high temperatures.

Among the Platinum group metals, Platinum is a rare metal, but is most widely used. Platinum of the highest purity is required for use in resistance thermometers and thermocouple wires. Platinum and its alloys are used for chemical production, manufacturing spinnerets for staple fibres, anodes, jewellery and various fabrications in the Glass Industry.

Platinum is also an outstanding material as a catalyst for oxidation in the production of nitric acid. One of the largest uses of Platinum is in the production of auto catalyst for reduction of toxic gases.

Properties of Platinum

Density	21.45 g/cm ³
Melting Point	1770 °C
Electrical Resistivity at 0°C	9.85 μ Wcm
Temp coeff of resistance (0-100°C)	0.0039 °c-1
Annealed Hardness	40 H _v
Ultimate Tensile Strength at 20°C	125 N/mm ²
Tensile Elongation at 20°C	40%
100-Hour Rupture Stress at 1450°C	0.9 N/mm ²
100-Hour Rupture Stress at 1250°C	3.8 N/mm ²
Glass Wetting Resistance (Equilibrium Contact Angle of "E" Glass at 1200°C)	26



Product Profile

Introduction

There is a constant increase in need for metallic material with melting point over 1700°C (for use at very high temperature) and for metals having characteristics like chemical stability, oxidation resistance in air and resistant to many molten oxides.

Chemical analysis usually involves processes with exothermic reactions. Due to this, conventional material such as tantalum, molybdenum, glass, nickel, etc. cannot be used. As Platinum possesses the above mentioned properties and is highly ductile and malleable, laboratory wares are usually made from high purity Platinum. For specific applications, other precious metals such as Rhodium, Iridium or Gold might be added to Platinum to either increase mechanical strength or to increase non-wetting properties.

Our most common Laboratory apparatus have been standardized. Hindustan Platinum manufactures all special purpose products made from precious metals to meet customers' specific requirement. We would be pleased to undertake work on standard or customized purpose apparatus.

All platinum laboratory apparatus dimensions and weights shown in this catalogue are to be taken as a guide only, and may be subject to fluctuation.

We believe in innovation

When technology and innovation meet, engineered products are brought to life. Armed with an in-depth knowledge of engineered products, we at Hindustan Platinum possess a world-class calibre to provide our customers precious metals engineering materials, that are purely defined as distinguished, exceptional and unmatched.

We Manufacture Platinum Laboratory Apparatus Products Of Global Standards:

- Platinum Labware
- Electrodes
- Platinum Labware Allied Products
- Temperature Sensing Products Wire





Product Offering:

PLATINUM LABWARE Crucibles & Dishes

Considering the chemical stability and resistance to oxidation and corrosion, crucibles and dishes of Platinum and Platinum alloys are mainly used as equipment in Research and Development. The tables on the following pages show the standard forms of crucibles and dishes. Apart from standard forms, we also deliver crucibles and dishes in different thicknesses with reinforced rim, and in case of dishes with or without pouring lid. Crucibles and dishes of other sizes and shapes such as cylindrical, conical etc. with different types of lids are offered against individual specifications in pure Platinum, Platinum / Rhodium or Platinum / Gold.

▲ Platinum Crucibles: *

Crucibles shape 'AZ'

Crucibles in these series have nominal capacities ranging from 5cc to 250cc. These crucibles are designed with an extra thick base to withstand heavy wear. Unless otherwise specified crucibles are always supplied having a plain rim and with lid. The purity of Platinum used for manufacture of AZ crucibles is at least 99.95%.



				Аррі	oximate Weight	in Gm
No	Capacity (cc)	Top Diameter (mm)	Height (mm)	Standard Form	With Reinforced Rim Only	Standard Cover Only
101	5	22	22	4	5	1.5
102	8	25	24	6	7	1.5
103	10	25	28	7	7.5	2
104	15	30	31	11	12	3
105	20	33	35	15	16	4
106	25	36	34	19	20	4
107	30	40	36	22	24	6
108	35	41	38	25	26	6
109	40	42	42	30	32	7
110	50	45	44	38	40	8
111	60	45	47	46	48	9
112	70	49	53	50	52	12
113	80	52	53	51	54	14
114	90	54	57	52	59	15
115	100	56	57	59	68	17
116	110	57	60	68	71	19
117	120	64	66	84	88	22
118	150	65	69	100	104	27
119	200	79	65	150	159	30
120	250	81	73	175	179	32



• Crucibles shape 'BZ'

Crucibles in these series have nominal capacities ranging from 8cc to 200cc. These crucibles are designed with an extra thick base to withstand heavy wear. Unless otherwise specified crucibles are always supplied having a plain rim and with lid. The purity of Platinum used for manufacture of BZ crucibles is at least 99.95%.



				A	oproximate Weight	in Gm
No	Capacity (cc)	Top Diameter (mm)	Height (mm)	Standard Form	With Reinforced Rim Only	Standard Cover Only
121	8	25	21	6	7	1.5
122	10	26	26	7	7.5	2
123	15	30	27	11	12	3
124	20	33	28	15	16	4
125	25	36	30	19	20	4
126	30	40	32	22	24	6
127	35	42	33	25	26	6
128	40	43	34	30	32	7
129	50	46	37	38	40	8
130	60	48	39	46	48	9
131	70	52	41	50	52	12
132	75	52	44	50	52	13
133	80	52	47	51	54	14
134	90	57	48	52	59	15
135	100	57	51	59	68	17
136	110	57	54	68	71	19
137	120	57	57	84	88	22
138	125	58	59	97	101	25
139	200	79	66	150	159	30

^{*}Customised sizes available on request



▲ Dishes *

Standard Form

We design standardized form dishes with a round thick base for heavy wear, with a pouring lid and without lid that ranges between 25 cc to 700 cc. Also, manufacturing shallow dishes to specification along with lids of watch-glass type or crucible type is our expertise. Shallow dishes for iron and steel, water and sugar analysis can be manufactured to specification along with Lids of watch-glass type or crucible type with options of reinforced rim and/or heavy bottom.



		Ton		Appro	ximate Weight in	Gm
No	Capacity (cc)	Top Diameter (mm)	Height (mm)	Standard Form	With Reinforced Rim Only	Standard Cover Only
140	25	42	23	8	9	10
141	35	49	25	12	13	13
142	40	51	26	15	17	14
143	50	57	26	19	22	15
144	60	63	27	24	26	18
145	75	70	28	28	31	20
146	100	75	29	37	41	22
147	125	77	34	42	44	28
148	150	83	35	57	62	33
149	175	85	40	55	59	41
150	200	90	40	74	80	44
151	250	100	41	93	100	45
152	300	110	45	94	98	55
153	400	118	48	133	137	58
154	500	125	50	170	180	65
155	799	143	58	200	212	82

^{*}Customised sizes available on request



Platinum, Platinum/ Rhodium and Platinum/ Gold alloy Crucible and mould XRF Analysis



Platinum and its alloy possess the following properties to use for laboratory apparatus:

- · Higher strength
- High melting point
- Ductility
- · Corrosion resistance
- · Oxidation resistance

And therefore, Platinum and its alloy are widely used as an analytical laboratory apparatus. The properties of Platinum and its alloys are summarized as under:

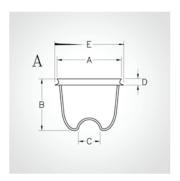
Platinum / 10% Rhodium

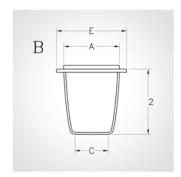
This Platinum group metal alloy melting point as high as 1850 degree Celsius. This alloy has greater hardness and higher strengh.

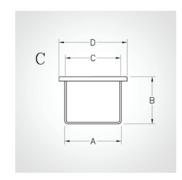
Platinum / 5% Gold

This alloy is universally accepted for Crucibles and casting moulds for spectro-graphics analysis by x-ray fluorescence (XRF). This alloy has property of higher temperature strength than pure Platinum and has "non-wetting" property for easy removal of the sample after fusion and allows many reproducible assays.

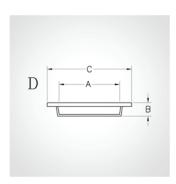
Different Shape of XRF Crucible:

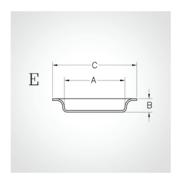


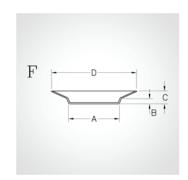




Different Shape of XRF Casting Dish









ELECTRODES

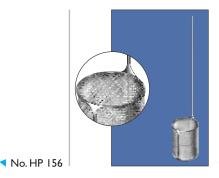
Consisting attributes of being economical, speedy and accurate, we play a pivotal role in manufacturing Platinum electrodes of required specifications and dimensions. At Hindustan Platinum, we serve you with plethora of options. We engineer Fischer Electrodes and Platinum Electrodes.

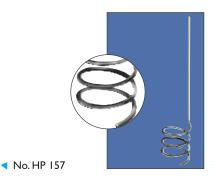
▲ Fischer Electrodes *

Fischer electrodes are commonly used in laboratories for electrochemical analysis. The stems of cathode and anode are supplied in round as well as square wire and can be straight or cranked, with or without rings. The helical anode, made of round wire, is used when no anodic deposition or less than 0.2% lead as lead peroxide is required.

No	Height Overall (mm)	Height of Cylinder (mm)	Diameter of Cylinder (mm)	Approximate Weight (in Gm)	Approximate surface area cm2
HP 156	125	45	45	34	125
HP 157	140	32	32	19	70
HP 158	140	32	32	13	0.75







◀ No. HP 158

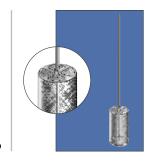
Similar to the heavy Fischer type, Platinum electrodes have a cathode with a straight stem and no rings over it. These electrodes can be used for both stirred and unstirred solutions. When no anodic deposition is required, we use a helix made of round wire which is substantially cheaper than that of wire gauze anode.

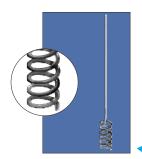
These cathodes can be employed with round wire helical or paddle type electrode and used for both stirred and unstirred solutions.

No	Height Overall (mm)	Height of Cylinder (mm)	Diameter of Cylinder (mm)	Approximate Weight (in Gm)	Approximate surface area cm2
HP 159	150	45	45	31	125
HP 160	170	45	25	36	70
HP 161	140	30	10	10	0.35

No. HP 160

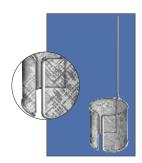


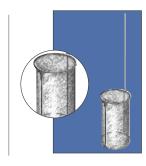




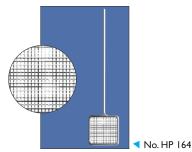


No	Height Overall (mm)	Height of Cylinder (mm)	Diameter of Cylinder (mm)	Approximate Weight (in Gm)	Approximate surface area cm2	Paddle Dimensions (mm x mm)
HP 162	150	45	45	28	120	-
HP 163	130	50	30	16	95	-
HP 164	140	-	-	13	18	30 x 30





No. HP 162



No. HP 163

PLATINUM LABWARE ALLIED PRODUCTS

Hindustan Platinum believes in continuous innovation. Hence, driven by superior quality, our manufacturing products include spatulas, spoons, combustion boats, filter cones, tipped forceps, triangles, wire gauze, wires, foils, micro-chemical apparatus such as micro dishes and micro boats. Amongst other parameters, we also have a stronghold on creating temperature sensing products, Thermocouple wires, Platinum and Rhodium Wires.

▲ Spatulas *

We manufacture spatulas in Platinum and its alloys. Besides the standard specifications, customizations in sizes and shapes are available.

No. and Style	Length	Weight in grams
HP 165 - Flat style	90 mm	14
HP 166 - Flat style with handle	64 mm	4



▲ Spoons *

We manufacture high quality platinum spoons of hemispherical shape with a handle.

No. and Style	Length of Handle	Approximate Weight in grams
HP 167	35 mm	4



*Customised sizes available on request

Combustion Boats

Our standard Combustion Boats are available with or without a handle in the following specifications. Sizes can be customized to suit the client's requirements.

Micro-Combustion Boats can also be manufactured against special orders.

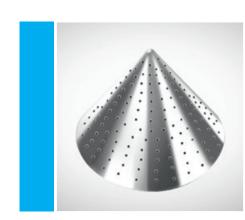
No	Length (mm)	Width (mm)	Depth (mm)	Weight (in Gm)
HP 168	38.1	12.7	9.5	3
HP 169	50.9	12.7	9.5	4
HP 170	76.2	12.7	9.5	7
HP 171	95.3	12.7	9.5	9
HP 172	101.6	12.7	9.5	12



▲ Filter Cones*

Our standard filter cones, manufactured from perforated Platinum sheet with 36x0.9 mm holes per sq. cm. are available in following sizes. They can be specially customized as well.

No	Daimeter (mm)	Depth (mm)	Approximate Weight (in Gm)
HP 173	20	17	1.5
HP 174	25	22	3
HP 175	50	43	12



▲ Tipped Forceps*

Platinum Tipped Stainless Steel Forceps having either sharp or round tips are available in following sizes.

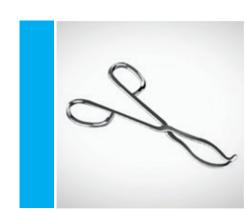
No	Length (mm)	Weight of tips (in Gm)
HP 176	20	1.5
HP 177	25	2



▲ Tipped Tongs*

Our standard Platinum Tipped Stainless Steel Tongs are available in the following specifications. Other sizes can also be manufactured as per the clients' specifications.

No	Length (cm)	Weight of tips (in Gm)
HP 178	20	1.5
HP 178-a	25	2.5
HP 178-b	30	4.0
HP 178-c	45	6.0
HP 178-d	60	8.0



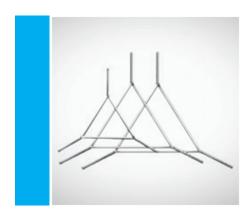
^{*}Customised sizes available on request



▲ Triangles*

Our Platinum triangles with twisted ends help avoid contact with other metals while heating. The following specifications are available with us.

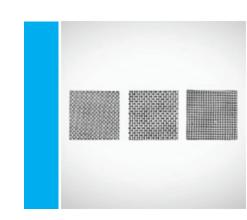
No	Crucible Capacity (cc)	Length of side (mm)	Approximate Weight (in Gm)
HP 179	15	40	9.5
HP 180	25	50	12
HP 181	30	57	12.5
HP 182	40	63	15



▲ Wire Gauze*

Apart from our standard sizes, we also make gauze of mesh and wire to specifications in Platinum, Platinum/Rhodium alloys.

No	Mesh per sq.cm.	Wire Dia. (mm)	Approximate Weight per 100 sq.cm.
HP 183	200	0.2	25 grams
HP 184	360	0.15	15 grams
HP 185	1000	0.06	4.5 grams



▲ Foils*

Platinum foils are made to superlative standards of high precision and quality. Foils completely free of burrs and proven indispensable to operation are available in the exact specifications required by our clients.

▲ Micro Chemical Apparatus Allied *

There are certain conditions where traditional methods cannot be used. In such cases, Microchemistry allows a technique for performing chemical experiments on trace quantities. Micro chemical apparatus are manufactured for the same by considering the specifications and properties for which the apparatus is to be used.



				Approxim	ate weight (in	gms)
No	Capacity (cc)	Top Diameter (mm)	Height (mm)	Dish with plain rim	Dish with Reinforced rim	Crucible Type Lid
HP 186	10	35	17	7	9	5
HP 187	15	38	19	10	12	5.5
HP 188	20	42	20	12	15	7.5

*Customised sizes available on request



▲ Micro boats *

					Approximate	weight (in gms)
No	Capacity (cc)	Height (mm)	Width (mm)	Length (mm)	With Handle	Without Handle
HP 189	0.25	5	5	10	0.60	0.5
HP 190	3.00	9	9	60	5.75	5.5
HP 191	12	13	15	100	18	16

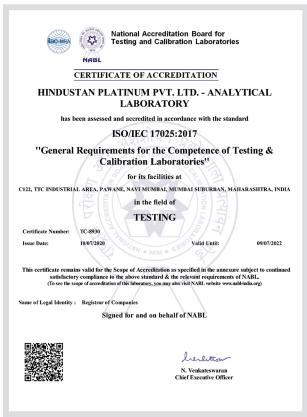
Quality

Our world class state-of-the-art manufacturing facility follows stringent quality control policy right from refining, alloying, melting and manufacturing of products. Our certification and accreditation stands testimony of our capabilities, robustness of our processes and strengthens our commitment to serve customers globally with quality management systems and proficient testing of precious metals.

- To ensure high quality at all times, we adhere to our quality policy ISO 9001: 2015 certification
- Hindustan Platinum's Analytical Testing Laboratory is NABL Accredited Testing laboratory vide Certificate Number TC-8930. This ISO/IEC 17025:2017 accreditation enables us to issue test certificates with ILAC MRA Mark for high purity Platinum and Palladium metals along with Gold and Silver

[NABL - National Accreditation Board for Testing and Calibration Laboratories. ILAC MRA Mark is registered as a worldwide mark and is owned by the International Laboratory Accreditation Cooperation (ILAC).]







TEMPERATURE SENSING PRODUCTS – WIRES

We manufacture platinum wires of a very high standard, uniform composition and free from chemical or physical defects. We have available wire diameter ranges from 0.025 mm to 5.00 mm. Platinum and its alloys are reliable sensing elements in high temperature measurement. We make temperature sensing products that give better process control, consistent product and improved energy conservation. This includes thermocouple wires, resistance thermometers, throwaway tips and alpha wires. We also supply precious metal sheaths, wherever necessary.



Platinum and Rhodium Wires

Platinum and Platinum/Rhodium thermocouple wires are widely used for optimum accuracy and stability for measuring temperatures ranging from 1000°C to 1800°C. These are produced from high purity metals to maintain accurate e.m.f. values within tolerances of international standards.

Material		Pt	Pt 6% Rh	Pt 10% Rh	Pt 13% Rh	Pt 30% Rh
Specific gravity at 20°C	g Cm³	21.4	20.6	20	19.6	17.7
Specific electrical resistance at 20°C	$\frac{\text{Wmm}^2}{\text{m}}$	0.107	0.185	0.193	0.197	0.21
Average temperature coefficient of the resistance 20 to 1600°C	1 °C	3.10 ⁻³	1.810 ⁻³	1.410 ⁻³	1.310 ⁻³	1.310 ⁻³
Thermal conductivity at 20°C	cal s cm°C	0.166	0.085	0.072	0.065	0.055
Specific heat at 0°C	cal g°C	0.032	0.034	0.035	0.036	0.04
Average thermal expansion between 20 C and 800°C	1 °C	9.310 ⁻⁶	9.110 ⁻⁶	9.010 ⁻⁶	9.010 ⁻⁶	8.810 ⁻⁶
Tensile strength 6 _B	Kp/mm²	12 to 16	25 to 30	30 to 35	34 to 38	45 to 50
Ductility δ ₁₀₀	%	25 to 35	25 to 30	20 to 30	20 to 30	20 to 30

Generally negative wires are of pure Platinum and positive wires are of Platinum/Rhodium10% or Platinum/Rhodium13% ranging in diameter from 0.20 mm to 1.0 mm as ex-stock basis. These stress relieved wires are manufactured from highly pure virgin metals with only spectrographic traces of other elements.



Specification and Calibration

Platinum and Platinum/Rhodium Wires are made to ISI specification IS: 6683:1973 and as amended thereafter, they meet International Standards and are in accordance with the EMF/Temperature relationship based on the International Temperature Scale of 1990 (ITS 90).

Tuno	Com	bination	Working Tempo	erature Range °C
Type	-ve	+ve	Maximum	Continuously
S	Pt	Pt/10%Rh	1600	1300
R	Pt	Pt/13%Rh	1600	1300
В	Pt/6%Rh	Pt/30%Rh	1700	1500

Platinum and Platinum/Rhodium Wires for Throw-Away Tips

Platinum – Platinum/Rhodium throwaway tips of wire diameter below 0.1 mm. are now used for their economy, to measure high temperatures, particularly in Steel Plants. We make high temperature application wires for throw-away tips of wire diameter up to 0.025 mm. Great care is taken to maintain accuracy of the relation between the temperature and e.m.f, within the standard tolerance.

Wire Diameter Tolerance

Diameters mm	Tolerance mm
0.025 – 0.05	± 0.001
0.05 to 0.09	± 0.001
0.10 to 0.25	± 0.005
0.30 to 0.40	± 0.005
0.45 to 1.00	± 0.010
1.50 to 2.00	± 0.020

Pure Platinum Wire for RTD

Resistance thermometers, also called resistance temperature detectors (RTDs), are sensors used to measure temperature. Many RTD elements consist of a length of fine wire wrapped around a ceramic or glass core but other constructions are also used. The RTD wire is a pure material, typically made of Platinum, Nickel, or Copper.

Platinum resistance thermometers (PRTs) offer excellent accuracy over a wide temperature range (from –200°C to +850°C). The most common type (PT100) has a resistance of 100 ohms at 0°C and 138.4 ohms at 100°C. There are also PT1000 sensors that have a resistance of 1000 ohms at 0°C.

Furnace Winding Wires

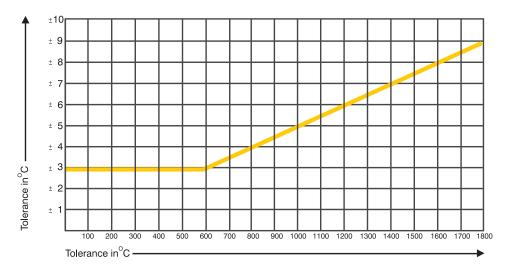
Platinum and Platinum/Rhodium wires are employed for winding the furnaces for the temperature above 1000°C because of their high melting point and resistance to reaction with oxygen in air. Although these resistors cost more compared to those made of base metals, their longer life and higher resale value make them far more economical for furnace winding. These wires can be reworked into new ones at nominal charges when scrapped.

Properties of Platinum Furnace Winding Wires

Details	Platinum	Platinum / 10% Rhodium Wire	Platinum / 20% Rhodium Wire
Melting Point	1773	1830	1860
Specific Gravity	21.4	20	18.7
Resistance: Ohm/mil ft.	65	115	125



Tolerance for Pt-10% Rh/Pt, Pt-13% Rh/Pt & Pt Rh-18 Combinations



Handling Platinum

Replacement of damaged Platinum apparatus

Platinum apparatus are subject to wear and tear after normal use. But greater scrap value and low manufacturing costs allow processing of damaged and old Platinum Labware into new ones. Users can send their old damaged apparatus to us for replacement with new ones by paying nominal charges.

After use Platinum labware should be cleaned. Following methods can be used for cleaning:

- Immersion of labware in Chromic acid cleaning mixture to remove organic matter
- Boiling with Hydrochloric acid to remove insoluble carbonates or metal oxides
- Cleaning by fused potassium bisulphate to remove adherent silica, silicates, metal and metal oxides
- After cleaning, the Platinum labware should be polished. Cleaning material, clean sand or talc can be used for polishing
- Certain precautions need to be taken while using Platinum. Destructive elements are released due to thermal decomposition under reduced conditions. Therefore, it is necessary to carry the process in open crucibles. At higher temperature, Platinum diffuses through the walls of equipment and can reduce the material contained within
- Presence of even trace amount of silicon, lead or arsenic forms a low melting point alloy with Platinum. This causes damage to equipment when heating takes place in muffle furnaces
- Ensure prevention of Platinum being oxidized in air at any temperature or attacked by acid
- Alkaline earths, caustic alkalis, nitrates and hydroxides of barium and lithium attack Platinum at high heat
- Platinum apparatus should not be treated with easily reducible metals like lead
- Avoid heating Platinum with phosphorous and arsenic
- Clean well, handle gently and place on clean refractory surface after use
- · Remove stains by boiling in dilute nitric acid
- · Polish dulled surfaces with red sand



Milestones







Hindustan Platinum

Industries We Serve Products We Make

Electroplating industry	Precious metal salts and solutions
Fertiliser, industrial & defense explosives, Caprolactam and cyanide manufacturers	Platinum/Rhodium catalyst gauzes Palladium alloy catchment gauzes
Glass fiber and glass wool industries	Platinum/Rhodium alloy bushings Spinner baskets
Glass and optical glass industries	Platinum/Rhodium alloy stirrers Thimbles, orifice rings, liners, etc
Man-made fiber industries	Precious metal spinnerets cluster spinnerets Tantalum filters Stainless steel spinnerets
Pharmaceutical and chemical industries	Precious metal salts supported and unsupported catalysts
Research and analytical laboratories	Platinum laboratory apparatus
Steel and glass industries	Platinum and Platinum/Rhodium Thermocouple wires Throwaway tips
Switchgear, control gear, automobile, spacecraft, elevator and home appliance industries	Electrical contacts
Watch industry	Gold sputter targets
Oil refineries, petrochemical industry and all other industries	Recovery and refining of precious metals from industrial scrap
Jewellery Industry	Supplier of Pt 950 granules in composition of Palladium, Cobalt, Copper, Ruthenium, Iridium etc. Supplier of Pt 950 Chain in roll, Pt 950 Blanks/Rings and other Pt 950 allied products for jewellery industries.



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