

Chemicals

# Thermo Scientific palladium products

an exceptional precious metal

# Thermo Scientific palladium products

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Pd

Palladium is now perhaps the most valuable of the four major precious metals. Because of tight supply and high demand, it has topped the price of gold since December 2018. It is an extremely rare, silver-white metal that has the purity and lustrous tone of platinum, and keeps its brilliant color for life. Palladium has a relatively low melting point and low density compared to the other platinum group metals, which include ruthenium, rhodium, osmium, iridium and platinum. Palladium was first extracted from platinum ore in 1803, but as early as 1700, miners in Brazil were aware of a metal they called ouro podre or 'worthless gold', which we now know to have been a native alloy of palladium and gold.

We offer a broad, diverse catalog of palladium products which are also available in bulk quantities and pack sizes that can be customized to your requirements. Explore our Premion™ line of precious metal compounds and pure elements. The minimum purity of our Premion line of products is 99.99% (metals basis). Premion pure elements include: Platinum (Pt), Palladium (Pd), Rhodium (Rh), Iridium (Ir), Ruthenium (Ru), Osmium, Silver (Ag), and Gold (Au).

The Thermo Scientific portfolio of palladium products can be used in a wide range of applications, from emission control and electronics to dentistry and medicine. New applications are currently in development, including as a component in fuel cell technology and in the removal of toxins and carcinogens in groundwater.



## Application highlights

### Palladium in chemistry

Finely divided palladium, such as palladium on carbon, is used as a heterogeneous catalyst in hydrogenation, dehydrogenation, and petroleum cracking. Combined with a variety of ligands, e.g., bis(triphenylphosphine)palladium(II) dichloride, palladium acts as a homogeneous catalyst in the synthesis of fine chemicals. The 2010 Nobel Prize in chemistry recognized the significance of palladium reagents as catalysts in the synthetically important Heck, Negishi, and Suzuki cross-coupling reactions.

We offer a vast portfolio of supported and unsupported palladium catalysts, and versatile palladium complexes pure palladium products.

### Palladium in emission control devices

Over 57% of the palladium supply is used in the catalytic converters found in more than 98% of all new vehicles. Palladium in these devices play a crucial role in converting harmful gases emitted by gasoline engines, such as carbon monoxide, hydrocarbon, and oxides of nitrogen into less harmful carbon dioxide, nitrogen, and water vapor.

Our portfolio includes a large range of supported and unsupported palladium catalysts, versatile platinum complexes.

### Palladium in jewelry

Palladium jewelry is 95% pure and will not tarnish like sterling silver. It is also hypoallergenic, making it the metal of choice for sensitive skin. Its malleability allows designers to make very intricate pieces. Palladium is often used in white gold alloys, being more affordable and lighter than platinum, purer than white gold and does not need to be plated with rhodium plating to keep it shiny.

Take a look at our diverse portfolio of pure palladium forms and alloys.

### Palladium in electronics

Because of its electrical conductivity and its durability, palladium is widely used in electronics. A small amount of the metal is used in the components of virtually every type of electronic device, from basic consumer products to complex military hardware. The metal is most commonly used in multilayer ceramic capacitors (MLCC) found in laptop computers and mobile phones. Smaller amounts of palladium are used in hybrid integrated circuits (HIC) and for plating connectors and lead frames.

We offer a very diverse portfolio of pure palladium forms and alloys to meet your specifications.

### Palladium in medicine

Because it is nontoxic and not antagonistic toward the human body, palladium also is used in medicine, in particular to treat prostate and breast cancer in the early stages of the disease. In a procedure called brachytherapy, small seeds of the radioisotope palladium-103 are injected into the affected area, delivering local doses of radiation over a period of time. The treatment is reported to be associated with low complication rates and a long-term disease-free survival rate of 90 percent.

### Palladium in dentistry

Rising gold prices in the 1980s made palladium a popular option for dental inlays, crowns, and bridges. Japan, where dental alloys contain at least 20 percent palladium by government mandate, consumes the most palladium for dental uses.

# Thermo Scientific palladium products

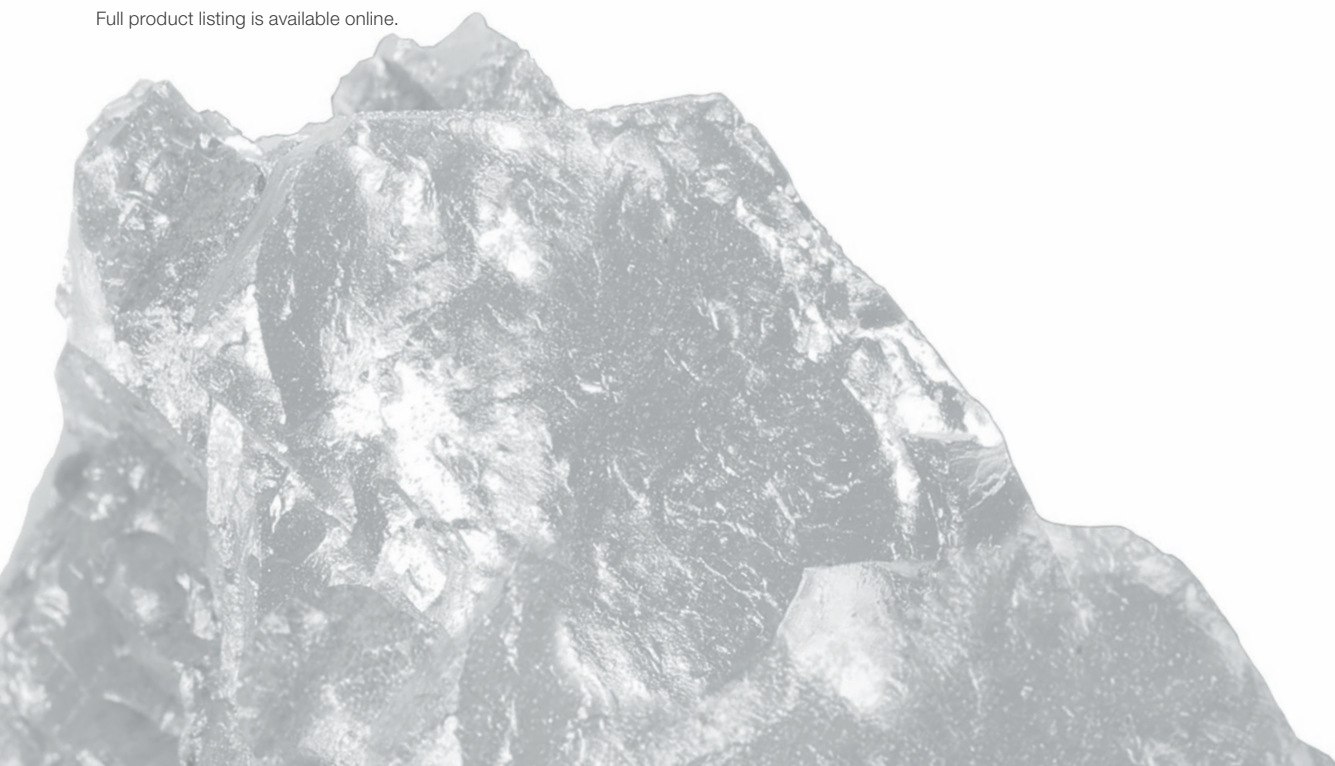
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Pd

## Pure palladium

VWR Cat. No.	Description	Size
AA11517-FF	Palladium foil, 0.025mm (0.001in) thick, 99.9% (metals basis)	25 × 25 mm, 50 × 50 mm, 100 × 100 mm
AA00659-03	Palladium black, 99.9% (metals basis)	1 g, 5 g
AA10788-03	Palladium powder, -22 mesh, Premion™, 99.995% (metals basis)	1 g, 5 g, 5 × 5 g
AA11515-FF	Palladium foil, 0.1mm (0.004in) thick, 99.9% (metals basis)	25 × 25 mm, 50 × 50 mm, 100 × 100 mm
AA12068-03	Palladium powder, -200 mesh, 99.95% (metals basis)	1 g, 5 g, 25 g
AA43353-03	Palladium granules, 99.95% (metals basis)	1 g, 5 g, 25 g
AA46327-G1	Palladium wire, 0.4mm (0.0159in) dia, annealed, 99.95% (metals basis)	1 m, 5 m
AA43010-04	Palladium powder, -60 mesh, 99.9% (metals basis)	2 g, 10 g
AA10961-BW	Palladium wire, 0.5mm (0.02in) dia, Premion™, 99.99+% (metals basis)	50 cm, 250 cm, 1000 cm
AA10962-G1	Palladium wire, 0.25mm (0.01in) dia, Premion™, 99.99% (metals basis)	1 m, 5 m, 25 m
AA47249-77	Palladium powder, APS 0.35-0.8 micron, 99.95% (metals basis)	0.1 g, 1 g, 5 g
AA10963-G5	Palladium wire, 0.1mm (0.004in) dia, Premion™, 99.99% (metals basis)	5 m, 25 m
AA10278-G1	Palladium wire, 0.25mm (0.01in) dia, 99.9% (metals basis)	1 m, 5 m
AA45037-G1	Palladium wire, 0.406mm (0.016in) dia, as drawn, 99.9% (metals basis)	1 m, 5 m
AA40212-BS	Palladium wire, 1.0mm (0.04in) dia, 99.98+% (metals basis)	10 cm, 50 cm
AA45003-FF	Palladium Silver foil, 0.025mm (0.001in) thick, 99.9% (metals basis excluding Pt)	25 × 25 mm, 50 × 50 mm
AA12216-FF	Platinum Rhodium Palladium gauze, 80 mesh woven from 0.076mm (0.003in) dia wire, 99.9% (metals basis)	25 × 25 mm, 50 × 50 mm, 100 × 100 mm
AA11516-FF	Palladium foil, 0.25mm (0.01in) thick, 99.9% (metals basis)	25 × 25 mm, 50 × 50 mm, 100 × 100 mm
AA42187-FF	Palladium Silver foil, 0.025mm (0.001in) thick, 99.9% (metals basis excluding Pt)	25 × 25 mm, 50 × 50 mm, 100 × 100 mm
AA42684-FF	Palladium Silver foil, 0.5mm (0.02in) thick, 99.9% (metals basis excluding Pt)	25 × 25 mm, 50 × 50 mm

Full product listing is available online.



## Palladium compounds

VWR Cat. No.	Description	Size
AA11034-02	Palladium(II) chloride, 99.9% (metals basis), Pd 59.0% min	0.5 g, 2 g, 10 g, 50 g
AAA10548-02	Tetrakis(triphenylphosphine)palladium(0), 99.8% (metals basis), Pd 9% min	0.5 g, 2 g, 10 g
AA10516-03	Palladium(II) acetate, Pd 45.9-48.4%	1 g, 5 g, 25 g
AAA12012-04	Palladium, 10% on carbon, Type 487, dry	2 g, 5 g, 10 g, 25 g, 50 g
AA12760-03	Tris(dibenzylideneacetone)dipalladium(0), Pd 21.5% min	1 g, 5 g
AA11035-04	Palladium(II) nitrate hydrate, 99.8% (metals basis), Pd 39% min	2 g, 10 g, 50 g
AA10491-03	trans-Dichlorobis(triphenylphosphine)palladium(II), Pd 14.0% min	1 g, 5 g, 25 g
AA12764-01	Bis(dibenzylideneacetone)palladium(0)	0.25 g, 1 g, 5 g
AA42578-04	Palladium hydroxide, Pd 20% on carbon, nominally 50% water, Pearlman's Catalyst	2 g, 10 g, 50 g
AA43086-03	Palladium(II) acetate, trimer, 99.98% (metals basis), Pd 47% min	1 g, 5 g
AA43085-03	Palladium(II) chloride, Premion™, 99.999% (metals basis), Pd 59.5% min	1 g, 5 g, 25 g
AA39448-03	Palladium(II) trifluoroacetate, 97%	1 g, 5 g
AA10517-03	Palladium(II) 2,4-pentanedionate, Pd 34.7%	1 g, 5 g
AA44845-01	Bis(tri-tert-butylphosphine)palladium(0), Pd 20.9%	0.25 g, 1 g, 5 g
AA10002-03	Bis(acetonitrile)dichloropalladium(II), Pd 40.5%	1 g, 5 g
AA44446-77	Di-μ-bromobis(tri-tert-butylphosphine)dipalladium(I)	0.1 g, 0.5 g, 2 g
AA41245-03	trans-Dichlorobis(triphenylphosphine)palladium(II), Premion™, 99.95% (metals basis), Pd 14.7% min	1 g, 5 g, 25 g
AA43172-06	Palladium, 5% on calcium carbonate, Type A306060-5, lead poisoned	5 g, 25 g, 100 g

Full product listing is available online.

## Palladium analytical standards

VWR Cat. No.	Description	Size
AA13833-AD	Palladium, plasma standard solution, Specpure™, Pd 1000μg/ml	50 mL, 100 mL, 500 mL
AAA44765-AE	Palladium nitrate, Matrix Modifier Solution, Specpure™	100 mL
AA44241-AE	Palladium nitrate, Matrix Modifier Solution, Specpure™	100 mL
AA88085-AE	Palladium, AAS standard solution, Specpure™, Pd 1000μg/ml	100 mL
AAA44631-AD	Palladium, plasma standard solution, Specpure™, Pd 1000μg/ml	50 mL, 100 mL, 500 mL
AA14432-AD	Palladium, plasma standard solution, Specpure™, Pd 10,000μg/ml	50 mL, 100 mL, 500 mL
AA45291-AK	Palladium nitrate & Magnesium nitrate, Matrix Modifier Solution, Specpure™	250 mL
AA45290-AK	Palladium nitrate & Magnesium nitrate, Matrix Modifier Solution, Specpure™	250 mL

Full product listing is available online.



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