Precious Metals Refiners





Precious Metals Refiners



PRECIOUS METALS REFINING

Recovery of precious metals Our challenge every day

Resources are not infinite. Recovering and recycling resources makes them infinite. Increasing the recovery percentage of precious metals means reducing mining expenses and the impact on the environment: recovery costs less than mining both in financial terms and in terms of carbon dioxide emissions. Precious metals exist in numerous industrial sectors and, consequently, in much industrial scrap.

Europe produces 8.7 million tons of electronic waste per year and recycles little more than 2 million. In the United States, less than 20% of electronic waste and only 10% of PCs are recovered. If we consider that one ton of hardware scrap contains

approximately 16 grams of

precious metal, it is evident that much more gold and silver could be recovered.

Likewise, from 50% to 90% of palladium could be restored to circulation, whereas currently merely 5% to 10% of palladium is recycled.

A low recovery percentage is also found in the gold, medical and chemical sectors.



Every day TCA, like a modern Alicanto, the mythological creature that fed itself only on gold and other precious metals, faces with enthusiasm and competence the challenge for a world richer in resources.



Precious Metals Refiners

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Welcome to the world of TCA





Our origins From the heart of the Tuscan gold sector

TCA came into being in Tuscany, in the pulsating heart of the Italian gold-silver district. Founded in 1977 in Arezzo, where it is headquartered, TCA has two other branches in Vicenza and Valenza, for a total of more than 100 employees and three plants.

Its partners lend to TCA their extensive experience and in-depth knowledge of the sector acquired in the Tuscan company, which has become a global leader in the jewelry industry.

From its initial specialization in the treatment of ashes containing gold and silver, TCA has grown to include platinum, palladium and rhodium recovery.

Having always aimed at achieving the highest quality standards, TCA has successfully undertaken a strong internationalization strategy and has established new, major business relations with top world players in refining and trading precious metals.

Who we are Your global refiner partner

Its high level of specialization has enabled TCA to establish itself on the market as a leading company that runs the entire recovery and refining process with adequate rates, guaranteeing the certainty of results. Specialized in the recovery

of gold, silver, platinum, palladium and rhodium from ashes and rods, TCA acts as a sole reference point: from the logistics management of waste to the extraction of precious elements, TCA accepts industrial scrap originating from all the manufacturing activities that generate waste containing precious metals.

THE NUMBERS THAT MAKE US BIG

Sales in the refining area have grown by 30% annually in the past three years



Our mission To grow responsibly



TCA is run by management that combines business with sustainability. Two key factors that act as

a driving force behind the company's growth are an integral part of our mission: continual innovation and respect for the environment. TCA pursues its growth objectives responsibly and sustainably, upholding very high professional and managerial standards and using the most environmentally safe processes and technologies in order to reduce the impact of its manufacturing and business activities to a minimum.



In the world An Italian company with international horizons

TCA has been undergoing a gradual internationalization process that has led it to achieve important goals in a few years. From Europe to the Middle East and from the United States to Asia, TCA has established itself on a global level thanks to its state-of-the-art technology and reliable extraction and sampling methods. For the foreign companies that wish to enter into a partnership with TCA, Tuscany has never been so close.Our sales office offers an efficient service that organizes every detail of your trip. Quick response, accuracy and on-time delivery are the strengths acknowledged by all our customers and the driving force for constant growth oriented towards maximum competitiveness both in terms of products and services offered.

WE GIVE A FORM TO YOUR VALUES

At the end of the precious metal recovery cycle, you can receive the corresponding value in the form you prefer: pure metal, credit to your account or a cash transfer to your bank account. To guarantee the seriousness of our work, we have metal accounts open at major banks.

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Plants and production Full efficiency at every level



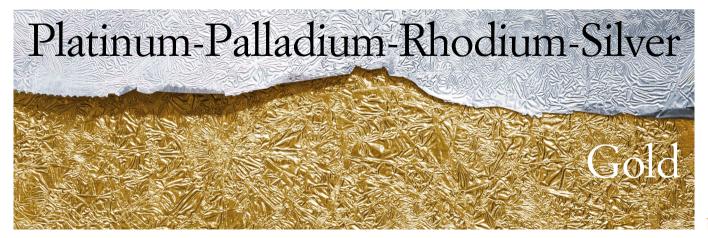
The main plant is situated in Capolona, near at the gates of Arezzo. It stretches over an area of approximately 10,000 covered square meters and 20,000 uncovered square meters with 13 incineration furnaces and 5 smelting furnaces. The plant has an annual productive capacity of 2,000 tons of ashes, 220 tons of pure gold and over 400 tons of silver. The Vicenza and Valenza plants are important sales location and serve as collection and preliminary treatment centers for the materials that are then handled in Arezzo.

Arezzo Vicenza Valenza Employee expertise, compliance with safety regulations and attention to the environment are the distinctive strength of our plants, production centres par excellence thanks to our investments plan under which new technology is acquired and employees are updated contantly. Our experts are in constant contact with international research institutes and are brought up to date on the current state of the art.



Doing business all over the world





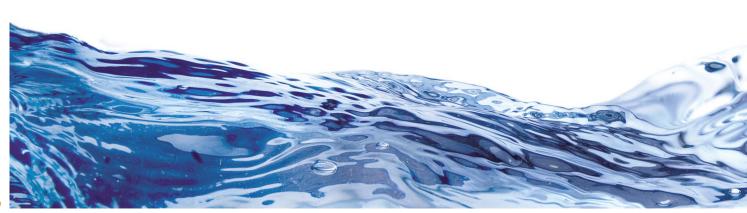
Sustainable growth

Commitment to the environment, an investment for the future

TCA addresses environmental themes globally, systematically, consistently and completely with a view to the continuous improvement of processing cycles.

TCA has always been aware of the close relationship existing between business interests and the natural and social environment in which it operates. Having the conviction that success cannot be pursued without respecting the environment and without the consent of civil society, the company has put sustainability at the core of its corporate culture. As part of its commitment to grow in a manner that protects the territory for present and future generations, TCA invests in the plant renewal and develops low impact processing techniques.





Air and water in excellent health

Recycling industrial scrap is of primary importance to the environment but it is essential to conduct it in compliance with the legislation in force.

The company has the necessary instruments to treat process wastewater and its own and third parties' exhausted solutions and to constantly monitor gaseous emissions originating from its treatment of ashes, burning systems and static furnaces. To avoid dispersion into the atmosphere of the substances used in the production cycle, appropriate abatement systems are used for significant emissions. These systems are kept up efficiently and undergo continuous controls to ensure their proper operation. Accredited independent laboratories monitor all authorized emissions periodically. Liquids emerging from the physiochemical treatment are sent for storage and disposal using authorized independent firms.







As part of the obligations that TCA undertook when it established its quality and environmental policies, the parameters representing the objective Quality and Environment Management System and its capacity for improvement are determined and monitored.

MATERIALS AND ENERGY SUPPORT SERVICES TO OPERATING ACTIVITIES WASTE EMISSIONS SERVICES PROVIDED BY THE ORGANIZATION



Certifications Management systems that enhance quality

TCA complies with the international standards stipulated by the quality and environmental management systems. UNI EN ISO 14001:2004 - UNI EN ISO 9001:2008 BS OHSAS 18001:2007

The company obtained UNI EN ISO 9001:2015 certification regarding the recovery, treatment and marketing of precious metals. The ISO 9001:2015 standard sets the quality requirements and ensures production supervision through control procedures that optimize company processes according to efficiency criteria and ensure high-quality products and services.

TCA voluntarily chose to adopt the UNI EN ISO 14001:2015 standard that fixes the requirements for an environmental management system to prevent pollution and keep the impact of its activities under control by systematically improving its production performance in a sustainable way. The company obtained certification of its safety management system under ISO 45001:2018, the standard that defines the requirements of Employee Safety and Health Management Systems.

The Responsible Jewellery Council is a not-for-profit, standards setting and certification organisation. It has more than 900 Member companies that span the jewellery supply chain from mine to retail. RJC Members commit to and are independently audited against the RJC Code of Practices an international standard on responsible business practices for diamonds, gold and platinum group metals. The Code of Practices addresses human rights, labour rights, environmental impact, mining practices, product disclosure and many more important topics in the jewellery supply chain.













TCA HAS BEEN ADDED TO THE LBMA'S GOOD DELIVERY LIST FOR GOLD AND SILVER.

TCA has satisfied the LBMA as to its ownership, history, production capability and financial standing. It has also passed the LBMA's exhaustive testing procedures, under which its gold bars were examined and assayed by independent referees, and its own assaying capabilities were tested. TCA SpA was accredited by the London Platinum and Palladium Market as a CERTIFIED GOOD DELIVERY PLATINUM AND PALLADIUM REFINER (LPPM). This very high standard, which has only been granted to roughly thirty companies all over the world, is awarded by the London Platinum and Palladium Market.

LPPM is the world's most relevant organization in matters regarding quality and features of platinum group metals and refiners working to recover these important raw materials and distribute them.

Platinum and Palladium are increasingly used in numerous industrial applications, but they are also getting scarcer. Recovering them instead of extracting them is paramount to not only guarantee environmental **sustainability**, but also to ensure the **competitiveness** of many companies and economic systems all over the world.



- LPPM's accreditation requirements are strict and involve different kinds of testing, beside the assessment of the excellent quality of Platinum and Palladium metals. Good Delivery Platinum and Palladium ingots have, as a matter of fact, a purity of at least 99.95%, they are smooth, free from cavities and easy to handle.
- Companies included in the list are well established on the market; they have a steady annual production of Platinum and/or Palladium of not less than **five hundred kilograms**; they keep the same production levels for at least three consecutive years and can demonstrate that they have the ability to produce Good Delivery platinum group metals of an acceptable standards.
- LPPM associates the longterm profitability of a refinery and its ability to comply with the required standards with, among other things, its volume of production and a **minimum tangible net worth**.
- The accreditation process involves **constant testing** on the quality of refined and recovered metals, on infrastructures, on analytical capacity, on applied standards and on the tools available in the chemical analysis laboratories.

INGOTS

LPPM quality, guaranteed performance and maximum purity, for industrial applications and much more.

LPPM Palladium is available in bars weighing around 2.6kg, which are smooth, easy to handle and free from cavity, with a purity of at least 99.95%.

LPPM Platinum is available in bars weighing around 4.6kg: the quality is extremely high, ideal for all industrial uses.

PALLADIUM 999,5 2549.50 2022





TCA Refining





Gold, Silver, PGM Conductors of progress



They often go unnoticed because they are concealed: they are hidden in the depth of electrical systems, in our cars, computers and medicines but also in the jewelry that we wear and in the mirrors in which we admire ourselves.

They are precious, rare metals, which exist in our daily lives in quantities that we cannot even imagine. In addition to being used to make jewelry, silver has many applications in photography, in the electronics industry and in minting, as well as a catalyst. As gold is an excellent conductor of electricity, it plays a major role in electronic components but its main use is in the jewelry and astronautics sectors and in minting coins.

By virtue of their physiochemical properties, the Platinum Group Metals (PGMs) - platinum, rhodium, palladium, iridium, osmium and ruthenium - are widely used by industry as synthetic catalysts and in catalytic converters, electrochemical products, hard disks, pollutioncontrol systems and pigments for ceramics.

They are also used frequently in medicine - both in pharmaceutical compounds and equipment - and in jewelry, especially on account of platinum's high value.

Recyclable materials













JEWELRY SECTOR

Jewelry manufacturing scrap Gold bars Silver bars Gold-plated items Silver-plated items PGM scrap and bars Cadmium-free contact materials Eyeglass frames Coins

MEDICAL AND DENTAL SECTOR

Dental amalgams Laboratory components and samples Dental processing residues

PREVIOUSLY INCINERATED ELECTRICAL

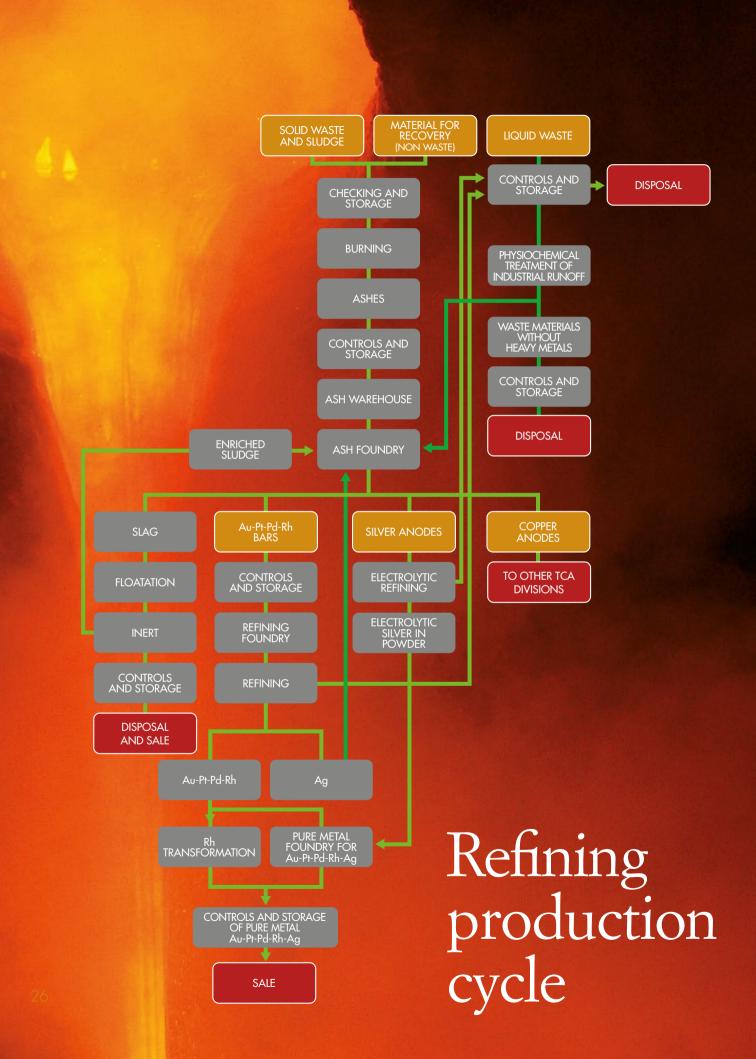
Hardware components Electronic components, gold-plated cables Computer manufacturing scrap Portable electronic devices Electrical switch contact materials

PRINTING CHEMICALS

Exhausted catalyzers with PGM Film

MISCELLANEOUS ITEMS

Ashes to be smelted Workbench scraps Floor scraps Filing dust Sewage sludge Aerospace components Catalytic converters Mirror and glass manufacturing scrap Filters Abrasives Boraxes Cruscibles Carpeting Resins Slag Coal Vacuum cleaner bags Rags Paper

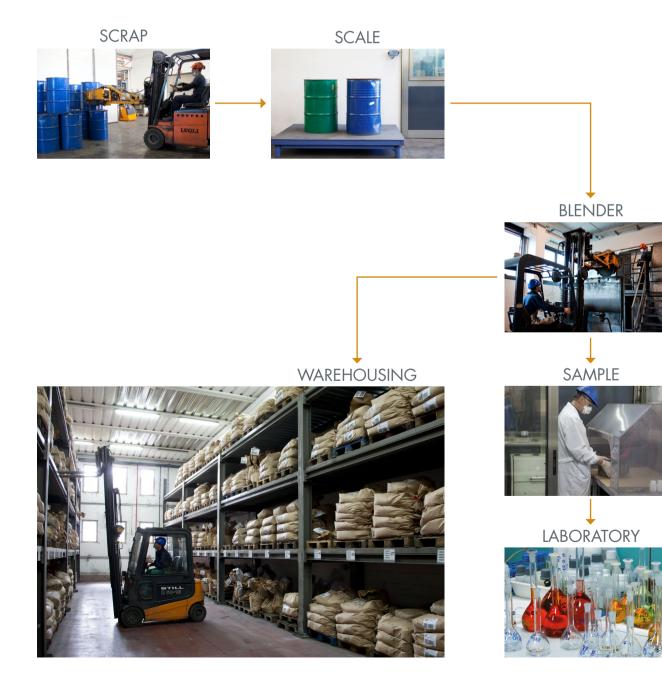


Sampling Transparency above all

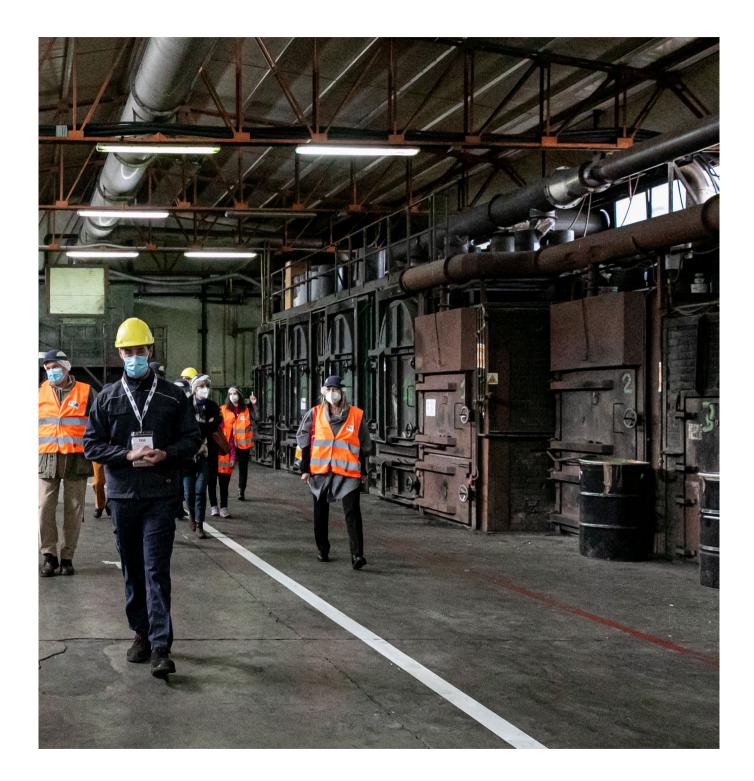
The most important stage of precious metal recovery consists of sampling, i.e. identifying the sample representing the processing scrap that will serve to determine the value of the whole batch.

Sampling is essential for the accurate quantification of the

real content of precious metals in scrap and the economic value to correspond to the customer. TCA's approach to this delicate operation is based on maximum transparency and professional competence.



Incineration High productivity process



The entire recovery cycle, from the incineration of scrap to the treatment of industrial runoff, is entirely managed in TCA's plants using a constantly monitored process and latest generation equipment which undergoes thorough maintenance regularly in order to keep operating at maximum capacity.

From waste to precious metals in 5 moves



Not all materials undergo the same treatment: some require incineration while others are directed straight to the smelting or chemical area.

Part of the industrial scrap classified according to the European Waste Catalogue codes - is incinerated in the large static furnaces before continuing to the metallurgic treatment stage and then smelted in the rotator furnaces.

The resulting metal part is transferred from the metallurgical area to the chemical area, where it is transformed into a solution from which the precious metals are extracted.

- 1 WEIGHING OF THE BATCH OF INDUSTRIAL SCRAP
- 2 incineration
- 3 CREATION OF A UNIFORM SAMPLE
- 4 ANALYSIS
- 5 REFINING OF GOLD, SILVER, PLATINUM, RHODIUM AND PALLADIUM

TCA: the art of Smelting





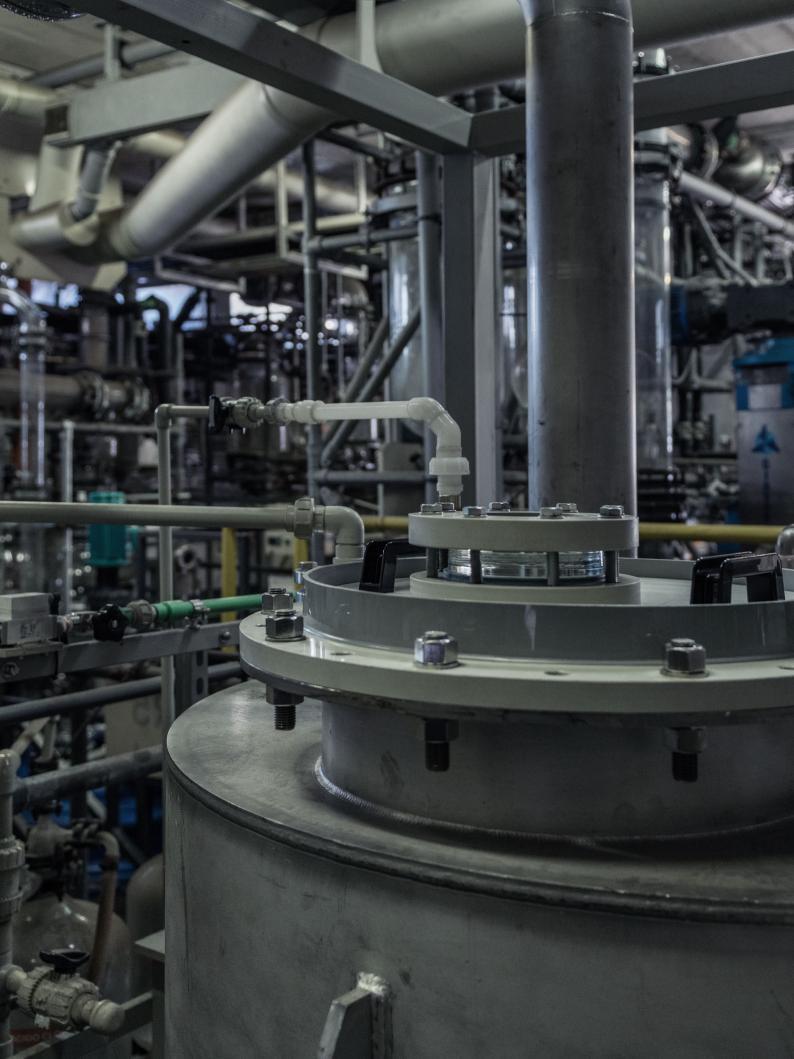
Silver Refining













Pt Pd Rh Refining

Palladium - Platinum LPPM certified excellences

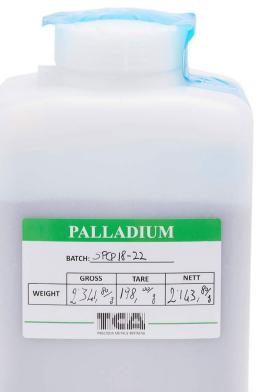
TCA Palladium is also available in **foil** form with a thickness ranging from 3 to 4mm, in several shapes and sizing depending on the application, and in **sponge** form with a homogeneous particle size and a purity of at least 99.95% palladium.

- 400 kg of palladium can be refined in our facilities every month
- 100 g/t minimum quantity of precious metal required for the recovery process
- 99.95% guaranteed minimum purity
- 2022 TCA Palladium joined the LPPM list

Platinum is also available in **foil** form with a thickness ranging from 3 to 4mm, in several shapes and sizing depending on the application. We produce platinum in **sponge form** with a purity of always at least 99.95%.

- 110 kg of platinum can be refined in our facilities every month
- 100 g/t minimum quantity of precious metal required for the recovery process
- 99.95% guaranteed minimum purity
- 2022 TCA Platinum joined the LPPM list









Recovery services Production, supply, analysis

PRODUCTION CAPACITY

By employing applied techniques and technology, we are able to recover metal from materials containing very low quantities, thereby properly recovering platinum from all kinds of scraps, even **low-grade materials**. In our facility in Castelluccio, our plant can recover an astounding 100kg of platinum, 400kg of palladium and up to 15kg of rhodium every month.

 100 g/t – minimum quantity of precious metal required for the recovery process

We carry out **pyrometallurgical processes in our facilities** in Castelluccio (province of Arezzo) and Valenza (province of Alessandria). This technology is complex and constantly evolving: it is the result of large **investments**, such as the new foundry 4.0*, opened in 2021, as well as **experience and research**.

We work alongside **technology partners** that lead us to potential innovations and improved production efficiency, with the objective of **using as few resources as possible** in our processes.

OUTPUT FORM OF RECOVERED PGMs

- After the refinement, metals sourced from recovered materials are supplied in **physical form** with a purity of at least 99.95% in the format ordered and chosen by the client among the available range. Delivery is carried out by the most trustworthy courier services which are fast and equipped to transport valuables, both in Italy and all around the world.
- We purchase platinum, palladium and rhodium recovered from supplied materials, granting the best applicable purchase prices. We are able to handle all orders and build a long-lasting relationship in a reliable manner, given the high business volume that we have developed all around the world.
- We have been working with metal accounts for years, i.e., tools that have been granted by international credit institutions from London, New York and Zurich, which guarantee the highest speed and trust when transferring virtual valuables from one side of the world to another, for gold, silver, platinum and palladium.

ANALYZING PGM

WD XRF or ED XRF technology to analyze powders or compounds and to determine the acceptability of the material. We apply certified and accredited reference standards.

In the case of **palladium**, analysis protocols are not determined according to its content, but they are always applied using the ICP instrumental methodology.

The most suitable analysis protocols for **platinum**, including the gravimetric analysis or instrumental methods such as the ICP, are chosen depending on the mix of metals found in the material.

- High-pressure digesters, stateof-the-art ICP-OES, ED-XRF and WD-XRF
- ICP, an efficient standard for all levels of palladium
- Tailored sample preparation protocols according to the platinum content
- Applied analysis prior to the arrival of the material and during each step of the process





TCA Laboratory and research





Research and innovation of processes The driving force of competitiveness



TCA is a company based on research and it centers all its development plans on innovation. TCA considers process innovation to be the key to its success. Operating in hig-tech sectors, TCA can discern new trends of progress and is prepared to welcome them. Fuelling our knowledge to nourish our expertise.

Based on this idea, we collaborate closely with the university in a stimulating exchange in order to find solutions to problems connected to the chemistry of metals. In particular, the refining process is studied to optimize the qualitative standard of the purity of precious metals recovered from the most complex raw materials.



Assaying Safety and technology



Assays are safely performed with automated methods implemented with the best technologies available on the market monitored by skilled staff.

The methods are agreed upon with the customer and it is possible to take two routes: the customer samples the material on its own premises and then sends it to TCA, which re-samples the material to check the correspondence of the precious metal content; TCA makes its sampling department available and creates a perfectly uniform sample with the aid of blender and micronizers.

To ensure the protection of mutual interests, it is possible to use an independent laboratory.



Laboratory The best instruments for precise analyses



Our chemical laboratory selects the assay methods that best apply to the specific materials in order to accurately determine the precious metal content. The laboratory can carry out both gravimetric analysis (cupellation) and instrumental analyses (ICP and XRF) with the utmost precision. The right combination of classic analysis methods and instrumental methods guarantees

the exact precious metal content of the materials tested, ranging from traces to 100% purity.

Having established the composition of metals, the most appropriate analysis methods for the type of material are selected and the most suitable procedure to recover precious metals is determined.



TCA Galvanic technology







Galvanic technology Production and sale of solutions and salts



⁴⁵Rhrodium ₇₈Pt platinum ₄₆Pd palladium

TCA completes its offer of products and services with the production and sale of rhodium sulfate and tetramine palladium, salts and precious metal solutions. Rhodium and palladium are widely used in the galvanic, gold and electronics industries. Rhodium is of great sales

importance thanks to its hardness and corrosion resistance that make it an excellent material for plating optical instruments, among other applications.

The industry makes extensive use of rhodium, in particular as an alloying element for platinum and palladium and in electrical

contact materials.

This production is based on high-tech methods that lead to the optimization of raw materials and the recycling of scrap in a virtuous circle in which nothing is lost. Qualified staff offers assistance and support on products and their respective uses.



TCA Investment





Metals Trading A reference point for precious metals

Moving on the precious metals market in 360 degrees means keeping up with the major financial markets every day. The updating in real time of commodity prices enables us to act promptly, an indispensable quality for those involved in the sale of gold, silver, platinum and palladium.

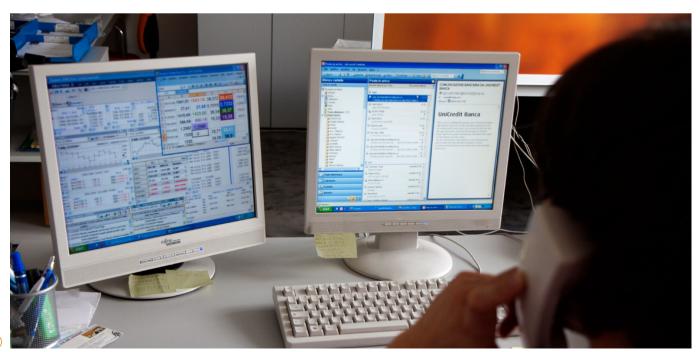
TCA communicates the commodity trading prices of precious metals and the major currencies around the clock through a customized information network and acts as a qualified consultant, capable of skillfully handling trading transactions. TCA operates on the Italian and international market in precious metal trading both in euros and in the leading foreign currencies, making use of its extensive in-depth knowledge of the sector. For those seeking security, it is best to rely on expert advice.

:: Home :: Azienda :: Conta	tti :: Prodotti :: Certificazione	:: Info :: Contatti :: <mark>Quotazioni</mark>
Variazione del		alle 16:00
Valute	Cambio Dollaro	Cambio Euro
Sterlina Inglese	1,5749	0,8750
Franco Svizzero	0,8974	1,2366
Yen	77,31	106,54
Euro	1,3773	1,0000
Metalli	Per oncia	Per grammo attuale
Oro	1 684,90	39,356
Argento	32,65	0,7632
Platino	1 555,50	36,56
Palladio	621,75	14,76
Rodio	1 625,00	43,77

- Trattamento ceneri - Trattamento metallurgico - Ricerca e Laboratorio - Sali per processi galvanici - Tr

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Pure Gold Minted and certified gold bars

INVEST IN SUBSTANCE Thanks to the new regulation introduced with Law 7/2000, which has abolished the monopoly on gold, private individuals and companies are now free to invest in gold bars and other forms of gold without paying VAT.

A SECURE INVESTMENT

A gold bar is a tangible, fast, no-constraint, solid way to protect your capital over time from the vagaries of international finance. It has real value, which is globally recognised, beyond the country and currency of reference and keeps its purchasing power intact. An excellent investment when choosing how to differentiate your capital through different forms of investment.







SAFE TAMPER-RESISTANT PACKAGING TCA INVESTMENT bars are protected and delivered to customers in a safe tamperresistant plastic blister-pack containing the guarantee certificate.

CERTIFICATE

LBMA

REFINER

TCA INVESTMENT bars are made using the sector's most advanced and qualified technologies. The 999.9 purity of the gold is certified. TCA is an Associate Member of the London Bullion Market Association (LBMA) and a Patron Member of IPMI (International Precious Metals Institute).



A GIFT OF ASSURED VALUE

A gold bar makes a prestigious gift which acquires value over time; a shelter asset in moments of crisis, inflation and fluctuation and which, for centuries, has been a symbol of prosperity and affluence.

A universal message of good wishes to enhance life's important moments such as baptisms, graduations, weddings (etc.) bestowing serenity.



ALL OUR GOLD BARS

Gold Standard Bar

1000 grams. Size: 51.8x111.1 mm
500 grams. Size: 52.5x94.51 mm
250 grams. Size: 44.1x72 mm
100 grams. Size: 36x59.3 mm
50 grams. Size: 25x38 mm
1 ounce. Size: 18.5x29.5 mm
20 grams. Size: 18x28.8 mm
10 grams. Size: 13x21 mm
5 grams. Size: 11.3x18.4 mm

INVESTMENT GOLD

We offer our customers investment gold in the form of bars weighing a minimum of 5 g, with a purity level of 999.9 and quality guaranteed by assays and tests. TCA guarantees its products by producing the investment bars directly in-house. They are punched and furnished with a guarantee certificate inside sealed tamper-resistant packaging. The certificate and the TCA brand guarantee the purity of the gold and that the bar is hallmarked by an authorized investment gold refinery. The price of the investment bars is established at the time of the order on the basis of the London Gold Fixing: a commission for processing costs is added at a rate that decreases with the quantities sold. Investing in pure gold is totally tax free.



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PRECIOUS METALS REFINING

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