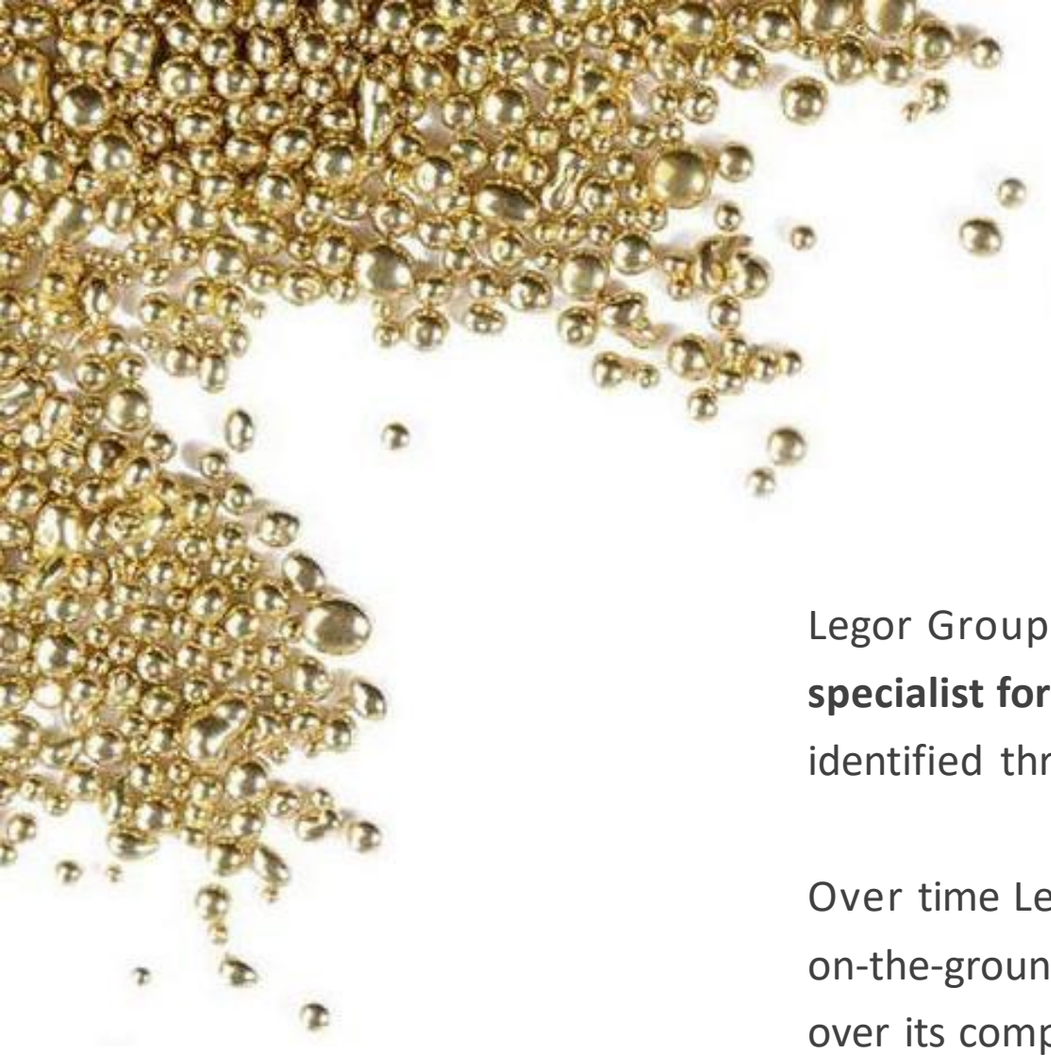
Your jewelry technology provider

LEGOR® GROUP

Metallurgy and Chemistry since 1979

COMPANY PRESENTATION. Focus on: “INDUSTRIAL APPLICATIONS PLATING LINE”



Legor Group S.p.A. is first and foremost a **metallurgy and chemistry specialist for the production of jewellery and fashion accessories,** identified throughout the world by its **master alloy products**.

Over time Legor Group has made expertise and comprehensive on-the-ground presence its distinguishing features, giving it the edge over its competitors.

Your jewelry technology provider

OLEGOR® GROUP

Reference point in the gold and silver jewellery and fashion markets for all cutting-edge production processes, as far as transformation, processing or finishing of precious and non-precious metals are concerned.

The whole production cycle is covered: from the raw material transformation to the final object finishing.

Production of master alloys and soldering products

Plating solutions and plants

Sale of machinery, consumables and tools

Brazing solutions to a number of different industrial soldering requirements

Dental alloy and Cad-Cam products for the dental technician

MASTER ALLOY PLATING MACHINERY AND TOOLS BRAZING DENTAL

IN RECENT YEARS LEGOR GROUP HAS IMPLEMENTED A LINE DEDICATED TO THE INDUSTRIAL APPLICATION PRODUCTS FOR JEWELRY, FASHION ACCESSORY, ELECTRONICS:

a line of products completely dedicated to plating process installations of an industrial scale and the maintenance and management of precious metal-based processes in excessive volumes.

It represents a technical approach to plating support and takes into account all of the most important factors to plating operators in the precious metal industrial plating sector.

INDUSTRIAL APPLICATIONS LINE

1. FLEXIBLE PRODUCT DELIVERY

Opposed to delivering the electrolyte as an all inclusive ready-to-use product, the solution is broken down into separate components and delivered as a complete electrolytic system. The bath make-up, precious metal compounds, replenishing systems, and all of the maintenance products are sold separately allowing us to meet the individual needs of each customer.

2. EASE OF MAINTENANCE

All products under the AI product umbrella are supplied with pre-calibrated replenishing systems based on ampere minute consumption. This allows for the independent additions of both precious metal and brilliant additives, permitting operators to move from day-to-day to less frequent analytical laboratory checks.

3. QUICK ANALYTICAL SUPPORT

Our in-house lab offers plating bath analysis ranging from chemical titration to metallic examination through the means of ICP. We understand the chemistry of our plating solution and are confident in what necessary additions to make, both organic and inorganic, to keep chemistry in good health.

4. TESTED PLATING DEPOSIT QUALITY

Legor Group offers a variety of testing procedures to back the quality of our precious metal coatings. Using testing methods based on international normative compliance, we know how our plating solutions perform in a wide range of tests, to include salt spray, synthetic sweat, chlorine, and abrasion.

TECHNOLOGIES AND PROCESSES FOR FASHION ACCESSORIES

- Salts and precious metals compounds
- All rhodium processes
- E-coating and passivation solutions
- Acid gold electrolyte
- Gold thickness plating
- Palladium Iron
- UltraBlack Ruthenium

ONLINE CATALOGUE

SALTS AND PRECIOUS METAL COMPOUNDS

Gold, Silver, Palladium, Rhodium, Ruthenium, Platinum

Description *Descrizione*	Code *Codice*	Pack *Confezione*		Metal content *Contenuto in metallo* %	 g	Form *Formato*
GOLD - Au						
Gold (I) potassium cyanide *Oro (I) potassio cianuro*	AUS683	100 g	•	68.3%	68,3	Salt *Sale*
Gold (III) potassium cyanide *Oro (III) potassio cianuro*						
Gold (I) potassium cyanide solution *Soluzione di oro (I) potassio cianuro*						
Gold (I) sodium sulfite solution *Soluzione di sodio oro (I) solfito*						
SILVER - Ag						
Silver (I) cyanide *Argento cianuro*						
Silver (I) potassium cyanide *Argento potassio cianuro*						
Silver (I) oxide *Ossido di argento*						
Dog bone silver anodes *Anodi in argento ad osso di cane*						
AGOF, 99.99% oxygen free silver grains *AGOF, argento 99.99% in gocce oxygen free*						

Description *Descrizione*	Code *Codice*	Pack *Confezione*		Metal content *Contenuto in metallo*		Form *Formato*
1 L			•	–	100	
PALLADIUM - Pd						
Palladium (II) dichlorotetrammine *Palladio (II) cloruro tetrammino*	PD100R	230 g ≈		43.4% ≈	100	Salt *Sale*
Palladium (II) dichlorotetrammine *Palladio (II) cloruro tetrammino*	PD20R	46 g ≈		43.4% ≈	20	Salt *Sale*
Palladium (II) tetrammine sulfate *Palladio (II) tetrammino solfato*	PD100RW	254 g ≈		39.3% ≈	100	Salt *Sale*
Palladium (II) tetrammine sulfate *Palladio (II) tetrammino solfato*	PD20RW	50,9 g ≈		39.3% ≈	20	Salt *Sale*
RHODIUM - Rh						
Rhodium (III) sulfate solution *Soluzione di rodio (III) solfato*	RODI0S	1 L	•	–	100	Concentrated solution *Soluzione concentrata*
Rhodium (III) sulfate solution *Soluzione di rodio (III) solfato*	RH10S	100 ml	•	–	100	Concentrated solution *Soluzione concentrata*
RUTHENIUM - Ru						
Ruthenium (III) sulfamate solution *Soluzione di rutenio (III) solfammato*	RU50R	1 L		–	50	Concentrated solution *Soluzione concentrata*
PLATINUM - Pt						
Platinum (II) diammine nitrite solution **Platinum "P" salt** *Soluzione di nitrito di diamminoplatino (II)*	PT25R	1 L		–	25	Concentrated solution *Soluzione concentrata*

Focus on: **RH2FZ**

Rhodium plating electrolyte designed to be used in larger rhodium installations due to the minimal components needed for maintenance.

The bath is efficient at room temperature, allowing minimal water evaporation which is also in advantage for large rhodium baths.

Though the rhodium can be used at room temperature, the deposition is high due to the low acidity in the formulation. This high throwing power makes this product perfect for chains or other thin products which require excessive power to obtain complete coverage.

- High throwing power
- Low water evaporation
- Replenishment done with rh sulfate and brilliant compound separately

Primary metal: Metallo principale:	Rh
Working metal concentration: Concentrazione di lavoro ottimale:	1-2 g/l
Chemical type: Forma chimica:	Acidic Acido
Hardness: Durezza:	1000 HV

E-COATING AND PASSIVATION SOLUTIONS

Passivation and coating technology is conceived to assist with oxidation protection or to improve wear resistance of metallic surfaces.

Legor Group is very keen to offer suitable solutions to advance these characteristics common to plated and non-plated metallic substrates. We offer a selective line of products using diverse technologies, specifically studied to protect surfaces from external degradation.

E-COATING

A process that deposits a cross linked organic polyurethane or acrylic coating to any suitable pre-treated electrically conductive substrate. It is applied by the means of electrophoretic deposition. Coatings can be clear or colored, translucent or opaque, and have uniform thickness over the part, typically in the 10-20 microns range. Heat treatment in an oven also known as the curing phase is what centers the particles providing the coating with durability.

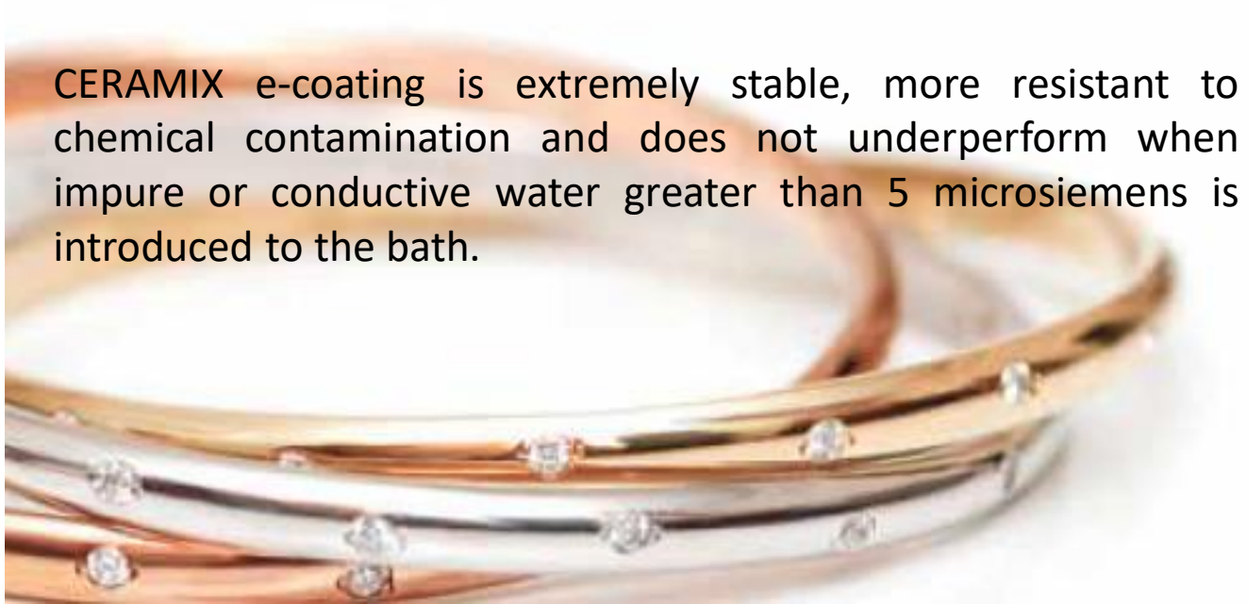
CHEMICAL PASSIVATION

It refers to a material becoming “passive” and being less affected by environmental factors such as air or pollution. Passivation is the generation of a shielding layer comprised of oxides which protects the surface that it is applied to from corrosion. A passivation layer is typically 10 nanometers thick and completely invisible to the naked eye without altering surface color or reflectivity.

Focus on: **CERAMIX**

Ceramix is a second generation, transparent nano-ceramic e-coating specifically designed for industrial scale productions. It is a hybrid resin impregnated with ceramic improving resistance to abrasion as well as other international normative testing procedures. The incorporation of the ceramic particles also provide a metallic sensation to the touch. Achievable thickness ranges of the coating layer cover from 6-35 micron while remaining completely transparent and undetectable. The resin matrix has been specifically studied to remove the “orange peel” phenomenon common when coating large flat surfaces.

CERAMIX e-coating is extremely stable, more resistant to chemical contamination and does not underperform when impure or conductive water greater than 5 microsiemens is introduced to the bath.



- Ceramic impregnated into the resin improving abrasion resistance
- No “Orange peel” defects on large flat surface areas
- Undetectable uniform film thickness
- 100% coverage of complex parts
- Stable for use in industrial production cycles
- REACH & OSHA compliant

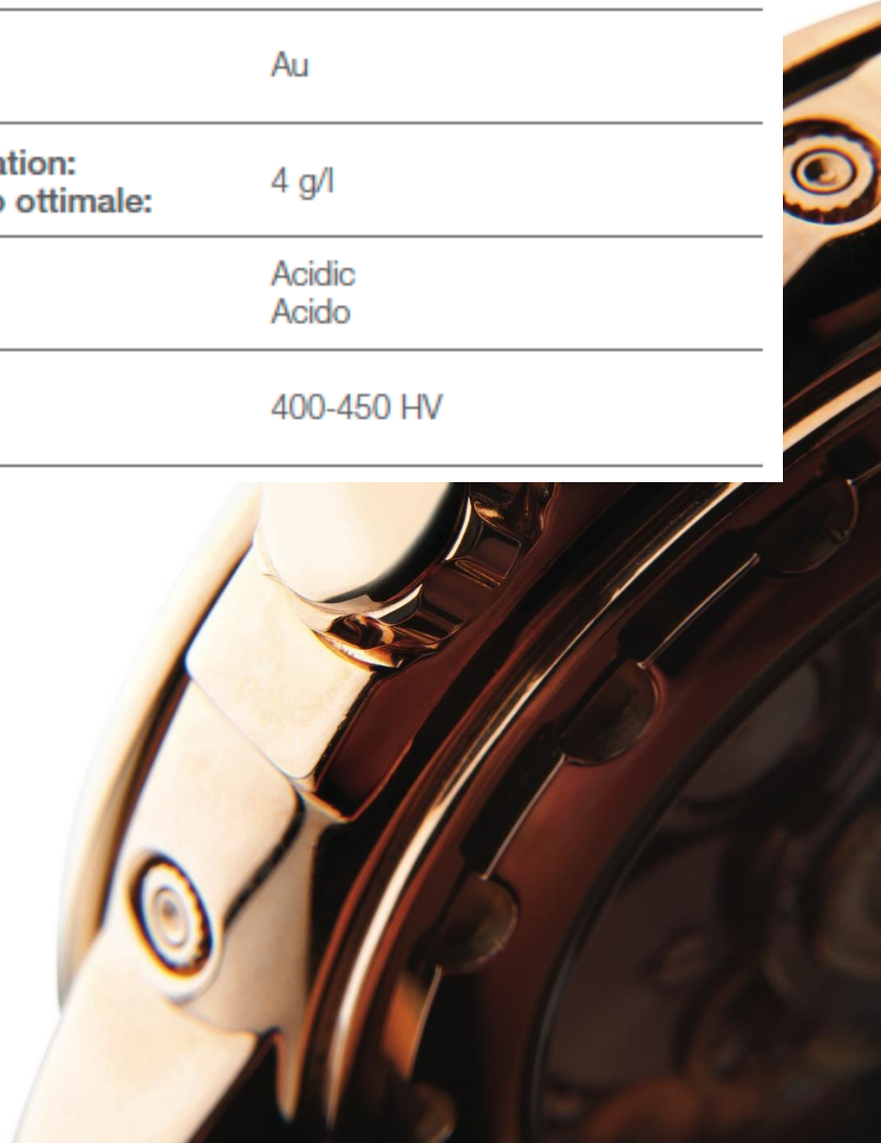
Voltage Voltaggio	30-80 Volts
Working temperature Temperatura di lavoro	22-26 °C
Coating time Tempo di deposizione	10-60 Seconds / Secondi
Curing temperature Temperatura di cottura	120-150 °C / 30-60 Minutes / Minuti
Thickness Spessore	5-35 micron
Anode Anodo	316 grade stainless steel Acciaio inox 316
pH	3.7-4.3

Focus on:
18 kt ACIDIC PINK GOLD ELECTROLYTE

The first 18 kt pink thickness electrolyte available on the market in an acidic process. This system is particularly indicated for decorative applications which require hard gold or thickness plating in a pink shade while reaching thickness up to 5 micron.
The gold is co-deposited with copper to generate an alloy which is 75% (18 kt) gold by title, granting significant cost savings. With a 400 HV hardness the layer is durable and tightly nit at the microstructure.

Primary metal: **Metallo principale:**	Au
Working metal concentration: **Concentrazione di lavoro ottimale:**	4 g/l
Chemical type: **Forma chimica:**	Acidic Acido
Hardness: **Durezza:**	400-450 HV

- 18 kt (75%) Gold deposit by title
- Slightly acid electrolyte
- Bright pink gold color
- Easy to maintain
- Thickness up to 5 micron
- Cadmium and Lead free
- Free of potassium cyanide



Focus on:
RUTHENIUM EXTRA BLACK

This extra black ruthenium plating electrolyte deposits a glossy layer of ruthenium metal in a jet black color. This acidic based compound is primarily used in decorative plating applications for a deep black color option in the case where corrosion resistance is also a requirement.

Due to the fact that ruthenium has a lower conductivity than other precious metals, the electrolyte requires a greater metal concentration to function optimally. The formulation is 100% arsenic free both in the metal deposited and in the chemical itself and falls within REACH compliance.

- Deep black color
- Arsenic free
- REACH Compliant
- 5 grams per liter
- Economical precious metal deposit

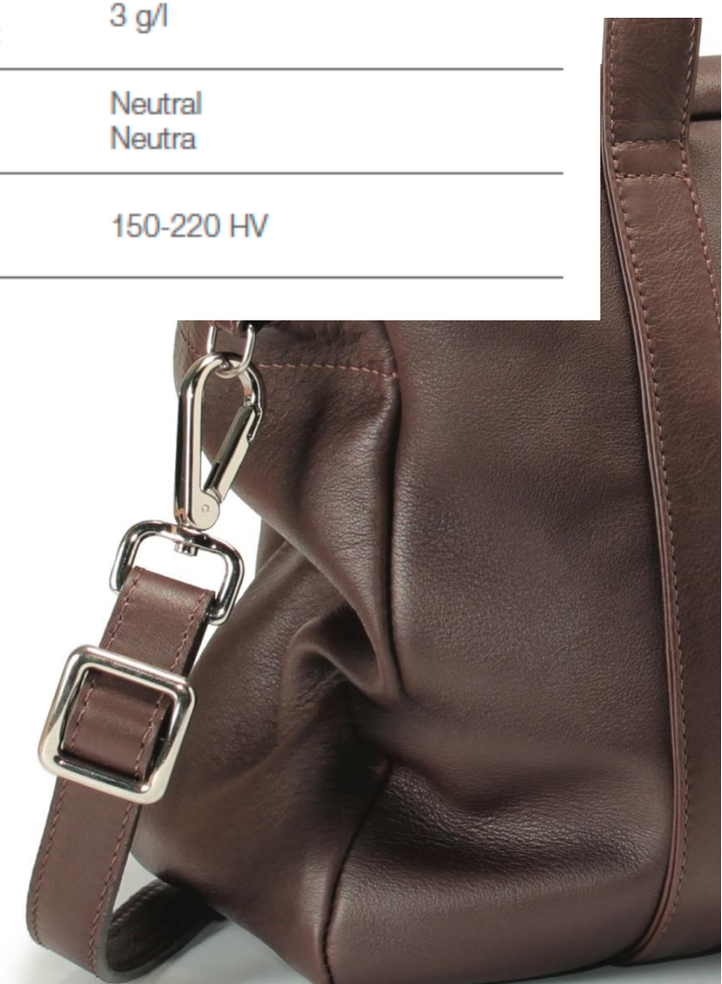
Primary metal: Metallo principale:	Ru
Working metal concentration: Concentrazione di lavoro ottimale:	5 g/l
Chemical type: Forma chimica:	Acidic Acido
Hardness: Durezza:	400-700 HV

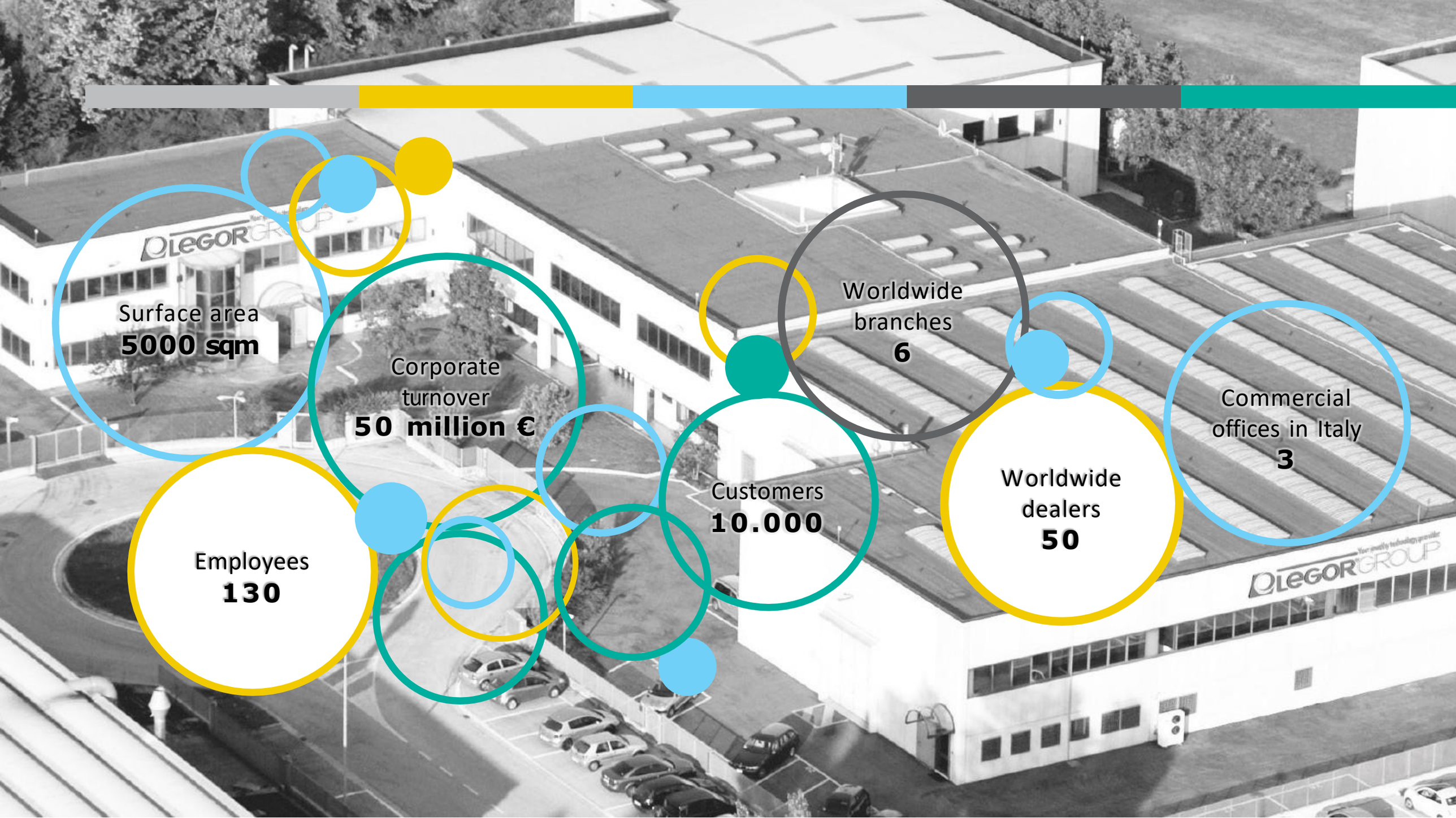
Focus on: **PALLADIUM IRON**

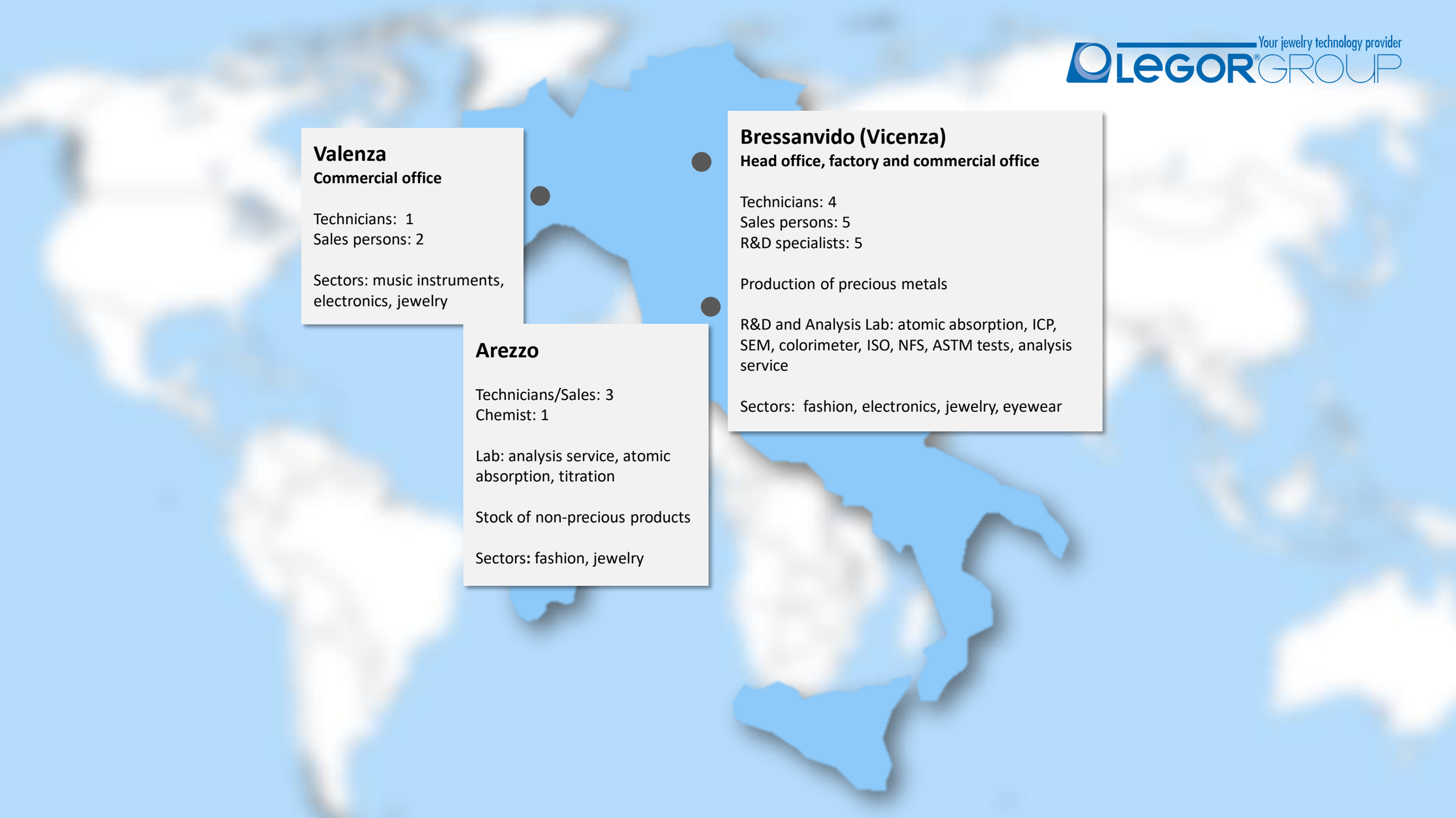
A new generation palladium totally absent of free ammonia granting extremely simple production management and an eco-friendly production approach. In addition to reducing environmental impact, this system makes the operator's work both healthier and easier as frequent pH management or regular additions of concentrated ammonia is not required. Moreover, since the pH of the bath is near neutral, hydrogenation of the deposit is limited compared to the traditional ammonia baths. This provides a white deposit almost like rhodium and a less porous structure compared to the traditional palladium baths.

Primary metal: **Metallo principale:**	Pd
Working metal concentration: **Concentrazione di lavoro ottimale:**	3 g/l
Chemical type: **Forma chimica:**	Neutral Neutra
Hardness: **Durezza:**	150-220 HV

- New generation palladium formula
- Totally absent of free ammonia
- pH stability and easy to use
- Thickness up to 1 micron




Surface area
5000 sqm
Corporate
turnover
50 million €
Employees
130
Customers
10.000
Worldwide
branches
6
Worldwide
dealers
50
Commercial
offices in Italy
3



Valenza
Commercial office

Technicians: 1
Sales persons: 2

Sectors: music instruments, electronics, jewelry

Arezzo

Technicians/Sales: 3
Chemist: 1

Lab: analysis service, atomic absorption, titration

Stock of non-precious products

Sectors: fashion, jewelry

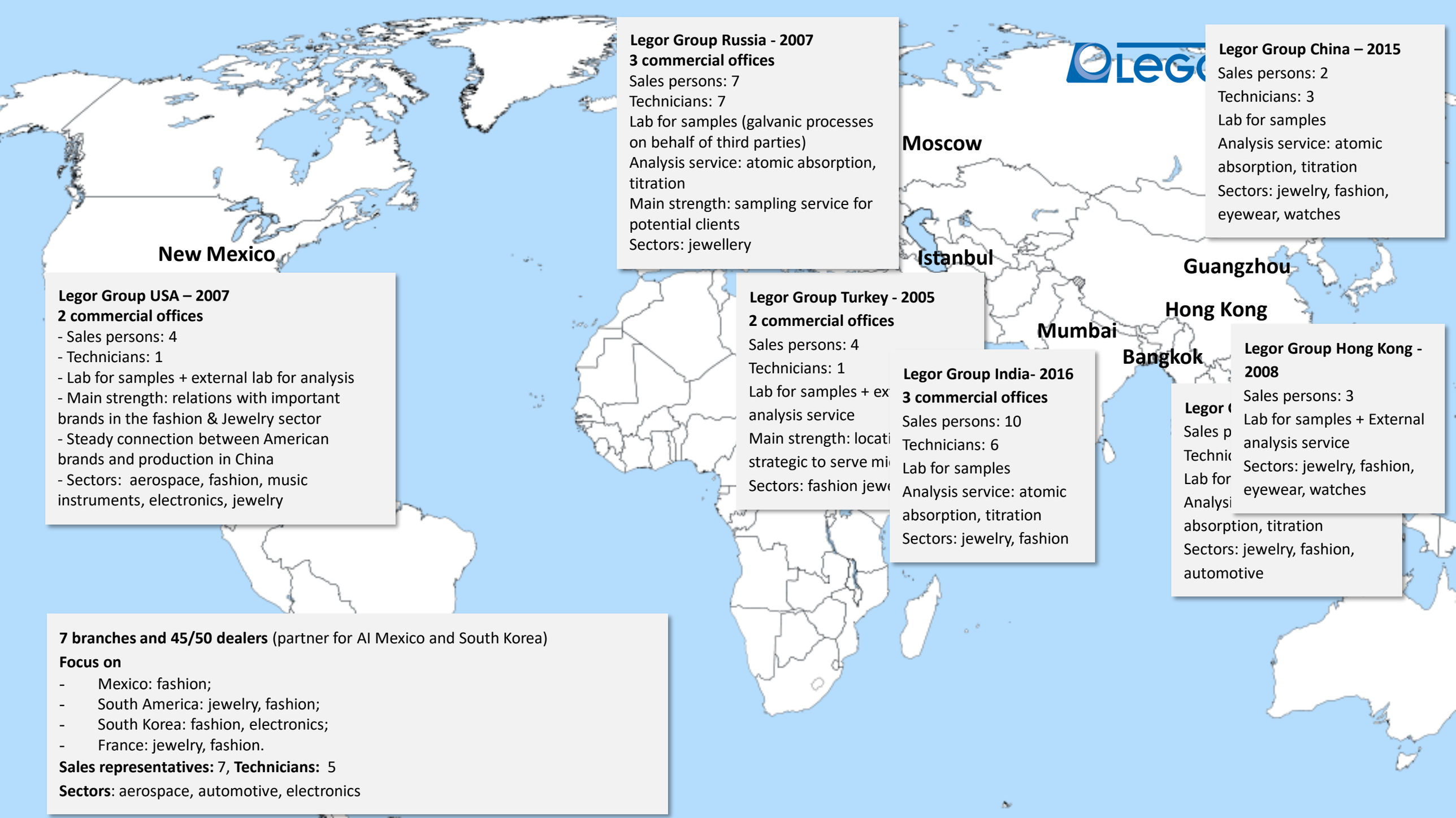
Bressanvido (Vicenza)
Head office, factory and commercial office

Technicians: 4
Sales persons: 5
R&D specialists: 5

Production of precious metals

R&D and Analysis Lab: atomic absorption, ICP, SEM, colorimeter, ISO, NFS, ASTM tests, analysis service

Sectors: fashion, electronics, jewelry, eyewear



Legor Group Russia - 2007
3 commercial offices
Sales persons: 7
Technicians: 7
Lab for samples (galvanic processes on behalf of third parties)
Analysis service: atomic absorption, titration
Main strength: sampling service for potential clients
Sectors: jewellery

Legor Group China – 2015
Sales persons: 2
Technicians: 3
Lab for samples
Analysis service: atomic absorption, titration
Sectors: jewelry, fashion, eyewear, watches

Legor Group USA – 2007
2 commercial offices
- Sales persons: 4
- Technicians: 1
- Lab for samples + external lab for analysis
- Main strength: relations with important brands in the fashion & Jewelry sector
- Steady connection between American brands and production in China
- Sectors: aerospace, fashion, music instruments, electronics, jewelry

Legor Group Turkey - 2005
2 commercial offices
Sales persons: 4
Technicians: 1
Lab for samples + ex
analysis service
Main strength: locati
strategic to serve mi
Sectors: fashion jewe

Legor Group India- 2016
3 commercial offices
Sales persons: 10
Technicians: 6
Lab for samples
Analysis service: atomic absorption, titration
Sectors: jewelry, fashion

Legor Group Hong Kong - 2008
Sales persons: 3
Lab for samples + External analysis service
Sectors: jewelry, fashion, eyewear, watches

Legor
Sales p
Technic
Lab for
Analysi
absorption, titration
Sectors: jewelry, fashion, automotive

7 branches and 45/50 dealers (partner for AI Mexico and South Korea)

Focus on
- Mexico: fashion;
- South America: jewelry, fashion;
- South Korea: fashion, electronics;
- France: jewelry, fashion.

Sales representatives: 7, **Technicians:** 5

Sectors: aerospace, automotive, electronics

Legor Group has an **in-house R&D Laboratory** equipped with the latest technologies and sophisticated analytical instruments.

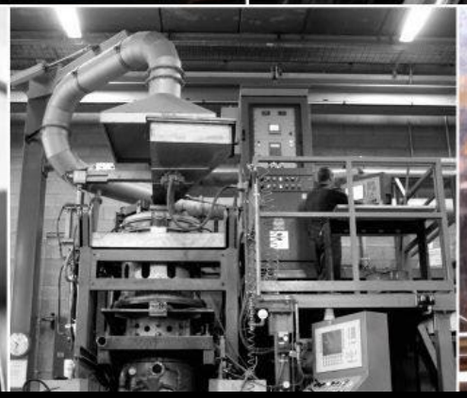
Here, the team of technicians and engineers study, design and test formulations on a daily basis in order to anticipate and meet customers' needs and transform creative ideas into innovative targeted products.
In Legor Group innovation is a strategic business advantage.

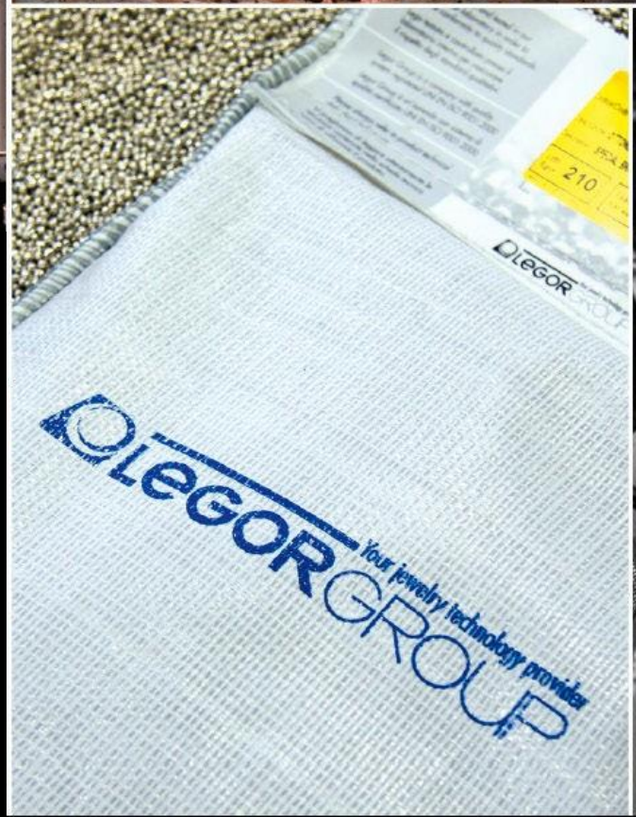
This has led to achieve an undisputed market recognition and leadership in the industry. The results attained are reflected in the numerous patents registered, the many International recognitions achieved and the global collaboration network between industry experts, universities and research centers.











All Legor Group products are manufactured at the factory in Bressanvido (Vicenza - Italy), guaranteeing a high quality standard, batch repeatability and maximum competitiveness in terms of price.

The production cycle begins with analyzing the needs identified by programmed planning function.

Legor Group's commitment to act in a responsible and sustainable way results in certified processes for ethics (RJC CoP), quality (ISO 9001), respect for the environment (ISO 14001), health and safety in the work environment (OHSAS18001) and traceability of precious (TFashion).

INTERNATIONAL NORMATIVE TESTING: AN ADDED VALUE

For companies which are keen on quality and require a guaranteed surface finish, Legor Group offers qualitative surface finishing analysis. All analysis is carried out in a sophisticated laboratory following a rigid protocol in accordance with the most known International Normative Testing.

International normative tests are standardized methods for benchmarking the quality of surface finishes. They have been developed by various reputable organizations such as ISO, NFS, & ASTM which are recognized internationally in quality control and testing. These procedures are common to the fashion sector, watch industry, as well as many other industrial segments.

This service is developed through testing methods which are designed to simulate the stress which the product is introduced to in an everyday environment: resistance to abrasion, corrosion, sea water, and critical climatic conditions. Alternatively, we are able to offer testing which determines the release of heavy metals such as nickel, lead, and cadmium.

	Microscopic analysis of surfaces
UNI ISO 4524/2	Exposure to nitric acid
EN ISO 4524/5	Plated layers adhesion test
EN ISO 4611	Resistance to damp heat
ISO 9227	Resistance to salt spray
ISO 4538	Thioacetamide test
ISO 105 E04 and NFS 80-772	Synthetic sweat resistance test
UNI EN 12568	Brine resistance test
	Determination of colorimetric coordinates
ISO 105 E03	Chlorinated water resistance test
ISO 105 B02	Xenotest
	Determination of alloy composition
	Measurement of deposit thicknesses via x-ray
	Pencil test (Cross Hatch)

https://youtu.be/j3LSe_317_4