

TECHNICAL INTRODUCTORY QUESTIONNAIRE FOR THE STUDY OF RECOVERY AND REFINING PLANTS OF PRECIOUS METALS

1) GENERAL INFORMATION:

DATE OF THE REQUEST
<div style="display: flex; justify-content: space-around; align-items: center;"> _____ / _____ / _____ </div>

Name and address of the company making the request:

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Telephone number, fax number, e-mails address, web-site:

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Name of the person to contact and his position in the company:

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Main Company production:

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2) WHICH TYPE OF PRECIOUS METALS REFINING PROCESS ARE YOU INTERESTED IN?

- **GOLD REFINING BY INQUARTATION (NITRATION)** YES NO

Refining process of low grade gold alloys carried out using only nitric acid in different concentrations.

Do you already have experience in this specific refining method? YES NO

GOLD REFINING BY AQUA REGIA: YES NO

Refining process of gold alloys carried out using hot Aqua Regia (HNO₃+HCl) which allows to dissolve the gold alloys with the possibility to precipitate the gold solution (AuCl₃) with proper chemical reagents.

Do you already have experience in this specific refining method? YES NO

GOLD ELECTROLYSIS: YES NO

Refining process of gold alloys carried out using rich gold chloride solutions. This method is used to obtain very pure fine gold (999,9 ‰)

Do you already have experience in this specific refining method? YES NO

- **ELECTROLYTIC SILVER REFINING:** YES NO

Refining process of silver alloys carried out using rich silver nitrate solutions. This method is used to obtain very pure fine silver (999‰)

Do you already have experience in this specific refining method? YES NO

3) WHICH MATERIALS AND/OR PRECIOUS METALS YOU INTEND TO RECOVERY AND REFINE? (PLEASE MENTION THE QUANTITIES IN KG)

Gold alloys scraps (normally coming from the jewellery industry)

Quantity per day _____ or per week _____ or per month _____

Gold bars from mines (Dorè):

Quantity per day _____ or per week _____ or per month _____

Silver alloys scraps (normally coming from the jewellery industry)

Quantity per day _____ or per week _____ or per month _____

Sweepings, polishing dusts etc coming from the jewellery industry.

Quantity per day _____ or per week _____ or per month _____

4) FOR THE ABOVE MENTIONED TYPES OF MATERIAL PLEASE SPECIFY THEIR CHEMICAL COMPOSITION IN THOUSANDS(‰)

(It is important to receive, if possible, the metal content on the above described material.)

Metallic Gold bars:

Au = ‰.....
 Ag = ‰.....
 Cu = ‰.....
 Others ‰.....

Important notice:

Knowing the % of silver contained in the alloys to be refined, is extremely important because it allows to choose the right refining process (Inquartation, direct Aqua Regia, electrolysis etc) to obtain the best results.

5) In case it is not possible to get the analysis of the metals contained in the alloy to be refined, it is advisable to indicate the possible carat content. Beside it is also important to specify the quantities to be treated as indicated below:

8 Kt gold alloys = quantity per day _____ or per week _____ or per month _____
 9 Kt gold alloys = quantity per day _____ or per week _____ or per month _____
 14 Kt gold alloys = quantity per day _____ or per week _____ or per month _____
 18 Kt gold alloys = quantity per day _____ or per week _____ or per month _____
 21 Kt gold alloys = quantity per day _____ or per week _____ or per month _____
 Other carats alloys= quantity per day _____ or per week _____ or per month _____

6) We would like to remark that the presence of an Assay Laboratory, in any refining plant, is absolutely necessary. Only with an Assay Lab it is possible to carry out the refining process in appropriate way. The determination of metals contained in the alloys to be refined before the refining itself, allows to calculate with precision the proper refining process and the reagents to be utilized.



Is Your Company equipped with an Assay Laboratory? YES NO

Have You any experience concerning the Fire Assay Laboratory analysis? YES NO

7) Is there already in your building one area that can be utilised, after improvements, for recovering and refining precious metals process? YES NO

If You like You can send us the drawing of the building and area where the refining plant will be installed. Appreciated also AutoCAD drawing concerning the type of construction, height, windows, doors, location of the building, if near to the city etc etc.

Notice:

The height of the building is very important to be known because, according to it, our staff can decide the most suitable type of Plant.

8) After the refining and all chemical processes, do You intend to recovery the solutions containing Silver and Copper salts ?

Notice:

The recovery of these solutions requires special tanks (cementators, sedimentation tanks etc etc) which are normally used when the quantities of the above metal salts are high and their recovery becomes economically convenient.

Beside to this the residual solutions are more easy to be treated in the water pollution plant.

9) Do You want to equip Your Company with a water pollution plant? YES NO

In case You do not wish to equip Your Company with a water pollution Plant it is possible to store and consign residual solutions to local specialized Companies that will take care of their treatment.

In case You want to equip Your Company with a water pollution plant kindly send us (if available) copies of the provincial rules concerning the industrial discharges like fumes and the water pollution plant.

10) What is the water availability for industrial use? (Aqueduct water, or well water, or others?)

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11) What is the availability of the gases or oil (natural gas, LPG gas, or diesel?) (Specify which one of them is easily available)

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12) What is the electric power availability? VOLTS = _____ CYCLES (Hz) = _____ PHASES = _____

13) Specify if Your Company is equipped with a complete section of melting where to melt the ingots and prepare the grains for refining. In case of affirmative answer please specify the capacity of Your melting equipment

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14) Please be kind to send us the list of machines already in Your Factory that might be used in the refining process. Thanks to this information we can make a best selection of the machines to be offered.

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15) Are the following chemical commercial reagents easily available in your country?

Nitric acid concentrated 67,5% (42 Bè): (HNO₃), Hydrochloric acid 32-33%: (HCl), Sulphuric acid concentrated 94%: (H₂SO₄), Sodium disulphide salt (NaHSO₃), Sodium Metabisulphite salt (Na₂S₂O₅), firm Caustic salt in flakes (NaOH), Urea salt in powder (NH₂ CO NH₂), Ammoniac Hydrated solution 30%: (NH₄OH), Sodium Carbonate in powder: (Na₂CO₃), liquid reducing agent to be used instead of sodim metabisulphite (only FIOA INTERNATIONAL supply), Stannous Chloride, Zinc powder.

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