



# K-ALS VACUUM DISTILLATION REFINING FOR KARAT GOLD



The K-ALS is the ultimate **GREEN** technology developed by IKOI: a high-tech solution, practical, suitable for meeting the refining needs of Jewellery manufacturers and small refineries. IKOI advanced technology for vacuum distillation under high temperature is applied into a compact furnace that allows a pre-treatment of a variety of feedstock by reducing the silver content to less than 10% and hence making it suitable for gold refining. Specifically designed for small refiners working with high silver content, K-ALS is a flexible, cost effective and sustainable furnace, a true step towards green gold production.



### Main applications

K-ALS provides significant benefits in terms of cost reduction, metal loss reduction, less effluent generation and sustainability for the following applications:

- **Sprue's scrap trees from casting production**

Sprue's gold scrap trees from Jewellery casting production needs to be refined and re-used. This material is usually refined by Aqua Regia process, with inevitable metal loss, consumption of chemicals and generation of fumes and effluents. Aqua regia does not work well when silver content exceeds 10% leading to multiple refining for a single lot having silver in excess of 10%.

By including a pre-refining melting step with vacuum distillation, the alloyed gold is upgraded by evaporating the excess silver, allowing the final refining step to have faster turn-around time due to reduced silver content in input. The improved process efficiency has significant benefits in terms of cost of operation, gold loss and effluent generation.

- **Powders from scraping operations**

Scraps powders containing precious metal is produced by different processes in Jewellery manufacturing. All this powders can be refined back to pure gold using an efficient combination of vacuum distillation and traditional methods.

- **Inquartation process**

Inquartation using silver is another common method used to pre-refine alloys and intermediate by-products of Jewellery manufacturing processes. Due to its higher silver content, Aqua Regia refining is not the suitable process to treat this metal and instead parting or silver electrorefining is used to extract the locked gold. The recovered gold is then fed for the final gold refining.

This method is a comparatively slow process for gold recovery due to multiple steps, this process has higher cost of recovery. It also has loss of gold with high impact on the environment, generating more effluent and by-products to be treated.

Vacuum distillation with Mini-ALS can be used to substitute the inquartation by providing silver selective evaporation from the feedstock, without using any chemicals a generating by-products and effluents applicable in the parting process.



## TECHNICAL DATA

Installed power (KVA)	7
Power supply	400V - 3Ph - 50Hz/60Hz
Heating technology	Induction
Cycle time	1,5/2 hours
Weight loss (g/Kg)	0,01
Crucible capacity per batch* (Kg)	1
Crucible material	Graphite
Crucible internal dimensions** (mm)	Ø 50 - h 70
Furnace dimensions** (mm)	670 x 530 x 930
Furnace weight (Kg)	90

\* Crucible capacity indicated is considering a feedstock density of 14 kg/dm<sup>3</sup>

\*\* The dimensions do not include the vacuum pumps group, which can be installed separately according to plant layout needs.



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**IKOI** is the leader in the pyrometallurgical processes for the precious metals refineries, mints and jewellery market, thanks to our technology for vacuum distillation, melting & casting, heat treatments and crystallization.

Our Vision is to create a Safe, Efficient and Green way to Process Precious Metals and our Mission is to bring Innovative and Sustainable Technology to Precious Metal Industry.

With more than 300 plants installed in more than 50 countries, we are a reference point for the industry.