Recuperación de Oro
Recuperação de Ouro
Récupération de l'or
Добыча золота

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Patents Pending

iCON Gold Recovery Corporation

Enhanced Gravity Concentration for

Small Scale and Artisanal Miners

Without Mercury - Without Cyanide

iCON is used for...

Hard Rock (No Chemicals Required)

- Scavenging/Reprocessing Hard Rock Tails
- Initial Processing of Hard Rock Ores
- Concentrating Ores/Tails for Regional Final Processing

Alluvial and Dredging

- Primary processing when you know your gold is too fine for a sluice
- Reprocessing years of old concentrates
- Processing daily sluice box concentrates

Upgrading Concentrates

- Classifying and upgrading sluice concentrates
- Upgrading concentrates for regional processing

Prospecting, Drilling, Sampling

- Analyzing samples in the field. iCON is portable and conveniently classifies your sample to give you confidence in the size of your gold.
- It is easily cleaned from sample to sample without fear of contamination.

Mercury Remediation

- iCON has been shown to be the most cost effective means of Mercury Remediation in the World
- Our Concentrators have been shown to recover 97% of Mercury from tailing in a single pass

Hard Rock Applications

Hard Rock miners around the world have historically recovered as little as 30% of their free gold using mercury amalgamation. The iCON process is being used to scavenge/reprocess old tails without using mercury. These miners are now recovering more gold reprocessing tails with iCON than the original miners recovered. They are also recovering significant quantities of Mercury.

Hard rock miners must first understand some definitions:

- Free Gold has been liberated and depending on its size will be visible in a pan.

- Free Milling Gold is the gold that can be liberated by a standard rotating ball mill or other locally available milling methods.

- Refractory Gold is that which is not recoverable by standard milling and/or leaching processes. This may be ‘entrapped in sulfides.’ A standard ball mill may grind your ore to 75 microns.

- Gravity Recoverable Gold (GRG) refers to how much gold you can recover based on how fine you are grinding/milling your ore.

The GRG (Gravity Recovery Gold) testing is available at Met-Solv labs (see links).

The number 1 application for iCON i150 worldwide is Hard Rock. The 2tph capacity and the ability to recover fine, flat milled gold are ideal for iCON. The major mines of the world use gravity concentration in their grinding circuits. The concentrators can recover over 90% of the overall production of major/professional mines.

A typical Hard Rock application would involve a crusher and ball mill. The material would be size classified using a cyclone in closed-circuit or simply a screen in semi-closed circuit milling. After the mill the material will pass through the concentrator. The major mines have a ‘recyclic load.’ Their processes are designed for the feed to pass through a concentrator multiple times before passing to the tails.

A Hard Rock operator may choose to run 1.5 tons per hour of a high grade ore. He may choose to rinse the bowl every 20 minutes. Here, he would have run 500 kg in 20 minutes and collected 1 kg of concentrate. That is a concentration ratio of 500 to 1.

The concentrate will still need to be upgraded or cleaned to have a sellable product. Some miners around the world are choosing to collect the concentrates from multiple mine sites and clean the cons at a regional secure facility. This is known as ‘pre-concentration’.

When scavenging old tails the operator must understand that there is a reason the first miner missed this gold. It may be that it was poorly milled and needs to be re-milled to liberate more gold. In order to recover what another team missed the operator must pay attention to the details and be prepared to adjust their process as required. To understand your ore and how much gold you can expect to recover, IGR recommends testing your samples at Mel-Solv labs. (see links)

Alluvial/Placer & Dredging

The i350 is impacting the world of Alluvial Mining and Dredging the way the i150 has done for hard rock.

Alluvial miners often ignore the fine gold because sluices and jigs can't catch it. Depending on the size and shape of your gold a sluice may begin to lose gold at 40 mesh. Some alluvial deposits have 90% of their gold finer than this. This is where enhanced gravity, iCON, is the only solution.

Concentrators are being tested on the ends of sluices and dredges. In this case the operation is still capturing the same amount of gold in the sluice. The added value of the concentrator becomes very clear.

After seeing the additional recovery of the concentrator some operators are choosing to redesign their process. An efficient plant design would include a screen (typically 2mm or 10 mesh) where only the coarse material will be routed to a sluice and only the fine material will be routed to your concentrator.
An example of this process is the iCON IGR 1000 / 3000 Plant.

Comments on Alluvial Mining

Please see separate document regarding Alluvial Mining and Processing CLAY.

Upgrading Sluice Concentrates

Any placer miner or dredger understands the vast amount of concentrate you will accumulate. They also understand the incredible amount of work required to clean the cons. Considering that a concentrate is already 'heavy,' an i150 operator may run 1 tph through a concentrator. He may choose to rinse the bowl every 6 minutes which means after each 100 kg of feed. Here the i150 will produce 1 kg of cons from 100 kg of feed.

Placer miners also understand the need to classify their concentrate. Let's say a placer miner is processing ½ inch material. He will have this coarse material and the finest sands in his sluice concentrate. The first step here is to classify or separate this concentrate into at least 2 sizes of material. The iCON IGR 100 Plant will handle this process for you. The screen will separate you material into 2mm+ and 2mm- sizes. (+/- 10 mesh) The fine material will be pumped to the concentrator and the coarse material will go to the nugget trap.

To give complete confidence all clean-up process should be ran 2 or 3 times. Whether using a table or concentrator, the miner must pan the tails to determine when his is satisfied with the process.

You may choose to wash your sluice directly into an iCON Slurry Pump. The pump could then move the material to your screen to greatly reduce the daily labor involved in cleaning your sluice, lifting, storing and transporting the material.

Prospecting / Drilling / Bulk Sampling

The small physical dimensions of the i150 and IGR 100 Plant make them mobile. The internal structures make them easy to clean from batch to batch or sample to sample. The i150 capacity makes it ideal for processing samples from individual drill holes. Overall the i150 is ideal for processing any volume from individual drill holes up to bulk sampling at 2 tons per hour.

The iCON IGR 1000 Plant can process up to 10 tons per hour. It is skid mounted for mobility. For larger volume bulk sampling the IGR 1000 Plant may be right for you. This pilot plant will give you confidence in the various values across your deposit and in the process of using a grizzly, scrubber, screen and concentrater.

Methods to Clean Your Concentrates

The gravimetric concentrator provides a concentrate which requires final cleaning or upgrading. Common methods include:

Table

Tables and bowls have been proven to be very effective for final cleaning. They use no chemicals are safe for the environment and your family. They are fun and provide immediate gratification – after each cleanup you will see high grade gold.

The Blue Bowl is available from Pioneer Mining in California. It is slow but produces a very clean final product. Its capacity is acceptable for the i150.

At the capacity of the i350, tables are the most common means of upgrading the concentrate to a sellable yellow product. The most common brand in the world is Holman-Wilfley.

Regional Processing

Regional processing is becoming more common around the world. Miners are using iCON at their site and transporting a small volume of concentrate to regional processing plants. This is becoming the method of choice where hard rock miners have learned the value of their tails and are using the iCON to pre-concentrate their

product.

Cyanide Leaching

This is the recommended method of the Global Mercury Program. Without pre-concentration the volume of material to treat and the amount of chemicals are tremendous. Concentration allows the operator to treat a reasonable amount of material either on site or at regional facilities serving many mines.

Mercury Amalgamation

This is not recommended due to the environmental impacts and the effectiveness of bowls and/or tables. When practicing 'whole ore amalgamation' a miner will place mercury directly into the ball mill or sluice. In this case 100% of the ore is exposed to mercury. When a concentrator is used the amount of ore can be reduced dramatically to a small amount of concentrate. 1 ton (1000 kg) of ore could be reduced to 1 kg of concentrate. If the miner chooses to amalgamate the concentrate only a fraction of the mercury would be used and only a small percentage of the ore would be exposed to Hg.

What is iCON

iCON is a family of products specifically designed to recover fine gold and provide the correct modular process to various regions of the world. iCON was designed by the professional engineers at Falcon Concentrators and uses the same patented technologies used at the largest mines in the world.

The heart of the iCON family are the world famous i150 and i350 Concentrators. iCON uses classification and enhanced gravity in its centrifugal concentrators to ensure that you are recovering the most gold possible.

In addition to concentrators iCON offers a line of complete modular plants for Alluvial and Eluvial operations. We offer scrubbers plant for clay and screen decks for clean gravel.

iCON is supported by governments around the world due to its ability to recover gold without the use of mercury. iCON was designed for the United Nations' Global Mercury Project to bring professional techniques to small miners throughout the world. iCON uses the same proven technology as the Falcon brand of professional mining products: it was designed by Falcon's engineers and is now a product of iCON Gold Recovery Corp.. History and Environmental Responsibility are discussed on our website.

Features that make iCON Concentrators ideal for small scale applications include:

- Low machine weight
- Ease of Installation
- Only one moving part
- Use of wear components readily available in developing areas
- Rigid structure conducive to running at high speeds
- Low acquisition and operating costs
- A proven, robust and simple mechanical/electrical platform
- Efficient clean out
- High concentration ratios
- All iCON products include a VFD/Soft Start
- Value priced well below the competition
- Short 1 minute rinse times
- Simple push button start/stop

How It Works

The iCON Concentrator is designed to capture all heavy minerals including Gold, Silver and PGMs and Mercury. It uses enhanced gravity to concentrate very fine, free minerals that are not recoverable using the traditional techniques of small scale and artisanal miners. The technology is based on the batch-type Falcon concentrator and designed by the same Falcon engineers that design concentrators for the largest mines in the world.

In operation, material is fed as a slurry of minerals and water into a rotating bowl that includes special fluidized grooves or riffles to capture the heavies. Periodically, a rich concentrate is rinsed out and requires further upgrading to be turned into a final gold product.

General Comments on Mineral Processing

Throughout history gold processing has been plagued with inefficiency and contamination. Millions of dollars of fine gold have been discarded in the tails or “washed down the creek” due to inadequate processing. Other operations have long put the health of both workers, and our planet at risk with the use of mercury, cyanide and other dangerous chemicals. iCON technology successfully addresses both issues, ensuring that the highest percentage of gold is recovered and no hazardous chemicals are needed.

The most important factor in mineral processing is classification; the relative size

of the gold you are processing must be known. Mineral processing is expensive and time consuming. Processing large material that is known to have no value, costs both money and time. With classification, time, energy and money will not be wasted processing excess material that is known to have no values. For example, if you know that your largest gold is .5mm then there is no reason to put 10mm material through your process. Also, the large feed will affect the efficiency of any process. The large material will hinder the recovery of the finer materials. For example, one miner improved his recovery from 40% to 70% simply by screening his feed from 8mm to 2mm. No gold was lost, because his largest gold was around .5mm. The iCON method will improve your process by screening your feed to the proper size (reducing the volume of feed) and increasing the percentage of gold that you recover.

iCON uses a 2 step process; classification and concentration. Your feed will be screened to 2mm (or less based on your results) before processing in the concentrator. Any material larger than the screen will pass over the nugget trap. This will give the user confidence that they are collecting the BIG gold while minimizing the feed to the concentrator and maximizing its efficiency.

Batch Process / Cycle Time

The iCON "i" series of concentrators use a batch process. Your cycle time will depend on the grade and weight of your feed. A heavy or rich feed will need a shorter cycle time. The iCON "i" series concentrators can be cleaned out in 1 minute.

Hard Rock operations may have 100 grams of gold per ton of feed. This is very rich. In this case it is common to run for only 20 minutes between rinse cycles.

Alluvial operations with heavy black sand may run 20 minute cycles. Without black sand an alluvial cycle time may be up to 2 hours.

When upgrading concentrates you will be processing rich and heavy material. In this case the cycle time may also be only 10 minutes. Here you may be feeding at ½ ton per hour to the smaller i150.

Every feed is different. The proper cycle time for you will be determined by analyzing/planning the free gold in your tails and adjusting your process to fit your ore.

Capacity

The throughput of the i150 centrifugal concentrator is nominally 2 tons per hour. If you have large material in your feed, if you have a heavy feed or if you are using iCON to 'upgrade' a concentrate the throughput will be reduced. All ores and all

processes are different. Each user must assess their situation as with any mineral recovery process.

i150 Process Examples

These Are Only Examples	Aluvial Mining	Upgrading Aluvial Concentrates	Drilling Sampling Exploration	Initial Hard Rock Processing	Hard Rock Tails Scavenging
Feed Rate					
Tons per Hour	2	0.5	2	1-2	1-2
Kilograms per Hour	2000	500	2000	1000-2000	1000-2000
Batch Time					
Minutes	120	30	<5	10	10
Feed per Batch				165	165
Kilograms	4000	250	20 Kg Sample	330	330
Concentrate Volume					
Kilograms	1	1	1	1	1
Concentration Ratio				165:1	165:1
Ratio	4000:1	250:1	20:1	330:1	330:1

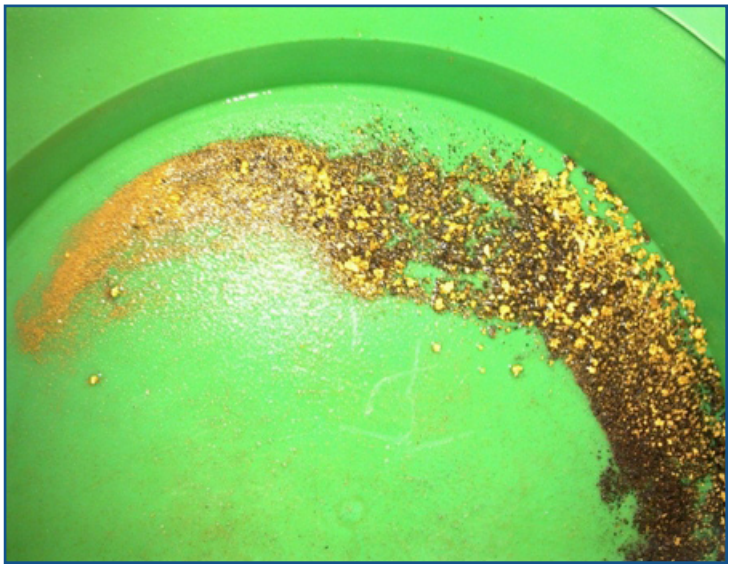
What to Expect from iCON

It is common for internet advertisements to show a process where a small amount of gravel goes in and a large quantity of bright shiny gold comes out. Experienced miners know this is not the case. A sluice box is a gravity concentrator. Let's say you put 1000kg of feed over your sluice. At the end of the day, you may have 50kg of 'concentrate.' This concentrate is not bright and shiny, in fact, it looks just like the feed material. This material has to be post processed to further 'clean your cons' and give you a sellable product. Although a sluice can give you a very high concentration ratio, it is not effective for recovering fine gold. In the case of sluice operations, miners are choosing iCON to reprocess old tails and recover the values left behind by sluice operations.

When using an 'enhanced centrifugal concentrator,' you may put up to 1000 kg into the process and get 1kg out. This will be a 'concentrate.' It will look just like the feed material. Some people choose to sell this concentrate while others choose to continue refining it to shiny, clean, high grade gold.

This photo shows what your concentrate may look like.

It will not be pure gold and will require post processing.



This photo reveals 2 sizes of gold.

The larger material passed over the iCON Screen and was caught in the nugget trap.

The finer gold was recovered in the concentrator. It is the same material from above.

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The iCON Product Line

iCON Gold Recovery Corp. offers a wide range of gold recovery plants and sells the components individually. The product line includes:

- **iCON i150 Concentrator**
- **iCON i350 Concentrator**
- **iCON iPump 1.0**
- **iCON iScreen 15 Inch x 29 Inch**
- **iCON IGR 100 Plant**
- **IGR 500 Sluice Tails Plant**
- **iCON IGR 1000 Plant -** *Dual i150 Scrubber Plant for Clay*
- **IGR 3000 Plant – now available 'a la carte'**
- **i350 Battery Plant**
- **100 TPH Modular "a la carte" Scrubber Plant**