INLINE LEACH REACTOR

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GEKKO SYSTEMS

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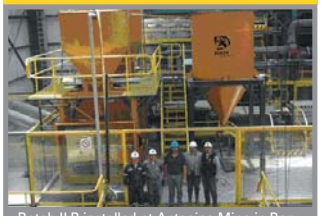

Batch ILR installed at Antapine Mine in Peru

MINERAL PROCESSING TECHNOLOGY

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GEKKO SYSTEMS specialises in the design and development of mineral processing equipment with particular emphasis on gravity separation.

The company's motto *"from challenge comes innovation"* reflects our focus on pro-active and progressive solutions.

APPLICATIONS

The InLine Leach Reactor (ILR) has been used to increase recoveries of both free gold and sulphide related gold. In all installations of the ILR to date, significant increases in total recoveries have been achieved. This reflects the ILR's very fast leach kinetics and capacity to leach coarse and high grade gold concentrates.

The use of batch centrifugal concentrators has become standard practice to recover **free gravity gold** from grinding circuits. Traditionally concentrates from these separations are upgraded by shaking tables. Replacing the tables with ILR will significantly improve recoveries and lower the security risks associated with gravity circuits. The fast leach kinetics and aggressive chemical conditions of the ILR have also been shown to limit the impact of sulphide minerals such as stibnite, pyrrhotite and pyrites in **complex sulphide gold** concentrates. Accordingly, the ILR offers potential to significantly increase overall mill recoveries.

THEORY OF OPERATION

The InLine Leach Reactor is an intensive cyanidation reactor of which there are two model lines – batch and continuous units. In principal, it is a sophisticated production version of the laboratory bottle roll. The batch ILR has been designed to treat small volume gravity gold concentrates produced by batch separators. The continuous ILR has been developed to treat gold and complex sulphide concentrates produced by the InLine Pressure Jig and flotation.

Gravity concentrates are de-watered in a cone prior to injection into the drum where they are exposed to a high oxygen, high cyanide solution. The horizontal drum rotates at low speed with custom designed baffles enhancing liquor contact with solids for maximum leach performance. Residence time is predicted in the laboratory and set by reactor volume and solids feed rate. Barren solids are removed from the circuit via a de-watering cone and de-watering screen. The pregnant solution is pumped to electrowin, resin or carbon circuits for gold recovery. Barren solution is recirculated through the ILR to optimise the use of reagents

ADVANTAGES

High recovery: The target recovery of free gold for the ILR is plus 98%. Very high recovery rates on complex sulphide-related gold can also be expected.
High security: The ILR will significantly improve gold concentrate security by replacing the tabling step and eliminate concentrate handling.
Low operating cost – high automation: The system offers fully integrated electronic control of all critical leach parameters and is fully automated. Recovery costs per ounce are attractive.
Ease of installation: This complete system can be retro-fitted to any grinding circuit. The ILR is modular and can sit adjacent to the plant. Controls easily integrate into existing plant distributed control system.
Bench scale test work: The performance and cost for this simple system can be effectively predicted at bench scale in a laboratory. Reactor conditions can be optimised prior to full scale installation.
Low maintenance: There are no high speed / high wear components in the system.
Very simple: Only one pump and one drum drive. No complex reagents.
Proven technology: Thorough mixing of solids / solution with the rotating drum, unlike vat leaching systems.

SPECIFICATIONS

Model ILR	100**	1000	2000	5000
Maximum Throughput* (kg/hr) (Continuous)	100	500	600	1500
Maximum Throughput* (kg/hr) (Batch)	1000	2500	5000	13000
Dimensions (mm)				
Length	4500	5400	6950	11600
Width	1800	2600	2600	2600
Height (exc. cones)	2400	3000	3000	3000
Feed Height	1800	2400	2400	2400
Dry Weight (t) approx.	3.0	8.5	11.5	18.8

* Throughput for each unit is derived from testwork and dependent on concentrate specific gravity and leach kinetics
** ILR 100 Model is designed specifically for use on Inline Spinner, Knelson, Falcon and other batch concentrators

Note: The manufacturer reserves the right to change design specifications without notification at any time.