

## EXTRACT WEALTH FROM OUR EXPERTISE



Mixing solutions for  
all Mining and Mineral  
processing applications.

[www.haywardgordon.com](http://www.haywardgordon.com)

**MIXERS**

## EXPERTS IN THE MINING INDUSTRY

For over 50 years, Hayward Gordon has been actively involved in the selection and manufacture of mixers for the mining and mineral process industry. In this time, we have developed an expertise and installation portfolio second to none. Hayward Gordon has been at the forefront of many of the largest and most innovative projects in the world. Discover how our expertise can improve your process result.

### GOLD LEACH/CARBON ABSORPTION

Hayward Gordon designed and installed the first draft tube CIP and leach mixers in Canada. Over the years as technology has changed, we led the market with larger and larger open tank installations. With literally hundreds of mixers successfully operating on tanks from 20' to 59' in diameter, Hayward Gordon is a clear leader in this market.



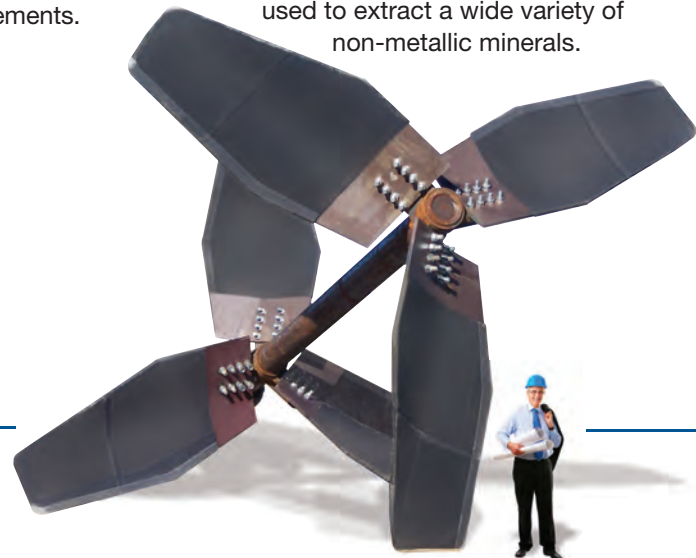
### CONDITIONING

Hayward Gordon worked closely with one of Canada's leading metallurgical research facilities on high intensity conditioning of fine grind ores. This patented process includes the use of Hayward Gordon developed impellers. We have provided high intensity conditioners in North and South America with excellent process improvements. Standard conditioners are also available from our heavy duty line of mixers.



### NON-METALLIC EXTRACTION

With massive Potash deposits in Central Canada, diamonds in the far north and a mature phosphoric acid business, non-metallic extraction processes have been a large market for our mixers. Phosphoric attack tanks, scrubbers for potash slurries, leach mixers for silvite, silvinitite and schoenite slurries, kaolin storage mixers and asbestos leaching - Hayward Gordon's expertise has been successfully used to extract a wide variety of non-metallic minerals.

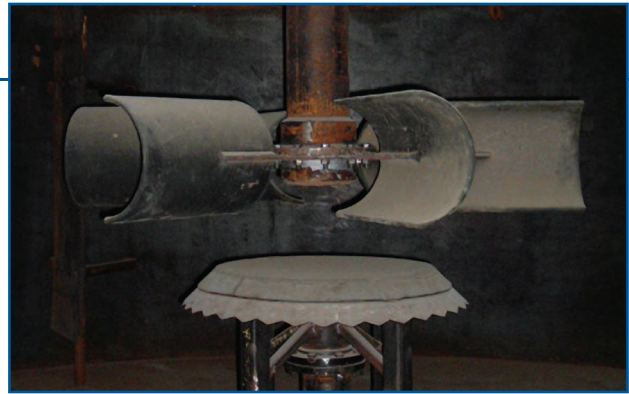


# INSTALLATIONS

## AUTOCLAVE MIXERS

In the late 1960s, Hayward Gordon was involved in the first commercial copper leach circuit. This provided a capability that has subsequently led to many mixer installations for high pressure, high temperature oxidation, leach and reduction autoclaves.

With installations in all of these processes, Hayward Gordon has established itself as a market leader in high pressure mineral extraction.

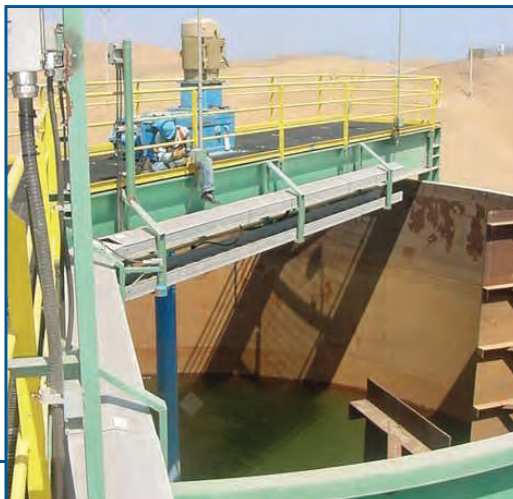


## HIGH DENSITY SLUDGE MIXERS

The treatment of acid mine water and sludge disposal is a key process in the recovery and discharge of the water into the surrounding environment. Hayward Gordon has been successful supplying mixers into these applications for many years. Depicted in the photo is a Smith Turbine impeller and a bottle-cap style air sparging device. This combination will effectively incorporate the lime and disperse the gas promoting the acid neutralization and the precipitation of the heavy metals from solution.

## CYANIDE DESTRUCTION MIXERS

One of the more demanding applications encountered in mineral processing combines the three major categories of agitation: blending, solid suspension and gas dispersion. It is important to provide the appropriate type and amount of mixing to each of these categories to ensure the desired process result - destroy all the cyanide prior to releasing the slurry to the tailings pond. With dozens of successful installations we have the experience to optimally size the mixer for your application.



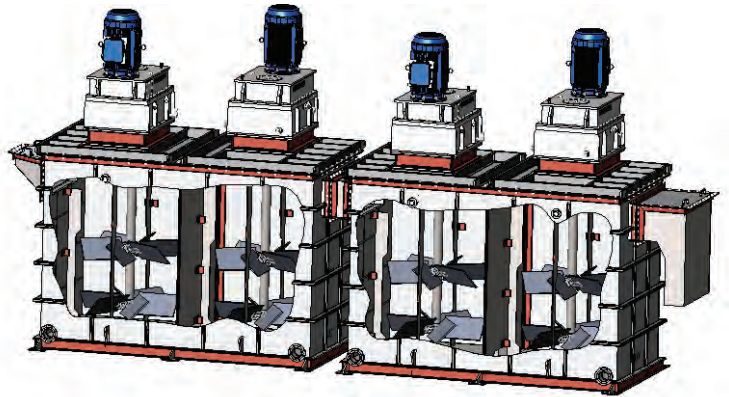
## PIPELINE FEED AND STORAGE

In South America, the copper mines are typically located high up in the remote regions of the Andes. Copper ore is concentrated, then slurried and pumped to port or railhead where it is dewatered. At both ends of the pipeline, large mixers maintain a uniform suspension of the concentrate slurry in feed and storage tanks.

Hayward Gordon was chosen to supply mixers to many of the largest systems in South America. Our units were selected for their rugged reliable design and efficient maximization of tank surge capacity.

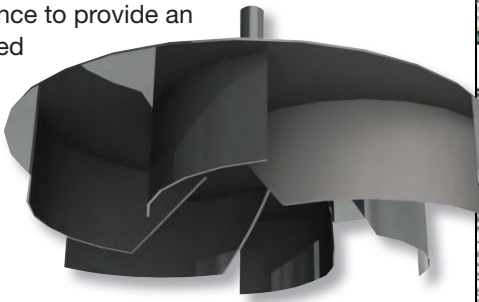
## ATTRITION SCRUBBERS

A suitable line extension to our successes with conditioning and high intensity conditioning agitator applications. Hayward Gordon's approach to attrition scrubbers combines our experience in mixing and mining applications to provide a complete solution. As mixing specialists Hayward Gordon can choose the optimum impeller style from our large selection and identify the spacing and number of blades suitable for your application. In addition, ideal cell and baffle geometry and configuration is selected by our experienced mixing application engineers



## SOLVENT EXTRACTION PROCESS

Hayward Gordon uses powerful customized software developed with years of first-hand experience to provide an optimized system.



Process Window		Unit	Design	Units	Service	Capacity	Unit	Design	Units	Service	Capacity
Process Window	Unit	Design	Units	Service	Capacity	Unit	Design	Units	Service	Capacity	Unit
Process Window	Unit	Design	Units	Service	Capacity	Unit	Design	Units	Service	Capacity	Unit

**Hayward Gordon**  
Post Mixing  
Calculation and Control

**Client:** Alstom  
**Location:** India  
**Date:** November 17, 2010  
**Classified by:** Top Secret  
**File:** TAP-10-117

**Process Data:**  
 - **Flow Rate:** 1000 m³/hr  
 - **Temperature:** 40°C  
 - **Pressure:** 1.5 bar  
 - **Viscosity:** 100 cP

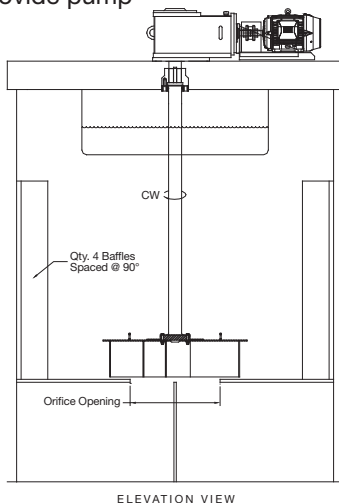
**Agitator Data:**  
 - **Speed:** 150 RPM  
 - **Power:** 100 kW  
 - **Impeller Type:** 6-Blade Turbine

**Motor Data:**  
 - **Power:** 120 kW  
 - **Speed:** 1500 RPM  
 - **Efficiency:** 90%

**Dimensions:**  
 - **Height:** 10m  
 - **Width:** 4m  
 - **Depth:** 4m

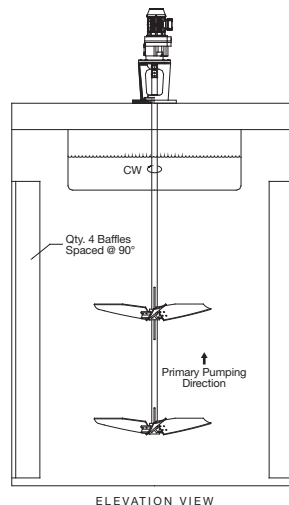
## PUMP MIXERS

Hayward Gordon designs pumps as well as mixers. Pump Mixers combine both our areas of expertise. Installations in the U.S.A. and South America have provided us with the process and mechanical background to provide pump mixers that meet head and flow requirements while minimizing entrainment.



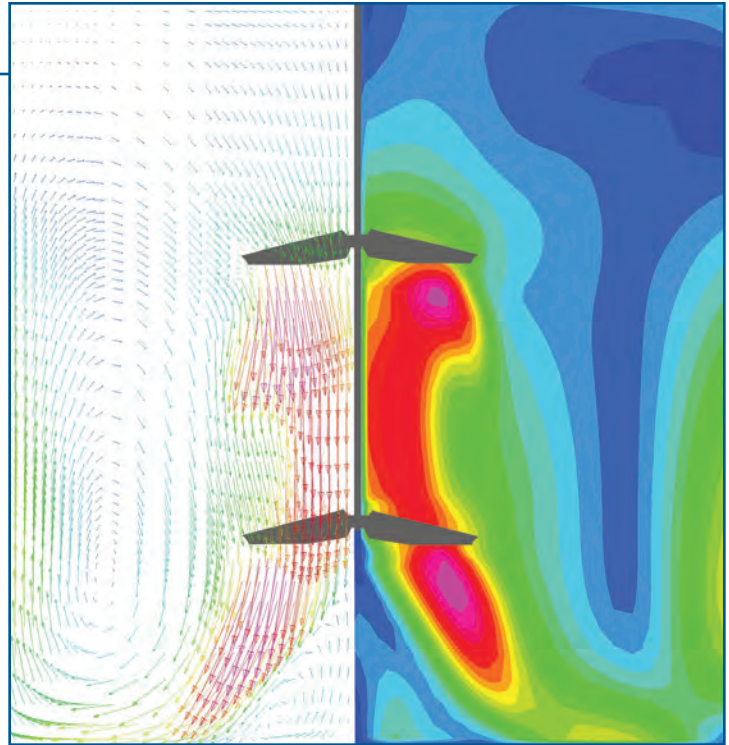
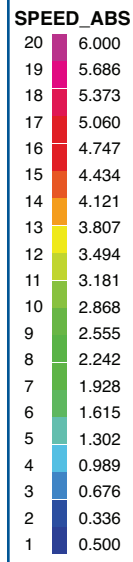
## AUXILIARY MIXERS

Hayward Gordon auxiliary mixers maintain the ideal dispersions created by the pump mixer.



## COMPUTATIONAL FLUID DYNAMICS

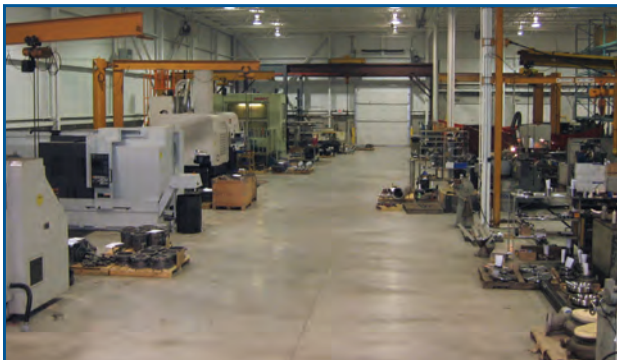
- CFD is a powerful fluid flow analysis software tool which simulates many aspects of mixing applications.
- CFD can be used to predict operating parameters such as fluid velocities, flow patterns, blend times, power draw, shear and strain rates.
- With the ability to predict mixing performance, optimum impeller/tank/baffle selection and configuration can be made, leading to more efficient mixing systems and better process control.
- CFD can also be used to improve the performance of existing equipment.



## LAB SERVICES

- State of the art equipment to measure and determine the appropriate level of mixing required.
- Well proven scale-up procedures are used to ensure reliable results at the full scale plant size.
- Full inventory of lab sized impellers ensures most efficient mixing is achieved.
- Testing and scale-up services are provided at no cost or obligation to the customer.

## MANUFACTURING FACILITY



# MIXERS FOR OTHER MINERAL PROCESSING APPLICATIONS



LHX-13C operating on a 59' diameter copper concentrate slurry surge tank.



LHX-160 with 150 HP drives operating on zinc and copper concentrate tanks.



LHX-10S supplied with anchor impeller, tank and tank furnace on Uranium Denitration.



200 HP mixers operating on 59' CIL tanks.



200 HP, LHX-160 mixers on 52.5' diameter gold leach tank.



Serving process industries since 1952, Hayward Gordon is strongly positioned to provide reliable engineered solutions to your pumping and mixing needs. Our wide range of products allows our experienced applications engineers to select the proper equipment for your application.

Hayward Gordon's modern, 50,000 square foot head-office and factory located outside just Toronto, Canada, is fully equipped with design engineering, manufacturing, assembly and testing facilities to ensure your equipment performs to expectations.



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