



## PREPQUIP ATOMIX (IN-LINE MIXER)

### 1. Introduction

The ATOMIX (see Figures 1, 2 and 3) was originally designed for flotation processes to produce ultra fine bubbles in the flotation units. The concept is based on shear forces that break the gas up into small uniform sized bubbles, therefore drastically increase the surface area of the gas for the same volume of gas. Due to the high shear forces created by pressure drop over the ATOMIX, the unit can be classified as a high wearing item. The construction of the ATOMIX consists of a steel casing with abrasive resistant ceramic internals.



Figure 1: PrepQuip ATOMIX



Figure 2: ATOMIX – Inlet



Figure 3: ATOMIX – Outlet

## **1. Operation principle**

Refer to Figure 4. Slurry enters the feed inlet at a pressure of 2 to 4 Bar (G). Gas is introduced into the slurry feed stream via a gas inlet port equipped with a non-return valve. The gas need to be supplied at a pressure of at least 4 Bar (G). The aerated slurry now flows into the ATOMIX manufactured from abrasive resistant ceramics. The design includes a four (4) stage mixing system. Two (2) stages of atomisation of the gas bubbles and two (2) stages of dispersion are incorporated in the design.

Operating the system correctly will result in micro gas bubbles dispersed in the slurry therefore, maximum bubble surface area is generated which will result in effective gas absorption. To enhance the absorption and leaching process even further, the discharge pipeline operates under pressure. This backpressure is created with a ceramic orifice installed in the discharge pipeline, prior to the discharge end of the pipe.

Pressure indicators are installed on the inlet and outlet of the ATOMIX to monitor pressure differences.

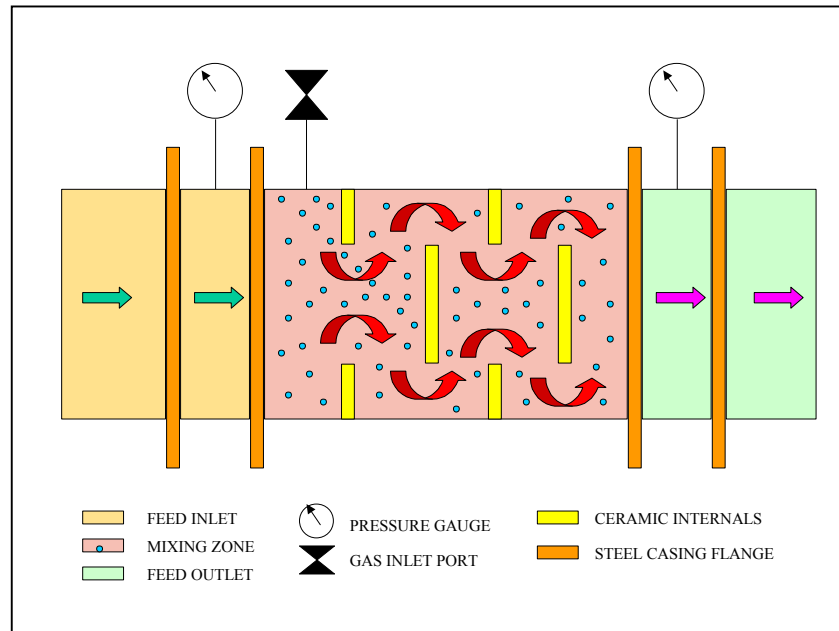


Figure 4. Flow sheet of the PrepQuip ATOMIX

## 2. Benefits

Each application is unique and factors such as slurry density, gas pressure and pulp viscosity influence the size of the gas bubbles formed and the effectiveness of mixing.

The ATOMIX offers the following benefits:

- Excellent gas dispersion and utilisation efficiency
- High mass transfer efficiency
- No moving parts
- Compact design
- High wear areas from abrasive resistant ceramic material
- Low energy consumption
- Low operational cost
- Longer service life
- Minimal maintenance



### 3. Models available

Several PrepQuip ATOMIX models are available to suit a variety of slurry flow rates (see Table 1).

Table 1: ATOMIX Models available

PrepQuip Model	Pipe line size	Flow rate range (m <sup>3</sup> /hr)
PM 100/YY	100 NB	31 - 75
PM 150/YY	150 NB	77 - 171
PM 200/YY	200 NB	172 - 323
PM 250/YY	250 NB	322 - 522
PM 300/YY	300 NB	493 - 758
PM 350/YY	350 NB	620 - 929

### 4. Installation options

The ATOMIX can be installed in a number of different configurations. The most common configurations can be described as follows:

- a) For **easy** applications where fresh feed is pumped to the first leach tank. The ATOMIX can be installed directly into the feed line on the pump discharge side (see Figure 5). A ceramic orifice is installed in the feed line prior to the leach tank to affect a backpressure and assist in high pressure leaching prior to discharge into the leach tank.

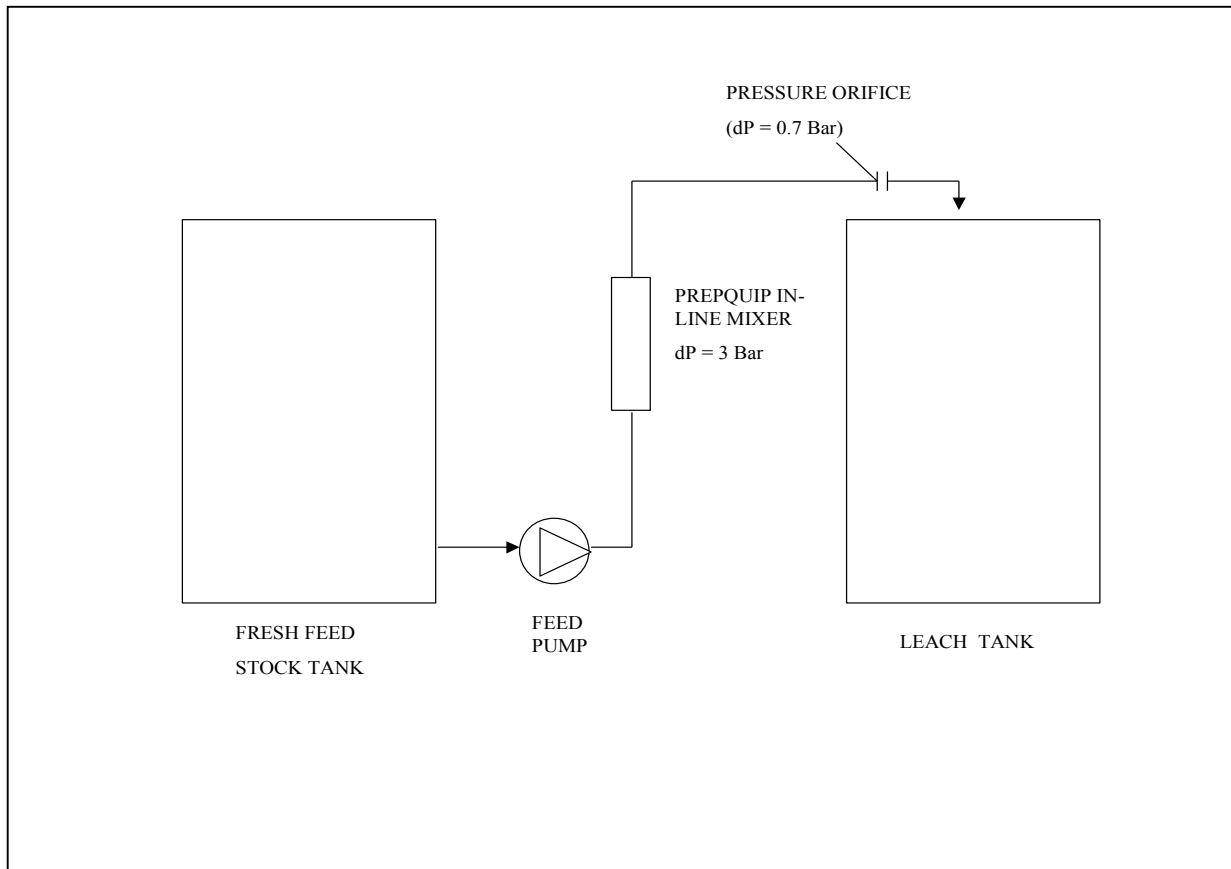


Figure 5: Atomix directly on feed line

- b) For **difficult** applications, a pre-conditioning system is proposed. Slurry is recycled through the ATOMIX systems with the discharge returning back to the pre-conditioning tank (see Figure 6). A ceramic orifice is also installed on the recycle pipeline to create a backpressure.

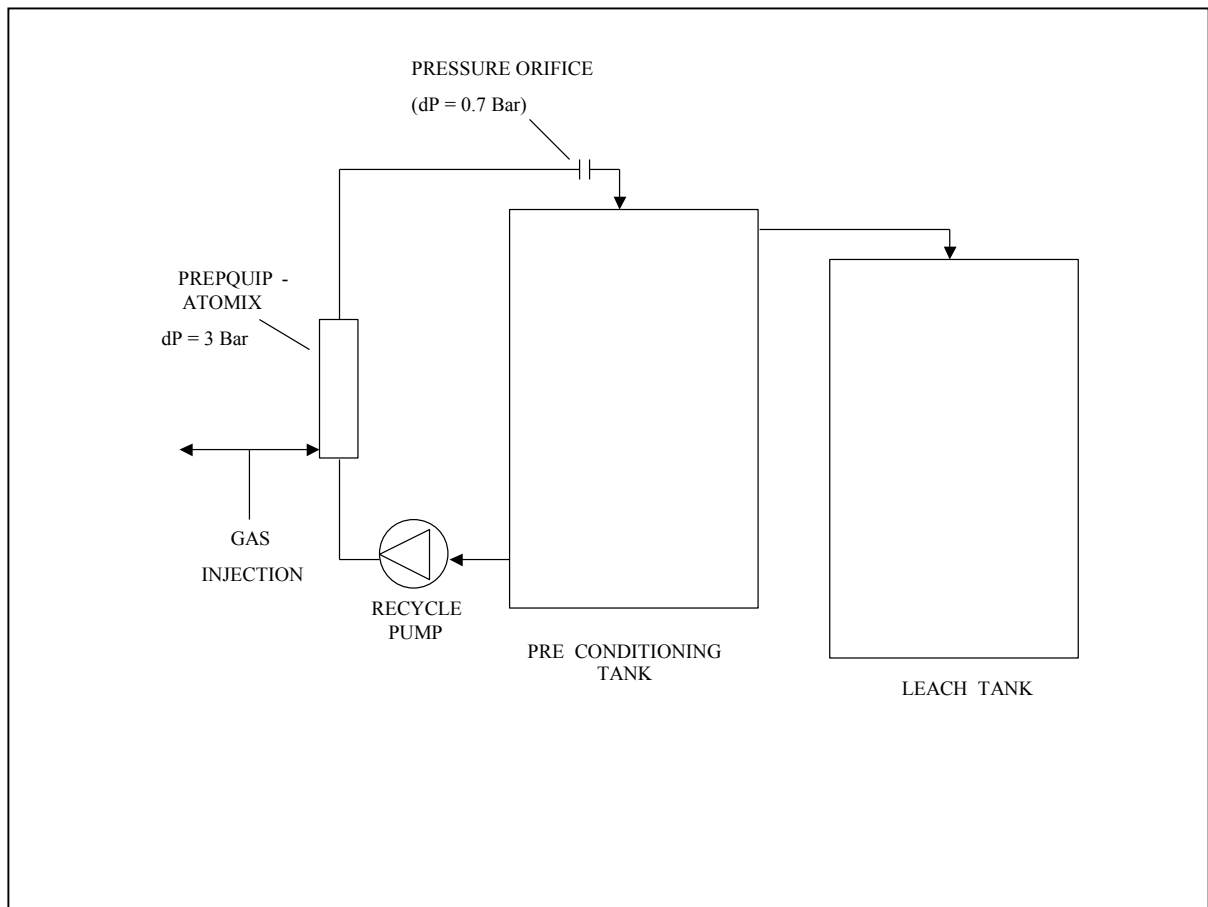


Figure 6: Atomix recycle application

This is the most common features of the PrepQuip Atomix. Please feel free to contact us on [process@prepquip.com](mailto:process@prepquip.com) or visit our website [www.prepquip.com](http://www.prepquip.com) for more info.