



**Begg Cousland**  
World Class Process Equipment



**Reaction Tank Agitator  
and Thickener Equipment**

## Thickeners

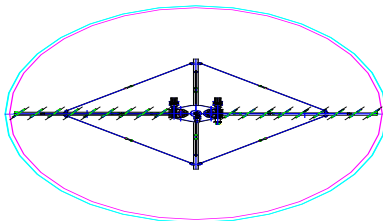
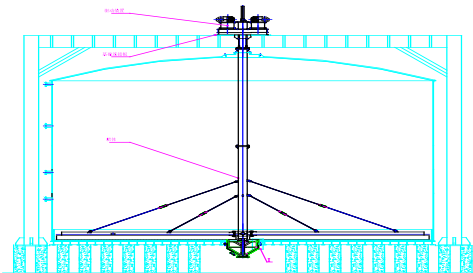
Clarifying tanks make use of gravity to assist separation and sedimentation of liquid / solid mixtures from a blended phase. For example, Clarifying Tanks with thickeners are used in :

- Ore Preparation Plant, separating ore concentrates and washing.
- Slurry sediment tanks in Fine Hydrochloric Plant
- Chlorine Plants separating solution and slurry by sedimentation.
- Sewage Disposal Plant,
- Water Clarification Plant
- Wet Phosphate Processing Factory.



The principle is to separate the liquid and solid by making use of the difference in density between the two phases, generating a relative movement. The lighter phase will flow upward, and solid particles will sediment to the bottom.

Sediment tanks are usually cylindrical and the rotating thickener collects the slurry towards the central bottom outlet. (See sketch below)



## Deep Cone Thickeners



As with the Agitator series, each thickener is designed and manufactured according to the needs of each application and its process conditions.

## Other Equipment

Begg Cousland also offer the following equipment made in China by the Jiangsu New Hongda Group

- Rotary Table Vacuum Filters
- Vertical Rotary Vacuum Filters
- Vertical Filter Presses
- Tank Rakes

For further information, please contact us at

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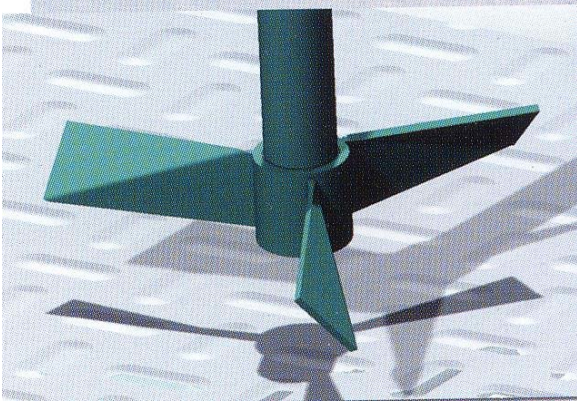
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## Streamlined Agitators

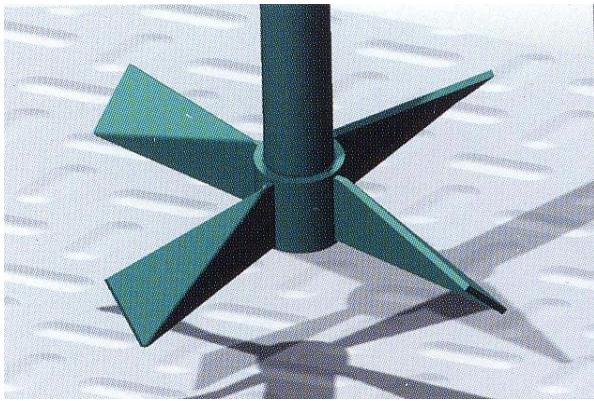
This agitator is primarily designed for phosphorus acid extraction tank, however, it can be used in many applications.

In phosphorus acid reaction tank, the agitator moves the liquid in the same direction as the liquid flow ; The liquid movement of liquid on the surface is small, which can help decrease vapour corrosion and fouling of agitating shaft.



The streamlined agitator has its agitating blades' diameter designed according to the optimum position of the critical area. Although the diameter of this agitator blade is smaller than that of a pitched agitator blade, it has a better effect than the latter.

And as the critical area has small diameter and radial flux, the risk of damage to the wall of the reaction tank will be decreased, which would prolong tank life.



## Variable Section – Variable Angle Agitator

The Variable Section - Variable Angle Agitator gives a high axial circulation flow, and low 'cutting' speed at the same time.

Compared with the traditional turbine type agitator with a 45° folded blade, this improved type of agitator can save energy by 40%~50% , for example in a solid-liquid suspension application, without loss of efficiency.

An application where it has many benefits is in phosphorus acid reaction tanks, and as replacement in some heavy non-ferrous smelting industries, where this type of tank agitator will

- minimise solid material crystallisation
- provide better results for the next filtration and sedimentation stage



## Extra-long Agitator in Large Scale Utilized for Phosphorous System

Jiangsu New Hongda made the large-scale mixing equipment for the first 300Kt/a phosphoric acid project in China. To do this they developed a new range of agitating equipment of high power, heavy load and with an extra-long shaft.

In addition to using traditional materials such as plates and pipes in 304L, 316L, 317L and 904L, more than ten new materials were successfully developed.

We can therefore offer excellent / optimum anti-corrosion & wear characteristics of the agitator in many different alkali & acid liquid conditions .



## Typical Applications :

- Non-Ferrous Ore Oxidising Tank
- Phosphoric Acid plant Digestion Tank
- Phosphoric Acid plant Reaction Tank
- Phosphoric Acid plant Slurry Tank



## Introduction

Begg Cousland and the Jiangsu New Hongda Group began their collaboration in 2002, when a license agreement was signed between the 2 companies. Since then the Begg Cousland mist eliminator range has been assembled and marketed in China by Jiangsu New Hongda, with huge success.

In 2006 Begg Cousland started to market the Jiangsu New Hongda process equipment range to the Phosphate / Process industries outside China, under an exclusive agreement.

Begg Cousland has now supplied many such agitators, and the customer reaction is 100% positive in terms of the quality and performance, and of course for the extremely attractive price.



## Agitator Design

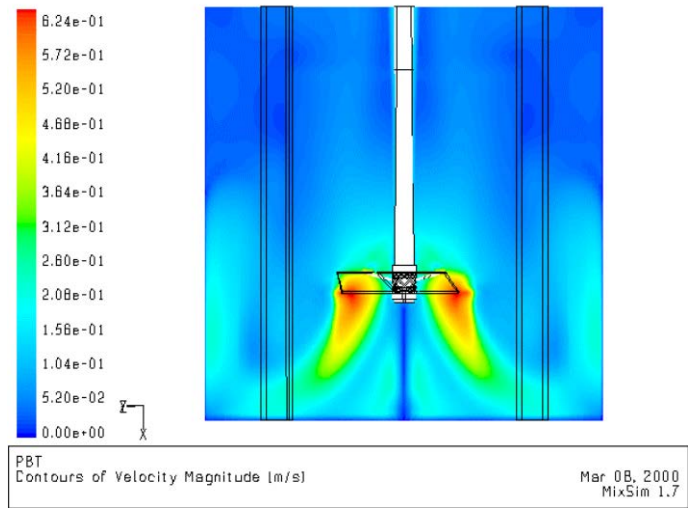
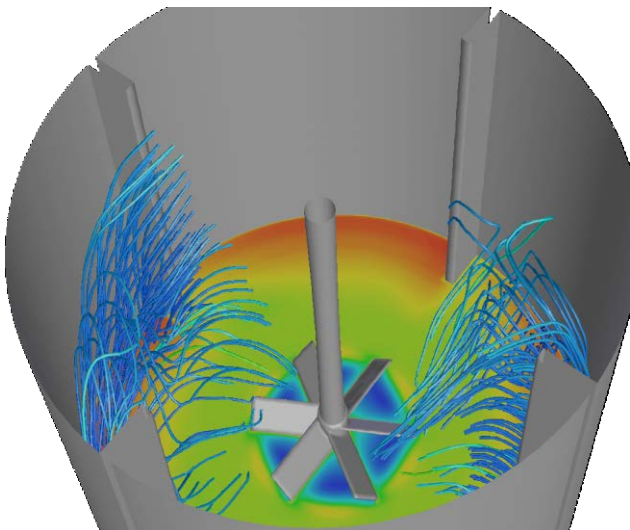
Design and selection of the agitator type depends completely on the process duty. Different agitating processes need to be done by different agitating equipment.

Initially, design focuses on agitator type, motor power and rotating speed.

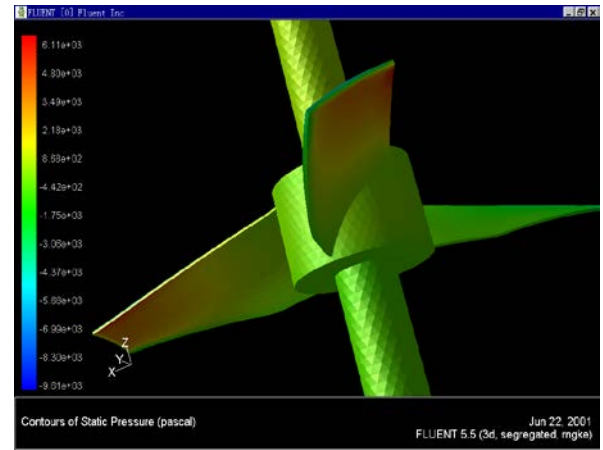
Next we select components such as speed reducer, brackets, agitating shaft and bearing sealing, etc.

- The agitator type is selected according to general process duty requirements.

If in doubt, our own CFD software for agitator simulation is used to aid selection.



- Motor power, rotating speed and agitator diameter are calculated by computer simulating design software. In cases of unusual mixtures, this can be done by testing in our test tanks to prove the agitating mixture time, the sedimentation speed and the degree of dispersion.



- The reducer is selected according to motor power, rotating speed, torque etc.



- The Design of the agitating shaft and it's construction involves careful calculation of rigidity.

- A speciality of ours is the design of large agitators with extra-slim and long flexible shaft.

- Generally we suggest agitator designs without any supporting structure inside the tank, to minimise the risk of abrasion, vibration and excessive energy consumption.