

**sonix™**

BIO SOLID SOLUTIONS

A Sound Proposition :

**sonix™**

Your sonix™ licensee :



Under license from Sorileo Limited, a joint venture company of Purac Limited and Atkins Limited.

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ULTRASOUND TECHNOLOGY

**sonix**™



sonix™ unique radial horn technology produces intense, concentrated ultrasound within the reactor, increasing and accelerating the break up of cells and particulates. When applied to wastewater sludge, this activity results in more effective downstream processing in terms of sludge reduction, conditioning and biogas generation. In a world where sustainability is the focus and biosolids are seen as a resource, sonix™ technology is a sound proposition.



INTENSE ENERGY FOCUSED BY THE SONIX™ RADIAL HORN CAUSES CAVITATION WITHIN THE FLUID. THIS, IN TURN, GENERATES EXTREMELY HIGH TEMPERATURES AND PRESSURES, WHICH...

- Rupture cellular material
- Solubilise organics

## FINDING A BETTER WAY

### GREEN TECHNOLOGY :

sonix™ treatment has complementary effects. One, it improves digestion and sludge treatment performance, while optimising gas production in the process. Two, it enhances nutrient removal, filamentous control, odour control and sludge reduction. The amount of energy released in the sonix™ process can be up to 20 times the power absorbed! Further benefits help make sonix™ a truly sustainable solution.

### REDUCING PLANT RUNNING COSTS :

Assessment of factors such as the cost of power, road transportation, sludge disposal and chemicals – plus any incentives for using Green technologies or generating power from renewable resources – shows that sonix™ provides hard evidence of significant payback.

### FACTS AND FIGURES :

Because of superior digestion:

- Up to 75% of volatile solids are destroyed.
- Gas production is increased by up to 75%.
- Sludge dewaterability is boosted by up to 15%.

And in activated sludge:

- Sludge yields may be reduced by up to 40%.
- SSVI is dramatically reduced to <80ml/g
- There's improved biological nutrient removal.



**Challenging assumptions :** A sonix™ installation is more than a piece of advanced sewage processing kit. It does all that we claim but, just as importantly, it enhances the utility and productivity of existing plant and processes, helping to make the entire plant more effective. With sonix™, you're assured of fast payback.

When used for digestion enhancement, sonix™ substantially improves the degradation of secondary sludges, increasing gas yields, improving dewatering and vastly reducing sludge disposal costs. In activated sludge applications significant reductions in sludge yield and improvements to mixed liquor settlement are easily achieved.

The key to its success is the focusing of ultrasound through a radial horn. The energy this produces causes cavitation within the fluid and extremely high temperatures and pressures at the foci of the collapsing bubbles. As a result of this, retention times within the reactor are a mere 1 to 2 seconds, simply not possible with more conventional systems. All this capability is delivered by a process so compact that solutions can be implemented very rapidly, whether new build or retrofit.

- Reduce particle size
- Improve the availability of micro-nutrients
- Enhance interaction between immiscible liquids
- Accelerate chemical reactions



## 1 SLUDGE

Feed can be any biological or cellular material. It can be non-organic, but the greater benefits are obtained on organic material with a well defined cellular structure.

## 2 RADIAL HORN

Normally of titanium, the radial horn or sonotrode vibrates at 20KHz. Sludge passes through the inner zone and around the edges of the radial horn, with its curved surfaces focusing the cavitation. The process is most intense within the inner core.

## 3 EXTENDER/BOOSTER

The extender/booster connects the radial horn to the transducer through the flange booster. While the horn operates in radial mode shrinking and expanding thousands of times a second, the extender/booster operates in the axial (up and down) mode. It is both an amplification and transmission device.

## 4 TRANSDUCER

Also referred to as a converter, the transducer converts electrical signals to mechanical energy. It comprises a series of piezo-electric crystals sandwiched together. The transducer is cased in a protective cowling.

## 5 FAN

Fitted at the top of each transducer cowling, the fan helps to keep the transducer piezo-crystal assemblies cool.



### Typical V5 five-stack sonix™ unit :

A sonix™ unit this size measures a mere 700mm from entry flange to exit flange. Operating with a retention time of between 1.5 and 2.0 seconds, a unit this size is capable of processing 200 cubic metres of sludge every 24 hours. A smaller V3 three-stack sonix™ unit can cope with around half of that.



SONIX™ IS A ROBUST, PROVEN AND WELL SUPPORTED TECHNOLOGY WITH GUARANTEED PAYBACKS, USUALLY ACHIEVED IN UNDER TWO YEARS.

- A 'green technology' system
- Renewable energy potential

## PROVIDING PEACE OF MIND

### ORANGE COUNTY, CALIFORNIA :

Orange County Sanitation District, seeking to improve wastewater treatment, decided to trial sonix™ on one of their 26 digesters. The ultrasound pilot was installed on the digester's feed line and the proportion of sonicated SAS was gradually increased up to 80%. Comparisons of gas yields, solids destruction, stability and pathogen kill all demonstrated significant benefits.

### AVONMOUTH, UK :

At Avonmouth, the problem was that when SAS feed percentage to the digesters exceeded 25%, their performance was compromised. Surplus SAS had to be stabilised with lime rather than digestion and drying. For commercial reasons, Avonmouth trialed sonix™ - with excellent results.

### PRIME BENEFITS :

- Greater gas production
- Commensurate solids destruction
- Greater digester stability
- Reduced foaming
- Greater sludge stability
- Greater digester utilisation
- Pathogen reduction
- Rapid payback



**Proven Technology :** sonix™ is a reliable and robust technology in service worldwide, with systems installed by various Sonico licencees operating in Europe, North America, Japan and Australasia. Our clients are assured of optimum plant performance through tailored sonix™ support and service. The result delivers what the client needs – a fit and forget solution.

sonix™ technology is well proven. During its development, field trials conducted in collaboration with six major utility companies, proved that the technology yields important results, attractive for any scheme that also needs to comply with the green technology aspirations of government and public alike.

All this activity comes as part of our overall commitment to stay ahead in the development of appropriate technologies and solutions. Changing and accelerating influences of many kinds – legislative, regulatory and financial – as well as the activities of environmental pressure groups, make this a dynamic field in which to work. sonix™ is a prime example of a technology whose time has come. It's a wholly appropriate solution – and one that works!

- Service packages ensure minimal operational involvement
- Superior reliability means uptime of 98+%
- Enhances existing assets
- Higher productivity across the plant



SOUND THINKING

**The way ahead :** These are remarkable times in fluidsonics. While Sonico products are unquestionably at the cutting edge of a fast evolving science, we know that our programme of Research & Development is certain to produce new and exciting moves forward.

We're investing heavily in improving sonix™ technology and developing its applications. Of late, a better understanding of hot metallurgy has improved component life and sound transmission efficiency, while improved system control is pushing system uptime to over 99%. Fluidsonics has potential applications across a spectrum stretching from environmental systems to chemical engineering. We are on the threshold of many such developments, with a series of demonstration plants and test units available.

If our progress could make a contribution to your way ahead, why not get in touch?



sonix™