



A general introduction

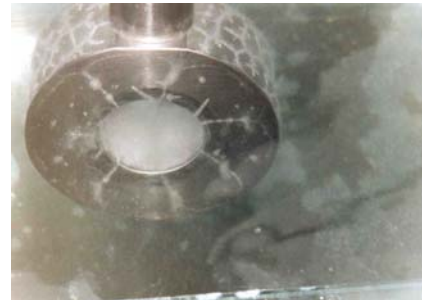
What is it ?

sonix™ is the trade name for a patented technology that uses ultrasound energy in fluids. Ultrasound is sound energy at frequencies above 20kHz. Conventional block horns do not easily lend themselves to fluidsonics except in cleaning bath and low power systems. Conventional systems are also generally for intermittent usage at powers of only a few watts. Conversely **sonix™** is high-powered ultrasound using transducers rated for continuous duty at 3 kW and above.

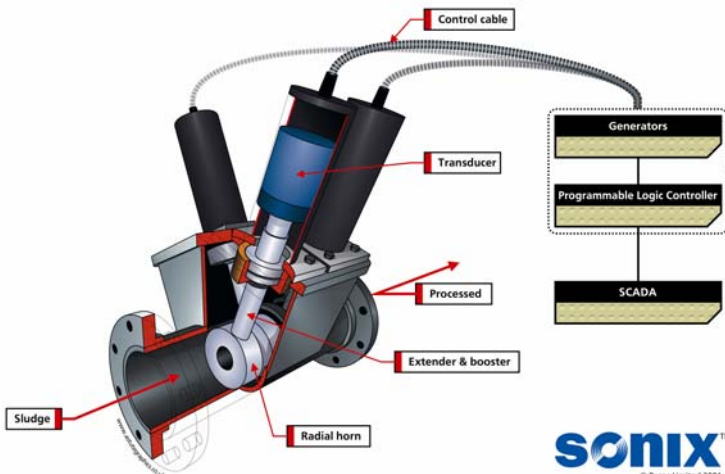
The key development in **sonix™** is the focusing of the ultrasound by means of a radial horn or Sonotrode. The intense energy focused by the horn is sufficient to cause significant cavitation within the fluid. This cavitation generates extremely high temperatures and pressures of many thousands of degrees and atmospheres at the foci of the collapsing bubbles. As the energy is so intensely focused retention times within the reactor can be reduced to 1-2 seconds, unachievable with systems using the more conventional block horns. The effect of this is that **sonix™** power requirements of 4-5kJ/l. are up to an order of magnitude lower than competing systems.

sonix™ uses these high temperatures and pressures to:

- Rupture cellular material,
- Solubilise organics,
- Improve availability of micronutrients
- Reduce particle sizes,
- Breakdown refractory organics,
- Enhance interaction between immiscible liquids.
- Accelerate rates of chemical reaction



Radial Horn



In the standard **V5** reactor 5 titanium **sonix™** stacks are mounted adjacent to one another, perpendicular to the direction of flow, within a polished 10 Bar(g) rated stainless steel reactor. The fluid to be sonicated is pumped through the reactor flowing through the center of the radial horns where it is exposed to the intense cavitation energy. Higher throughputs catered for by multiple units..

Applications

➤ Biosolids pretreatment

- Anaerobic digestion enhancement,
 - Pretreatment of secondary sludges prior to digestion
 - Enhanced gas Production (see case studies)
 - Greater Solids Destruction
 - Greater Digester Stability
 - Reduced Foaming
 - Pathogen reduction
 - Improved downstream dewatering following Digestion
 - Attractive payback periods of less than 2 years
- **Reduced Secondary Sludge production**
 - Sonicating return sludges

➤ Filamentous Bulking Control

- Sonicating RAS streams during periods of filamentous growth.
 - Rupturing filaments with cavitation
 - Dramatic improvements in SSVI

➤ BNR Enhancement

- Releasing micronutrients
- Stressing biomass to enhance uptake



340,000PE sonix reactor

*sonix™ technology is supplied under licence from Sonico
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For further information contact:
Fergus Rooksby Product Manager ~ Biosolids
gfrooksby@purac.co.uk
Telephone 01562 828762