



An Indo-Swiss joint venture



Bonded Transducer (BT)	Tube Resonator (TR)
- have poor rating, maximum 100 W. To generate higher power, a number of Transducers are connected in parallel.	- a single Transducer is capable of delivering large power. TRs are available upto 2 KW of power rating in a single Transducer.
- a large number of Transducers are driven by a single generator and, hence, it is not possible to optimize all the Transducers at one time.	- TR is driven by a single generator and single Transducer. Hence, maximum optimization is possible.
- BTs are connected in parallel. If one Transducer fails, the entire system fails.	-No such problem can occur.
- BTs are fixed on a stainless steel tank which, in turn, transmit ultrasonic waves in the tank.	- TRs transmit the ultrasonic waves directly in the fluid. Hence, they have more uniform ultrasonic pattern in the tank.
-BTs are matched to the tank and the water load inside the tank.Hence, they cannot operate dry.	-TRs have no such restrictions on the volume of the liquid in the tank and can be operated dry without being damaged.
-BTs have poor response time to their environment. There is a considerable amount of delay in responding to changes in load.	-TRs are sensitive to their environment and have faster response time.
-BTs are driven by independent driving circuit and the loads are not part of the resonance circuit.	-TRs are part of the resonance circuit and even load is part of the resonance. Hence, they are much more dynamic in response time and have higher adaptability to their environment. (changes in load).
- the wall thickness of the SS tank is an obstruction to the ultrasonic wave. Thinner the plate, better it is for BTs. Smaller thickness will rapidly erode the tank, while larger thickness will reduce the overall efficiency and a compromise is always necessary.	- TRs have large wall thickness (more than 3mm) and , practically, even a solid rod can be used. TRs being a part of the resonance circuit, the ultrasonics emitted is independent of thickness of the tube.
- BTs get eroded at place of bonding (due to abrasive accumulation at bottom).	- TRs normally hang in the media. As a result, there is no chance of deposition and having localized erosion.
- BTs have poor efficiency.	- TRs are highly efficient and the overall efficiency is above 95%.
- BTs are normally mounted at the bottom of the tank.	- TRs can be mounted in any direction, horizontally, vertically and even in an inclined position.

- BTs have the general problem of falling off and failure of bonding is difficult to repair at site.

- TRs are a clamp on type of device which can be fixed or removed easily.

- BTs are normally operated with constant energy mode only.

- TRs can be operated with constant energy or constant amplitude mode.

- Bts life is determined by the wall thickness of tank and, normally, have 15,000 hours of operation.

- TRs have a longer life.

- BTs are conventionally an old design.

- TRs are the latest in technology - patented.