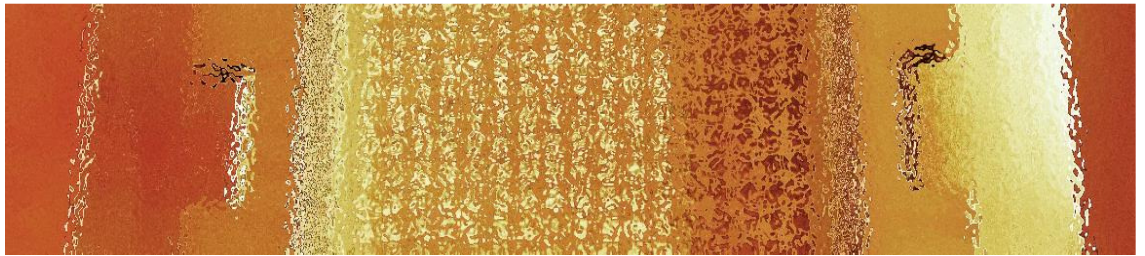


NTS ULTRASONICS PTY LTD: PRODUCTS AND SERVICES



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2015

NTS Ultrasonics Pty Ltd

This document outlines the variety of products and services offered by NTS Ultrasonics Pty Ltd, Perth, Western Australia.

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NTS ULTRASONICS PTY LTD

N.T.S. Ultrasonics Pty Ltd is a Perth, Western Australia based business specializing in the application of both high power and low power ultrasonic technologies in a variety of industries. A range of services are offered to users of ultrasonic technology including consulting and prototype development. A range of ultrasonic system components are offered for sale to system integrators as well as complete ultrasonic systems to end users.

The low power ultrasonic work at NTS Ultrasonics tends to involve non-destructive testing or ultrasonic measurement and “smart sensor” design. The high power ultrasonic work may involve some sort of process enhancement in cleaning or mineral processing.

N.T.S. Ultrasonics Pty Ltd services include consulting, prototype development and “proof of concept”, as well as providing custom built systems and system components (for OEMs and system integrators to build into their own ultrasonic systems).

When undertaking a new commission, N.T.S. Ultrasonics can make use of existing technology, developed in-house, and design experience developed over many years. In-house technology includes designs for: ultrasonic wheel probes, electronics for ultrasonic flaw detection and similar applications, high power inverters, and high power ultrasonic transducers. This technical knowledge, experience, and “know how” can be accessed by clients through a consulting contract.

There are several types of consulting contract available to cater for different needs:

- **Scoping study:** Many enquiries require significant technical work before any costs, or even feasibility, can be addressed. A scoping study is a short investigation that allows some research to be carried out: patent search, technical literature search, technical drawings, etc, which provides sufficient information to allow a more detailed development plan to be drawn up.
- **Literature survey:** Technical literature and patent search on a topic.
- **Development plan:** For projects where a customized technical solution or ongoing technical investigation is required, the work is done according to a development plan. A development plan can be applicable to consulting and also to custom design and manufacturing.
- **Technical support:** For clients doing their own development but who want technical backup and advice available for when needed.
- **Design plan:** For clients needing hardware designed for a specific project. The hardware might be electronic or mechanical.

Some examples of consulting contracts carried out by N.T.S. Ultrasonics:

- Wheel probe design issues for flaw detection in rail wagon wheels (Technical Support);
- Electronic hardware design of a DSP based ultrasonic rail flaw detection system (Design Plan);
- Use of ultrasonic vibration to prevent scale formation in pipes (Development Plan);
- Applying ultrasonic technology for the prevention of bio-fouling (Literature Survey);
- Relation of axle overloads to damage in rail (Scoping Study);
- Examining ultrasonic distillation of methanol (Development Plan);

- Monitoring third party ultrasonic NDT inspection of wharf tie rods (Technical Support);
- Establishing procedures for ultrasonic bond inspection and refractory brick inspection (Technical Support).

Custom design and manufacturing: Development projects may require a customized piece of equipment to be designed and built. Sometimes the entire project is based around the design of equipment.

Some examples of development projects that required customized equipment to be designed and built:

- Measurement of longitudinal stresses in rail,
- Supply of a portable rail flaw detection system,
- Development of ultrasonic C scan technology for flaw detection in tyres,
- Specialized wheel probes capable of using ultrasonic PA probes,
- Mitigation of blockages in pipes,
- Ultrasonic cleaning systems for use in a coin mint,
- Design of electronics for an ROV deployed ultrasonic densitometer.

N.T.S. Ultrasonics also supplies various types of standard or customized equipment for ultrasonic applications:

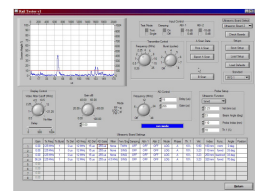
- Probe assemblies: wheel probes, IRIS turbines, bubblers and squirters, boreprobes,
- High power ultrasonic transducers and inverters,
- Pulsers and preamplifiers,
- USB and Ethernet controlled ultrasonic systems.



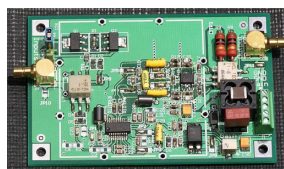
Ultrasonic wheel probe



High power ultrasonic transducer



Computer controlled ultrasonic systems



Preamplifier

Partial list of clients: Alcoa Australia, Public Transport Authority of WA, Westnet Rail, Applus RTD, Synergy, Horizon Power, Gilardoni SpA (Italy), Scripps Oceanographic Institute (USA), Gemco Rail, Goldcorp, Rail Technology International, Woodside Research Facility – Curtin University, Total Marine Technology, ALS Industrial, Centrum Diagnostyki (Poland), Glafcos Marine (Greece), Edison Welding Institute (USA), Nickel West Refinery Kwinana, Rio Tinto Technology and Innovation, Herzog Services (USA), Unidata, ATTAR, Kontroll Technik (Germany).

About N.T.S. Ultrasonics Pty Ltd: The Director, John Norman, B.Sc Hons. (Physics), has been involved with ultrasonic technologies for nearly 35 years and has developed a wide range of technical knowledge and experience in many low and high power ultrasonic applications and also in electronic and systems design. In previous employment he has been involved in the design and manufacture of rail flaw detection systems, ultrasonic C scan systems for aerospace, and multi-channel ultrasonic inspection systems for use in steel mills.

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