

Introduction to Electrical Capacitance Tomography

Electrical Capacitance Tomography (ECT) is a high-speed measuring technique which allows information about the operation of Process plant to be generated which, until now has been difficult or impossible to obtain other than by computer modelling. Potential applications include imaging the contents of pipes and vessels, measuring the voidage (volume ratio) in two phase systems and measuring concentration and velocity profiles over vessel cross sections. The only limitations are the need for the fluid flowing in the pipe to have low electrical conductivity and for the capacitance sensor electrodes to have a view of the material to be monitored which is not screened by metallic or other conducting objects. In many cases, the capacitance sensor can be completely non-invasive. Where a metal vessel is in use, the electrode assembly can be installed inside the vessel.



An early ECT system imaging water droplets in kerosene.

The ECT systems currently available from PTL are suited primarily for use in research laboratories and pilot plants. The most successful applications of ECT to-date have been in research into the operations of fluidised beds and investigations of multi-phase flows in oil pipelines. Other successful applications of ECT technology include flame imaging and the detection of air bubbles which form under conditions of water hammer in pipes.

PTL works closely with both established and new customers to seek optimum solutions to process measurement problems. We have strong links with many of the research groups active in the development of ECT technology and we try to make available new and improved hardware and software as soon as it becomes available.

We recognise that investment in ECT technology is a major decision for most of our customers and we therefore try to offer practical assistance and advice to customers at the evaluation and pre-purchase stage. We will hire equipment, give instructions in its use and carry out trials for customers either on their own plant or in our own laboratories. We provide a limited amount of technical advice free of charge, after which, we charge for this work on a daily basis. However, a significant fraction of any costs incurred by potential customers in this way is allowed against subsequent equipment purchases.

For further information, please contact our sales department at the address below or email us at enquiries@tomography.com

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