

PIPE OUT OF ROUNDNESS MEASUREMENT

There are many circumstances under which it is a requirement to determine if the outside of a pipe is round, and to quantify any out of roundness found. TSC Inspection Systems (TSC) have developed a non-contacting electromagnetic method of determining the degree of out of roundness of pipelines without the need for contact with the pipe. The technique can also be used to accurately measure non-conductive coating thickness.

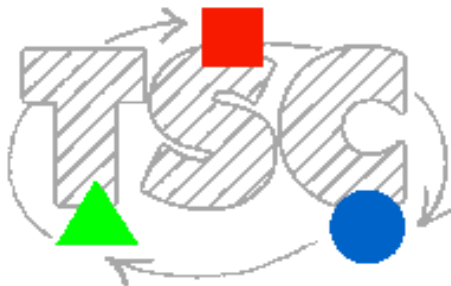
The requirement for the determination and measurement of out of roundness may come from the need to assess impact damage (denting), localised buckling or elastic deformation during pipe laying. In most cases the pipe needs to be inspected without removal of any external coating.

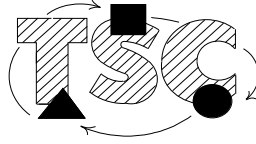
Plastic deformation of a pipeline will preclude the use of mechanical connections and in some circumstances there is a need to determine a suitable location at which to cut the damaged pipe, in order to ensure that a mechanical connection will properly fit over the cut. Plastic deformation will also affect the structural strength of the pipeline and hence there is a requirement to identify and quantify buckling.

For deep water pipe laying operations, the measurement of elastic deformation of the pipeline close to the seabed during laying operations can allow pipe laying parameters to be controlled to reduce the likelihood of plastic deformation.

The TSC pipe ovality measuring system is based around a special electromagnetic proximity sensor capable of accurately measuring the distance between the face of the sensor and the outside surface of the pipe. A single sensor can be scanned around the outside of a pipe on a special frame. Alternatively a number of sensors can be fitted into a frame which is placed over the pipe and the sensors then interrogated in turn rather than scanning a single sensor.

These deployment options allow the system to be deployed in air or subsea. For subsea applications the option exists to use the system either deployed by diver or ROV. If deployed by ROV, the system electronics are mounted on the vehicle. All data is transferred to the system PC controller on the surface via the ROV umbilical. The system requires the ROV to provide 110V AC and a twisted pair for data communication.





OUTLINE SPECIFICATION

Power Requirements	110V AC, 1AMP
Communication	Single Twisted Pair RS485 (subsea) Supplied with unit (topside)
System Controller	Standard PC operating Windows 3.1 or later
Minimum Pipe Diameter	6" OD
Maximum Pipe Diameter	No limit for technique
Maximum Coating Thickness	Depends on pipe diameter and sensitivity required. Coating must be non-metallic. In some cases metallic reinforcement may affect the technique
Sensor Accuracy	Better than 1mm at 30mm from surface
System Accuracy	Depends on mode of deployment and coating types

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Please Note: *As part of its continuing programme of product improvement, TSC reserve the right to alter specifications with prior notice.*