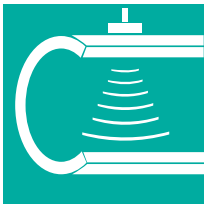
Truscope A/S™ (Amalog-Sonoscope)

The Tuboscope™ Truscope A/S™ *(Truscope-Amalog-Sonoscope)* Inspection System combines non-destructive techniques of EMI *(Electro-Magnetic Induction)* and UT *(Ultrasonic)* principles to detect, evaluate and classify, in a single pass of the pipe through the system, transverse, longitudinal and oblique, internal and external flaws as well as wall thickness variations and laminations.

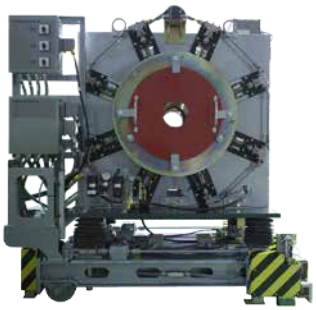


The Truscope A/S System provides full-body inspection across a large range of pipe diameters. These pipes can be seamless or ERW; manufactured of ferrous or non-ferrous alloy materials; and with a variety of end conditions — saw-cut or cropped; plain-end; threaded; coupled; and upset or non-upset.

With its combination of EMI *(Amalog and Sonoscope)* and UT *(Truscope)* techniques, the Truscope A/S satisfies the latest editions of API 5CT, 5L and 5DP, as well as numerous other international specifications for non-destructive inspection of tubular products for the energy industry.

The inspection system is comprised of two main sections — the inspection platform and the computerized inspection electronics.

Inspection Platform



Sonoscope Inspection Unit

Amalog Inspection Unit

Truscope Inspection Unit

Inspection Platform:

Placed within a pipe conveyor line, the pipes are advanced to the Inspection Platform. Mounted on this Platform are Pinch Rolls which contain the pipe and provide the driving power to move it at a constant speed though the three individual inspection heads, or Positioners, The testing sequence is first the Sonoscope, followed by the Amalog and ending with the Truscope. All three Positioners are mounted on track roller systems to allow them to be moved in or out of the conveyor line for pipe size changeover or maintenance.

Sonoscope Inspection Unit

Pipe to be inspected is first conveyed through the Sonoscope Inspection Unit, where a high strength active magnetic field oriented longitudinally is introduced into the pipe. With the entering pipe end, a multi-number of stationary detector assemblies, or *"shoes"*, are brought into contact with the outside diameter pipe surface. Flaws such as transversely-oriented cracks, rolled-in slugs and pits are detected by this inspection method.

Amalog Inspection Unit

The pipe is next conveyed through the Amalog Inspection Unit. The Amalog Inspection Unit is equipped with a dual-shoe detection system, integrated into a rotating magnetizer assembly. As the pipe enters the Amalog Inspection Unit, a high-strength active magnetic flux field, circumferentially oriented, is introduced into the pipe. The rotating detector shoes then scan the outside surface area of the pipe circumferentially in a helical path. Flaws such as longitudinally oriented seams, cracks, and overlaps are detected by this inspection method.

Truscope Inspection Unit

The pipe is then conveyed through the Truscope Inspection Unit, which identifies internal and external flaws and wall thickness variations by utilizing ultrasonic sound waves coupled to the pipe surface by water.

As with the Amalog, the Truscope is equipped with a multiple-shoe detection system integrated into a rotating assembly. As the pipe enters the rotating assembly, water is applied to the outside pipe surface to provide the acoustic coupling required for ultrasonic inspection. The detector shoes are then brought into contact with the outside pipe surface to scan it circumferentially in a helical path.

The Truscope can be configured to detect longitudinal, transverse and oblique defect orientations, as well as out of tolerance wall thickness variations and laminations.

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Computerized Inspection Electronics

Computerized Inspection Electronics:

Operated either in combination or individually, defect indications on the pipe from any of the three inspection positioners are transmitted from the Inspection Platform to the Computerized Inspection Electronics.

These indications are processed by Tuboscope proprietary software and then presented on computer monitors.

In addition to graphical presentation, the software collects the inspection date in a format which can be shared with other computers, as well as to provide hard copy printouts of all inspection parameters and settings; the inspection data; and reproduction of the graphical presentations. And for long term storage of all inspection data, the Inspection Computer incorporates DVD drives.

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