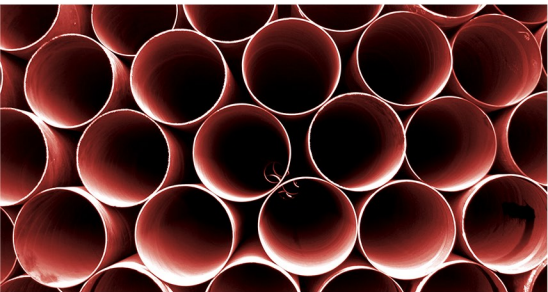


Meta Laser Vision for SAW Pipe Mills



Laser Vision has been long established as the premier method of guaranteeing accuracy of electrode placement in pipe mill welding, and Meta has been similarly established as the market leader in the supply of laser tracking systems to the pipe sector.

More recently, Meta has been at the forefront of introducing laser vision for pipe inspection and measurement. Meta's bevel and weld inspection systems are already well established in the industry. With the introduction of our highly innovative Pipe End Measurement System, Meta takes pipe end measurement to a new dimension.

Over the past thirty years, Meta has supplied hundreds of systems to both longitudinal and spiral mills in six continents. Meta will continue to develop its close relationship with the pipe sector by supporting our products in the field and developing new products which meet real needs and provide practical solutions giving value to our customers.

Quality Improvements

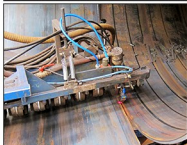
- Accurate weld placement every time
- Fewer weld defects
- More consistent penetration
- Better ID/OD interpenetration
- Better bead appearance
- Less reliance on operator skill level

Productivity Improvements

- Reduced mill manning
- Less rework
- Faster welding speeds possible
- Operator free for other tasks

Meta Vision Systems

Meta in Spiral Pipe



Meta has unrivalled experience of sensing and control for spiral pipe mills. This ranges from simple laser vision systems for tracking on a single weld head all the way through to the design and manufacture of complete spiral mill electrical systems.

We work closely with several of the leading spiral mill manufacturers. As a result of this experience, we understand the needs of spiral pipe producers better than any other laser vision company.

Applications in One Step Spiral Pipe Mills

- Single Systems for ID or OD Welding
- Dual Systems for combined ID & OD Welding
- Automatic Gap Control Systems
- Automatic HiLo Control Systems
- Automatic Adaptive Fill Control
- Bead Profile, HiLo Measurement & Logging Systems
- Combined Tracking & Bead Inspection for online UT Systems
- Complete, integrated Mill Control Systems

Applications in Two Step Spiral Pipe Mills

- Single Systems for ID Welding on the Mill itself
- Automatic Gap Control Systems
- Dual Systems for combined offline ID and OD welding
- Combined Tracking & Bead Inspection for online UT Systems
- Multihead Systems for offline UT guidance



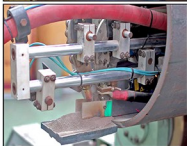
Meta in Longitudinal Pipe

Meta first installed its flagship VistaWeld systems on the Tack Welders and OD Welders of a UOE LSAW mill in March 1996. Since then we have maintained continuous product development and offer systems today which are carefully matched to longitudinal pipe mill applications and offer unique benefits to mill operators.

Meta has led the way with improved lookahead tracking algorithms for longitudinal pipe, which significantly improve accuracy with the large multi torch heads commonly used.

Applications in Longitudinal Pipe Mills

- Tack Welder Seam Tracking
- Tack Welder Hilo and Gap Measurement
- ID Welder Seam Tracking
- Milling control for tack weld removal
- OD Welder Seam Tracking
- Multi-head bead tracking for offline UT guidance
- Automatic Adaptive fill control
- Special solutions for thick wall pipe with fully automatic multipass welding
- Combined bead tracking and inspection systems for UT applications





Meta was formed in 1984 as a spin out from a research project at the world renowned Oxford University. Since then we have combined high-tech development with practical solutions to produce over 3,000 laser vision systems for welding applications.

Meta has an extensive R&D programme for pipe mill sensing and control systems, working in partnership with a number of welding equipment suppliers, research institutes, pipe mill builders and other interested parties.

The aim of our R&D has always been to develop practical new systems that meet the real needs of SAW pipe mills and provide demonstrable value to our users.

Meta Introduces 3D Pipe End Measurement

Meta has been involved with various aspects of pipe measurement for several years. Meta's bevel measurement systems and internal weld inspection systems are well established and have been used on many pipeline projects.

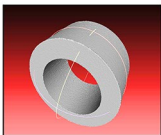


Following an intensive development programme, Meta has introduced a highly innovative Pipe End Measurement System (PEMS).

By combining two Meta SLS laser sensors with various special modifications and advanced calibration techniques, the Meta PEMS generates a complete 3D model of the end of a pipe together with all required dimensional measurements in real time.

This is in comparison to systems using single point rangefinders which measure around a single line on the pipe and require post measurement processing.

The Meta PEMS system measures the end face as well as both the ID and OD surfaces up to 100mm into the pipe.



Having a complete model available provides great flexibility in making accurate measurements in a well defined way relative to the true pipe end geometry. The 3D models can themselves be stored and retained for retrospective analysis.

In summary, Meta's new PEMS system adds a new dimension to pipe end measurement.

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