

Pipe Checker™ 'Smart-Fit'™

SERVICE: Fit-up Optimisation in the Firing Line

Client Requirement

Pipeline welding is an exacting task, but when pipes have geometrical defects or fit together poorly, then difficulties can begin to mount, raising the chances of delays and rework which in turn impacts tight production schedules.

Counterboring may not be viable as a means of controlling geometry, due to cost considerations or pipe wall thickness limitations.

How can fabrication specialists ensure that pipes delivered into the bead stall will fit together within the specification requirements for welding?

OMS has the answer: 'Smart-Fit' software that uses pipe measurement data to predict and control the fit-up, before the pipes are brought into the bead stall for welding. This can avert production hiccups that relate to poor fit-up and can manage the assembly of problem pipes to maximise welding productivity.

Measure, Mark, and Fit-Up

Measurement data for pipes is the starting point for a 'Smart-Fit'. Pipes are pre-measured and data is made available to a 'Smart-Fit' station. This comprises of a laptop computer system being used prior to the firing line, for example in a pre 'ready rack'.

Each pipe in turn is identified and entered into the software. The software analyses the fit-up of pipes and allows the operator to mark the best rotational position on each pipe end.

In the bead stall, these marks are aligned to immediately achieve the best rotational position so that misalignment is minimised.

Any problem pipes that won't fit at a specified HiLo are also indicated and are re-sequenced or removed so that fit-up problems do not occur in the bead stall. Production delays due to mismatched pipes are avoided.

Identifying and Avoiding Fit-Up Problems Before They Occur

Fit-Up problems occur when two pipes of different geometries are brought together. Sometimes this is due to imperfections in either of the pipes. Sometimes chance may play its hand, for instance one pipe may have a diameter at the upper limit, and the other pipe may have a diameter at the lower limit. Or the roundest and the most oval pipes may be brought together. Whatever the cause, the consequence can be difficulty in the bead stall aligning pipes to the required HiLo.

If pipes have to be fitted up using repeated trial and error, or in the worst cases removed altogether from the bead stall, this will impact production schedules. The proportion of pipes that are a problem can vary depending on pipe geometry trends and the allowable extent of misalignment. Measurement coupled with simulation can identify this even before production starts, allowing a suitable 'Smart-Fit' solution to be put in place.

Sequence of operation for the Smart-Fit solution

▼ Stack of pipes awaiting processing



▼ Pipes being loaded onto the rack for measurement



▼ Pipes loaded onto racks for sequencing



▼ Pipes being selected for the required sequence



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Solving the Problem with Smart-Fit

Experience shows that with typical flowline HiLo limits and using typical seamless linepipe that has not been counterbored, fit-up issues can occur regularly depending on the HiLo requirement. For a HiLo of around 1.0 to 1.2 mm problems are likely every 10 to 20 pipes (this will vary according to the exact project and pipe type). In this case using 'Smart-Fit' enables the required Hi-Lo's to be achieved in the bead stall without trial and error. But when pipes will not fit, this will be indicated and the problem pipe can be taken out of sequence, thus avoiding problems in the bead stall. For a HiLo of 0.8 mm to 1.0 mm problem fits will typically occur in twenty to fifty percent of the cases. In this case 'Smart-Fit' delivers a sorting operation which is carried out before the pipes are put into the firing line.

Proven Technologies for Any Pipeline Project

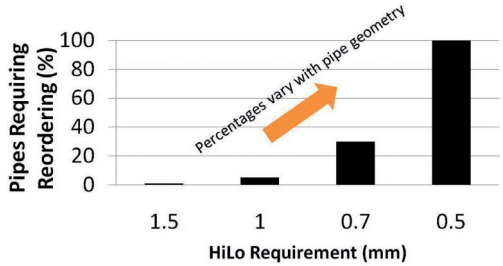
OMS provides a suite of measurement and 'Smart-Fit' technologies to solve fit-up issues on any pipeline project, onshore or offshore. For cost-conscious land-based projects or for large UOE pipes OMS offers the most cost-effective measurement solution using the 'Manual PipeChecker' tool. For the highest productivity and 'gold standard' measurement accuracy, OMS offers the Automatic PipeChecker service. Options for 'Smart-Fit' stations include 'Visualisation' which gives the user an on-screen view of the simulated fit-up, or the 'Sequencer' software which gives the user a model of the ready rack and allows re-sequencing at a click, while presenting a table of fit-up data with any problems highlighted. When it comes to marking the rotation, both laser-based and tape-based methods are available. OMS has deployed these technologies in numerous projects worldwide, achieving fit-up improvements for an enviable list of projects.

Tailor-made Solutions to Suit Production Requirements

Elements of the 'Smart-Fit' solution can be deployed in different ways to suit the realities of different production processes, both onshore and offshore. A key element of the solution is to use prior measurement data and alignment marks to immediately achieve the best fit-up while avoiding bringing problem pipes into the bead stall. But there are different ways of dealing with problem pipes. When pipes don't fit they can be re-ordered or managed in various ways. Depending on the available space and equipment, pipes can be re-sequenced, or set aside for later use. OMS has a wealth of projects successfully completed using this technology and can advise clients on the most efficient procedures for their production scenario.

Deploying the System

When you need to deliver a pipeline welding project against challenging logistics, use 'Smart-Fit' to minimise your fit-up risks. OMS can measure a sample of your pipes and quantify the likely problems. You can consider the issues ahead of time and OMS can tailor a solution for you using proven technology. Don't leave it to chance – use 'Smart-Fit'.



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