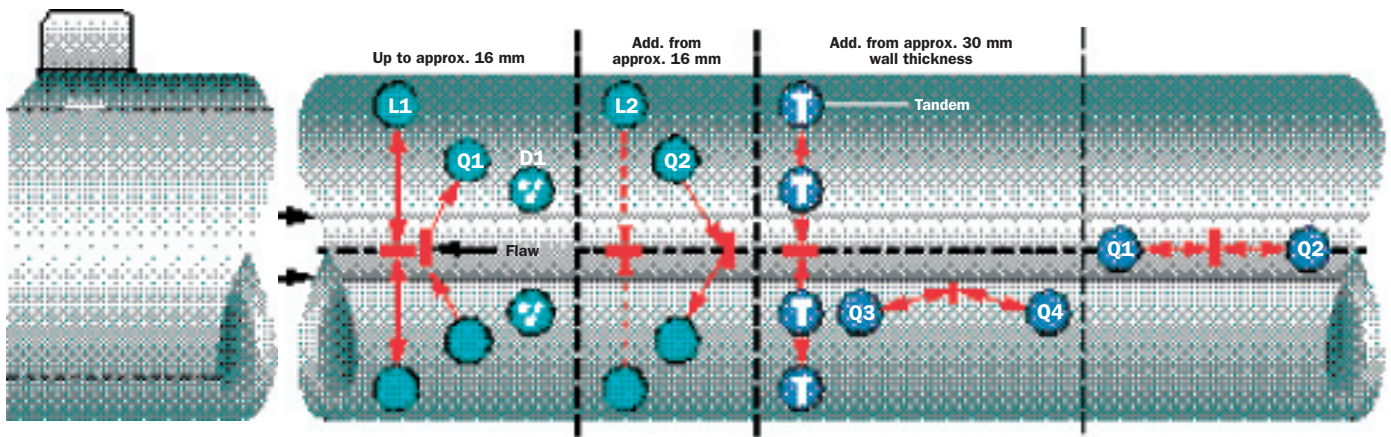


# Krautkramer Testing Machines

## Submerged Arc Welded (SAW) Pipes



### Submerged arc, longitudinally welded tubes: testing weld seams, heat affected zones and tube ends

The facts are somewhat different with submerged arc, spirally welded tubes: The complete test of the parent material (plate testing) should be made in the production process: The test in the pipe wall is possible but involves more cost.

Therefore all that remains for the finishing shop to do is to test the weld seam, the parent material in the heat affected zone and the tube ends.

Frequently such longitudinally welded tubes have thick walls for which further testing is required: on one hand, additional levels for longitudinal and transverse defects can be included, on the other hand testing can be extended to the so-called tandem technique.

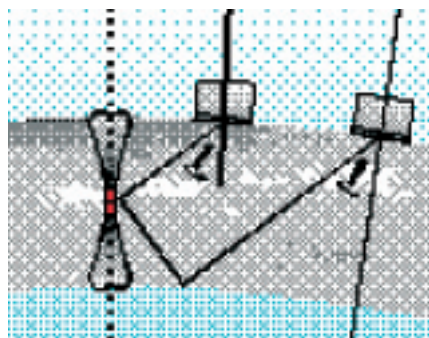
The tandem method separately monitors the center area of the weld in order to detect defects which are vertical to the surface.

Angle-beam probes can be used which test for transverse flaws in the heat affected zone. The orientation of these defects is perpendicular from the weld seam into the HAZ.

### Testing weld seams and parent material with complexed systems: SNUP

With this testing machine the probes are positioned from above in pairs. Probe guiding devices with vertical and horizontal movement units enable automated tracking of the test system.

The complete mechanics must be mounted on a column support with boom or onto a portal.



Tandem test



Weld seam inspection on SA-longitudinally welded pipes

**Submerged arc, spirally welded tubes: testing of weld seam, the parent material in the Heat Affected Zone (HAZ), the remaining parent material and tube ends**

Defects in the weld should be detected as soon as possible i.e. firstly during the production. We have the testing machines which can test the pipes after welding has been carried out. The type of defects detected are longitudinal or transverse flaws in the weld and in the adjacent parent material laminations.

In addition to that a test in the finishing shop may also be necessary depending on the specification. Testing is carried out on the tube crown.

Normally six probes are used with this test system. Four angle-beam probes for detection of longitudinal and transverse flaws, and two straight-beam probes for detecting laminations.

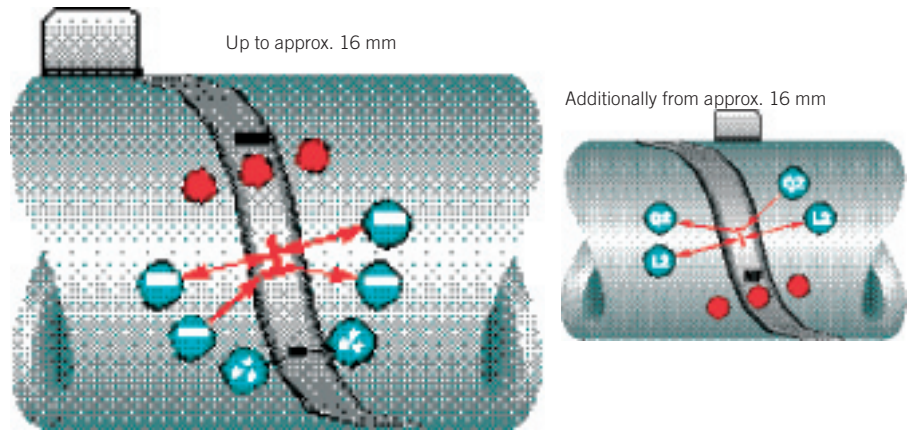
Depending on the tube dimensions, it is possible to extend the number of probes for each type of flaw.

**For spiral weld testing: SNUP**

The complete test mechanics of the SNUP, a machine for testing welds and parent material, is mounted onto a lifting frame with cantilever arm and transverse shift or onto a portal. Vertical is made by a central pneumatic unit and horizontal movement is motorized, gimble mounted probe holders fixed to guiding rods.

Our systems for acceptance testing of submerged arc, spirally welded tubes in the finishing shop do not differ from those of online testing. However, in this case there is additional tube end testing.

In both cases we use pneumatic lifting and lowering devices for each probe or each test level. In this way, we are able to avoid long untested ends when testing in the finishing shop.

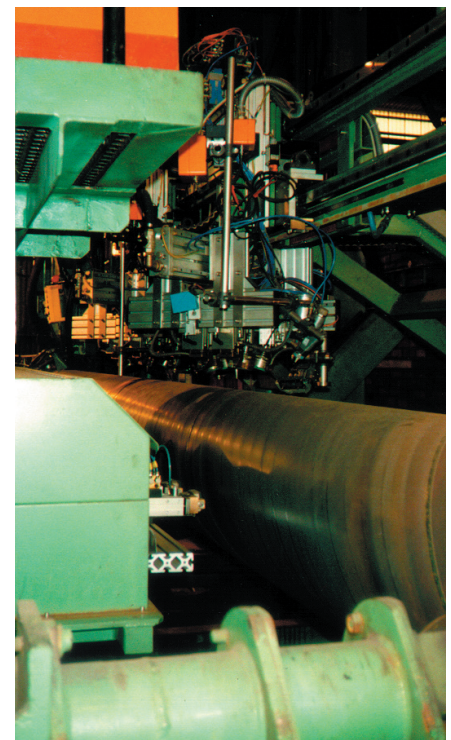
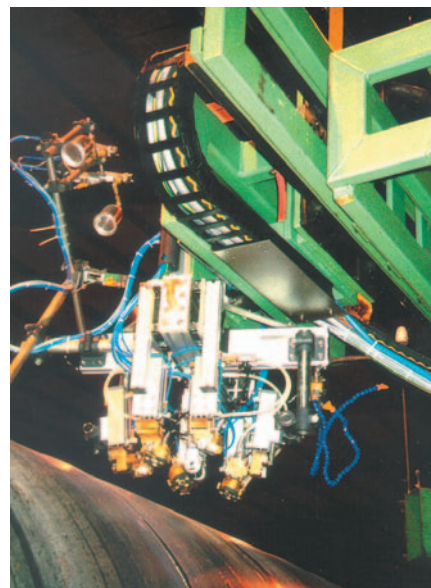


**Inclusive testing of the tube end: SNUP, REP**

The central test machine can operate either with a stationary tube or with tube movement. When testing in the tube transport mode, the tube is mostly transported with a pipe transportation car up to the testing machine (a spiral roller conveyor would be an alternative).

The first end is now tested. Whilst the tube is passed through, both the weld seam and, if required, the parent material are tested followed by the second tube end.

The testing sequence is the same as above when testing stationary tubes. However, the test mechanics are driven over the tube using a trolley attached to a portal.



Test in 2 pitches

**Weld seam and HAZ-testing of spirally welded pipes**

Test in 1 pitch