

# Krautkramer Testing Machines

## GRP - VIS

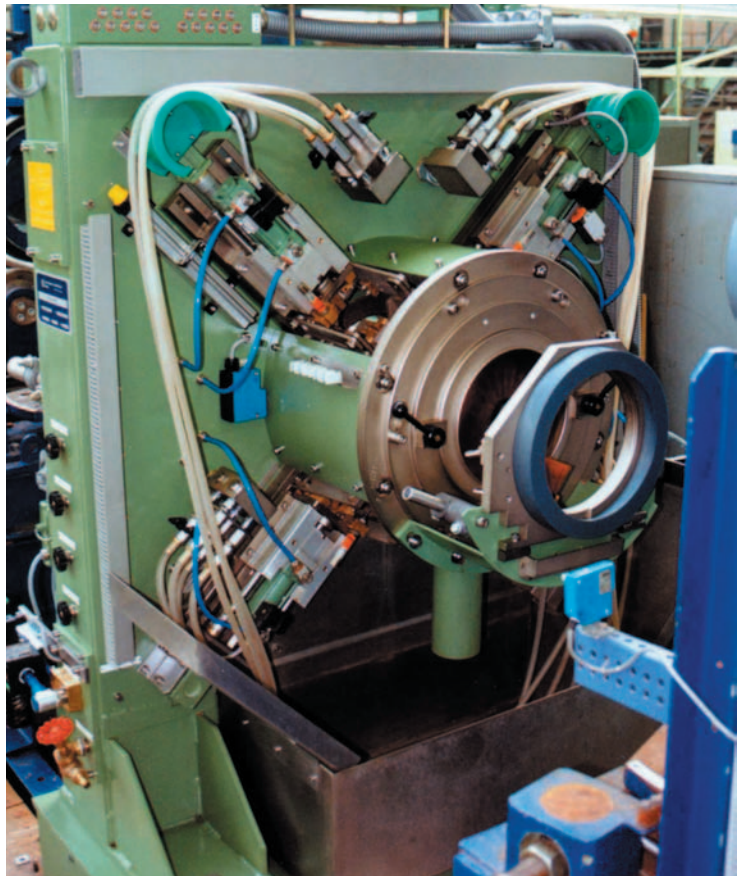
### Ultrasonic large-diameter tube testing machines

For the ultrasonic testing of larger seamless tubes the principle of our fast rotaries is not suitable anymore. For such tubes, but also for lower tube production rates in the medium diameter range, we have developed the CLUSTER technology.

The CLUSTER is a special probe holder able to take up to 9 probes. With the exception of the wall thickness/lamination probe installed at the center, all other probes are arranged in circular mode in the holder with their sound beam directed towards a mutual beam index or sound entry point.

This arrangement enables testing for longitudinal (2 probes), transverse (2 probes) and oblique or inclined (4 probes) flaws. In addition, the wall thickness/lamination probe makes a reliable coupling check possible for all test types directly at the test location.

When testing by means of this GRP-VIS (CLUSTER), the tubes are either helically transported through the stationary test mechanics on spiral roller conveyors or stationarily rotated, and the CLUSTER probe holders are guided along the tube. In the through-transport system, 2 to 4 CLUSTER probe holders are arranged around the circumference (90 degrees each) to increase the throughput rate. This arrangement on one level helps to obtain short untested tube ends while a uniform distribution (pitch) of the scan helices is always attained, irrespective of the tube advance.



GRP-VIS - 4 CLUSTER test mechanic

Depending on the tube diameter and wall thicknesses, different CLUSTER probe holders are used. The HIGH-SPEED CLUSTER is a special design. This HS CLUSTER is equipped with 2 x 2 longitudinal flaw probes and one wall thickness/lamination probe.

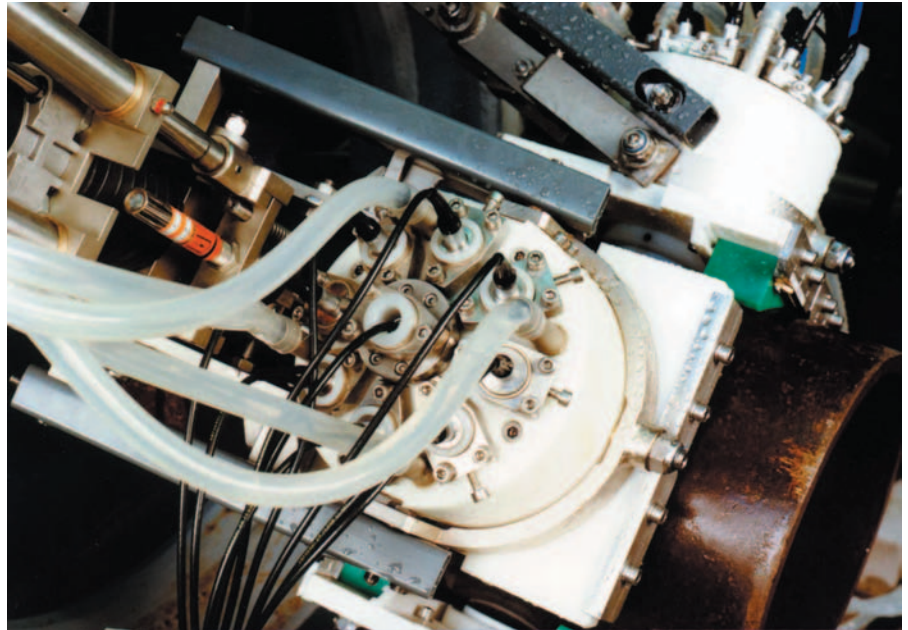
In the through-transport system, the incoming tube is recognized by initiators or light barriers, and the CLUSTER probe holders are lifted/lowered into position on the tube by means of pneumatic cylinders. Shortly afterwards, the test release is given.

GE imagination at work



The newly developed, PCB-based and fully parallel operating ultrasonic test and evaluation electronics, type VIS, processes all returning signals and carries out a separate evaluation according to flaw type and position. The single tube and production lot results are permanently displayed on the monitor and stored during this. In addition, an LED display indicates the current status of the inspection line.

Any flaws detected are paint marked, and the tubes are finally sorted according to the test results.



## Technical Data

### Data of the test objects:

Outside diameter: (25) 60 to 600 mm  
 Wall thickness: 2 to 60 mm  
 Minimum tube length: approx. 3 m

### Data of the testing machine

Linear test speed depending on the possible surface speed, on the tube diameter, on the number of CLUSTER probe holders, and on the flaw length to be detected: max. 45 m/min;  
 Surface speed: max. 2 m/s (depending on the geometrical tolerances on the tubes)  
 Probe assembly: 4 (or 2) standard CLUSTER probe holders, each with max. 9 probes (2 LF, 2 TF, 4 OF, 1 WT / lamination probe);  
 high-speed CLUSTER with 2 x 2 LF and 1 WT / lamination probe each

Measuring accuracy for wall thickness:  
 +/- 0.03 mm (higher accuracy is possible by means of averaging)

### Test electronics

- Modern PC systems electronics VIS
- User interface under WINDOWS NT
  - Max. 20 kHz pulse repetition frequency
  - VME bus controller
  - Parameter storage
  - Automatic sensitivity adjustment or check
  - Extensive monitoring functions, self-tests and diagnostic supports
  - State-of-the-art PC technology

Wall thickness measurement using the UMW electronics. Display and storage of wall thickness profile of individual tubes during testing.

### Test specifications

SEP 1915, 1918, 1919  
 API 5 CT, API 5 D, API 5 L  
 other specifications on request

### Options

- Lifting/translation table for test mechanics
- Water circulation system
- Test tube manipulator