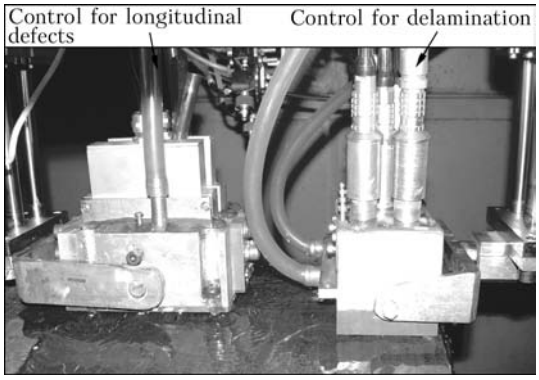
DEVELOPED IN PWI

INSTALLATION NK 362M

It is designed for automatic ultrasonic control of end areas of pipes of diameter of 508–1420 mm with 7–50 mm thickness of wall.

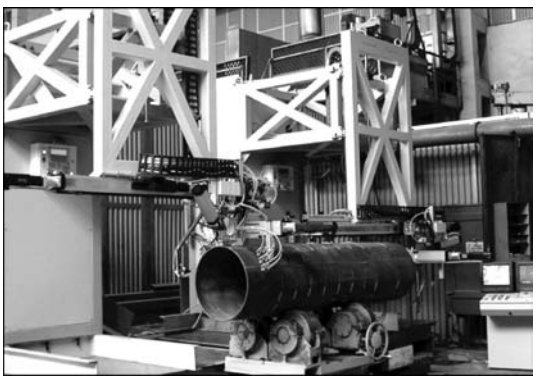


Local-immersion acoustic heads

The installation provides:

• sounding of both ends of pipes around the whole perimeter across the wall thickness, detection of defects of delamination type on the width of 60 mm from the end and longitudinally oriented defects of crack type on the width of 30 mm from the end;

• automatic control of quality of acoustic contact in all flaw detection channels.



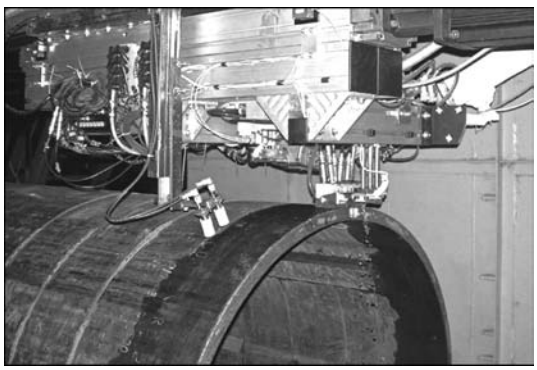
The following operations are automatically performed in the installation:

• record and storage of information about the process and results of control;

• output of light and sound signal about presence of flaw;

• output of light and sound signal about inadmissible deterioration of quality of acoustic contact;

• diagnostics of equipment operation and sending of messages to the device of man–machine interface;



• preparation and transfer of necessary information about results of control and installation operation to workshop database;

• making marks of different colors on the pipe surface, defining location of defects and areas with unsatisfactory acoustic contact.

Multichannel ultrasonic flaw detector is designed on the base of «Socomate» boards.

Basic technical characteristics of the installation NK 362M

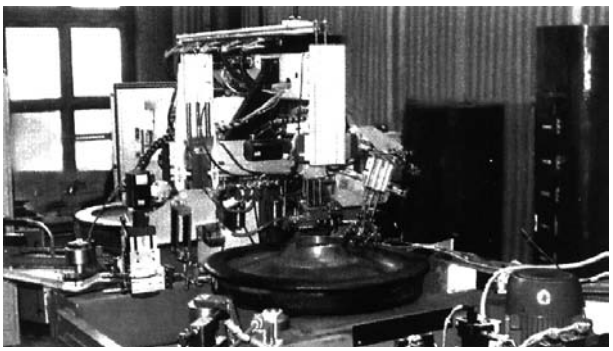
Parameter	Value
Working frequency, MHz	2.5; 4.0
Linear control speed, m/min	max. 20
Range of speed control	not less than 1/100
Number of US channels on the base of «Socomate» boards, pcs	16
Frequency of tracking of sounding pulses along each channel provides pulsing for 1 mm	not less than 2
Reserve of sensitivity along channels in dynamic mode, dB	not worse than 12
Incontrollable area on the ends of pipes, mm	not more than 10
Incontrollable area in the region of a weld, mm	not more than 15
Water consumption, l/min	not more than 50
Power consumption, kV·A	not more than 8

INSTALLATION NK 364

It is designed for automatic ultrasonic testing of solid-rolled railway wheels made on GOST 10791 and specifications as well as wheels of foreign standards UIC, AAR in a processing line of their production of 760–1092 mm diameter.

The following operations are automatically performed in the system:

- record and hold of the results of testing;
- defect light and sound alarm signals;
- light and sound alarm signal of inadmissible loss of quality of acoustic contact;
- equipment operation diagnostics and display of a messages on human-machine interface device;
- preparation and transfer of necessary information about results of testing and operation of system into a shop database.



The system has 6 acoustic locally immersion blocks for testing:

- rim in axial direction;
- rim in radial direction;
- hub;
- disk;
- disk in axial direction by inclined transducers;
- flanges.

Systems of AUST of railway wheels successfully passed metrological certification in Ukraine, Russia and guarantee tests and were introduced in commercial operation.

Capacity of the system makes 70 wheels per hour.

Main performance characteristics of NK 364 system

Operating frequency, MHz	2.5–5.0
Wheel speed, rpm	5–20
Number of US channels, pcs	20 (40)
Time instability of response level for 8 h of work, dB	not more than 2
Instability of response level on width of testing zone at 70 mm depth, dB	not more than 0.5
Frequency of movement of monitoring pulses through each channel provides pulsing per 1 mm	not less than 1
Margin of response level in channels in dynamic conditions, dB	not worse than 8
Uncontrolled zone of side surfaces of controlled areas, mm:	
internal side surface of a rim; wheel disk	not more than 5
external side surface of a rim (for direct PET), internal and external side surfaces of a rim (for inclined PET); thread, side surfaces of a hub	10
Size of acoustic gap, mm:	
in control of rim and disk of a wheel for direct and inclined transducers, operating in immersion variant	10–40
in control of wheel hub for direct transducers, operating in gap variant	0–3
Initial edge of control zones monitoring accuracy, mm	±0.5
Consumed power, kV·A	not more than 12