



# Department of Computer and radioelectronic systems of testing and diagnostics

**The main directions of research and  
development.**

# I

- Research and development of electromagnetic and acoustic method of ultrasonic pulses excitation and reception in conductive or ferromagnetic materials and products without contact liquids.



# EMA defectoscope

- Based on a personal computer and two microprocessors. Intended for metal products flaw detection and thickness evaluation without contact liquid. Suitable for wide array of ultrasound input surfaces including heavily corroded ones without the need to clean it. The device can initiate and receive ultrasonic pulses of all wave types both perpendicularly to the surface and at an angle with any surface curvature.



# Contactless ultrasonic thickness meter with dual processors

- intended for measuring the diameter and thickness of the conductive products and (or) the use of ferromagnetic materials without contact liquid by electromagnetically - acoustic means. Application of the device requires no special surface treatment for removal of paint or plastic coating, oil, rust, scale, etc. When testing tubulars in operation only residual thickness of metal is measured. The measurement result is not affected by the thickness of the outer covering and deposits on the inner surface of the shell. Thickness meter modification allows for thickness monitoring of ferromagnetic metal over the layer of dielectric coating up to 10 mm wide.





# **A device for high performance diameter (perimeter) monitoring**

- and inspection of tubular metal products of any section shape (circular, elliptical, square, rectangular, etc.) by electromagnetic-acoustic method. During the ultrasonic inspection it is sufficient to move a single EMA transducer along product generatrix only.

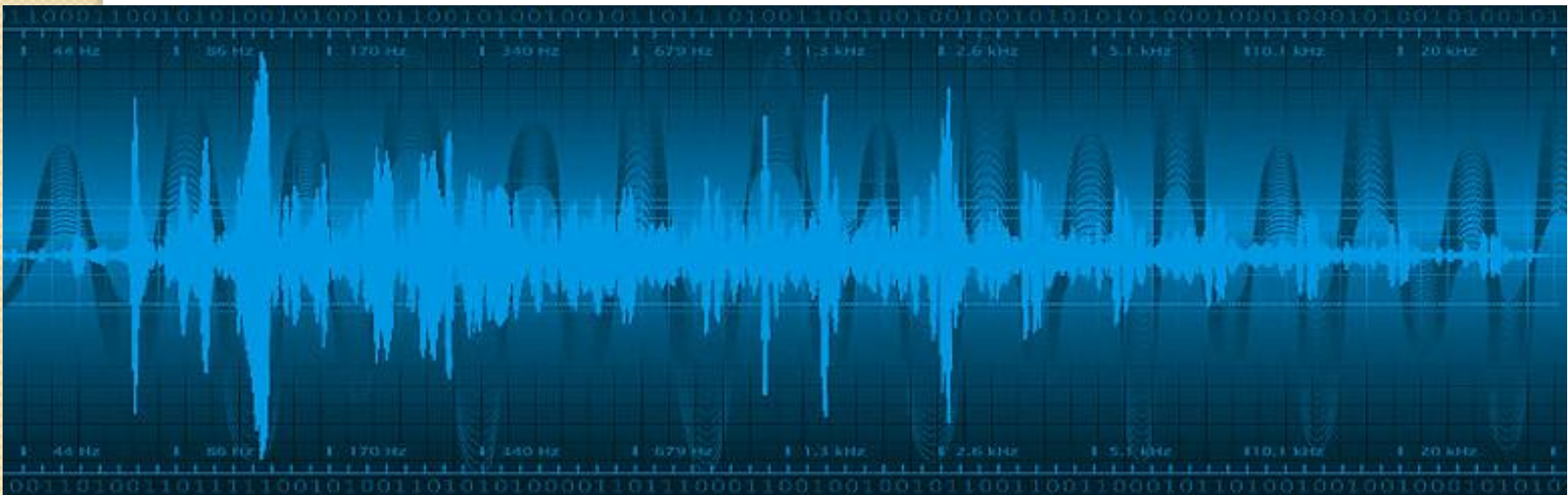
# An ultrasonic testing device

- for EMA-method metal surface and surface layers testing. 30-mm deep untestable area is absent for this method.



# II

- Methods for testing sensitivity increase in the excitation and receiving of ultrasonic pulses. Device prototypes for capacity-transducer ultrasonic pulse excitation and receiving in conductors.



# III

- The development of low-cost vortex-current devices with characteristics improved in comparison to issued by well-known companies





# Vortex-current microprocessor defectoscope "TOT M"

- Designed to detect surface cracks of conductive and/or ferromagnetic products via vortex-current method. Maximum testing sensitivity - 0.1 mm deep rectangular groove on a flat Steel 45 sample. The cost of the device is much lower than of traditional, mass-produced ones.



# Vortex-current defectoscope WD-1GD

The device is designed to detect surface defects of electrically conductive products, evaluation of the defect shape (crack or hole), measuring the depth of defects over a wide range (picture 4).

Main specifications of the defectoscope:

- The minimum depth of the detected defect: 0.2 mm;
- Minimum defect disclosure: 0,005 mm;
- Depth measurement range of the defect up to 20 mm;
- Operating temperature range: -15 ... +40°C.



# Microprocessor vortex-current defectoscope VD-1

Microprocessor vortex-current defectoscope VD-1, Picture 5, is designed for inspection of pipes, oil and gas pipelines of power, chemical and special production facilities, of machine and mechanism constructive parts and others. The cost of the device is minimal.

- Main specifications of defectoscope:
- The minimum depth of the detected defect: 0.1 mm;
- Minimum defect disclosure: 0,005 mm;
- Operating temperature range: -15 ... + 40°C



# Microprocessor vortex-current dielectric coating thickness meter VTDEP-1

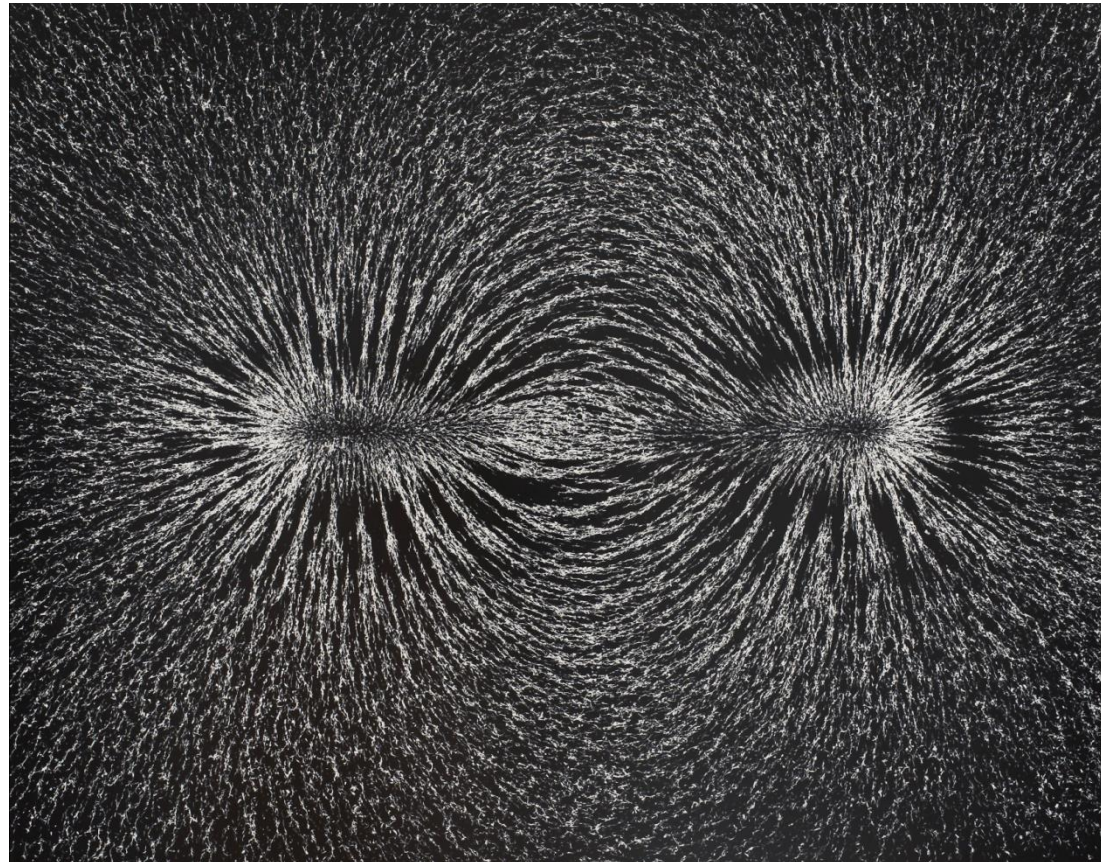
- Thickness gauge for non-destructive testing and thickness measurement of bitumen, film and other dielectric layers on electrically conductive (metal) foundations in the thickness range of 0.2 ... 20.5 mm.
- The device is used to measure the protective insulation thickness of oil and gas pipelines before placing them in the ground or carrying out repair and maintenance work, fire control coatings on steel constructions, etc.





# IV

- Measuring tools for residual magnetic fields





# Magnetic field strength meter PF-2M

- PF-2M stationary meter, Picture 7, is designed to measure the strength of constant magnetic fields. The device makes it possible to determine the magnitude and direction of the local magnetic poles, to determine the value of ferromagnetic material products and their components residual magnetization. The device allows to detect ferromagnetic or magnetized bodies within biological objects.



# Residual magnetization microprocessor meter ION-1M

- designed for determining components and workpieces residual magnetization after demagnetization, and residual magnetization in magnetized components after magnetic particle inspection, grinding, during unloading of parts via magnetic washer and in other cases. The device is effective for detection of magnetic field influence on electricity, gas and water meters.



№	Parameter	Value
1	Measurement ranges	0-1999 A/m
2	Measurement error limit	5 %
3	Power consumption	75 mW
4	The permissible ambient temperature range	-10 +40 °C
5	Dimensions, mm	120x75x 35 mm
6	Weight	0,12 kg

# V

- Powerful generators for low-resistance load pulse currents (up to 200 A) and voltage (up to several kV) forming with predetermined frequency (0.1 ... 20 MHz) and pulse duration (up to 20 filling rate periods) .

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Monitoring performance increase compared to traditional methods estimates in **30-70** times.



# VI

- Means of sheet-product (plates, containers, tanks, etc. with wall thickness up to 10 mm) ultrasonic testing via EMA method with single-sided product access.





# Contact information



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