

1.10.22. NON-DESTRUCTIVE QUALITY TESTING OF UNITS AND ELEMENTS OF CONSTRUCTIONS

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JSC “Rocket-space corporation “Energiya” named after Korolev S.P. is the leading enterprise in Russian rocket-space industry.

At present, there are the following non-destructive testing methods are used in the corporation:

1. Radiation (X-ray). This method is widely used at the enterprise for testing of 100% of welded joints, soldered constructions and casting.

2. Accoustic (elastic ultrasonic and acoustic-emission). Semi-finished products, subproducts and items made from steels, aluminum and titanium alloys are tested by means of ultrasonic method: echo-impulse and shadow method in its immersion variant.

3. Liquid penetrants (luminescent). This testing method is applied to damage sensitive items made from non-magnetic alloys.

4. Electromagnetic (eddy current) method is utilized for determination of surface defects on finished items and assemblies, testing of aluminum forgings and pressings with a view to overburning and estimation of coatings' thickness.

5. Magnetic (magnetic particle). Details made from ferromagnetic alloys undergo this type of testing.

6. Optical method is used for testing of internal surfaces with a view to reveal scratches, cracks and foreign particles.

7. By means of thermal method is applied for testing of solar-cell panels production quality and assessment of hydrogen nitride level in cooling systems of automatic space devices.

8. Leak detection.

The mentioned testing methods and aids ensure reliable defects detection in units under testing.