

ABOUT STANDARDIZATION IN AREA OF LEAK TESTING IN RUSSIA.

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Abstract: Standardization of leak testing methods in Russia today matters not only as formal necessity of development and application of the most correct and unified ways of tightness control of products, installations, systems, but also becomes especially important action in connection with a number of the following circumstances:

- increase of requirements to reliability and safety of an objects,
- renewal of leak-testing instrument base,
- disutility of a test experience applying from one type of product to another one,
- diversity and relative complexity of leak-testing, leak-testing experience

Today the responsibility for a choice of manufacturing techniques of production, methods of its control, lays on the manufacturer basically. Application of the international norms of quality, use of the standard quality monitoring of production raises its competitiveness.

It is necessary, that supervision instances, developers of research and development institutes, engineers and technologists of the enterprises could use the unified norms and the methods, worked out by experts of all world.

However, in the country, where the English language not become so widespread that any engineer freely could use the English document, there is a problem of translation and interpretation. The choice of foreign standards as normative base, for example ASTM, would complicate process of standardization in Russia, would disregard the wealth of national experience. Development of system of national standards is necessary. In field of leak-test the Russian vacuum society already begins such work.

It is possible to tell, that standardization of leak-testing in Russia occurs today at three levels:

- branch levels - experience of the tightness control is generalized in branch standards, obligatory to inside application in the industry branch,
- state levels - national standards are in creating on basis of the branch experience,
- international levels - world experience is used for developing of national standards

Introduction: Standardization of a leak testing methods in Russia today matters not only as formal necessity of development and application of the most correct and uniform ways of tightness control of products, installations, systems, but also becomes especially important action in connection with a number of the following circumstances.

- 1 Increase of requirements to reliability of work of the objects representing danger to the population and an environment in case of occurrence of failures. It especially concerns those, which have already exceeded normative term of operation.
- 2 Developing of market relations in Russia moves Russian enterprises to struggle for a foreign market, aspiration to international cooperation and unifications of requirements to production.
- 3 Modernization of leak-testing instrument base, both foreign and domestic, which give number of advantages at their use.
- 4 Relative complexity of performance of tests for the tightness, which demands use of special methods and ways of the control.
- 5 An experience of leak testing in Russia is saved up basically in the closed industries (cosmic, electronic, nuclear) and limited therefore in distribution.
- 6 Inefficiency of blind applying of test experience of one objects to other class of technical systems ones.

Results: About 25 industry branches produce or have in operation sealed items, which tightness must be checked. Today the responsibility for a choice of manufacturing techniques of production, methods of its control, lays on the manufacturer basically. Application of the international norms of quality, use of the standard quality monitoring of production raises its competitiveness.

It is necessary, that supervision instances, developers of research and development institutes, engineers and technologists of the enterprises could use the unified norms and the methods, worked out by experts of all world.

It is possible to tell, that standardization of leak-testing in Russia occurs today at four levels:

- detached plant - methods of quality control (MQC) of a similar products, technology of control,

- branch level - experience of the tightness control is generalized in branch standards (BS), obligatory to inside application in the industry branch,
- state level - national standards (NS) are creating on basis of the branch experience,
- international level - standards, having international using by law in any community, or without special law – practically (IS).

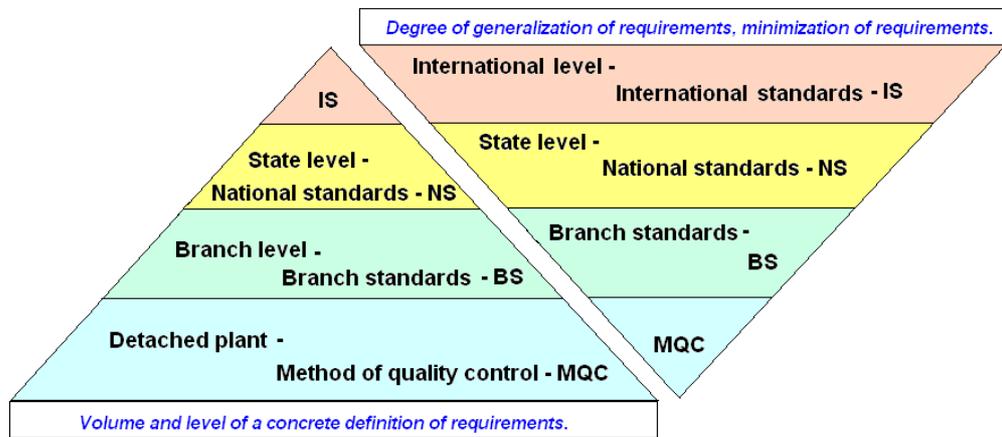


Fig. 1. Four levels of standardization.

On the fig.1 two pyramids of four levels of standardization are shown. The direct pyramid symbolizes increasing of volume and level of a concrete definition of requirements with moving down. Inverse pyramid symbolizes increasing of degree of requirement generalization, of requirement minimization with moving upward.

Any standard is a dogma in some measure. In questions of requirements safety, reliability of object work, product quality it is necessary. As for questions of a choice of the used equipment, application of alternative methods and ways of tests, achievements of higher results in production process, standards should not limit activity of the enterprises if those observe other obligatory norms.

However, in the country, where the English language not become so widespread that any engineer freely could use the English document, there is a problem of translation and interpretation. The choice of foreign standards as normative base, for example ASTM, would complicate process of standardization in Russia, would disregard the wealth of national experience. Development of system of national standards is necessary. In field of leak-test the Russian vacuum society already begins such work, completing existing fund of the state standards (GOST) in this area.

Meanwhile, the attentions to other standards arise. Standards ASTM, AVS are translating and learning in Russia now.

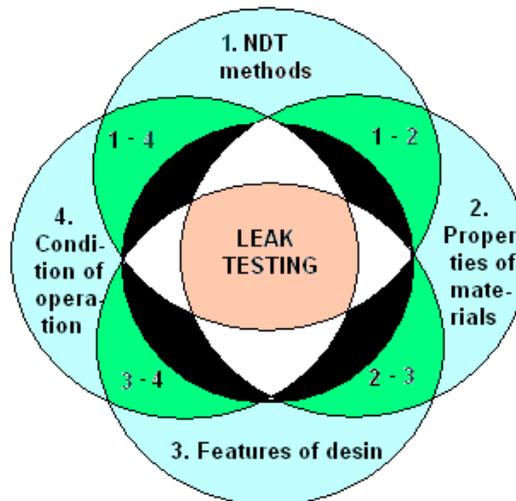


Fig.2. The rose of influence factors on tightness control.

There are many factors, which influence on successful tightness control. Main of them are given on the rose of tightness control factors, fig. 2. They are:

1. NDT methods – there are more than 10 of methods for tightness control. They have different ability to discover 1. NDT methods – there are more than 10 of methods for tightness control. They have different ability to discover through defects.
2. Properties of materials – different materials have diverse kind of defects and ways of control.
3. Feature of product design.
4. Conditions of operation.

For approach to right way of control it is necessary to analyze of the rose of influence factors on fig.

2. It better do on spiral:

First round – analyzing of main factors.

Second round – analyzing of binary mutual relations (1-2, 2-3, 3-4, 4-1), election of way of control.

The third circle - analyzing of ternary mutual relations, verification of elected way.

To simplification of election ways of tightness control methods a number of standards and manuals it is required. From existing standard systems ASTM standards are most developed and can be taken as example.

Conclusions: Standards of different level, national or international, must operate for solving technological and control of quality tasks in the best manner. They should take into account all national and international experience on detection through defects in products.