STANDARDIZATION ROLE FOR IMPROVEMENT OF ENGINEER'S EDUCATING PROCESS

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Abstract. In various study courses for notation of the same notions there are occurred different terminology. There are explored situation on Faculty of Engineering as well as on the basis of Latvia standardization and practical experience the recommendatory for improving of study process are developed.

Key words: standardization, standards, engineering graphics, quality.

Introduction

In Latvia, in the same way, as in other countries, the fast development of industry at the beginning of 20 century created necessity to develop special service for occupation with standardization. There were created all preconditions for development of standardized industry: high level of development of industry and technology, well organized market and wide customers network. The demands of standardization first of all were establish for export goods (flax, wood, butter, bacon and seed).

In the year 1939, February 21, the government official magazine "Latvijas vēstnesis" published announcement Nr.43, where it was declared if the standard RIS1 for paper format is developed. This standard for formats of paper and polygraph goods was first among more then one hundred standards and provisory standards, which one were published until august of year 1940. So fast temp of standards development was possible due to establishment of various norms and instructions in different fields of industry, which ones only got status of standard.

Interesting is fact, if the main idea of standard format for paper, which one is actual in nowadays, was worked out by professor Vilhelm Ostvald (1853-1932), German chemist and inhabitant of Riga. He offered to accept as paper main standard the 1 m^2 sheet with the same edge proportion as square edge proportion to their diagonal, it is $1:\sqrt{2}$. When that sheet (841- 1189 mm) has folded, the derived formats are got with the same proportion of edges, but two next formats proportion is 1:2 [3, 4].

Research object and methods

After the Second World War in Latvia was developed USSR unified standardization system. Only after Latvia resumed independency it became possibly to develop national standardization system accordingly with International and European practice.

The basic structure for developing standards on the any level (International, European, National) is the Technical Committee of standardization.

In the process of adaptation of International or National standards there are considered basis principles (LVS 100.1). Accordingly with these standards, LVS (Latvian standard) has developed procedures for regulation or development of national standards as well as adaptation of Europe or international standards [2].

The standard adaptation means, to accept international (or national) standard in status of Latvian standard.

In status of Latvian national standard LVS adapts:

- European standards;
- Harmonization documents, accepted by European committee of standardization;
- ISO standards of international organizations.

The adaptation of standards is managed by one of three adaptation methods:

- The method or translation;
- The method of front page;
- The method of declaration.

If for adaptation there is used method of translation, it has allowed publishes standard only on Latvian language or on two languages: official working language of organization of standardization

and Latvian. The official languages of European standardization committee are English, German and French.

If for adaptation there is used method of front page or declaration, the text of standard is on the one of official working language of organization of standardization.

Standardization is one of the basic tools for quality providing. Standardization provides the link between producer and market.

Results and discussions

Saeima of Republic of Latvia in year 1998 accepted the Law of Standardization, this Law declares if application of standardization is voluntary, but Cabinet of Ministers can decrees obligatory used National standards. It means, if any producer or service supplier could follow standards by own free choice, as well as, which country or region standards use depends on them. This approach is definitely opposite from preliminary experience, when it had defined legislative responsibility for standard using.

However, is this approach of standards using totally free? For example, in Latvia engineering and power industry are regulated not by standards, but laws of Saeima and rules of Cabinet of Ministers, which define basic requirements and duties and order producer to choose tools for realizing of these demands [1, 5].

Therefore, on the one hand, standardization is voluntary, but on the other hand, if the product doesn't satisfy to the demands of corresponding standards, it is held a view, if it doesn't satisfy to the demands of rules of Cabinet of Ministers and it is forbidden to offer this product or good on the market. Therefore, the demands of voluntary standard could be understand in correct way, the level of safety of the product always could be compared with demands of appropriate standard and can't be lower. It demonstrates, if standardization is one of the basic tools for quality providing. Standardization provides the link between producer and market.

The fact, that any Latvian producer or service supplier can use any country standards confirms the industry of Latvia. The LUA Faculty of Engineering lectures by taking part in EU project "The promotion of technologic competences of LUA EF lectures in engineering and metalworking industry" got acquainted with industrial and design documentation in 12 engineering and metalworking industry companies: Ltd "LARTA1" Rezekne, Ltd "EastMetal" Dobele, S/C "Liepajas matalurgs" Liepaja, S/c "DITTON gear chain factory" Daugavpils, Ltd "Baltrotors" Salaspils, Ltd "Zieglera Masinbuve" Daugavpils, S/C "Rebir" Rezekne, S/C "Valpro Corp" Valmiera, Ltd "LMR Azene" Riga, S/c "Jelgavas Masinbuves rupnica" Jelgava, S/C "Dambis" Riga, Ltd "Tehnika Auce" Auce.

The documentation in the one part of enterprises is appropriate with demands of ISO standards. The early making draughts are remade from GOST to ISO system. But part of enterprises, which send their production to Russian and other CIS (post USSR countries), still uses GOST standards.

For analyzing the basic differences between LVS EN ISO and GOST standards we have used important parameter of surface obtaining – surface roughness. For complete definition of the demands for surface roughness, the designation is added by parameters of surface roughness as well as numeric value of roughness.

For recent time in production and teaching process the location of surface roughness parameter was defined by GOST 2.309-73, but today it is defined by demands of standard LVS EN ISO 1302: 2002 [5].

Fig. 1. **Complete graphic designation of surface roughness:**
a – by GOST demands; b – by LVS EN ISO demands

a – The demand of surface roughness; the numeric marginal value is indicated for parameters R_a or R_z;

a and b – Two or more demands of surface roughness; show upper and lower marginal value of surface roughness parameter;

c – Modification of processing shows the modification of mechanical processing, the fastening of surface and perfusion, for obtaining of necessary quality of surface; for example: turned, grounded and covered;

d – Designation of direction of surface roughness;

e – Technological tolerance is showed only in cases, when on the one draught, it is showed different rates of processing for one detail;

f – The length of base.

Simplified application of surface roughness designation is showed on Fig. 2.

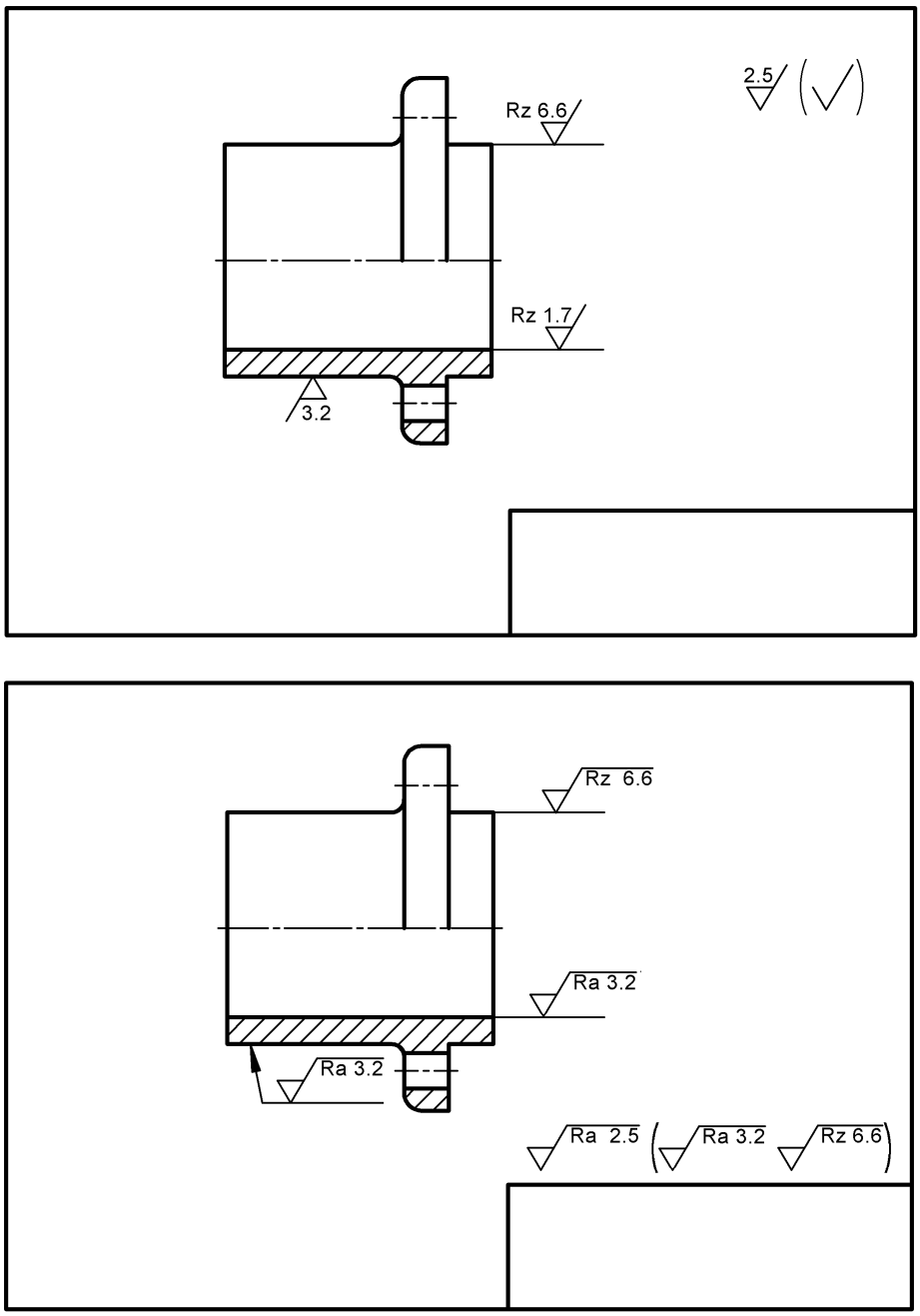

Fig. 2. **Simplified surface roughness designation in draught**

Conclusions

1. After evaluation of technical documentation and standards, which were used for working out of this documentation, we discovered that in teaching process of young engineers, we have to teach both, LVS EN ISO and GOST – differences between demands for draughts execution. It is necessary, when young specialist, after becoming into the enterprise, could be able to understand the technical documentation, which are made using GOST system.
2. The objective of any study aid (study book, handouts and standards) is to support the introduction of unified system for technical documentation execution in preparation process of young specialists.
3. This knowledge is important for eldest courses students for learning Computer-Aided design and drawing as well as to be able use this knowledge in other subject courses. The information about execution of graphic documentation, draughts and sketches concern with demands of LVS standard is very important study aid for working out of course papers and bachelor's papers.

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