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## ASSESTMENT OF THE OPTIMAL QUALITY LEVEL OF ENGINEERING PRODUCTS IN AZERBAIJAN

### ОЦЕНКА ОПТИМАЛЬНОГО УРОВНЯ КАЧЕСТВА ПРОДУКЦИИ МАШИНОСТРОЕНИЯ АЗЕРБАЙДЖАНА

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*Abstract.* Some aspects of determining of dynamics of the optimal technological level of quality level engineering products are considered. It is established that the optimal quality level is constantly changing due to the systematic increasing requirements of consumers and continuous improvement processes. The dynamics of the optimal technological level of production quality and nature of the change of various kinds of quality levels is defined. It is specified that the optimum quality level expresses the degree of compliance of product to the specific needs. It is approved that improvement of the quality is reasonable only at the optimum quality level of the product to be achieved under optimum performance.

*Аннотация.* Рассмотрены некоторые аспекты определение динамики оптимального технического уровня качества изготовления машиностроительной продукции. Установлено, что величина оптимальных уровней качества постоянно меняется, что обусловлена систематическими возрастающими требованиями потребителей и непрерывным совершенствованием технологических процессов. Определена динамика оптимального технического уровня качества изготовления и характер изменения различных видов уровней качества. Указано, что оптимальный уровень качества выражает степень соответствия продукции конкретным потребностям. Утверждено, что повышение качества целесообразно только при оптимальном уровне качества продукции, который должен достигаться при оптимальных показателях.

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*Keywords:* dynamics, optimal technological level, quality of manufacturing, engineering products, product quality, optimum performance.

*Ключевые слова:* динамика, оптимальный технический уровень, качества изготовления, машиностроительная продукция, качества продукции, оптимальные показатели.

In the coming years the quality of products in the engineering industry of Azerbaijan should be substantially improved. The most effective way to solve this problem is to create a quality system focused on the requirements of ISO-9000 based on the concept of total quality management [1, 2].

In a market conditions the tasks for the objective assessment of product quality and competitiveness are updated. The results of this assessment have a significant impact on the adoption of the most important management decisions on product quality [3, 4].

Considering the optimal level of product quality in terms of the manufacturer and the consumer, it is logical to conclude that for each one it is different. However, there is a general tendency over time: the value of the optimum levels are constantly changing, which can be represented by a smooth curve.

Such dynamics is determined by systematic increasing demands of consumers for quality and continuous improvement of processes and organization of production. For optimal technical quality level of manufactured products, as a function of cost components, the nature of their dependence is shown in Figure 1.

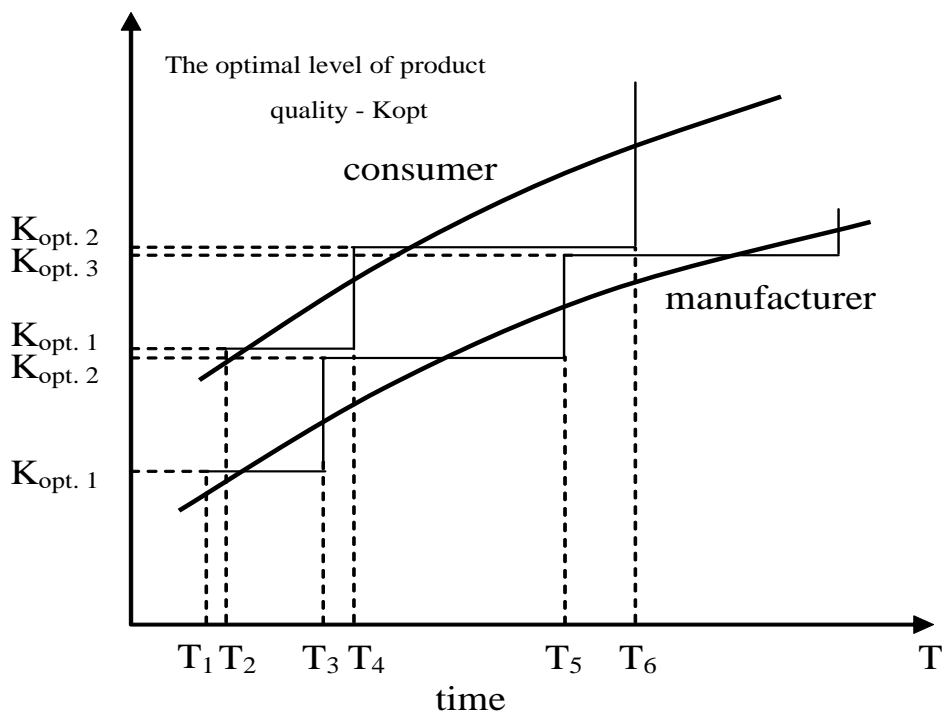


Figure 1. Dynamics of optimal quality levels of engineering products.

It was found that [5, 6] the cost of defects is about 65%, the cost of product quality assessment — about 25% and the cost to prevent losses from defects – 10% of the total cost for quality. Obviously, it is expedient to increase the cost to prevent defects and for the quality evaluation to reduce the loss from defects.

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For the consumer, it is advisable to investigate the dependence of its costs from the operational level of product quality. The most important components of costs in this case are the purchase price and the consumption price of the product (Figure 2).

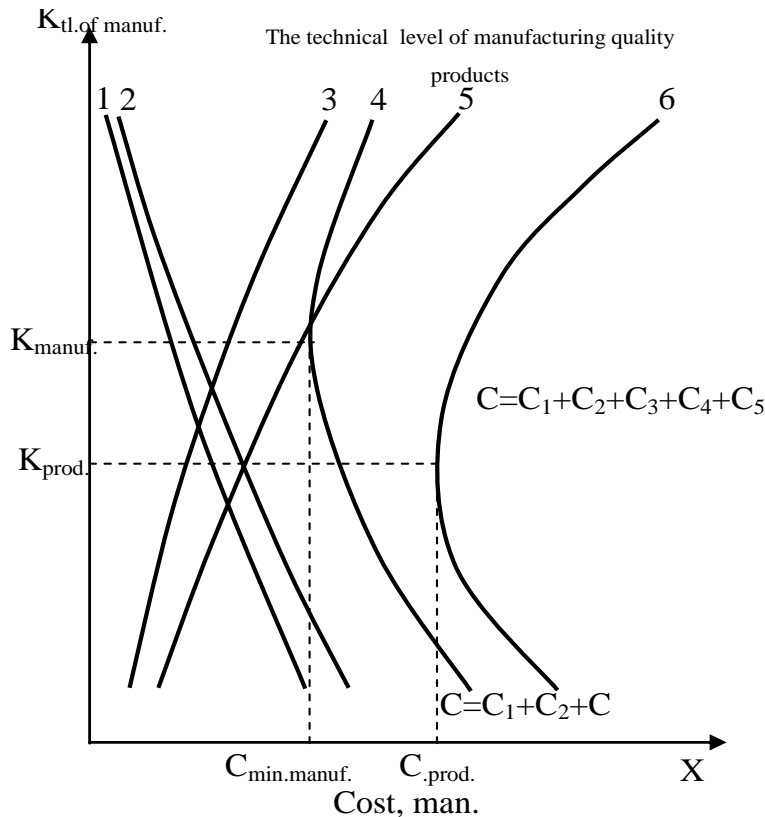


Figure 2. The optimum technological quality level of engineering products.

Dependency analysis shows that there are technically and economically optimal levels of quality. Moreover, it is important for the manufacturer to provide not only the optimal technical quality, but also no defects to the product reaching the consumer [7, 8]. Therefore, you should ensure that the technical quality level is somewhat higher than optimal.

The overwhelming majority of companies currently in determining the optimal level of quality prefers obtaining the maximum profit. However, with regard to the technical level of quality for the consumer and the manufacturer has an economic optimum level of quality (Figure 3).

Currently, the vast majority of enterprises then determining the optimal quality level prefer to obtain the maximum profit. However, with regard to the technical quality level for the consumer and the manufacturer there is the economic optimum quality level exists.

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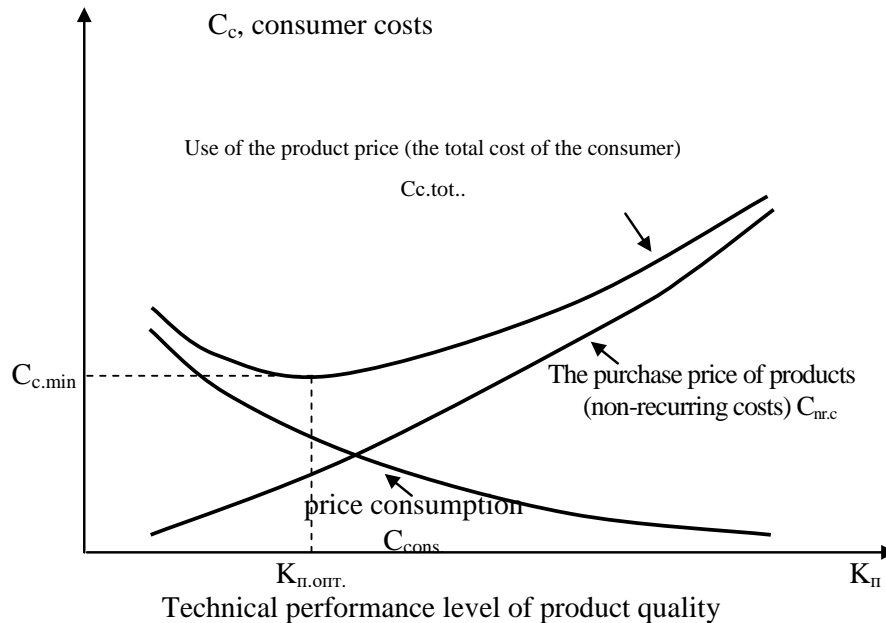


Figure 3. The nature of changes in the operational quality level of engineering products.

As can be seen, the dependence of the economic effect on the quality level  $K$  represented as a saturation curve, i.e. with increasing of quality level the values' rising rate on the  $W(K)$  curves is continuously reduced and  $H(R)$  cost — sharply increases.

Thus, the optimal quality level expresses not only the degree of conformity of products to the specific needs, but also includes the production of it in optimal quantities. In market conditions the improvement of the quality is always advisable, since only if based on higher quality products than the competitors you can keep existing and get new markets [9, 10]. However, it should be noted that the optimal quality level of the engineering products can be achieved with the respective optimum performance.

#### Conclusion

Thus, some aspects to determine the dynamics of the optimal technical quality level of engineering products are analyzed. The fact that the optimal quality level is constantly changing due to the constantly increasing consumer demands and continuous improvement of technological processes in engineering is determined.

The dynamics of the optimal technical level of production quality and character of the dependences of the technical and operational quality levels of engineering products is determined. The fact that the optimal quality level expresses the degree of the product's conformity to the specific needs, and provides the optimal amount of its production is found. Stated that it is advisable to improve the quality with optimal technical quality level of engineering products that can be achieved with the respective optimum performance.

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