# DEVELOPMENT OF AUTOMATIC QUALITY CONTROL SYSTEMS IN ENGINEERING

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**Abstract**

The development of automatic quality control systems in mechanical engineering is an important task that can help improve the quality of manufactured products and reduce the number of defects. This abstract will consider an approach to the development of automatic quality control systems in mechanical engineering.

**Keywords:** Automatic, system, control, quality, mechanical engineering , methods.

The first step in developing a quality control system is the definition of quality criteria for manufactured products. This may include parameters such as dimensions, shape, weight, hardness, strength, and other characteristics. A valid range of values must be defined for each parameter.

Then it is necessary to develop methods for measuring quality parameters. This may include the use of sensors, cameras, and other devices to measure dimensions, weight, hardness, and other parameters. For each parameter, the measurement method and measurement accuracy must be specified.

Next, it is necessary to develop quality control algorithms that will be used to analyze the received data. These algorithms may include the use of mathematical models, statistical analysis methods, and machine learning. Algorithms must be able to determine whether each product meets the specified quality criteria.

Finally, it is necessary to develop a production management system that will use the results of quality control to control production processes. This may include automatic rejection of substandard products, adjustment of production parameters and other measures to improve product quality.

The development of automatic quality control systems in mechanical engineering can help improve product quality and reduce scrap. This can lead to increased productivity and reduced production costs. However, the development of such a system may require significant research and development costs, as well as training of personnel to work with new technologies.

The development of automatic quality control systems in mechanical engineering is an important task that can help improve product quality and reduce scrap. For the successful development of such a system, the following factors must be taken into account:

1.  Definition of quality criteria. The first step in developing a quality control system is the definition of quality criteria for manufactured products. This may include parameters such as dimensions, shape, weight, hardness, strength, and other characteristics. A valid range of values must be defined for each parameter.

2.  Methods for measuring quality parameters. Various methods can be used to measure quality parameters such as sensors, cameras, ultrasonic and radio wave methods. Each parameter must be measured with high accuracy, and measurement methods and measurement accuracy must be defined.

3.  Quality control algorithms. Quality control algorithms may include the use of mathematical models, statistical analysis methods and machine learning. Algorithms must be able to determine whether each product meets the specified quality criteria.

4.  Production management system. The results of quality control should be used to control production processes. This may include automatic rejection of substandard products, adjustment of production parameters and other measures to improve product quality.

5.  Application of new technologies. New technologies such as the Internet of Things ( IoT ), artificial intelligence (AI), machine learning and others can be applied to develop automatic quality control systems. These technologies can help improve the efficiency of a quality control system and increase the accuracy of quality measurement.

6.  Training. For the successful operation of automatic quality control systems, it is necessary to train personnel to work with new technologies and quality control algorithms.

In general, the development of automatic quality control systems in mechanical engineering can help improve product quality and reduce scrap. However , for the successful development of such a system, many factors must be taken into account, such as the definition of quality criteria, methods for measuring quality parameters, quality control algorithms, production management system, the use of new technologies and personnel training .

Additional information on the development of automatic quality control systems in mechanical engineering includes the following:

1.  Determining the acceptable level of marriage. To successfully develop a quality control system, it is important to determine the acceptable level of rejects. This may depend on the type of production, product characteristics and customer requirements. Determining the acceptable level of rejects will help determine the compliance of products with specified quality criteria and make decisions to improve production processes.

2.  Using machine learning. One of the methods of data analysis in quality control systems is machine learning. It allows you to automatically analyze data and determine relationships between quality parameters. This can help improve the accuracy and reliability of the quality control system.

3.  Integration of the quality control system with other systems. The quality control system can be integrated with other systems such as production management system (MES), production planning systems (ERP) and others. This allows you to automatically adjust production processes based on quality control results.

4.  Use of cloud technologies. Cloud technologies can be used to store and analyze large amounts of data obtained during quality control. This allows you to process data faster and more efficiently, as well as improve the availability of data for various users.

5.  In general, the development of automatic quality control systems in mechanical engineering

has great potential to improve product quality and reduce scrap. However , for the successful development of such a system, many factors must be taken into account, such as the definition of quality criteria, methods for measuring quality parameters, quality control algorithms, production management system, the use of new technologies and personnel training.

### Conclusion

In conclusion, the development of automatic quality control systems in mechanical engineering is an important direction in the development of production. It can help improve product quality, reduce scrap and increase the efficiency of manufacturing processes.

To successfully develop a quality control system, many factors must be taken into account, such as the definition of quality criteria, methods for measuring quality parameters, quality control algorithms, production management system, the application of new technologies and personnel training.

The application of new technologies such as the Internet of Things, artificial intelligence, machine learning and cloud technologies can help improve the efficiency of the quality control system and increase the accuracy of quality measurement.

The use of automatic quality control systems can lead to lower production costs and increase the competitiveness of the enterprise. However, the development of such a system may require significant research and development costs, as well as training of personnel to work with new technologies.

In general, the development of automatic quality control systems in mechanical engineering is an important direction for improving product quality and improving the efficiency of production processes.

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