

# Ensuring the Quality of the Design Product

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**Abstract** – The present study is the quality of the product. Product quality must be planned right from the product design. The thought of the proposed product is too low because we need to adapt technology to the proposed product. Impact of emerging technologies currently very complex makes finding new vision of technological progress is the main task of any business. Development of the product due to the installation of a thorough analysis of needs and structure, shape of parts and assemblies, and the techniques used connections. Manufactured blanks in the assembly process are to submit individual parts into a finished product. A characteristic feature of any business is the competition, through which it is mobilized to produce better and cheaper products. It is also essential to the production of goods to be friendly to humans and the environment.

**Keywords** – Planning, Ensuring, Quality, Products.

## I. INTRODUCTION

Device called a good capable of satisfying human needs each product has features distinguishing it from the other, can be described and appropriately named. Products often have marks that distinguish them from other products. A trademark is a symbol of the company, it should be clear to make it easy to distinguish from others [1-4]. Products to meet the need, but with different characters, in fact, differ in many features of external and utilitarian values products differ depending on the manufacturing technology, the species, type, usage, model, shape and packaging products can be combined in certain groups of homogeneous goods, including the ability to satisfy a specific need, but also differ in method of execution or by use (furniture, clothes, bicycles) [5-7]. The broadest classification is an industry body that includes various product groups linked together by the ability to satisfy user needs. In this way is distinguished by various industries including clothing, automotive, construction products, machinery, mechanized equipment and other appliances. This means that a market in a particular industry, must demonstrate knowledge and understanding of the physical-chemical characteristics of their products [8]. The intention to leave the new company always puts the problem to the issue of whether to maintain the current product, modify it and try it for further expansion of the market through a variety of marketing strategy or abandon it and replace it with a new, improved product. It should be noted that the new product must be the result of interaction of research, technology and marketing, and so are Contemporary In Oriented Businesses, where it forms the mixed teams made up of representatives of various cells[9-11]. The starting point for planning a new product needs to be an analysis, by which obtains the answer to the question of whether the company has the conditions for

doing so, to promote a new product? Attention is the financial possibilities, as the modern high maintenance costs of scientific research base, which is the primary source of innovation. These costs are often so high that it exceeds the capabilities of one company and make connecting to different companies. Another condition is to have a unique knowledge (i.e. know-how) [12-15]. in the field of production of the product, so it is about patents, staff qualifications, including knowledge workers and specialized engineers, ambitions manager and his will to ensure the company a leading position in the market.

The idea of new products is not easy, because raising them is usually from multiple sources, which requires pledging network at source. a notable source of ideas of new products are consumers themselves who are in contact with him every day present their ideas of new products, or offer to their improvement. Got a new product idea is just the beginning of the road, because for every idea that can be taken into account by the company, there are dozens of others that are necessarily be rejected.

The phases through which the selection of new product ideas, vary depending on the industry, sector or company, but have some common rules in the selection process. Selection idea of new products (for example 51 companies). Phase I - Preliminary assessment of new product ideas for exploration those which are of interest to the company. Phase II - Analysis of sales of new products that are really useful and important and these are subjected to detailed use by the company. Phase III - Development is to transform the idea of the (draft) in the prototype possible to demonstrate practical. Phase IV - Testing - The product produced in the trial is testing in during the current estimates and judgments are subject to verification. Phase V-That is, the transition from the commercialization of the trial for mass production and sales of the product.

All this time, depending on the device takes a lot of time. Introduction of new products on the market combined with the risks arising from the fact that at the time of the formation of a new product could appear new competitive technology, new materials and new fashion.

## II. PRODUCT DEVELOPMENT

### 2.1. The Role of the Assembly to Ensure the Quality of Complex

Editing is the process of the final, in which we combine the separate parts of a whole. The technological process of installation is part of the production process including the general operation aimed at linking the various parts in assemblies, mechanisms and equipment in the finished product. The unit is part of the product assembly mounted separately, which is involved in the assembly as a whole.

Units may be mounting: individual parts, components terms. Mounting units allow you to: assembly cycle time reduction, better organization of work, better use of space and equipment mounting. There are different methods of installation. These methods, depending on the volume of production, organization and process equipment company, may be as follows [16]:

### 2.2 Installation Methods

Editing of fungibility total units consists of folding assembly of such parts, which are made according to established dimensions and requirements. Installation of the total variability requires careful execution, but within the limits established requirements of individual components made in the mounting devices. The method of installation of fungibility total used in high volume production. the advantages of this assembly are: simple and economical installation teams and the whole product, does not require highly skilled workers, production of individual parts or assemblies can be easily distributed among several cooperating plants ease of standardization of the assembly because there are no jobs is not provided. Installation of partial fungibility can be implemented as: installation of fungibility conditional installation using compensation assembly using selection assembly of individual parts fit. When installing the fungibility conditional not intended to preserve in any case established judicial boundaries accident, but is satisfied with the probability that the number of defective items shall not exceed a fixed percentage, usually 27%. Intentionally expands tolerances of some dimensions, assuming that the processing savings will be higher in relation to the increased time for assembly. For production, it is better for use in rare cases such as the exchange of the most important parts than strengthen tolerance and thus raise the cost of implementing this section. Installation using this compensation is that the required accuracy of dimension object is achieved by introducing into the structure of the compensation component mounting unit, capable of producing a desired size under certain limits. In practice, discrete compensators: washers, spacers, etc. and continuous compensators screws, wedges, etc. the discrete compensators thick washers should be calculated for an employee to use the pad, without the need for testing. Instead of one thick pad can be used washers file. Installation using selection is used when the required accuracy of the components of the assembly is technically infeasible or economically unviable at a workshop given. This assembly generally refers to a hollow shaft fits in the sleeve or disc. Required tolerance increases to such a field tolerance of such a class, the performance does not present any difficulties. Then the established tolerance is divided into groups of selection. Erection of the following part of belonging to the group selection. Number of group selection depends on the ratio range of economically attainable accuracy of processing the scope of the accuracy required to install. This assembly requires an appropriate measurement and marking of defining their membership to a group selection. assembly of individual

parts is fitting that one of the required tolerance dimension, a predetermined part, by grinding, turning, sawing, etc. under such assembly shall be provided appropriate allowance for the possibility, even in the least favorable confluence of different dimensions, components of an appropriate treatment. Cons assembly with individual adjustment in the production of small series: high labor, need to employ highly skilled workers. Decisive influence on the formation of a complex product quality in the assembly process are: product design, organization of the assembly process, modernity and parameters of the installation process. Modern organization of assembly processes include planning and control over the course of assembly processes, distribution and organization of the assembly stations, procurement in part, of the assembly, the organization of quality control.

### 2.3. Methods for Manufacturability

Installation of regardless of the correctness of the assembly design process, ensuring a certain quality of the final product and the manufacturing sphere, so in the practical implementation of this process may also occur due to quality defects by the employee, resulting from: poorly made work and assembly operations do not comply with the developed technology assembly, not testing simulation and control operations, lack of qualified staff, poor organization of work at the workstation. Processes assembly meet two basic tasks [17-18]: giving the functional characteristics and the final shape fitted to products by: the level of organization of the production process, the complexity and desired product quality, series production which is the determining factor in the mechanization and automation of work and assembly operations. Final inspection, during which revealed inaccuracies design and technology and other deficiencies resulting in earlier stages of the production process. Control operations are mainly after major surgery and have a decisive impact on the quality of the product. Control operations of individual calls, teams and the entire device should clearly address the accuracy of the assembly and form the basis for assessing the quality of the product. Design process to installation, technical preparation of production. The design process technology takes place in two stages: Stage 1 - Preliminary design. Stage 2 - Detailed design. Errors made in the initial design can lead to quality defects in the realm of production such as wrong division of labor, wrong order of execution of work, working method is not suited to the organizational form. Errors in the detailed design can be reflected in production in the form of quality defects caused by: poor quality tools and equipment, improper placement of workstations, anomaly in the calculation of working time rules. The structure of the assembly design process can be represented as a function of the following variables:  $DIPT = F(Pp, St, N, Op, Np)$  where: DIPT - designed installation process technology  
Pp - The division of labor  
St - An assembly  
N – Tools  
Op – Instrumentation

Np - Standardization work [18].

The ergonomic design of assembly technology was developed in the form of an algorithm taking into account the ergonomic factors, determining the working conditions in the assembly. The installation should be designed by the technologist so that technical factors, organizational and material cause the least inconvenience to the working man. These conditions favor the obtaining of high quality effects. Technologist is responsible for the organizational factors. These factors require the technologist principles and practical application of modern methods of organization in the assembly.

#### 2.4. Rules for Selection of Material for the Process of Recycling

The problem of waste disposal and decommissioning is of paramount importance not only for economic reasons but also due to the reduction of environmental pollution. Plastic waste generated as a result of violations of technological processes and as secondary products after a period of use, i.e. packaging, containers, films, etc. depending on the type, nature, etc. purity of the waste plastics can be used various methods for their disposal. In the case of the direct use of waste, especially waste clean technology in the production process as a few percent additives in the manufacture of other types of injection-molded products (containers, packaging), extrusion (film), or in the case of pollution, the use of thermal energy. Evaluate will waste polypropylene granules. Polypropylene granules to the processing plant is supplied in bags. Granules purity is assessed that states the following pollutants: sand, wood, cigarette butts, matches, parts of plants. It was found that the amount of impurities was about 50%. The granulate is pre-purified in a sieve and a stream of air is removed in this way, dust and other dirt particles. Washed pellets are often mixed with detergents, after centrifugation is dried in a vacuum oven at 50 ° c for 2 hours. It is obtained with a degree of white granules similar to the granular pure productively. For the production of extruded tapes used in the initial stage of a mixture of the following composition:

80% Pp

10% Pe

10% Re grind (50% Scrap Ribbon + 50% Re grind)

Total 100%

Unfortunately, this compound extrusion process did not give up, because rupture followed about 40% of tapes. In the second stage was changed and the proportions used a mixture of the composition: 65% polypropylene 35% re grind (such as waste) total 100% the ratio of this mixture is suitable for production by extrusion. However, to this mixture unsuitable for the production of a melt index re grind should be 30 g/10 min, a melt flow index polypropylene 10g/min. No differences are observed in the use of pp fibers and pp fibers doped re grind. In order to obtain colored ribbons can add a dye in a proportion of 25 kg of the mixture (and reclaimed polypropylene) and a liter of the dye. There is no such dyes are completely safe for the environment. Therefore, the heavy metals in dyes must not exceed: 0.8 ppm – lead 0.1 ppm – cadmium 0.02

ppm – mercury 0.2 ppm – arsenic the quality of organic materials determine the risks from water - sewage. This mixture after the dyeing process should not be harmful to humans and the environment. Producing such material should be considered the ecological quality of products, taking into account environmental factors.

#### 2.5. Example of a Project, Taking Into Account the Technological Quality

Polypropylene will use to manufacture the product-window pot-the injection. With this plastic container will do the following dimensions:

Length - 300 mm

Height - 190 mm

Width - 250 mm

The observations technologist that polypropylene worked perfectly injection molding. It can be used to express any big components [19-22]. No one can use for the preparation of granules of formulas openwork elements, because due to the higher melt index compared with normally used plastic injection molding may be followed by pouring orifices. To get started injection include: switch on the heating system; determine the temperature of the injection:

1 - I Zone From The Hopper 180 - 185 °C.

2 - The Second Zone of the Hopper 210 - 215 °C

3 - The Third Zone of the Hopper 215 - 225 °C

4 - The Fourth Zone from the Hopper 225 - 230 °C.

The upper part of the injection molding machine is a ground waste hopper. Inside the basket is mounted vertical mixing augers used for compacting plastic waste ground. Polypropylene melt flows from the vertical mouthpiece, which form freezes. Then the product is removed and treated further. After verifying that the walls are carefully molded by the controller, the products are transferred to the finishing or trimming of continuity parts [23, 24].

### III. CONCLUSIONS

#### 3.1. Consideration of the Material

Analyzing the presented material should be noted that "quality is a collection of features and characteristics of the product affecting the ability of the product to satisfy stated or anticipated needs." the quality of the product depends on many interrelated activities, such as design, manufacture a product, service or maintenance. Companies producing goods and choosing to fight in a competitive environment, they must operate in harsh environments, because they seem to realize that their development can contribute approach to issues of quality.

For proper design of the product is appropriate to make the initial concept, resulting in the initial design. However, after establishing specific criteria to design specific. The purpose of FMEA is to identify defects that could have a negative impact on the design, fixing defects and classify them. The causes of defects are determined in order to correct the defects. All this makes the design of the product is risky because at the time of its creation may appear competitive products or new fashion. The product that wants to compete must have better quality, to meet

additional needs, in addition to these essential and should be produced cheaper by the company. Manufacturability of products associated with the subsequent treatment, and specific guidelines for the product. This is connected with the required product characteristics and minimal production costs.

Environmental technologies are designed to minimize by-products or convert them into main products. Thus began to think about recycling aimed at waste collection and re-processing. Unfortunately, waste collection is carried out to a small extent. Assembly which is the final stage of the manufacturing process is to combine the various parts into finished goods. There are several methods of installation, depending on the volume of production. The final step is to assess the quality of assembly manufacturability. The quality of the product determines the extent of its usefulness in certain conditions of use.

### 3.2. Applications

The quality of the product should be considered as a component of the ecological quality of the product. Production should be friendly to humans and the environment. Making decisions regarding the selection of new technologies should be aware of their future effects on the environment. Be sure to enter quality issues in the development of institutional. Product quality is a confirmation of the complexity of the issue of quality of installation.

Be aware of cost-effective management of natural resources so that future generations can benefit from them yet. We should implement green technologies to minimize the amount of by-products, or eliminate them, or transform existing products in the main products. Many organizational units in the company are responsible for the quality of the final products.

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