

Influence Industry on the Environment

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***Abstract:** The article provides an overview of selected aspects of production and operation of cars for environmental reasons. It indicates negative impacts of automobile and machinery industries on the environment and the strategy for the elimination particularly in relation to reducing fuel consumption and emissions and increasing the recyclability of materials used. Also for machine tools in engineering production generates noise and vibrations. Machine tools are highly complex engineering systems with a large number of system components and elements having different movements as to the shape and speed. Machinery, like other technical devices are characterized by their utility function, and in the environment. Terms unilaterally raising the utility function were already in the majority of machinery overcome. Increasingly enforce aspects of evaluation functions of these devices in the environment – secondary function. Despite these tendencies Experience shows that a substantial part of the environmental burden caused directly or indirectly machinery. Integration of economic, social and environmental policy is a new phenomenon and currently is a basic requirement for business strategy. Its practical implementation is the improvement of efficiency of technological processes so that they reflect innovation and environmental aspects and the whole process of production towards efficiency, increasing productivity and quality, flexibility and meet customer demands.*

***Keywords:** noise, vibration, machine tools*

1 Introduction

Steady state of the natural environment that existed millions of years before the earth appeared the first human ancestors, are now starting to change slightly stabilized. Natural equilibrium is disturbed by human activities. That fact has the most powerful and productive tool - your brain and thinking capacity. As part of the standard of living it puts on his environment requirements which would be like an animal - part of the natural environment - not to ask. This includes technical achievements (automobiles, electronics, etc.) And various instruments, apparatus,

enabling and facilitating the existence of man in the man-made environment. Man also asked the company to provide its affairs and services that increase the comfort of living and living - home, furniture, white goods, brown goods, services and financial advisory nature services of the government related to its demographic affiliation.

Human society in its rapid technological development is progressing and intellectually, came to the point where the protection of the natural environment appears to be a necessity for the further preservation of civilization. People are gradually realizing that increasing demands have resulted in expansion of production, which is concentrated in manufacturing enterprises. As these companies are almost at the very beginning of production, it is necessary to begin with the implementation of greening measures right away.

Improving the quality of the production process always leads to a reduction of pollution in the environment. Any undertaking that invests in improving the quality of its production, it also means investing in improving the quality of the environment.

2 Engineering and Environment

Machinery, energy, technology, manufacturing, machinery representing the technical means by which man uses natural energy sources and raw materials, facilitate and replaces human labour, producing functional objects, transport of material and persons, protects and regulates the environment, retrieving and disseminating information.

In terms of effects on the environment are three categories of machinery:

1. Machinery, the mechanical effects, the production of waste products and waste energy sources act as depreciation of environmental pollution (transport, energy, manufacturing machines and equipment).
2. Specific machinery serving on the containment and use of waste materials and waste energy, which is emitted from technical sources (primarily other machinery) in environmental equipment (separators, filters and air emissions, wastewater and industrial wastewater treatment plants, sewage silencing and vibration).
3. Special machinery, which serve to modify the purity of air and the microclimate in the interior of residential and working environment (ventilation, air conditioning and heating systems).

The trend in the development of machines leads to the formation of complexes with each succeeding principles of transformation, transmission and processing. Formed aggregates lines - a set of devices equipped with metering and regulation devices and automatic control systems. In general terms these units as machinery.

If they are used to the application of technical procedures that are technological devices if they are intended to produce the products they are manufacturing facilities.

As an example of the union machinery it includes energy facilities for heat supply, which include:

- Solid fuel boiler (conversion of chemical energy of fuel into heat energy and its transfer).
- The diesel, chemical, refractory particles (ash) from the flue gas (transfer agents, chemical processing agents).
- Trap gaseous impurities.
- Electric motors, pumps (energy conversion).
- Heaters, heat exchangers (transfer of heat energy).
- Measuring and automatic control (transmission and processing of information).

Machinery, like other technical devices are characterized by their utility function, and in the environment. Terms unilaterally raising the utility function were already in the majority of machinery overcome. Increasingly enforce aspects of evaluation functions of these devices in the environment - secondary function.

Despite these tendencies Experience shows that a substantial part of the environmental burden caused directly or indirectly machinery. The main reasons for this unfavorable situation may be different.

The conversion process and transfer of energy and matter, process mechanical treatment substances in machinery are always accompanied by waste. Energy conversion and transmission shall take effect less than 100%, then loss-making energy environmentally harmful. Converting electric power to drive the machines generated by thermal load of the internal environment. The transformation of the chemical composition of substances is accompanied of side substances often with a more severe effect on the environment than had the starting material.

Machine, machinery, such as anthropogenic environmental spheres to interact on humans and other environment components, their mechanical factors, fabric, functional and aesthetic. Relationships between machines and other components of the environment and man expresses Fig. 1.

As an example, the instantiation relationships include automobile. While driving one regime change affects engine exhaust emissions, noise and vibration. Climatic factors affecting human performance management of heating, respectively. air conditioning. Automobile exhaust emissions affect climate through other parts of the environment, principally flora.

Man as architect, designer of the design concept of the car affects the production of exhaust emissions and noise and the influence of man on the natural ingredients is limited and relates primarily to the elimination of consequences of the devastation of flora.

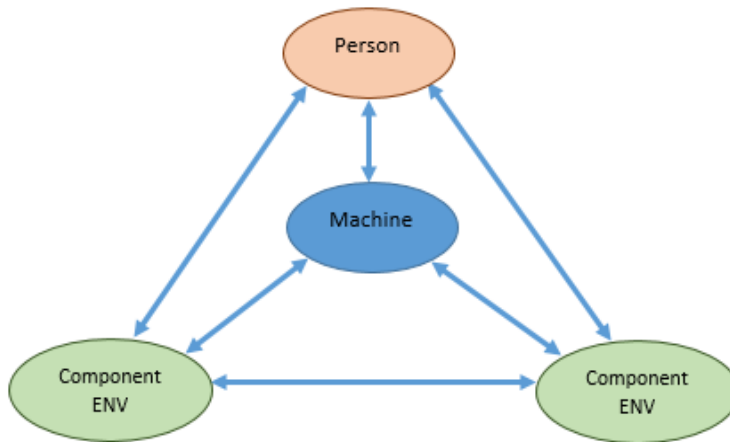


Figure 1

Relations in the system of machine components ENV, person

3 Noise and Vibrations in Machine Tools

It is necessary to implement the terms shake, vibration, vibration. Shake and vibration occurring under certain conditions and concerns the system machine, tool, work piece. Transmitting vibrations relate this phenomenon as a whole on the environment, or vibration environment on the whole, ie Machine tools. Machine tools are highly complex engineering systems with a large number of system components and elements having different movements as to the shape and speed. The causes of noise and vibration are several: unbalanced inertial force rotational and translational mass, excessive fatigue strength, throwing roller bearings, variable forces of friction in sliding joints, changing the cutting force due to changes in the depth of cut when changing cutting tools for local variations in thickness, hard place , lack of flexibility elements and system components.

Vibration can be divided according to cause for:

- Forced oscillations caused by periodic external forces.
- Available with damping vibrations that arise in transient operating modes.
- Vibrations caused by dynamic instability in certain operating modes.

The vibrations are transmitted in two ways:

- Basics - the surrounding environment - construction objects.
- Zone processing - work piece - tool.

Vibrations can be divided also:

- Internal vibration sources that the machines are their dynamic properties.
- External vibrations from the environment, the resources in the vicinity of the machine.

One of the successful ways to reduce vibration machine is standing on an elastic pad. In this way, it reduces noise and vibration that is transmitted from the source to the floor and around the building. In connection with the vibration isolation, we distinguish between active and passive insulation. With an active isolation must first remove the causes - internal stimuli, while with passive is necessary to eliminate a source of external stimuli. Both types of insulation are effectively applied using appropriate methods of creation:

- Stable - hard base, Fig. 2
- Elastic foundation, Fig. 3
- Spring washers, Fig. 4

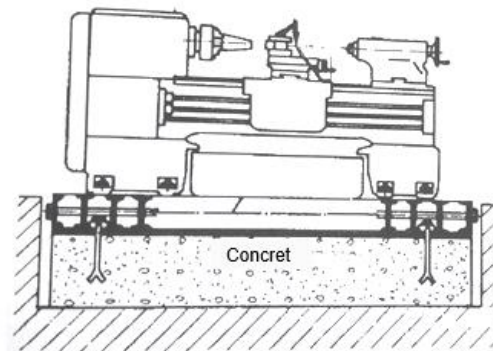


Figure 2
Stable - hard base

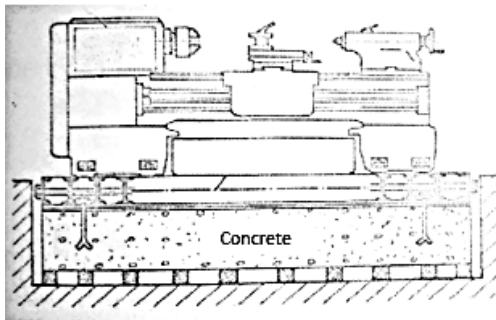


Figure 3
Elastic foundation

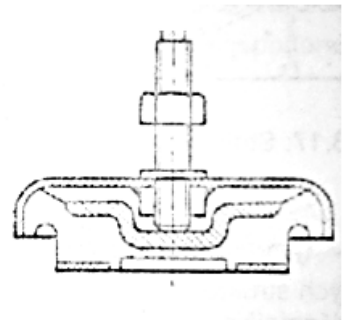


Figure 4
Spring washers

The elastic foundation is very similar to a stable core of the team that are with him elastic and damping properties secure storage of concrete block on the cylindrical elastic body made of special rubber [1].

4 The Method of Active Environmental Activities

Currently available to firms and numerous methods and techniques for the introduction of environmentally oriented management system or to forms of governance in which the changes require an environmental profile. In practice, the following methods are applied:

- TQM - Total Quality Management - continuously improving quality management and quality management - essential elements of the management system.
- CP - Clean Production - Net production - identification of environmental aspects, production, solving minimization of waste and emissions.
- QMS (ISO 9000) - Quality Management System - a systematic approach to quality management, joint, respectively, similarities with EMS building under ISO 14,000 All the time improvement.
- RC - Responsible Care - responsible behaviour, the requirements for the application of environmentally oriented management - EMS elements - continuous improvement of environmental performance.
- EFQM - EM - European Foundation for Quality Management - Excellence Model - a model of excellence. Expansion criteria TQM and QMS to the requirements of criterion for reducing environmental burdens.
- BPR - Business Process Reengineering - Principles and rapid rebuilding of business processes in general, including management processes, as well as the principles of environmental management.

The introduction of environmentally oriented management systems is very closely linked to quality management systems (QMS). In practice, it is evident that the introduction of EMS according to STN - EN ISO 14001 is much more operative when the undertaking has implemented a quality management system according to ISO 9000. Both systems share many respectively. Similar elements of a common goal – continuous improvement.

The EU is dedicated to the recycling of old vehicles and motor vehicle manufacturer prescribes a fixed quota. A European Union directive (2000/53 / EC) set ambitious targets for the recycling of cars. At present, the recycling rate of the car industry is between 78 - 82%. The planned 80% recyclability in 2006 and 85% in 2015. It is expected that mainly motor vehicles with extremely lightweight construction will have difficulty in meeting the quota and granting type EU approval. That has been reduced weight and fuel savings, must be increasingly used hydrocarbons or fasteners sandwich construction. Because the recycling of these materials is not meaningful economical, it would be wiser to burn their use as a source of thermal energy. However, since the EU regulation severely limits the burning is out of use of lightweight construction materials for recycling into account. Even vehicles with aluminium bodywork are given the fixed quotas disadvantaged. Lighter vehicle during its period of use will save significantly more energy than can be obtained at its recycling.

Another point of criticism of the new regulation of EU allowances are renewable resources that are in the last years, increasingly used, e.g. Parts of vehicles, coconut, flax or cork are not recyclable and these materials can be burned. Incineration is failing to EU quotas. It follows that the automotive industry in the future to give up organic material if he fails to settle outstanding regulation. The new EU directive on recycling of old vehicles prescribes that all new models that will be on the EU market after 01/01/2005 must be 95% recyclable. Up to 10% by weight this may be used for energy utilization (incineration). In addition, the EU regulations vehicle manufacturer fixed recycling quotas for all already authorized vehicles. Until 2009, it must again be re-utilized at least 85% by weight, more than 5% can be burned and a maximum of 15% can travel to landfill. By 2015, the boundaries even at 95% for recycling and only 5% landfilled. [2]

4.1 Selected Automotive Producers Access to Environmental Concerns

BMW

BMW is now 80 - years engaged in the recycling and play in this area in the automotive industry forefront. The European automotive industry began at the initiative of BMW back in 1992 to build a network of recycling facilities that old vehicles disposed of in accordance with regulations on environmental protection. In 1991 he created the first pilot plant for professional disassembly, were launched in 1994 in the north of Munich, recycling and dismantling centre where BMW develop and test technologies and tools for ecological and economical recycling. This research centre is the know - how platform for the development of BMW in the "Design for Recycling".

Together with other car manufacturers there it includes creation of a database by which they can recycling operation to identify all the design features of current models and find there a warning for time-saving removal.

In this connection it is important to mention the downward trend of the combination of different materials in one of components. In the past, e.g. dashboard composed of various plastics, sheet metal, screws and metal clamps. The dashboard of the BMW 5 on the other hand consists of only polyurethane. After removing the plastic used without significant cost re-use as it is mixed with other plastics. Such so-called. Pure - grade plastic grinder is milled and processed into granules. It may then be melted without affecting the quality and re-used for production of high quality components for motor vehicles.

Skoda Auto a. s.

The strategy of Skoda Auto a.s. in the field of environmental protection is enshrined in the basic document "Environmental Policy", which essentially

defines environmental activities and objectives. For the realization of these goals is introduced eco-management system (EMS), as an integral part of company management. The main objectives of technological developments include:

- The design of the car, complying with all regulations, standards and laws applicable in the countries of sale.
- Intensive work on measures based on the upcoming EU legislation, for example recycling and take-back vehicles.
- Honoring of obligations defined in "environmental protection objectives of the Technical development "for the following areas:
 - **Material** - In the construction materials used are not subject to prohibitions or restrictions for use cited in the standard VW 91101, for example cadmium, asbestos, mercury and chlorofluorocarbons. This standard, in many cases tightens statutory regulations. Preferred materials are recyclable and well with a share of recycled parts. It is also reduced range of process materials.
 - **Manufacturing processes** - Auto a.s. manufactures fully galvanized body with a ten - year guarantee period to rusting. Painting is done adulterable colours.
 - **Recycling** - Due to the rapid identification of the dismantling and subsequent separation of the plastic components are labelled according to VDA 260. Already in 1993, it was developed by dismantling studies and cars Favourite Forman, also are ready for dismantling studies types of Felicia, Octavia and Fabia.
 - **Fuel consumption including CO₂** - Skoda high technology, for example high-pressure injection system TDI. Fuel consumption is directly constrained optimization engine design, reducing vibration and friction losses in the powertrain, improving aerodynamics and reducing vehicle mass.
 - **Emissions** - are offered not only complying with EU3 emission limits valid from 01/01 2001, as well as engine conforming to EU4 standard valid from 01/01 2005th.

Part of the environmental policy of the company Skoda Auto as in addition to greening its own operations also support environmental activities with business partners. To this end, created a qualified and flexible Advisory Service for Environmental Protection, which aims to establish for each business partner eco-system quality management and control. Traders who meet demanding environmental audit and eliminate shortcomings, will receive the prestigious certificate considerate approach to the environment, so-called. Green Seal. The advantage of obtaining this certificate is for the merchant and offer technical discount on annual insurance. Partners Skoda is both annually participate in courses on ecology and health, but above all, in its operations in a manner compatible with environmental protection manual maintenance services Skoda. This methodology provides advisory services, information on proper waste management, water protection, air quality and health of employees. In addition to

this guide is offered to trader's catalog of environmental equipment for the collection and storage of various kinds of automotive waste, [3].

Conclusion

Implementation of environmental policies in the current period is increasingly characterized by the precautionary principle, as a result, among other things, gives greater attention to the impact of products and technologies on the environment. Under these approaches range States adopt principles of environmental product policy and implemented systems of the environmental aspects of a product before it entered the market, combined with the direct ie legal regulatory mechanisms incorporated into a mandatory system of registration, certification and authorization of indirect instruments, which are in different countries various forms of valuation and favouritism. In European countries in recent years as one of the main instruments of environmental motivation producers pushed through environmental assessment and labeling. A system which ensures that the product complies in accordance with the current state of knowledge parameters, minimizing or even negative adverse effects on the environment. The issue of preference products that meet the criteria for protection of environment during their entire life cycle, however, is increasingly coming to the fore of interest not only to consumers but also businesses and communities.

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