ECOTEHNOLOGICAL ANALYSIS OF THE PROCESSES OF OBTAININGOF THE SEMI-PRODUCTS THROUGH PLASTIC DEFORMATION

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ABSTRACT: To create the prerequisites for a sustainable development is necessary to provide solutions in the sense of limitation of the amount of materials used in the economy, through the recycling and recirculation of them and by avoiding the polluting industrial processes. Because in the semi -products processes large amounts of pollutants are discharged, in the paper was realisedthe analyze of the situation that occurs when are obtained semi-products by plastic deformation at hot and cold. Also, it has been highlighted the amount of CO_2wich is released at the obtaining through plastic deformation of each tonne of semi-product.

KEY WORDS:ecotehnologic analysis,semi-products, hot plastic deformation process, cold plastic deformation processes

1. INTRODUCTION

The development of eco technologic organizations represents a new approach of industrial development that enables organizations to ensure economic and social benefits for the present generation without compromising the ability of future generations to meet their own needs without damaging the fundamental ecological processes [1, 2].

From this definition follows that any significant degradation of ecological processes, due to industrial organizations should not be on long term. To achieve sustainable development of the organization three criteria have to be met [3]:

- protection of eco-capacity, namely maintenance of the capacity of ecosystems to function in spite of pollution;
- efficient use of human, material and energy resources;
- ensuring a fair distribution among nations both of the goods supplied by the development of organizations as well of the hardships caused by environmental degradation.

Choosing the initial semi finished product is a very complicated problem and it is realized in accordance to: geometric configuration, weight and dimensions of product, production volume, the possibilities of mechanization, automation and robotics; the material with functional, technological and economic properties; geometric accuracy imposed by functional role, the degree of smoothness of surfaces, existing or possible purchased necessary equipment [4, 5].

2. POLLUTION SOURCES AT PLASTIC DEFORMATION OF THE MATERIALS

The most common semi finished products are those obtained by hot plastic deformation (rolling, drawing, extruding, forging free, die forging, stamping, bending etc.). If the chosen semi product is obtained by hot plastic deformation, the sources of pollution that must be taken into account can be seen in Figure 1. And here it is found that a strong pollution of both air and water and soil takes place. If the semi processed product is achieved mainly by cold plastic deformation (rolling, extrusion, drawing, drawing, free forging, die forging, bending, upsetting, stamping, bending etc.), then pollution sources are presented in Figure2 and there is a significant air, water and soil pollution.In order to design the eco technologic process with all the necessary data to firstly know the technologic route corresponding product to the process to achieve is useful. To calculate the ratio of pollution, to determine the optimal degree to reduce pollution and to

prepare the eco technologic route stages and moments of the environmental impact should be known [6, 7]. These will be marked with an asterisk (*) used in all schemes to follow.

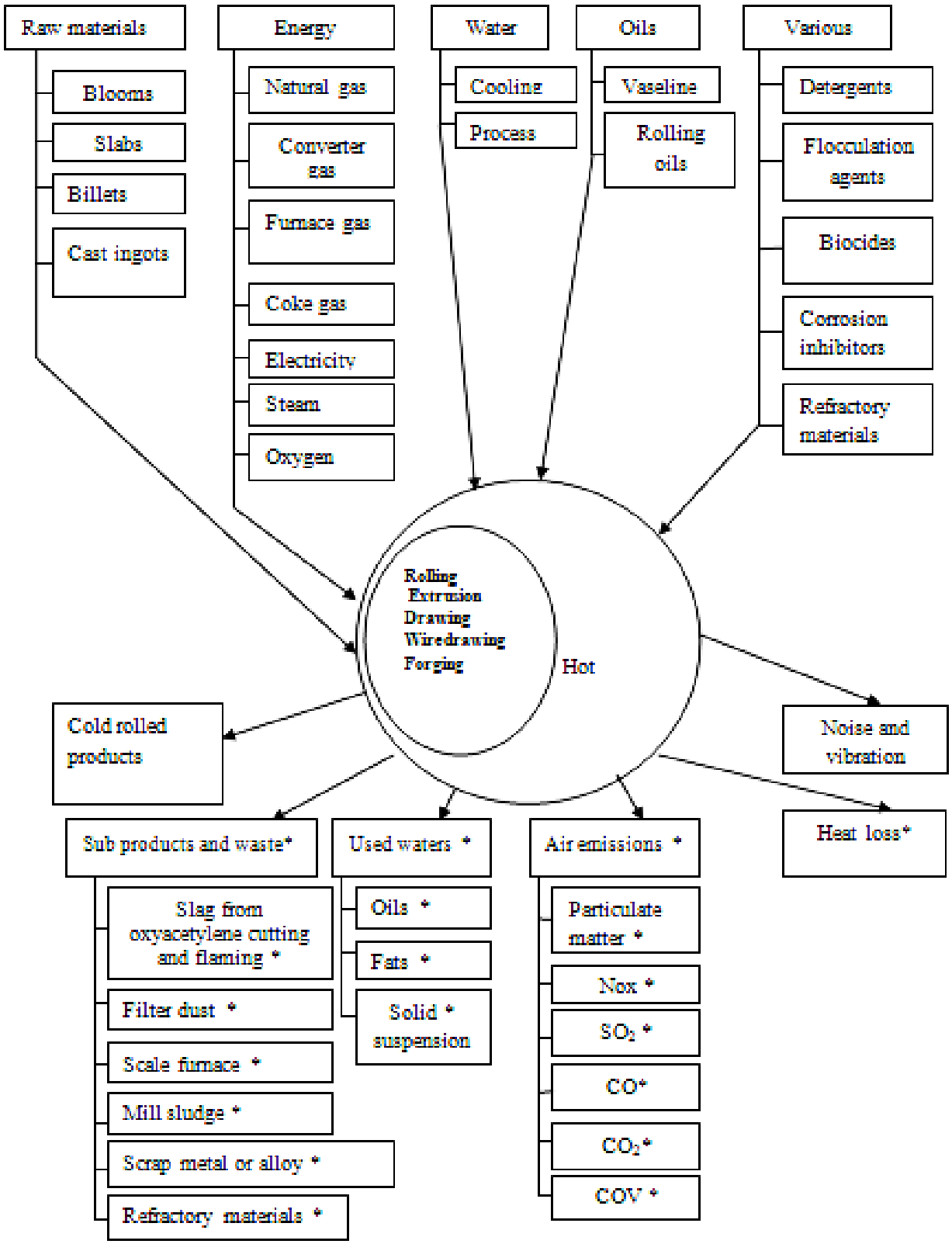

Figure1. Hot plastic deformation processes and sources of pollution (*- stages and sources of pollution), volatile organic compounds VOC. [1]

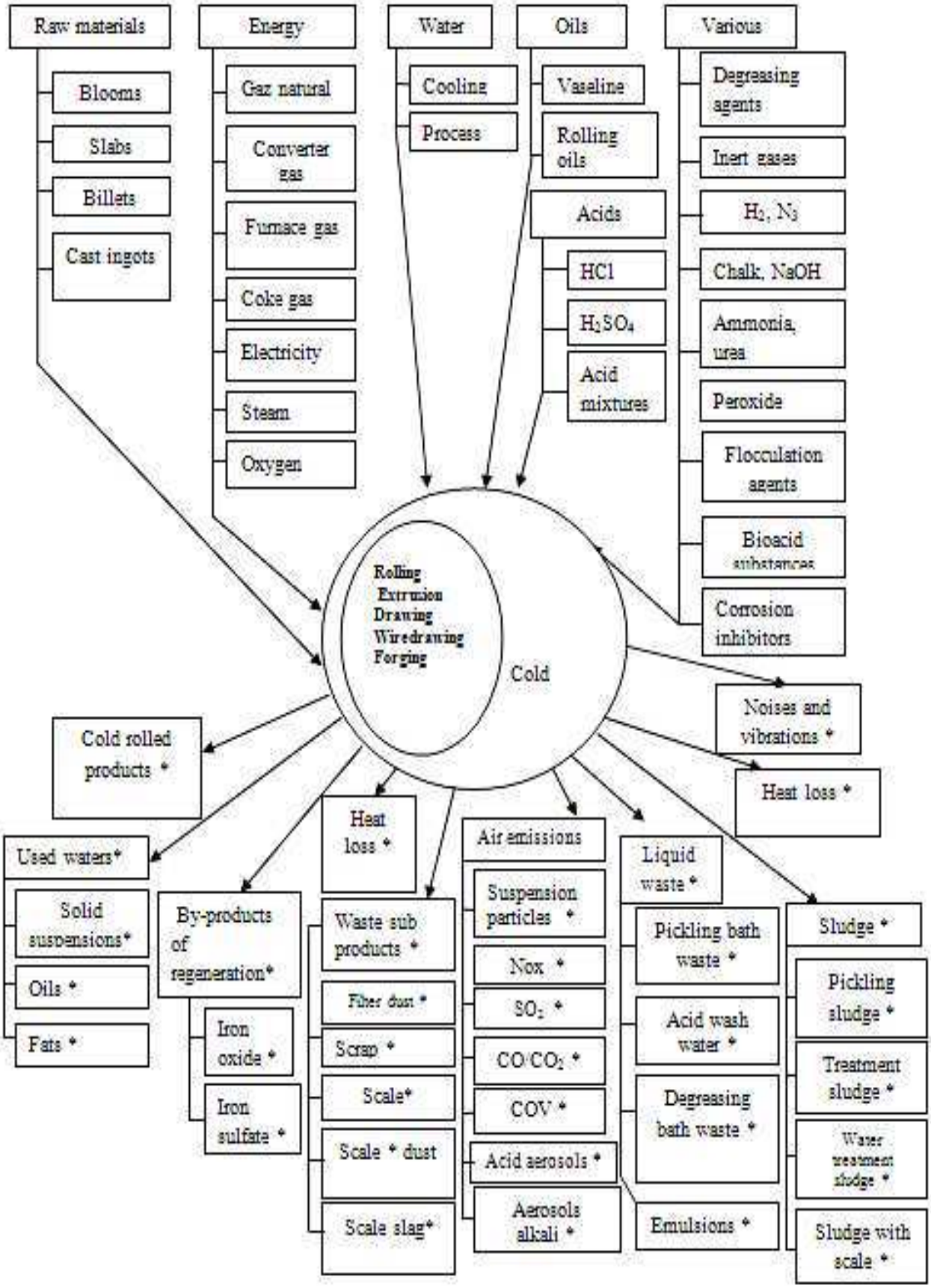

Figure 2. Cold plastic deformation processes and sources of pollution (*- stages and sources of pollution), volatile organic compounds VOC. [1]

For example, CO_2 global emissions per ton of rolled metal produced in a integrated metallurgic enterprise are shown in Table 1, and some carcinogenic sources are represented by emissions given by the heating furnace data (in Table 2 there are given emissions for ben (a)-pyrene, in tons per year, as the main source of carcinogen).

Table 1. Global emission of CO_2 [kg CO_2/t rolled] [1]

Technologic flow	Furnace +LD (inclusive coke)	Corex + direct reductions + CAE	Scrap + CAE
Direct emission [kgCO_2/t]	1900	1400	140
Indirect emission [kgCO_2/t]	100	770	520
Total emission [kgCO_2/t]	2000	2170	660

Table 2. Size of bin (a) - pyrene emitted in an integrated enterprise [t/year] [1]

Emission source	Quantity [t/year]	Quantity [%]
Coke-chemical plant	0,770	7.22
Agglomeration	0,040	3.70
Furnace	0.002	0.20
Steel foundry	0.187	17,50
Mills	0.041	3.80
Refractories and chalk	0.003	0.30
Repair stands rolling	0.003	0.30
Thermo-electric plant	0.021	2.00
Total	1.067	100%

3. CONCLUSION

In conclusion we can say that the design of any ecoproduct, any ecoprocess to provide any services or any activity resulting from a technological ecoprocess should consider the following elements: quality plan; technological route;technological process flow diagram; stages and times of environmental impact; sources of pollution;the nature of pollutants; coefficient of pollution at each stage and the total pollution coefficient necessary to establish measures necessary for performance of established objectives, namely: changes in the technological process in order to transform it into an eco technologic process, replacement of operation or phases with high pollution; recovery treatment and recyclingmeasures of secondary waste;

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