



# **TECHNOLOGIES OF COKE WASTEWATER TREATMENT IN THE FRAME OF LEGISLATION IN FORCE**

**Author: mgr inż. Piotr Bargiel**



## ABOUT COMPANY

The coking plant is recognized on the European market as a producer of the highest quality coke, carbon products and coke oven gas for external customers. The company is part of the ZARMEN Capital Group since 2009, which has created conditions for stable, harmonious and dynamic development of the workplace located in Czestochowa.



# PRODUCTS

**BENZOLE**



**COKE**



**COG**



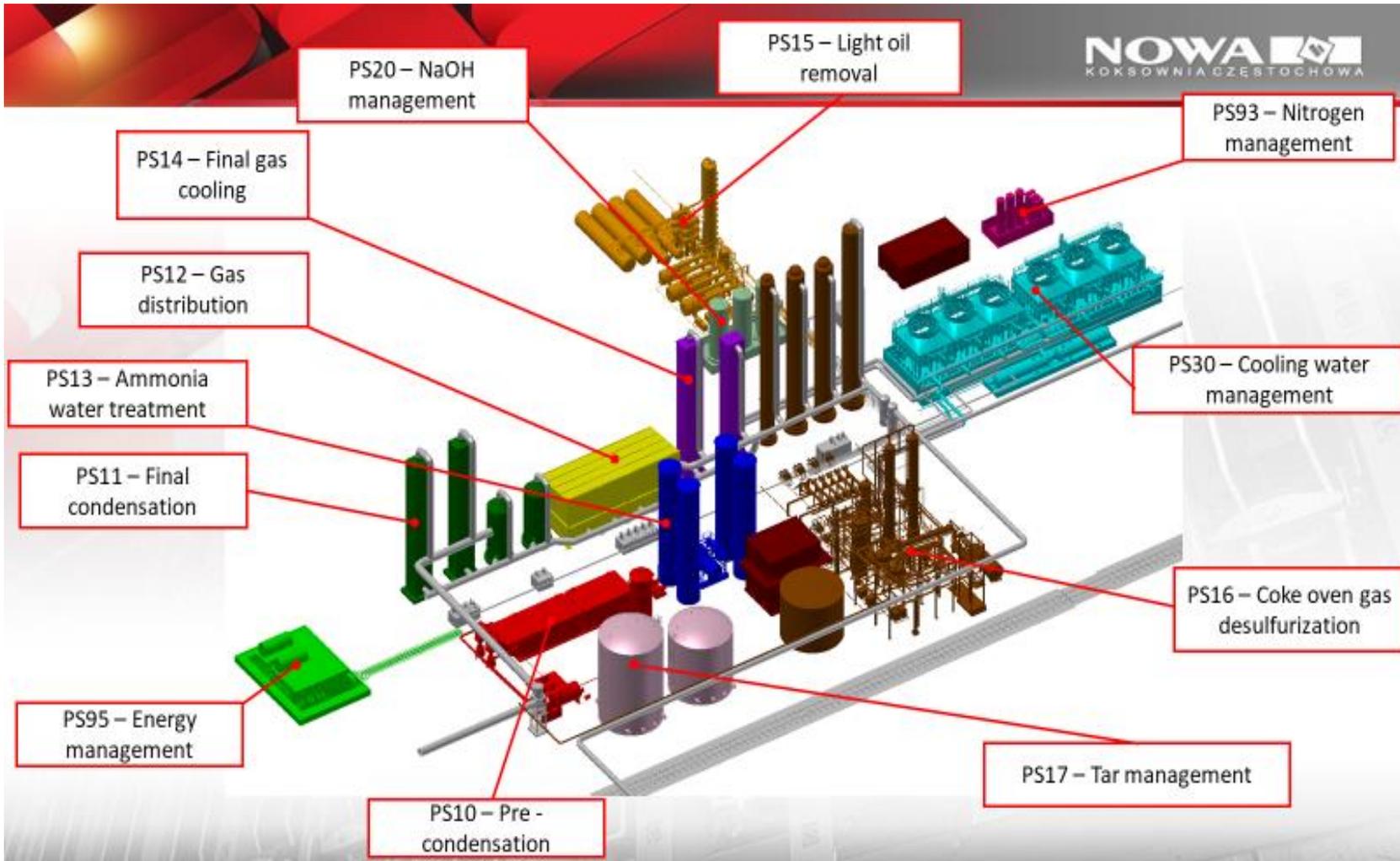
**TAR**



**LIQUID SULFUR**



# COKE OVEN GAS CLEANING INSTALLATION





# CHARACTERISTICS OF COKE WASTEWATER

In the process of coal coking and obtaining carbon derivatives, phenolic coke wastewater is generated. They have a very complex chemical composition. The main substances found in coke wastewater are: oils and tars, phenols, ammonia, rodents, cyanides and sulfides.





## CHARACTERISTICS OF COKE WASTEWATER

**Table. 1. Raw coke wastewater**

Parameter	Concentration mg/dm <sup>3</sup>
Ammonium nitrogen	600
Total nitrogen	900
COD	4500
Phenol	2000
Thiocyanates	30
Free cyanides	5
Hydrogen sulfide	50

The table above shows that coke wastewater contains very high concentrations of pollutants are harmful to the soil and water environment, which requires the search for increasingly advanced technologies of wastewater treatment.

# BIOLOGICAL SEWAGE TREATMENT PLANT

The Częstochowa coking plant has a biological coke wastewater treatment plant using denitrification and nitrification processes.

The installation was launched in 2008. In 2016, the biological part was modernized.

The installation cleans 600 m<sup>3</sup>/d.





## LEGISLATION IN FORCE

Until the 4 of September 2018 coking plant installations are obliged to adapt their sewage treatment facilities to the new pollutant limit values set out in the best available techniques, so called BAT 56. It means that, in accordance with BAT conclusions 56, the coking plant must achieve concentrations in treated wastewater after biological sub-treatment of coking wastewater before discharge to waters or land at new levels:

**Table. 2. New levels of pollution in coke wastewater**

Parameter	Concentration mg/dm <sup>3</sup>
Ammonium nitrogen	50
BZT <sub>5</sub>	20
COD	220
Phenol	0,5
Thiocyanates	4
Free cyanides	0,1
Free sulphides	0,1



## AREA OF RESEARCH

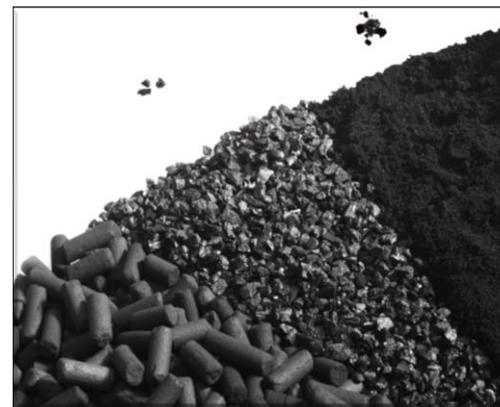
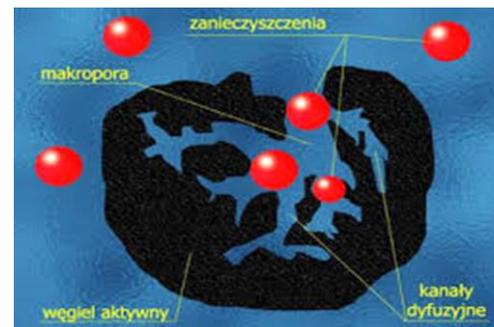
The main area of my research is how to of biochar, coke dust and coal dust in the adsorption process to clean coke wastewater. I am currently conducting laboratory tests.

### RESEARCH PROBLEM

How is dose of biochar, coke dust, coal dust and absorption time, coke wastewater treatment is affected.

### THE PURPOSE OF THE RESEARCH TASK

Assessment of the applicability of selected dust and granular adsorbents to clean coke wastewater from total nitrogen and phenol.





## SUMMARY

The dynamically developing coke production in Poland requires use of effective methods of wastewater treatment. Due to the content of many chemical compounds, coke wastewater treatment creates a lot of problems, which is why their treatment is most often carried out in many stages. Currently, efforts are being made to implement modern methods of wastewater treatment in order obtain treated wastewater that will meet the requirements of the legislation and at the same time be environmentally friendly.





**THANK YOU FOR YOUR ATTENTION**

