GOST chose Ozone for the treatment of waste water to obtain:

♣ the reduction of COD and increase of biodegradability of some special slurry (ex leachates)
♣ the disinfection of drinking water and wastewater
♣ Removal
- Color (oxidation),
- Surfactants
- The residual COD
- Smell (oxidation)

♣ removal (oxidation) of phenols, cyanides, hydrocarbons, pesticides, organic substances likely to radical attack, inorganic reductants
♣ industrial or agricultural reuse of treated water
♣ energy efficiency: the use of 'ozone results in a reduction of 50% of the use of air pumps.
♣ the decrease in production of sludge (up to 50%)
♣ the oxidation of inorganic components (cyanides, sulfites, nitrates)
♣ the oxidation of iron and manganese
♣ removal of suspended solids or turbidity (oxidation)
♣ micro flocculation the dissolved organic components (oxidation)
♣ disinfection of bacteria and viral inactivation

The benefits that accrue with the use of ozone can be summarized in the following points:

• Has a strong oxidizing power
• Do not produce sludge or concentrates
• Degrades pollutants, without transferring pollution to other stages
• Do not cause secondary pollution, because the reaction occurred ozone degrades to molecular oxygen and leaves no harmful residues
• Improves the general characteristics of water and increases the biodegradability of the wastewater
• Do not make further salinity water to be treated
• Oxygen, who is not converted to ozone, can be recovered and used in other stages of purification treatment

- After the ozone treatment, the wastewater is already disinfected, this avoids the use of chlorine compounds and thus the formation of chlorinated organic byproducts toxic
- The strong disinfection and oxygenation prevents corrosion and fermentation with consequent emission of unpleasant odours, even in case of lengthy stops
- It have a great flexibility of dosing and simple plant, which minimize the cost of management and operational control.

All forms of industrial work are producing masses of waste and waste water discharges that change the hydro geological conditions, until to contribute to the degradation of groundwater. The main impurities arising from waste are: acidity, dissolved solids, metals, radioactive materials and toxic chemicals.
Spills of toxic fluids, gasoline or oils can migrate through areas of permeable soil to reach groundwater.

The hydrocarbons represent the main source of contamination as a result of payments or losses due to breakage of pipe lines or underground storage vessels.

The effects can persist for decades in the subsoil, causing bad taste and residues in water pumped from aquifers. The best known cases of accidental contamination were countered by careful management of the incident tending to form suitable barriers, performing cleaning and implementing appropriate preventive measures through indiscriminate discharges.

The treatment of industrial wastewater with ozone had a huge growth in Europe in the last past 15 years. Date have been made in European countries over 1500 ozonization plants for the purification of industrial waste, in various sectors.

The use of ozone is beneficial for the following reasons:

1. Strong oxidizing power that allows reactivity with many organic compounds;
2. Absence of secondary products;
3. No variation of pH of the wastewater;
4. Possibility of reuse of water under the complete removal of substances containing chlorine.
5. Improvement of the organoleptic properties of water as it make oxygen;

The major applications are aimed at treatment of ozonation disinfection, micro flocculation for removal of suspended solids, oxidation of organic compounds, and ☒deodorization sludge treatment.

The cost / benefit of ozone appears to be superior to other methods of disinfection.

The investment costs for the realization of ozonization, compared to plants for dosing of chlorine, are greater. Actually, this comparison is not very expressive, because the two disinfectants have divers depuration chemistry and maintenance costs, over time, for ozone.

If used for the decomposition of wastewater containing hydrocarbons, formation of by products such as aldehydes, ketones with potential toxicity. Ozone is without action on 'ammonia contained in the water, unlike chlorine, which instead form the chloramines, which are highly toxic.

Action of ozone on industrial waste

The chemical characteristics of the wastewater influence the absorbed dose of ozone, because several compounds present in wastewater can get into competition with the disinfectant activity of ozone. In fact, competition between these chemical reactions is not harmful to the water discharged on their reactions make the compounds less hazardous and stable, thus vastly improving the discharge end.

What follows are the major pollutants usually found in industrial waste. It 'clear that this list represents only a fraction of those that actually can detect and treat, with excellent results, through the ozone treatment.

• Iron and Manganese
• sulfide ion
• Cyanide Ions
• nitrite ion

With organic compounds, ozone reactivity is strong, even with those very stable, such as acids fulvic and umisci responsible for the formation of organo-halogenated compounds, but also more stable molecules such as phenols, benzene, pesticides (atrazine), but Ozone also exerts a reduction activities of the organic (COD) discharge.

Generally, the reactivity of ozone is in respect of those organic compounds which also contain double bonds, in this case the molecules are broken molecules to form simpler and more biodegradable. It also shows significant activity for removal of surfactants, organic molecules, which
may come from both the civil and industrial discharges.

Especially by washing the textile industry, but also of substances that produce undesirable water color output.