

## **FLUE GAS PURIFICATION FROM SULFUR**

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Currently, there are more than 750 flue gas purification devices worldwide. About 70% of these devices use flushing of combustion products with lime or limestone slurry. About 20% are equipped with dry and moist systems with applied suspensions of sodium or lime. Another 10% of devices use other different technologies. In the process of studying this topic, it should be borne in mind that chemical methods of cleaning flue gases of boiler devices from harmful impurities are complex and expensive gas cleaning systems. Therefore, their introduction into the energy sector should be carried out only in cases where other, simpler and, accordingly, cheaper methods are completely exhausted. At the same time it is necessary to know that the main advantages of flue gas sulfur purification are their unconditionally high efficiency (90 - 95%) and possibility of application practically regardless of the type of fuel. It should also be borne in mind that the basis of chemical purification methods is a chemical reaction and its role is predominant over the processes of absorption, adsorption, condensation or combustion. In the energy sector, the most promising of wet methods of sulfur purification are: limestone, magnesite, ammonia-cyclic, soda-cyclic. Their main advantages include: a high degree of purification, the possibility of obtaining marketable products in the form of sulfuric acid, sulfur, fertilizers, building materials. However, they are not without drawbacks: large capital and operating costs, problems with ensuring operational reliability, there is a need for additional space in the area of thermal power plants and heating of the purified gases before evacuating them into the environment. The process that is most fully developed and put into practice is the limestone sulfur treatment method. It is based on the binding of sulfur dioxide in the absorber to cheap alkaline reagents: oxide hydrate or calcium carbonate. The simplicity of the technology, the high degree of purification (85 - 95%), inexpensive reagents and materials for the manufacture of apparatus, the absence of high pressure and vacuum, high reliability in operation have determined its priority application in energy. Dry and wet-dry methods of sulfur purification are less expensive than wet ones, but the cleaning efficiency is lower. The use of dry methods can reduce the concentration of sulfur dioxide by 25 - 30%, wet-dry - by 40 - 60%. These methods are based on the process of combustion of sulfur-containing fuel by feeding it into the furnace of a boiler or gas pipelines to which granular or crushed reagents are supplied: lime, limestone, dolomite, sodium salts, etc. Technological process of oxidation. occurs in a special reactor on a vanadium catalyst at high temperature and due to the oxygen contained in the combustion products. After cooling the gases and washing them with cold sulfuric acid, 85% strength is captured in the fiber filter. Sulfur removal efficiency reaches 90%.