

Question of the month - March 03/2020

What are the possibilities of regeneration/desorption?

Adsorption processes only make sense if desorption processes exist with which the loaded adsorbents can be regenerated for multiple use in such a way that they are not damaged or impaired in their adsorption capacity.

Regeneration increases the service life of aeration dryers many times over.

Desorption is the reversible process of adsorption. Therefore desorption is a reverse function of adsorption. In the following, the basic procedures for desorption are described.

Regeneration through temperature change

An increase in temperature shifts the equilibrium of the load to the lower value. The load difference is transferred to the gas and must then be flushed out. The adsorbent bed is pre-loaded by the purging process so that the load is minimized by another fluid.

Regeneration through pressure

By generating a pressure change with the help of a vacuum, the partial pressure is lowered by lowering the total pressure. The partial pressure decreases proportionally to the total pressure and the load of the adsorbent is reduced. This is not possible when using aeration dryers.

Displacement Desorption

Another possibility to regenerate the loaded desiccant is desorption by adding an additional component. This component displaces the load of the fixed bed bedding and settles in the adsorbent. Afterwards, the additionally introduced component must be removed again. The removal of the additional component is possible by two different process steps. The additional component is removed by the adsorptive itself.

Displacement desorption is used for the separation of organic components from activated carbon. However, this method of operation is not economical with a high apparatus and energy expenditure.

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