GIEBEL Adsorber®
...setting standards in aeration drying!

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Bretzfeld, 16.07.2018

Adsorber-Diameter
What influence does the diameter of an adsorber have?

The influence of the speed inside the adsorber was tested two diameters of 110mm and 150mm. For both adsorbers, the mass of the used silica gel orange is exactly 0.5 kg. This is flowed through at a temperature of 20 ° C, a relative humidity of 90% and a flow rate of 50l / min. The mass flow is thus 46.6g / h. The calculated velocities inside the adsorbers are listed in the table below. Increasing the adsorber diameter from 110 mm to 150 mm halves the speed inside the adsorber.

Table: Calculated speeds inside the adsorber.

flow [l/min]	Diameter [mm]	Speed [m/s]
50	110	0,087
50	150	0,047

As the adsorber diameter increases, the loadings at which the color change occurs decrease. For loading, a dependence on the adsorber diameter is apparent. With increasing adsorber diameter, the maximum load is reached later. The behavior of the breakthrough curve over the load is very similar for both adsorber diameters (see following tables). For this reason, in both color envelopes, the breakthrough curve of the adsorber, with 150mm diameter, is lower. The water absorption has, with the same load, higher values when the adsorber diameter is larger. This results in the lower water absorption of the adsorber with 110mm diameter.

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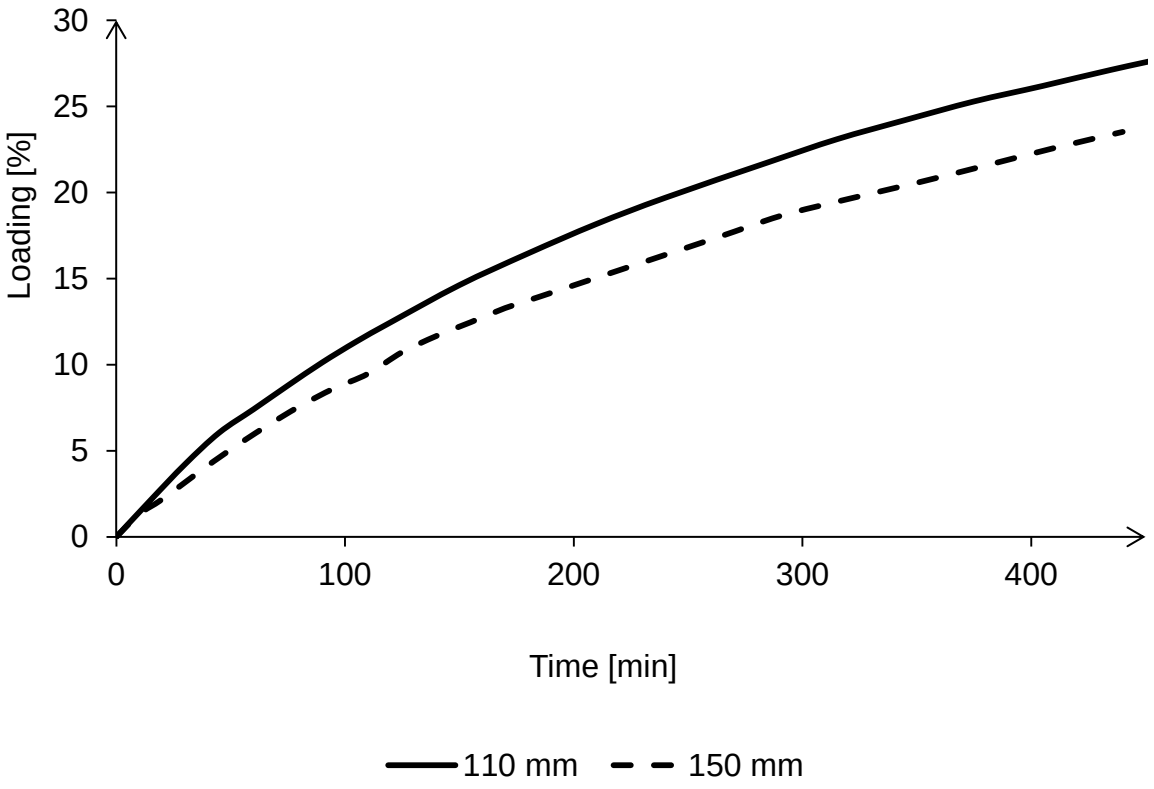

Figure: Dependence of load on time at different adsorber diameters.

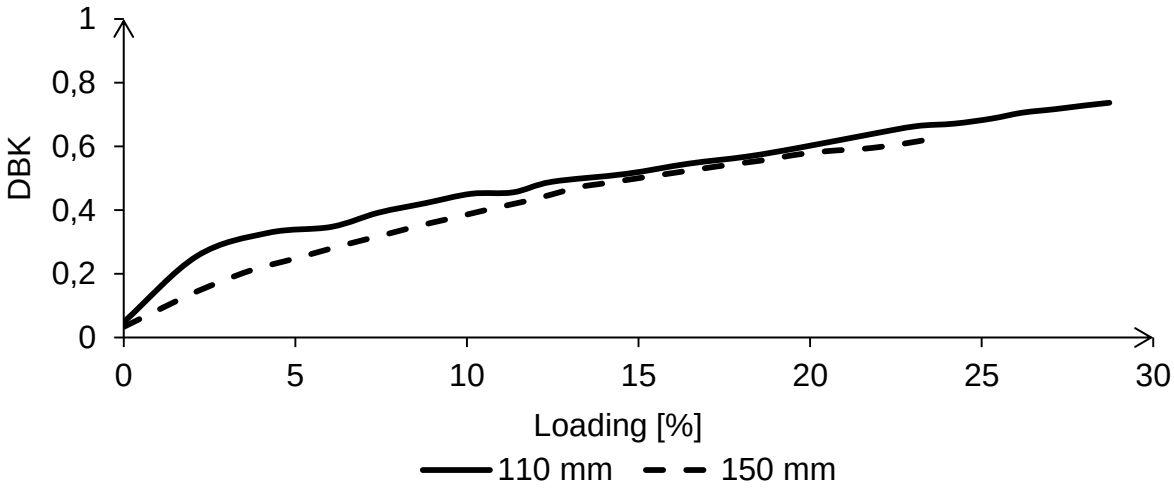

Figure: Dependence of the DBK on the load at different adsorber diameters.

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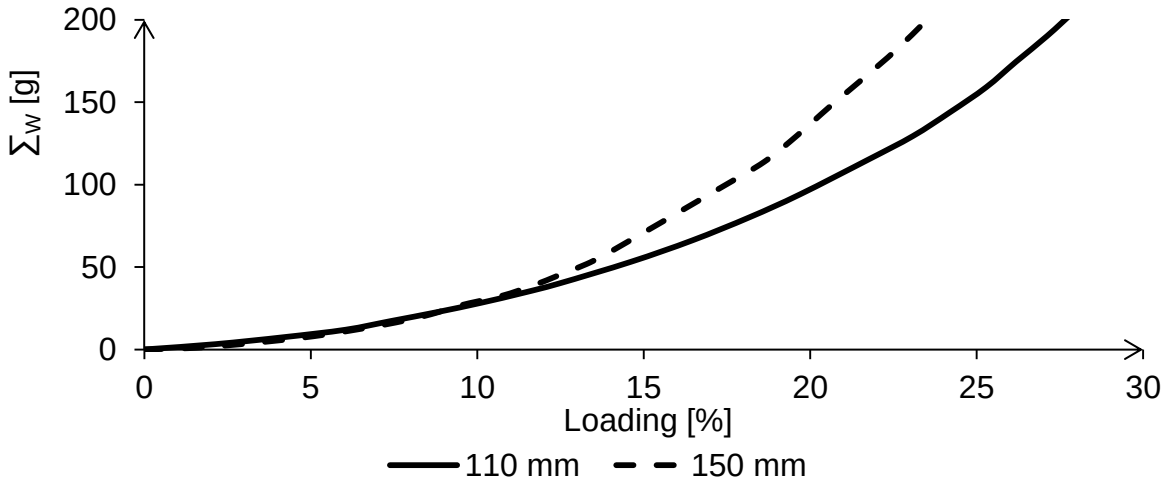

Figure: Dependence of water absorption on the load at different adsorber diameters.

Result

A larger adsorber diameter reduces the residence time of the humidity in the silica gel. As a result, more moisture flows into the system without being adsorbed. **A supposedly longer useful life of the adsorber is the result of a poorer drying performance** and thus the proven slower discoloration of the silica gel with the same amount of water. It is therefore always advisable to use a **slender and long as possible adsorber.**