

## Standard Series DGE-FBAD-S for vertical fixed-bed adsorbers to clean waste gas

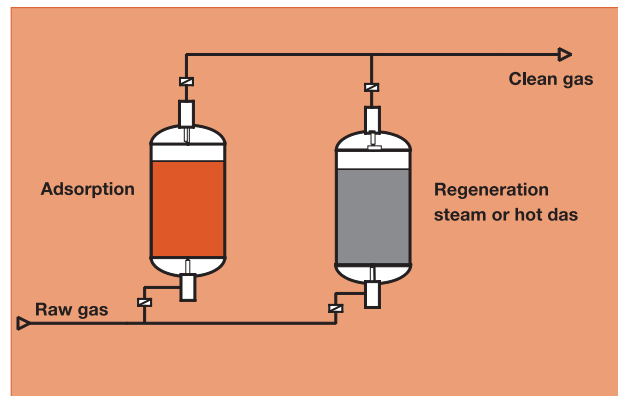
**DGE fixed-bed adsorbers** are designed as single- or multi-bed systems. The horizontal design is capable of cleaning large quantities of air with low raw gas concentrations to clean gas values of less than 50 bis 100 mg/m<sup>3</sup>.

**DGE fixed-bed adsorbers** are of round design. Adsorption and regeneration are designed with the help of computer programs. For multi-component mixtures in adsorption the interaction of components taken into account. For determining the bulk height the break-through curves are calculated based on the IAST method and specially developed layer models used for that purpose.

Horizontal-type **DGE fixed-bed adsorbers** mainly use steam for regeneration. A proper adsorption also requires in addition to regeneration a cleaning of the adsorber bed, which is then put back to operation again. To make sure that the given clean gas limits are maintained the adsorption and regeneration must have a sufficient spare capacity to compensate load fluctuations.

Any components disturbing adsorption, such as dusts, acidic or alkaline components, oils, high boilers, have to be removed depending on the adsorbent. Adsorbents used are all types of activated coal, resins, molecular sieves, zeolites etc. In addition to common regeneration techniques using steam or hot gas processes for deacidifying and extracting activated coal can be integrated if need be.

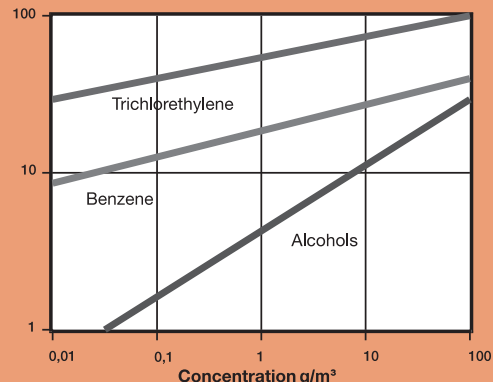
**DGE fixed-bed adsorbers** are made of carbon steel, stainless steel, special high-alloy steel, plastic material or with lining depending on the required resistance to corrosive media.



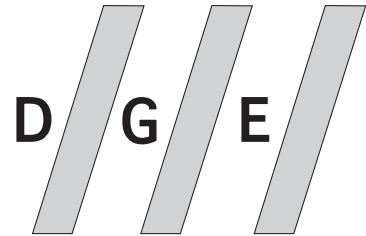
### DGE Adsorption process

For strictly maintaining the clean gas values below of the individual 5 mg/m<sup>3</sup> by applying advanced technology.

Adsorption isotherm for different components on activated coal (% absorption capacity)



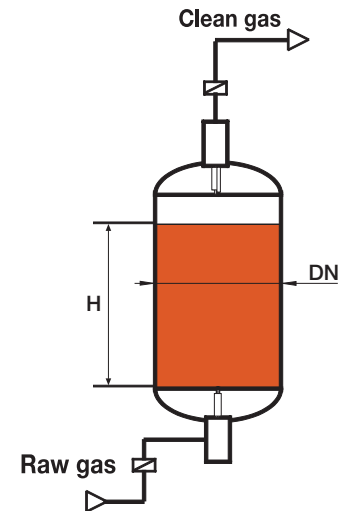
- Environmental Protection
- Process Engineering
- Plant Engineering



Dr.-Ing. Günther Engineering GmbH

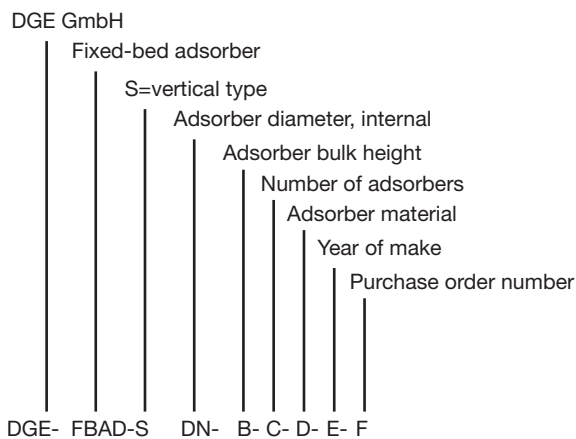
**Vertical DGE fixed-bed adsorbers for waste gas cleaning consisting of the following standard units:**

Unit	DN	Waste gas quantity m <sup>3</sup> /h			H Bulk height mm		
DGE-FBAD-S	200	20	–	50	500	–	1.000
DGE-FBAD-S	300	40	–	100	500	–	1.000
DGE-FBAD-S	450	85	–	250	500	–	1.200
DGE-FBAD-S	600	150	–	400	800	–	1.200
DGE-FBAD-S	750	250	–	650	800	–	1.200
DGE-FBAD-S	900	350	–	900	1.000	–	1.400
DGE-FBAD-S	1.200	600	–	1.650	1.000	–	1.400
DGE-FBAD-S	1.500	950	–	2.550	1.000	–	1.600
DGE-FBAD-S	1.800	1.400	–	3.700	1.000	–	1.600
DGE-FBAD-S	2.200	2.050	–	5.500	1.000	–	1.800
DGE-FBAD-S	2.600	2.900	–	7.650	1.000	–	2.000
DGE-FBAD-S	3.000	3.850	–	10.200	1.000	–	2.200



The dimensions given refer to the round standard type.

### Type designations of DGE fixed-bed adsorbers



For pilot testing complicated waste gas cleaning jobs DGE provides its **DGE test facilities**.

The pilot plants help to determine the break-through curves under operating conditions. Different adsorbents are used and low clean gas parameters achieved.

Based on existing operational conditions the most cost-effective regeneration method is determined. The necessity of recycling drying air is considered component-related.

**DGE fixed-bed adsorbers** are system solutions for environmental protection.

For special applications in waste gas cleaning **DGE** has its own cleaning techniques, long years' expertise and a large number of references.

As a system solutions provider we provide consultancy services and together with our customers we develop the most efficient concept for the job to be done. We optimise utility consumption and cut disposal costs. In doing so we particularly investigate possibilities of running the process as a closed material cycles.

The **DGE** system of an **adaptive process control** ensures optimum regeneration of activated coal and low operating cost. A safe plant operation for all conditions is guaranteed.

For specially sensitive plant systems we offer a repair service within 24 hours as a **mobility guarantee**.