

HS-Securesorb Activated Carbon Adsorber



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HS-Securesorb will filter airflows of 5.000 to 15.000 [m³/h] in size, which contain gaseous or toxic impurities. The highly efficient System contains an air heater, particulate matter filters, adsorption filter, and final filtration.

For the carbon to work most efficiently, the relative air humidity should be relatively low. In order to accomplish this status, an air heater can be installed at the air intake side. As pre-filtration elements the following filters may be offered: fine dust filter, filtration class EN 779: F6 to F9 (e.g. HS-Makro 95), HEPA Filter, filtration class EN 1822: H13 or H14 (e.g. HS-Mikro S). Particulate matter filters protects the adsorption layer of dust, aerosols, and particles. The filtration units can be changed without contamination (Safe Change, refer to page 1/D11). The adsorption layer, which adsorbs gaseous impurities, is fabricated out of activated carbon.

Its charging depth as well as the type of carbon depends on the requirements (e.g. necessary time of contact, volume of air stream, or differential pressure).

The adsorption range includes the filtration of odors as well as hazardous substances (for example solvent, or phosphate), gaseous radionuclides, and warfare agents.

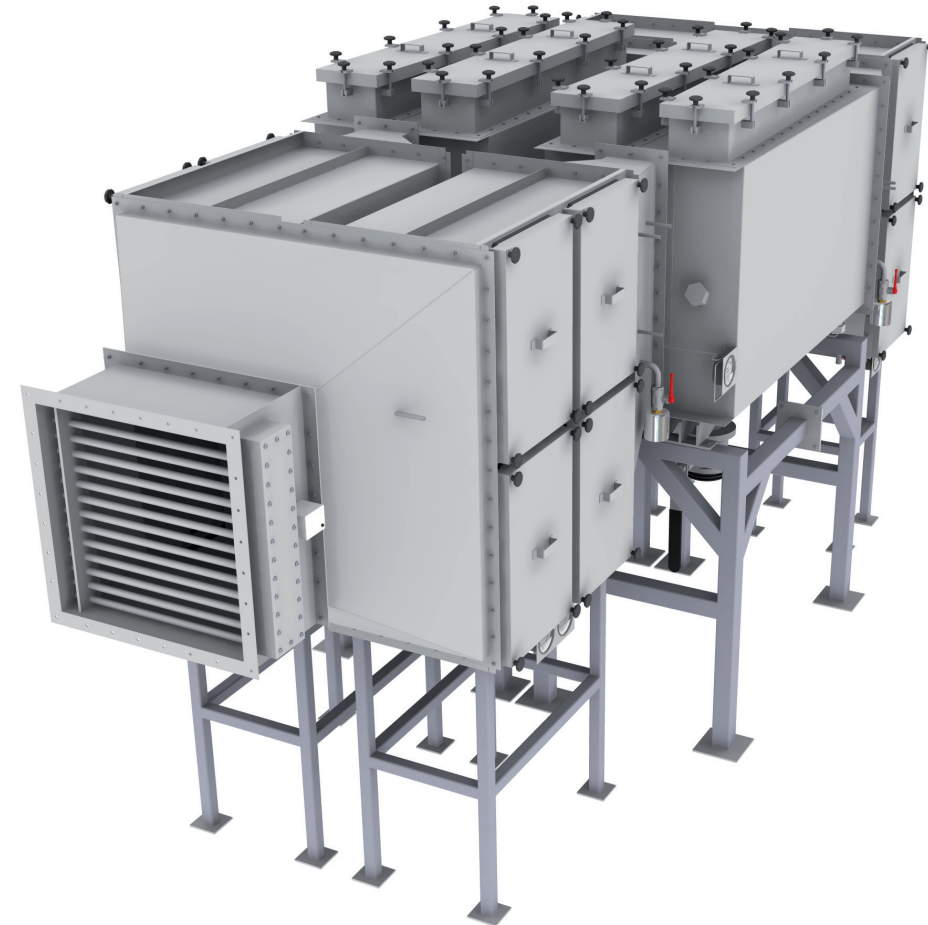
The carbon packed bed (PB) is filled via a spacious aerial platform, which also serves as reservoir for follow-ups. In order to eliminate bypasses the activated carbon should be compressed through a vibrator after being placed inside the PB. Used up carbon can be discharged on a save way via Safe-Change Bags.

The final stage in this system is a security filtration element, containing a HEPA Filter of filter class EN 1822: E11 or better. This stage makes sure that none of the carbon particles will pollute the air, which may escape while filling the PB.

Pressure relief equipment at various parts of the case ensure a save a contamination-free pressure equalization prior to maintenance. The flow of any gas while opening the maintenance flap will therefore be controlled.

The case is fabricated from stainless steel (grade 1.4301) or better. The surface was bead blasted, and therefore can easily be decontaminated.

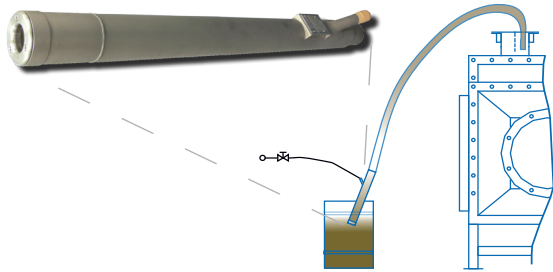
HS-Luftfilterbau will take the system apart for transportation. It can be put back together without difficulty at your facility. The connections will be placed after your specifications.



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Filling of Activated Carbon Packed bed (PB)

The PB will usually be filled with the HS-injector system. A circular nozzle venturi injector, made from standard carbon bins or Big-Bags, sucks the carbon directly into the PB. Different from common worm/snail type feeders this injector system delivers the carbon into its encasement without crushing the granules.



Discharging of Activated Carbon Packed bed

The carbon's encasement is being emptied through a gas tight ball stop-cock at the reservoir at the bottom of the case. Optional the discharging can be done through an automatic system (e.g. gas-tight worm type feeder or mobile extraction system with injector mechanism). If required a maintenance board for Safe-Change Bags can also be equipped.

Evaluation of Carbon's Condition

In order to check the carbon's adsorption capacity, one has to either determine the weight or analyze a sample. HS-Luftfilterbau offers various systems for taking samples:

- **Sample taking device:** This instrument can be plunged into the packed bed (PB) through an inspection flap. Through a closable opening the carbon is directly taken from the PB.
- **Bottle Rack:** Gas-tight bottles and a ball stop-cock enable service personnel to take the sample directly from the packed bed (PB).
- **Samples via Bypasses:** In a bypass drift the air that needs filtration passes various carbon samples. Single samples can be taken and tested for their efficiency. The amount of inspections is limited to the amount of bypass samples (app. 3 to 5).

With the taking of samples with pipette and bottle rack carbon will move up from the aerial platform.

Technical data according to the design

Air flow	5.000 - 15.000	[m ³ /h]
Pressure loss	500 - 2500	[Pa]
Amount of activated carbon	500 - 1000	[Ltr.]
Depth of packed bed	100 - 300	[mm]
Height of the hopper	100 - 300	[mm]
Weight (stainless, 1.4301)	900 - 1600	[kg]
Performance of the air heater	10 - 20	[kW]

Sample taking system:	Sample taking device
	Bottle rack
	Bypassprobe (3-5 Samples)

Further specifications

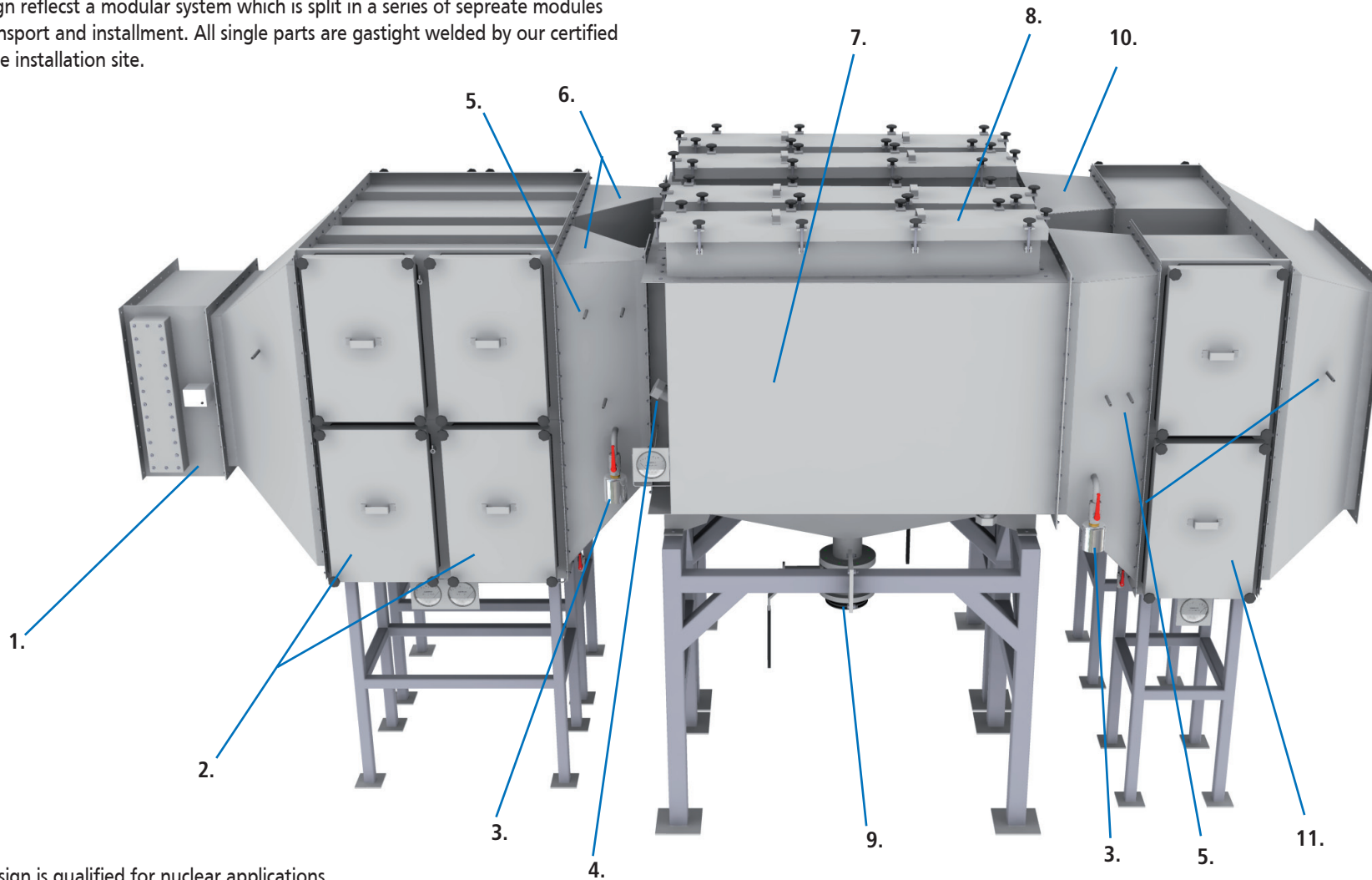
- **Air Heater:** To facilitate the most favorable efficiency, the carbon is not supposed to be placed in environments with more than 70 percent humidity. Therefore air heater can be placed at the air ingress sides upon request.
- **Test Points:** Measuring points and sensors for checking the pressure difference may also be equipped upon request.
- **Pressure relief filters:** With pressure relief equipment the system can be operated even with negative pressure, so as to avoid contamination. Via the pressure relief filter and gas-tight ball stop-cocks outside air will flow controllably.
- **Vibrators:** To avoid bypasses when filling the PB, pneumatic vibrators can optionally be placed at the case. Controlled vibrations ensure an equally compressed carbon PB.
- **Gas-tight dampers:** If requested may be installed. Tightness can be proven through various test methods.



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Exemplary Design:

HS-Securesorb Filter will be fitted according to your specifications and environments. The example design reflect a modular system which is split in a series of sepreate modules for better transport and installment. All single parts are gastight welded by our certified welders on the installation site.



- 1. air heater
- 2. aerosol filter stage
- 3. pressure relief filter
- 4. carbon probe port (activated carbon PB)
- 5. diverse probe ports (aerosol, pressure drop etc.)
- 6. passage to adsorbtion element
- 7. adsorbtion element
- 8. hopper / reservoir
- 9. discharger (gas tight ball-stop-cock)
- 10. passage to abraision filter stage
- 11. abraision filter stage

Designspecs:
 length: aprox. 6 m
 width: aprox. 3 m
 height: aprox. 4 m

The actual design is qualified for nuclear applications.