



HOK ACTIVATED
LIGNITE

HOK[®] ACTIVATED LIGNITE WATER TREATMENT

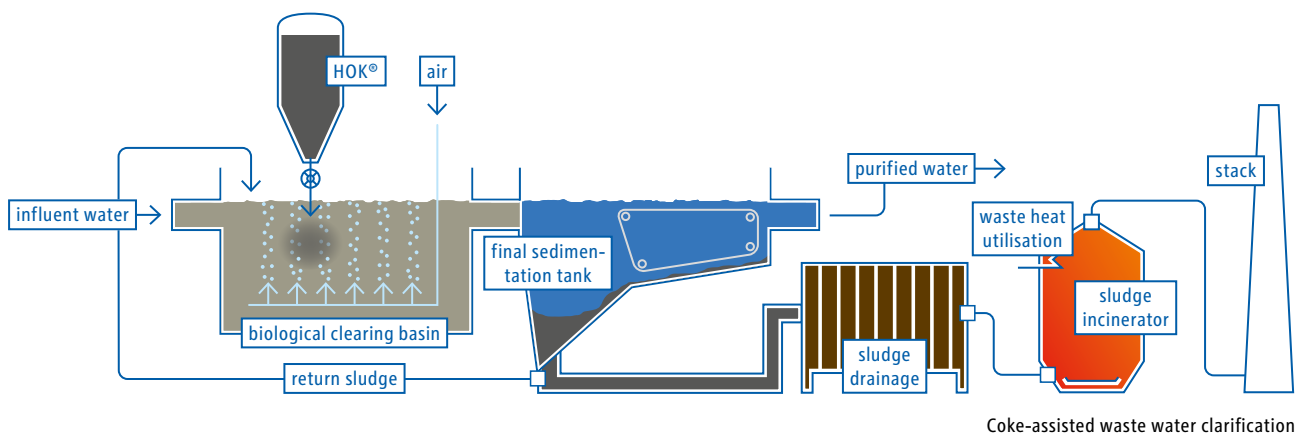
ACTIVATED LIGNITE HOK® – AN EFFICIENT PRODUCT IN BIOLOGICAL AND ADSORPTIVE WATER CLARIFICATION

Activated Lignite HOK® is produced from Rhenish lignite by activation in a rotary hearth furnace, which has given the product its name, i.e. HOK®. Production, distribution and logistics are based on a consistently implemented quality system in accordance with DIN EN ISO 9001. Due to its special properties, Activated Lignite HOK® is used as activated carbon for numerous applications in the environmental field, for example:

- in biotechnology, e.g. in biological waste water clarification
- as filter material in drinking water treatment
- as adsorbent for cleaning industrial sewage water and waste dump seepage
- as adsorbent for waste air and flue gas purification

Analytical reference values

Water content	0.5%
Ash content	9.0%
Volatile compounds (mainly CO and CO ₂)	3.0%
Fixed carbon	87.5%
Sulphur content (total)	0.5%
Heating value	29.9 MJ/kg
Specific surface area	300 m ² /g
Pore volume	50%



WATER CLARIFICATION

Biological waste water clarification specifically uses pulverised Activated Lignite HOK®, which is produced by grinding. For use in fixed beds and stirring loops, suitable grain sizes are available as HOK® grained and HOK® medium. More and more plant operators are being faced with substantially increased costs due to strict environmental regulations and the often insufficient decomposition provided by existing equipment.

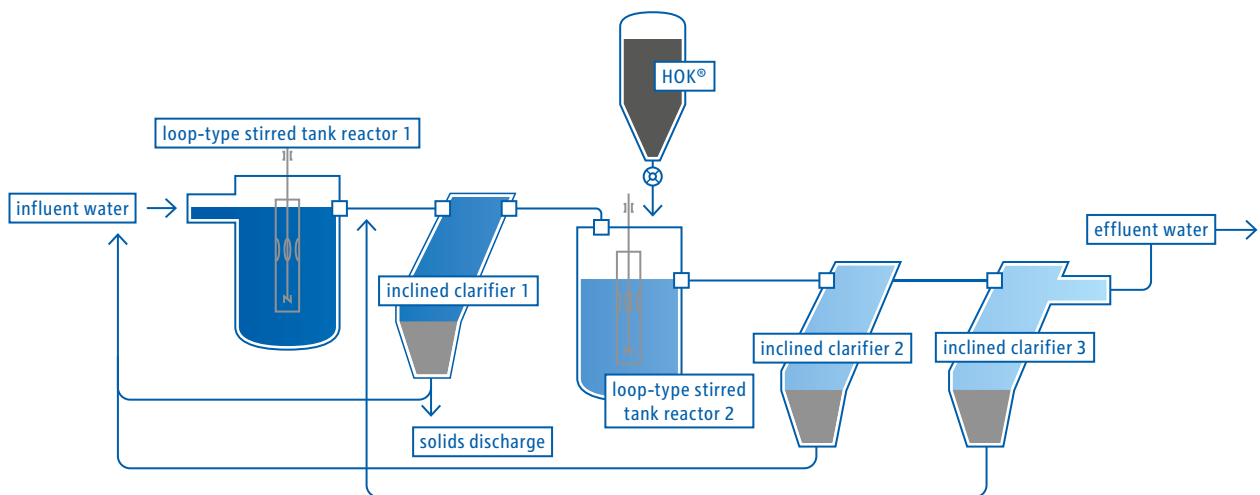
Expensive chemicals, plant conversions and extensions push up operating costs. Against this background, biological and adsorptive processes have been developed to solve a wide range of water clarification problems, and these processes are in successful use today.

HOK® products for use in water clarification

HOK® GRAINED
(1.25–5 mm)



HOK® MEDIUM
(0.1–1.5 mm)



Stirring loops for biological/adsorptive waste water clarification

BIOLOGICAL WASTE WATER CLARIFICATION

The function of HOK® in biological waste water clarification is based on the so-called “food source model”. The individual HOK® particles are considered to be the “food source” that provides the microorganisms in its surroundings with nutrients and oxygen.

Hence, these nutrients, i.e. the waste water ingredients to be reduced, and the oxygen are present on the HOK® particles in a higher and unchanged concentration than in the surrounding water. In view of the adsorption and desorption taking place, the HOK® particles act as a buffer and as temporary reservoirs, i.e. they reduce fluctua-

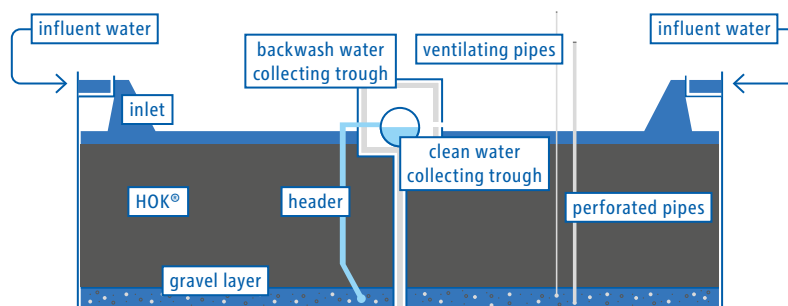
tions in the load and in the medium. The result of this HOK® assisted biology is a compact sludge that sediments quickly.

This rise in sludge concentration in the activated area brings about a reduction in the sludge index and an increase in decomposition capacity. The advantage is a stabilisation of the overall system and a higher decomposition level. In addition, this favours sludge drying with the HOK® supporting scaffold and, as a result, saves conditioning agents. For smaller waste water quantities and for special applications, there is the option of fixed bed biology with HOK®.

HOK® PULVERIZED
(0–0.4 mm)



HOK® SUPER
(0–0.125 mm)



Fixed bed filter for biological/adsorptive waste water clarification

ADSORPTIVE WASTE WATER CLARIFICATION

Besides low-cost biological waste water clarification, some substances difficult to degrade also require adsorptive waste water treatment. In this process, large molecular compounds in particular are readily deposited on Activated Lignite HOK®. The technical solutions for such adsorption processes involve suspension technology or a fixed bed filter, depending on the concentration range.

In the case of suspension technologies, use is made of loop-type stirred tank reactors which, depending on requirements, are in single-stage or multi-stage design as a countercurrent cascade. The advantages of suspen-

sion technology are, in addition to continuity of plant operations, high mass transfer and, owing to the cascade effect, high loading of the Activated Lignite HOK® with pollutants.

In the fixed bed filter version, which can be operated by varying the ventilation either with biological or adsorptive clarification or in combination, the material passes through a solid fill of HOK®. Where the water level is operated below the HOK® surface, the free upper HOK® provides for adsorptive separation of the olfactory matter. Selective back-washing helps ensure high filter life and the necessary loading of the HOK® with pollutants.



With Rheinbraun Brennstoff as a partner, your supplies of Activated Lignite HOK® are assured. RWE Power AG's past performance is a consistent demonstration of reliability and dependable delivery.

CONSULTING

The experience RWE Power AG has accumulated over decades of handling Activated Lignite HOK® and the know-how acquired through close cooperation with its many customers are reflected in the service provided by an expert team of advisers. RWE Power AG's experienced engineers and businesspeople will select the right solution for your pollution control needs. Moreover, RWE Power AG provides you with a complete range of services throughout every phase, including developing concepts, planning systems, consultation during approval procedures and in matters of safety, personnel training, financing options and production cost analyses, i.e. a full range of convincing solutions, both now and in the future. Why not find out at first hand?

DISTRIBUTION

Activated Lignite HOK® is distributed by Rheinbraun Brennstoff GmbH. The company offers the necessary know-how concerning the preparation and use of the product. The Group's own logistics department is responsible for proper transportation and ensures accurate scheduling.

Activated Lignite HOK® is supplied in bulk by large-capacity dump truck or silo truck and transhipped mechanically or pneumatically in a sealed system at the customer's site. The sorbent is stored in simply designed sheet steel silos. Small quantities of Activated Lignite HOK® can be supplied in special units such as sacks, big bags or small containers.

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