Work sheet F 3.2 a HYDRO–ANTHRASIT P
Edition12/99 Operating instructions

1. General

HYDRO-ANTHRASIT P is used mainly in water filtration as upper material layer in multi-layer filters. The layer has a great void space and a high capture capacity for dirt and airborne particles. With combined use of a specific heavier fine grain material as lower material layer, quality of filtrate is being safeguarded. Process of multi-layer filtration is characterised by prolonged filter runs at constant filtrate quality as well as by operational safety and little maintenance required. Its use, however, is subject to observance of construction features with respect to filtering technology according to DIN 19 605.

2. Filling

2.1 Preparation

Before filling in materials, the strainer plate and backwash conditions have to be checked carefully. In order to do this, the filter is filled with water to about 15 - 20 cm above strainer plate and scavenging blower actuated. Rinsing air must flow evenly across the whole area.

2.2 Supporting layers

Layer height indicated by the supplier of the filtering plant and grain sizes of supporting layer material must be observed. If several different grain sizes are used, each single layer must be levelled after entering. Since bacteriological contamination cannot be excluded in handling, disinfection of supporting layers and of the complete filtering plant should be done, in order to exclude microbiological contamination out of the system. (see DVGW work sheet W 291).
With filters for condensate treatment no supporting layers of silica gravel has to be used.

At those applications Hydro-Anthrasit P should be used as supporting layers, too.

2.3 Filter materials

After entering, levelling and disinfecting the supporting layers, the filter is filled from below to 2/3 with water. Subsequently at first the lower material layer is washed-in or supplied manually. This layer should then be washed in order to remove undersize shares of grain. If necessary, undersize fines have to be peeled by hand from the surface of material layer and disinfected again. Subsequently, HYDRO-ANTHRASIT P is washed in or entered manually by observing general hygienic rules.

3. Starting-up and insertion

Before starting-up, the filtering has to be backwashed thoroughly several times and operation should be started immediately after washing. In the first weeks of operation the filter should be backwashed once a day for relaxation of filtering material and disposal of remaining undersize particles.
At later re-filling of filtering materials, please, proceed accordingly.

4. Load of filtering plant

A satisfactory filtration result will be obtained when planned load and adequate backwashing in regular intervals are observed. Underloads will have no negative effects on filtration result. Abrupt or constant changes of load may worsen filtration outcome considerably. Continuous overload should be avoided in order to exclude loss in quality.

5. Backwashing of filtering plant

Filters filled with HYDRO-ANTHRASIT P are to be washed at least once a week after insertion of the filtering material. If raw water is more contaminated, washing is to be carried out more often. Companies supplying the plants will provide comprehensive operating manuals on washing procedure to follow. Instructions on washing given in the following shall serve for orientation.

5.1 Backwashing of multi-layer filters

5.1.1 Backwashing with air and water (separately)

1. Water backwash
   at grain combination I approx. 45 m/h
   at grain combination II approx. 70 m/h
   time: approx. 3 - 5 min
2. Lowering of water level to short above filter layer
3. Air scour approx. 60 m/h
   time: approx. 3 – 5 min
4. Holding time gas evolution of rinsing air
   Duration: 2 – 5 min
5. Clear washing with water
   at grain combination I approx. 45 m/h
   at grain combination II approx. 70 m/h
   time: about 2 – 5 min
   in dependence on degree of contamination
6. Pre-run

Depending on design of installation agreed upon, step 1 and 6 may be may not be necessary.

5.1.2 Backwashing with water

at grain combination I approx. 45 m/h
at grain combination II approx. 70 m/h

5.1.3 Backwashing with air and water (combined)

We do not recommend combined air/water washing at backwashing in multi-layers filters.

5.2 Backwashing of single-layer-filters (recommendation)

With air and water (combined)

1. Air scour approx. 60 m/h
   time approx. 5 min
2. combined air/water backwash
   with air approx. 60 m/h
   with water approx. 8 – 12 m/h
   time: approx. 10 min
3. Water backwash approx. 20 – 25 m/h
   time: until clear water drain
4. Pre-run

5.7 Calculation of freeboard height

At backwashing as to 5.5:
In order to avoid backwash losses, a freeboard of 25% of height of filter layer (without supporting layer) plus a 200 – 300 mm safety margin have to be planned.

At backwashing as to 5.6: approx. 300 – 500 mm

6. Re-filling

HYDRO-ANTHRASIT P as an inert filter material is not subject to consumption. Due to breeze and fines removal during backwashing there may be backwash losses of up to 2 % annually which can be compensated by occasional re-filling. Filters have to be backwashed after re-filling.

7. Storage

HYDRO-ANTHRASIT P is indefinitely storable in clean and dry stores. Damage of packing at material packed in bags have to be avoided by all means in order to prevent contamination of material. Re-fillings should be done exclusively out of original containers.

8. Putting out of operation and Re-operation

8.1 Putting out of operation

Before putting out of operation, the filter is being washed intensively. Filter can stay filled with water at short-time standstills (3 - 4 weeks). Water will be drained off after washing before longer periods of standstill with open dirty water drain via bottom drain. After water having drained off, the filtering material will be dried for 15 minutes with rinsing air. In order to avoid formation of condensation water, the upper manhole should remain open until re-operation.

8.2 Re-operation

Filtering plant has to be washed intensively several times before re-operation. Seat density of filter material has to be checked during water washing at opened manhole.
If re-filling should be necessary, it should be carried out before closing of the manhole. Wash again after re-filling. Then start up operation of the plant immediately.

9. Individual advice

Because of particularities in each case of application to be considered, advice and description of characteristics can be given only individually corresponding to the particular case. Information, notes and advice, therefore, contained in this work sheet are not legally binding. We shall be responsible only, if and as far as these are either confirmed by us on request in writing in the particular case or characteristics have been guaranteed in writing. Individual proposal will be made on request.