

# Work sheet E 2.4 a

## Edition 12/99

# AKDOLIT – GRAN

## Operating instructions

### 1. General

Utilization of AKDOLIT-GRAN allows for neutralization to adjustment of calcite saturation according to drinking water regulation and filtration at the same time. Process is characterized by great operational safety and little requirement for maintenance. Its use, however, is subject to observation of construction features with respect to filtering technology according to DIN 19 605. Filter should be operated continuously. In state of standstill, the filtering material must be completely covered with water.

### 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).

#### 2.3 AKDOLIT-GRAN

After entering, levelling and disinfecting the sup-

porting layers, the filter is filled from below to  $\frac{2}{3}$  with water. Subsequently, AKDOLIT-GRAN is filled in hydraulically at open dirty water drain or supplied manually (see 3. Starting-up and insertion).

At correct handling, disinfection of dolomitic filtering materials is not required due to high alkalinity at the grain surface in the beginning. If necessary, our engineering department should be contacted.

### 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. During initial operation hydration of filtering material will occur causing over alkalization of the filtrate. At very soft raw water poor in  $\text{CO}_2$ , this process can last for several weeks. This passing condition can be compensated for by supply of filtering material in partial shares (e.g.  $\frac{1}{3}$  at a time) or a respective overload at the beginning of operation.

(Note: For Ks 4,3 + 2 \* Kb 8,2 < 0,5 mol/m<sup>3</sup> is pHc > 9)

Filter should be flushed once a day in the first week of operation to allow for relaxation of filtering material until initial state eases. At later re-filling of filtering material, please, proceed accordingly

### 4. Load of filtering plant

The pH value required will adjust automatically, when planned load, timely re-fillings and correct backwashing of filters in regular intervals are being observed. At overload of the filtering plant, target of conditioning will fall short.

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Short-time underloads of maximum 30 % of rated capacity are admissible.

### 5. Backwashing of filtering plant

Filters filled with AKDOLIT-GRAN 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 (recommendation)

##### 5.1.1 With air and water (combined); Grain sized I–III

- |                                |                         |     |
|--------------------------------|-------------------------|-----|
| 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                     |                         |     |

##### 5.1.2 With air and water (separately); Grain sized 0

- |                       |                         |     |
|-----------------------|-------------------------|-----|
| 1. Air scour          | approx. 60              | m/h |
| time:                 | approx. 5               | min |
| holding time:         | approx. 2               | min |
| 2. Water washing with | approx. 35              | m/h |
| time:                 | until clear water drain |     |
| 3. Pre-run            |                         |     |

#### 5.2 Freeboard height

At backwashing as to 5.1.1: prox. 300 – 500 mm

At backwashing as to 5.1.2:

15 % of height of filter layer plus 200 mm

#### 5.3 Slop water and pre-run

Slop water and pre-run with pH values of > 8,5 must not be conducted to water with fishes, since such water could cause death of fish.

High pH values can be expected to be the case at filters filled with AKDOLIT-GRAN during starting-up period, after filling and re-filling as well as at conditioning of very soft raw water, poor in CO<sub>2</sub> (see 3.).

### 6. Re-filling

AKDOLIT-GRAN is subject to consumption depending on amount of carbonic acid set. Sufficiently good result of conditioning is given, when filling level is between 90 – 100 % of layer height required. Re-filling is necessary at the latest, when 10 % of basic filling has been consumed (layer height

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AKDOLIT-GRAN). At shorter intervals of re-filling, the more equal the yield of neutralization will be. Plant has to be flushed after each re-filling.

### 7. Storage of AKDOLIT-GRAN

At storage of AKDOLIT-GRAN, care has to be taken that material will not be exposed to moisture. In order to exclude contamination of material, damage of packages of material packed in bags must be prevented by all means. 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.