Huber Technology (Pty) Ltd, South Africa

HUBER TECHNOLOGY
WASTE WATER Solutions

Good reasons to use air filters in water reservoirs

A man with a breathing mask and a water reservoir with air filter plant – what do these two have in common? Both protect against themselves against dust!

In Germany, Austria and Switzerland, enough water of high quality is naturally available at any time. One could almost forget that our most important resource is highly sensitive and gives life not only to humans and animals but also to germs and microorganisms. There are therefore good reasons to protect our water resources and use air filters in drinking water reservoirs.

“We have never always built water reservoirs without air filters. Why should we use air filters now?”

You may have heard this provocative counter-question sometimes from a customer when you recommended that he should improve his reservoir and try something new. If you sometimes do not have the time and patience or the right arguments in such a case to counter such a question, frequently asked by a person with “experience”, we explain in the following several good reasons why to use air filters in water reservoirs:

Water comes clean from a spring or well and is intermediately stored in a "clean" reservoir before it is distributed to the consumers via pipelines. Even if the operators of public water supply facilities are well familiar with germ numbers, they often do not consider that the source of germs can be dust in the air which the water reservoir sucks and releases.

The long established practice of using ventilation chimneys in water reservoirs is still very common, frequently with “diagonal” supply and exhaust air streams. Many operators think it is enough to have an insect screen with 1 mm mesh or perforation. They think everything is all right with some air draft. Basically, air exchange is the right idea but only as long as the air is very clean.

We all tend to forget that dust is always present in the air. We only remember it in spring, during the blossoming of the trees, when a yellow dust layer covers our cars we have cleaned the day before, or once a year when the wind brings dust from Africa and colours the sky in ochre creating exceptionally beautiful red sunsets. We should then be aware that also our water reservoirs ‘breath in’ this dust and the undesired germs contained if the air remains unfiltered.

We want to explain below how much dust and germs are present in the ambient air which stream into the water reservoir with the unfiltered air and settle on the water surface and the reservoir walls and ceiling. Due to their huge volume water reservoirs are ideal ‘dust settlement chambers’ where the air is cleaned like in a wet scrubber. But the problem is that the scrubbing water is our drinking water. We should therefore think twice and better filter the air before we say: “We have never used air filters. Why do we need them now?”

The HUBER catalogue "Innovative Solutions for Potable Water" and our PG8 brochure “Hygiene in Drinking Water Reservoirs” explain the fundamentals of air filtering for water reservoirs. An annual amount of 21,000 mg dust and 1680 billion germs pass into a 500 m³

water reservoir. This figures can be explained: If you search the internet to find the 'average dust content', you will find 0.05 mg/m³ (after rain events) or 0.1 mg/m³ (dry weather) in rural areas and 0.1 to 0.45 mg/m³ in urban areas (source: ikz.de). This is not much, one may think at first glance. But we should look at these figures in more detail: If we assume a ventilation number of only 1.2 per day, due to the varying water level, and multiply it with the a.m. 0.1. mg/m³ and 365 days, the result is 500*1.2*0.1*365 = 21,900 mg or 21.9 g per year, which is not a small amount.

HUBER Air Filtering Plants offer a complete program of products to meet all air filtering requirements in water reservoirs

We offer our HUBER air filter plants L251, L252, L361, L661 and L662 especially for the use in water supply facilities. Air throughput capacity is specified for a pressure difference of 120 pascal. In order to dimension the filter plant to suit the individual water reservoir, we use the formula “reservoir volume divided by 2.0 to 2.5”. The water reservoir either breathes the air in and out automatically as the water level falls and increases, or an additional ventilator is installed upstream of the filter (and operated with overpressure!). An additional ventilator is recommended where condensation is expected to occur and needs to be reduced. In this case, it must also be provided for an outlet air duct with a flap closing without current.

For applications with an additional ventilator we recommend to use the type L 361 filter plant if there is sufficient space. Our L 361 filter plants have a class F6 fine filter upstream of the class H13 filter for suspended matter. The fine filter retains already approximately 95% to 99% of the dust (depending on particle sizes), with the result of a significantly longer life of the class H13 filter with a gravimetric separation efficiency of 99.95%. H13 filters are used in clean rooms, semiconductor production, sterile bottling plants of the pharmaceutical industry, or to filter the exhaust air from nuclear-technical plants.

The costs of a HUBER air filter plant are in the parts per thousand range of a complete new building project or complete refurbishment of a water reservoir. The budget for an air filter plant without pipelines and additional ventilator is 1,500 to 3,000 €, depending on the range of equipment features. No chimneys are required if a lateral safety louvre with insect screen and wall connection plate is used.

Now that you have read this article, we of HUBER are asking you:
Aren‘t significantly improved hygiene and safety worth the extra expense?

Related Products:
- Aeration of water reservoirs

Related Solutions:
- HUBER Solutions for Water Storage

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