

## QUARTZITE AND CARBON FILTRATION PLANTS

### Fast pressure filters (quartzite)

Fast pressure filtration is actually pressure-induced percolation of water containing different impurities (sand, slime, oxidized iron, any type of suspended particle) through layers of filter material.

Fast pressure-induced filters are multi-layer, that means they are made of superimposed layers of various materials bearing different granulometry.

Compared to standard single-layer filters, this technique boasts the following strong points:

- Higher volume of suspended solids retained per filtration cycle;
- Enhanced quality of filtered material;
- Water saving in backwashing stage;
- Higher activated carbon filter protection.

### Activated Carbon

The term “activated carbon” indicates that the same has undergone a special physical process called “activation”. Activation endows carbon with an exceptional degree of porosity which greatly enhances its inner surface: adsorption capacity is hence dramatically increased.

The term “adsorption” indicates a chemical process through which a solid or liquid substance retains on its surface a layer of molecules or ions of a certain gas, liquid or solute in comes in contact with.

Activated carbon adsorption capacity is influenced by certain conditions; the most important are:

**Temperature**

**Humidity**

**Water flow velocity**

**Concentration:** The higher the concentration of the substance to be adsorbed, the higher the quantity of activated carbon needed for treating it.

The main pollutants the system is able to cut down are: TURBIDITY, COD, SURFACTANTS, OIL AND A SMALL PERCENTAGE OF HEAVY METALS, with values up to 90% with the following incoming parameters:

pH ..... 6 - 8.5  
COD ..... 600 - 1000 mg/L  
TOTAL HYDROCARBONS ..... 10 - 20 mg/L  
TOTAL SURFACTANTS ..... 5 - 15 mg/L

### Running and maintenance

Activated carbon has the capacity to “attract” organic molecules into its active sites, creating steady, even though not irreversible, bonds, which saturate all active sites over time. It is hence necessary to carry out periodical treatment efficiency checks and, if needed, replace or reprocess carbon.

Before usage, carbon must be washed with running water in order to fully eliminate superficial dust.

As regards quartzite columns, running operations involve periodical backwash according to quantity of filtrated build-up.

Upstream the quartzite and activated carbon treatment, water must be previously separated from sand and oil or, if applicable, be purified by a suitable plant (e.g. chemical-physical plant) to cut down part of the pollutants it holds.

## QUARTZITE AND ACTIVATED CARBON COLUMN INSTALLATION DIAGRAM

