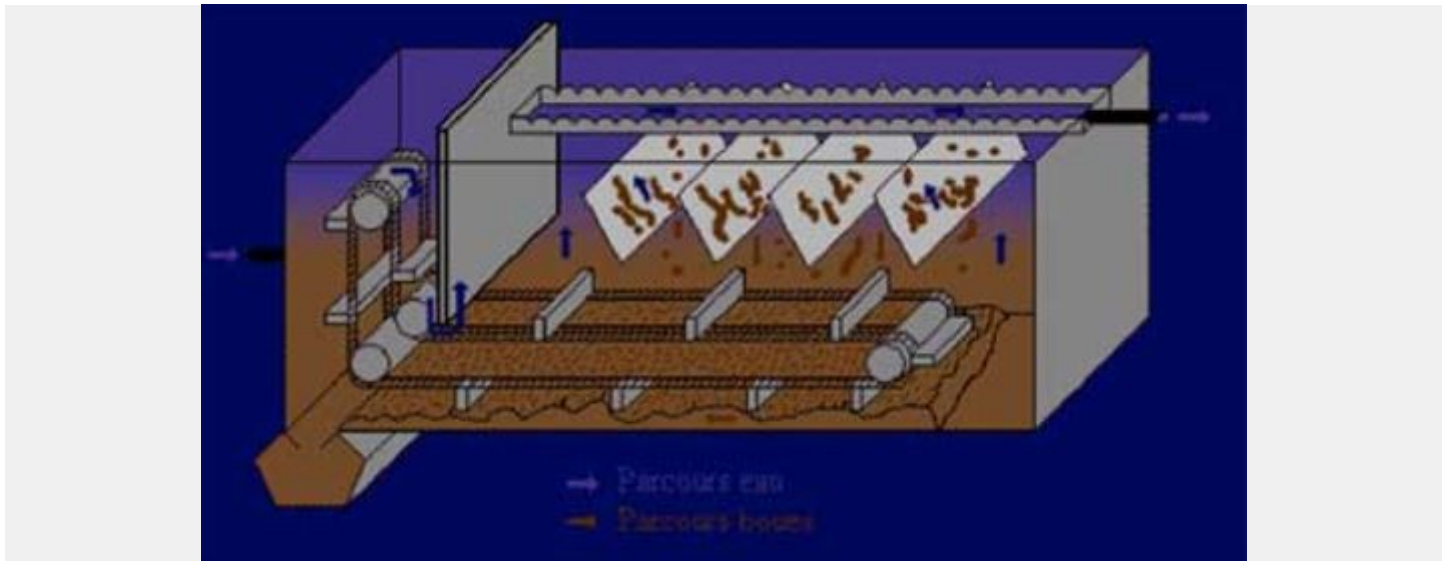


E24 - Pretreatment in urban area by lamellar settling

20 March 2012



1) What is involved ?

The purpose of the settling is to remove from the water the naturally heavy particles or those formed previously during the treatment via flocculation and/or coagulation. This is carried out in basins that are generally rather voluminous.

"Lamellar" settling **consists in causing water to flow in parallel stacks of settling tanks** of smaller dimensions, which has for effect to save a lot of space and increase the settling speed compared to the "traditional" method where we simply wait for the particles to settle to the bottom.

2) Who use or recommends this means and since when ?

This has been used in treatment plants in developed countries for a rather long time, but the process is now used in several cities in developing countries

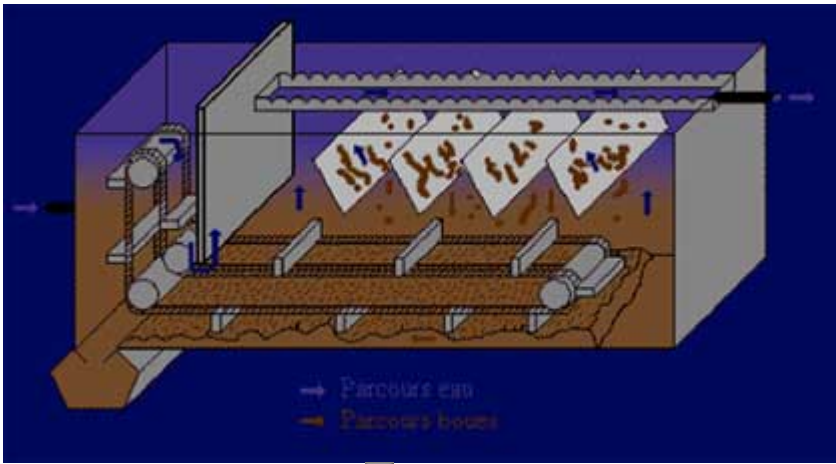
3) Why ?

This is a method that has proven its effectiveness and for which the principle is rather simple and the cost is less.

Its advantage over "traditional" settling is to be able to obtain the same quantity of treated water in systems that are more compact (this in fact is a development in settling).

4) Who is primarily concerned ?

The locations that are primarily concerned are water treatment plants (but sanitation also) for rather large-sized cities. This method is particularly recommended for **cities with at least 50,000 inhabitants**.



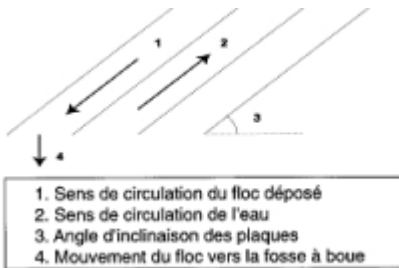
Water path Sludge path ❌

5) What does this technique involve ? How is it used ?

The lamellar settlers are usually installed after the step of flocculation of the water to be treated which ensures the formation of flocs (larger particles formed via the accumulation of smaller particles) as the finer particles cannot settle correctly. **The water flows successively over several lamellar settling modules or plates.**

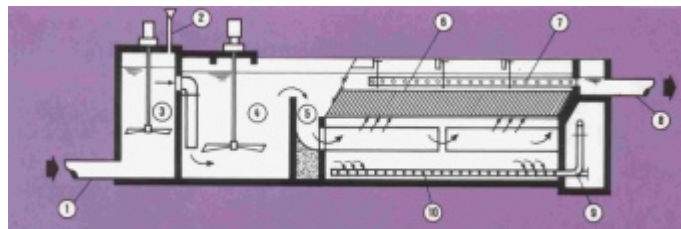
The removal of sludge formed by "lamellar" setting is faster than with the traditional method thanks to the increase in the deposit surface obtained by setting up lamellar modules (which can be simple plates) in the upper portion of the settling vessel. The size and the inclination of these modules are important parameters that condition the performance and the space that the structure takes up. So they must be sufficiently inclined, not only so that the sludge continues to move down in order to settle on the bottom, but also to expose the largest surface area possible to the flow of water and improve the settling of sludge on their surface.

There are several methods including the counter-current, cross-flow and co-current methods, with the counter-current method used the most as it is the most reliable. The principle of this method is illustrated in the following diagram :



1. Sens de circulation du floc déposé
2. Sens de circulation de l'eau
3. Angle d'inclinaison des plaques
4. Mouvement du floc vers la fosse à boue

1. Direction of flow of the deposited floc
2. Direction of water flow
3. Angle of inclination of the plates
4. Movement of the floc towards the sludge pit



"Multiflow" lamellar settling method. OTV /VWST diagram ❌

The water is supplied from below, then the water rises along the plates, depositing its sludge. The water therefore has a movement in the direction opposite that of the sludge which descends along the plates.

6) Main advantages and drawbacks

Advantages : Compactness, gain in surface, performance and lower cost.

Disadvantages : Possible clogging of the lamellar modules, sludge removal is more complicated

