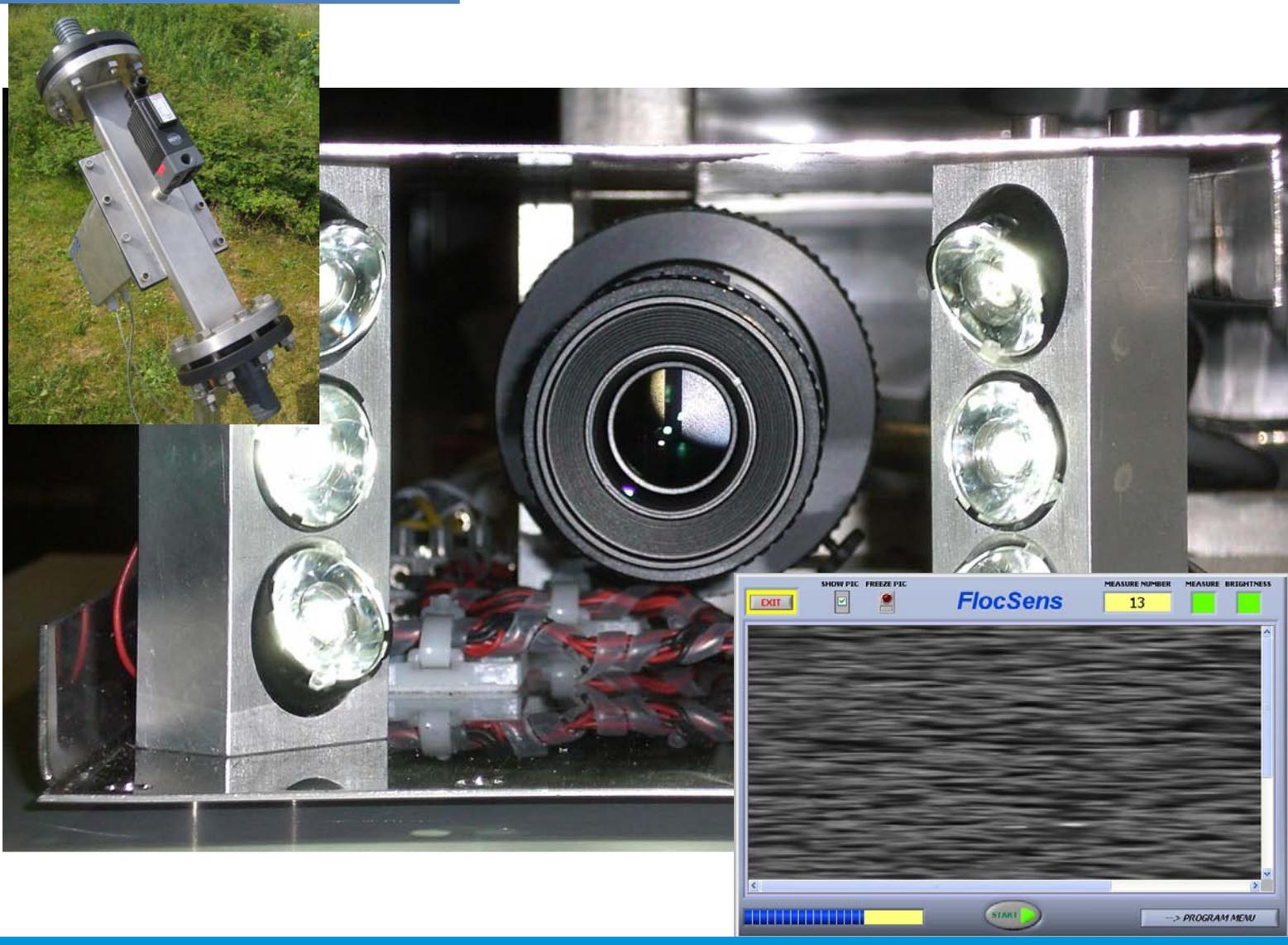




FlocSens[®]

– get a picture of your flocs
or suspensions!

aquen aqua-engineering gmbh



**PERFORMANCE
FOR PROCESSES**

– get a picture of your flocs or suspensions!

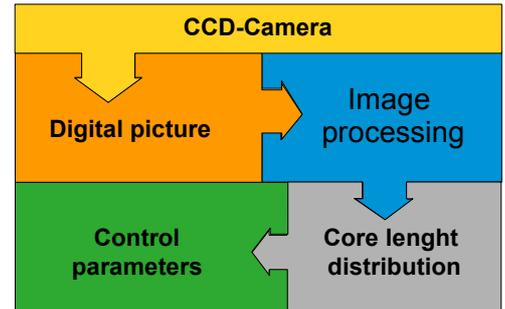
Our sensor for the photo-optical assessment of floc properties

The situation

So far, there was no possibility for an online assessment of flocculated particle system properties. Thus, the direct control of dewatering processes was not feasible. On the other hand, the dewatering properties of a flocculated system could be qualitatively evaluated by optical parameters.

Our solution

The new developed analyser is an optical instrument. The conditioned sludge is automatically sampled by a CCD-line scan camera fixed transverse to the flow direction. The sludge is analysed online. The image processing does not identify isolated structures of the particles but rather special characteristics of the sludge. The particle or floc size distribution in terms of cumulative run length distribution has been calculated by interpretation of spatial extrema distribution of the line scan. With this method an online monitoring is realised and there is no need for preparation of the sample.



Functional scheme FlocSens

The FlocSens is suitable for stationary application in pipes or is available as laboratory unit.

In stationary application the sensor is linked directly to the main piping or is bypassing the main volume. An over pressure of 6 bars is acceptable. The preferred flow velocity is in the range of 0,1 to 0,5 m/sec.

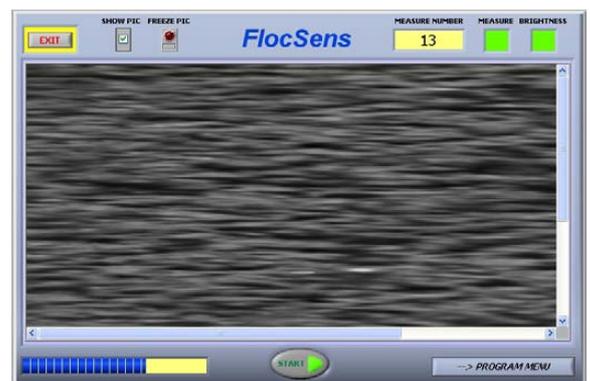
The lab unit offers the possibility to analyse e.g. the shear stability or the dewaterability of the flocs / particle systems in dependence of the polymer used.

A reproducible polymer screening will allow the optimization of your process parameters.



Different types of floc structures

The calculated values are specific for your process and can be calibrated.



Flocculation image FlocSens

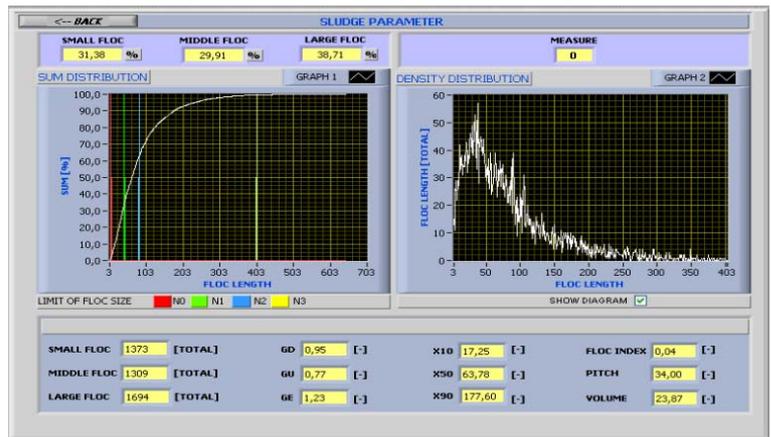
FlocSens screen of floc size distribution

FlocSens is easy to maintain. The light sources are LEDs with an average lifetime of about 80.000 hours. A flushing unit is part of the process sensor.

The new and international patent protected photo-optical online sensor FlocSens evaluates the floc properties by using a CCD-camera. The measuring system correlates the signal with empirical data. The sensor will give specific information e.g. for following variables:

- floc size distribution and changes of it
- shear stability of the flocs
- effectiveness of your flocculation agent
- the estimated dewaterability of the sludge / particle system

The software of FlocSens could be easily adapted to your special conditions and is a universal tool for the characterization of any flocculation processes.



FlocSens is the optimal completion of our FlocFormer process for the conditioning of municipal sewage sludge

The advantages at a glance

- quick and reproducible variables of floc or suspension properties
- control (even closed-loop control) of your process via online measurement system
- wide range of application due to parameter driven software.

Talk to us about your special measurement or control requirements!



FlocSens for stationary process application





**Environmental
technology made
in Germany**

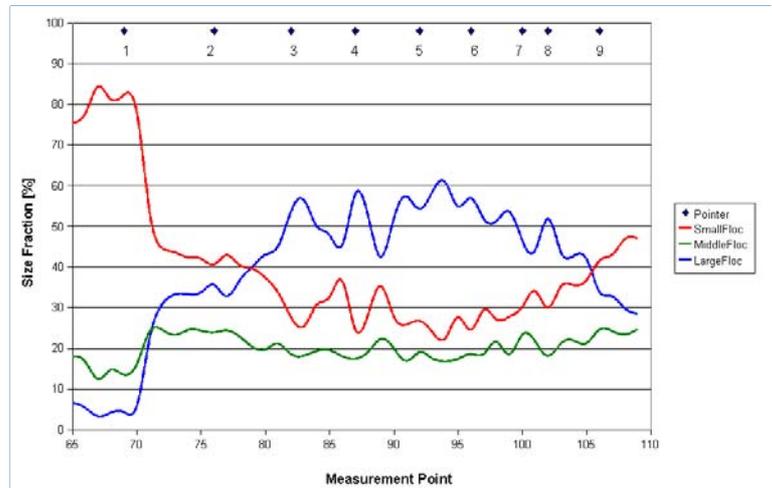
Example of a floc structure analysis in laboratory FlocSens application

As an example of a typical laboratory application the flocculation process of two different polymers, polymer A and polymer B, is determined. In the test procedure the flocculation in a beaker glass is analysed.

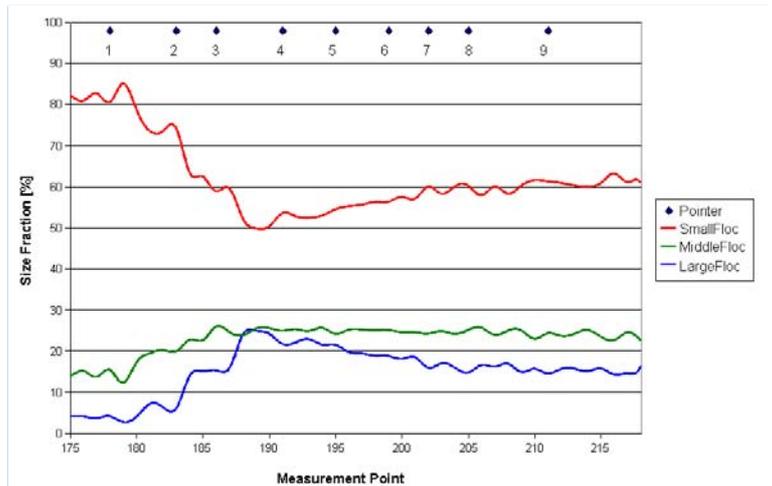
In the beginning of the trials the untreated sludge is stirred. After a while a specific amount of polymer is added to the sludge. This point is indicated by label 1. The floc size distribution of the sludge is changing. The diagram for polymer type A shows instantly a decrease of small floc structures (identified by the red line). The diagram for polymer B shows a significant change for the small structures not till then additional polymer is injected (label 2-4). Reciprocal the fraction of large flocs is increasing (blue line).

While the suspension is stirred further, more polymer is added (label 5-7). If the lines are horizontal the flocs are stable. In point 8 and 9 the velocity of the stirrer is increased and the shear rate is forced. Under the condition of the high shear rate the long term stability of the flocs can be analysed.

The result of the trials is obvious: because of the big floc sizes, polymer A is convenient for primary filtration processes. Because of the small and stable flocs polymer B is more adequate for centrifugal separation processes.



Example Polymer A



Example Polymer B

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aquen aqua-engineering gmbh

PO Box 11 28
D-38679 Langelsheim
Lange Straße 53
D-38685 Langelsheim
Germany

fon +49 (0) 5326-92977-0
fax +49 (0) 5326-92977-10
email: info@aquen.de
www.aquen.de