

Tracer Testing at Water & Wastewater Treatment Works

Tracer testing provides a valuable diagnostic service for measuring hydraulic or mixing performance on new or redesigned systems or where a change is required to the process design parameters. On existing systems where solids deposition may have occurred, tracer testing provides important information on active volume.

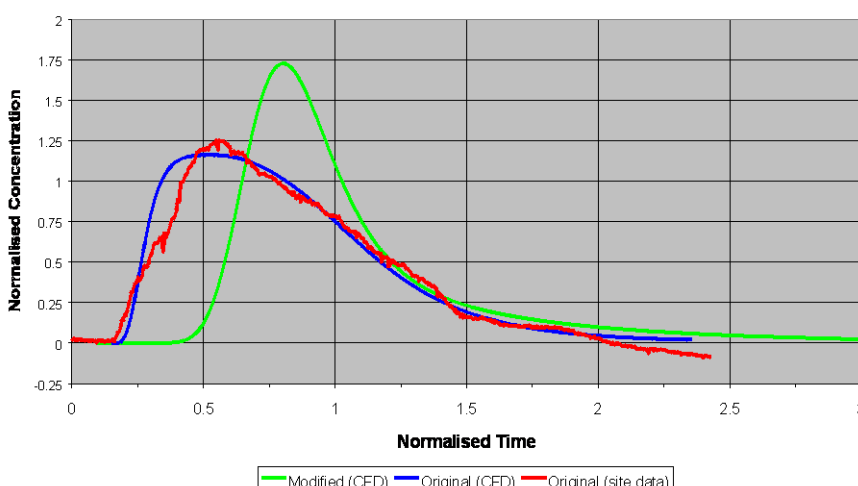
Measurement of Residence Time Distribution (RTD)

RTDs are useful for characterising flow patterns and diagnosing short-circuiting or stagnant zones in vessels. Modifications to tank geometries or the retrofit of baffles can then be implemented to improve flow patterns and process efficiency. RTDs are obtained by the rapid addition of a small amount of concentrated salt tracer solution and are produced by normalising the output tracer concentration-time traces.

Measurement of Coefficient of Variation (CoV)

Salt tracer can be added as a step input to allow the statistical determination of the quality of mixing (the coefficient of variation) to be determined. This technique is applicable to open channel, pipe or stirred tank systems and is particularly appropriate for the determination of mixing efficiencies at wastewater treatment works where chemical assisted sedimentation is employed

Comparison of Clarifier RTDs



Problems Diagnosed

- short-circuiting
- dead-zones
- poor quality treated water
- solids carry-over
- inadequate chemical dosing & mixing

Significant chemical cost savings and improved quality treated water can be achieved

Tracer Testing



Applications

- digesters
- mixers and mixing chambers
- activated sludge plant
- filters
- sedimentation tanks
- clarifiers
- contact tanks
- service reservoirs

The group performs tracer testing at both water and waste-water treatment plants

Lithium Chloride Tracer Testing in Digesters

LiCl tracer tests should be carried out over at least 3 - 4 hydraulic retention times of the digester. This ensures that the RTD curves plotted with the LiCl concentration is an exact representation of the mixing in the digester. During the early part of the mixing, samples are taken at shorter time intervals to compensate for the fact that the effect on the mixing characteristics is quite pronounced during the initial stages. As the retention time increases, the mixing performance gradually becomes less variable.

Tracer testing of your digester will determine the:

- mixing time or the feed sludge dispersal time
- mean sludge retention time and active volume
- short circuiting behaviour
- mixer performance compliance

For more details, please contact us or see our website

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