



TECHNICAL DATASHEET

# Langelier Index

ALS Environmental are able to analyse for a range of inorganic drinking water parameters in addition to the Langelier Index. These tests will be performed at our Drinking Water “Centre of Excellence” in Wakefield, Yorkshire. The laboratory holds a breadth of UKAS and Drinking Water Testing Specification (DWTS) accredited methods which provide our customers with additional confidence in our analytical data.

The Langelier Index is an approximate measure of the saturation degree of calcium carbonate (CaCO<sub>3</sub>) in water. It is calculated using the Hydrogen Ion (pH), Alkalinity (CaCO<sub>3</sub>), Calcium concentration, Total Dissolved Solids, and water temperature of a tap water sample.

The Langelier Index (LI) is calculated as follows:

$$LI = pH - pHS$$

pHS - Saturation pH  
pH - pH Value

LSI	Indication
LSI < 0	Water is undersaturated with respect to calcium carbonate. Undersaturated water has a tendency to remove existing calcium carbonate protective coatings in pipelines and equipment.
LSI = 0	Water is considered to be neutral. Neither scale-forming nor scale removing.
LSI > 0	Water is supersaturated with respect to calcium carbonate (CaCO <sub>3</sub> ) and scale forming may occur.

LSI (Carrier)	Indication
-2,0 < -0,5	Serious corrosion
-0,5 < 0	Slightly corrosion but non-scale forming
LSI = 0,0	Balanced but pitting corrosion possible
0,0 < 0,5	Slightly scale forming and corrosive
0,5 < 2	Scale forming but non corrosive

The Langelier Index is one of several tools used by water operators for stabilising water to control both internal corrosion and the deposition of scale. Water supply operators can optimise their water supply systems and identify leakage potentials with the Langelier Index.

Experience has shown that Langelier Index in the range of -1 to +1 has a relatively low corrosion impact on metallic components of the water supply. Langelier Index values outside this range may result in laundry stains or leaks.

Records from the DWI demonstrate that Drinking Water in England is generally considered to be ‘very hard’, with most areas of England exhibiting above 200 ppm for the calcium carbonate equivalent. Generally water is mostly hard in urban areas of England where soft water sources are unavailable.

**Reference:**

- Benefield, L., Judkins, J & Weand, B. 1982. Process Chemistry for Water and Wastewater Treatment. Prentice-Hall, Inc. Englewood Cliffs, New Jersey.
- Metcalf & Eddy, Inc. Wastewater Engineering Treatment and Reuse, Fourth Edition



