BOLETÍN TÉCNICO

CALCULATION OF SATURATION INDEX (LANGELIER) AND STABILITY INDEX (RYZNAR)

The Langalier index or calcium carbonate saturation index of a cooling water is of value in predicting the scaling or corrosive tendencies of the water. The index can be calculated for most cooling waters with reasonable accuracy by use of the data in table B-1. To compute the index it is necessary to know (1) the total alkalinity, (2) the calcium hardness, (3) the pH, (4) the approximate concentration of total dissolved solids, and (5) the maximum temperature of the water.

To determine the saturation index, obtain values of A, B, C, and D from table B-1, and calculate the saturation pH as follows:

$$pH = (9.3 + A + B) - (C + D)$$

Then using the actual pH of the water, calculate the index:

$$Saturation\ index = pH - pH$$

All values of the stability index will be positive, and values above 6.5 indicate a corrosive tendency, while values below 6.0 indicate a tendency to form scale.

Table B-1 Data for calculation of saturation and stability indexes

Total Solids	A	Calcium hardness	C	Total alkalinity	D
p.p.m		p.p.m $CaCo_3$		p.p.m $CaCo_3$	
50-350	0.1	10	0.6	10	1.0
400-1100	0.2	12	0.7	12	1.1
		14	0.8	14	1.2
		18	0.9	18	1.3
Temperature	B	23	1.0	23	1.4
C°	F°		28	1.1	28	1.5
		35	1.2	36	1.6
0	32	2.6	44	1.3	45	1.7
2	36	2.5	56	1.4	56	1.8
7	44	2.4	70	1.5	70	1.9
10	50	2.3	88	1.6	88	2.0
14	58	2.2	111	1.7	111	2.1
18	64	2.1	139	1.8	140	2.2

22	72	2.0	175	1.9	177	2.3
28	82	1.9	230	2.0	230	2.4
32	90	1.8	280	2.1	280	2.5
38	100	1.7	350	2.2	360	2.6
44	112	1.6	440	2.3	450	2.7
51	124	1.5	560	2.4	560	2.8
57	134	1.4	700	2.5	700	2.9
64	148	1.3	870	2.6	880	3.0
72	162	1.2	1050	2.7		
82	180	1.1				