

**Relationship between Electrical Conductivity (EC -  $\mu\text{S}/\text{cm}$ ), salinity concentration, chloride concentration and Practical Salinity Units**

EC @25°C	Salinity ppt or g/l	Salinity ppm or mg/l	Cl ppm or mg/l	PSU	EC @25°C	Salinity ppt or g/l	Salinity ppm or mg/l	Cl ppm or mg/l	PSU
100	0.05	51	31	0.07	5000	2.68	2678	1626	2.41
200	0.10	97	59	0.12	6000	3.25	3253	1975	2.88
300	0.14	144	88	0.17	7000	3.84	3836	2328	3.33
400	0.19	193	117	0.22	8000	4.43	4426	2687	3.79
500	0.24	241	147	0.27	9000	5.02	5022	3049	4.24
600	0.29	291	177	0.32	10000	5.62	5625	3414	4.69
700	0.34	341	207	0.37	12000	6.85	6846	4155	5.57
800	0.39	391	237	0.42	14000	8.09	8087	4909	6.44
900	0.44	442	268	0.47	16000	9.35	9345	5673	7.31
1000	0.49	493	299	0.52	18000	10.62	10621	6447	8.15
1200	0.60	596	362	0.61	20000	11.91	11911	7230	8.99
1400	0.70	699	425	0.71	22000	13.22	13215	8022	9.82
1600	0.80	804	488	0.81	24000	14.53	14534	8822	10.64
1800	0.91	910	552	0.90	26000	15.86	15865	9630	11.45
2000	1.02	1016	617	1.00	28000	17.21	17208	10446	12.25
2200	1.12	1123	682	1.10	30000	18.56	18564	11268	13.04
2400	1.23	1231	747	1.19	32000	19.93	19931	12098	13.82
2600	1.34	1339	813	1.29	34000	21.31	21309	12935	14.60
2800	1.45	1448	879	1.38	36000	22.70	22699	13778	15.37
3000	1.56	1558	946	1.48	38000	24.10	24099	14629	16.13
3200	1.67	1668	1012	1.57	40000	25.51	25510	15485	16.88
3400	1.78	1778	1080	1.67	42000	26.93	26932	16348	17.63
3600	1.89	1889	1147	1.76	44000	28.36	28364	17217	18.37
3800	2.00	2001	1215	1.85	46000	29.81	29806	18093	19.10
4000	2.11	2113	1283	1.95	48000	31.26	31259	18975	19.83
4200	2.23	2225	1351	2.04	50000	32.72	32722	19863	20.56
4400	2.34	2338	1419	2.13	52000	34.19	34195	20757	21.27
4600	2.45	2451	1488	2.23	54000	35.68	35678	21657	21.99
4800	2.56	2565	1557	2.32					

**NB There is no direct conversion between many of these units.  
The above information is a guide only and where relationships between values have been established, they are specific to Hickling Broad water quality data only**

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## Background Information

1. EC is the specific conductivity in microsiemens/cm.
2. PSU values given above have been calculated using the equation below. If specific conductance values have been compensated to 25 °C and water depths are sufficiently shallow making pressure corrections unnecessary, salinity can be calculated from specific conductance values using standard equations. Schemel (2001), following principles of the 1978 Practical Salinity Scale, simplified the general equation for salinity described by Lewis (1980) for the case of a single temperature (25 °C) and atmospheric pressure (760 mm):  
$$\text{Salinity} = 0.012 + (0.2174 * ((\text{SC}/1000)/53.087)^{0.5}) + (25.3283 * ((\text{SC}/1000)/53.087)^1) + (13.7714 * ((\text{SC}/1000)/53.087)^{1.5}) + (-6.4788 * ((\text{SC}/1000)/53.087)^2) + (2.5842 * ((\text{SC}/1000)/53.087)^{2.5})$$
  
Only use this equation if you have SPECIFIC conductivity compensated to 25 degrees C. For a complete reference see page 36 of (no www) [pubs.usgs.gov/tm/2006/tm1D3/pdf/TM1D3.pdf](http://pubs.usgs.gov/tm/2006/tm1D3/pdf/TM1D3.pdf)
3. The practical salinity unit (PSU) values are unitless, and approximately equal to parts per thousand.
4. Salinity refers to the mass of salt (dissolved ions) in a given mass of water

Molecular mass NaCl  
Na = 22.95  
Cl = 35.45  
NaCl = 58.4

Hickling specific relationship between Cl and conductivity  Conductivity = Chloride / 0.2903
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Hickling Broad water quality data supplied by the Environment Agency.

5. Further information

<http://www.salinometry.com/>

<http://www.seawatersolutions.com/>

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Dan Hoare, Broads Authority - 15th October 2010

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