

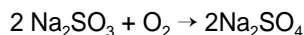


# DOWEX Ion Exchange Resins

## The Removal of Oxygen and Chlorine from Water

### The Removal of Oxygen

Dissolved oxygen can be reduced by using sodium sulfite according to following reaction:



Based on this equation, a minimum of 7.87 mg  $\text{Na}_2\text{SO}_3$  is necessary per mg dissolved  $\text{O}_2$ . The table shows levels required to remove different amounts of dissolved oxygen:

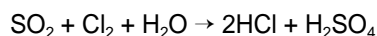
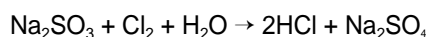
Dissolved Oxygen		Sodium Sulfite (theoretical amount)	
cc/liter**	mg/l	mg/l	lbs/ 1000 gal.
0.1	0.14	1.1	0.0094
0.2	0.29	2.3	0.019
0.3	0.43	3.4	0.028
0.4	0.57	4.5	0.038
0.5	0.72	5.6	0.047
1.0	1.4	11.3	0.094
2.0	2.9	22.5	0.19
5.0	7.2	56.3	0.47
10.0	14.3	112.5	0.94

\*\*1 cc dissolved oxygen per liter = 1.43 mg/l

1 mg/l dissolved oxygen = 0.698 cc/liter

### The Removal of Chlorine

Chlorine is a strong oxidant and may readily degrade ion exchange resins. Chlorine levels in water can be reduced using sulphur dioxide or sodium sulphite according to following reactions:



Per gram of chlorine to remove, one needs to add a minimum of 0.91 gram of  $\text{SO}_2$  or 1.78 gram of  $\text{Na}_2\text{SO}_3$ . This leads to following amounts of reducing agents to add per 1000 liter of water for the given chlorine levels:

$\text{Cl}_2$ mg/l	$\text{Na}_2\text{SO}_3$ (theoretical amount)		$\text{SO}_2$ (theoretical amount)	
	g/1000 l	lbs/1000 gal.	g/1000 l	lbs/ 1000 gal.
0.1	0.18	0.0015	0.09	0.00075
0.5	0.89	0.0075	0.45	0.0038
1	1.78	0.015	0.91	0.0075
2	3.56	0.030	1.82	0.015
3	5.34	0.045	2.73	0.0225
4	7.12	0.06	3.64	0.03
5	8.90	0.075	4.55	0.038
10	17.80	0.15	9.10	0.075

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# DOWEX

## Ion Exchange Resins

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**WARNING:** Oxidizing agents such as nitric acid attack organic ion exchange resins under certain conditions. This could lead to anything from slight resin degradation to a violent exothermic reaction (explosion). Before using strong oxidizing agents, consult sources knowledgeable in handling such materials.

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