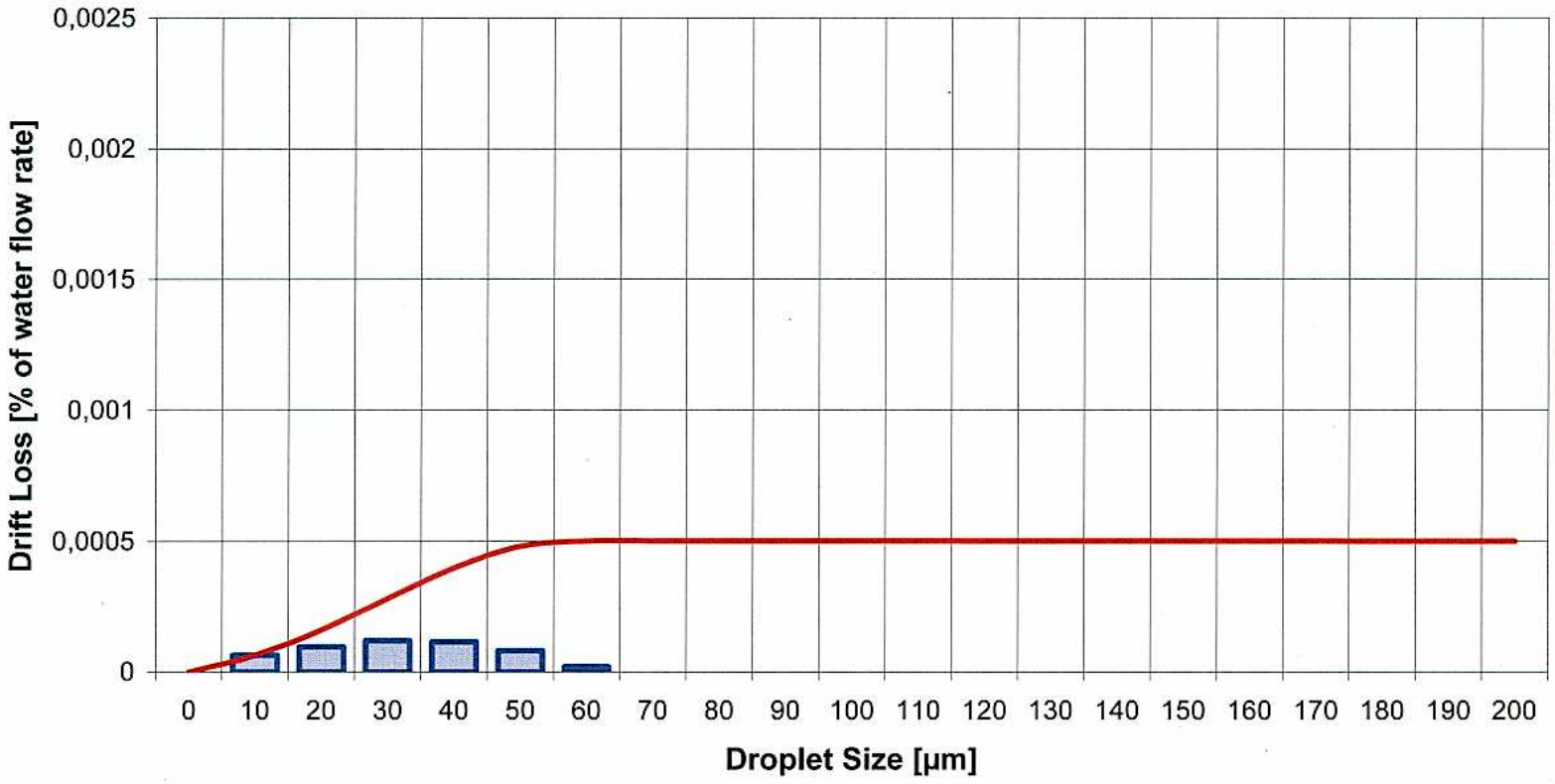
Cooling Tower Drift Loss (Standard Data)

SPX Cooling Technologies
Balcke | Hamon Dry Cooling | Marley

Drift Loss as a Function of the Droplet Size
(Total Drift Loss = 0.0005% of water flow rate)



Droplet Drift Rate for CTS Cooling Towers

Methodology for calculating salt particle size from drift droplets taken from "Calculating Realistic PM10 Emissions from Cooling Towers", Reisman and Frisbie, *Environmental Progress*, July 2002. Drift droplet sizes estimated from SPX Drift Loss Curve for 0.0005% assumed to be representative of 0.0004% drift efficiency tower.

Salt Content	1.75	wt. %	MACTEC estimate for annual average worst-case
Cycles of Concentration	2		From CCNPP Unit 3 ER, Table 3.4-2
Salt Density	2.20	gm/cc	From Reisman and Frisbie

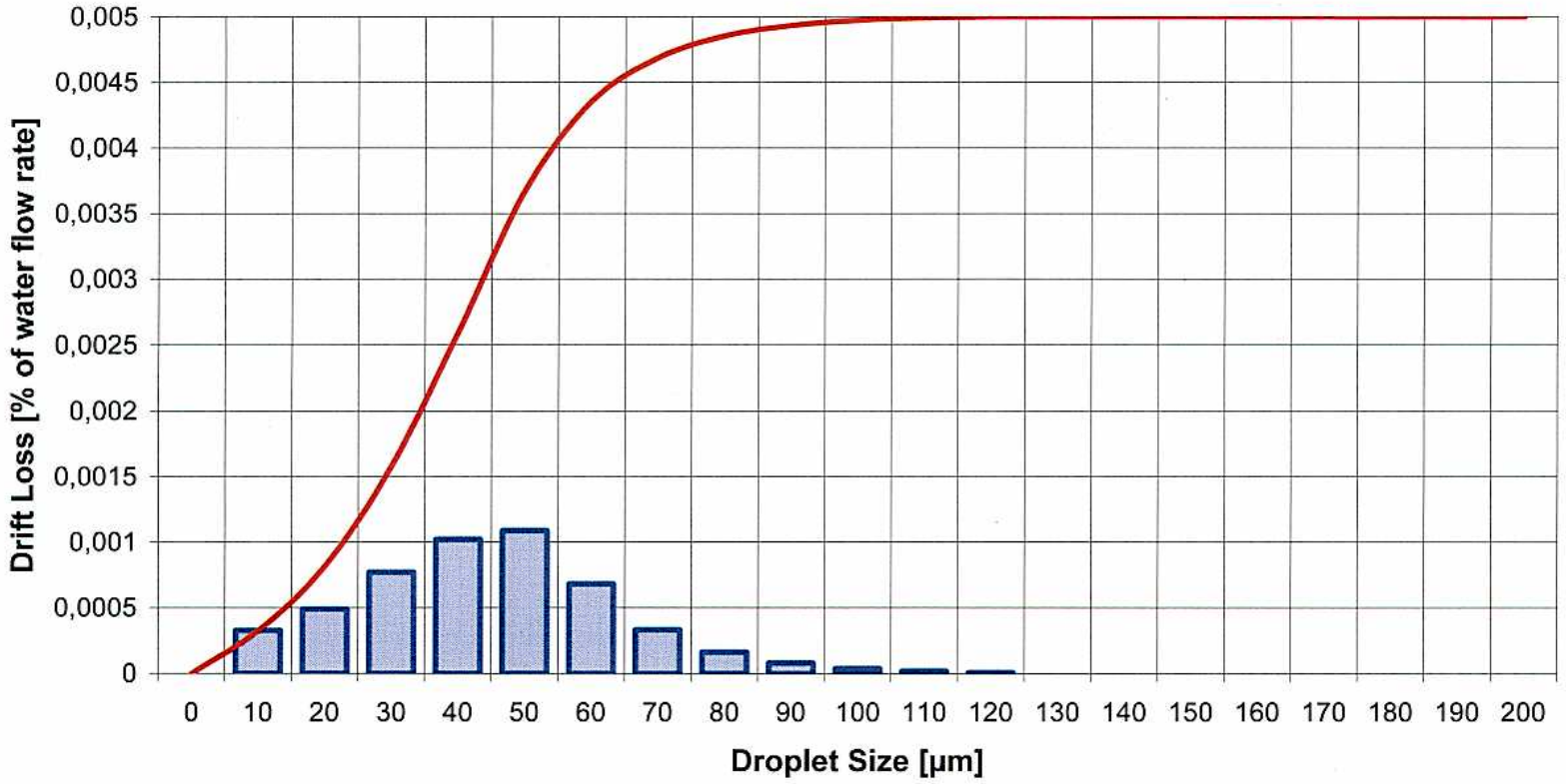
Droplet Diameter (um)	Droplet Volume (cu. um)	Droplet Mass (ug)	Droplet Salt mass (ug)	Droplet Salt Volume (cu. um)	Salt Droplet Diameter (um)	Droplet Fraction (Estimated from SPX Figure)	Droplet Fraction Contributing to Particles Below 10 um	Droplet Fraction Contributing to Particles Below 2.5 um		Calculated Droplet Size Distribution* (Percent)
10	524	5.2E-04	1.8E-05	8.3E+00	2.5	0.00007	0.00007	0.13	Total	13.0
20	4,189	4.2E-03	1.5E-04	6.7E+01	5.0	0.00010	0.00010		Fraction	18.5
30	14,137	1.4E-02	4.9E-04	2.2E+02	7.5	0.00013	0.00013		2.5 um &	24.1
40	33,510	3.4E-02	1.2E-03	5.3E+02	10.1	0.00012	0.00012		below	22.2
50	65,450	6.5E-02	2.3E-03	1.0E+03	12.6	0.00009	0.8	Total		16.7
60	113,097	1.1E-01	4.0E-03	1.8E+03	15.1	0.00003		Fraction 10		5.6
70	179,594	1.8E-01	6.3E-03	2.9E+03	17.6	0		um & below		0
80	268,083	2.7E-01	9.4E-03	4.3E+03	20.1	0				0
90	381,704	3.8E-01	1.3E-02	6.1E+03	22.6	0				0
100	523,599	5.2E-01	1.8E-02	8.3E+03	25.2	0				0
110	696,910	7.0E-01	2.4E-02	1.1E+04	27.7	0				0
120	904,779	9.0E-01	3.2E-02	1.4E+04	30.2	0				0
						0.00055	Total			100.0

* e.g., 0.00007 / 0.00055 x 100 = 13%

Cooling Tower Drift Loss (Standard Data)

SPX Cooling Technologies
Balcke | Hamon Dry Cooling | Marley

Drift Loss as a Function of the Droplet Size
(Total Drift Loss = 0.005% of water flow rate)



Droplet Drift Rate for ESWS Cooling Towers

Methodology for calculating salt particle size from drift droplets taken from "Calculating Realistic PM10 Emissions from Cooling Towers", Reisman and Frisbie, *Environmental Progress*, July 2002. Drift droplet sizes estimated from SPX Drift Loss Curve for 0.005.

Influent Salt Content for ESWS Towers	0.37	wt. %	TDS Content in feed water from desalination plant, taken from Calvert Cliffs Desalination Study, Table 4.4.1, based on 50% recovery
Cycles of Concentration	2		From CCNPP Unit 3 ER, Table 3.4-3
Salt Density	2.20	gm/cc	From Reisman and Frisbie

Droplet Diameter (um)	Droplet Volume (cu. um)	Droplet Mass (ug)	Droplet Salt mass (ug)	Droplet Salt Volume (cu. um)	Salt Droplet Diameter (um)	Droplet Fraction (Estimated from SPX Figure)	Droplet Fraction Contributing to Particles Below 10 um	Droplet Fraction Contributing to Particles Below 2.5 um		Calculated Droplet Size Distribution* (Percent)
10	524	5.2E-04	3.9E-06	1.8E+00	1.5	0.00033	0.00033	0.0003		6.4
20	4,189	4.2E-03	3.1E-05	1.4E+01	3.0	0.00050	0.00050	0.0005		9.7
30	14,137	1.4E-02	1.1E-04	4.8E+01	4.5	0.00083	0.00083	0.16	Total Fraction 2.5 um & below	16.1
40	33,510	3.4E-02	2.5E-04	1.1E+02	6.0	0.00104	0.00104			20.1
50	65,450	6.5E-02	4.9E-04	2.2E+02	7.5	0.00108	0.0011			20.9
60	113,097	1.1E-01	8.4E-04	3.8E+02	9.0	0.00071	0.0007			13.7
70	179,594	1.8E-01	1.3E-03	6.1E+02	10.5	0.00033	0.0003			6.4
80	268,083	2.7E-01	2.0E-03	9.1E+02	12.0	0.00017	0.93	Total Fraction 10 um & below		3.2
90	381,704	3.8E-01	2.8E-03	1.3E+03	13.5	0.00008				1.6
100	523,599	5.2E-01	3.9E-03	1.8E+03	15.0	0.00004				0.8
110	696,910	7.0E-01	5.2E-03	2.4E+03	16.5	0.00002				0.4
120	904,779	9.0E-01	6.7E-03	3.1E+03	18.0	0.00003				0.6
TOTAL						0.00518				100.0

* e.g., 0.00033 / 0.00518 x 100 = 6.4%