

APPROXIMATE ACID DEW POINTS AND CORROSION RATES

SO2 In flue gas	Approx. H2S in fuel	Approx. S in fuel	ADP		Approx. Corrosion Rates	
[ppmv]	[ppmv]	[WT%]	[°C]	[°F]	[mm/year]	[in/year]
0.1	1		74	164	0.00053	0.00002
0.5	5		87	188	0.00271	0.00011
1	10		92	198	0.00547	0.00022
2	20		98	208	0.01104	0.00043
3	30		101	214	0.01665	0.00066
4	40		103	218	0.02229	0.00088
5	50		105	221	0.028	0.001
6	60		107	224	0.034	0.001
7	70		108	226	0.039	0.002
8	80		109	228	0.045	0.002
9	90		110	230	0.051	0.002
10	100	0.005	111	232	0.056	0.002
20	200	0.011	117	242	0.114	0.004
30	300	0.016	120	248	0.171	0.007
40	400	0.022	122	252	0.229	0.009
50	500	0.027	124	255	0.288	0.011
75	755	0.041	127	261	0.433	0.017
100	1010	0.055	130	265	0.580	0.023
200	2020	0.11	135	275	1.169	0.046
300	3030	0.17	139	281	1.8	0.07
400	4040	0.22	141	285	2.4	0.09
500	5060	0.28	143	289	3.0	0.12
600	6075	0.33	144	291	3.6	0.14
700	7090	0.39	145	294	4.2	0.16
800	8110	0.44	147	296	4.8	0.19
900	9135	0.5	147	297	5.4	0.21
1000	10160	0.6	148	299	6.0	0.23
2000	20500	1.1	154	309	12	0.47
3000	31000	1.7	157	315	18	0.71
4000	41700	2.2	160	319	24	1.0
5000	52600	2.8	161	322	30	1.2

Notes:

Acid Dew Points calculated based on Oxygen: 1.7 vol% and Water: 17 vol%.

Corrosion Rates calculated based on regular C.S. and turbulent flow.

The above values are only meant for quick estimation on corrosivity of a flue gas containing SO2

$$K_p = \frac{pSO_3}{pSO_2 \times \sqrt{pO_2}} \quad K_{p_{clean}} = e^{\frac{11373}{T} - 10.75} \quad T(K)$$

$$ADP = 69.5 + 18.7 \times \log_{10}(P_{gas} \times ySO_3) + 17.2 \times \log_{10}(P_{gas} \times yH_2O) \quad T(^{\circ}C), P_{gas} (Pa \text{ abs}), y(\text{vol fraction})$$

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