

# Moisture in compressed air system

## Solutions 1 - Pre-cooler



One of the most simple way to solve the moisture in your compressed air system is look into your compressed air temperature discharged out from the compressors.

### **Fact 1**

Most of the dryer manufacturer designed their dryers based on operating temperature of 35°C and operating pressure of 7 bar (g).

### **Fact 2**

For air cooled compressor, the discharged compressed air temperature is normally 10 ~ 15°C above the ambient temperature, which means, if your compressor room temperature is 35°C, your compressed air discharged temperature will be 45 ~ 50°C.

### **Fact 3**

Air receiver tank is not designed to cool down the air temperature, the purpose of the receiver tank is to stabilize the air pressure.

### **Solutions**

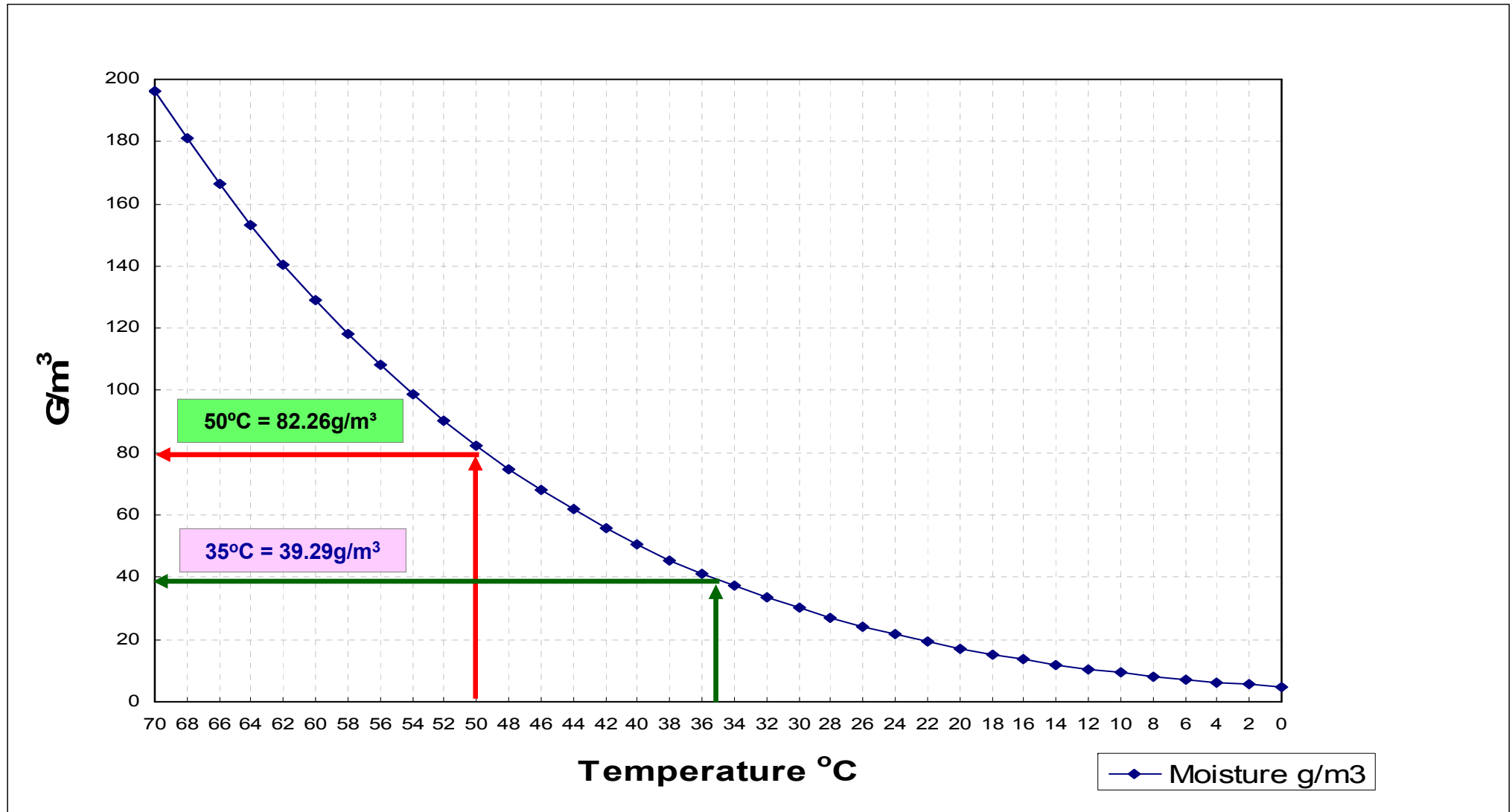
One of the best way to solve this problems is to install a pre-cooler upstream of the dryer, by reducing the air temperature from 50°C to 35°C, you are able to reduce the moisture by approximately 50% before entering the dryers.

For a typical 100hp compressor, to cool down your compressed air temperature from 50°C to 35°C, you only required about 2tons of cooling capacity from your existing cooling towers.

# The water content in the air at different temperature

Dew Point °C	Moisture g/m <sup>3</sup>	Dew Point °C	Moisture g/m <sup>3</sup>	Dew Point °C	Moisture g/m <sup>3</sup>	Dew Point °C	Moisture g/m <sup>3</sup>	Dew Point °C	Moisture g/m <sup>3</sup>	Dew Point °C	Moisture g/m <sup>3</sup>
100	588.21	72	212.65	44	61.77	16	13.53	-12	1.80	-40	0.117
99	569.07	71	204.29	43	58.82	15	12.74	-13	1.65	-41	0.104
98	550.38	70	196.21	42	55.99	14	11.99	-14	1.51	-42	0.093
97	532.13	69	188.42	41	53.27	13	11.28	-15	1.38	-43	0.083
96	514.40	68	180.86	40	50.67	12	10.60	-16	1.27	-44	0.075
95	497.21	67	173.58	39	48.18	11	9.96	-17	1.15	-45	0.067
94	480.39	66	166.51	38	45.59	10	9.36	-18	1.05	-46	0.060
93	464.12	65	159.65	37	43.51	9	8.78	-19	0.96	-47	0.054
92	448.31	64	153.10	36	41.32	8	8.23	-20	0.88	-48	0.048
91	432.89	63	146.77	35	39.29	7	7.73	-21	0.80	-49	0.043
90	417.94	62	140.66	34	37.23	6	7.25	-22	0.73	-50	0.038
89	403.38	61	134.68	33	35.32	5	6.79	-23	0.66	-51	0.034
88	389.23	60	129.02	32	33.49	4	6.36	-24	0.60	-52	0.030
87	375.47	59	123.50	31	31.74	3	5.95	-25	0.55	-53	0.027
86	362.12	58	118.20	30	30.08	2	5.57	-26	0.51	-54	0.024
85	340.19	57	113.13	29	28.49	1	5.21	-27	0.46	-55	0.021
84	336.66	56	108.20	28	26.97	0	4.87	-28	0.41	-56	0.019
83	324.47	55	103.45	27	25.52	-1	4.49	-29	0.37	-57	0.017
82	311.62	54	98.88	26	24.14	-2	4.14	-30	0.33	-58	0.015
81	301.19	53	94.48	25	22.83	-3	3.89	-31	0.30	-59	0.013
80	290.02	52	90.25	24	21.58	-4	3.51	-32	0.27	-60	0.011
79	279.28	51	86.17	23	20.39	-5	3.24	-33	0.24	-65	0.0064
78	268.81	50	82.26	22	19.25	-6	2.98	-34	0.22	-70	0.0033
77	258.83	49	78.49	21	18.19	-7	2.75	-35	0.20	-75	0.0013
76	248.84	48	74.87	20	17.15	-8	2.54	-36	0.18	-80	0.0006
75	239.35	47	71.40	19	16.17	-9	2.34	-37	0.16	-85	0.00025
74	230.14	46	68.06	18	15.25	-10	2.16	-38	0.14	-90	0.00010
73	221.21	45	64.85	17	14.37	-11	1.96	-39	0.13		

# The ability of air to hold moisture is depending on air temperature



# Reduce moisture in compressed air system with pre-cooler

