



## DEW POINT TEMPERATURE

*The temperature at which 100% relative humidity  
or "saturation" is reached and condensation starts to form.*

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### Percent Relative Humidity

Dry Bulb Temp. Degrees F	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%	100%
5	-35	-30	-25	-21	-17	-14	-12	-10	-8	-6	-5	-4	-2	-1	1	2	3	4	5
10	-31	-25	-20	-16	-13	-10	-7	-5	-3	-2	0	2	3	4	5	7	8	9	10
15	-28	-21	-16	-12	-8	-5	-3	-1	1	3	5	6	8	9	10	12	13	14	15
20	-24	-16	-11	-8	-4	-2	2	4	6	8	10	11	13	14	15	16	18	19	20
25	-20	-15	-8	-4	0	3	6	8	10	12	15	16	18	19	20	21	23	24	25
30	-15	-9	-3	2	5	8	11	13	15	17	20	22	23	24	25	27	28	29	30
35	-12	-5	1	5	9	12	15	18	20	22	24	26	27	28	30	32	33	34	35
40	-7	0	5	9	14	16	19	22	24	26	28	29	31	33	35	36	38	39	40
45	-4	3	9	13	17	20	23	25	28	30	32	34	36	38	39	41	43	44	45
50	-1	7	13	17	21	24	27	30	32	34	37	39	41	42	44	45	47	49	50
55	3	11	16	21	25	28	32	34	37	39	41	43	45	47	49	50	52	53	55
60	6	14	20	25	29	32	35	39	42	44	46	48	50	52	54	55	57	59	60
65	10	18	24	28	33	38	40	43	46	49	51	53	55	57	59	60	62	63	65
70	13	21	28	33	37	41	45	48	50	53	55	57	60	62	64	65	67	68	70
75	17	25	32	37	42	46	49	52	55	57	60	62	64	66	69	70	72	74	75
80	20	29	35	41	46	50	54	57	60	62	65	67	69	72	74	75	77	78	80
85	23	32	40	45	50	54	58	61	64	67	69	72	74	76	78	80	82	83	85
90	27	36	44	49	54	58	62	66	69	72	74	77	79	81	83	85	87	89	90
95	30	40	48	54	59	63	67	70	73	76	79	82	84	86	88	90	91	93	95
100	34	44	52	58	63	68	71	75	78	81	84	86	88	91	92	94	96	98	100

### Principles of Water Vapor

Water vapor exists as a gas which moves independently of the air, from areas of high water vapor pressure to areas of low water vapor pressure. Air is capable of holding a specific amount of water depending on its temperature. Warmer air can hold more water vapor than does cooler air. The term "relative humidity" indicates the quantity of moisture in the air as a percentage of the maximum it can hold at a given temperature. When the air is cooled without removing water vapor, the relative humidity increases.

Water vapor moves from high pressure areas to low pressure areas. A building interior maintained at 70 degrees F and 40% RH has a water vapor pressure of almost .30" Hg. If the outside air has a temperature of 25 degrees F and a relative humidity of 80%, the water vapor pressure is only .10" of Hg. In this example, the water pressure inside the building is almost 3 times that of the outside air. Consequently, the water vapor attempts to move from the interior through structural components and other building materials to the lower pressure outside the building.

### Dew Point

The Dew point is the temperature at which 100% Relative Humidity or "saturation" is reached. Water vapor that contacts a surface that is below this temperature will start to condense to its liquid state. The shaded area on the graph shown above indicates that air with a temperature of 70 degrees and an RH of 65% will condense on a surface that is at 57 degrees F.

### Vapor Retarders & Insulation

A vapor retarder is any material that effectively slows the movement of moisture from a point of high vapor pressure to one of lower vapor pressure. A material with a perm rating (degree of ability to restrict water vapor transmission) of "1" or less is considered to be a vapor retarder. The primary method of controlling condensation is through adequate ventilation, although in a steel building it is also controlled using insulation with a vapor retarder. The combination of these two items effectively moves the dew point to a location that is less harmful to the structure - typically above or the cold side of the vapor retarder.

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