

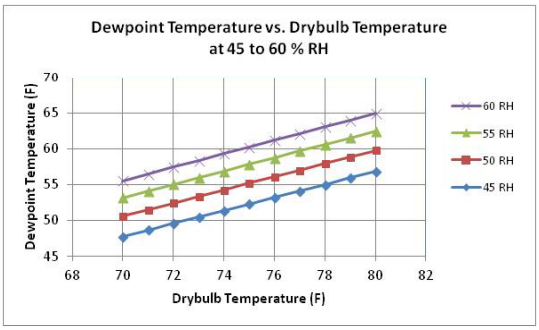


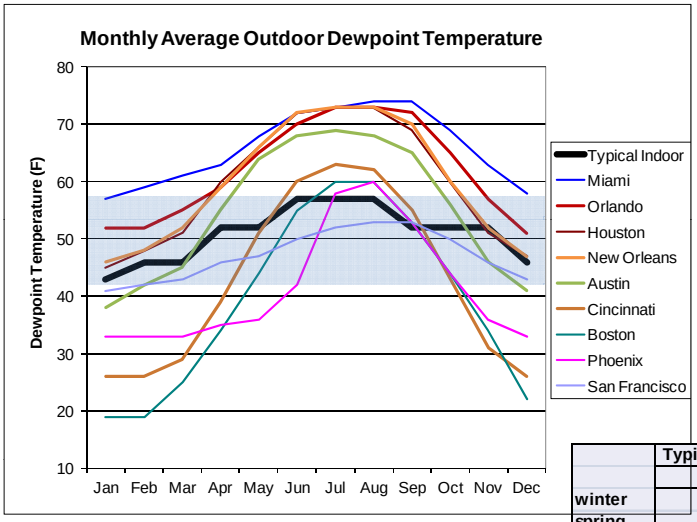
Recommended Approaches To Humidity Control In High Performance Homes

BSC Building America Expert Meeting
10/16/2012 Westford, MA

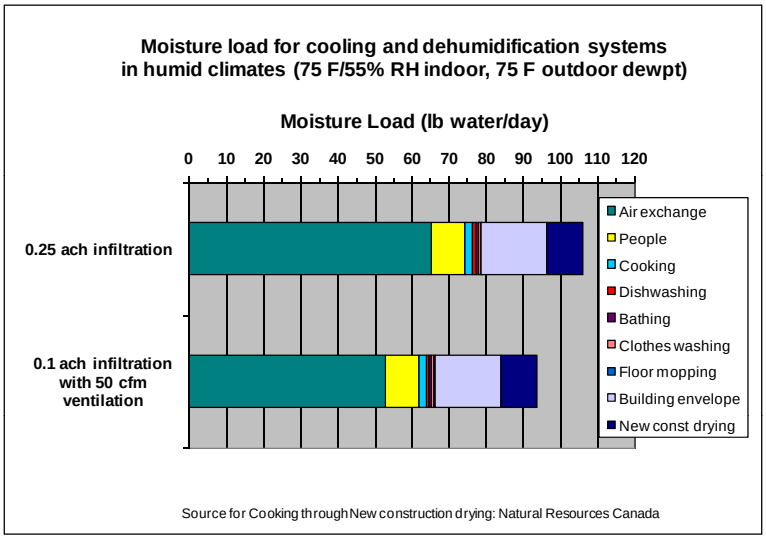
Drybulb Temp (F)	Dewpoint Temperature (F) at given RH (%)			
	45	50	55	60
70	48	51	53	56
71	49	52	54	56
72	50	52	55	57
73	50	53	56	58
74	51	54	57	59
75	52	55	58	60
76	53	56	59	61
77	54	57	60	62
78	55	58	61	63
79	56	59	62	64
80	57	60	62	65

= supply air temperature





	Typical Indoor (humid climate)		
	Tdb	RH	Tdp
winter	72	40	46
spring	75	45	52
summer	77	50	57
fall	75	45	52



Source for Cooking through New construction drying: Natural Resources Canada

Conventional Cooling System Dehumidification Enhancements

AHU Dehumidification Enhancement Features	Carrier[1]	Lennox	Goodman[2]	ICP[3]	Nordyne[4]
Variable speed airflow	FV4	CBX32MV	AVPTC	FVM	B4VM
Selectable cooling/heat pump/heating fan speed/airflow	✓	✓	✓	✓	✓
Selectable airflow Adjustment (+/- %)	✓	✓	✓	✓	
Selectable constant fan speed/airflow	✓		w/ communicating tstat	✓	✓
Selectable fan delay after cooling can be zero	✓	✓		✓	✓
Dehum fan profile with lower airflow for a time		82% for first 7.5 min	82% for first 7.5 min		75% for first 10 min
Receives Dehum signal from tstat or dehumidistat	✓	✓	✓	✓	✓
Dehum logic is 0 Vac on humidity rise	✓	✓	✓		✓
Dehum logic is 24 Vac on humidity rise				✓	
Lower cooling airflow if RH is above RH setpoint	80%	60% to 70%		80%	✓
Extended cooling after thermostat setpoint reached	✓	✓			
Intermittent super-low cfm/ton during extended cooling	50%, 10 min on/off				

[1] Carrier includes Bryant
[2] Goodman includes Amana
[3] ICP includes Comfortmaker, Tempstar, Heil, Arcocaire, Day&Night, Keep Rite
[4] Nordyne includes Frigidaire, Gibson, Westinghouse, Tappan, Kelvinator, Philco, Nutone

Proposed humidity control test conditions for central dehumidifying equipment

Performance map data needs at each test condition and at each equipment control state
For dehumidifer equipment with both indoor and outdoor heat transfer components

		Outdoor T/RH/Tdp (F/%/F)	Inlet T/RH/Tdp (F/%/F)	Outlet T/RH/Tdp (F/%/F)	Indoor Wet-coil Airflow (cfm)	Sensible Cooling Capacity[1] (Btu/h)	Latent Cooling Capacity (Btu/h)	Moisture Removal Capacity (L/h)	Total Power (kW)	Moisture Removal Efficiency[2] (L/kW-h)
Summer, full sensible load[3]	Test 1a	95/58/78	80/60/65							
	Test 1b	""	78/55/61							
	Test 1c	""	75/50/55							
Summer, part sensible load[3]	Test 2a	80/85/75	80/60/65							
	Test 2b	""	78/55/61							
	Test 2c	""	75/50/55							
Spring-Fall, part sensible load[3]	Test 3a	75/85/70	78/60/63							
	Test 3b	""	78/55/61							
	Test 3c	""	75/50/55							
Winter, latent load only[3]	Test 4a	65/90/62	72/60/57							
	Test 4b	""	70/52/52							
	Test 4c	""	68/45/46							

[1] Negative cooling capacity denotes net heat added from inlet to outlet
[2] Same units as the USDOE and USEPA Energy Factor for dehumidifiers
[3] All tests with steady wet coil

	Air entering outdoor unit			Air entering indoor unit			Comment
	drybulb (F)	RH%	dewpoint (F)	drybulb (F)	RH (%)	dewpoint (F)	
ARI ratings (67 indoor wetbulb)	95	40	67	80	51	60	45 F saturated suction
AHAM dehumidifier rating				80	60	65	