

SD.H Series **Honeycycle** Dehumidifiers

It is proven that the hygroscopic materials used in the plastics industry such as nylon, polycarbonate, polyester etc. and not be dried effectively by conventional hot air drying systems because those systems are dependent on ambient conditions and are relatively inefficient in reducing moisture content.

These materials demand a steady 'low dew-point' dry air and constant drying temperature which guarantee a residual moisture content of 0.02% or even less. Once this is achieved, these engineering plastics can exhibit their optimum physical performance and surface finish. Efficient desiccant dryers can also help the moulder avoid difficulties such as material shrinkage, splash and sink-marks because these dryers operate in a closed loop system with the dew-point of the dried air being down to -50°C which accelerates the moisture transfer from the plastic granules to the dry air.

The SD.H series of Honeycycle dehumidifiers have been designed and built using the **'Rotating Honeycomb'** principle. A purpose built desiccant rotor slowly turns through a continuous cycle of dehumidification, regeneration and cooling thus providing a near

constant delivery of low dew-point dehumidified air (better than multi-tower desiccant dryers).

The closed loop circuit design eliminates the risk of moisture re-absorption and hence, is suitable for polymer drying applications involving particularly large quantities of hygroscopic materials.

Features include:

- Accurate P.I.D. temp controller provides digital setting and display of regeneration temperature.
- 24-hour timer for auto start-up operation.
- Operation fault diagnosis.
- After cooler fitted as standard.
- Adjustable rotation speed of the desiccant rotor.
- Motor overload and phase reversal protection.
- Display of return air temperature.
- Dried air has a dew-point of down to -50°C .
- Electrical circuit built to comply with CE Safety Requirements.





Machine Control

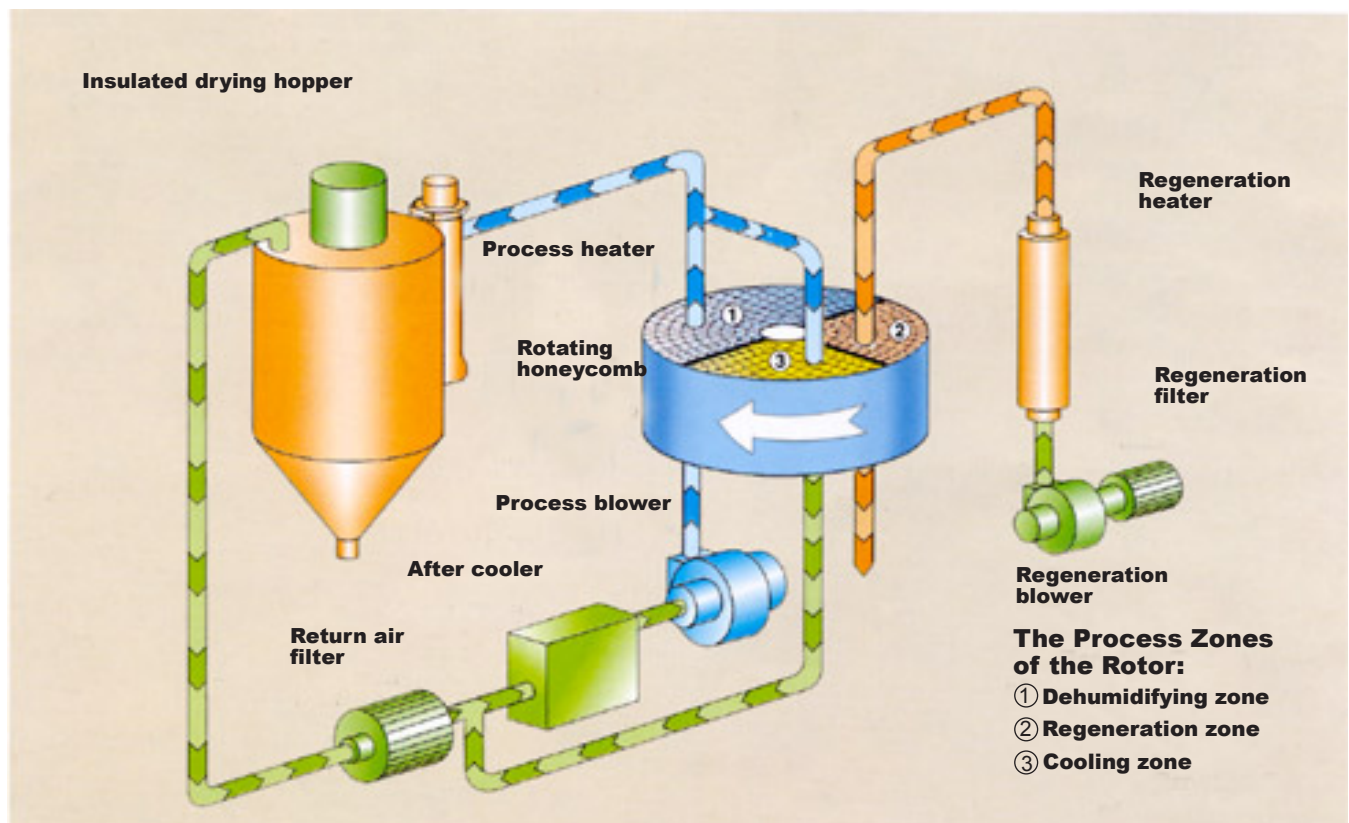
The machine control contains a P.I.D. temperature controller giving digital setting and display of regeneration temperature, 24-hr timer of auto start-up, display of return air temperature, and audible and visual alarms. Dew-point monitor with 'high' alarm and process heater are optional features.



What is Honeycle?

The molecular sieve and silica gel are strongly bonded to ceramic fibres inside the rotor by special chemical crystallisation therefore, the rotor does not produce any powder and offers an extremely long service life. Moist air passes through numerous small holes in the rotor (desiccant) which efficiently absorbs the moisture therefore, the air departing from the rotor is thoroughly dehumidified and produces extremely low dew-point dry air. Regeneration is operated under the same principle but in reverse direction through the rotor (desiccant).

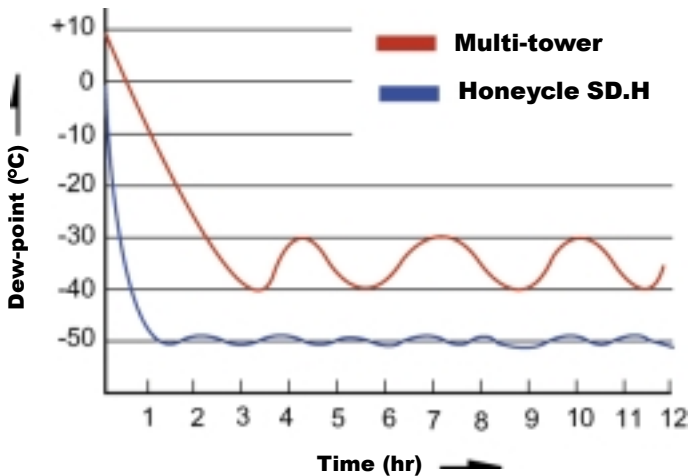
The Dehumidifying Principle



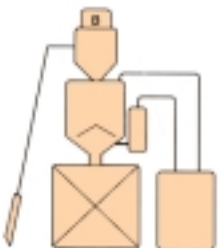
Hygrometric Equivalents

Dew-point (°C)	Relative Humidity (%)	Moisture Content	
		PPM	%
+20	100	23,072	2.307
+10	52.50	12,117	1.212
0	26.10	6,027	0.603
-10	11.20	2,574	0.257
-20	4.40	1,025	0.103
-30	1.60	378	0.038
-40	0.60	128	0.013
-50	0.20	39	0.004

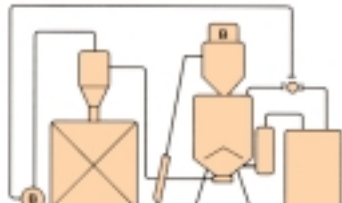
Dew-point Comparison



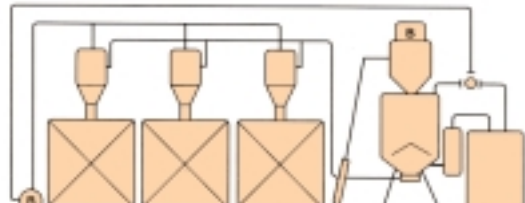
Typical Installation



Individual drying station 1
(on the processing machine)



Individual drying station 2
(beside the processing machine)



Central drying station
(one material for several processing machines)

Drying/Loading Combination



Drying Capacities Kg/hour

Material	Drying ⁽¹⁾ Temp.(°C)	Drying ⁽²⁾ Time (hr)	Moisture Content(%)	Specific Heat	Drying Capacity ⁽²⁾ / SD.H model								
					100	150	200	300	400	500	700	1000	1500
ABS	80	2-3	0.2-0.6	0.34	60	90	120	180	240	300	420	600	900
POM	100	2	0.08-0.25	0.35	60	90	120	180	240	300	420	600	900
PMMA	80	3	0.1-0.7	0.35	60	90	120	180	240	300	420	600	900
IONOMER	90	3-4	1.4	0.55	40	60	80	120	160	200	280	400	600
PA6 / 6.6	75	4-6	1.2-5	0.40	40	60	80	120	160	200	280	400	600
PA11	75	4-5	1.0-1.5	0.58	35	50	70	105	140	175	225	350	500
PA12	75	4-5	1.0-1.5	0.28	35	50	70	105	140	175	225	350	500
PC	120	2-3	0.3-0.36	0.28	60	90	120	180	240	300	420	600	900
PU	90	2-3	0.2-0.9	0.45	60	90	120	180	240	300	420	600	900
PBT	130	3-4	0.08-0.34	0.3-0.5	40	60	80	120	160	200	280	400	600
PE	90	1	0.01	0.55	100	150	200	300	400	500	700	1000	1500
PET	160	4-5	0.08	0.3-0.5	30	40	60	90	120	150	210	300	450
PPO	110	1-2	0.13	0.40	60	90	120	180	240	300	420	600	900
PI	120	2	0.32	0.27	60	90	120	180	240	300	420	600	900
PP	90	1	0.02	0.46	100	150	200	300	400	500	700	1000	1500
PS (GP)	80	1	0.01	0.28	100	150	200	300	400	500	700	1000	1500
PSU	120	3-4	0.22	0.31	60	90	120	180	240	300	420	600	900
PVC	70	1-2	0.1-0.4	0.20	100	150	200	300	400	500	700	1000	1500
SAN (AS)	80	1-2	0.1-0.3	0.32	60	90	120	180	240	300	420	600	900

Note: (1) In an independent drying hopper.

(2) Base on relative humidity 65% with ambient temperature of 20°C, moisture content after drying can be 0.005% or less.

Specifications

SD.H model		100	150	200	300	400	500	700	1000	1500	
Dry air flow rate	m ³ /hr	100	150	200	300	400	500	700	1000	1500	
Lowest dew-point	°C	-50									
Process blower power	kW	0.75	0.75	1.9	2.6	1.87*	2.2*	3.7*	5.5*	7.5*	
Regen. Blower power	kW	0.2	0.37	0.75	0.75		1.9		2.6	1.5*	
Regeneration heater	kW	3.5	4	5.4	7.2		10		15	30	
In/outlet pipe diameter	inch	2"		2-1/2"		3"		4"		5"	6"
Required cooling water flow**	L/min	7.7	11.6	15.5	23.2	30.9	38.7	54.1	77.4	116.1	
Cooling capacity**	Kcal/hr	2320	3480	4640	6960	9280	11600	16240	23200	34800	
Voltage (phase)	V	380 ~ 460 (3Ø)									
Width	mm	500	600			800			900	1200	
Depth	mm	780	1100			1380			1450	1500	
Height	mm	1270	1680			1790			1990	2200	
Weight (approx.)	kg	180	215	220	240	280	290	300	400	510	
Largest adaptable hot air dryer (hopper dryer)	litre	160 (SHD100)	250 (SHD150)	350 (SHD200)	500 (SHD300)	600 (SHD400)	850 (SHD600)	1200 (SHD800)	1650 (SHD1000)	2500	

* Those models use high-efficiency turbo blower.

** Base on the condition of "before" air temperature at 100°C and "after" air temperature at 20°C, and using 10°C chilled water.

Options include:

- Dew-point monitor with 'high' dew-point alarm. (denotes 'D')
- Filter for eliminating oil.
- Built-in process heater. (denotes 'P')
- Insulated hot air dryer.
- Hopper loader.

How to specify the right model

To obtain best efficiency, apply 85 to 90% drying capacity to the table shown below.

For example:

For drying 80 kg/hr of PET, the SD300H would be recommended.

How to size the correct hopper dryer

Capacity of hopper dryer (litres) \geq [Material throughput (kg/hr) ÷ bulk density] X Drying time (hr) }

For example:

For drying 80 kg/hr of PET, choose to use the SHD300A will be appropriate (in case of 4 hours drying time).