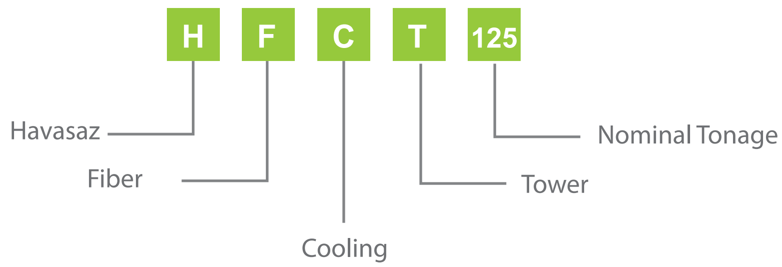
HAVASAZ
Life Is Cool Air Conditioning since 1967

COOLING TOWER


LEGG MASON
LEGG MASON
erica


H
F
C
T
125
Havasaz
Fiber
Cooling
Tower
Nominal Tonage

Cooling tower

A cooling tower is a heat rejection device, which extracts waste heat to the atmosphere though the cooling of a water stream to a lower temperature. The type of heat rejection in a cooling tower is termed "evaporative" in that it allows a small portion of the water being cooled to evaporate into a moving air stream to provide significant cooling to the rest of that water stream.

The heat from the water stream transferred to the air stream raises the air's temperature and its relative humidity to %100, and this air is discharged to the atmosphere. Evaporative heat rejection devices such as cooling towers are commonly used to provide significantly lower water temperatures than achievable with "air cooled" or "dry" heat rejection devices, like the radiator in a car, thereby achieving more cost-effective and energy efficient operation of systems in need of cooling. Think of the times you've seen something hot be rapidly cooled by putting water on it, which evaporates, cooling rapidly, such as an overheated car radiator.

The cooling potential of a wet surface is much better than a dry one.

Common applications for cooling towers are providing cooled water for air-conditioning, manufacturing and electric power generation. The smallest cooling towers are designed to handle water streams of only a few gallons of water per minute supplied in small pipes like those might see in a residence, while the largest cool hundreds of thousands of gallons per minute supplied in pipes as much as 15 feet (about 5 meters) in diameter on a large power plant.

The generic term "cooling tower" is used to describe both direct (open circuit) and indirect (closed circuit) heat rejection equipment. While most think of a "cooling tower" as an open direct contact heat rejection device, the indirect cooling tower, sometimes referred to as a "closed circuit cooling tower" is nonetheless also a cooling tower.

A direct, or open circuit cooling tower is an enclosed structure with internal means to distribute the warm water fed to it over a labyrinth-like packing or "fill."

The fill provides a vastly expanded air-water interface for heating of the air and evaporation to take place.

The water is cooled as it descends through the fill by gravity while in direct contact with air that passes over it.

The cooled water is then collected in a cold water basin below the fill from which it is pumped back through the process to absorb more heat. The heated and moisture laden air leaving the fill is discharged to the atmosphere at a point remote enough from the air inlets to prevent its being drawn back into the cooling tower.

The fill may consist of multiple, mainly vertical, wetted surfaces upon which a thin film of water spreads (film fill), or several levels of horizontal splash elements which create a cascade of many small droplets that have a large combined surface area (splash fill).

An indirect, or closed circuit cooling tower involves no direct contact of the air and the fluid, usually water or a glycol mixture, being cooled. Unlike the open cooling tower, the indirect cooling tower has two separate fluid circuits.

One is an external circuit in which water is recirculated on the outside of the second circuit, which is tube bundles (closed coils) which are connected to the process for the hot fluid being cooled and returned in a closed circuit.

Air is drawn through the recirculating water cascading over the outside of the hot tubes, providing evaporative cooling similar to an open cooling tower.

In operation the heat flows from the internal fluid circuit, through the tube walls of the coils, to the external circuit and then by heating of the air and evaporation of some of the water, to the atmosphere.

Operation of the indirect cooling towers is therefore very similar to the open cooling tower with one exception.

The process fluid being cooled is contained in a "closed" circuit and is not directly exposed to the atmosphere or the recirculated external water.

In a counter-flow cooling tower air travels upward through the fill or tube bundles, opposite to the downward motion of the water.

In a cross-flow cooling tower air moves horizontally through the fill as the water moves downward.

Cooling towers are also characterized by the means by which air is moved. Mechanical-draft cooling towers rely on power-driven fans to draw or force the air through the tower. Natural-draft cooling towers use the buoyancy of the exhaust air rising in a tall chimney to provide the draft.

A fan-assisted natural-draft cooling tower employs mechanical draft to augment the buoyancy effect. Many early cooling towers relied only on prevailing wind to generate the draft of air.

If cooled water is returned from the cooling tower to be reused, some water must be added to replace, or make-up, the portion of the flow that evaporates. Because evaporation consists of pure water, the concentration of dissolved minerals and other solids in circulating water will tend to increase unless some means of dissolved-solids control, such as blow-down, is provided.

Some water is also lost by droplets being carried out with the exhaust air (drift), but this is typically reduced to a very small amount by installing baffle-like devices, called drift eliminators, to collect the droplets.

The make-up amount must equal the total of the evaporation, blow-down, drift, and other water losses such as wind blowout and leakage, to maintain a steady water level.

Some useful terms, commonly used in the cooling tower industry:

Drift - Water droplets that are carried out of the cooling tower with the exhaust air.

Drift droplets have the same concentration of impurities as the water entering the tower.

The drift rate is typically reduced by employing baffle-like devices, called drift eliminators, through which the air must travel after leaving the fill and spray zones of the tower.

Blow-out - Water droplets blown out of the cooling tower by wind, generally at the air inlet openings.

Water may also be lost, in the absence of wind, through splashing or misting. Devices such as wind screens, louvers, splash deflectors and water diverters are used to limit these losses.

Plume - The stream of saturated exhaust air leaving the cooling tower. The plume is visible when water vapor it contains condenses in contact with cooler ambient air, like the saturated air in one's breath fogs on a cold day. Under certain conditions, a cooling tower plume may present fogging or icing hazards to its surroundings.

Note that the water evaporated in the cooling process is "pure" water, in contrast to the very small percentage of drift droplets or water blown out of the air inlets.

Blow-down - The portion of the circulating water flow that is removed in order to maintain the amount of dissolved solids and other impurities at an acceptable level.

Leaching - The loss of wood preservative chemicals by the washing action of the water flowing through a wood structure cooling tower.

Noise - Sound energy emitted by a cooling tower and heard (recorded) at a given distance and direction. The sound is generated by the impact of falling water, by the movement of air by fans, the fan blades moving in the structure, and the motors, gearboxes or drive belts.

HAVASAZ COOLING TOWER

INTRODUCTION

The technology of havasaz fiberglass cooling tower offered low maintenance and high performance, designed to provide cooled water for air-conditioning, manufacturing and electric power generation. The primary task of a cooling tower is to reject heat from hot water to the air.
FB Cooling tower are designed in counter-flow. The air movement is vertically upward through the fill by the fans, counter to the downward fall of the water.
Air and water are in direct contact to transmit of heat.
This configuration allows counter-flow towers to make more efficient use of available air.

TOTALLY CONSTRUCTED OF CORROSION-RESISTANT MATERIAL

Manufactured to provide durability at minimum maintenance, with corrosion-resistant materials even for motor and structural fill support.

SHELL CONSTRUCTION

- High strength fiberglass molding
- UV stabilized coating for long life and durability
- Designed to withstand high wind loads.

Design shall provide quick removal of single casing section for total
access to all components of tower for maintenance and service
and also shall prevent bacterial growth environment.
In addition, this lightweight, high strength material is virtually
impervious to any environmental condition or chemical in the circulating water.

INLET LOUVERS

- Fiberglass construction
- Easily removed for cleaning
- Vertical orientation to eliminate water loss
-Directs air flow for even distribution through wet deck
-Prevent sunlight exposure in tower basin, permitting easy access
to basin and diminishing noise

WET DECK

-Stacked honeycomb pattern maximize water and air flows for greater cooling efficiency
-PVC construction

FAN

Axial fans have aerodynamic blade profiles that are computer generated for optimum performance and efficiency. The material fan blades is of PPG and fiberglass or aluminum with lightweight and long-life.

LOW NOISE LEVEL

High efficiency fans directly driven by low speed motors provide low noise Operation level.

- THE COOLING TOWER IN HAVASAZ CONSTRUCTED IN DIFFERENT COLLORS WITH CONSIDERING CONDITION OF ENVIRONMENT

BENEFITS

Reduces annual maintenance non-corrosive composite structure is virtually Maintenance free

Reduced treatment costs-no caustic preservative treatment required

Low replacement tower costs -stocked replacement parts

Longer service life

Ease of maintenance

Optional Accessories

Basin Heaters

Cooling towers exposed to below freezing ambient temperatures require protection to prevent freezing of the water in the cold water basin when the unit is idle.

Factory-installed heaters, which maintain °40+F water temperature at °0F, are a simple and inexpensive way of providing such protection.

Electric Water Level Control Package

The electric water level control replaces the standard mechanical makeup valve when a more accurate water level control is required. This package consists of a conductance- actuated level control mounted in the basin and a slow-closing solenoid in the make-up water line. For water supply pressure greater than 40 psig, a surge suppressor may be required (by others).

Capacity Control (Variable Frequency Drives (VFD))

Fan cycling is the simplest method of capacity control for Series 3000 Cooling Towers.

The number of steps of capacity control can be doubled by using the ENERGY-MISER® Fan System or two-speed fan motors in conjunction with fan cycling.

The ENERGY-MISER® Fan System and two-speed fan motors also provide substantial energy savings when compared to simple fan cycling.

Engineering Considerations
Location

Cooling Towers must have an adequate supply of fresh air to all air inlets.

When units are located adjacent to building walls or in enclosures, care must be taken to ensure that the warm, saturated discharge air is not deflected and drawn back to the air inlets.

CAUTION: Each cooling tower should be located and positioned to prevent the introduction of the warm discharge air and the associated drift, which may contain chemical or biological contaminants, including Legionella, into the ventilation systems of the building on which the tower is located or those of adjacent buildings.

Piping and Valves

Piping should be sized and installed in accordance with good piping practice.

To prevent basin overflow at shutdown and to ensure satisfactory pump operation at start-up, all heat exchangers and as much tower piping as possible should be installed below the operating level of the tower.

All piping should be supported by pipe hangers or other supports, not by the cooling tower.

Cooling Towers may require flow balancing valves (supplied by others) at the hot water basin inlets to balance flow between the hot water basins or, to individual tower cells on multicell installations.

External shutoff valves (by others) may also be required if the system design necessitates the isolation of individual tower cells.

When multiple tower cells are used on a common system, equalizing lines should be installed between the basins of individual cells to assure balanced water level in all cells.

Water Treatment

As water evaporates in a cooling tower, the dissolved solids originally present in the water remain in the system. The concentration of these dissolved solids increases rapidly and can cause scale and corrosion.

In addition, airborne impurities and biological contaminants, including Legionella, may be introduced into the recirculating water. To control all potential contaminants, a water treatment program must be employed.

In many cases, a simple bleed-off will be adequate for control of scale and corrosion. However, biological contamination, including Legoinella, can be controlled through the use of biocides.

Accordingly, it is strongly recommended a biocide be initiated when the cooling tower system is first filled with water and continued regularly thereafter

The water treatment program employed must be compatible with the cooling tower materials of construction.

The pH of the circulating water system must be maintained between 7.0 and 9.0. Units constructed primarily of galvanized steel with a circulating water pH of 8.3 or higher will require periodic passivation of the galvanized steel to prevent the accumulation of white, waxy, non-protective zinc corrosion called white rust. Batch feeding of chemicals into the unit is not recommended. If units are constructed with the optional corrosion resistant materials, acid treatment may be considered; however the water quality must be maintained within the guidelines set forth in the Operating and Maintenance Instructions.

For specific recommendations on water treatment, contact a competent water treatment supplier.

Maintenance Checklist for:

Cooling Towers,

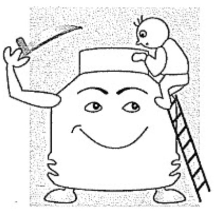
Inspect and clean as necessary:	Start-Up	Monthly	Quarterly	Annually	Shutdown
Inspect general condition of the unit [2] and check unit for unusual noise or vibration	√	√			
Inspect cold water basin/Spray nozzles	√		√		
Drain basin and piping			√		√
Inspect air inlet louvers/Combined inlet shields	√	√			
Check and adjust water level in basins	√	√			
Check operation of make-up valve	√	√			
Check and adjust bleed rate	√	√			
Inspect unit finish				√	

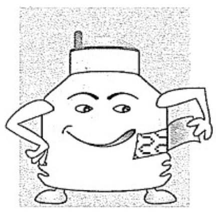
Mechanical equipment system:	Start-Up	Monthly	Quarterly	Annually	Shutdown
Check belt condition	√	√			
Adjust belt tension [3]	√		√		
Lubricate fan shaft bearings	√		√		√
Lubricate motor base adjusting screw	√		√		√
Check and lubricate optional gear drive	See product specific O&M Manual for detailed instructions and schedule				
Check drive alignment				√	
Check motor voltage and current	√		√		√
Clean fan motor exterior	√		√		
Check fan motor for proper rotation	√				
Check general condition of the fan			√		
Check and unplug fan drain holes (hollow blade fans)			√		
Check fan for uniform pitch			√		
Check fan for rotation without obstruction	√		√		
Check and recoat steel shafts with RUST VETO ®	√		√		√

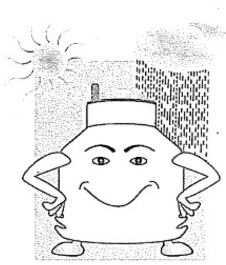
WARNING: Do not perform any service on or near the fans, motors, or drives, or inside the unit without first ensuring that the fans and pumps are disconnected and locked out.

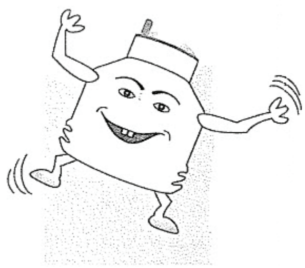
NOTES:

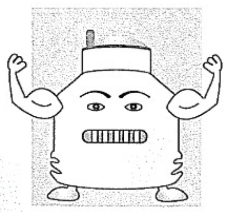
1. Recommended service intervals are the minimum for typical installations. Different environmental conditions may dictate more frequent servicing.
2. When operating in ambient temperatures below freezing, the unit should be inspected more frequently.
3. Tension on new belts must be readjusted after the first 24 hours of operation and quarterly, thereafter.

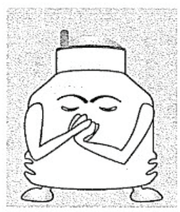

Havasaz high efficiency filling

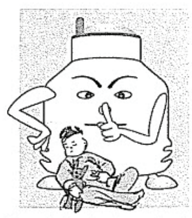

Self-rotating sprikler with low head loss

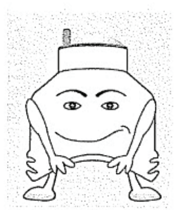

FRP construction OK in rain,hail or shine


Light weight and small


Strong FRP casing


Quiet operation from belt driven fan


Specially designed quiet fan


Non direction installation

GENERAL DATA

TABLE -1GENERAL DATA

MODEL	NOMINAL WATER (GPM)	NOZZLE HEAD (FT)	FAN			WEIGHT	
			MOTOR POWER(HP)	DIAMETER (MM)	NOMINAL AIR FOW(CFM)	DRY (KG)	OPR. (KG)
HFCT-8	28	5	1/4	600	3000	52	120
HFCT-10	35	5	1/4	600	3180	56	138
HFCT-15	53	6	1/2	800	6360	83	218
HFCT-20	71	6	1/2	800	7000	110	264
HFCT-25	88	6.5	1/2	800	7770	115	329
HFCT-30	105	7	1	900	8480	160	363
HFCT-40	141	7	1	900	9410	171	410
HFCT-50	176	8	1 1/2	900	11300	215	515
HFCT-60	212	9	2	1200	14500	399	708
HFCT-80	282	9	2	1200	17100	431	792
HFCT-90	318	10	2	1200	21800	549	854
HFCT-100	352	10	2	1200	24100	519	943
HFCT-125	442	12	3	1500	27500	629	1053
HFCT-150	528	12	5 1/2	1500	29700	789	1468
HFCT-175	618	13	5 1/2	1800	32900	874	1553
HFCT-200	705	15	5 1/2	1800	47100	1260	3043
HFCT-225	795	15	7 1/2	1800	57100	1462	3162
HFCT-250	880	16	7 1/2	2400	66500	1657	3357
HFCT-300	1050	16	7 1/2	2400	76900	1766	3479
HFCT-350	1230	17	10	2400	83500	1861	3861
HFCT-400	1410	17	15	2400	90700	2305	4305
HFCT-450	1580	18	15	3000	106500	2535	5818
HFCT-500	1770	18	15	3000	119500	2590	7155
HFCT-600	2120	19	15	3300	139500	3493	10588
HFCT-700	2460	19	20	3300	171000	3652	10747
HFCT-800	2830	21	25	3600	197100	5229	12808
HFCT-1000	3520	21	30	3600	217700	5449	13247
HFCT-1250	4400	22	30	4200	270700	6476	15458

DIMENSIONS & CONNECTIONS

MODEL	DIMENSION(MM)		PIPE CONNECTIONS(IN)					
	HIGHT	DIAMETER	INLET	OUTLET	OVER FLOW	DRAIN	FLOAT VALVE	QUICK FILL
HFCT-8	1400	930			1	1	1 1/2	-
HFCT-10	1630	930			1	1	1 1/2	-
HFCT-15	1680	1170	2	2	1	1	1 1/2	-
HFCT-20	1780	1380	2	2	1	1	1 1/2	-
HFCT-25	2200	1380	2	2	1	1	1 1/2	-
HFCT-30	1890	1630	3	3	1	1	1 1/2	-
HFCT-40	2000	1780	3	3	1	1	1 1/2	-
HFCT-50	2340	1870	3	3	1	1	1 1/2	-
HFCT-60	2370	1990	4	4	1 1/2	1 1/2	1 1/2	-
HFCT-80	2480	2100	4	4	1 1/2	1 1/2	1 1/2	-
HFCT-90	2350	2590	4	4	1 1/2	1 1/2	1 1/2	-
HFCT-100	2770	2590	4	4	1 1/2	1 1/2	1 1/2	-
HFCT-125	2800	2950	5	5	1 1/2	1 1/2	3/4	3/4
HFCT-150	2800	2950	5	5	1 1/2	1 1/2	3/4	3/4
HFCT-175	2800	3330	6	6	3	1 1/2	3/4	3/4
HFCT-200	2920	3710	6	6	3	1 1/2	1	1
HFCT-225	3150	3710	6	6	3	1 1/2	1	1
HFCT-250	3660	4390	6	6	3	1 1/2	1	1
HFCT-300	3280	4390	8	8	3	1 1/2	1	1
HFCT-350	3450	4850	8	8	3	1 1/2	1	1
HFCT-400	3680	4850	8	8	4	2	1	1
HFCT-450	4040	5510	10	10	4	2	2	2
HFCT-500	4270	5510	10	10	4	2	2	2
HFCT-600	4600	6530	10	10	4	2	2	2
HFCT-700	4830	6530	10	10	4	2	2	2
HFCT-800	5000	7590	12	12	4	3	3	3
HFCT-1000	5230	7590	12	12	4	3	3	3
HFCT-1250	5560	8790	12	12	4	3	3	3

SOUND POWER

TABLE-3-SOUND (dB)

MODEL	DISTANCE(M)		
	MESURED AT 15 M	MESURED AT TOWER DIAMETER	MESURED AT FAN DIAMETER & 45 DEG ANGEL
HFCT-8	44	53	57
HFCT-10	44	53	57
HFCT-15	45	56	61
HFCT-20	45	57	62
HFCT-25	45	57	62
HFCT-30	46	59	4
HFCT-40	47	60	65
HFCT-50	47	60	65
HFCT-60	49	61	67
HFCT-80	51	61	67
HFCT-90	52	62	69
HFCT-100	52	62	69
HFCT-125	55	65	72
HFCT-150	55	65	73
HFCT-175	57	66	74
HFCT-200	58	66	75
HFCT-225	58	67	76
HFCT-250	59	68	76
HFCT-300	59	69	77
HFCT-350	61	70	79
HFCT-400	61	71	79
HFCT-450	62	72	80
HFCT-500	63	73	82
HFCT-600	64	74	82
HFCT-700	65	74	84
HFCT-800	69	76	84
HFCT-1000	69	77	85
HFCT-1250	70	78	85

SELECTION EXAMPLE – DIAGRAM

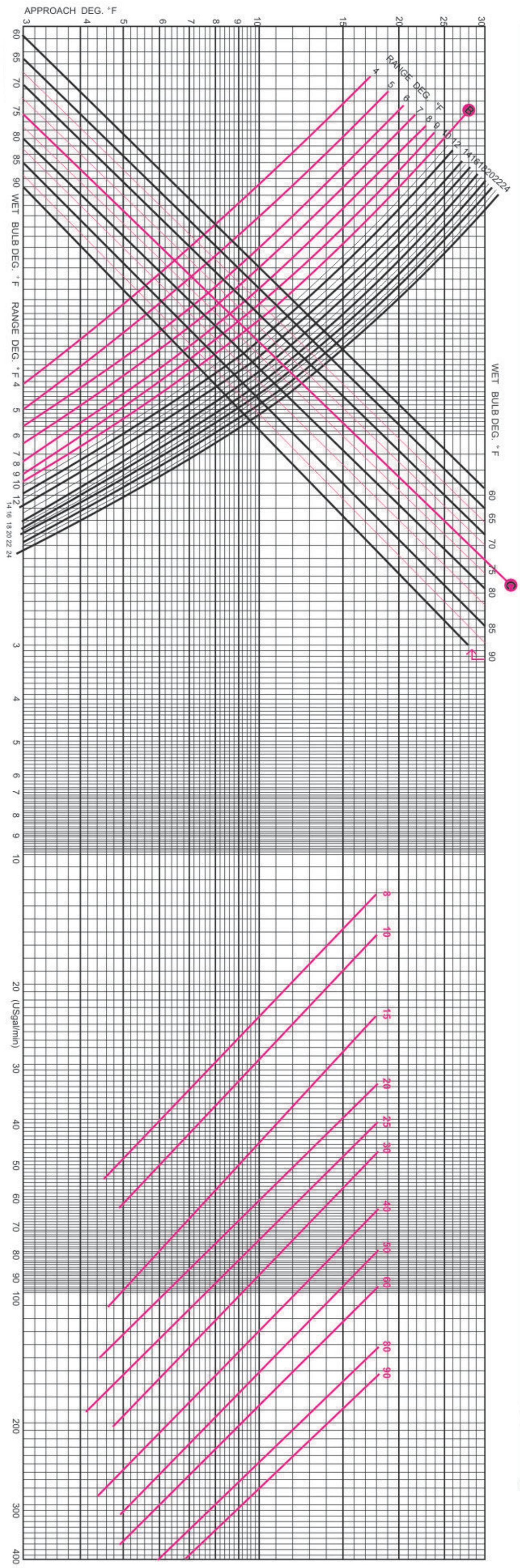
SELECTION EXAMPLE:

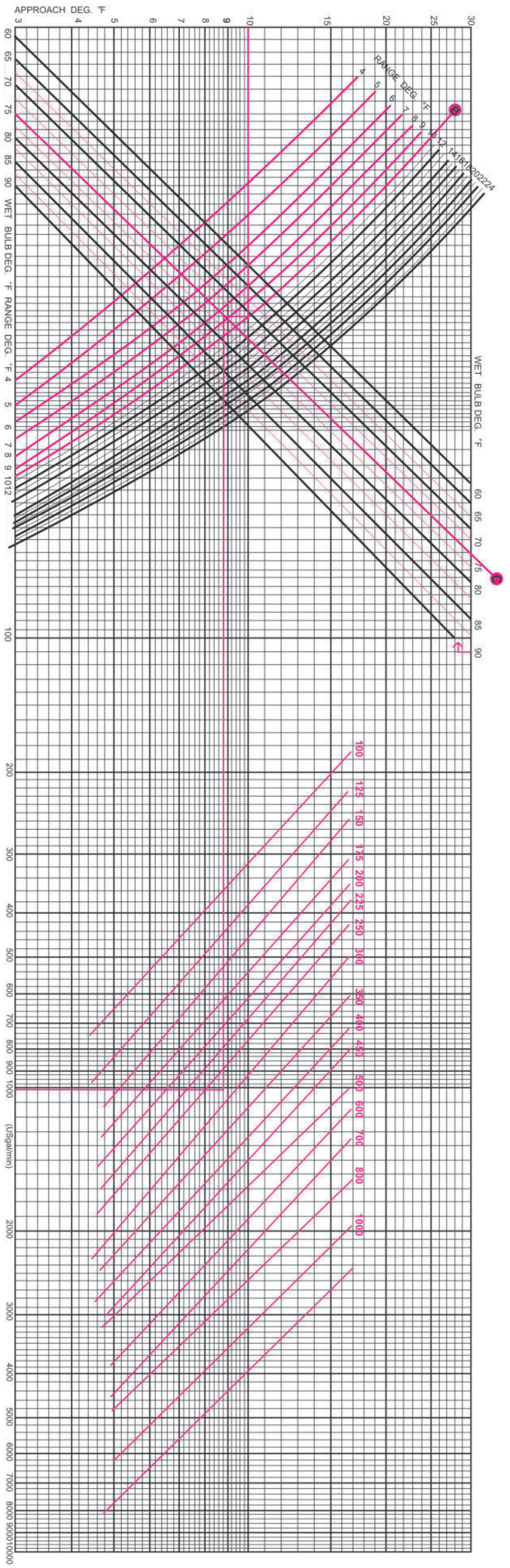
GIVEN:

to cool 1000 GPM of water from 95 °F to 85 °F at 75 °F wet bulb.
solution:
determine range;water inlet temp (95 °F)-water outlet temp. (85 °F)=10 °F
determine approach : water outlet temp (85 °F)-wet bulb temp. (75 °F) = 10 °F

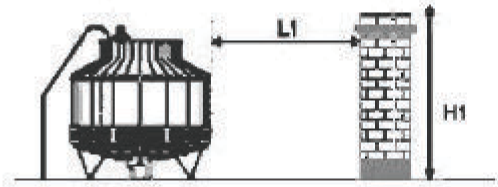
STEPS:

draw horizontal line on 10 °F approach of the selection chart up to range curve on 10 °F
from the contact point,draw vertical line to join wet bulb 75 °F curves.
Draw horizontal line from the contact point to seek crossing point with,vertical line
(water flow 1000 GPM).
the point we have is between or inside 300 curve,so the model is HFCT-300.


APPROACH DEG. °F
RANGE DEG. °F
WET BULB DEG. °F
(USgal/min)

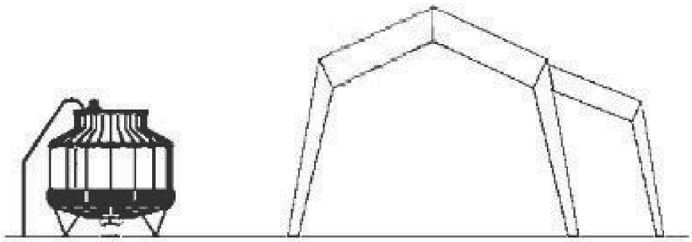

APPROACH DEG. °F
RANGE DEG. °F
WET BULB DEG. °F
WET BULB DEG. °F RANGE DEG. °F
(USgal/min)

INSTALLATION

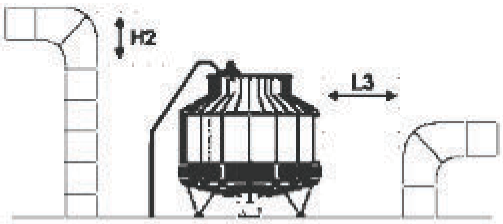


L1> Tower Diameter
H1< Tower Height

Any restriction in flow of fresh air or discharge of molst air will reduce thermal performance. We recommend you to place your cooling towers as far as its diameter away from any durrounding wall.

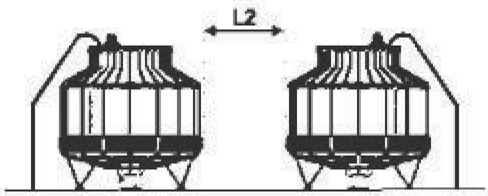


Always consider a proper location for you cooling tower. Top of your cooling lower Has to be always open to free air.



L3≥ 5m
H2≥1.5m

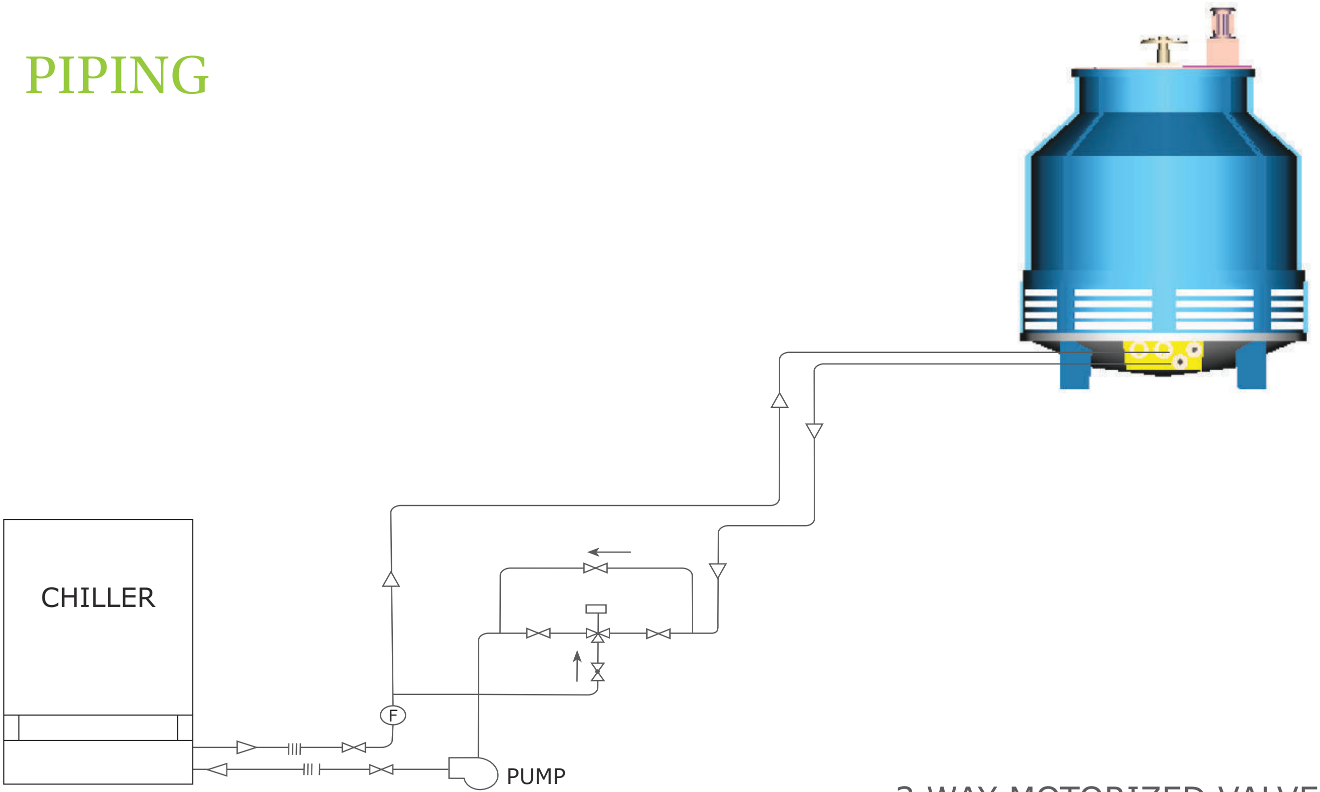
Make sure you have no low elevation exhaust located less than 5 meters around your cooling tower. If you can´t move them, elevate your exhaust duct 1.5 m above cooling tower´s discharge level.



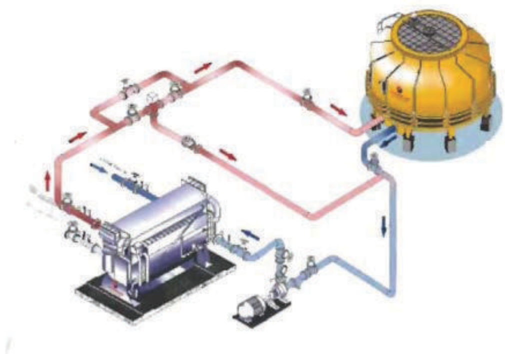
L2≥(Tower Diameter)/2

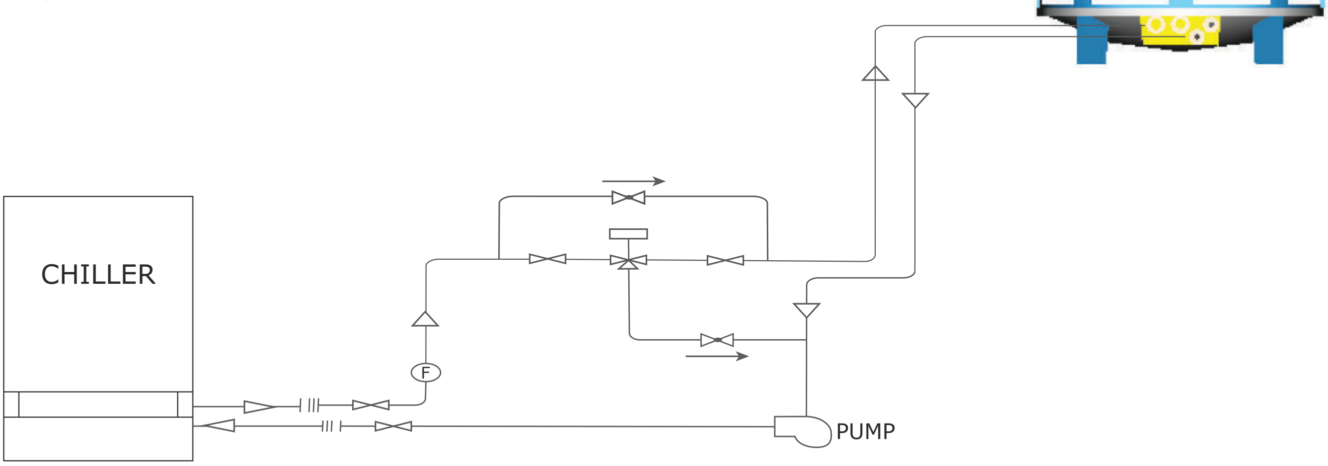
If you are using more than one unit, at least consider a half of cooling tower diameter between unis to prevent air recirculation.

PIPING



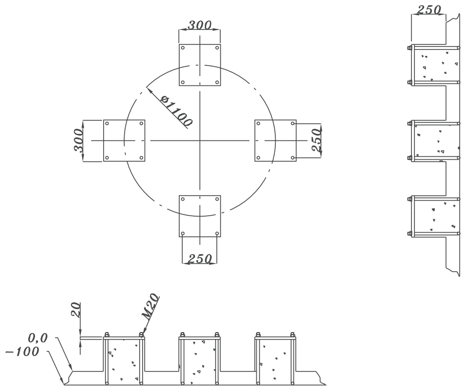
3 WAY MOTORIZED VALVE



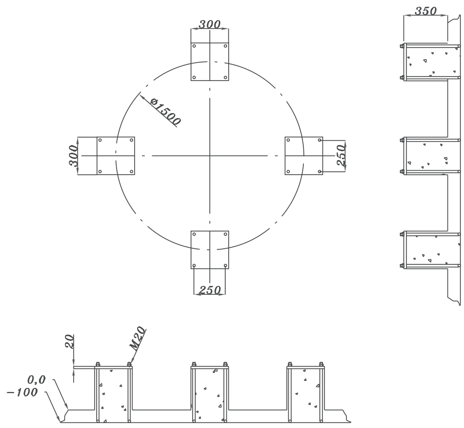


DIVERTING 3 WAY MOTORIZED VALVE

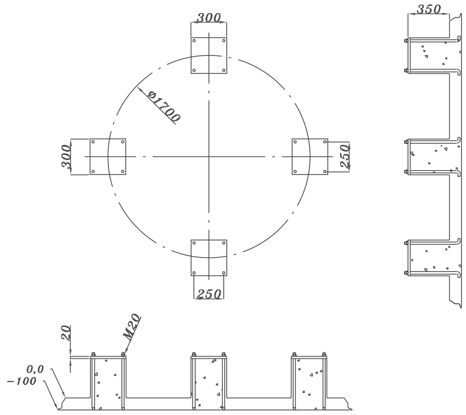
FOUNDATION



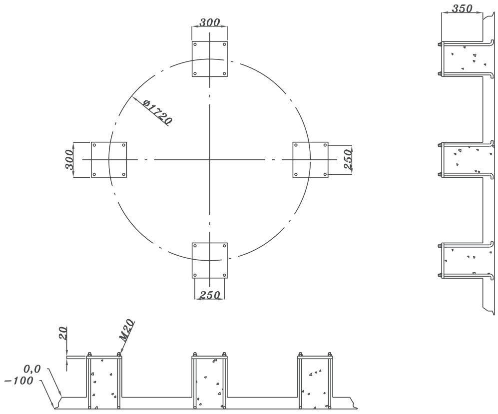
HFCT - 20,25



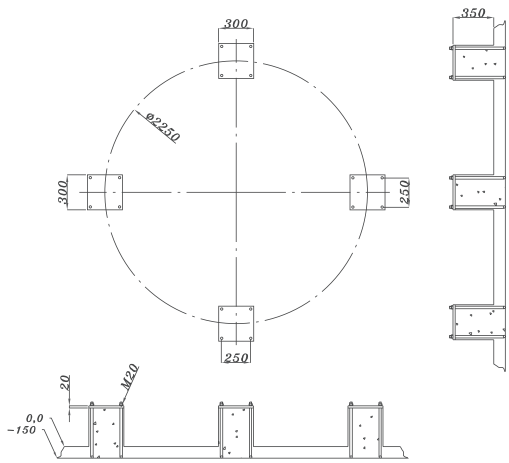
HFCT - 30,40



HFCT - 50,60

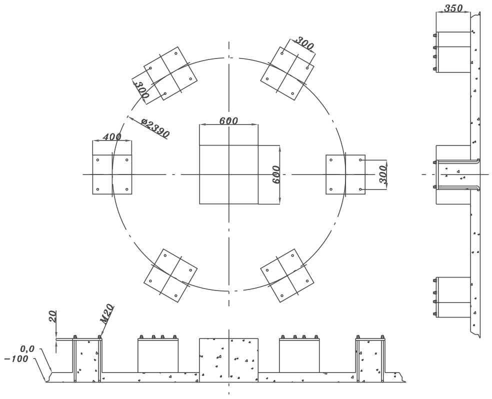


HFCT - 80

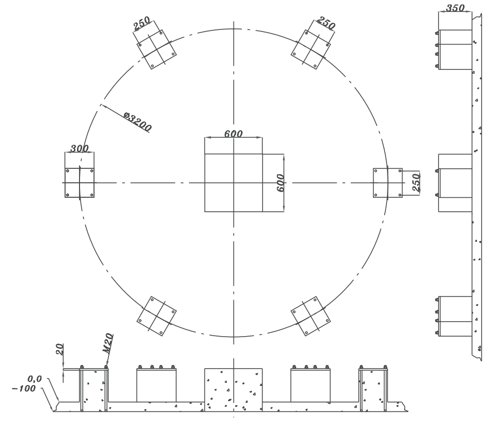


HFCT - 90,100

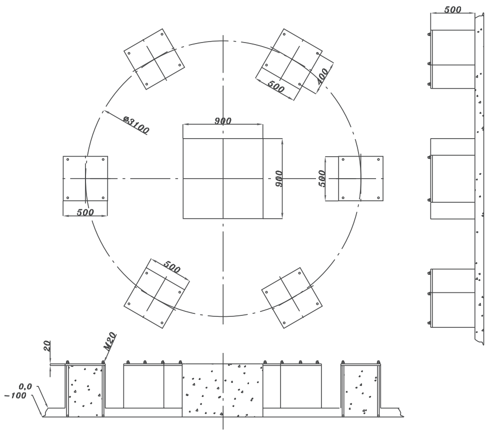
FOUNDATION



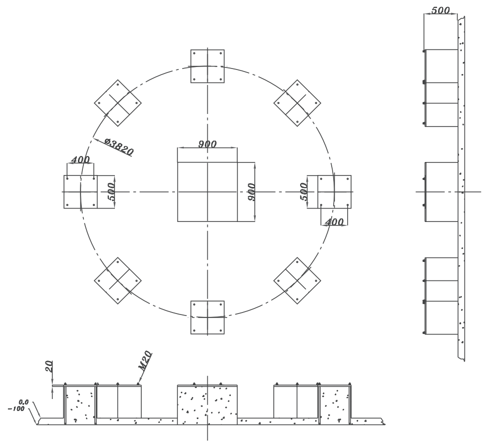
HFCT - 125,150



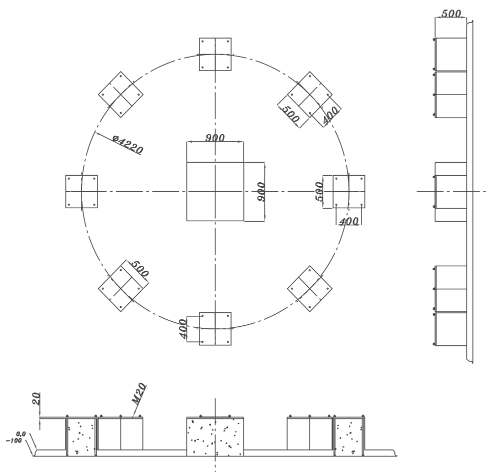
HFCT - 175



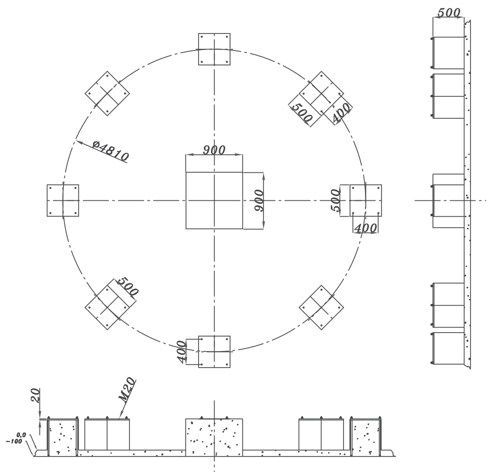
HFCT - 200,255



HFCT - 250,300



HFCT - 350,400

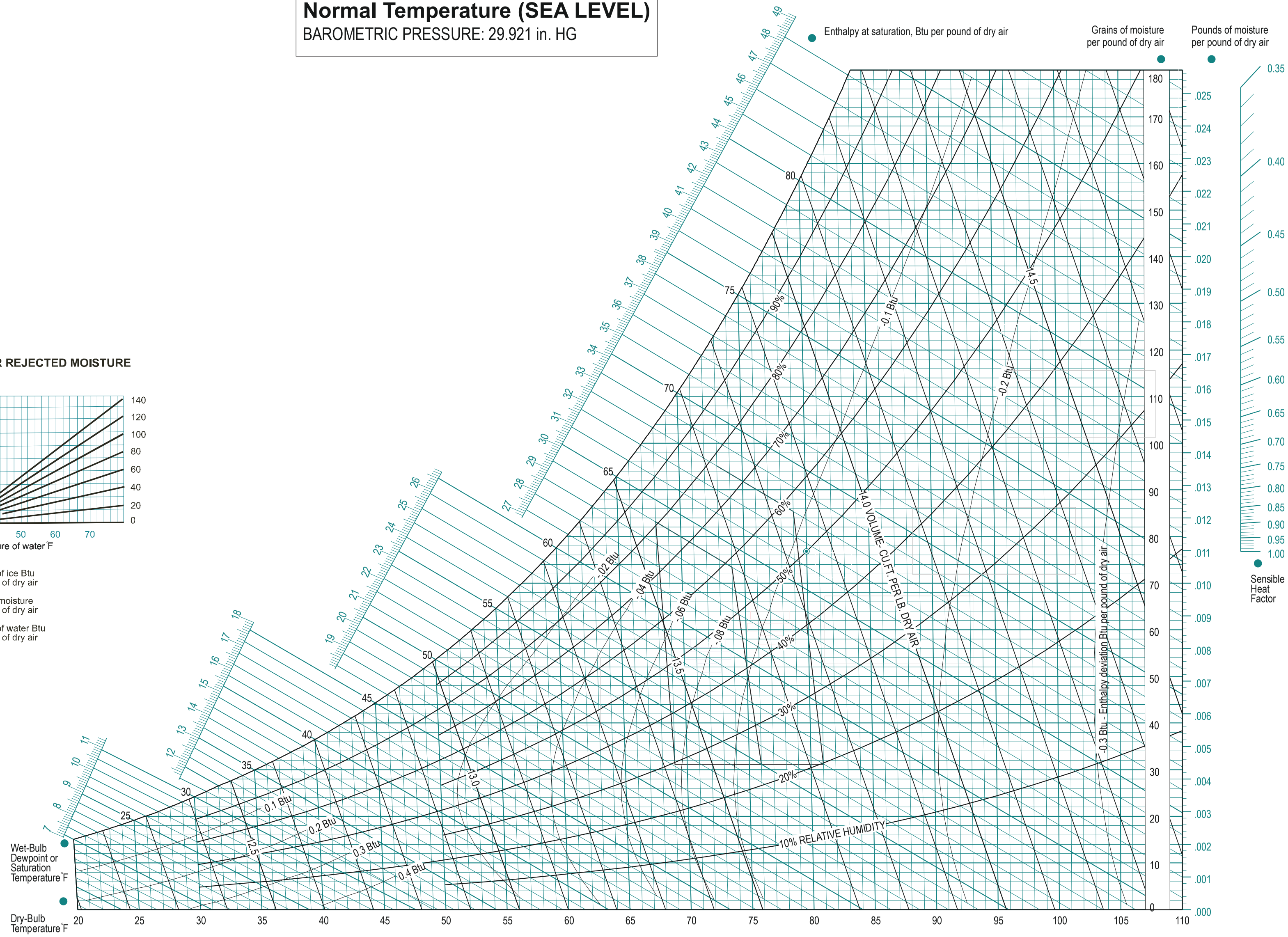


HFCT - 450,500

Note:
for receive foundation detail drawing please contact with HAVASAZ technical department.

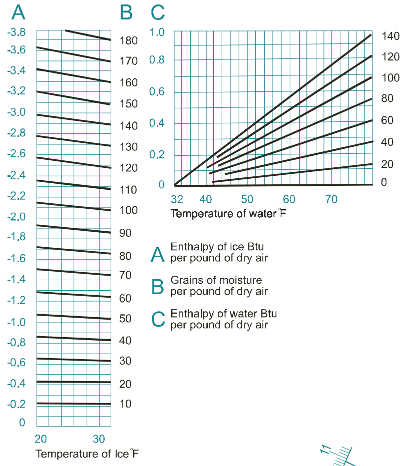
PSYCHROMETRIC CHART
Normal Temperature (SEA LEVEL)

BAROMETRIC PRESSURE: 29.921 in. HG



Below 32°F, properties and enthalpy deviation lines are for ice.

ENTHALPY OF ADDED OR REJECTED MOISTURE



CONVERSION TABLE

LENGTH 1inch=25.4 mm 1foot=0.3048 m 1yard=0.9144 m 1mile=1.609 km	AREA 1sq inch = 645.2 mm^2 1sq foot = 0.0929 m^2 1sq yard = 0.8361 m^2 1sq km = 0.3861 sq mile	VELOCITY 1 ft/min = 0.00508 m/s 1 ft/sec = 0.3048 m/s 1 ft/sec = 1.097 km/hr 1 mile/hr = 0.4470 m/s
VOLUME $1in^3$=16.39cm^3 $1ft.^3$=0.02832 m^3 $1ft.^3$ =28.32 liters $1yd^3$=0.7646 m^3 1 gallon (US)=3.7853 liters 1 gallon (UK)=4.546 liters	MASS 1 gm = 15.4324 grains 1 oz = 0.02835 kg 1 oz = 28.35 gm 1 lb = 0.4536 kg 1 ton = 1016.0 kg 1 cwt = 50.80 kg	HYDROSTATIC TABLE 1 litre of water weights 1 kg 1 cubic meter = 1000 liters 1 bar = 100k pa 1 gallon (UK) = 10 lbs 1 cu. ft = 6.25 gallons (UK) 1 bar = 10.20 m
PERSSURE 1 in wg = 249.1 N/m^2 (Pa) 1 bar = 33.45 ft head H2O 1 bar = 14.50 lb/in^2 (psi) 1 bar = 0.9872 atmosphere 1kPa = 4.015 in H_2O 1kPa = 0.2953 in Hg	ENERGY 1 btu = 1055 J 1 MJ = 0.2778 kW-hr 1 therm = 29.31 kW-hr 1 therm = 105.5 MJ 1 therm = 100,000 btu 1 btu = 0.2520 kcal	POWER 1HP =745.7 W 1 btu/hr = 0.2931 W 1 btu/hr- ft^2= 3.155 W/m^3 1 btu in/ft^3 hr °F = 0.1442 W/m °C (Thermal Conductivity = K) 1 btu/hr ft^3 °F =0.1442 W/m °C (Thermal Transmittance) = U
TEMPERATURE °C = 5/9 (°F - 32) ° = 9/5 °C + 32 ° K = °C + 273 °R = °F + 460 °R = 9/5 °K	FLOW RATE 1 m^3/s =2119 cfm 1 m^3/hr = 0.5886 cfm 1 m^3/hr = 16.67 l/min 1 l/s = 2.119 cfm 1 l/s = 15.85 usgpm	REFRIGERATING CAPACITY 1 Ton = 12000 btu/hr 1 Ton = 3.517 kW 1 W = 3.414 btu/hr 1Btu = 1.055 kJ 1 kCal/h = 3.968 btu/hr 1 HP = 2545 btu/hr

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شرکت هواساز همیشه سعی بر آن دارد با استفاده از قطعات و متریال مرغوب نیاز مشتریان خود را برآورده سازد که در ذیل به معرفی برخی از مشارکت کنندگان در تامین قطعات این شرکت می پردازیم :
مرغوب ترین قطعات و اجزاء :

انواع کویل های Cu/Cu , Cu/hydrophilic Al Heresite Coating
کمپرسورهای Frasscold,bitzer,copeland , Carrier,refcomp از نوع Scroll , Screw , Reciprocating
مبدلهای Shell & Tube مارک رادیران و Compact Plate Heat Exchanger مارک Danfoss

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دفتر فروش : تهران - خیابان شهید بهشتی - خیابان سرافراز - پلاک ۵۵ - مجتمع دریای نور

تلفن : ۸۸۷۵۴۹۱۰   فکس : ۸۸۷۵۴۹۱۱

کارخانه : کیلومتر ۱۹ جاده قدیم کرج - منطقه صنعتی اسماعیل آباد - خیابان اول - پلاک ۶

تلفن : ۷۵-۴۶۸۸۱۹۶۵   فکس : ۴۶۸۴۲۲۹۲