MEGA-FIN™

CO_2 AMBIENT AIR VAPORIZERS

Thermax
A Chart Industries Company

Product Datasheet **3.9**

Mega-Fin™
Ambient Air Vaporizer

Thermax Mega-fin™ Ambient Air Vaporizers

can now be used for Carbon Dioxide service in regions with high minimum ambient air temperatures or indoors. Carbon Dioxide (CO_2) is not a true cryogen, since it boils near -70°F at atmospheric pressure, and is therefore more difficult to vaporize than traditional cryogens (N_2, O_2, or Ar). For this reason, we use our largest surface area extrusion–the Mega-fin™, which has 16 fins for maximum vaporization capacity.

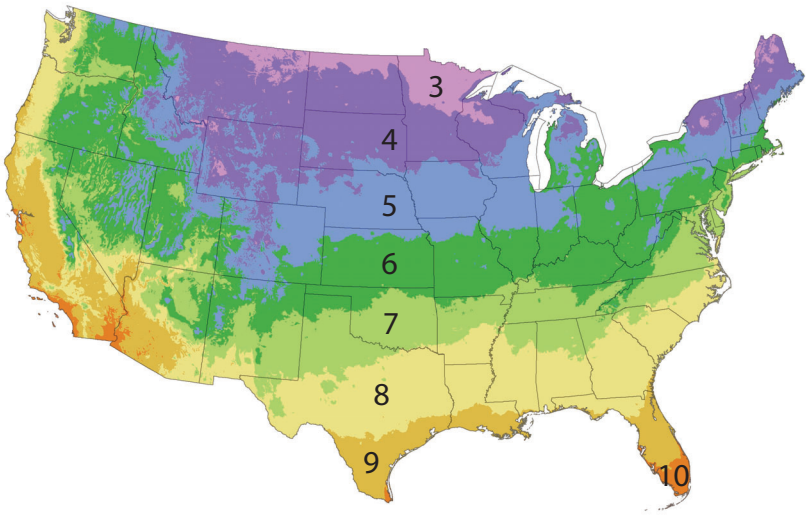
The key factor in determining the vaporization capacity of a Mega-fin™ vaporizer is the difference in temperature between the ambient air and the liquid CO_2 entering the vaporizer.

The minimum ambient air temperature for a region can be seen in the map of the continental US and Table 1. For cold weather regions, installation indoors (in a 60°F minimum ambient temperature) may be preferred. The warmer the ambient air, the higher the capacity of the vaporizer. If the vaporizer can be placed near a boiler/furnace (>80°F ambient conditions), smaller units may be used.

The standard CO_2 tank pressure is 300 PSIG (corresponding to liquid at ~0°F), but some may use a lower pressure tank, or regulate down in pressure before the CO_2 enters the vaporizer. The pressure of the CO_2 entering the vaporizer corresponds to a liquid temperature as seen in Table 2.

Table 1	
Zone	Min. Air Temp.
3	-40 °F
4	-30 °F
5	-20 °F
6	-10 °F
7	0 °F
8	10 °F
9	20 °F
10	30 °F

Table 2	
CO_2 Pressure	CO_2 Temperature
130 PSIG	-40 °F
165 PSIG	-30 °F
200 PSIG	-20 °F
245 PSIG	-10 °F
290 PSIG	0 °F
345 PSIG	10 °F
405 PSIG	20 °F
475 PSIG	30 °F



Possible design codes, available upon request.

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MEGA-FIN™

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Carbon Dioxide 24 Hour Rating (lb/hr) (before defrost)										
	Vaporizer ΔT = Min. Air Temp. (Table 1) Minus CO_2 Temperature (Table 2) (°F)									
MODEL	90	80	70	60	50	40	30	Conn. Size	Dims. (in)	Weight (lbs)
MF065A-HF-C	142	126	110	98	79	63	47	3/4"	20x28x79	170
MF125A-HF-C	283	252	220	197	157	126	94	3/4"	30x39x79	335
MF205A-HF-C or MF128A-HF	453	403	352	315	252	202	151	3/4"	39x48x79 28x35x127	542 495
MF1610A-HF	755	672	587	525	419	336	251	3/4"	39x39x151	825
MF2010A-HF	944	840	734	656	524	420	314	1"	39x48x149	1,015
MF2412A-HF	1,359	1,210	1,057	945	755	605	452	1"	39x57x176	1,500
MF2415A-HF	1,699	1,512	1,321	1,181	943	756	565	1"	48x57x212	1,765
MF3612A-HF	2,039	1,814	1,585	1,417	1,132	907	678	1-1/2"	58x66x175	2,140
MF4812A-HF	2,719	2,419	2,114	1,889	1,509	1,210	904	1-1/2"	62x76x175	2,830
MF6412A-HF	3,625	3,226	2,819	2,519	2,012	1,613	1,206	2"	77x84x187	3,805
MF6420A-HF	6,042	5,376	4,698	4,198	3,354	2,688	2,010	2"	77x84x283	6,000
MF7220A-HF	6,797	6,048	5,285	4,723	3,773	3,024	2,261	2"	78x92x282	7,100
MF7225A-HF	8,496	7,560	6,606	5,904	4,716	3,780	2,826	2"	78x93x342	8,790

Note: The 60°F ΔT column has been highlighted to show the capacities of units installed indoors (60°F min.) vaporizing 300 PSIG liquid CO_2.
Note: Thermax recommends a CO_2 monitor for any CO_2 vaporizer installed indoors.
Note: Thermax recommends at least a 30°F ΔT to ensure complete CO_2 vaporization.

City	Min. Air Temp.
Houston, TX	20 °F
Jacksonville, FL	20 °F
Ft. Worth, TX	10 °F
Atlanta, GA	5 °F
Raleigh, NC	5 °F
Kansas City, KS	-10 °F
Pittsburg, PA	-10 °F
Chicago, IL	-15 °F
Green Bay, MI	-20 °F
Duluth, MN	-25 °F

Note: Cold weather regions may require an electric vaporizer or installation indoors

The vaporization capacities for the various Mega-fin™ vaporizer models can be seen above. To calculate the Vaporizer ΔT, take the minimum air temperature of your region (for outdoor installation) from Table 1 and subtract the CO_2 temperature from Table 2. For example, if you are sizing a vaporizer for indoor installation (60°F ambient air minimum) with a CO_2 tank pressure of 300 PSIG (~0°F), ΔT = 60°F – 0°F = 60°F. You would then read down the 60°F column to see the capacity of each vaporizer model. If you need to vaporize 500 lb/hr of CO_2 for 12 hours per day, you would select a Model MF1610A-HF vaporizer, which has a capacity of 525 lb/hr given a 60°F ΔT. If you require a continuous flow of gas (24/7), you will require two (2) vaporizers of the appropriate capacity; one in-use and one defrosting, switching every 24 hours.

Note: The negative signs in the ΔT calculation are important! For example, if you are sizing a vaporizer for outdoor installation in Pittsburg, PA (-10°F) and the CO_2 tank pressure is ~130 PSIG (-40°F), ΔT = (-10°F) – (-40°F) = 30°F. Likewise, if the ΔT were negative, vaporization would not occur, and an electric vaporizer would be required.

All Mega-fin™ vaporizers are designed and manufactured to ASME B31.3 and have an all-Canada CRN number.

Thermax also offers process and pressure building electric vaporizers for CO_2 applications. See Product Datasheets 1.0, 1.6, and 2.2.

Nominal flow rate is based on 24 hours service between defrosts, and a relative humidity of 50%.

All tables shown on this Datasheet are intended as a guide that reflect our experience on these models. Actual performance may vary. Please contact Thermax, Inc. for specific applications.

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