

Desiccant Dehumidification

For

Recreational Ice Arenas



 **ARID-Ice™**
Advanced Reactive Drying
5931 Ford Court Brighton, MI 48116 • 810.229.7900
Fax: 810.229.7908 • sales@cdims.com • cdims.com
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Fog and Condensation

Fog and condensation are the most visible result of high humidity.

The fog in this photo is the result of improper dehumidification on a 70 degree day with rain.

Energy needed to maintain the ice sheet is increased by the latent or water load coming in contact with the ice sheet.

The building structure can also suffer due to water corroding & degrading the support structure. Mold & mildew can form inside and on the walls.



Condensation Facts

Condensation is the water vapor in air which concentrates as the air is cooled

Water will condense on any cold surface which is below the dew-point temperature of the air

To Prevent All Condensation, the Dew-Point of the Air must be at or Below the Dew-Point of the Cold Surface

If MOISTURE IS NOT CONTROLLED THE ICE ARENA SACRIFICES....

- Fog/ Condensation
- Reduced Customer Comfort & Safety
- Increased Energy Usage
- Lost Ice Time/ Poor Ice Conditions
- Slowed Resurfacing Time
- Mold/ Mildew

Moisture Load Facts

- Outside air is the largest moisture load
- Every 1,000 SCFM (standard cubic feet per min.) of summer outside air brings up to 6 gallons of water per hour
- 6 gallons of water is 51 pounds of water vapor

A wide-angle photograph of a vast, deep blue ocean under a bright blue sky with wispy white clouds. The sun is visible on the left side, creating a shimmering reflection on the water's surface. The horizon line is clearly visible in the middle of the frame.

Where does the moisture come from ?

INFILTRATION AIR

- MOISTURE WILL LEAK IN THROUGH CRACKS AND GAPS IN THE BUILDING



Spectators and Skaters



Door Openings

Resurfacer Room Roll-Up Door



People Doors



Walls and Ceilings



Lets talk about Dew Point Control

Controlling the ambient dew point eliminates the visible moisture and reduces the latent (moisture) transfer to the ice sheet.

With a dehumidifier you can provide air at a dew point below the control design point to absorb the internal load.

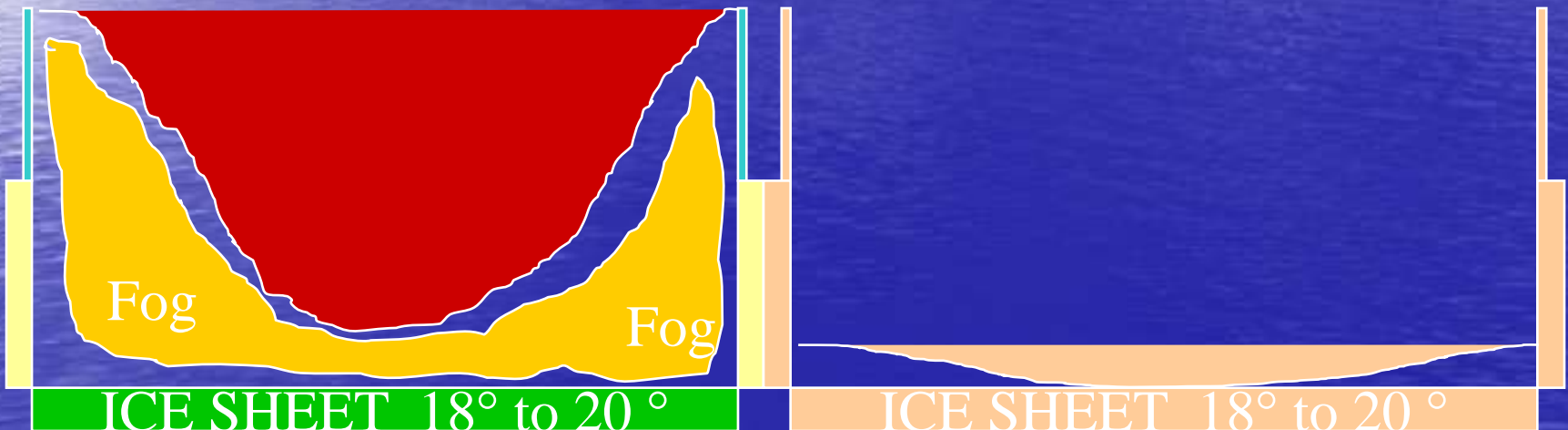
The Arid-Ice Desiccant design...

- Removes water vapor using the stabilized silica-gel to provide a low dew point discharge condition
- The silica gel removes water in its vapor form
- No liquid is condensed so we can depress the discharge humidity well below the freezing point of water
- By providing dry air below the control level, the dry air will absorb the internal loads.
- This will allow the rink to operate at the 32 F dew point

The Psychometrics' of Fog and Condensation

Arena 75 ° at 80 % RH
67 ° Dew-Point

Arena 55 ° at 40 % RH
35 ° Dew-Point



Why are we different....

- The Direct Expansion or Chilled Brine Refrigeration units which are considered a Mechanical Dehumidification where air is drawn across a cooling coil to reduce temperature and remove water. This Approach is considered difficult to operate and energy intensive. The approach has limited applications in the Ice Arena environment where the required dew-points are well below freezing.
- The desiccant dehumidification uses a permanent, stabilized silica gel wheel to remove water vapor from the air. The wheel is reactivated using heat energy, propane, natural gas or electricity; typically, natural gas will provide the best cost benefit as compared to electricity, but different regions should compare energy sources to pick the most cost-effective fuel source.

Comparison Points:

1. When an equivalent sized desiccant unit is compared to the refrigeration coil, the cost of operation is lower for the desiccant system.
 2. Desiccant equipment is smaller and easier to maintain.
 3. There is no defrost cycle with the desiccant unit.
 4. The airflow through the desiccant is constant, not reduced from ice formation
 5. The desiccant dehumidifier is independent of the ice refrigeration plant.
 6. The cost to maintain the desiccant dehumidifier is lower than the associated cost to maintain the added capacity and run time on the refrigeration plant.
- Ask to see the full Technical Bulletin No 12 "Comparison of Glycol Refrigeration Dehumidification to Desiccant Dehumidification"

The Arid-Ice MS-Desiccant Dehumidifier a better solution

The MS Arid-Ice Desiccant Dehumidifiers have been specifically designed for the seasonal ice rink, the smaller recreational, practice and curling ice rinks. It is a perfect solution when replacing your old mechanical dehumidifier that no longer works

- Benefits
 - Very dry air can be achieved
 - Better thermodynamic efficiency
 - Simple construction
 - Simple maintenance
 - Better construction
 - Modern controls
 - Now – more sizes available

for more information, specifications and a free load estimate for your ice arena please contact:

Becker Arena Products, Inc.
800-234-5522

ARID-Ice
Advanced Reactive Drying

Abbreviated Load Estimate

Project Name: Scripps Arena

2. Select Geographical Use Category

For Warm (General Risk, Design Ambient Ambient, 70°F or 75°F) Climate
Seasonal or Moderate Risk (Design Ambient 60°F to 70°F)
Cold (Year Round Risk, Design Ambient 50°F, 55°F or 60°F)

3. List Load Items

Item	Frequency	Frequency and Unit Conversion Factor
Number of Electric Motor Drives	1	1 Pounds/Drive
Number of Roll-Up Doors	10	10 Pounds/Door
Number of Internal Motor Drives	2	2 Pounds/Drive
Number of Motor Drives (DPT)	2	2 Pounds/Drive
Building Height (11-Ft, 12-Ft, 13-Ft)	10	10 Pounds/Foot
Roofs	2	2 Pounds/Drive
Supports	2	2 Pounds/Drive
Other Loads (Pounds/Drive)	0	0 Pounds/Drive
Utility Factor	1	1 Pounds/Drive
High Wind Factor	1	1 Pounds/Drive
Design Outdoor Temperature (°F)	1	1 Pounds/Drive
Total Adjusted Estimated Load	10	10 Pounds/Drive

4. Select Number of Livets Required

Description	1-1	2	3	4	5	6	7	8	9	10
Space Control Load of 100 to 1000 lbs	1	2	3	4	5	6	7	8	9	10
100 to 1000 lbs	1	2	3	4	5	6	7	8	9	10
1000 to 10000 lbs	1	2	3	4	5	6	7	8	9	10

Notes:

- The number of Livets is based on the internal loads.
- CDIMS ARID-Ice (DPT) or LiveLoad (DPT) is required for all Livets.
- Livets must be supported by the structure.
- DPT is recommended.

The external wind and weather-related loading and the internal loads only as a result of the design of the structure. The structure must be designed to support the maximum live load. The structure must be designed to support the maximum live load. The structure must be designed to support the maximum live load.

CDIMS, Scripps Arena

Becker Arena Products is the exclusive distributor of the MS Arid-Ice Desiccant Dehumidifiers for ice rinks in the United States



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