



Dry facts

...from Arctic India Sales

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Bry-Air 'PROTECTORS OF THE DEFENDERS'



Dehumidification in service of Defence was the theme of the seminar presented by Arctic India Sales in Delhi in the month of April. In Defence, the one common, silent enemy, to be combatted is the moisture or humidity in air, which causes unrepairable damage to equipment and machinery, arms and ammunitions—impairing its availability and reliability.

Army, Airforce and Navy all suffer from corrosion, spoilage, breakdown during storage, production and operation.

Storage of ammunition, explosives, tanks, aircrafts, jet engines, missiles, reserved sea vessels, records, negative films, uniforms, parachutes, ration, all need protection from organic and inorganic corrosion.

Production of ammunition, missile assembly, jet engines, propellant fuel require controlled conditions of humidity and temperature.

Humidity Control eliminates potential breakdowns and failures of sophisticated machinery on ships, submarines, radars and telephone exchanges.

Dehumidification ensures protection of equipment under all weather conditions, maintains defence systems and equipments in readiness. Bry-Air dehumidifier provides the most cost effective and simple method of humidity control and are being used in the U.S. and Europe extensively by the Defence Services.

The text matter of the presentation is available from our office at Delhi on request.

Bry-Air DEHUMIDIFIERS FOR POLYESTER CHIP DRYING

Drying of polyester chips in the manufacture of polyester yarn is a critical process. Bry-Air Dehumidifiers have been successfully applied to remove the hygroscopic moisture from the polyester chips.

The drying system involves surrounding the polyester chips with very dry air with a very low dewpoint so as to enable the pellets to give up the moisture to the surrounding air, thus drying the pellets.

IEL, Thane, is using Bry-Air Dehumidifier Models MVB-15.B and MVB-10.B for this application. These dehumidifiers operate in series to handle 850 cfm of air to obtain an outlet condition of 6.5 grains/lb or -20°C dewpoint at a temperature of 180°C .

To obtain the low dewpoint the two units are used in cascade, where the outlet air of one dehumidifier is partially passed through the second dehumidifier to obtain the required dewpoint. The system also incorporates Bry-Air heat exchanger at the outlet of the first dehumidifier to precool the inlet air of the second dehumidifier.

This system is an example of the Bry-Air capability to engineer a job to suit specific requirements. Bry-Air dehumidifiers are capable of obtaining dewpoints as low as -40°C .

Dehumidifiers can be engineered with precooling, aftercooling and heat recovery options to provide the total solution to any drying need to meet the most stringent requirements.



AT&T, THAILAND USES BRY-AIR HEAT EXCHANGERS

They say waste not want not.

Waste heat recovery in process or comfort application provide good returns whether applied to low temperature or high temperature recoveries.

AT&T, Thailand are using the Bry-Air heat recovery system for gainfully recovering waste heat from an air cooled condenser and reheating the air coming from the AHU.

Electric heaters were being used previously to reheat supply air being fed into the production area to maintain comfort temperature. The heat exchanger now recovers the heat from the condenser exhaust and transfers the same to reheat the supply air. This enables them to eliminate the need for heaters for reheating.

The heat pipe based heat exchanger is a totally passive device requiring no external source of energy with no moving parts and hence no wear and tear. The thermal efficiency ranges between 55 to 70% and thus saves millions of BTUs year after year.

The application of the Bry-Air Heat Exchanger extends to process to space Heating and process to process and is gainful in all applications where exhaust temperature range from 50°F to 500°F.

Bry-Air has proved it that even at low temperature heat recovery is viable.



SOME RECENT APPLICATIONS

Katha Drying

Ganesh Katha, Haldwani and Chandra Katha, Nazibabad are using Bry-Air dehumidifier to dry Katha. Room conditions being maintained are $55 \pm 5\%$ R.H. and $40^\circ - 50^\circ\text{F}$ Temp. Drying time has been reduced from 15-17 days to 7 days.



Propellant Fuel Mixing

Indian Space Research Organisation, Sriharikota is using Bry-Air Dehumidifiers (MVB 45 DB) for its propellant fuel mixing room.



Dehumidifier for Archives

Visva Bharati is using Bry-Air BA.0.5A (50 cfm) dehumidifier to maintain condition $50 \pm 5\%$ RH at 77°F in their archives storage room.



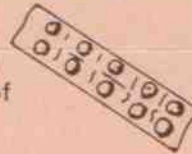
Coffee Drying and Packaging

Indodan, Muzzaffarnagar is using Bry-Air Dehumidifiers to dry as well as pack their well known Gold Cafe Coffee.



Manufacture of Disprin Tablets

Reckitt and Coleman, Mysore is using Bry-Air Dehumidifier to supply 6700 cfm of air at 17% RH being used for manufacture of Analgesic Tablets, Disprin.

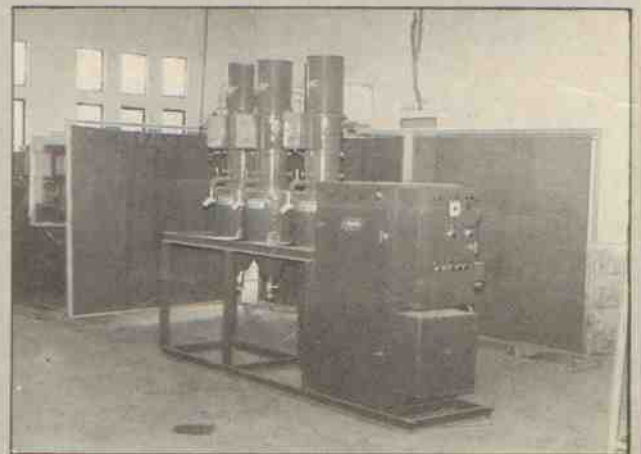


Electrode Storage

Maharashtra Weld Aids Ltd., Nagpur is using dehumidifier BA-1.22A for storing electrodes.

PLASTIC DRYERS FOR SIEMENS

Siemens India Ltd., are using the model RM 50 Bry-Air Plastic Dryer for drying of thermoplastic resins. The dryer supplies 50 cfm of dried air at -40°C dewpoint to three hoppers mounted on the same trolley. The material is loaded in the hoppers automatically through separate loaders mounted on the hoppers.



When Moisture is Torture !!! DEHUMIDIFICATION IN DATA PROCESSING SYSTEM AREAS

Data Processing System areas contain computer equipment, as well as the necessary ancillary equipment to meet a particular data processing function.

Computers generate heat and contain components sensitive to extremes of temperature, humidity and presence of dust. Exposure to environmental conditions outside prescribed limits can cause improper operation or complete shut down of equipment.

Ancillary spaces for activities directly related to the computer or for the storage of computer or for the storage of computer components and material including magnetic tapes, disk packs and cartridges, data cells, paper and punch cards should have environmental conditions comparable to the areas housing the computers, although tolerances generally are wider and degree of criticality of conditions is usually much less than computers.

If components and supplies are exposed to temperature and humidity levels outside the limits established by the manufacturers, they must be conditioned to the operating environment in accordance with manufacturer's recommendation.

The Problems You Are Familiar With

Erratic printouts, frequent break downs, data dropout and other damages and problems faced by computers is due to high humidity. High humidity has an adverse effect on the performance of all electronic equipment. The basic problem arises from the fact that water vapour condenses on any surface cooler than the dew point of the surrounding air. A sudden rise in temperature of air in the computer room (typically on account of a power cut/breakdown of air-conditioning equipment) is very likely to result in condensation of water vapour on the computer surface.

Design Criteria

The environmental conditions required by computer equipment vary widely depending on the manufacturers. Criteria should be to remove computer equipment heat adequately and preclude the possibility of condensation within the equipment.

Typical Computer Room Design Conditions

Temperature $22 \pm 1^\circ\text{C}$

Relative Humidity $50 \pm 5\%$ non condensing.

(*These conditions are typical and fall within the conditions recommended by most computer equipment manufacturers).

Dehumidification provides the solution

Though these conditions are easily achievable with the help of refrigeration, the refrigeration equipment, however, needs to be specially designed and operated.



The dehumidifier simplifies the environmental control problem by taking care of the moisture load independent of refrigeration equipment, and simple airconditioning equipment takes care of temperature control. The air conditioner and the dehumidifier control temperature and humidity independently.

You can literally dial your weather by setting your required and desired parameter on the thermostat of the dehumidifier and airconditioner. With this approach the airconditioner at end of the computer-working day can be switched off prior to the dehumidifier. Condensation does not take place on the cold interior surfaces of the computer, which is the root cause of most computer break downs.

Further, in this context, it needs to be emphasised that room air conditioners do not control humidity. The use of dehumidification reduces the dewpoint to such a low value that condensation is prevented. Also, the continuous removal of moisture by Bry-Air Dehumidifiers ensures that humidity in the room remains at a reasonably low level even during power cuts.

The Bry-Air Dehumidifier

The equipment for dehumidifying air in computer rooms has to be essentially portable as well as occupying minimal space.

Bry-Air offers 25 different models out of which the smallest five in the range of 50, 75, 150, 222 and 300 cfm, are all compact and meet the requirements of virtually any computer room.

The dehumidification process in Bry-Air chemical dehumidifier is constant enthalpy which does not show up by way of heat input into the room.

Desiccant employed is adsorbent, non-toxic, non-dusting and can be regenerated continuously.

Further, the use of high efficiency filters enables the Bry-Air dehumidifier to control dust infiltration into the room.

Last but not the least, Bry-Air Dehumidifiers are being satisfactorily used by several computer rooms in military and public sector organisations.

Partial User's List

- ★ Badarpur Thermal Power Station Training Centre.
- ★ Cancer Research Institute, Ludhiana.
- ★ Indian Oil Corporation.
- ★ Defence Institute of Warfare.
- ★ IAS Academy, Mussorie
- ★ ONGC
- ★ Patni Data Products
- ★ Webel Machines
- and many more.

delair

— ADSORPTION DRYERS — DA and PDPA Series

Why Use Adsorption Dryers?

Only adsorption dryers can achieve pressure dewpoint -40°C and lower. All applications, requiring extra dry air and pressure dew point below 2°C use Adsorption or Regeneration Dryers.

Basic Concept of Adsorption Dryers

There are several types of adsorption dryers but they all have the same basic principle.

Water vapour molecules are removed by means of adsorption. As compressed air flows through, the water vapour is abstracted by a bed of the appropriate adsorption agent. For continual service

two adsorber beds are used with automatic change over to facilitate the drying regenerating cycle.

There are two fundamental methods of regenerating the adsorbents.

- ★ By changing the Isotherm (Temperature swing)
- ★ By changing the relative pressure. (Pressure swing)

Why are Heat Regenerated Dryers Used?

Heat regenerated dryers are used to prevent loss of large quantity of compressed air as purge air, especially when a large volume of compressed air is to be dried.

Delair Heat Regenerated—Reduced Purge Dryers

Working Principle is based on a combination of pressure and temperature swing of regeneration of dessicant.

Drying—The wet compressed air entering through supply valve on top is dried by desiccant in the adsorption chamber and leaves as dry air through a check valve.

Change over—The compressed air is directed to the other adsorber by activating an electromagnetic valve to maintain a continuous drying process.

Regeneration—The adsorber is depressurised with the aid of heating elements and the heat generated liberates the adsorbed water vapour.

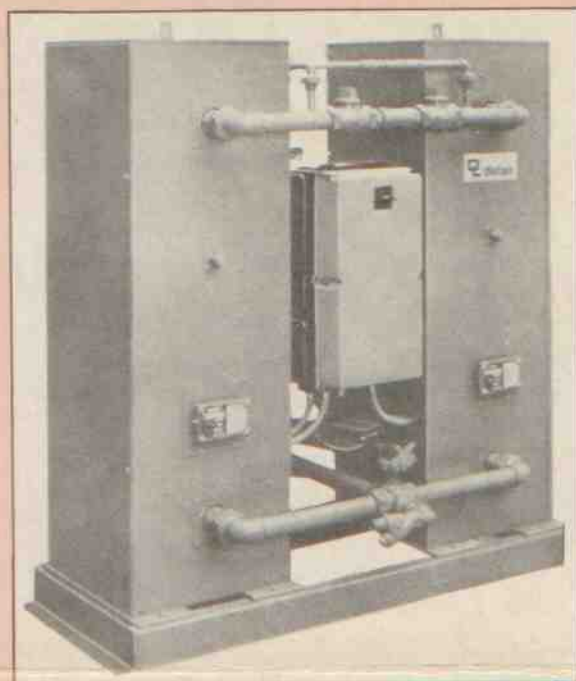
A small flow of very dry purge air, expanded to atmospheric pressure, takes the desorbed water vapour out of the adsorber and leaves via the purge air outlet.

Difference between DA & PDPA Dryers

The only difference between these two types is that in DA dryers, the heating of the adsorbent is effected by internal heating elements which are provided with an extended surface in order to achieve a proper heat transfer to the adsorbent and in the PDPA dryers, the heater strips are mounted around the adsorber and heat is transferred to the adsorbent.

Design Features

- ★ Guarantees pressure dewpoint of -40°C or lower.
- ★ Very low purge air consumption.
- ★ Two series of dryers available in this type.
 - DA Series available in 11 models, capacity ranging from $192\text{ m}^3/\text{hr}$ to $3540\text{ m}^3/\text{hr}$ with PDP achievable -40°C or lower. Operating pressure



4 kg/cm^2 to 10 kg/cm^2 . Regeneration by internal heating elements.

— PDPA series available in 7 models, capacities ranging from $48\text{ m}^3/\text{hr}$ to $1186\text{ m}^3/\text{hr}$. PDP achievable

-40°C or lower. Operating pressure 5 kg/cm^2 to 10 kg/cm^2 .

Regeneration by external heating element.

Applications

- Special instrumentation
- Electronic Assemblies
- Wind tunnels
- Space research
- Dry Air of Ozone generator
- Instrument 'glove boxes'.
- Climatic chamber!
-etc.