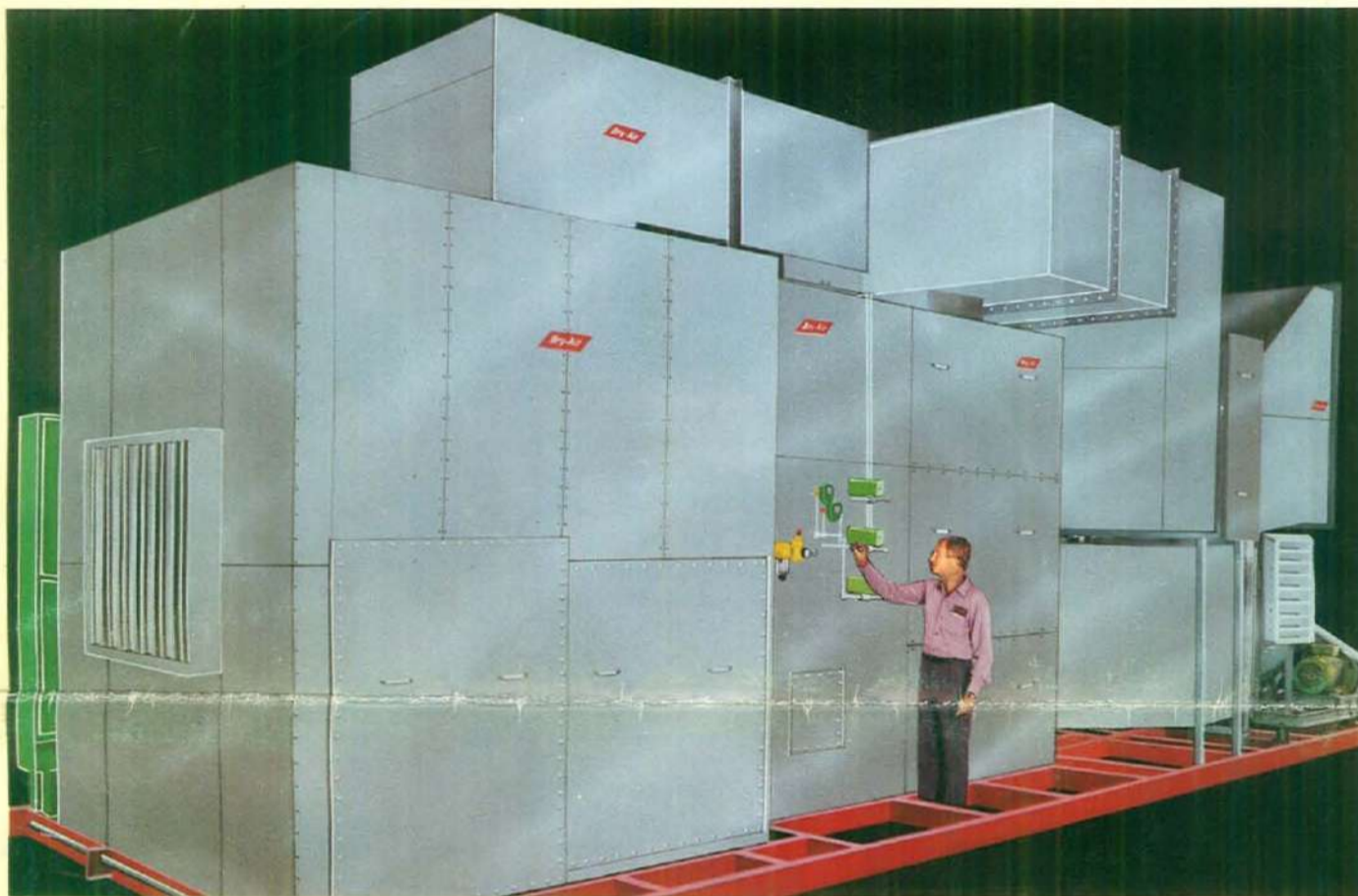


## A positive move

### Bry-Air sets up world's largest dehumidifiers for photofilms



Dehumidification in recent years has revolutionized the process of product drying applications where heated air is detrimental to the product quality. Photographic film manufacturing is one such area, amongst hundreds of product drying applications. Hindustan Photo Films used Bry-Air Dehumidifiers for the positive effects of low temperature drying for their sensitive X-ray film manufacturing process.

#### The HPF Story

Nestled among the misty ranges of blue mountains of Ootacamund in the South of India is the sprawling complex of Hindustan Photo Films (HPF). Hindustan Photo Films is one of the six companies in the world, and the only one in India, to manufacture photofilms from start to finish. Their product line includes cine films, medical and industrial X-ray films, magnetic tapes, graphic art films and roll films.

This high technology, high investment industry depends on a delicate manufacturing process highly sensitive to pollutants through trace contaminants in raw materials, air, water and other inputs. Though the locational advantage provides pure mountain air and crystal clear water, the **manufacture, processing and storage** of sensitized photographic products require the temperature,

humidity and quality of air to be controlled.

In the course of upgrading their technology, HPF tied up with Dupont, USA for production of new generation polyester based X-ray films for industrial and medical usage.

#### Bry-Air calls the shots

For the manufacture and storage areas, Dupont USA specified Bry-Air Dehumidifiers. Five MVB Dehumidifiers ranging from a capacity of 15,000 cfm to 25,000 cfm of air and capable of removing 3,135 lbs of moisture per hour, were manufactured at the India plant. These units constitute the largest single order of units of this size in the world. The equipment passed stringent quality tests of Dupont engineers and was shipped in a record time as complete skid mounted units.

#### Dehumidification for a better picture

The manufacture of X-ray films is a process highly sensitive to atmospheric conditions, requiring controlled temperature and dry air.

The polyester base is coated with several sensitive emulsions which must be dried in between each application. Since the film is sensitive to temperature, heat cannot be used for drying. Hence, dehumidified air is used, which adsorbs moisture from the surrounding air and accelerates the safe drying of the film.

#### Dry air needs for processing and storage

Ashrae has laid down specific standards at which films should be processed and stored for best results.

Thus sensitive film which is produced under stringently controlled conditions needs to be processed and stored under controlled conditions too.

While virtually all photosensitive material deteriorates with age, the rate is largely dependent on the storage conditions — temperature and humidity. High humidity accelerates loss of sensitivity and

contrast, increases shrinkage, produces mottle, causes softening of emulsion, damages the gelatine base and promotes fungus growth.

Storage of unprocessed and processed photographic material must be under controlled conditions of between 30-40% RH and 20-25°C. Air-conditioning with dehumidification easily provides the ideal conditions.☺

#### The positive move

Dehumidification has distinct advantages over heated air when drying at temperature below 120°F or 48.8°C is called for. Yeast, gelatine and gelatine based products, reagents and enzymes are all products demanding low temperature drying. Your product may need just this to cut down on the drying time and yet preserve quality. **So make that positive move !!**



## A peep at the inside stories



How Bry-Air helped preserve -

- 11 deluxe suites at a premium resort hotel
- King of Brunei's vintage car fleet
- the freshness and flavour of 'Earl Grey' and 'Twinings' teas
- ... and more

# The finishing touch

## Powder coating environmental systems

### The better choice

*Powder coatings have opened a new horizon in the product finishing industry all over the world providing the user improvements in coating quality, efficiency and economy. Powder coating permits the painting of objects by spraying a dry product with no solvent, thereby avoiding pollution of the water or the atmosphere. From an economical standpoint, overspray or excess powder can be reclaimed through a recovery system and reused.*

Efficiency and reliability of powder coatings is mainly a function of the compulsory control of the interactions between the product to be applied i.e. its chemical composition and the various elements e.g. charge decay of the equipment operating under the surrounding conditions of the application.

Relative humidity and temperature directly affect the practical application achieved. However, in most powder coating spraying facilities, these **surrounding conditions are not controlled.**

### Humidity — A marked influence

Humidity has a direct relationship with ion charge decay, particle deposition, regularity of deposited thickness, adjustments required of the operating conditions of the spray guns, caking or agglomeration (clustering) of the powder particles and has a measurable negative effect on powder resistivity. High humidity may cause the powder particles to stick to the corona electrode and thus quench the corona. In severe cases, powders that have been exposed to high humidities, cannot deposit at all.

### Bry-Air Dehumidifiers

Utilization of Bry-Air Dehumidifiers and environmental systems

accomplishes complete control over both **relative humidity and temperature** within the powder spray booth area and often the entire coating room.

The advantages stem from two basic points —

1. Lower humidities will provide the ideal environment for the powder particles to sustain their charge, prior to impact with the target.
2. Since most powders are hygroscopic to varying degrees, high humidities will cause agglomerates to form on the walls of the recovery duct, filters and tubing. The filter bay house becomes less efficient requiring frequent attention.

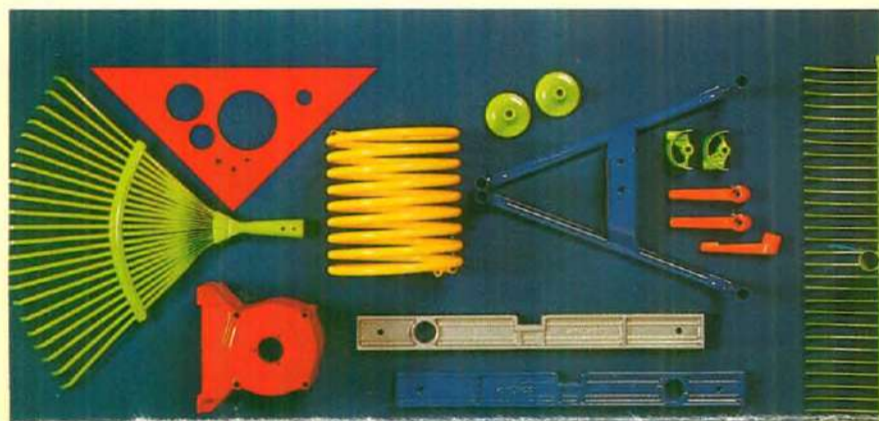
### The advantages of using the engineered environmental systems

1. **Upto 15% less powder is required** — due to uniform control of film thickness and reduced losses from powder build-up and agglomerates.
2. **Increased control over film thickness** — by controlling the electrostatic field more precisely, the ability to coat the target more uniformly is achieved (particle deposition coupled with long term ion decay).
3. **Increased system fluidizing** — the recovery system works nearer its peak performance level due to reduced powder build-up in the duct, filter and tubing.

4. **Reduced agglomeration** — dehumidified air reduces the powder's ability to adhere to the inside surfaces.

5. **Reduced spray gun build-up** — a noticeable, marked improvement in quality.

*The economic benefits as well as the product quality improvements make the Bry-Air powder coating environment systems the ideal choice for giving that final finishing touch to your products!*



# Steering clear of rust

*In the Marine Industry, due to the presence of high humidity levels at ports and docks, tank and ship interiors are subject to corrosion and require regular refinishing. Coating manufacturers will not guarantee the life of the coatings, unless the contractor can prove that the surface was clean and dry when the coating was applied. Bry-Air Dehumidifiers are being used by more and more contractors in blasting and coating operations regardless of weather conditions, thus saving on cost, time and labour.*

### Marine and land - based sandblasting

In marine and land-based coating operations the first step is the sandblasting operation. Sandblasting removes surface damage and exposes the base material, often metal, that will receive protective coating. At sea, where the humidities are close to 100%, the surface begins to rust even before the sandblasting operations are over. The problem originates due to the difference between inhold and outside humidities and air temperatures. The air within the tank is cooler than outside air, leading to condensation on the interior walls of the holds, resulting in rust formation.

### Condensation prevention

The obvious solution to the problem is prevention of condensation on the vessel's surface. Inside the ships or in underground land-based storage tanks, a flow of dehumidified air on the newly prepared surfaces prevents rust or mildew formation while the clean up operation for surface preparation and coating is in progress.

### The Bry-Air method

When the internal surfaces of large storage tanks and ships are being prepared for painting / coating, the inside air must have a dew point of at least 10°F below ambient to prevent condensation on the steel surface. At the same time, to provide suitable conditions for people working inside, 100% fresh air must be supplied with 1 or 2 air changes per hour at temperature not exceeding 95°F.

A typical system procedure would be to totally recirculate the dry air within the vessel and dehydrate to a 10°F dewpoint level below the vessel wall temperature. Once all surface moisture is removed, additional dehydration is allowed for two to six hours depending upon the tank size, then switched to 100% outside air mode before the personnel enter to perform the work required.

The dehumidifier or the drying unit is normally mobile and is placed on the deck and the dry air is forced inside the vessel by a high pressure blower into the main air duct. The reason for using the existing lines is to get an easily workable and low cost system.

On-board dehumidification is also popular where dry air may be used to protect hygroscopic cargo at sea or for dehumidifying vital areas like engine rooms and controls, while at dock.

### The economy

At sea, weather conditions are never favourable for efficient operations of sandblasting and coating, resulting in extended harbour time, extra costs and poor coatings. Dry air lets the contractors keep the cleaned surface

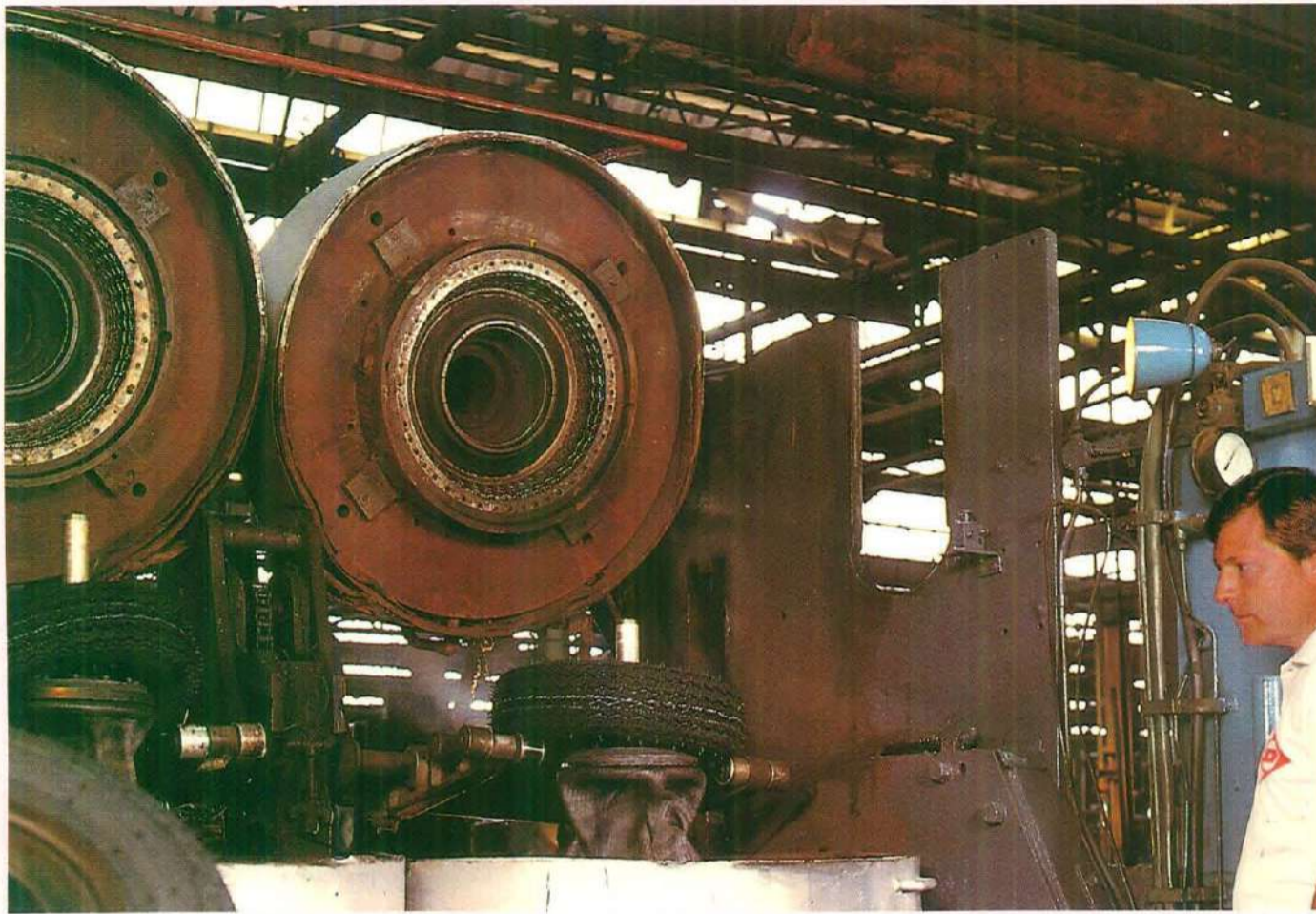
free from condensation indefinitely, scheduling coating operations more economically.

*Bry-Air Dehumidifiers are being sold regularly to ship builders, shipowners and contractors for controlling marine humidity problems. The investment is low compared to cost savings and quality finishes — keeping both, end-users and contractors happy!*



# Tire\*-less performance

## The lasting bond



**Today, nearly 90% of the automotive world rides on radial tires. Michelin Brothers fitted the first radials on the French motor car Citroen way back in 1948. By the 60's, almost all European car manufacturers had switched to the steel belted radials. The US market, though slow to respond, made the switch as late as 1979 with Ford taking the lead. Radials today is the tire technology in use the world over.**

The radial scores over the bias tire on many fronts — a longer life, lower fuel consumption, greater riding comfort and skid resistance, which explains the shift from the conventional cross ply technology.

### **The radial difference —**

A radial tire is an improvement on the bias tire. The essential difference

has to do with the placement of plies and the addition of belts. In a bias tire the plies run diagonally across the tire from bead to bead. In each successive layer, the cords run in opposite directions.

In a radial tire, the cords are radially placed, perpendicular to the central line of the tire.

All radials are, however, not the same. The plies may be encased in a belt made of steel, fibreglass, rayon or nylon fabric. However, the fabric or fibreglass can never match the efficacy of steel.

The steel belted radials are, therefore, the most commonly used radials. The only disadvantage observed, was the rusting of the steel belts over a period of time leading to the tire's quicker wear and tear. The rusting during usage was eliminated by using the nylon casing over the steel. However, due care is always required

during the manufacturing stage, to see that rusting of steel belts does not occur during the bonding process.

### **The manufacturing process**

Manufacturers follow various processes for preparing the multi-layer tires. Some use only steel belts for that added strength, others add cross knitting of steel wires which makes it stronger.

The room in which steel wires are covered with fabric, converting it into a single bonded ribbon which is then braided, is referred to as the 'Creel Room'.

In the creel room, various wires of fabric and steel pass to the winding machine from large spools. Presence of high humidity in this room leads to rusting of steel wires,

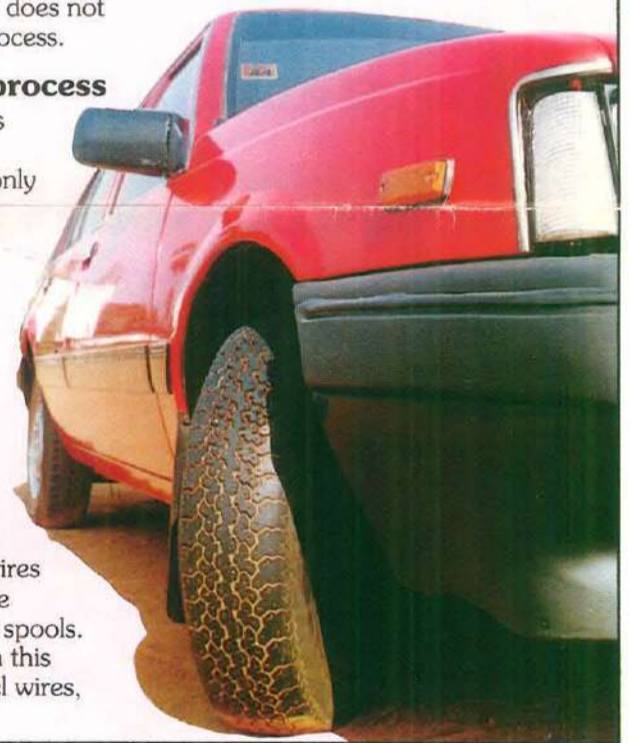
leading to a large rejection rate and loss of strength. Rusting prevents proper bonding between the steel and rubber.

Dehumidification of creel rooms, therefore, becomes a vital application area. Bry-Air has installed several dehumidifiers in creel rooms for all the well-known tire companies maintaining conditions of 30% RH and lower at ambient temperature.

### **The benefits**

Tires incorporating the superior radial tire technology have withstood the test for a longer life than conventional tires. All this has been made possible due to adherence to quality manufacturing practices. Adding a desiccant dehumidifier to protect the steel cord ensures a **'lasting bond which never tires'**.

\* spelt as 'Tyre' in most countries



# Making safety glass safer

**Automotive windscreens are made of very special glass called the safety glass. The safety element is ensured by a special bonding of the pieces of glass with a special film inside which holds the shattered glass together in the event of breakage. The fragmented glass does not scatter, thus protecting the driver and the passengers.**

The thin, transparent plastic film which is used as an adhesive between the layers of glass is quite hygroscopic. During storage, prior to manufacturing and during the bonding process, if the film is allowed to absorb moisture, then moisture vaporizes during the autoclaving process and gets trapped between the layers of glass, as bubbles of moisture. The trapped moisture reduces the visibility of the glass and the effectiveness of the bond between the two layers of glass, rendering the product unsafe.

The solution lies in dehumidifying the glass laminating area. Maintaining RH conditions of 20-22% at 70°F (20 °C) ensures that the plastic sheet does not regain moisture. The temperature control is not critical but should be in the comfort level for workers.

Bry-Air has done several jobs for manufacture of safety glass for a number of automobile manufacturers. Desiccant dehumidifiers are an effective

method of humidity control at low temperature to prevent moisture regain in most hygroscopic products.

**More specifically, in the manufacture, storage and use**

**of this laminating adhesive plastic film, the desiccant dehumidifier creates a low humidity environment, making the safety glass safer.**





# A package deal

## Environment control makes the delicious differ

*Candies, biscuits, fruit powders, instant coffee, tea, sugar, powdered drink mixes, dried vegetables, soups and milk powder — all have one thing in common. They are all hygroscopic and sensitive to high relative humidity. Moisture regain in food products not only alters their appearance but foods generally become soggy, rubbery and less appetizing.*

Foodstuffs are made using high temperature processes. So we expect that excess water has been driven off. However, if these products are exposed to humid environment, even for a short time, they will absorb water from the surrounding air.

In processing powdery foods such as cocoa, gelatin and dehydrated concentrates the presence of moisture

in the surrounding air can cause tiny particles of the powder to stick or cluster together, inhibiting their free flow during processing or packaging.

On humid days, it is exasperating when salt from the salt shaker refuses to flow. In the processing and packaging machinery, sticky powders can interfere with the operation and obstruct the free and easy movement of the foodstuff. Candy wrapping machines and packaging machines for food powders are typical examples. Something as simple as a cake mix becomes a double problem. Not only does the powdery mix lump and refuse to flow smoothly in humid conditions, it also hinders the functioning of the packaging equipment.

Obviously, when moisture can have such a profound effect on food and / or machinery, the solution lies in conditioning the air in the packaging

area in the same way as in the processing and manufacturing stage. So no change in state can take place in the food from the finished material to the final packaged product.

### The Bry-Air Package

Desiccant dehumidifiers are effective in controlling humidity at low temperatures. In fact, the Bry-Air Package Unit can provide the total environmental control with very close tolerances of not only humidity but also temperature. The Package Unit is a self-contained environmental control unit which is made up of the following components:

- A. Pre-cooler to cool the outside air to remove a part of the high moisture content of the ambient air.
- B. Dehumidifier to maintain the required RH in the space.

Super clear. Super fresh.

# Super choice for supermarkets

*In the highly competitive area of consumer products, supermarkets constantly vie with each other to have the best product and the best display and yet make profits. Frozen display cases, peeling labels on cans, sweating bottles and cans and puddles of condensed moisture certainly do not lead to customer satisfaction. Controlling high levels of humidity is proving to be the single most important factor in higher energy costs and reduced product appeal.*



### The traditional choice

Supermarkets traditionally use air-conditioning systems to control both air temperature and humidity. In presence of high humidity, store air-conditioning systems and refrigerated display cases overwork to control the temperature and humidity in the environment. This leads to overcooling the shopping environment. The moisture condenses on the freezer cases and refrigeration cases. Frost

builds up on the case coils and products, leading to lower product appeal. This ultimately leads to product deterioration.

### The alternative choice

The better and more economical solution lies in controlling the humidity separately from air temperature by using a desiccant dehumidifier. The benefits are the greatest where the moisture loads are

high compared to the sensible heat load ratios, which affects refrigeration system efficiency and increases energy bills.

Solid desiccant dehumidifiers are typically applied in low RH air-conditioning applications at dewpoints below 40°F (36 gr / lb dry air), a level of humidity that is impracticable by other means. Additionally, with the desiccant dehumidifier using heat as the primary energy input, natural gas, electricity, waste heat or solar energy can be used either singularly or in a cost effective combination to lower the prime electrical loads of the air-conditioning system.

Separating the sensible and latent loads allows each part of the system to be designed for its calculated share of the load and gives a substantial reduction in equipment cost.

### The benefits of dry cooling

The greatest advantage lies in considerable energy savings.

A desiccant dehumidifier removes water vapour much less expensively than the cooling systems. By lowering humidity levels of stores, refrigeration loads can be reduced: that is, at 35% RH, refrigerated case energy can be reduced by as much as 15 to 20%.

At this lower RH, frost build-up on case coils is virtually eliminated. Thus defrost cycles are greatly reduced and cases will suffer less wear and tear.

Display cases and products are also virtually frost free and, therefore, more appealing to the consumer.

By incorporating a desiccant dehumidifier to reduce the moisture of make-up and store air the size of air-conditioning equipment can also be reduced.

In actual supermarkets, where natural gas-fired desiccant dehumidifiers have been installed, an annual savings in energy of \$0.65 to \$0.95 per sq. foot of store has been achieved.

### The retrofit option

The dehumidification equipment lends itself well to a retrofit programme in improving the environment in the existing supermarkets or their expansion programmes, providing major energy savings.

The dehumidifier is ducted into the existing HVAC system with the return air and outside air passing through the dehumidifier and the dry air is passed onto the HVAC system for cooling. This reduces the load on the air-conditioning equipment by as much as 50% of the design load.

**Hence, by providing conditioned air at lower humidity levels, and providing a double benefit of energy savings and a more comfortable and appealing environment, desiccant dehumidification does prove to be a super choice for super markets!!**



ence

- C. After-cooling for temperature control.
- D. After-heat for temperature control.
- E. Humidistats for precise humidity control and humidifiers if the air being delivered is below the desired humidity level.
- F. A dehumidifier by-pass for energy savings and control.
- G. Electronic controls to keep the serviced area at the design conditions.

Depending on the product, it may be necessary to dry the packaging and even provide a dry bath for storage bins and hoppers. One example occurs in sugar storage, prior to packaging. In situations where packages are heat sealed, the moisture content of the package may

adversely effect the adhesion of the sealing material. Surrounding the area with dry air eliminates this problem.

The Bry-Air package is indeed a 'package deal' since environmental control of the packaging area provides several benefits —

**Reduction in first cost** as temperature and humidity are controlled by a single unit.

**Reduction in operating cost** as machine and packaging equipment downtime is totally eliminated.

**Improvement in product quality** is ensured by preventing agglomeration, wastage and preserving product appeal.

**This package undoubtedly ensures the delicious difference.**

# For the cup that cheers

*It is a long journey from the gardens to the tea cup. Will your tea still retain its garden freshness?*

For tea lovers across the world, 'Earl Grey' and 'Twinings' spell topmost quality in speciality tea made from the finest blends of Darjeeling and Assam tea. Their aromatic blend is unsurpassed.

The journey from the gardens of Darjeeling and Assam in North Eastern India, though a tedious one, is quality controlled at each step to ensure the all-important 'Garden to the tea cup freshness'.

### Entwined bush

For two decades, Bush Tea Co. in India has been exporting speciality tea in bulk to R. Twining and Company Limited, U. K. for their famous 'Twinings' and 'Earl Grey' tea packets and tea bags which are sold in 90 countries worldwide. In addition, Bush also supplies Darjeeling and Assam orthodox varieties for Jacksons of Picadilly.

### Retaining that garden freshness

Twinings, in line with their policy of stringent quality control, had felt the necessity of minimising any deterioration in tea brought from North East India. The deterioration was due to the effect of climatic conditions in Calcutta where the tea was stored, blended and packed before being sent off to its final destination.

As tea is highly hygroscopic, it is very susceptible to the high humidity that is often experienced in Calcutta. The intake of moisture by tea seriously reduced its quality and flavour, and this was particularly true with the fine quality Darjeeling and Assam tea purchased by Twinings.

Experiments were conducted by maintaining controlled environment in the warehouse in which tea was stored and bulked to find out the beneficial effects on the quality of tea. The success in maintaining quality led to the setting up of the dehumidified tea warehouse.

Bry-Air Dehumidifier, designed to supply 2,000 cfm of dehumidified air, maintained 30-35% RH in storage, blending and packaging area where a constant ambient temperature was maintained by means of an air-conditioning plant.

The entire process helped retain the moisture content at a desirable level of 2% and stopped the absorption of moisture during the storage, blending and packaging operations, thus ensuring that tea shipped from India stays in peak quality condition.

**The next time you sit down to enjoy the aromatic 'Earl Grey' Jasmine, remember Bry-Air's role in helping to retain that freshness from the garden to your tea cup.**

## Suite success Resorting to dry-air solutions

*In the highly competitive business environment of today, hotels and motels vie with each other to provide the traveller the best of facilities. Large investments are made in furnishings, interiors and other luxuries to pamper the guests.*



Recently a hill resort hotel with a casino and other entertainment facilities spent four million dollars to build 11 deluxe suites. Seven of these were luxuriously decorated, each with its own private bath equipped with jacuzzis, high power showers, gold plated fittings and furniture to match special theme settings.

The ambient conditions had perfect temperature but very high humidity, almost to saturation point, all year round. Moisture load was high as water vapour was being brought in constantly with the fresh air. Sensible heat load being low, the air-conditioning system dropped the room temperature so quickly that it shut off, leaving the moisture to build up. The result was moldy odour and damage to the expensive carpets and furnishings which soak up the moisture. The attached jacuzzi baths also did their bit to add to the moisture load.

Bry-Air Dehumidifiers were added to dry the make-up air. Room humidity was maintained at 50%, a level comfortable to the occupants.

Improved customer satisfaction, reduced maintenance costs and above all, reduced replacement costs more than pay for the installation of dehumidifiers. Most hotels and motels assume that mold and mildew as well as normal wear and tear will require replacement of room furnishings on a regular basis. Preventing mold and mildew has allowed the hotels to extend the useful life of furnishings, reducing the need for capital expenditure.

**Hence, a little dry air helped new luxury suites to maintain the four million dollar investment and, more importantly, pamper the all-important guest. A suite success indeed!**



## Sweet and Dry that's how it should be

### Sugar storage and packaging

After refining, sugar is fed through belt conveyors to sugar bins and hoppers. At this stage, the sugar is about 48°C with moisture content of approximately .035% of its weight.

The sugar must be cooled down to 38-40°C before it is packaged. This takes between 12 to 36 hours. During this period, in the presence of high relative humidity and temperature changes, condensation

takes place on the bins. This is picked up by the top layer in the bin resulting in caking and lumping of sugar and, subsequently, in deterioration of quality.

The problem is solved by blowing cool dehumidified air into the bin or providing a dry bath for bins. This not only eliminates the condensation problem but also reduces cooling time down to approximately one-third the time.

**The Bry-Air package keeps the sugar sweet and dry.**

# Compact answers to massive problems

*Bry-Air compact dryers answer a very special need in the 'industrial class' desiccant dryer area.*

## Small in size only

Normally, smaller versions of machinery are presumed to have lighter performance. It's not so with the "Compact" from Bry-Air. Here is a tool for the industry that performs to the same levels as its behemoth relative, the "MVB".

The "Compacts" operate on the same principle as the "MVB" — providing dry air by passing it through a patented rotating bed filled with an adsorbing material. The desiccant adsorbs the moisture and dried air is moved to the controlled area. Desiccant which has adsorbed moisture moves to the reactivation sector of the dehumidifier as the bed

rotates, whereby heated air reactivates the desiccant by driving off the adsorbed moisture.

## Benefits at large

Continuous, even dehumidification with no peaks or valleys is achieved with this process, thus providing precise control. High desiccant-to-air ratios ensure longer and more uniform performance.

The adsorption process does not require the complicated machinery or draining needed when dehumidifying air by using cooling or compression methods.

A newer version of the compact uses counterflow reactivation process and has a higher thermal efficiency.

Desiccant replacement is easy and constitutes only a fraction of the total cost of the unit.

The compact design provides ready access to the unit for the relatively little maintenance which is necessary. Mechanical and control design is simple, making it reliable and easily maintainable.

The unit lends itself to easy engineering and can be combined with mechanical cooling systems. The Compact can be used 'in line' without the risk of damage to the Bry sorb desiccant.

## Where Bry-Air is important

Compacts can be used in any small area where humidity control is essential. The unit may be installed inside or outside the controlled area. Overhead installation is also possible because of its relatively small size and weight.

Compacts can be mobile, mounted on trolleys for applications where the site is not fixed.

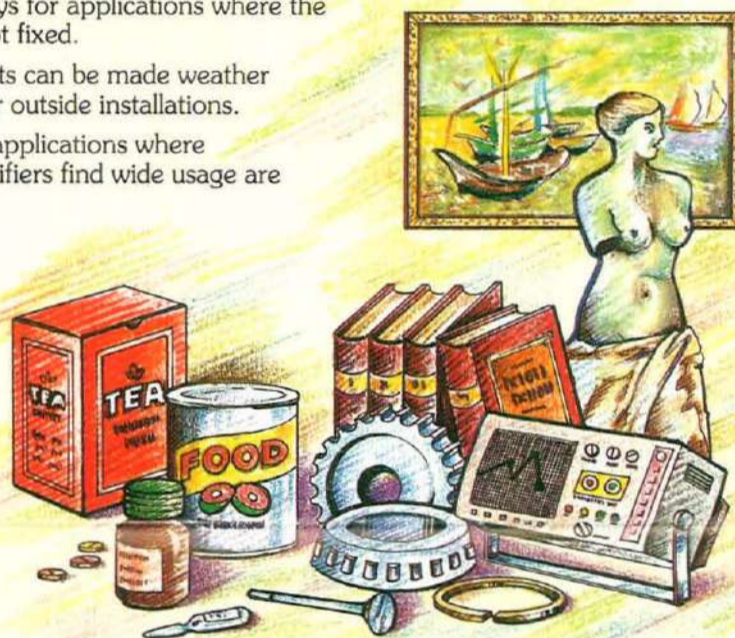
Compacts can be made weather proof for outside installations.

Typical applications where dehumidifiers find wide usage are

**pharmaceutical manufacturing rooms, storage rooms, data processing centres, environmental or clean rooms, permanent record areas, labs, test rooms, pumping stations, water treatment plants, food processing, packaging areas and a whole gamut of other applications.**

Bry-Air has specialized in custom designed environmental control equipment for more than 27 years. **Compact or custom designed**, special units can be engineered by experts at Bry-Air.

**Problem of any size, massive or small, can be addressed by the Bry-Air Dehumidifier.**



# Powder drying—no longer a problem

A molder in Minnesota was having difficulties in molding critical medical parts as the speciality resin powder was absorbing moisture prior to molding, thus affecting the quality of the finished products. Bry-Air installed a powder drying system to eliminate the problem.

## 'Concept 1' powder drying system

The Bry-Air powder dryer incorporates the use of high efficiency fluidized bed batch drying technology to ensure uniform drying.

The system incorporates a dehumidifying dryer which is used to supply dry air to a specially designed drying hopper. The hopper is built to allow for fluidization of the material without the carry-over of fines back to the dryer, often a problem with conventional systems. As a result, the customer is able to process without constantly having to clean his filters.

## The range package

The specialised hopper packages are ideally suited to dry a wide variety of materials including regrind or

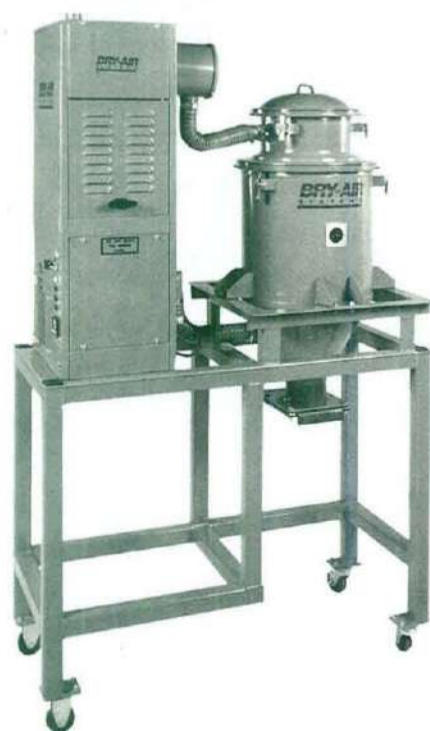
reclaim. The hoppers can be supplied as a turnkey package mounted with a small dryer as shown alongside or several hoppers can be mounted on one common stand with one of the large Bry-Air RD series resin dryers supplying the dry air.

Current models range in size from 80 lbs to 220 lbs capacity.

## A complete range for plastics industry

The Bry-Air product range consists of dehumidifying dryers from 20 to 600 pounds per hour drying capacity, hoppers, loaders, pneumatic conveying systems, mold dehumidification systems and now, powder dryers.

All Bry-Air products for the auxiliary plastics machinery industry satisfy a basic underlying need i.e. a 'quality molded part.' **Therefore, whatever Bry-Air makes, makes plastics handling easier.**



Suitable for powders, regrind and reclaim material

# In total command!

When DMKL of the Dutch Army required to conserve weapon systems of Anti-aircraft artillery in an environmentally unconditioned warehouse, Delair supplied the dehumidifying system. The system supplied dry air directly to the tanks through flexible ducting and kept the internals flushed, thus preserving them from corrosion and rust. The American military and NATO requirements for military preservation have also been met by Bry-Air dehumidifying systems.



**Well beyond human comfort and well-being, the need for a perfect environment extends to man-made machines, products and processes. Corroded steel parts, rusted bolts, decayed parchments, rotten seeds, moldy clothes, disintegrated tablets, coagulated powders, sparking contacts, unclear communications are all evidence of the adverse effects of high humidity in the environment.**

Low humidity conditions and clean air are the main elements for safe preservation as is evident from the well-preserved relics and mummies enshrined in the pyramids for over thousand years. Moisture control is of utmost importance for the safe preservation of materials during **storage, manufacturing and processing.**

Dehumidification is being widely used by the defence in the preservation of equipment in storage of active status material. Though modern armoured vehicles are designed and built to operate in tough operational conditions, they cannot withstand harsh climatic conditions when not in operation. As weapons get smarter and equipment packages assume higher values, the need to protect and preserve them, both in transit and in storage, becomes ever more challenging.

## The Dry Storage System

Bry-Air, using the concept of dehumidification, has been able to come up with the perfect solution of the outdoor storage problems, where permanent storage structure is not available and indoor storage problem, where the structure or warehousing is available.

The Bry-Air Flexible Dry Storage System provides a proven solution to storing all types of mobile ground and airborne equipment, allowing storage in any outdoor area and assuring flexibility and movability in the choice of storage site. Depending on the requirement, the dehumidification can be connected inside the shroud. It can be kept in a weather proof trolley serving 2 to 4 shrouds at the same time. Bry-Air offers both cluster and individual installation options.

## Advantages of the system

The system protects military equipment from corrosion. It forms a barrier against humidity, salt, sand, dust, insects and the sun's ultra violet rays which are so damaging to rubber, paintwork and canvas. Microbiological attack is inhibited and optics and other fittings stay free of fungus. The usage of the FDS system results in increased meantime between failures, reduced maintenance cost and greater time availability for training.

**Equipment stored in dry storage is always battle ready and can be made operational in a very short time.**

## Indoor storage

In indoor storage conditions, the dehumidifier is connected to the inside of the tank or aircraft through flexible ducting to keep the insides flushed with dry air. Environmental protection for storage of static materials like optics, rubber parachutes, rations, records, microfilms and medicines can be provided by dehumidifying the entire storage space. Smaller components can be stored in glove boxes.

## The Bry-Air experience

The Bry-Air experience with several

military equipment applications over the years shows that dehumidification basically is a function of :

- The type of preservation the equipment has already received.
- The stage of readiness for which the equipment has been scheduled.
- The type of equipment.

Typically, standard equipment such as trucks, tanks, guns usually fall into 35% RH category, requiring no temperature control. Whereas finished ammunition can be kept in the 35% RH area and max. of 80°F, considering the volatility of raw material an atmosphere of 10-50% RH and 35-75°F would be required.

There is no singular system to cover the entire field of applications. This is

where the Bry-Air experience comes in to design a special system to meet the required needs.

## Complete capability

Bry-Air has been manufacturing dehumidifiers for over three decades, but its strength lies in providing total solutions. Bry-Air engineering research and development provides it with the ability to seek and develop new concepts, to apply established practices to new requirements, to co-ordinate from draft specifications through design and prototype stages into production and through into service.

**This capability places it in 'Total Command' to provide the most effective solutions for protection and preservation in civil and military operations.**



# Preservation of Brunei King's vintage cars



**All the King's men and all the King's staff could not keep the moisture menace away.**

Maintaining a fleet of 398 cars with Porches, Rolls Royce, Ferraris and Mercedes and several antique and vintage models is no small task even for the royal family of Brunei. Keeping all the beauties in gleaming condition and purring and ready to go at the touch of a key required extensive maintenance and upkeep by a large staff.

Bry-Air offered a simpler and more economical solution. Four MVB dehumidifiers were put to work to dehumidify the entire storage block

housing the cars. A temperature of 75°F and 45% RH helped keep the cars in perfect condition, free from rust, needing minimum maintenance and upkeep.

Dehumidification does provide the most cost effective solution for preservation of metal and other hardware from corrosion in industrial storage, commercial and defence sectors.

**Bry-Air has a wide experience of combating the moisture menace. A little investment may go a long way in preserving all your big investments.**



# Widening our horizons in the East



Ribbon cutting - (l to r) H.E. Mr. Paul Cleveland, US Ambassador to Malaysia, Mr. Paul D. Griesse, President Bry-Air Inc., Mr. Deepak Pahwa, President Bry-Air India, H.E. Mr. R. S. Rathore, India's High Commissioner to Malaysia.

**With the opening of the Bry-Air Malaysia plant in May 1991, Bry-Air completed that all-important link to the Asian Pacific markets, in its goal towards increasing its global presence.**

The emergence of East Asia as a dynamically growing market and an economic force has prompted large-scale foreign investments and increasing trade and export opportunities. In these tropical humid countries, and ever-increasing use of sophisticated technologies, environmental control finds wide applications. The increasing demand for environmental control technologies prompted Bry-Air to establish a greater presence in the area and Malaysia was the obvious choice.

## Malaysia — A land of opportunities

Malaysia is gaining ground as a land of opportunities where natural resources abound, labour is cost

effective, industrial land ample and infrastructure adequate. It has a stable currency and English language base.

Foreign private investment is encouraged through various incentives. The main thrust of economic development is to stimulate greater and wider private sector growth. This is precisely the reason for Malaysia's growing popularity with investors — domestic as well as foreign.

Bry-Air Malaysia enjoys a, pioneer status, granted by the Malaysian Government because it is the first venture of its kind to manufacture state-of-the-art chemical dehumidifiers, plastic resin dryers and energy recovery systems.

Bry-Air Malaysia effectively supports the ASEAN and Asia Pacific Region through the network of agents in Singapore, Thailand, Hongkong, Taiwan, Philippines, Indonesia, New Zealand and Australia.

## Bry-Air — Thinking globally... acting locally

Though Bry-Air is a SME (small-medium enterprise) it strongly believes in thinking globally and acting locally. In the rapidly changing scenario of world markets, **assessing the needs of local markets, modifying product to suit local applications** and adapting marketing techniques to promote the products in different territories are very strong

considerations which have made Bry-Air successful in its operations in India, Netherlands and the U.S.A.

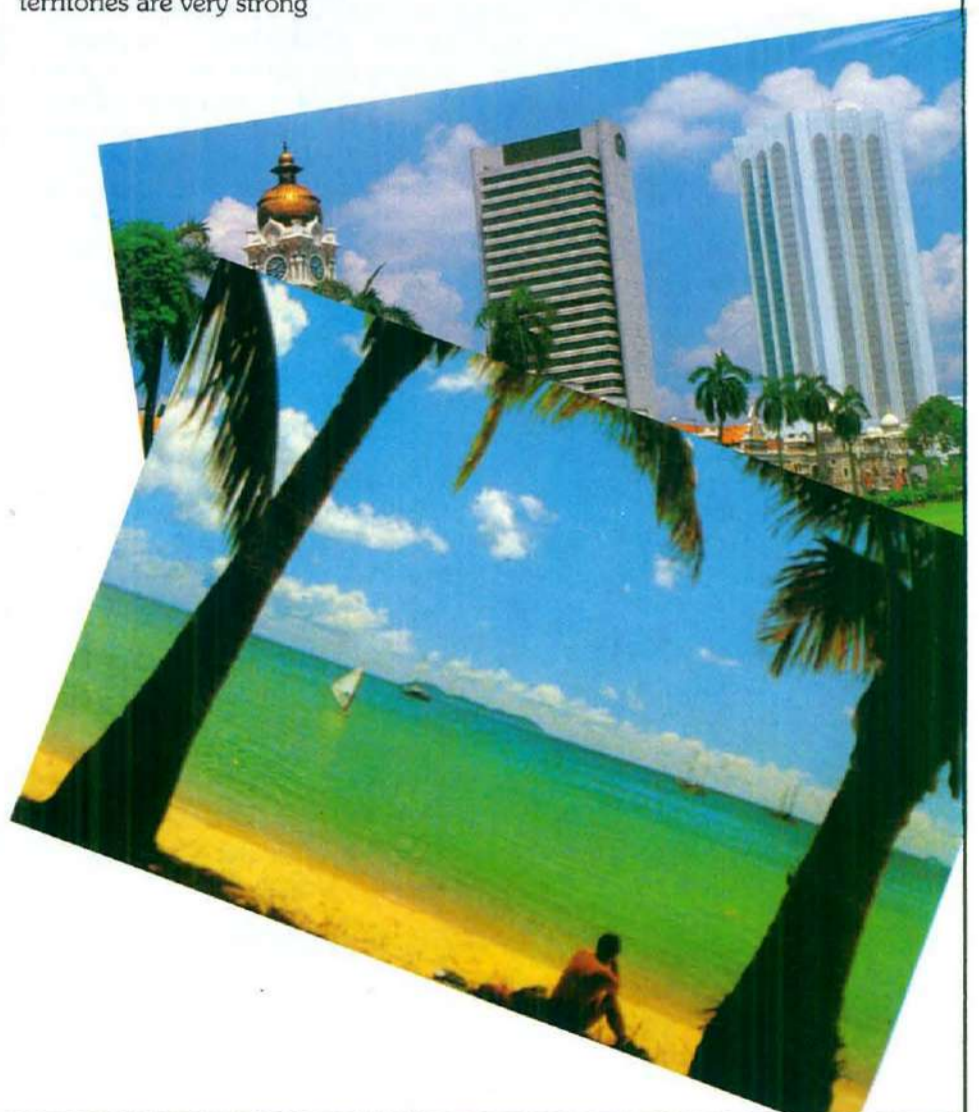
This is the right ingredient for success in the emerging economic "borderless world of today"

## Customer satisfaction — A common philosophy

Globally, Bry-Air maintains 'customer satisfaction' as its key operating factor. Bry-Air's philosophy is to constantly use its technological edge to continuously improve quality and, thereby, customer satisfaction.

Bry-Air not only sells products, it sells solutions. This is the essence of its philosophy! Bry-Air worldwide is known for its expertise as a 'solutions' company for moisture / humidity control problems. This is because we believe that people not only buy things, they buy the benefits offered. Providing and proving benefits of dehumidification based on engineered solutions and customer education has made Bry-Air world leaders in this field.

**With this fundamental thinking and philosophy, Bry-Air in the East or the West, is geared up to provide you with what it is best at — 'Dry Air'.**



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