

Yielding splendid results



"Fertilizer Quality - A pre-requisite to food quality" is the truth borne out by the fact that fertilizer is the single most important input for better yield. In every part of the world, no other single input in crop production technology exercises such a decisive role as the fertilizer. Yet this very single factor can be uneconomical through the use of inappropriate storage methods. Wrong timing and wrong methods of storage can often entail a loss of 1/3rd to 2/3rd of the yield.

The Chemie Linz experience

Chemie Linz in Austria is one of the biggest manufacturers of fertilizers



in Western Europe. Increasing demand, leading to higher production, entails a continuous extension of production and storage facilities. During an extension of their facility they faced a unique problem.

Before the bagging process, the fertilizer is stored in silos as large as artificial mountains. The silos are mammoth in size and, in this instance, the volume of the unheated phosphate silos is 24,000 m³ and that of the fertilizer silo is 90,000 m³. As the fertilizer is highly hygroscopic in nature, the dried fertilizer regains moisture from the surrounding air until it reaches an equilibrium with the surrounding air. The result is that the surface of the fertilizer "mountain" becomes solid and very hard.

The solution to this problem of surface hardening and slippery floors lay in surrounding the stored fertilizer with dry air. For this, the relative humidity to be maintained inside the warehouse had to be less than 40%.

The problems were solved with the use of MVB dehumidifiers, supplying 17,000 m³/h (10,200 cfm) and 26,560 m³/h (15,936 cfm) air quantity, maintaining three silos at 40% RH.

The Chemie Linz experience is a recent one. However, Bry-Air Inc. in the United States has done pioneering work in providing environmental control in the form of dehumidification for many fertilizer storages throughout the world.

Dehumidification – The best solution

Almost all types of fertilizers are essentially stored at ambient temperature conditions but the relative humidity needs to be controlled at 40%. If the humidity goes above 40% the prills being very hygroscopic will absorb moisture, causing them to stick to each other, rendering the product useless. Another side effect of high humidity is that in contact with hydrocarbon, the ammonium nitrate becomes explosive in nature. Hence it becomes very important that for successful storage/bagging of ammonium nitrate the humidity be kept or held below 40% and temperature be kept stable, at prevailing ambient conditions.

Bry-Air dehumidifiers maintain

these conditions with ease regardless of ambient temperature.

Dehumidification systems can be applied to any of the following areas:
The prilling tower – low humidity improves the prills.
Bulk storage – to protect the prills, etc.
Bagging operations – for ease in handling of prills.

Bry-Air Experience – in a lead position

Bry-Air has a number of installations to its credit and through this experience it has acquired the expertise to handle ammonium nitrate dehumidification - an economical and successful fertilizer storage technique.

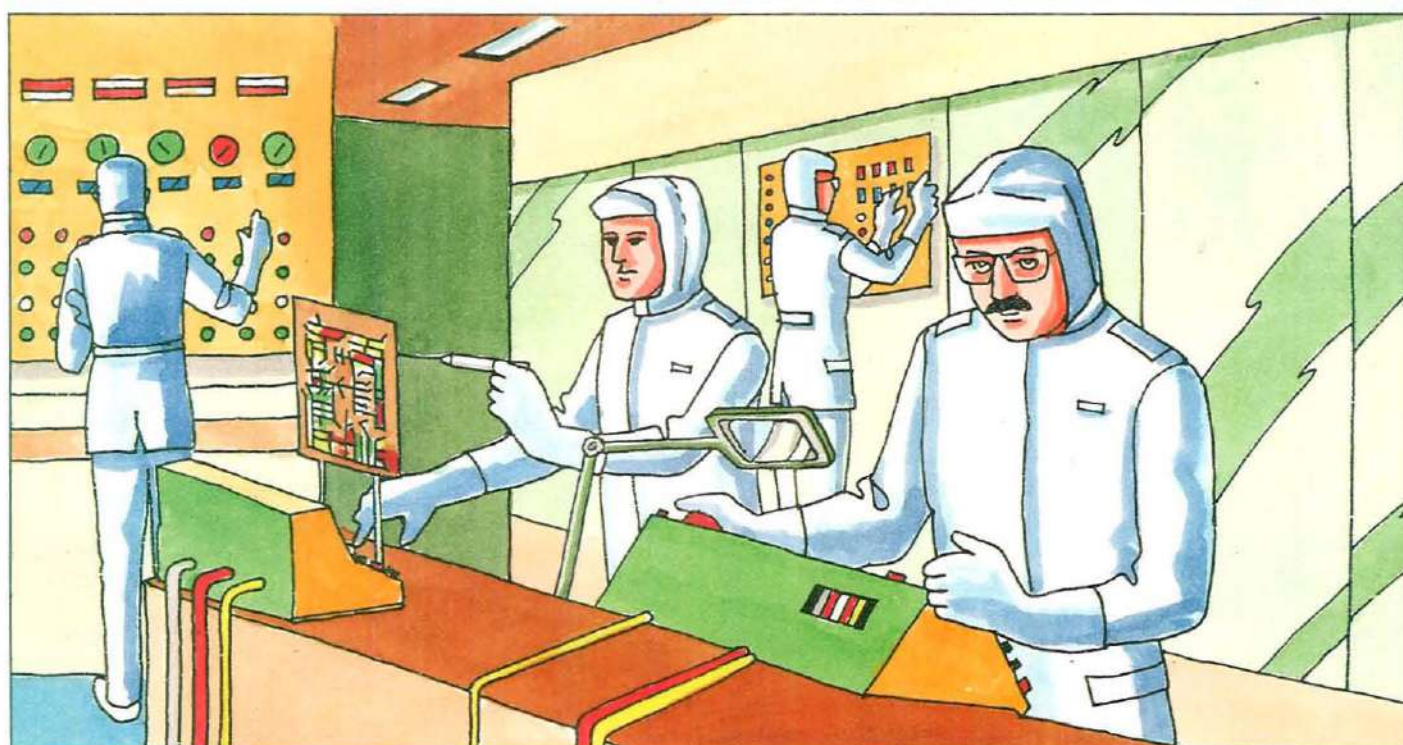
Our ever expanding customer list proves Bry-Air leadership.



Help
for
Helsinki

(STORY ON
PAGE 6

Towards a clean environment



Contamination control technology is a complete industry by itself, better known to us as 'clean rooms'.

The clean rooms are workplaces where contamination is controlled. They provide an environment for research, development and manufacturing of equipment or processes which are susceptible to airborne contaminants. This applies to the fabrication of microscopically small subassemblies, electronic devices and instruments, and to the increasing demand for more sterility and purity in drugs, foods and a germ-free atmosphere for medical and biological applications.

Contaminants can be particulate or chemical. Particulate contaminants may be inert (dust) or alive (bacteria, spores, fungi). The live particulate contaminants are capable of multiplying. Contaminants can come from a wide variety of sources: air (the cleanliness of which is defined according to classes of clean rooms and classes of dust); water, chemicals, the physical plant itself and personnel.

Thus, the clean room becomes a specially constructed enclosed area environmentally controlled with respect to airborne particulates, temperature, humidity, air pressure, air pressure flow patterns, air motion, vibration, noise, viable organisms and lighting.

Humidity Control – an important variable

Humidity control is necessary to (1) prevent corrosion (2) prevent condensation on work surfaces (3) reduce static electricity (4) prevent product contamination (5) provide personal comfort (6) compensate for hygroscopic materials and (7) control microbial growth within the clean rooms.

General applications may require humidity levels to be maintained at 35% - 40%. However, critical applications may require lower levels of humidity with closer tolerances.

Bry-Air dehumidifiers have been effectively controlling humidity levels in clean rooms for various applications the world over. Clean room dehumidification is an important area of Bry-Air specialization.

Major application areas include the

electronics industry for manufacture of integrated circuits and semiconductors. In addition, the pharmaceutical industry, aerospace, automotive and computers are a few of the many others requiring more stringent manufacturing conditions.

The changing face of workplaces

With more and more emphasis on zero defect products, the design parameters and manufacturing

norms are becoming extremely stringent.

With greater sophistication being built into cleaner work places, environmental control by way of temperature and humidity control becomes an even more important factor for control and monitoring.

Bry-Air dehumidifiers will remain in the forefront for contamination control technology in order to help create a cleaner environment.

A vital breakthrough Kidney manufacturing plant

With increasing awareness and availability of dialysis machines on a fairly large scale, a large number of people who suffer from chronic, irrevocable and non-operable kidney complications have been given a fresh lease of life. This is largely due to the artificially manufactured filtration membrane which serves the purpose of a glomerulus (small clusters of tiny blood vessels which filter the blood).

The manufacture of this special filtration membrane requires sterile conditions and strictly controlled humidity levels.

Organon Technica in Oss, Netherlands manufacture this special membrane filter in their production facility where a constant dewpoint of minus 27°C and a temperature of 70°C is maintained.

Delair in Netherlands designed the system and was able to maintain the dewpoint and temperature in spite of varying airflows.

Monitor the moisture

Data processing systems are the lifeline of any organisation today. That is why it is imperative that they have the environmental protection needed for all such systems.

Data processing systems areas contain computer equipment as well as necessary ancillary equipment to meet a particular data processing function.

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

Effects of High Humidity

High relative humidity levels may cause improper feeding of cards and paper and also lead to condensation on machine surfaces. The basic problem arises from the fact that water vapour condenses on any surface cooler than the dewpoint of the surrounding air.

During the day, when the outside

temperature is higher and when machines and lighting produce additional heat, air-conditioning cools the air. The resultant humidity in the room at that time can be 65% to 70%.

However, at night, air-conditioners work only intermittently or are switched off. This leads to a rise in temperature and relative humidity reaches the level of outside air. Any sudden change in temperature results in condensation on the cold surfaces of the computer, leading to erratic behaviour and frequent breakdowns.

Design Criteria

The criteria for environmental control should be to remove computer heat adequately and preclude the possibility of condensation on the equipment.

Typical temperature and relative

humidity conditions recommended by most computer equipment manufacturers are 22° ± 1°C and 50% ± 5% RH (non-condensing).

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

One can literally dial the weather by setting required and desired parameters on the humidistat and thermostat of the dehumidifier and air-conditioner respectively.

The use of dehumidifiers reduces the dewpoint to such a low level that condensation is prevented.

The Bry-Air Dehumidifier

The equipment for dehumidifying air in computer rooms has to be compact, occupying minimal space.

Bry-Air offers twenty-five models out of which the smallest five are essentially portable. Bry-Air dehumidifiers are often a part of the air handling system which provides filtration, cooling and heating of air.

Bry-Air dehumidifiers are being satisfactorily used in computer rooms in large and small installations worldwide.



High-voltage performance

Rising to the occasion

pakmaya
ISTANBUL

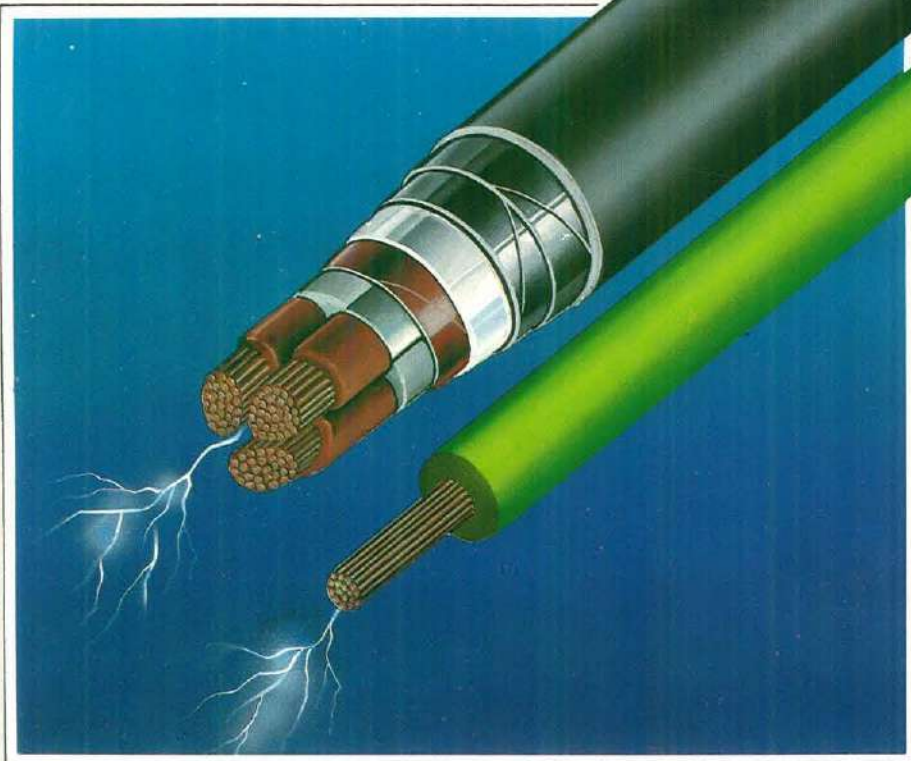
The story of yeast is as old as the story of bread. For centuries, yeast has been associated with bread-making as a fermenting agent.

The origin of bread, though obscure, dates back to the Stone Age. Flat breads were common in the late Stone Age, while raised bread developed around 4000 B.C.

Traces of yeast were discovered in beer jars and beer breads were used as offerings in Theban tombs in 2000 B.C. Fermentation, originally a matter of chance contamination of airborne yeast, was promoted by using a piece of old dough. To this day, this is the method the most prestigious bakers choose. By 300 B.C., however, yeast-making became a specialized profession.

the fluid in which they have grown by a filter process. The yeast cells are mixed with starch cells and pressed into large cakes. Fresh yeast can survive only for a few weeks at controlled temperature of 4°C. Hence, it needs to be stored in specially constructed cold stores. On the other hand, dry active yeast can be kept for two to three years without any loss of properties.

Dry yeast is also being manufactured by Pakmaya, employing a special technique. Drying of yeast is an intricate process, requiring cold dry air to produce quality yeast without



Ceat Cavi in Turin, Italy is one of the major manufacturers of high voltage cables. Special cables that can carry 200,000 volts are produced under low humidity conditions.

A laboratory in New York State tests cables for extra high voltage power transmission. Equipment capable of producing 3 million volts and testing 150 ft. lengths of cable carrying upto 350,000 volts for periods as long as three years is isolated in a precisely controlled atmosphere which must be maintained at a relative humidity of 10% or less, no matter what the weather outside may be.

Humidity is a Prime Factor

Humidity control is of vital importance in high voltage cable manufacturing for several reasons. Extra high voltage cables are insulated with an oil impregnated paper which is hygroscopic in nature. When exposed to humid air for several hours, enough moisture may be absorbed to form a potential electric breakdown.

The moisture being a good conductor of electricity, reduces the resistance to electricity in the insulation material. The result of this loss of resistance in high RH conditions results in electrical leakages, which usually ends up with failure of the equipment. Hence design conditions for the manufacturing area are such that they keep the surrounding environment quite dry.

Cable Wrapping

The process of cable wrapping involves cladding the copper interiors with a thick layer of specially treated paper. The wrapping paper is made from wide paper reels cut into narrow reels of approx. 2 cm width. A large number of such reels are mounted in a long row of wrapping machines. The blank copper heart enters the wrapping room at one end and is led through the wrapping machines. Each wrapping machine adds a certain thickness to the cable. When the cable arrives at the other end, the total thickness is more than five times the original thickness.

The process, if carried out in an uncontrolled humid environment, leads to moisture being trapped between the conductor and insulation and can cause shorting,

explosions and discharge at a later time. Paper insulation being hygroscopic can absorb moisture and lead to breakdown of electric insulation.

The final treatment involves impregnating the cables with chemicals and subsequently putting them in autoclaves to undergo heat treatment. Prior to this production stage, it is important that the paper is thoroughly dry.

Bry-Air equipment plays a major and important role in ensuring that the cables are produced at the absolute ideal temperature and humidity. Ultra dry rooms are designed with RH as low as 5% at 20°C as optimum conditions for the cable wrapping process.

Laboratory testing of high voltage cables

In the 1960s, a lab was set up for testing 150 ft. lengths of cables with terminals and splices at 350,000 volts while handling a current equivalent to the desired load, for continuous testing lasting two to three years.

It was essential that humidity be controlled in the lab to avoid moisture regain by paper insulation, specially when terminals and splices were made up to prevent potential electric breakdown. Hence design conditions for the lab were based on a maximum relative humidity of 10%. Bry-Air dryers helped maintain these conditions effectively.

Humidity control with Bry-Air dehumidifiers provides the ideal dry conditions for cable manufacture, winding and storage – truly a high voltage performance.



Yeast is now commonly available in packets and foil sachets in the supermarket. However, there is nothing new in its function of a raising agent for imparting that special light texture to the bread we eat.

Yeast is made up of living cells with the ability to change sugar into alcohol and carbon dioxide.

Making of Yeast

The yeast-making process is as interesting as the bread it helps to make. Pakmaya in Istanbul has been in the yeast-making business since 1973. Located in Izmir, the leading trade centre in Turkey, Pakmaya produces world-class instant and active dry yeast and exports 80% of its production worldwide.

Yeast-making involves growing the organism in suitable media. The crop is harvested when a sufficient crop of cells has appeared. Pakmaya uses 'Saccharomyces cerevisial' as the micro-organism which is prepared in the laboratory as the seed yeast. This is then passed into a clear mineral salt-sugar solution, used as the medium, where fermentation occurs. The temperature is kept constant for rapid growth to take place. The yeast cells are then separated from

destroying the organism. The quality of air required for drying of yeast has to be controlled and moisture content kept between 10–14 grains/lb (1.6 gm/kg – 2 gm/kg) or the dewpoint of air must be in the region of 12°–18°F (-11° to -7°C).

Delair Netherlands supplied the Bry-Air dehumidifiers to maintain these stringent conditions in the drying area of Pakmaya manufacturing. The use of the latest technology helps produce yeast to the international quality standards which Pakmaya is extremely proud of.

Pakmaya, through their sizeable export earnings, have become a symbol of pride for Turkey. Delair is proud too, for having helped them 'Rise to the Occasion'.



There's celebration

25 years of Excellence

★ 1964



Bry-Air Plant - Fall of 1964, first phase construction

"Making money out of thin air" is what Bry-Air has been doing for the last twenty-five years. No, they are not magicians; but doing away with dampness in the air has been a profitable business for Bry-Air Inc. of Sunbury, Ohio.

In 1963, Arthur G. Harms, a Bryant sales representative, decided to buy the Bryant division of Carrier Airconditioning Corporation. Shortly after the acquisition, Bry-Air began manufacturing in Sunbury, Ohio. The rest was truly an American small business success story.

The company began manufacturing industrial dehumidifiers in 1964 from 18,000 sq.ft. of covered area in Phase-I and has never looked back since then.



First A-1-B originally sold for 600\$



Art Harms shaking hands with Sam Shawhan (President) on the purchase of Bryant Dehumidifier Division

The Land Mark Years

In 1969, Bry-Air entered into a license agreement with a European company called Delair. Based in the Netherlands, Delair manufactured and promoted Bry-Air equipment throughout Europe, Africa and the Scandinavian countries.

In 1976, Bry-Air doubled plant size to 40,000 sq.ft. to accommodate increased demand for larger systems.

In 1978, Bry-Air acquired Van Dorn Systems, a division of Van Dorn Manufacturing Company and renamed it Bry-Air Systems. It manufactures and sells dehumidifying and material handling

equipment for the plastics industry.

In 1979, Bry-Air entered into a joint venture with Arctic India Sales, forming an Indian company called Bry-Air India. A full scale manufacturing facility was completed on the outskirts of Delhi in 1982 and currently services the entire South East Asian market, Far East and Russia.

At twenty-five, Bry-Air is a multilocation, multiproduct company poised for growth at a faster pace to meet the challenges of the 1990s. That's certainly not building castles in the air!



Bry-Air a Truly a G

"Having an international outlook goes hand in hand with learning how to manage in different cultural environments. Only when we are able to understand the different cultures in each country can we arrive at management styles and methods that can bridge different cultures and be effective."

-P.D.Griesse, President Bry-Air, Inc.

That is exactly what Bry-Air Inc., a medium sized U.S. company from Ohio has learned to do. With Delair as a licensee operating in The Netherlands for the last 15 years and the establishment eight years ago of the joint venture, Bry-Air India, Bry-Air Inc. is selling not only in varied markets but also dealing with rapid changes in the international business environment.

The accelerated pace of change is forcing a change in the character of business organization.

In its twenty-fifth year of operation, nothing else tests the mettle of the company more than its capability to face the new and rapidly changing business environment of the 1990s.

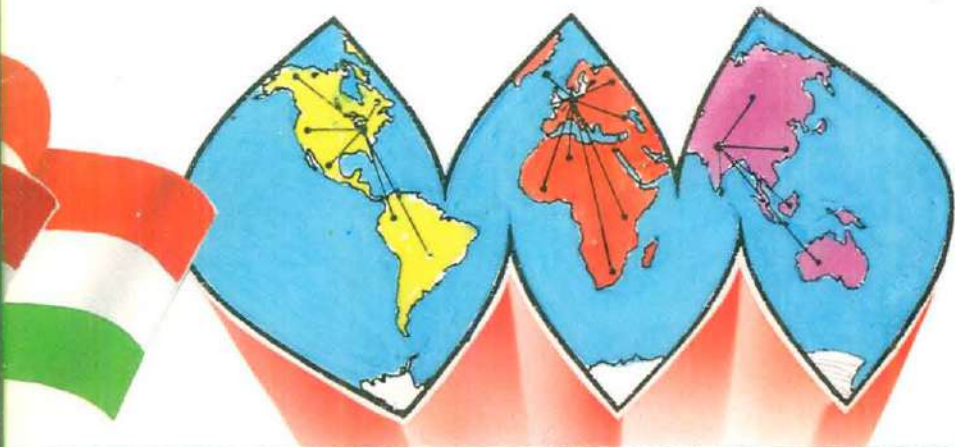
Old A-10-A Unit



Our Global Family

ation in the air

-1989★



25 - Global Company



Bry-Air Plant - Fall of 1989

U.S.A. - Bry-Air enjoys the best reputation in the drying industry because of excellent engineering and ontime production and delivery. Products are patented and designed for industrial applications. Bry-Air is a solutions company, offering complete solutions to the moisture problem. Bry-Air specializes in package systems, engineered to meet specific customer needs incorporating heating, cooling, air filtration, and heat recovery.

Bry-Air Systems, a division of Bry-Air Inc., manufactures and supplies drying, conveying and auxiliary equipment for the plastics industry. This is a fast expanding market as more and more use is being made of engineered plastics worldwide.

Research and development activities are very important at Bry-Air. Its unique laboratory helps upgrade the equipment in order to keep abreast of technological changes. The key focus in the new global setting is on technology. Its capability of transfer technology, a necessity in the global network, has been ably demonstrated by the two successful technology transfers carried through over the years.

Bry-Air views its overseas connections as partners in development. International

meetings at the highest level and training of personnel and agents at the parent company are given a great deal of importance to inculcate a sense of belonging and homogeneous understanding of the company's goals and policies.

Europe - Delair Netherlands is more than fifty years old and is a leading company in Europe involved in the air drying, treatment and separation business. They manufacture, atmospheric air dryers, Bry-Air



The New Generation Dryer

dehumidifiers and a wide range of compressed air dryers.

Housed under one roof with a covered area of 40,000 sq. m., Delair in Netherlands has the most modern sheet metal facility backed by highly qualified manpower to turn out products of the finest quality.

Delair is selling Bry-Air dehumidifiers to all countries in Europe and also Africa, through a network of agents in all major countries.

As Europe is set to become a single market place, competition between companies to gain a strong foothold in each nation will be fierce.

Obviously, any company already in business in Europe has to gear up to meet the challenge head on. Backed by sound knowledge and experience supported by a good product, Delair is set to double its sales in the next few years.

India - Bry-Air India has enjoyed tremendous growth in eight years. With a zero base in 1980, it has created a large dehumidification market through efficient marketing and direct selling.

Bry-Air in India is manufacturing dehumidifiers, heat recovery systems and a range of plastic auxiliary equipment. To meet the local market needs of drying agricultural products, it has developed seed dryers, katechu dryers and wood dryers.

With a fast increasing industrial base in India, Bry-Air in India is set to reap one hundred percent of the market demand created over the last decade.

The marketing-led approach has been applied with success to the South East Asian countries. It has resulted in the opening of markets in this region. A sales office in Malaysia is servicing the entire region with sales, engineering and after sales support. Furthermore, the emergence of East Asia as a growing market and an important economic force will provide the desired impetus for a greater presence. Bry-Air is ready to take advantage with a manufacturing facility planned in Malaysia.

Aiming at the sizeable North American and European markets, gearing up to deal with the realities of international competition and reaping benefits from the growing Asia Pacific region, Bry-Air has already re-oriented itself for its global role, because the international economy will not wait!



An artist with his work - the Bry-Air Portable System

Help for Helsinki!

'How Bry-Air Dehumidifiers helped protect the fresh water treatment building of Helsinki Water Works from corrosive damage'.



Clean water from lake to sea

An efficient system of water supply and waste water disposal is one of the fundamental requirements of modern urban life. In the beautiful and modern city of Helsinki, with a population of half a million people, the municipal utility of supplying water to the inhabitants, removing and treating the waste water is handled by the 'City of Helsinki Water and Sewage Authority'.

Raw water supply

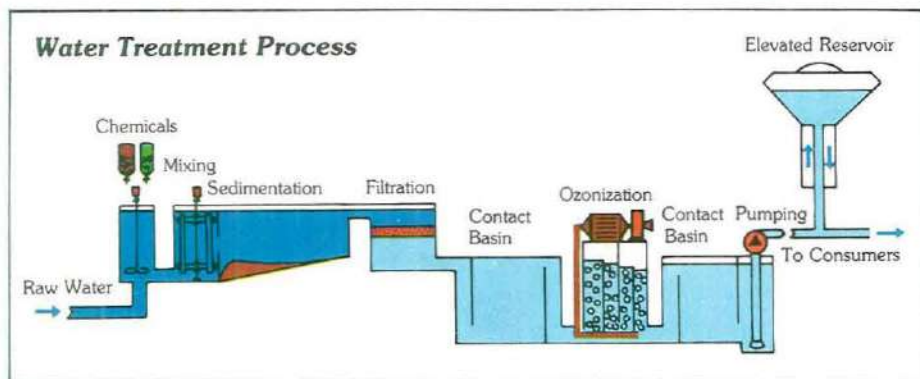
Fresh raw water is taken from Lake Paijanne situated over a hundred kilometers north of Helsinki. Water is piped from the lake to the city through a 120 km rock tunnel. The lakes are located on a higher altitude than the city of Helsinki and water flows downwards all the way by gravity.

The raw water is treated by systems -mechanical and chemical processes at the water treatment plants to produce the highest quality drinking water. An extremely thorough quality control of all phases of the water works process ensures that the treated water is hygienically and aesthetically acceptable. Health authorities monitor water quality and carry out regular tests.

Along with the constant check on quality by the chemical engineers, a very novel and natural test method is in use. Fish which are normally found in the lake are put in a large basin of treated water. If the fish show deviations from normal behaviour, a water monitoring cell calls for a red alert and rectifies the condition.

Water treatment process

This involves treatment by



chemicals which causes impurities to form a floc which is then settled in sedimentation basins and removed. Fine filtration is done by a sand bed. Bacteria, virus and other micro-organisms are destroyed by ozonization. The process of introducing ozone into the water is carried out in large basins.

During the ozonization process the water is constantly in motion and evaporating, thereby causing high relative humidity.

The basin halls have free water surface of 1,900 and 9,300 sq m respectively.

Water vapour condenses on the cold surfaces and causes damage to the building structure. Additional expenses for painting, curtailing rust and other problems would cost the water treatment plant large sums of money.

Delair solved the problem by installing a dehumidifier maintaining relative humidity in the hall at a dewpoint always lower than the coldest surface. An additional dehumidifier was installed in the pump tunnel, eliminating condensation.

Humidity control saves money

Help for Helsinki is not an isolated case. Humidity control in a water treatment plant or similar installation has been proven to be a factor that cuts maintenance and re-painting costs, controls corrosion and protects electrical controls. The dehumidifier installation can, in most cases, pay for itself in the first year by reducing the maintenance and painting costs.

Bry-Air dehumidifiers have been installed in hundreds of water treatment plants the world over to effectively control the sweating problem.



Season in any season

Well-seasoned wood is the first essential to a quality finish in wood. High standards of modern production can be matched only by using well-dried timber.

The duration of seasoning depends upon the application, like furniture, musical instruments or interiors. Typically, for a billiards table only that wood is used which has been seasoned for a minimum of twelve to thirteen years and for wooden string-based musical instruments seven to eight years. Seasoning or proper drying becomes a big factor in the final quality and hence the price is dictated by the wood and its product. The present production rates and high costs of timber force one to focus on the key question how to slash the time factor between the felling of the tree to the using of the timber, without sacrificing any of the qualities of well-seasoned wood. A drying process which is fast, economical and reliable becomes the solution to the problem.

Wood seasoning

Wood is a cellular material being made up of tiny spaces surrounded by cell walls.

The moisture in green timber is present in two forms:

- a) Free moisture in cell spaces and
- b) Bound moisture closely associated with wood substance of the cell walls.

The point at which the cells no longer contain free moisture is called the "fibre saturation point". The free moisture during drying is the first to leave and then the bound moisture follows.

For any given combination of temperature and relative humidity

of the air, there is a corresponding moisture content in the wood, which is termed "equilibrium moisture content". Obviously, higher EMC is associated with higher humidity and lower with less humidity.

Typical defects observed due to improper seasoning are splitting and checking, honeycombing, distortion, case hardening, staining and discolouration.

Drawbacks of the traditional system

The traditional method has been sun drying or natural drying. Four drawbacks of this conventional approach are unpredictability, high capital investment in stocks, poor quality control and the risk of 'blueing' due to attack by micro-organisms. Additionally, a long period of exposure leads to loss of colour, splitting, warping and staining, thereby making this method uneconomical and obsolete.

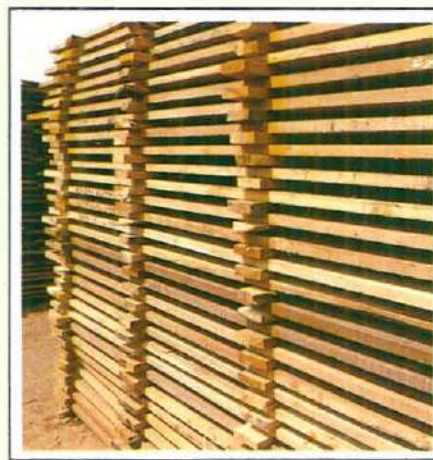
The artificial method uses heating for drying wood from 60%-55% moisture content to about 13%-14% moisture content. The high temperature reduces the drying time but at the same time degrades the timber because of warps, checks and honeycombing. The process is labour-oriented and also involves high operating costs.

The Bry-Air dehumidifiers which have been employed for wood seasoning overcome the problems and limitations of previously employed systems.

The dehumidification method dries wood by reducing the relative humidity of the air in the chamber in which wood is stacked by the use of a special dehydrating unit, rather than by raising the temperature as is done by conventional kilns.

Temperature and humidity are controlled precisely in order that any species of timber may be dried with the most appropriate drying gradient. This principle totally eliminates cracking and splitting and other hazards without compromising on time.

The process works without being affected by outside temperature and humidity conditions and eliminates the vagaries of weather from the drying time.



Now, small is big...

The use of sophisticated engineering polymers has become more frequent in recent years. It is imperative to pre-dry the material prior to processing in order to eliminate wastage because of high moisture content.

Plastic in the resin state is hygroscopic and absorbs moisture from the atmosphere, either during storage or while being processed. This adversely affects the final quality of the molded part.

Proper drying of the resin means not only the removal of surface moisture, but the removal of hygroscopic moisture within the material cells.

The removal of hygroscopic moisture is only achieved by creating a difference in the relative humidity between the product's equilibrium condition and that of the surrounding air.

Bry-Air dehumidifying dryers use the adsorption principle to supply dry air at -40°F dewpoint year round, regardless of ambient conditions. This kind of performance assures efficient and thorough drying of even the most demanding thermoplastic materials.

RD 50 - The mini dryer for greater drying capability

With the increase in numbers of small injection molding machines,



the need has arisen for smaller machine dryers.

The RD 50 was developed because of a need for a small, competitively priced dryer capable of producing -40°F dewpoint air.

Based on the design of the earlier RM series, the RD performs even better - by delivering 20 cfm of -40°F dewpoint air consistently. Capable of drying 50 lbs. of ABS in two hours, the RD 50 has design features which reduce maintenance and servicing costs.



In the RD machines, the switchover mechanism does not incorporate a valve as in other units. Instead, the desiccant bed cartridges have 1 inch wide silicon seals on top and bottom which rotate on Teflon coated wear plates, thus eliminating the problem of erratic dewpoints. This construction ensures a tight seal with no leakages or exposures to ambient air.

The counter current air flow design reduces the energy needed to reactivate the desiccant and extends desiccant life. The innovative multiple bed design ensures that constant low dewpoints are maintained throughout each cycle, thus eliminating the severe dewpoint spiking that is inherent with twin tower designs.

The RD unit permits regenerating at 400°F (the lowest regenerating air temperature of any unit in the industry) and ensures lower operating cost and 100% regeneration.

The Super Saver from Bry-Air

The RD 50 has all the advantages of a larger dehumidifying dryer - the drying capability, completely self-contained, automatic regeneration, at an affordable price.

The RD 50 is indeed a super saver for small molders - quality molding at an affordable price.

...and big gets bigger



Bry-Air introduces the Large Volume Resin Dryer! Designated as LVD, the large volume resin dryers, as the name suggests, supply dry air from 500 cfm to 3,000 cfm and can dry between 1,000 to 60,000 lbs/hr of plastics at one time.

Moldings - for large automotive plants, appliances, household goods, garden furniture - on bigger machines with several machines operating at one time has created a need for large dryers with greater capacities and higher drying rates. The LVDs fulfill this need and are finding more and more application in recent years. LVD is based on the principle of dehumidification and follows the principles of desiccant drying.

One real advantage of the dryer is the optional direct fired natural gas regeneration as opposed to the standard and more expensive electric regeneration. The typical processor or resin manufacturer can reduce operating costs by 60% to 80% as compared to electric powered desiccant dryers.

The LVD supplies dry air at a constant -40°F dewpoint which is sufficient for most types of thermoplastic materials. Further, central systems can supply dry air to several hoppers adding flexibility to your system.

To date, sales and customer response has been outstanding and there is every indication that interest and sales will continue to grow bigger and bigger.

R & D - Quest for perfection



"What next?" - The spur to excellence.

What next? - This question embodies the difficult, ever changing face of perfection. Today, in this fast moving world, a corporation will live or die by its adherence to this exacting ideal. What this means in real terms is a profound commitment to research - a willingness to move with the signs of change. A commitment that manifests itself both in a corporate philosophy and in its action.

Bry-Air has always acknowledged the importance of research and development. In the early years, Bry-Air invested in a state-of-the-art laboratory for in-house R & D. Complete with the most sophisticated instrumentation and capability to simulate the most stringent parameters, the lab is one of the best in the environmental control industry. Its continuing purpose has been to improve

designs, layouts, machinery and production methods that can be integrated into the everyday work environment.

Bry-Air's unique laboratory provides state-of-the-art product development in dehumidification and a place to tailor equipment to specific client needs.

The same facility has been duplicated at the India plant. This aids in sharing developmental time and also helps develop better understanding of product drying cycles in the tropical and subtropical climates.

A number of new projects are currently under development and refinement to provide a better and more efficient product to meet the exacting markets of the nineties - a continuing quest for perfection!

The best defence against moisture

Ready for take off!!

In a remote part of the world, located on a high altitude location and exposed to severe and hostile weather conditions, stand surface to air missiles.

These missiles require a response time quicker than the speed of an attacking aircraft. The controls for commanding the activation of these weapons are also exposed to the same environment. In due course, uncontrolled humidity takes its toll on the electronic system, fuel area and the warhead bay. The command to activate the weapon gets thwarted by the damage caused by humidity. Bry-Air dehumidifiers were used to keep the equipment flushed with dry air, to protect it from moisture damage. This is not the only example of how Bry-Air helped solve the moisture problems in the Defence Industry, but it certainly is an example of the diverse uses, dry air could be put to in military applications.

Military preparedness for active service is of prime importance to armed forces all over the world. Storage of steel and metal products presents major problems where air is humid and there is a big variation in temperature during the twenty-four hour day, causing



condensation resulting in corrosion of material.

Military hardware and equipment in storage like tanks, missiles, ammunition, gearboxes, engines and even replacement parts and stores are highly susceptible to changes in humidity.

Spoilage due to mold, mildew and fungal decay of stored uniforms, leather boots, batteries, tyres, maps, records, microfilms, foodstuffs, etc. are caused by condensed moisture on stored material. Temperature fluctuations can produce wide ranges of humidity leading to condensation and provides a base for organic corrosion to set in.

Deterioration of gunpowder, ammonium nitrate and solid fuel takes place rapidly on being exposed to humid conditions. If the humidity goes above a critical level, the material will absorb moisture, causing agglomeration and rendering it useless.

Weapons systems and electronic systems, in particular are prone to breakdowns if left in an atmosphere of uncontrolled humidity.

The best defence against moisture

Dehumidification as a technique for preservation against moisture attack

is not a new phenomenon in the defence sector. The most widespread early application was in naval warships and the result was so successful that it was adopted as a standard technique. It is being used now for military and industrial warehouses for parts, subassemblies or finished goods.

Warehouse storage calls for sealing the space against infiltration as far as is practical. Dehumidifiers are strategically placed for controlling the moisture in the storage area. The air temperature inside the building is cool but dry. In order that the equipment be kept rust-free and brought into operation quickly, small dehumidifiers provide an economic solution through cocooning for storage.

Bry-Air dehumidifiers have been successfully used by the military the world over for long-term and short-term storage, providing considerable savings in operating costs, building construction and safer storage.

Bry-Air dehumidifiers provide the best protection against humidity in all temperature conditions.

Never at sea with delivery schedules

In Norway, Ankertokken Verft was building two chemical carriers, each with a capacity of 31,000 tons, suitable for all liquid cargoes.

In keeping with demands for modern freighters, quick loading and short harbour time were the key factors in the designing and building of the chemical carriers.

Because of the lack of timely and sufficient drying of cargo tanks for chemical products, the ship owners are often at sea with delivery schedules.

Drying of cargo tanks for chemical products has been and still is very difficult. Weather conditions are very rarely the way they should be for efficient drying of tanks. The quality of products being shipped is however, improving. Hence more and more shippers demand high quality shipping facilities for their products. This means that clean and dry tanks are a necessity on modern chemical tankers.

Loss of time in drying due to rain or fog leads to costly downtime and higher operating costs. This has been reason enough for ship owners to equip their new chemical carriers with onboard dehumidifiers.

Why dehumidification?

Dehumidification removes the variable of weather as a factor in

efficient and timely drying of tanks. After the tanks are washed and the water puddle removed, it is the moisture inside which will not dry. In fact on an autumn afternoon if the hold is exposed to the ambient atmosphere the tank will get wetter and wetter. This happens because the sea water temperatures are low and subsequently the temperature of the steel storage tanks would be low too. If the temperature of the steel is lower than the ambient, RH being 90-95% at sea, tanks will not dry.

The dehumidifier, removes the moisture from the air and blows

very dry air into the hold. This dry air has a dewpoint much lower than the steel temperature. This means that the water left after the wash will evaporate, leaving the tank dry.

Several newly built ships in Holland, Germany and Norway are already equipped with Bry-Air dehumidifiers as onboard installations.

On time with delivery schedules

Onboard Bry-Air dehumidifier installations have helped overcome the variable of weather in the drying

of cargo tanks which can now be dried even during rain or fog. There is no necessity to be anchored at harbour as the installation is always ready to work independently.

Initial investment is low compared to the costs that can be avoided. Moreover, installation is easy to handle and maintenance kept to the minimum.



Bry-Air

BRY-AIR, INC.

P.O. Box 269, Rt. 37 West
Sunbury, Ohio 43074, U.S.A.
Phone: 614/965-2974
Telex: 246-698
Fax: 614-965-5470

BRY-AIR EUROPE

P.O. Box 570
4870 AN Etten-Leur
The Netherlands
Phone: +31 1608 85800
Telex: 54278 fwdl nl
Fax: 31-1608-85590

BRY-AIR (INDIA) PVT. LTD.

20, Rajpur Road
Delhi 110 054, India
Phone: (011) 252-2424
Telex: 031-78003 AISL IN
Fax: 91-11-353318

BRY-AIR MALAYSIA

92-A, SS-21/35, Damansara Utama,
47400 Petaling Jaya,
Selangor-Malaysia
Phone: 7192862, 7192863
Telex: 84-37783 TENASA MA.
Fax: 60-3-7189511