



# dry facts

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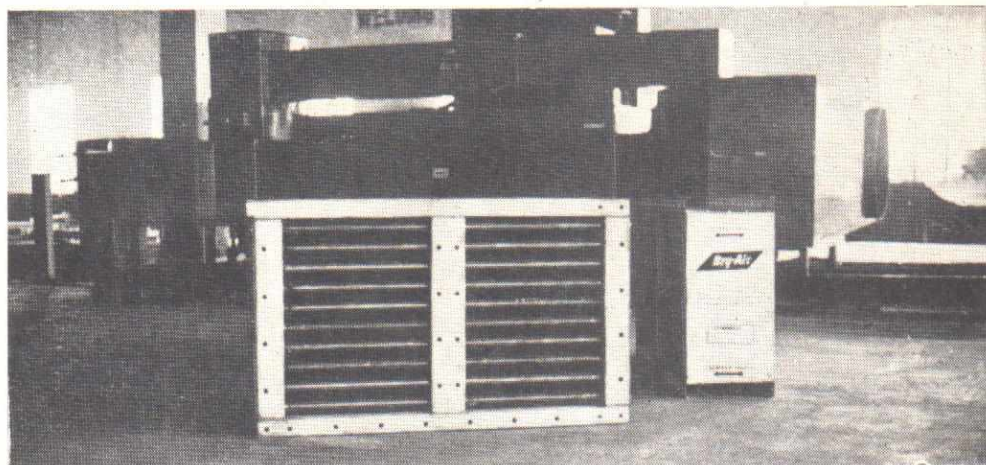
## HEAT RECOVERY COMES OF AGE !!!

Energy conservation and energy recovery are the "buzz" words of today and BRY-AIR (India) feels proud in being instrumental in bringing you the heat pipe based heat recovery systems for the first time in India. Bry-Air is already acknowledged as the world leaders in the dehumidification field.

Pictured along side are two of the recently shipped out heat exchangers to National Industrial Development Corporation Ltd. (NIDC) and Chemicals and Fibers of India Ltd. These were manufactured at the Bry-Air (India) plant which is a joint venture with Bry-Air Inc. U.S.A. Such exchangers have been designed using the heat pipe concept for successfully recovering about 80% of the wasted energy.

The Bry-Air Heat Exchanger can be used for all types of dryers, ovens, furnaces, boiler exhausts, kilns, air conditioning exhausts in hospitals and a myriad of industrial applications.

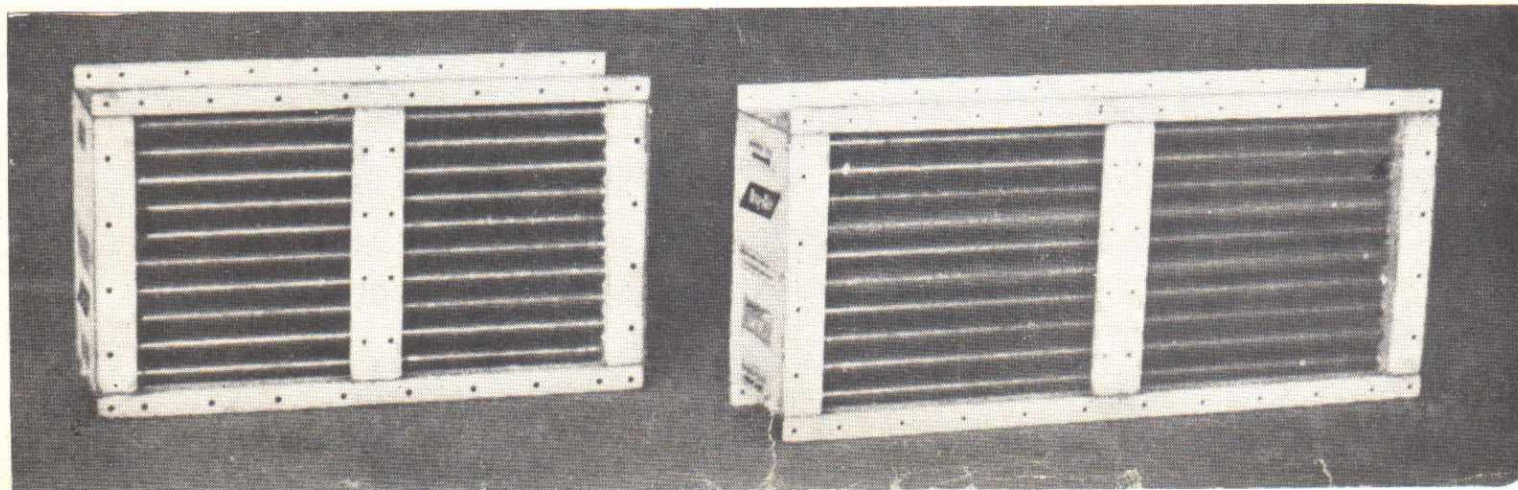
The industrial and commercial Heat Exchangers are made up of rows of finned heat pipes extending



horizontally across the total width of the exchanger and passing through a sealed partition in the centre. The heat pipe heat exchanger is installed across two parallel air ducts with separate counter flow air streams. In operation exhaust air is discharged across one section of the exchanger and supply air is ducted in counter-flow direction across the other section. Heat is transferred from the hot air stream to the cold air stream by the

heat pipes. The exchangers are built to handle temperatures ranging from  $-50^{\circ}\text{C}$  to  $+600^{\circ}\text{C}$ .

These units are already being manufactured as a standard production line item. With the presence of Bry-Air India's agents in Philippines, Thailand, Indonesia, Malaysia, Sri Lanka, Singapore & Bangladesh, these units are targeted for export in a big way to these countries.



Financial Express, Wednesday, March 2, 1983

## Heat recovery equipment Indo-US unit set up

Financial Express Bureau

**NEW DELHI, Mar 1**—A new Indo-US joint venture for the manufacture of dehumidification and heat recovery equipment was inaugurated by the US ambassador, Mr Harry G. Barnes, here on Monday.

Set up in collaboration with Bry-Air of the US, Bry-Air (India) will be the sole manufacturer of these equipment east of the Suez, in fact, Bry-Air US is the leader among the only three manufacturers of dehumidification and heat recovery equipment in the world.

Besides, as per available information, this is the first Indo-US joint venture in the small-scale high-technology sector.

As Bry-Air India will be the sole producer in this part of the world, the export potential of the unit is significant, according to Mr Deepak Pahwa, Chairman of the company.

In the first year of its operation Bry-Air expects domestic sales of around Rs 1 crore and an export turnover of the similar amount, Mr Pahwa told newsmen here on Monday.

The company has chalked out a two-phased programme of operation — manufacturing dehumidifiers in the first stage followed by heat recovery equipment manufacture.

The collaboration agreement with Bry-Air of the US will also ensure continuous inflow of technology as and when it is updated at the parent company. On its part, Bry-Air India will set up an R&D laboratory in the coming year and the findings will be sent back to the US for use in updating and in the modification of technology for use here.

The President of Bry-Air US, Mr Paul Giese, who was here for the inauguration, told newsmen

that high-technology small unit in the United States had become aware of the potential of the small sector in India and were interested in collaboration agreements. In October, 1984, Mr Giese will be leading a delegation of small industrialists from the state of Iowa to India to establish contacts with small units here.

About Bry-Air India, Mr Giese was optimistic of its success as the company will be the sole manufacturer of an equipment that is very essential for the pharmaceutical industry, for electronic equipment assembly units, seed storage, as well as the ferti-

Economic Times,  
4th October, 1983

## Heat recovery systems developed by Bry Air

By A Staff Reporter

BOMBAY, October 3.

Bry Air (India) in collaboration with Bry Air Inc., USA, has developed, for the first time in India, heat recovery systems with the heat pipe concept.

The heat pipe concept will help industrial units to recover waste heat from industrial exhaust like furnaces, kilns, and boilers, it is explained.

Bry Air also manufactures state-of-the-art dehumidifiers and other specialised environmental control systems.

Financial Express,

## Energy conservation

By K. U.

Energy conservation, which was once a mere slogan, is now fast becoming reality thanks to breakthrough in technology. While Japan, in a limited way, commercialised solar energy in the form of cells to energise calculators and watches, Bry-Air Inc. of the U.S., world's largest manufacturers of heat-recovery equipment and dehumidifiers, has found a way to recycle heat which otherwise would have been wasted through chimneys causing pollution and subsequent health hazards.

Bry-Air, which holds 50 per cent share in the market of heat-recovery systems and dehumidifiers world-wide with an annual turnover of \$ 60 million, is not a megacorporation and has never figured in the list of first 500 big world companies.

It started in a small way by supplying heat-recovery equipments using heat-pipe concept to prestigious NASA programmes, space crafts and nuclear reactors. At that time it never thought of commercialising the system for industrial uses. The development of the concept as energy conservation gathered momentum only in the last five years, particularly after 1979. Now the company is finding its way in the world market. It holds a near monopoly in the field and is one of the three or four companies (all hailing from the U.S.) offering this system for industrial use.

Bry-Air sources claim as high as 98 per cent of the heat can be recycled by using heat-pipe system. What is appealing about the system is that the equipment is not at all expensive. Bry-Air is among those select companies which do not believe in capitalising on their technological breakthrough but is interested passing on the benefits end-users. Al-

though the system is not costly, it is technology-intensive. All that Bry-Air has to do is to train engineers in application the engineering.

According to Mr. Deepak Pahwa, President Bry-Air (India) Pvt. Ltd., the first Indo-American joint venture in the small sector, the heat-recovery system is particularly important to India where energy is scarce. The Bry-Air heat-pipe concept can be put to use to recover waste heat from



Deepak Pahwa

industrial exhaust like furnaces, kilns, boilers, etc.

His company is manufacturing the system for the first time in the country. He says machinery required for the system can be indigenously fabricated. The company supplies the system in one piece along with the process know-how.

India, like other developing countries, has to pay a very price for crude import. Although country produces oil, the total output hardly meets 50 per cent of the needs and thus a huge amount of

The Patriot,  
March 3, 1983

## Bry-Air (India) to make dehumidifiers

Our Commerce Reporter

The heat recovery system is particularly relevant to our country where energy is scarce. The heat pipe concept is being used in the US to recover waste heat from industrial exhaust like furnaces, kilns, boilers whereby saving vital fuel inputs by improving the fuel efficiency of plants and factories. Bry-Air India would be manufacturing heat recovery systems for the first time in the country. This will be a major breakthrough in the indigenous manufacture of heat recovery system.

Indian Express,  
March 2, 1983

## New plant of Bry-Air (India)

Express News Service  
NEW DELHI, March 1.

A new Indo-US joint venture for the manufacture of dehumidification and heat recovery equipment was inaugurated by the US Ambassador, Mr Harry G. Barnes, at Gurgaon, Haryana, on Monday.

Set up in collaboration with Bry-Air of the US, Bry-Air (India) will be the sole manufacturer of these equipment east of the Suez. In fact, Bry-Air US is the leader among the only three manufacturers of dehumidification and heat recovery equipment in the world.

Besides, as per available information, this is the first Indo-US joint venture in the small-scale high-technology sector.

As Bry-Air India will be the sole producer in this part of the world, the export potential of the unit is significant, according to Mr Deepak Pahwa, chairman of the company.

In the first year of its operation, Bry-Air expects domestic sales of around Rs 1 crore and an export turnover of the similar amount, Mr Pahwa told newsmen.

The company has chalked out a two-phased programme of operation—manufacturing dehumidifiers in the first stage followed by heat recovery equipment manufacture.

The collaboration agreement with Bry-Air of the US also ensures continuous inflow of technology as and when it is updated at the parent company. On its part, Bry-Air India will set up an R & D laboratory in the coming year and the findings will be sent back to the US for use in updating and modification of technology for use here.

The Hindustan Times,  
Thursday, March 3, 1983

## Unit to manufacture dehumidifiers

With the inauguration of its plant on Feb. 28 Bry-Air (India) Pvt. Ltd. will be the first and only producer of dehumidification and heat recovery equipment in the east. The plant was inaugurated by Mr Harry G. Barnes, the US Ambassador in India.

Bry-Air (India) will service not only the Indian market but also

those of South East Asia, Middle East, Russia; none of which possesses indigenous manufacturing facility. The unit will, therefore, conserve, as well as, contribute directly to foreign exchange reserves.

The heat recovery system is particularly important to India where energy is scarce. The heat pipe concept is being used in U.S.A. to recover waste heat from industrial exhaust like furnaces, kilns, boilers, whereby saving vital fuel inputs by improving the fuel efficiency of plants and factories. Bry-Air (India) will be manufacturing heat recovery systems for the first time in this country with heat pipe concept. This is a major breakthrough in indigenous manufacture of heat recovery systems.

The US Overseas Private Investment Corporation (OPIC) Investment mission, President Craig A. Nalen, has stated: "We support projects like this one which represent on-going business commitments, transfer of technology, employment of local workers, 100 per cent utilisation of local materials, and the creation of new export markets."

2nd October, 1983

## ion breakthrough

HEGDE

exchange is drained in imports. It will take a long time for the country to become self-sufficient in this commodity. In the meantime, it has taken recourse to other alternatives like energy conservation, heat recycling, substitutes to oil, etc.

The Bry-Air process is so result-oriented, Mr. Pahwa claims that the entire cost of the system can be recovered within one year of installation. The amount of fuel saved in six to eight months, cost-wise, is equivalent to the price of the system. As regards the heat-recovery system currently available in the market, he says, they help to recover only to the extent of 10 to 15 per cent. Bry-Air system helps to recycle at least 85 per cent of the heat in an Indian environment.

Giving details of the system, he adds, Bry-Air offers efficiencies as high as 80 to 85 per cent on air-to-air recovery were considered impossible till a few years ago. Besides the system can be applied not only to industrial exhaust and conditions of high temperature but also to conserve tremendous energy wasted in air-conditioning systems in large buildings which require considerable amount of fresh air.

Not only the system pays back for itself within one year of installation but also holds out for industries promise of availing benefits offered to energy-saving devices by the Government in the form of write-offs and depreciation in the very first year of installation.

Bry-Air (India) offers the system from its very modern plant located in Haryana, just eight km. from the Palam airport. Mr. Pahwa says tie-up with the U.S. company is one of the happy coincidences. The U.S. principal

holds less than 40 per cent equity in the company although the process involved is technology-intensive. Terms offered by its collaborators were so attractive, he adds, the Government of India cleared the project within 90 days. It is unbelievable, as it is the general impression, that nothing moves in India because of bureaucracy and red-tape.

He says even the Haryana Government went out of its way to welcome the project and saw to it that the project was executed the earliest day possible. With all the assistance rendered by the Union and the State Government, the U.S. parent company has now offered to its Indian counterpart the whole export market in the South-East Asia.

Mr. Pahwa, an electrical engineer by profession with working experience in several U.S. companies, is happy that Indian engineers sent by him to his principals in the U.S. are quick to absorb the new technology and Bry-Air Inc. is also happy with their performance. It has assured the Indian company all the facilities for setting up an in-house R&D facility.

Bry-Air India, which saw its birth only in February this year, apart from making heat recovery systems, also manufactures dehumidifiers and other specialised environmental-control systems. Application engineering and sales of the company's products and systems are now offered to all major metropolitan cities of the country.

This year, it expects, the total sales in specialised heat recovery, humidity and temperature control systems to be around Rs. 3 crores. In its second phase, the company plans to diversify into dehumidification equipment and dehumidifying-type plastic dryers.

# ARCTIC INDIA

## Air-to-Air Heat Recovery Units

### TYPICAL APPLICATIONS

#### INDUSTRIAL

1

##### Dryers

Volumes: 7,000 SCFM supply and exhaust  
Exhaust Temperature: 400°F  
Cost: Rs. 57,400  
Recovered BTUs: 7,51,916/hr

##### Savings

Oil Fuel Cost: Rs. 36/million BTU  
Operating Hours: 5000  
Annual Savings: Rs. 1,35,345  
Payback Period: 5 months

2

##### Dehumidifiers

Volumes: 7,210 SCFM supply and exhaust  
Exhaust Temperature: 200°F  
Cost: Rs. 62,760  
Recovered BTUs: 2,63,703/hr

##### Savings

Electric Cost: Rs. 117/million BTU  
Operating Hours: 4,000  
Annual Savings: Rs. 1,23,413  
Payback Period: 6.1 months

3

##### Ovens

Volumes: 8,800 SCFM supply and exhaust  
Exhaust Temperature: 350°F  
Cost: Rs. 75,680  
Recovered BTUs: 8,26,431/hr

##### Savings

Natural Gas: Rs. 40/million BTU  
Operating Hours: 6,500  
Annual Savings: Rs. 2,14,872  
Payback Period: 4.2 months

#### AIR-CONDITIONING (HVAC)

4

##### Hospital

Volumes: 8,000 SCFM supply and exhaust  
Exhaust Temperature: 76°F  
Cost: Rs. 72,000  
Recovered BTUs: 1,60,000/hr  
(operating)  
Plant Capacity Reduction: 13.3 T.R.

##### Savings

###### Operation:

Electrical Cost: Rs. 25/million BTU  
(Based on 0.75kw/T.R.)

###### Capital:

Plant Capacity Reduction Cost:  
Rs. 10,000/T.R.  
Operating Hours: 5,000  
Capital Cost Saving: Rs. 1,30,000  
Operating Cost Saving: Rs. 20,000

A heat transfer device for furnaces, ovens, dryers, dehumidifiers, air-conditioning, etc., initially used by NASA in nuclear reactors and space crafts