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H & V News

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If your business is involved with gas, then

is the place to be on July 6th & 7th 1982

Burlington Hotel, Dublin
11 am to 8 pm daily
"If your business is involved with gas then Gas Ireland is the place to be". That was the message issued at the launch of the Gas Ireland Exhibition and now in the lead up to the show the very impressive list of exhibitors shows that everyone has taken our message to heart. Anyone who is anything in the gas business is at the show and no doubt with this array of product and information there will be a great response from the industry in general.


Gas Ireland Seminar ........................................ page 2
Details of this the first seminar on gas to concentrate on the services industry.

Newdesk .......................................................... page 5
Coverage of news, golf outings, seminars, etc.

DL's Energy Report ........................................ page 10

Grilles, Louvres and Ducting ................................ page 13

Profile on Masser Hammond ................................ page 17
H&V News this month looks at one of Ireland’s leading refrigeration companies.

Beaver Engineering's Gas Division ....................... page 21

Industrial & Commercial Boilers & Burners ............ page 23
SEMINAR in conjunction with GAS IRELAND EXHIBITION

"The Future of Gas in the Heating Industry"

morning of July 6, 1982
Eglin Room, Burlington Hotel, Dublin

ABOUT THE SEMINAR
There have been a number of conferences and seminars on the subject of gas ever since natural gas and LPG began to figure prominently in the energy stakes but with all the words that have been written and said on the subject little has been said on the practical side of the story. This seminar hopes to redress the situation by getting together a panel of speakers who by their experience and expertise will speak on all the important questions that have up to now gone unanswered. The subjects covered are those problems faced by the heating business, from the consultant to the contractor, from the merchant to the service engineer, from the specifier to the energy manager.

Space is limited so book early to avoid disappointment.

09.30 Registration
09.45 Welcome address by the Chairman

The following papers will then be presented in the course of the morning.

- Flues & Ventilation for Gas Appliances — Chris Davies, IIRS.
- Controls on Gas Heating Systems — Terry McQueen, Honeywell Controls.
- The Conversion Experience in the UK and Cork — John Davies, Cork Gas Co.
- The Use of Fan Assisted Gas Burners in Heating Boilers — Dave Stone, Radiant Superjet Ltd.
- Marketing Policy of Dublin Gas in Relation to Heating — by Dublin Gas Co.

There will be a coffee break at 11.00 am and the close of the Seminar at 1.00 pm will be followed by an "As much as you can eat" lunch in the Carvery Restaurant in the hotel.

BOOKING FORM

GAS IRELAND SEMINAR

Name .................................................................
Address ...........................................................................
............................................
Tel. No .............................................

When more than one person is attending from the same organisation, please indicate below the additional names.

FEE ENCLOSED IRE.

Completed forms to be sent with fee of £36.00 per applicant to:
Irish Trade and Technical Exhibitions (ITTEX) Ltd.
5/7 Main Street, Blackrock, Co. Dublin. Tel: 885001 Telex 92258

Telephone bookings cannot be confirmed until payment has been received.

The fee includes morning coffee, lunch and documentation. Fees cancelled more than five days in advance will be refunded subject to a 25% reduction for administration. Substitutions may be made at anytime.

CLOSING DATE FOR BOOKINGS: 1st JULY, 1982
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BS ON UNVENTED HWS

Unvented hot water systems eliminate the need for feed cisterns, but are not generally used in the UK or Ireland at present, though they may be installed if permitted by local by-laws. Such systems, however, have been common in other countries for many years. Now, in response to requests from the water industry, BSI has published BS 6144 Expansion vessels using an internal diaphragm for unvented hot water supply systems, which will help prevent design and construction problems arising from the wider adoption of this type of system in Britain and Ireland.

BS 6144 gives requirements for the manufacture and testing of both welded and non-welded steel expansion vessels which have a flexible internal diaphragm and are suitable for use in hot water supply systems where the heating medium is potable water. Vessels specified in this standard have a maximum stored volume of 150 litres and operate at pressures up to 6 bar.

In unvented systems the volume varies according to temperature and allowance must therefore be made for these fluctuations, which can be calculated for given conditions. Since gases are compressible it is possible to use a gas-filled vessel, connected to the system, to accommodate the increased volume of the water by compressing the gas; the system pressure thus increases as the gas is compressed. The flexible diaphragm in the expansion vessel acts as a permanent barrier between the gas and the water to prevent mixing. It is common practice to pressurize the gas side of the expansion vessel with air or nitrogen.

Similar expansion vessels for sealed hot water heating systems are dealt with separately in a companion standard, BS 4814.

Quiz Winners

New Berry Distributor

Berry Magiccoal Limited, Britain's leading manufacturer of fuel effect electric fires, has appointed Dick Keogh of Elland Electrical, Dublin as their distributor in the Republic of Ireland.

COMBINED H&P STUDY RESULTS

Fuel savings of up to 35 per cent. could be achieved through the use of combined heat and power units, according to energy experts. Pilot studies on six Dublin office blocks and two hotels have shown that the units — a generator which provides electrical and heat needs — give significant energy savings.

The studies were made by Mr. Gerard McMahon, National Board for Science and Technology. He had only one reservation: The price the government charges for natural gas.

For the pilot study envisaged that natural gas would fuel the combined heat and power installations, the total capital cost of which was put at £737,000.

Space Heating

Electricity generated would provide space heating and hot water for office blocks and hotels and any excess electricity produced would be sold back to the ESB and returned to the national grid.

The study, details of which were given recently to the Energy Conservation and District Heating Association, envisaged that the maximum pay-back period for the installation would be seven years. It pointed out also that the fuel efficiency of the generating unit was estimated at 80 per cent. compared to 52 per cent for the conventional boiler.

GRANTS FOR MANUFACTURING AND SERVICE INDUSTRY

The Department of Industry and Energy, 22-25 Clare Street, Dublin 2, phone 715233, provides grants of up to 33½% to manufacturing and service industries and hotels towards the cost of engaging consultants to carry out fuel efficiency surveys. Grants are also provided in respect of feasibility surveys for switching from oil and for combined heat and power projects.

To qualify, an application should be made before the survey begins together with a preliminary report from the consultant indicating the scope and estimated cost of the survey. A preliminary report is not necessary if the survey is to take 2½ days or less. A grant is not payable until the survey is completed and receipts for payment of the fees have been sent to the Department of Industry and Energy. They should be accompanied by a statement that the survey has been satisfactorily carried out and a copy of the consultant's report.

* I normally do not get into H&V News pictures myself but on this occasion we were presenting the joint winner of our 21st special issue quiz with his prize. That's me on the left handing over the wine to Pat Curran whom I now suppose has become very accustomed to it. ED.

A big thank you to all that entered our quiz in the 21st anniversary issue. The response was terrific apart from one form which took liberties with the serious elements to the questions.

The answers to all the questions was a simple yes and from the many forms returned we alas only got two correct replies, so we decided to split the case of Chateau Malescot St Exupery, Margaux, between the two bright boys, Brendan Meghan of the IIRS and Pat Curran of Hevac Ltd.

ET al.: H & V News

Published by ARROW@DIT, 1982
INDEPENDENT TESTS CONFIRMS AF/ARMAFLEX CLASS 1 PRODUCT

Independent tests carried out on AF/Armaflex flexible closed cell pipe insulation by the Warrington Research Centre, have confirmed that Armstrong World Industries Ltd., are producing a consistent Class 1 insulation product at their Oldham, Lanes, manufacturing plant.

Warrington Research Centre will carry out a quarterly quality control evaluation programme on Armstrong’s AF/Armaflex. Under the agreement, a representative of Warrington Research Centre visits the Oldham plant to freely select specimens of AF/Armaflex for testing to BS476 Part 7.

Sufficient samples of nominally 9mm, 13mm, or 19mm AF/Armaflex are selected to prepare six specimens of two different batches of material. Three specimens of each material are bonded to a nominally 12.7mm non-combustible insulation board with sodium silicate adhesive and are then nailed to carrier boards during the tests, care being taken to ensure that nails do not penetrate the AF/Armaflex in the ‘Class 1’ or ‘Class 2’ region.

The remaining specimens are retained until the results have been reported to Armstrong. In the event of failure of any of the specimens to achieve a Class 1 result the remaining specimens will be tested in the presence of Armstrong personnel.

To date, the Warrington Research Centre tests, report “all of the specimens tested were within the limits for a Class 1 result”. Copies of the test report can be seen at Armstrong’s European headquarters in Uxbridge, and at the Oldham manufacturing plant.

HOME GROWN BRASSWARE

Sanbra Fyffe have decided to take on the foreign competition in the area of brassware and bathroom fittings. They have launched a new range of bathroom taps and mixers, under the trade name Eirline. The new range was introduced to representatives from the Builders and Plumbers merchants in the Burlington Hotel recently.

Speaking at the launch, a company spokesman described the decision as a step forward for the Irish manufacturing industry. “In the past few years, we have seen more and more imported brassware on the market. We feel it is time to do something about this. The Eirline range is manufactured in Dublin and complies with B.S. 5412 in every respect. The name Eirline was chosen because of its obvious ‘Irishness’,” Sanbra Fyffe are convinced that they have a winner with their new designs. The Eirline range consists of basin and bath pillar taps, single and dual flow mixers, high-necked sink taps for the kitchen and, for the bathroom, a choice of bath mixers with shower attachments or an independent manually operated shower control valve with attachments.

It is company marketing policy to distribute Sanbra Fyffe products through builders and plumbers merchants around the country, and Eirline will be available from these sources from now on.

Although the new range is something of an innovation for them Sanbra Fyffe have been in the forefront of the Irish brassware industry for many years and have manufactured compression couplings for over fifty years. The company manufactures the well known Irish Instantor Compression Couplings, used in the plumbing and heating industries, and recognised as the Irish manufacturing industry.

SANBRA Fyffe have built up a solid reputation for reliability and quality control. The progressive development of their manufacturing unit of hot stamping presses and chucking automatic machines, designed specifically for compression couplings and brassware, has resulted in the company being and accepted as the market leader.

Sanbra Fyffe believe that their new range of Eirline bathroom fittings will prove to be another step forward on the road to Irish self-sufficiency. The company are now looking forward to being proved right.
**INSULATION**

"GOING BATS"

One way of insulating your house is to put a flock of bats in the attic.

According to research by an ecologist, Dr. Bob Stebbings, dry odour-free bat dung makes an ideal roof insulation. Just a three-inch layer of droppings should do the job just as well as expensive man-made insulation — and help cut those soaring fuel bills. While you are cosy and warm below, the benevolent bats are helping out in other ways, keeping down the insect and moth population. Just one evenous bat will gobble up to 3,500 insects in one night.

Dr. Stebbings said: "The bats cause absolutely no harm to the building, and in fact do nothing but good". He investigated 645 bat colonies as part of his research. Contrary to popular belief that they live only in ancient creaking mansions, he found a third were in modern homes.

Bats like the warmth of the central heating, he explained. Dr. Stebbings, who works at the Institute of Terrestrial Ecology at Monks Wood, near Huntingdon, Cambs, said home-owners "might not even know they are there, so little trouble do they cause."

He added: "We found one home with 1,000 bats in the loft, which produce droppings a foot thick each year." The delighted owners, who were unaware of their guests, now use some of the droppings as fertiliser for the garden.

Another boost for the misunderstood bats came from Mr. Derek Whiteley, assistant keeper of natural history at Sheffield's Weston Park Museum. He said the Dracula image had given them a bad press for years. "We want people to realise they are not vermin but likeable intelligent creatures, and householders who find them in their lofts should encourage them rather than drive them away," he said.

- High energy costs with heat being dissipated through the roof of a building, ineffective heat distribution and limited distribution of fumes are claimed to be overcome by a new system with economies in the region of 30 per cent on energy costs as a result of more effective distribution of heat. Glan Blake-Thomas, Sales Manager of the Environmental Systems Division of Flakt Ltd., gave case history examples to support an audio visual presentation which showed details of temperature stratification. The Flakt Dirivent system could achieve a difference of only half a degree Centigrade per metre over 10m height within a building. The system can also be used to achieve effective dispersal of fumes in normally stagnant working areas. Treated ventilation air is directed by small jets of air from special nozzles to the places where it is needed. The Dirivent system has been described as one of the most important breakthroughs in ventilation technology in recent years. Mr. Glan Blake-Thomas (left) is seen here with Technical Sales Engineer Mr. Tony Barnard and the three-projector audio visual equipment used in their Dublin presentation.

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**AGENT REQUIRED**

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WALKER RESTRUCTURE

The promotion of George Whillock from Director and General Manager, to MD of Walker Air Conditioning (UK) Limited, effective immediately, is the key appointment in a major restructuring of Walker as the company is geared for the next phase of its expansion programme in the UK and Ireland.

Whillock joined Walker ten years ago as a sales engineer in the Belfast office, became Manager of that branch and then, in 1975 when the company won the Carlyle franchise for Scotland, came across to Glasgow as General Manager for the company's UK operations.

Walker has grown to such an extent that in 1981, despite the recession, it had an order intake in excess of £5 million. The company, distributor of Carlyle products in Ireland and Scotland, has developed complementary activities to enhance its Carlyle product offering.

"The success of our Carlyle business has been such that we have restructured in order to ensure there can be no dilution of this mainstream activity. To achieve this we have physically separated our other business activities to operate from new premises close to the company's headquarters and created a new Division to operate them, called "WAC Products" said Jim Anderson, Walker's Chief Executive.

George Whillock, who will continue to be based in Glasgow, has total responsibility for the UK company but with the primary business objective of developing sales of Carlyle equipment in Scotland, Northern Ireland and northernmost England.

Sales of Carlylecompatible products will be developed through WAC Products, London, Iomar Hanrahan being responsible for Condair and Eddie Vaughan for Walk-Air.

In Northern Ireland, Leslie King was recently promoted to Manager of the Belfast branch, reporting to Whillock and to strengthen the team a new sales engineer has been appointed, James Cupples, B.Sc.

Dealers are being appointed by Walker Air Conditioning (UK) Limited, as part of the company's strategy of strengthening its distribution of Carlyle air conditioning, refrigeration and heating products in Scotland, Northern Ireland and northernmost England. Some ten dealers in all are to be appointed, one each in the major towns in the area of Walker's distribution responsibility.

In Dublin, Michael Buckley has responsibility for the operation of the Carlyle distribution activities in the Republic of Ireland, reporting to Jim Anderson. This team had an exceptionally good year in '81 and, as a result, Gerry Ross has been promoted to Sales Manager, reporting to Buckleys. An additional sales engineer has been appointed, Ivor Wills.

Stewart Roche, Director of Walker Air Conditioning Limited, has overall responsibility for all the company's activities in the UK and Ireland and, in additional has general management responsibilities for the new WAC Chesterton unit. This is part of the policy of devolution whereby each of these ancillary business units has its own independent management accountable to the Board of Walker.
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Because Kuterlex Plus, "Yorkshire" copper tube sheathed in a profiled and durable polythene sleeve, is designed to give maximum protection in all plumbing and heating situations.

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- Saves time and expense.
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- Reduced heat-loss.

For further information, please contact Bill Allen at:
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Belfast, BT9 7JG.
Tel: 0232 - 6676311.
My lack of enthusiasm for the Alliance & Dublin Consumers Gas Company (Gas Company) being the sole recipient of natural gas for Dublin was made known in my last article. I also made known my lack of enthusiasm for the present leadership. I feel that this lack of leadership is now shown in the situation where a company, under major financial pressure like the Gas Company has a Chief Executive and a Chief Operating Officer.

I was always of the opinion that only major multinational companies have chief executives and chief operating officers. After all, one can understand A.I.F. O'Reilly being the Chief Operating Officer of Heinz because they are a multi product, multi location company. One can also understand Michael Smurfit, who is Chief Executive having Howard Kilroy as Chief Operating Officer for Smurfits, because Michael Smurfit himself spends so much time in America, and Smurfits do have 11,000 employees throughout the world. How widely spread is the Gas Company? I'll tell you — it goes from Ballymun to Bray. They are not a multi product company and they have nothing like 11,000 employees, at most one-tenth of that figure. So why the Chief Executive and Chief Operating Officer? I don’t know. I’m sure, however, that if the dynamic duo of Kinsella and Teeling are appointed to the Board there will be a number of major changes in the Gas Company.

That the Board have allowed this to happen does not reflect much credit on them. We have Directors like Peter Keenan, ex-Unilever, Managing Director in Ireland, John Leper, a Director of Carrolls and also at one stage, Fieldcrest and John Rehill. This brings me to another bone of contention. Why is John Rehill on the Gas Company Board? After all, his company, Tedcastle McCormick and Coal Distributors (in which he has a major stake) is in competition with the Gas Company for both the domestic and industrial energy business. It does not make sense. Was he brought on the Board for his expertise? I do not believe that there are not other people in Ireland who have expertise in the energy field who could not have been persuaded to become a Director of the Gas Company.

The gas monopoly, which Dublin Gas after all is, will probably get, in the near future, one of the few natural resources we have in Ireland — natural gas. I am of the opinion that this should not be allowed. I have previously stated that there is an urgent need for Minister Reynolds to sort out all these problems before finally giving the natural gas to Dublin. However now that his portfolio includes not just energy but also industry, I am sure that the problems of the Gas Company pale into insignificance when one considers the losses of NET, Irish Steel and the Irish National Petroleum Company. Nevertheless, the fact is that in the interest of the consumer, both domestic and industrial, it is important that the Board of Directors and the management of the Gas Company is sorted out before they obtain natural gas.

Given then that the Gas Company get the natural gas, how will they develop their market? Well for one, they will have to scrap the absurd pricing structure they presently have. The success of any proposed market strategy of a utility depends upon the tailoring of tariffs to the market it is serving and negotiate its contracts for both industrial and commercial customers. At the present moment the Gas Company...
has six tariffs:
a. domestic b. pre-payments (slot meters) 
c. industrial 
d. central heating two-part tariff  
e. commercial two-part tariff  
f. Ballymun two-part tariff. 

In addition they also have slightly different rates being charged for 
Dublin City, Dublin County, Bray and Dun Laoghaire. It should be 
noted that the two-part tariff are a 
combination of a flat rate and a 
standard charge. It makes sense that 
these tariffs should be reduced 
considerably. In this day and age to 
continue with slot meters does seem 
a bit ridiculous and it should be 
sorted out. As a result one should 
only have a domestic tariff, a 
central heating tariff and an 
industrial/commercial tariff. 

In order that the Gas Company 
build up the gas load they must be 
price competitive. Unfortunately, at 
the time of writing this article, the 
price being charged by Bord Gais 
Eireann to the Gas Company is 
unknown. However, it is imperative 
for the Gas Company that they 

obtain a price advantage against the 
competition. For the industrial/ 
manufacturing segment of Irish 
industry, it is imperative that the 
cost of gas is cheaper than fuel oil. 
As industry could also be involved in 
significant capital costs in 
changing over to gas, they will have to 
see some tangible benefits, 
therefore it will make no sense for 
the Department of Energy or the 
Dublin Gas Company to charge 
"energy related price" as is being 
mooned at the present. Given then 
that the Gas Company will have a 
price advantage in the market place 
in the beginning, they will have to 
build up a large gas load quickly. 
To do this, the Gas Company must 
— retain their existing customers 
— convert to natural gas all 
installations quickly 
— have an effective marketing 
programme 
— provide efficient back-up 
support. 

As it stands the Gas Company 
have retained a domestic and 
industrial load in spite of the high 
cost of gas to date, so it should be 
expected that these customers can be 
retained. In fact they would 
probably be overjoyed at the 
prospect of natural gas. It is 
difficult to estimate the breakdown 
of the Gas Company output, 
however, at rough estimates the 
figure could be put at around 24 

million therms per annum, of which 
approximately 20 million therms is 
domestic/central heating and the 
remainder the industrial/commercial 
market. 

These customers will have to be 
converted to natural gas speedily. At 
the time of writing no decision has 
been made to award this contract by 
the Department of Energy. Given 
then that natural gas will be in 
Dublin by early 1982, it is leaving 

things a bit tight. From our 
understanding the problem is one of 
costs plus efficiency and 
effectiveness. The tender by 
William Press is supposed to be very 
high and considered unacceptable. 
Also due to some difference of 
opinion the British Gas Board have 
not been involved. Dublin Gas in 
turn are having talks with the 
company who converted Paris to 
natural gas, a company called 
Sofragas. Concern must be 
expressed at the ability of the 
Dublin Gas Company being given 
the conversion. It should really be 
undertaken by a private contractor 
or private contractors under Bord 
Gais Eireann or Department of 
Energy supervision. 

To justify the cost of the Dublin 
to Cork Gas Pipeline the figure of 
24 million therms per annum, will 
have to be expanded to 100 million 
therms per annum as soon as 
possible. Indications are that in 
the initial years the E.S.B. will be given 
some of the natural gas for their 
Ringsend Power Station. This will 
be phased out over time. The rapid 
expansion to 100 million therms per 
annum is where the problem arises 
because to do it requires an efficient 
marketing operation and sufficient 
technical back-up. 

To have an efficient marketing 
operation one has to have an 
adequately trained and active sales 
staff with a marketing policy. As I 
have explained in the previous 
article, the Gas Company has had a 
considerable number of changes of 
marketing executives in recent years, 
which would lead one to the 

conclusion that at this stage there 
must be no marketing policy decided 
on. In turn, from our enquiries, one 
could not be confident that the Gas 
Company has a trained sales staff. 
So the question of an effective 
programme has to be queried. 

In addition the Gas Company, in 
recent years, has not developed with 
Dublin City and County. It has not 
been involved in the new growth 
areas like Tallaght and Clondalkin. 

The problem of a marketing 
programme for natural is that it 
must go hand in hand with the 
development of laying of mains and 
this is an extremely costly exercise. 
As everybody knows, the mains 
department of any utility is a 
problem. The main growth areas of 
Dublin City and County in the last 
few years have been in Tallaght, 
Clondalkin/Lucan, Blanchardstown. 

In addition there are other fringe 
areas like parts of South County 
Dublin, Swords, Portmarnock, 
Malahide and even Donabate where 
major housing and 
industrial/manufacturing 
developments have occurred. By our 
estimates it would take 
approximately £16 million to lay a 
mains network in the main areas of 
Tallaght, Clondalkin and 
Blanchardstown with possibly 
another £5 million to cover those 
other areas. So, any marketing 
programme has its problems and the 
Gas Company problems have been 
well stated. 

With regard to technical back-up 
the company has always been well 
served by its technical support. It 
has an excellent training school, it 
has been training its own staff and 
there can be no problems here. The 
problems will arise when the 
marketing programme is calling for 
growth because this will also require 
the setting up of a network of 
dealers and installers. I should 
imagine the development will be 
along the line of the Corgi System 
in Great Britain, where approved 
installers are allowed to install gas 
appliances and the Gas Company, in 
turn, are basically only supervisors, 
rather like the system used by the 
E.S.B. This, however, will present 
its problems because there is no 
history of gas installers in Ireland 
due to the restrictive practices of the 
Gas Company, neither has there 
been any desire on the part of retail 
outlets to sell gas appliances, again 
because of the restrictive nature of 
the Gas Company. 

All in all, the problems for the 
development of a gas industry in 
Dublin are formidable. As I 
originally stated, it is a pity there 
was not another source other than 
Dublin Gas, but in the interest of 
the nation it is better that natural 
gas is used efficiently (not in E.S.B. 
power stations) and effectively (not 
in N.E.T.). So therefore, the 
quieter it is brought to Dublin and 
developed the better for all 
concerned.
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Then for that low-budget installation, there's our 'E' range—made from satin anodised extrusions.

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Grilles, Louvres and Ducting
Development Continues

While the ventilating and air conditioning business has had its share of recession, development continues in the grilles, louvres and ducting market with a number of new products and designs on offer. We review some of these new trends in this feature.

Spiro tubes can be supplied in any lengths required and the gauge of the material ranges from 30 s.w.g. to 16 s.w.g. and from 3” diameter to 80” diameter.

Any further information can be had by contacting Tru-Flow at 265984.

Hall Thermo tank Ireland
A well proven and widely used variety of air terminal units is available for air distribution for a number of applications.

Drum Louvre
The drum louvre is designed and developed for applications requiring long throws with a minimum of duct work. It is manufactured in aluminium with a satin anodised finish which, together with a versatility of mounting, enables it to blend into any architectural scheme. It incorporates adjustable deflecting vanes for complete air control for large enclosures such as shopping precincts and other public areas.

Volume Controller
The volume controller is designed to fit into the duct work behind the drum louvre. Its purpose is to direct the flow of air evenly at the louvre and provide a balanced flow through the blades. Its vanes are adjustable to enable a precise air flow to be achieved through a louvre.

Punkah Louvre
High velocity spot cooling is provided by the punkah louvre. This unit is fully adjustable and can be used as either a jet or diffused air outlet. Fully adjustable for direction of throw, the punkah louvre is particularly useful where ventilation is required in remote areas as its air velocity reduces the length of branch ducting needed.

Aircraft Punkah Louvre
Although designed specifically for aircraft air-conditioning systems, this louvre is ideally suited for all transport applications. The air flow can be adjusted for direction as well as volume and an off-position is also incorporated.

For further information please contact Hall-Thermotank Ireland Limited, Hall House, Main Street, Rathcoole, Co. Dublin. Tel: 01-580311 Telex 30943.

Airflow
The latest instrument from Airflow Developments.
Limited is a high quality, electronic rotating vane anemometer which features a direct, digital readout of air velocity and temperature. The DVA 6000T is a portable, battery-operated unit, lightweight and compact in design. It is suitable for most applications where the airstream is large enough to accommodate the measuring head and is especially useful for proportional balancing of air distribution systems and for monitoring laminar flow cabinets, fume cupboards and hoods.

The instrument has been designed with ease of operation in mind — three buttons providing all the necessary control functions. The velocity and temperature readings are indicated simultaneously on liquid crystal displays, the velocity being averaged over a period of six seconds.

Metric and Imperial versions of the DVA 6000T are available with velocity ranges 0.25 to 30 m/s and 50 to 6000 ft/min, and temperature ranges —17°C to 70°C and 0°F to 158°F. The Temperature display will also indicate a low battery warning when the voltage is too low to sustain normal operation and both windows may be illuminated for use in poor light conditions.

The DVA 6000T is supplied in a lightweight carrying case with a set of handle extension rods for use where access is limited. Details from McKenna Ireland Ltd., Tel: 383337.

Myson
The new pressure relief flap from Myson RCM permits the flow of air in one direction only. The gravity controlled hinged flaps are made from light gauge aluminium so that they open at a very low pressure difference and the pressure differences can be adjusted by the addition of weight to the flaps.

PRE's are normally used in walls or partitions to exhaust air and are not suitable for use in doors, or in duct systems as back draught shutters. They are not air-tight.

The frame is aluminium extrusion with welded mitre joints and a matching backing flange is available if required. The flaps are light gauge aluminium hinged on a duralumin rod, turning in nylon bearings.

The ED square or rectangular diffuser, manufactured from anodised aluminium extrusion, is now also available from Finheat Ltd.

It is available with cores giving one, two, three or four way discharge patterns, without the use of blanking plates. Principally for ceiling mounting, the ED can be used in free space when the throw will decrease by about 30% and the angle of the discharge will be approximately 25 to 30% from the horizontal.

Stove enamel finishes to BS colours are available and the diffuser is made with an inner sub-frame, which carries the control damper, and can be fixed to the duct outlets during the construction of the ceiling. The louvred cores are easily removable for access to controls or where frequent cleaning is necessary.

All Myson RCM products can be manufactured to individual specifications if required.

If you require any further information, please contact Finheat Ltd.

Finheat
A new modular heat recovery unit, designed to transfer up to 70 percent of waste heat from exhaust air to fresh intake air in commercial heating systems and industrial processes, has been introduced by Finheat Ltd.

Called Z-Duct, the compact heat exchange modules, manufactured by S&P Coil Products, have been developed for air-to-air energy recovery applications in factories, schools, stores and hotels.

These units can be integrated with air handling plant in any situation where fresh air is drawn into a building to replace stale or contaminated air of a higher temperature. By transferring heat from the outlet to inlet air stream, Z-Duct reduces fuel consumption and equipment capacity required to condition intake air.

Designed on simple principles for economical, high efficiency heat recovery, Z-Duct can be used in new or existing installations where hot air exhaust ducting can be adjacent to intake ducting. Each Z-Duct module consists of corrugated heat transfer plates mounted in a steel casing with counterflow inlet and outlet ports for exhaust and fresh air streams. The ports are flanged for simple duct connection and air streams are physically separated to prevent cross-contamination.

Removable panels provide access for maintenance and in integral drip pan and drain allow for removal of condensed liquid.

The basic module measures 990 x 445 x 575 mm and is nominally rated at 0.5m³/sec flow capacity. Banks of Z-Duct modules can be bolted together to accommodate any air flow rate. Units constructed in aluminium will operate at up to 230°C and stainless steel modules at up to 750°C.

New Diffalite
The Diffalite is one of a range of air terminal devices designed by RCM for architects and specifiers.

Combining a low level light source using Thorn’s, revolutionary energy saving 2D lamp with RCM’s own square diffuser, one integrated unit can be installed to provide two services. The Diffalite, which has been developed in association with Thorn Lighting incorporates a 2D lamp consuming 21 watt and giving a light equivalent to a 100 watt Tungsten lamp.

The applications are wide and varied, from confined internal areas such as toilets and cloakrooms, to a low energy option in larger office blocks and apartment corridors.

As with all RCM products, the emphasis is on adaptability and tailoring the product to individual requirements.
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Published by ARROW@DIT, 1982
Avo

The addition of a further three models, AT3, AT4 and AT5 to the Avo digital thermometer range, means that a choice of six instruments is now available. The new models complement the existing AT1, AT1/P and AT2 to provide a comprehensive selection of portable, battery operated temperature measuring instruments. With the exception of the AT2 which is a portable bench mounted, battery/mains instrument, the others are hand-held, and all have moulded plastic, shock-proof cases, attractively designed, with simple selection of each range. From the range, most requirements for measuring and monitoring temperature can be accomplished. Applications from those calling for high accuracy to the needs of those in field maintenance work, are within the capability of at least one of these instruments. All these instruments are manufactured in Ireland. The new Model AT3 can be used with the full range of Avo type K thermocouple sensors (or other sensors), and has a light emitting diode display with 7.6 mm high characters. The temperatures range is from -50°C to +999°C. A reading 'hold' facility is a feature of this model. Models AT4 and AT5 have permanently attached probes. The AT4 is fitted with an immersion probe, whilst AT5 is fitted with a surface probe. Each instrument has a light emitting diode display with 7.6 mm high characters. The temperature range is from -55°C to +125°C and the reading 'hold' facility is also incorporated. The complete range of Avo digital thermometers together with eight different K type sensors and four different platinum resistor sensors, the latter for use exclusively with the Model AT1/P, are available from Avo Distributors throughout the world. Further details are available from Industrial Instruments Limited, 6 Herbert Place, Dublin 2.
"Many things have changed over the last few years in the refrigeration business but we have proven that whatever happens we are able to take it on and win," so says Sean Ryan, Deputy Managing Director of Masser Hammond Ltd. Sean who has special responsibility for sales is very enthusiastic about the future for Masser Hammond and although there have been a number of changes in the company, the message is clear that they intend to stay on the top of the refrigeration business.

Masser Hammond Ltd. is a member of the TMG group and came under the umbrella of the group with the take over of Hammond Refrigeration and combining it with Masser Irish Food Machines Ltd. This bold combination under the control of Managing Director Terry Ford has blossomed into a company with great growth potential. With the bringing together of the two companies under the one roof it became obvious that the Kylemore Road premises was too small, so the group acquired the former Massey Ferguson HQ on the Naas Road, Dublin and the first in the group to move into new offices and warehouses was Masser Hammond. They are now well settled in and are now embarking on both in-house and around the country promotions.

To quote Sean Ryan: "One of the greatest advantages in being part of a large group of companies is that facilities are made available that you would not ordinarily be able to afford. One such facility is the use of the Group's computer which has revolutionised stock control and the availability of instant information on spare parts in Dublin and the branch in Cork. Any customer has only to telephone us and we can tell him straight away what the stock situation is and because of links with our suppliers computers we can also get very fast information on availability of equipment from them".

With the recession, many wholesalers around the country reduced their stocks to a very low level and this is where Masser Hammond can help with a very large stock of equipment and spares together with the computerised stock control no one need be delayed by waiting for a letter to be received and replied to, as a phone call to Masser Hammond will get the information straight away.

A successful company like Masser Hammond needs more than to be part of a large group of companies, it needs experienced staff and the right product. Both of these requirements are very well met in Masser Hammond with the technical side, Billy Farrell, Technical Manager with over 35 years experience in the refrigeration industry and Brian Martin, Technical Sales Representative, with over 20 years.

On the product side, the refrigeration division are agents for Scotsman Frimont the largest manufacturer of ice cube and flaking machines in the world, Fuji Koki controls for refrigeration and air conditioning, UPO display cabinets, and on a shared basis the agency for Foster Refrigeration equipment. A very impressive line up indeed.

With their planned promotions for the next few months and with a team and a product range geared for the market we will be seeing a lot of Masser Hammond in the future.
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Eirline® is a gleaming new range of taps and mixers for Irish bathrooms and kitchens. Developed and manufactured by Sanbra Fyffe, Eirline® superbly meets all the requirements of BS 5412.

For the kitchen, choose either sink taps or mixer. For the bathroom you have a choice of bath taps, bath mixer or an independent shower mixer unit – all beautifully complemented by matching basin taps.

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Tel: 379291. Telex: 25325.

Published by ARROW@DIT, 1982
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UNIDARE, FINGLAS, DUBLIN 11. (01) 771801.
Beaver Engineering Ltd., the well known distributor of Bosch products in Ireland have recently announced the setting up of a new heating division in the company. Managing Director Alec Morton explains the move as begin

controls and heat pumps are manufactured mainly under the brand name Junkers. The Junkers division of Bosch is regarded as the largest manufacturer of gas heating equipment in Germany and all products are made to DIN standards. Ray Dempsey, formally with the Dublin Gas Co., has been appointed as Sales Representative to the new division.

The range of gas boilers include, conventional and balanced flued units, wall hung and free standing, also cast iron with forced draught. Probably the most attractive of the Junkers range is their Combi unit which is a wall hung forced draught balanced flue boiler with a stainless steel heat exchanger. Other features include a stepless modulating control system, a 15 year guarantee on the heat exchanger's tube, the flue can have up to seven metres horizontal run between boiler and outlet, expansion tank and pump, included under the

- The Bosch/Junkers Combi central heating boiler and water heater.

their entire range of heating product at the Gas Ireland exhibition and will be delighted to discuss the Combi and all the other heating products from Bosch at the show.

**BEAVER LAUNCH HEATING DIVISION**

- Ray Dempsey — the new Heating Division Representative for Beaver Engineering, who are introducing a range of Bosch water heaters, central heating systems and heat pumps in Ireland, in line with the company’s planned expansion with the advent of gas as a prime energy source in Ireland. Within the Bosch group, gas water heaters, gas central heating units,

- Other features include a stepless modulating control system, a 15 year guarantee on the heat exchanger's tube, the flue can have up to seven metres horizontal run between boiler and outlet, expansion tank and pump, included under the

- The Bosch/Junkers Combi central heating boiler and water heater.

their entire range of heating product at the Gas Ireland exhibition and will be delighted to discuss the Combi and all the other heating products from Bosch at the show.

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The Overall Efficiency of Industrial Boilers

by Mr. Per F. Eenhold Danish Boiler Owners’ Association

At the recent Second National Conference on energy use and management, the above paper was presented. In this paper attention was focused on heavy fuel oil fired boilers. It described which factors may influence the boiler efficiency, methods for improving the combustion efficiency and methods for recovering None of the fuel energy. Finally monitoring and control systems will be mentioned and how to determine the overall efficiency of boilers. The following is the section dealing with the direct and indirect methods of determining overall efficiency and is followed by a synopsis of the conclusions drawn from the paper.

Overall Efficiency of Industrial Boilers

The overall efficiency of a boiler is determined either directly or indirectly. According to DIN 1942 both methods are equally good.

By the direct method the efficiency is determined as the relationship between the energy engaged in the heating medium — water or steam — and the supplied energy — fuel and air etc.

By the indirect method the efficiency is determined in the following way: efficiency, % = (energy input - all heat losses) x 100 energy input

The heat losses are stack loss, radiation and convection loss, and unburnt material in ash and flue gas. Determination of these losses are explained earlier in this paper.

Whether you use the direct or indirect method is your judgement or determined by the possibilities available. At big plants with full instrumentation the direct method is generally used, and at small plants the indirect method.

By acceptance test Danish Boiler Owners’ Association normally uses the direct method at steam plants and the indirect at hot water boilers.

Measuring the Overall Efficiency of Industrial Boilers

In order to determine the overall efficiency on industrial boilers in practice by measurements it is necessary to be equipped with a data registration equipment, automatically and continuously registering all the measured parameters. The data registration equipment is today based on micro processors and is very flexible in use. All analog data are converted to digital signal and transmitted in digital form to avoid interference. The data are stored on the floppy disk. The following measuring equipment is used by Danish Boiler Owners’ Association for sampling the different measuring data.

1. Indirect method for efficiency determination

The temperatures are measured with Pt 100 resistance temperature sensors or with thermo couples Ni/Cr/Ni. The oxygen content in the flue gas from fuel oils is measured by zirconium oxide fuel cell oxygen sensor. In flue gas from coal fired plants or incineration plants is measured with oxygen analyzer after the paramagnetic principle, as the zirconium oxide type is not specific in flue gasses containing carbon monoxide.

The oil rate is determined by pulse meter. The carbon monoxide is measured after the infrared measuring principle.

Oil analyses according to international standards.

2. Direct method for efficiency determination

Temperature measurements as mentioned under 1. Flow measurements of water and steam are made by orifice plates as described in DIN 1952, /17/ and VDI 2040, /18/.

The unreliability in a flow measurement with a single orifice plate is presumed in /18/, typically = +1.5%. If three plates are in a series, the unreliability in an example has been calculated to ~9.95%.

With two orifice plates in a series Danish Boiler Owners’ Association has at a measuring task determined the total unreliability = function (orifice plate measurement and temperature measurement) to ~2.4%.

Pressure measurements from the orifice plates are converted to analog data. How to obtain better boiler efficiency, energy savings and a better control of the combustion and heat distribution processes will now be summarized.

With the knowledge of today it is possible to obtain cleaner combustion and better boiler efficiency, according to the following guide lines:

1. Old, uneconomical burners must be replaced. A burner must observe smoke spot numbers 3 and 2.5g solids/kg oil with 12 and 14% CO2 = (5.3 and 2.7% O2) by minimum/maximum fuel rate.

2. Development of new types of burners must be intensified. By minimum excess air not only emission of carbon particulates must be small, but also the emission of NOx, SO3 and unburnt hydrocarbons.

3. The boilers of the future ought to be constructed with combustion chambers’ dimensions to ensure a longer burn-out time than today. Packaged boilers must not be loaded with more than approx. 100 kg oil/m3 combustion chamber per hour.

4. A co-ordinating research with a reference to determine analytically a “combustibility index” showing how difficult it is to burn a certain fuel oil. A “combustibility index” ought to be given by a delivery of fuel oil just as correctly and naturally as viscosity and sulphur content is given today.

5. Burning water-in-oil emulsions can prevent
BOILERS AND BURNERS

fouling of the heating surfaces, the flue and the stack. Smut is avoided. It is essential for the success of this combustion technique that the water droplets are not bigger than 2-5 μm and are evenly spread in the oil.

6. Heavy fuel oil fired boilers may be cleaned at the latest when the flue gas temperature has risen 50°C after the last cleaning. By hot water boilers this answer to both new and retrofit burner applications. The Eurotherm commercial range features burners for gas, light and heavy oil, and dual fuel covering applications from 0.15 to 10m Btu/h. Developments from the control side include the first showing of the new boiler digital monitoring and control system, the BDMC 32, in a simulated boiler monitoring feature. This micro-processor based system is designed to display monitored boiler and boilerhouse conditions, including all alarms, on a high resolution, colour VDU. As well as display in alphanumerical and graphical form, calculation of steam quantities, steam costs, stack losses and boiler efficiencies can be made and displayed, with selectable time base for any period within the preceding 24 hours.

7. A simple equipment for measuring of stack solids by the personnel of the plant ought to be developed.

8. Boiler owners may investigate the possibility for using the flue gas down to 80°C by placing a low temperature heat exchanger after the boilers. Normally it is possible in this way to obtain 6-8% energy saving. The stack must be of steel and emission problems concerning sulphur dioxide must be discussed with the local environmental authority.

9. O2 trim systems are today recognized as a reliable and effective way of readjustment of the air/oil ratio. A saving of 1-2% can be obtained. It is essential that the right regulation organ is chosen. Burning water-in-oil emulsion in combination with O2 -trim system has improved very good results of up to 3% energy savings.

The following notes are based on material submitted by the companies concerned.

Saacke
Since 1980 Saacke have introduced an increased range of energy conservation equipment — air sealing dampers, water injection units and variable speed drive FD motors and economisers.

Other important developments are the Saacke Fixed Grate Burner the industrial Type XF and a commercial burner Type PXF. The Type XF burner is complete with clinker crusher and robot ash handling system. Introduced in 1980 this new concept in forced draught, fixed bed coal firing has received instant acceptance as an economical, efficient answer to both new and retrofit burner applications in the 5,000 to 26,750 lb/h boiler range. It is suitable for use on both shell and water tube boilers or furnaces.

The development of this fixed grate burner with pneumatic, front coal delivery incorporating a characterised coal distributor, allows rapid and accurate boiler response to changing load; previously only a characteristic of oil or gas burner systems. A number of versions of this burner are available, together with a wide range of coal and ash handling, storage and treatment systems which allow the specification of everything from a basic burner with manual de-ashing to a fully automated burner system complete with all storage and handling facilities.

The commercial range PFX9 is a coal burner suitable for hot water boilers with a 1m to 5m Btu/h output, and shares the unique operating features of the large industrial XF range. A similar comprehensive range of storage, delivery and ash handling equipment is available.

Among the gas and oil burners available a version of the well established Saacke Rotary cup oil burner complete with water injection, variable speed drive FD fan and air sealing dampers. All these options can be specified separately for retrofit to existing burners.

The Eurotherm commercial range features burners for gas, light and heavy oil, and dual fuel covering applications from 0.15 to 10m Btu/h.

British Gas & Oil Burners
British Gas & Oil Burners Limited, a member of the Tecalemit (UK) Group of Companies, have launched their new range of Selectos commercial gas and oil...
Some boilermakers can offer an impressively wide range of boilers. Others specialise in tailor-made units for particular applications.

"NEI Cochran manufacture boilers for almost every conceivable application from the smallest to the very largest."

It's a capability matched only by a handful of companies in the world.

Starting with the Minipak and Wee Chieftain boilers with outputs from 1,000 lb/hr, NEI Cochran can supply units right across the range—with the new Coalminor (up to 10,000 lb/hr) and the Coalmaster III Series (up to 36,000 lb/hr), right through to the twin furnace versions of the Thermax with a massive 70,000 lb/hr capacity.

What's more, the Cochran range provides for economical operation on virtually all types of fuel: oil, gas, coal, and even waste fuels.

Today Cochran boilers are producing constant, reliable steam and hot water in over 90 countries throughout the world, from Europe to Australasia.

A fact which, more than anything, underlines NEI Cochran's undisputed leadership in boiler technology.

NEI Cochran Ltd.
Newbie Works, Annan,
Dumfriesshire DG12 5QU, Scotland.
Telephone: 046-12 2111. Telex: 775183.
boilers recently.

With the introduction of the Selectos SG13 and D13 commercial gas and oil burners onto the market in 1980, BGOB set the design standards for the decade and, following further research and development, their design engineers have produced a ‘Super Selectos’ range which they are confident will maintain their reputation for advanced, innovative quality engineering. The new Super range, plus the 13 Series, covers firing rates from 60 kW to 1,110 kW. Three burners are for class D fuel oil, and a further three are for Natural Gas.

Created for application to the latest generation of high-efficiency hot water boilers, the Super Selectos range of burners incorporates many advanced features that will appeal to the engineer. The D18 and D22 models embody not only fully closing air shutters as standard but also a fully automatic, self-adjusting combustion head which ensures constant optimum efficiency when operating at Low-fire setting. These advanced benefits combined with improved facilities for servicing, and handsome styling, make the new burners genuinely impressive examples of British combustion technology and quality engineering.

Armed with new ideas, new products, and the backing of Tecalemit, this fine well established company is striding with ever-increasing confidence into the future.

Dunphy

Dunphy Oil and Gas Burners Limited cover output ratings from 75 Kw (250,000 Btu/h) to 8,800 Kw (30 million Btu/h), using all liquid and gaseous fuels. Dual fuel burners and a new steam atomising burner with unique characteristics will be featured. The successful ‘T’ series burner has been up-dated in a Mark II version.

In promoting the Mark II range, Dunphy has taken a fresh look at a well-proved burner and provided a number of engineering refinements. The motor is now housed in the incoming airstream thus relinquishing it of the necessity to have a separate cooling fan. The forced draught impeller is dynamically balanced by computerised equipment and there is an option to use a purpose-made G.R.P. air inlet attenuator. As a result the combustion air is warmed by the motor which can be run at optimum efficiency. There is an option for a fully closing air damper which will isolate the boiler from any passage of air during burner shut-down. At a load factor of 50% on the boiler this option will save up to 1% of a fuel bill.

The control panel has been given a “mimic” facia which enables the operator to get a status report on the burner management system at a glance. Modular construction has been employed which assists in the easy removal of motor, impeller, burner head and gives supreme ease of access to all maintenance points.

The company sums up these advantages by claiming that the Mark II burner is “quieter than ever - stingy with energy - user friendly”.

Babcock Power

After extensive proving trials at the NCB Coal Research Establishment, Babcock Power Limited has introduced a range of fluidised bed boiler systems designed to offer optimum flexibility and efficiency in coal fuels.

The new boilers are the Babcock Fluidburn Compo and the Babcock Fluidburn LS Water Tube models, which are also available in conventional stoker fired versions. These are also designed for conversion to fluidised bed firing at a later date if required. The advantages of the Fluidburn boilers include: wider coal burning capability, labour saving control system, low combustion temperature, high heat transfer in bed and quick start-up and response.

BABCOCK COMPO BOILER

— the Babcock Compo boiler is of composite construction, utilising features from both fire tube and water tube boilers. "Membrane Wall" panels forming the furnace cage section ensure gas tightness, assist heat exchange efficiency and simplify insulation. A shell and tube section provides generous water volume and steam release area and, at the same time, incorporates a straight fire tube convective heating
## Comparison of Useful Energy Costs

### Commercial/Industrial Fuels

<table>
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<th>FUEL</th>
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<th>Delivered Cost</th>
<th>Solid Fuel Boilers</th>
<th>Gas or Oil Fired Boiler or Air Heater</th>
<th>Storage Heater</th>
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<th>Directly Fired Gas Heater</th>
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<td></td>
<td>20 - 50 tonnes</td>
<td>2.78</td>
<td>4.76</td>
<td>4.01</td>
<td>3.94</td>
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<td>50 - 100 tonnes</td>
<td>2.34</td>
<td>3.85</td>
<td>3.13</td>
<td>3.94</td>
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<td></td>
<td>over 100 tonnes</td>
<td>2.41</td>
<td>3.71</td>
<td>3.06</td>
<td>3.94</td>
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<tr>
<td>Electricity</td>
<td>Night Space Heating, Flat Rate of Charge</td>
<td>3.90</td>
<td>4.32</td>
<td>8.20</td>
<td>4.42</td>
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<td>Unrestricted Space Heating</td>
<td>8.20</td>
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<td>Industrial Maximum</td>
<td>6.88</td>
<td>9.58</td>
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<td>Annual, 11.5 (kW)</td>
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<td>3000 kW Load</td>
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<td>Demands, 11.5, 300 kW load</td>
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### Notes:
- Efficiencies quoted are seasonal efficiencies where relevant. Efficiency = Conversion Efficiency x Utilisation Efficiency.
- Delivered energy costs quoted above are for the conditions stated on IIRS Comparison of Energy Costs sheet.

---

## QUADRANT ENGINEERS LTD

**RIELLO**

Natural Gas Burners from 60,000 Btu/hr upwards

### Other Quadrant Products
- Buderus Omnical Steel Boilers
- Buderus Boilers and Radiators
- Buderus Thermoglaze Calorifiers
- Happel Convectoras
- Heraeus Infra-Red Heaters
- Wing and Andrews Heating Equipment
- Chromalox Electric Space Heaters

For details contact us:
Chapelizod, Dublin 20. Tel: 265711 Telex: 25283
REFRACTORIES Of Bailieborough

THE FIREBRICK SPECIALISTS

Manufacturers of Burner Quarls • Precast
Combustion Chambers for Sectional Boilers • Firebacks etc.

Agents for Craigend Refractories Ltd. • Fireclays • Jointing Cements •
Castables • Mouldables etc.

REFRACTORIES IRELAND LTD.


More Industries rely on

Fulton

than any other boiler

• Simple and efficient
• Proved in over 60,000 installations
  • Low capital cost
  • Low installation cost
  • Low running cost
  • Low maintenance cost

Get all the facts ... then get a FULTON

STEAM BOILERS

A.P.V. (IRELAND) LIMITED

Galvone Industrial Est, Limerick, Tel: 061/45211. Telex: 26923
surface. The Compo is designed primarily to burn coal and vegetable wastes but can also be arranged to burn oil or gas as standby fuels.

Boilers are manufactured in modular form for easy transportation and quick site erection. All units are provided with sootblowers, induced draught fan and grit arrestors to give a high degree of availability and to comply with clean air requirements.

Duty range: evaporation from 10,000 lb/hr to 100,000 lb/hr (4.535 tonnes/hr to 45.35 tonnes/hr); steam pressure up to 500 psig (35 bar); steam temperature up to 900°F (480°C).

Babcock LS water tube boiler - this is a recent development based on established design parameters to meet the market requirement of a modern medium sized industrial boiler to burn coal and to be suitable for combined heat and power systems needing steam up to 900 psig/62 bar and 900°F/480°C.

The integral cage construction allows complete workshop manufacture, resulting in a higher quality product.

Duty range: evaporation from 30,000 lb/hr (13.6 tonnes/hr); steam pressure up to 900 psig (62 bar); steam temperature up to 900°F (480°C).

**Potterton**

Potterton's Commercial Products Division comprises primarily of boilers of cast iron construction with the exception of the CCM modular model which is a copper finned tube boiler. Outputs range from 160,000 to 9,000,000 Btu/h and the boilers operate on a variety of fuels including dual and multi-fuel.

Included in the commercial range is both the Avon One and Avon Two boilers in modular form. Avon boilers are available in a range of twelve boilers sized from 160,000 Btu/h to 680,000 Btu/h with gas, oil or LPG burner options giving operating efficiencies of 78 per cent.

A new product is the modular versions of the Diplomat range. The versatile Diplomat can be used either singly or in modular form and gives a wide range of outputs to suit required heat loads.

Other commercial boilers include the Derwent, a compact sectional gas-fired boiler giving an output range from 440,000 to 2,000,000 Btu/h and the Isis which is suitable for oil, gas or dual fuel firing. The Isis offers an output range from 900,000 to 3,200,000 Btu/h and a gross CV of 80 per cent. It has been Europe's top selling boiler for the past 12 years.

A major interest is the revolutionary Controlled Circulation Micro (CCM) boilers. These give a power output equivalent to modules up to three times their size. There are three gas-fired models in the range with outputs of 286,000, 435,000 and 698,000 Btu/h. By using them singly or in combination, virtually all space and hot water heating requirements can be matched at a fraction of the usual capital/space cost.

The Eden Two boiler range has been specifically designed to replace old FOA and EOA boilers with minimal re-piping and sitework.

A number of commercial's unique NG100 multi-fuel boilers will be on display. Of top quality construction and built to the latest European standards, these boilers offer outputs from 1,600,000 to 8,900,000 Btu/h.
**Fulton Boilers**

The Fulton range of oil-fired and gas-fired steam boilers which are marketed by A.P.V. (Ireland) Limited, covers a comprehensive range with outputs from 140 lb to 2,100 lb/hr and pressures of up to 150 p.s.i.g.

These boilers, which are fully automatic in operation, do not require a high level of maintenance or service. As the units are completely tubeless, the steam raising chamber consists of an annular steel ring which contains the water with sufficient space above for the steam. Water level is controlled automatically to ensure that the water is in contact with all the furnace surfaces being heated by the hot combustion gases.

The burner operates by sending a spiralling flame down the length of the furnace which allows maximum heat absorption. As the hot gases reach the end of the furnace, they turn upwards to make a second complete pass around the outside of the shell. Any heat remaining in the gases is transmitted by convection and conduction into the pressure vessel, giving such high efficiency that a full head of steam is raised in seven to fifteen minutes.

A.P.V. (Ireland) Limited also market Fulton Dual Fuel boilers which are designed to operate on a choice of fuels and also the electric range of Fulton Boilers which have steam output ranging from 30 to 160 lb steam per hour. There are now over 60,000 Fulton boiler installations in operation around the world. Enquiries (061) 45211.

**Triano Redfyre**

Triano's newly-formed industrial boiler division made its trade debut at the recent Expoclima/Hevac exhibition, with samples of its extensive range for solid fuel, blown gas and pressure jet oil firing. The display included two of the new 'Turbo' series of cast iron sectional boilers for gas or oil firing.

With outputs ranging from 330,000 Btu/h to 1,740,000 Btu/h, the 16 models in this series incorporate a number of important design features leading to minimal boiler maintenance and maximum thermal efficiency.

Another new item was a gas-fired 600,000 Btu/h steel vertical tubed hot water boiler from a range of four, available also for oil-firing and designed to allow the steel sections to be passed through average door openings. Alongside the oil and gas fired boilers were the TGC 450, representing Triano's well-established anthracite-burning gravity feed commercial range.

TGC boilers ensure optimum heat absorption to water and are available in a choice of outputs from 300,000 to 900,000 Btu/h. Another anthracite-burning boiler, the G150, and the TRO 50/73 pressure jet oil boiler completed the display by Trianco.

**Teknigas**

Teknigas, the specialist burner and control manufacturer have developed, over the last 18 months or so, a number of new products.

The range of Tekni Solenoid valves for both domestic and non domestic applications has been proven and well accepted over many years. Teknigas are now introducing a number of new valves to the range in size up to 2″ BSP with fast and slow opening characteristics and flow limiting devices.

Further additions are both ½″ and 1″ double valves. A new ½″ "high flow" valve is also available and this will allow manufacturers to standardise on range rated appliances in the interest of economy. The same body can also be tapped ¾″ BSP so giving an exceptionally compact and competitive fast operating ¾″ solenoid valve.

To operate in conjunction with these is a range of domestic and non domestic flame control sets incorporating, once again, the most advanced technology to give the same high standard of reliability that is synonymous with all Tekni products. In addition, the Teknitronic range of automatic and semi automatic controls for commercial and industrial applications has been replaced by updated models.

Added to this new era of Tekni controls are the well known range of Teknitherm and Teknipilot thermo-electric flame failure valves which have been widely used for many years. This product range has, in itself, been enlarged over the last 18 months by the introduction of the CTB series of multifunction controls and single function flame failure valves and accessories.

The diverse range of Tekni thermocouples has now been suitably reduced following the introduction of their Universal thermocouple type 7000 which is very widely used, both in the UK and overseas.

Teknigas also boast one of the most extensive ranges of atmospheric burners for practically any domestic and non-domestic application giving them the singular distinction of being the only UK manufacturer of both burners and controls.

This overall package is completed with various secondary controls and ancillaries so giving the domestic and non domestic equipment manufacturers one of the most comprehensive programmes available from the one source.

**Bradlee**

Bradlee Boilers have just announced a new range of mini package automatic steam boilers.

Based on their existing three smallest shell sizes, these compact and proven units are now equipped and finished to a slightly different specification.
YOU NAME IT!
WE BURN IT!

- CRADLEY STEAMPACKET BOILER

Boilers for all types of fuels

Cradley Boiler Company Limited
Cradley Heath
Warley, West Midlands B64 7AN
Telephone: Cradley Heath 66003
Telegrams: Cradboiler Warley Telex 337024

Irish Agent: G. W. MONSON & SON LTD.
18 Ballyblack Road, Newtownards, Co. Down. Phone: 812350.
8 Lower Mount Street, Dublin 2. Phone: 765627.
MAXECON TWIN FURNACE

Sole Agents for Wallsend Engineering Ltd., (formally Clark Hawthorn), Maxecon & Westgarth Boilers throughout Ireland

Suitable for oil, solid fuel & natural gas.

Ranges from 3000 lbs/hr to 65,000 lbs/hr.
Pressures up to 450 P.S.I.

I.E.S. I.E.S. INDUSTRIAL (Ireland) Ltd.

Head Office:
21 Station Street, Belfast BT3 9DA
Tel: 732133/4 Telex: 74644

Dublin Office:
41 Dawson Street, Dublin 2. Tel: 710142

---

QUADRANT ENGINEERS LTD

Buderus Steel Boilers

Buderus/Omnical Steel Boilers ranging in output from 500,000 Btu/hr upwards for LTHW, MTHW and steam.

- The model illustrated is an Omnimat type OD.

Other Quadrant Products
- Buderus Cast-Iron Sectional Boilers
- Buderus Calorifiers and Radiators
- Riello Burners
- Happel Convectors
- Heraeus Infra-Red Heaters
- Wing and Andrews Heating Equipment
- Chromalox Electric Space Heaters

For details contact us at:
Chapelizod, Dublin 20. Tel: 265711 Telex: 25283
compared with the standard Bradlee boiler, and are offered at very competitive prices.

Available in five sizes (150-530 lb/hr output), the efficient three-pass, reverse-flame, wet-back Bradlee design is in these energy-conscious times an important development for small industrial and commercial applications. Efficiencies up to 84% can be obtained, which can mean useful savings on energy expenditure compared with older single or two-pass boilers.

Remarkably compact, these boilers require very little space at the rear or on the blind side, and so can be tucked into the smallest corner; moreover they are available left or right-handed to order. Lighter than the average boiler (because light-weight insulation is used), these boilers can be installed very easily, and they all fit through a normal door.

Designed for a life of 20 years, all Bradlee boilers are robustly built to British Standard 2790 and are considered and inspected to AOTC requirements. Apart from regular cleaning inside and out, these boilers are unlikely to require any major maintenance since the furnace and tubes are all fully immersed.

The horizontal shell contains a good volume of dry steam — so essential for many processes in the dry cleaning and clothing industries.

Bradlee boilers have for a number of years fitted their own probe control system, using four probes, the lowest two activating complete lock-out and alarm, so as to provide full fail-safe conditions. Riello gas or oil-fired burners are fitted and Lowara pumps. Other fittings include safety valve, pressure gauge and pressure stat. The boiler comes as a complete package, all ready to be connected to water, electricity, fuel and drain, and then to fire.

Designed and manufactured in London, customers for Bradlee boilers include many well-known names, like Firestone Tyre, Rolls Royce and United Biscuits. Sketchleys the cleaners required no electrical or computer skills on the part of the operator.

With the introduction of Bradlee's new Mini range at such competitive prices, it is no longer the case that you have to pay a premium for a compact, energy-efficient boiler which will have a long life and low maintenance costs.

Sintronic

IN less than three minutes oil, gas and solid fuel burning systems can be precisely adjusted for maximum efficiency with the new Sintronic Fuel Efficiency Computer. The hand-held, completely automatic flue gas analyzer not only measures flue gas temperature and oxygen content — but also instantaneously calculates and displays the percentage efficiency of the boiler or furnace. Fine burner adjustments can be made immediately, without guessing or error.

Light enough to be used with one hand, the F.E.M. required no electrical or damper large reduction in heat losses normally sustained during the cooling down process of the boiler. An energy saving of up to 10% can be expected from the combination of a fall in flue gas temperature of 100°C and the effect from the motorized flue dampers.

The economisers is manufactured from mild steel and stainless steel, the stainless steel model is being stocked in this country in five sizes from 500,000 Btu/h’s to 5,000,000 Btu/h’s. The Rondra-Ecomat is of tubular form, the gases passing through tubes.
circumferentially disposed around a straight through gas by-pass. The main flue tube and the by-pass being equipped with the integral damper system.

The installation can usually be carried out in a day by the removal of one section of flue duct and the replacement by the economiser. The boiler water on central heating systems being trapped off the return pumped through the economiser and then back into the return leg closer to the boiler. On steam boilers the water circulation would heat the feed water tank.

Pressure & Temperature Engineering Ltd. are very much aware of the corrosion factors in flue gases and the units are made from mild steel for gas firing and stainless stel for oil or solid fuel firing. The units have a very low pressure drop and can readily be fitted into most schemes, however ispection of every boiler location is carried out without cost to clients.

A nationwide network of agents are being appointed who will survey the plant and will be able to estimate a fuel saving and capital pay back which should normally be between eighteen months and two years.

Cradley Boiler Company manufacturers for over 100 years of high class steam and hot water boilers announce that they are now able to offer boiler units for steam operation up to 40,000 lbs per hour, hot water units up to 40,000,000 Btu/h.

This extension of the "Steampacket" range incorporates all the well known features of the existing boilers. All units incorporate boiler furnace with low heat liberation rates making the boiler easily suitable for gas and solid fuels.

The wet-back construction ensures flexibility and as the boiler is a genuine three pass unit guarantees high thermal efficiency. All "Steampacket" units are supplied as complete packages incorporating full complement of steam and water mountings, in addition to combustion equipment. For oil, gas and dual fuel, oil/gas fuels burners of the pressure jet high/low/off type are incorporated on the smaller units. Rotary cup burners are fitted as standard on the larger boilers, these burners arranged for modulating control. For maximum thermal efficiency in the case of solid fuel, burners can be fitted with oil/solid fuel mixer, fixed grate furnace or moving grate furnace for coal or turf firing.

Cradley representatives in Ireland, G. W. Monson and Sons Limited would be pleased to discuss the extension of the range of "Steampacket" boilers and offer assistance on all aspects of boiler installations.
A Full Range of Oil, Gas & Dual Fuel Burners from DUNPHY OIL & GAS BURNERS LTD.

K. B. COMBUSTION LTD.

WHARTON HALL, HAROLD'S CROSS, DUBLIN 6. TELEPHONE: 972168.
New "K" burners introduced by Radiant Superjet Ltd. The burners are suitable for modern boiler designs which have low firing centres. They will also fire boilers with combustion chamber resistances.

Superjet Ireland has set up a distribution centre in the heart of Dublin as this is a central location convenient to the maximum number of customers. Installation and servicing will be handled by the company's own team which has wide experience in the Irish Heating & Ventilation industry and which has received extensive training with the Radiant burners. Technical director is Louis Costello, commercial director John McInerney and service director Tommy Byrne.

The range manufactured by Superjet Ireland will include burners designed for use with oil, natural and town gas, LPG and dual fuel installations in on/off and high/low types. 'K' series burners can now be offered for outputs between 100,000 and 2.5 million Btu/h. They are particularly suitable for use with current compact boilers because of the modern appearance and acoustic housing. In addition the 'GL' series is available from 2.5-10 million Btu/h as is the range of dual fuel burners.

Superjet Ireland Ltd.
UNIT 22, TEMPLE LANE, HILL STREET, OFF GARDINER STREET, DUBLIN 1. TELEPHONE: 742855.
THE MOST SUCCESSFUL
CAST IRON
BOILER IN IRELAND

OIL OR
GAS
FIRED
LPG OR
NATURAL
GAS

Oil or Gas Fired.
Outputs from 60,000 btu/h to 604,000 btu/h

- Economical
- Reliable
- Corrosion-proof
- Efficient
- Easy Maintenance and Cleaning
- Elegant
- Long-lasting

CHAPPEÉ BOILERS

Highly efficient and compact, Chapée cast-iron sectional oil or gas fired boilers cover a range from 600,000 to 4.4 million Btu/hr (176 KW - 1.29 MW).

Multi-fuel with oil-gas-solid fuel from 70,000 Btu's/hr to 250,000 Btu's/hr.

HEVAC LIMITED, LISTER COMPLEX, BALLYMOUNT ROAD, CLONDALKIN, CO. DUBLIN.
TELEPHONE: 519411  TELEX: 30324 TUBE EI
Specifiers and users everywhere have acclaimed Crown Pipe Insulation in the best way possible. They've used it. On 1000 miles of pipes in its first few months. And what made these cost-conscious professionals vote so enthusiastically with their cheque books? – The Fibreglass superiority that's obvious from the moment you pick up a section of Crown Pipe Insulation. No other pipe insulation, for example, has the Z-lock heat-saving joint.

Just as visible, however, is a smooth, precise inner wall for all standard pipe o.d.'s, a dense firm surface, with the option of Class 'O' or canvas facings, a precisely-engineered hinge that enables one-piece Crown Pipe Insulation to be snapped around even a 324 mm o.d. pipe, and a standard 1200 mm length that cuts down waste and speeds installation.

Now add a choice of 263 sizes, 2°C to 540°C operating range and fast delivery from a nationwide network of distributors. And it's easy to understand why the first 1000 miles of success came so quickly.

Fibreglass Limited, 21 Merrion Square North, Dublin 2. Telephone: Dublin 767060 and 762395. A subsidiary of Pilkington Brothers P.L.C.
Superjet are now manufacturing in Ireland a range of gas/oil burners, both industrial and domestic in a range from 50,000 BTU’s to 15,000,000 BTU’s. These units are available ex stock and are backed up by a proven commissioning and service network.

Our trade counter holds complete spares for industrial and domestic and thus offers a valuable service to the industry.

Spares availability includes E.G. Probes and control boxes; Gas valves • U.V. cells and fans • Electric motors • Pipework and fittings, etc.

- SERVICE & COMMISSIONING
- A FAST REPAIR SERVICE
- CITY CENTRE TRADE COUNTER
- SPARES & FITTINGS, ETC.
- ANNUAL SERVICE
- CONTRACTS ON REQUEST.

SUPERJET IRELAND LTD.
Unit 22, Temple Lane, Hill Street, Off Gardiner Street, Dublin 1. Telephone: 742855.

A long awaited service to the industry!
EXHIBITION SITE PLAN AND EXHIBITORS

A.P.V. (Ireland) Ltd
Bosch - Junkers
Brooks Thomas Ltd
C&F Ltd
Calor Kosangas Ltd
Combex Engineering Ltd
Cyborg Electronics Ltd
Draeger Ireland Ltd
Dublin Gas
Dyle Electric Ltd
Elmfield Distributors Ltd
Ergas Ltd
Flogas Ltd
James Gleeson & Co Ltd
Heating Distributors Ltd
Hevac Ltd
International Gas Apparatus Ltd
K B Combustion Ltd
Landi-Hartog (Ireland) Ltd
Lister Tubes Ltd
Manotherm Ltd
P J Matthews & Co Ltd
Myson (Ireland) Ltd
Pioneer Radiant Products Ltd
PipeSeal Systems Ltd
Powrmatic Ltd
Precision Heating Equipment Ltd
Preston Ltd
Quadrant Engineers Ltd
Ridge Tool (UK) Ltd
Sunkiss Heating Ltd
Superjet Ireland Ltd
Taney Distributors Ltd
Midas Safety Systems
John R Taylor Ltd
Thermoplant Engineering Ltd
Turnmill Engineering Ltd
Unidade Ltd
Michael Vaughan Manufacturing Co Ltd
Wavin Pipes Ltd
Bord Gais Eireann
Thorn EMI Heating
Trilax A-S
Tilley & Barrett Ltd
I.I.R.S.
Glengorm Ltd

Stand No.
39
45
74
12
30/31/32
55
38
28/29
55
22
8/9
44
23/34
26/27
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11/12
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35/46
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58/59/60
### LATE ENTRIES

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<td></td>
<td>P. Lumley</td>
</tr>
<tr>
<td></td>
<td>P. Morgan</td>
</tr>
<tr>
<td></td>
<td>Unit 1, Belgard Road, Tallaght, Co. Dublin</td>
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<tr>
<td></td>
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</table>

Landi-Hartog (Ireland) Ltd., was formed in 1979 and is a fully Irish-owned company. The company is the market leader in the automobile gas conversion business investing heavily in research and development of new techniques for fitting and improving the existing range of equipment and technical training. Landi-Hartog moved to their new premises at Belgard Road, Tallaght, Co. Dublin on the 17th June where they have installed the most modern fitting facilities including the new electronically-controlled conversion system which is the first all electronic L.P.G. metering device in the world and is suitable for all makes of cars.

The company has access to a computer for which a special programme has been written. On the basis of data supplied by the customer including life of vehicles, fuel consumption, annual mileage and other factors the computer will produce an accurate and detailed cost comparison between petrol and L.P.G. Landi-Hartog also provides a leasing service called Lease Plan and experts are available to advise customers on the advantages of leasing conversion equipment.

The company executives will be pleased to discuss their services with you.

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<tr>
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<td>Stand Executive:</td>
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<tr>
<td></td>
<td>Alex O'Dowda</td>
</tr>
<tr>
<td></td>
<td>Bluebell, Naas Road, Dublin 12</td>
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<tr>
<td></td>
<td>Tel: 783422</td>
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Main distributors of all Baxi appliances, solid fuel and gas.

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<tr>
<th>STAND NO</th>
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<td>B. Hutton</td>
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<td>W. Taylor</td>
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</tbody>
</table>

Ilminster, Somerset, England. Tel: Ilminster 3535 Irish Address: 42 Wesley Lawns, Sandyford Road, Dundrum, Dublin 14. Tel: 953343

Powrmatic will have part of their large range of gas fired warm air heating equipment as well as their radiant tube heater on display. Staff from Heating Controls and Devices Ltd., main Powrmatic stockists will also be available for consultation.