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What Fuel This Winter?

Domestic Boiler Feature

See Inside...
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For further information contact your nearest ESB Office. There’s a team of specialists just waiting to put you in the picture.
1982 will be the 21st year of publication for H&V News and as part of our ‘coming of age’ celebrations we are promoting an important new exhibition which the major emphasis will be on gas but will also include building services. The exhibition will be held in conjunction with a one day conference and the venue will be the Burlington Hotel, Dublin, and will run from the 6th to the 8th (inclusive) July 1982, opening times 11am to 8pm daily. Gas in its many forms, as a source of energy will play a major role in the future of our industry and this exhibition will play a vital part in informing everyone involved of the developments that are associated with the increased use of gas.

Further details of the show are available from our sister company, ITTEX Ltd., 5/7 Main St., Blackrock, Co. Dublin, Tel: 885001.

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**Natural Gas Pipeline Contract**

Bord Gais Eireann have at last announced that following a detailed bid evaluation it proposes to award the contract for the Cork/Dublin pipeline to "Irishenco/NACAP B.V. Joint Venture".

The board will issue a letter of intent to sign a contract with Nacap/Irish Enco subject to approval of the gas pipeline project by the Government. Government agreement to the project is being sought.

The total cost of the project is estimated at IR£45 million of which the above contract represents about IR£30 million. This is for a turnkey lump sum fixed price contract and is to be completed by December, 1982, with the intention of having an allocation of natural gas available in Dublin early in 1983.

The board appears satisfied that the proposed contract will provide for an efficient and economical pipeline, constructed and operated to the highest international standards, being those of the Institution of Gas Engineers, upgraded for Irish conditions.

The remaining expenditure in the IR£45 million project will include, inter alia, the costs of the following matters following on the award of the above contract:
- Communications and Instrumentation;
- Project Management and Commissioning;
- Finance Charges;
- Preliminary Costs etc.

Adequate financing is available for the project without recourse to Exchequer funds. The project will be self financing from the sales of natural gas by Bord Gais Eireann.

The gas pipeline will be constructed along a route running from Cork close to Dublin. Construction work is expected to commence in March or April 1982 and to be completed before the end of that year.

B.G.E. have appointed Daniel/McCarthy/Flour to undertake project supervision on behalf of the board.

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**Pictured with Jim Maher, Coal Information Services, (centre back row) were a number of students who attended the recent CIS training course in the Engineers Club, Clyde Rd., Dublin. Those who attended included Michael Cullen, Kilkenny, Des Healy, Waterford, Jimmy Stubbs, Dublin, James Naughton, Newbridge, Michael McLaughlin, Dublin, Anthony Tobin, Waterford, Paul Terry, Cork, Chris Hosford, Cork, Pat Doyle, Ferbane, Brendan Morgan, Offaly, Thomas Deane, Cork, Peter Nolan, Newbridge, Gerry Craughwell, Galway, Gerry O'Sullivan, Naas, John Barry, Dublin and Pat Glynn.**

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**Temperature Control Services on the Move**

By the time you read this, Temperature Control Services Limited, the heating ventilating and air conditioning controls group, may have moved to larger and more modern premises or the Whitestown Industrial Estate, Tallaght.

The new headquarters double that of their existing facilities, cover 10,000 sq ft. and will represent an investment of £400,000 when fitted with equipment and machinery.

Centred there will be the complete TCS Group which now includes manufacturing, installations and export marketing subsidiaries as well as the TCS heating supplies company Mercon Limited.

The move to larger premises results from a substantial growth in TCS operations in recent years.

In particular TCS has expanded its manufacture of control panels, increased its emphasis on package deal installations and extended its service to provide total system commissioning.

With staff numbers up by 30% in the current year, Managing Director Gerry Curran sees the new premises as "gearing the group for major growth, particularly on the installation side and in the export of TCS services overseas".

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United Nations Symposium on LPG

A United Nations Symposium on liquefied petroleum gas took place in Dublin's Burlington Hotel recently. The three day conference, which was opened by the Tanaiste and Minister for Industry and Energy, Mr. Michael O'Leary, TD, was hosted by the Irish Government and organised by the Irish Liquefied Petroleum Gas Association.

The conference had the status of an intergovernmental meeting and was an important policy making forum for the LPG industry both at commercial and Government level over the next decade.

Many of the World's major producer countries were represented with delegations from the USSR, Iran, Australia, Canada and the U.S. 300 delegates from 30 countries attended the Symposium whose main aim was to exchange information on the Global and regional LPG situation during the decade 1980-1990.

Modern Boiler Design

The Tanaiste and Minister for Industry, Energy, Mr. Michael O'Leary, TD, has announced details of a competition being organised by his Department for awards to industry, including the Public sector, for energy conservation projects which have achieved or will achieve worthwhile savings in energy consumption. The awards are intended to give recognition to individual firms or organisations for special efforts and results in the field of energy conservation and to encourage energy saving throughout industry generally.

Mr. O'Leary stressed the importance to industry of energy conservation measures as a means of cutting production costs and maintaining competitiveness in the market. He pointed out that this year, Ireland face an energy bill which will be close to £1,000m and that, consequently, conservation could make a major contribution to the national economy and have a considerable impact on our balance of payments situation.

Even a 1% overall saving would keep £10m, at home and help in securing Irish jobs. Given that industry accounted for 33% of the total energy used in Ireland in 1980, there was considerable scope for savings in this sector. The importance to each firm of an Energy Audit and of a proper Energy Management Programme could not be overemphasised, the Tanaiste said. With these tools a company could easily gauge its conservation potential, the conservation efforts necessary to reach that potential and the rate at which it was attaining its conservation objectives.

The Tanaiste said the competition, would put the emphasis on practical effort in conservation and would be open to all sectors of industry. It would be arranged in three categories: Large Firms (50 employees or more), Small Firms (less than 50 employees) and the Public Sector. In the case of the large and small firms categories prizes would be awarded on a regional basis and for individual companies and organisations Mr. O'Leary said he was introducing a separate award for the Energy Manager of the firm or organisation submitting the best entry as decided by the judges.
Grants for House Improvements

The Government has announced a new scheme of Government grants for certain house improvements. Grants from the Department of the Environment are being made available as follows:

1. £200 for the provision of a water supply.
2. £200 for the installation of sewerage facilities.
3. £600 for the building of a chimney and the provision of a fireplace with back boiler in a house without a chimney.
4. £600 for the provision of a bathroom (or fixed shower).
5. £600 for the provision of an extra bedroom to relieve overcrowding.

Where the scheme of work involves the provision of both a bathroom and a bedroom the combined maximum is £1,000. The amount of the grant may not, in any case, exceed two-thirds of the cost.

Since the former scheme of house improvement was terminated on 1st February, 1980 the Government parties have expressed concern that the absence, for the first time since 1924, of grant assistance would have and would deny many families the opportunity of providing in their houses the necessary basic amenities which are taken for granted by most of the community. A comprehensive survey of the national housing stock carried out in 1980 showed that there were still 87,000 houses without an internal water supply, 141,000 houses without internal sewerage facilities and 185,000 houses without a fixed bathroom or shower. The lack of these amenities in so many of our houses amounts to a serious deficiency in our housing stock and any realistic housing policy must aim at the elimination of this deficiency.

The Government are also anxious to encourage and to assist families to extend their existing houses in order to relieve overcrowding in the most economic and convenient way possible. Thus the new scheme gives grant assistance for necessary extra bedroom accommodation.

In the era of cheap energy, during the sixties and early seventies many houses were built without chimneys — particularly in the larger urban areas. After the first oil crisis of 1973 this was seen to be a very unwise omission and a special grant for chimneys and fireplaces was introduced in October, 1974 but this was also discontinued from 1st February, 1980. The omission was rectified with the aid of grants in many of the houses but there is still a good number of householders who have yet to do so. The Government are confident that the grants now available will enable them to provide themselves with the desirable option of burning solid fuel.

There are other types of house improvements which, it could be argued, also merit grant assistance but the Government consider that the five categories now being included in the scheme rank highest in order of social priority. They are particularly anxious, as indicated in their Programme for Government, to give some grant assistance for energy conservation. However, it is impossible, at this stage to go beyond the grants for chimneys now being introduced due to financial limitations.

The new scheme comes into effect immediately but the Minister wishes to emphasise that work must not commence until an inspection has been carried out and the Department's written approval has been issued.

‘Fashionable’ Heat Pump from Carlyle

Heatung for a ‘with it’ boutique, Benetton, in Dublin’s fashionable Grafton Street, has been provided by a heat pump system.

A Carlyle 50RQ006 package heat pump, sited on the roof of the 300 sq. ft., shop supplies air at a rate of 0.90 m³/s to two ceiling diffusers. The return air grille is wall mounted at the back of the shop. The heat pump has a nominal cooling capacity of 16.29 kW and heating of 13.7 kW. When operating at an ambient of 32°F the heating capacity would be 10.5 kW and so the system incorporates a 4 kW electric heater battery and control ‘stat to boost the heating capacity if needed.

‘My only complaint’ said the manageress on a cold February day ‘is that the shop can sometimes get too warm, even with the door constantly being opened shut. But it will be marvelous to be able to switch to air conditioning when the summer comes’.

With oil prices rising, sometimes not too steadily and gas virtually unavailable in Ireland, it is becoming more apparent that the heat pump system is becoming the only real choice when it comes to installing heating systems in a whole range of applications. ‘Systems like this one operating in a small boutique demonstrates just how effective they are’ said Michael Buckley, Director, Walker Air Conditioning who supplied the unit. ‘We calculate the savings in running costs over conventional fuels will be in the region of 25 per cent. An added bonus is that since the air is filtered as well as heated or cooled in the summer, the decor will stay cleaner, the shop fresher and the dressing rooms much more pleasant for the customers.'
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Coalglo Coal Burning Room Heater

Although development has taken a number of years it now seems that at last the first bituminous coal burning room heater with high output back boiler has come on the market. It is called the Coalglo and is manufactured by Rayburn who have a long history in the development and manufacture of solid fuel appliances. The Coalglo operates on the down burning principle which burns off the normally wasted flue gases and makes good use of this combustion process.

The rated output is 30,000 Btu/hr to water with 9,000 Btu/hr to space, and is obviously aimed at the 3/4 bedroomed house market. The fuel used can be washed bituminous coal in doubles, nuts, trebles or large nut sizes with fuels available in Ireland having been tested over the last year. 70% efficiency at 4.25lb/hr fuel is claimed and the unit is thermostatically controlled.

Colours available are green, matt black, copper and pewter with optional extras of a wood effect surround, free standing kit, and coal hod.

For further details of the unit Taney Distributors Ltd., at 508120 will be pleased to help.

NEW IDHE COMMITTEE

At the recent AGM of the Irish Branch of the IDHE the following officers were elected to the committee:

Chairman: W. Victor Madigan, A.M.I.D.H.E.
Hon. Secretary: Harold P. Pattison, M.I.D.H.E.
Hon. Treasurer: J. Griffin, A.M.I.D.H.E.
Education Officer: T. Dinnigan, A.M.I.D.H.E.
P.R.O.: K. Long, M.I.D.H.E.

In our September issue we committed the cardinal sin of mixing up the picture captions of Ideal Standards on page 48 and Twyfords on page 46, apologies to both companies concerned.

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CIBS PROGRAMME FOR 1981/82

The following is the remaining programme of the Republic of Ireland branch of the CIBS for the 1981/1982 session.

Thursday November 5th — One day Symposium of the Draft Building Regulations.
Thursday December 3rd — Computer Programming.
Friday December 18th — Hot Air — Bright Lights Christmas Drink In.

1982
Thursday January 28th — Lighting — Energy Saving Control Systems.
Monday February 22nd — Ladies Evening — Details to be advised.
Wednesday February 24th — Visit to National Concert Hall.
Thursday February 25th — Paper on National City Concert Hall.
Thursday April 15th — Annual General Meeting and Annual Students Awards.
Friday May 14th — Golf Outing and Ladies Evening at The Hermitage Golf Club.

Meetings will be held at the Institution of Engineers of Ireland, 22, Clyde Road, Dublin 4 at 18.00 for 18.30 hours unless otherwise stated.

Clyde Annual Golf Competition

1. Our photograph shows a section of the competitors at the dinner which followed the Clyde annual Golf Trophy Competition in the Dublin Sports Hotel.

2. Also at the Clyde Golf Competition were (left to right) Mr. Michael Byrne, Amalgamated Hardware; Mr. Tom Kirnan, Office of Public Works; the winner Mr. Larry McGee, Office of Public Works; Peter McKeon, Clyde Systems; and Mr. Denis Kiely, Office of Public Works.

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INVITATION TO JOIN ECDHAI

The Energy Conservation & District Heating Association of Ireland founded in December 1974 with the main objective of promoting energy conservation through the establishment of Group Heating, District Heating and Combined Heat and Power (CHP) schemes in Ireland.

Other objectives are: the advancement of the art, science, standards and knowledge of District Heating and CHP: exchange of information pertaining to the management and operation of District Heating and CHP systems; encouragement of a cooperative exchange of information and CHP from manufacturing and production to ultimate use for space heating in the industrial, commercial and domestic sectors.

Applications for membership are now invited from organisations, firms, individuals and students who are interested in promotion of the objectives of the Association. It is intended that large firms and organisations would apply for Corporate membership at an annual fee of £20.00, individual membership £10.00 and student membership £1.00, for the period from 1st September to the following 31st August.

For further information contact: Mr. Michael Higgins, Hon. Treasurer, EC & DHAI c/o Cape Insulation (Ireland) Limited, St. Pancras Works, Mount Tallent Avenue, Terenure Dublin 6.

IDHE BIENNIAL CONVENTION

The 6th Biennial Convention of the Irish Branch of the IDHE titled "Indecision - a Future" recently took place in Jury's Hotel, Dublin.

The Convention was opened by the Rt. Hon. Lord Mayor of Dublin, Alexis Fitzgerald. There are six speakers and the subjects range from the generation of your own electricity with water turbines to the incineration and heat recovery from domestic waste. The Convention had a wide interest to those involved in Heating Contracting Work, Design Engineering Consultancy and Architecture.

The attendance at the Convention was in excess of 70 persons and there were 21 sponsors for the Convention.

Chairman for the conference was Jim Maher PC, Managing Director of Coal Information Services Ltd. and the programme included the following papers:


3rd Paper: Natural Gas and the Domestic Heating Contractor - Tony O'Leary M.Sc., Applications Engineer, Dublin Gas Co.

4th Paper: Generating your own electricity with small water turbines - P. Belton, Managing Director, Belton Engineering Co., Co. Longford.

5th Paper: Heat Pumps - Application and the design characteristics - David Kelham, MCIBS., Commercial Manager, Lennox Industries Ltd.

6th Paper: "He who Hesitates is Lost" - I.M. Daly, B.Sc., Plant Chemist, Irish Dunlop, Cork.

The closing address was given by the chairman and founder E. Eric Farrow, FIDHE, MASHRAE.

Wavin Hold PE Gas System Course

Gas distribution design, pipe line installation techniques, and codes of practice were some of the subjects covered in a series of two-day training courses run by Wavin Pipes Ltd. at its factory training centre in Balbriggan, Co. Dublin.

The course was attended by engineers, consultants, and contractors, and AnCO personnel. It was conducted by Mr. Colin G. Burley, BSc., MSc.; Products Development Manager, Wavin Plastics Ltd., formerly of British Gas.

These were the first of a series of courses planned by Wavin for those concerned with gas distribution. The company will also run ongoing training courses for operatives as well as special programmes for trainers.

The course included an overview of the development of MDPE pipe systems for gas distribution, the design characteristics of the WavinGas system, fusion joining, storage and handling of PE, installation considerations and techniques, Codes of Practices, etc.

Published by ARROW@TU Dublin, 1981
Heat Pumps at Tuam Swimming Pool

by J. N. Crotty, B.E., C.Eng., Deputy County Engineer, Galway Co. Council

One hundred and fifty feet beneath the town of Tuam lies a vast area of groundwater which is now supplying the bulk of heat for the town’s swimming pool. Two heat-pumps are used to extract sufficient heat from the groundwater to save thousands of pounds worth of oil annually.

The price of oil has increased at an annual rate of 34%, on average, since 1973. In 1973 a litre of oil cost 2.04 pence. If the price had increased at the normal rate of inflation (average 15%) then a litre of oil would cost between six and seven pence to-day. In fact a litre of oil today costs approximately three times this amount.

The enormous increase in the cost of oil was, needless to say, reflected in the cost of heating swimming pools, which are large energy consumers. Average annual oil consumption at the Tuam pool has been of the order of 112,000 litres and the cost of this oil has soared from £2,300 in 1973 to £24,000 in 1981. This has become an ever-increasing burden on Local Authorities’ finances. The heat pump is definitely one very adequate answer to the question of how Local Authorities can continue to keep swimming pools in operation.

The heat pump takes in air or water and extracts heat from it by means of an evaporator and condenser and deposits this heat where it is required.

The performance of a heat pump is measured by referring to its coefficient of performance rather than its efficiency. This is because the Coefficient of Performance is always greater than unity. The Coefficient of Performance (C.O.P.) is measured as follows:

\[ \text{C.O.P.} = \frac{T_H}{T_H - T_L} \]

If we take the source temperature as 8°C, which is 281°K, and the operating temperature of the heat pump to be 60°C, which is 333°K then C.O.P. = \( \frac{333}{333 - 281} \) = 6.40

In practice the C.O.P. varies between 2.0 and 5.0 due to factors which affect the theoretical C.O.P.

Water source heat pumps tend to have a somewhat higher C.O.P. than air source heat pumps, which means that they show a somewhat larger saving when compared with conventional oil-burning installations. Ground water sources are best as they generally maintain a fairly constant temperature. Surface water and air suffer the disadvantage that special defrosting precautions have to be taken in winter.

The Installation in Tuam Pool

In 1978 the firm of Energy Management Contractors Ltd. embarked on a survey of ground and surface water sources in County Galway in order to...
determine where there were suitable locations for the installation of heat pumps. The work was grant-aided by the Galway County Development Team. One of the locations which was chosen and which was, subsequently found to have a very satisfactory ground water source near at hand, was the Tuam Swimming Pool.

A scheme for the installation of two water source heat pumps in Tuam Pool was submitted to the County Council in 1980. The proposal consisted of sinking a borehole a few yards from the pool building, installing a submersible pump in this borehole, a large heat pump of 86 kW output, which would extract heat from the incoming ground water and use this heat to maintain the temperature of the pool water at around 27°C and to heat the pool building when required, a small heat pump, of 2 kW output, to heat water for showers and W.H.B.'s, and a run-around heat recovery system to use the heat from the exhaust air from the building to pre-heat incoming air.

The proposal also set out estimated savings over a five year period, related to the increase in the cost of energy, and offered to install the system at no cost to the County Council and to maintain it for five years, in return for the payment by the Council to the company, of ¾ of the calculated savings over a five year period. The company would sell the whole installation to the Council at the end of the five year period for a nominal sum, and thereafter the Council would benefit for the full savings.

Estimated gross savings over the five year period were given as £66,000, based on an assumed 20% per annum increase in both oil and electricity prices. Of this the Council would pay £44,000 to the company over the five year period, with the net savings to the Council being £22,000. Based on this proposal, the Council entered into an agreement with the company for the installation of the heat pumps. The agreement also included a method of assessing the savings, based on (1) the measured thermal efficiency of the existing oil-fired boiler, (2) the calorific value of the oil being burned, (3) the amount of electricity used by the heat pumps and (4) the measured Coefficient of Performance of the heat pumps.

**Operation and Savings**

The installation of the equipment commenced early in March 1981. When the installation of the heat pumps was completed, the measured C.O.P. of the larger pump was found to be 4.0 + while that for the smaller pump was found to be of the order of 2.8. These figures are satisfactory and are, in fact, more or less as expected.

The run-around system of heat recovery was not completed until mid-July, so during the initial short period, while space heating was required, full savings were not realised.

Figures for electricity consumption fluctuated during the first few months while the installation of the equipment was proceeding, but since July the weekly meter readings have shown that the total electricity consumption has steadied and is now averaging 460 kWh per day. The highest daily average, from the weekly meter readings, during the period July-September was 497 kWh/day and the lowest was 423 kWh/day. This means that the total electricity used by the pool, including heating, is averaging 460 KWh per day, during Summer months. This is expected to rise to about 800 KWh/day during Winter, when space heating is required.

These figures include the reduction in the heat requirement of the pool water brought about by the provision of a thermal blanket, which was installed in June, and which, in itself, has the effect of reducing pool water heating costs by around 30%.

In comparing figures for costs of heating with oil prior to the installation of the heat pumps and costs of heating by means of the heat pumps account must be taken of the effect of the thermal blanket.

The average daily electricity consumption for pool water heating is 160 KWh, which is all at night rate (£0.600 per unit) and the total annual cost is £2,280. The same amount of heating, using oil, would cost £7,560 (and, incidentally, £10,800 without the thermal blanket).

This gives an annual saving of £5,280 at to-day’s prices, or almost 70%.

For shower water heating approximately 21 KWh per day is required, and the annual cost of this is £480. Shower water heating, from our records, before installation of the heat pumps required about 10 gallons of oil per day. At to-day’s prices this would cost £3,600. This high figure was caused by several factors. The use of a large boiler to heat a small quantity of shower water, particularly in Summer leads to a very low boiler efficiency (around 30%) and in addition to this the storage...
tank was poorly insulated and there was no control on the amount of water used per heat in the showers. Now the shower water is heated by the small heat pump, which is sized for the job, the storage tanks are highly insulated, and we have installed control buttons on the showers which have reduced water consumption in the showers from 10 gallons/head to three gallons/head.

Space heating costs have to be estimated for the heat pumps at this stage as the heating season has not yet got under way. The amount of oil from records, required for space heating is 46,000 litres/year. Present cost of this is £9,600. The estimated usage of electricity is 48,000 KWh/annum and at 6.25p per unit, this will cost £3,000. These figures are based on heat requirement calculations, taking into account the fact that the run-around system of heat recovery will provide about 46% of the heat required to heat the incoming air.

To summarise the heating costs then, we get the following picture:

The figure of £20,780 is some £3,000 less than was quoted earlier in this paper as the total cost of heating for the pool, but this is attributable to the thermal blanket which was not in use at the pool prior to the installation of the heat pumps. Also the figure of £3,600 for shower water heating could have been reduced to £1,200 by installing control. These figures show an annual saving of 68% of the cost of heating.

Other usage of electricity for lighting, filtering, etc. costs about £5,700 per annum, from meter readings, so the savings are, in total, from £20,780 to £11,460 or approximately 45%.

Financing
To date we have been operating the heat pumps installation under the agreement referred to earlier, and a recent agreement for the nett savings for the period March to mid-September, in order to arrive at an amount to be paid by the Council to the company was £5,400 which corresponds quite well with the above figures. Winter savings will be larger because of the element of space heating.

The County Council has recently submitted an application to the Department of the Environment for loan sanction and subsidy and we are hopeful that this application will be successful, as the Council would then get the full benefit of the savings immediately. The project is also a very viable one with a pay-back period of 2½ to 3 years. The installation is expected to have a long and relatively maintenance-free life (15-20 years).

Conclusion
I am satisfied that the installation of the heat pumps in Tuam Pool is a very sound investment. Apart from the obvious advantages of considerable savings in running costs, there is also the aspect that, as resources of oil become scarce, oil may not continue to be available for recreational purposes, such as swimming pools.

The installation also uses a considerable percentage of its electricity at night which saves further costs and also helps to keep E.S.B. production costs down.

I see the Tuam project as a highly successful venture and I see a number of applications for heat pumps in swimming pools, leisure complexes, hospitals, institutions and in horticultural activities, such as tomato or mushroom growing.
H&V: Who are the Directors of Mosten Engineering and what background did they come from?
SMcA: The Directors are Sean McAuley (Managing), previously Director of Hall Thermotank Ireland Ltd., and Don Lister who has had considerable experience in installation of industrial piping systems and was Contracts Manager with Hall Thermotank Ireland.
H&V: What ideas had you in mind when you set up the company?
SMcA: The purpose in setting up the company was to provide a high class welding service, mechanical service contractors, with particular emphasis on providing this type of service to refrigeration contracting organisations.
H&V: When starting a new service company what way did you envisage that your company would be different and better than others?
SMcA: The methods used in ensuring that a class 1 service would be provided was firstly, having welding procedures to BS4870 witnessed and approved by IIRS and Lloyds Register of Shipping; secondly, having all welders both air and gas carry out welder qualification tests to BS4871 class 1. These tests were witnessed by IIRS and Lloyds Register of Shipping.
Consequently all welders employed by the company are capable of class 1 welding to BS2633. The importance of class 1 welding is high standards now being sought and enforced to comply with EEC standards.
H&V: Do you intend to quote on or install total services contracts?
SMcA: No. The company is not a refrigeration contractor and does not, nor is it the intention to quote for refrigeration or air conditioning contracts. Rather it can provide a service to contractors.
H&V: How many are employed by Mosten?
SMcA: There are at the moment approximately 25 people working for the company.
H&V: Could you give some examples of work carried out since you started business?
SMcA: We have installed the refrigeration system for Star Refrigeration at the new one million cubic ft. cold store built for Irish Cold Stores Ltd. at Ballymount Cross, Dublin. This entire project was subject to Lloyds approval, and in random radiographic inspection carried out on approximately 100 welds, welded to BS2633, there was not a single failure.
Another contract was the fabrication of 10 wb laterals to be used on the Alcan plant at Aughinish Co. Limerick.
H&V: Have you branched out into any other areas of business?
SMcA: Yes, we have a sister company called Mosten Engineering Supplies Ltd. set up on 1st July 1981, which acts as sole distributor for the range of products manufactured by Willison Controls Ltd. of Dallas Rd., in Bedford. The products include Grasso valves, refrigerating specialities controls, AC&R equipment, Fanal equipment Egelhof equipment, Poekless equipment, Henry equipment.
H&V: With your supply company what way do you intend to handle the agency business?
SMcA: Unlike some other companies we intend to keep a comprehensive stock of products available “off the shelf” at the Mosten premises in Lucan. This must be of considerable benefit to refrigeration and air conditioning engineers, as previously equipment was not available ex stock in Ireland with consequent delays caused by shipping, etc.
H&V: Finally, at a time of recession what future do you see for any company in the services industry?
SMcA: Although business in general may be slow we have proved as a company that hard work combined with quality workmanship will ensure growth for any company willing to see these principles through.
After Asbestos — What?

This article is an excerpt from a talk delivered by Bob Crosier, Vice-President Marketing, SEPCO Corporation, to the Industrial Stores Managers Association Semi-Annual Conference, Mobile, Alabama, USA which examines mechanical shaft sealing techniques other than asbestos and the problems of asbestos.

Since that day in the 9th Century when King Charlemagne prevented a war by throwing his tablecloth into a roaring fire and retrieving it unharmed, asbestos has played an important role in mankind’s development. Today, after centuries of faithful service, it has fallen into disfavour.

A fibrous silicate of metal, such as magnesium, calcium or sodium, its ore is mined from seams in rocks. In earlier times it was used almost exclusively as lamp wicking which may explain the paradoxical derivation of its name from the Greek word meaning “unquenchable” or “inextinguishable”. Of the two most common types, white asbestos (Chrysotile) has achieved greater popularity than its sister, blue asbestos (Crocidolite).

After centuries of faithful service as an outstanding material for wicking, insulation, and fire protection, why has it suddenly fallen into such terrible disfavour? Essentially, the notoriety of the health problems associated with asbestos stems from the frantic activity associated with preparing ships for military service during World War II. During this time ship hulls were being sprayed with asbestos insulation without benefit of respiration protection. Asbestos dust accumulated in the lungs of the workers where it lay dormant for as much as 20 or 30 years, after which there was an outbreak of asbestosis. Individuals who smoke are particularly prone to this disease. That propensity for the disease has to do with the druglike effect of cigarette smoke. Hairlike ciliated cells lining the bronchial tubes are anesthetised by the smoke and are incapable of performing their function of maintaining the cleanliness of the bronchial structure. These fine hairlike cells beat or vibrate constantly to move the mucous carpet covering the tissue in the direction of the nose so that dust and foreign matter collecting in the mucous may be removed. When these cells are anesthetised and discontinue their beating action, dust migrates into the lungs where it lodges permanently. This explains why heavy smokers have throat congestion in the morning. During the night these cells awaken and resume their activity removing congestion that collected during the day when they are made inactive by the anesthetic effect of the smoke.

As asbestos dust reaches the lungs, the body builds protective pus sacks around the dust particles which ultimately one day may become cancerous. Smokers run the greatest risk from this disease. The disease usually occurs 20 or more years after heavy exposure which explains why, 35 years after World War II, there has been a great deal of attention given to this hazard. Fear of infestation has made many companies totally eliminate the material from their purchasing patterns.

Apparently, there are two alternatives to the problem: (1) find ways to eliminate airborne asbestos dust entirely or (2) eliminate asbestos from use altogether.

The government has established guidelines and safety regulations for the use of asbestos materials and limited the level of the airborne asbestos dust in working areas. Research is developing methods to produce asbestos products which will not release dust capable of becoming airborne. In most mechanical packing manufacturing plants in this country the fine amorphous asbestos powder associated with asbestos fibres is entrapped with impregnants to prevent their release into the atmosphere.

On the other hand, this research and development of dust-free processing has increased the cost of asbestos packing to a point where the cost of non-asbestos substitutes are no longer as relatively expensive as they once were. At this point in time it is difficult to predict which way the mechanical packing industry will ultimately go. As long as there is a demand for asbestos products, the industry is responding with new dust-free processes to meet those needs. At the same time, new cost effective packings are being developed to replace asbestos wherever the customer seeks a substitute.

Polytetrafluoroethylene (TFE) was one of the earliest substitutes and is often used as an impregnant for asbestos products assisting in locking the asbestos dust into the packing. TFE has excellent chemical resistance and boasts a low coefficient of fric-
Graphite yarns, which are manufactured from carbonous fibres heat treated to 5500°F/3037°C in an atmosphere devoid of oxygen to form a crystalline graphite fibre, has become an excellent substitute. It has the ability to function at temperatures in excess of 5000°F in non-oxidizing atmospheres and 850°F/454°C in oxidizing environments. It has a low coefficient of friction and conducts heat away from the source of friction far better than asbestos, although it still may be classified as an insulator.

The most superior heat conductor in the family of mechanical packings is a product known generically as corrugated graphite ribbon.

It also enjoys the advantage of having the lowest coefficient of friction. It will operate at temperatures of 5000°F/2760°C in non-oxidizing atmospheres and 850°F/454°C in oxidizing atmospheres. Since superheated steam has been treated to remove oxygen, this product is an excellent substitute for asbestos in high-temperature steam applications. In high-speed, rotating-shaft applications this material has such unique heat transfer characteristics, no longer is frictional heat entrapped and insulated at the shaft but is transferred out through the stuffing box rapidly. It also has a better pH range than asbestos.

Aramid fibres also have arrived on the scene as viable asbestos substitutes. These fibres have unique tensile strengths and are similar to asbestos in withstanding chemical attack.

Some manufacturers have been experimenting with polyacrylonitrile fibres. Some of these fibres have been thermally treated to resist temperatures up to 600°F/316°C. Although they do not exhibit the versatility of asbestos products, they are competitively priced with asbestos packings.

Fibreglass has also found a place among asbestos substitutes.

The newest products, which not only exhibit superior performance characteristics to asbestos but also are in the same price range, are proprietary blends of several fibres. These appear to be the most practical substitutes available for applications up to 600°F/316°C and on high-speed rotary shafts.

Field tests have demonstrated that some of these packings will perform better than asbestos.

Compressed asbestos sheet substitutes are now appearing and promise to replace asbestos in many applications. Nitrile bound synthetic fibres are now being compressed into sheet form to be used as flange gasketing.

Although there are several types of compressed sheets, most of them meet the same specifications as compressed asbestos; however, they are higher in cost.

Metallic gaskets are also being fabricated from non-asbestos fillers such as TFE, ceramic paper, corrugated graphite ribbon, and other high-temperature chemically-resistant fillers.

Mechanical shaft seals have assumed an important role in competition with mechanical packings. Many chemical plants have virtually eliminated all asbestos packings on rotary pump applications. New seal designs and super hard seal face materials have made mechanical seals an excellent substitute for asbestos packings on abrasive, crystalizing, and clogging applications that formerly were not practical for mechanical seals. Pulp and paper mills had been reluctant to use mechanical seals because of their difficult applications. However, more and more seals are replacing packings in these mills as new technology evolves.

It's apparent that there are many viable substitutes for asbestos packings, and some display superior service capabilities; however, generally these products are relatively higher in cost. The cost difference has begun to narrow now that exploration for new asbestos ore deposits has dropped off, causing the existing ore to escalate in price. New regulations regarding the handling of asbestos fibres have made asbestos processing more costly. Time only will tell whether asbestos will continue to be a servant of industry or will be replaced by man-made substitutes.

BACKGROUND INFORMATION
ON SPEAKER: Mr. Crosier is a leading authority on mechanical shaft seals. He serves as Secretary of the Seals Technical Committee of the American Society of Lubrication Engineers, is a member of the Fluid Sealing Association, has taught fluid sealing classes for the Milwaukee School of Engineering, has instructed sealing technology for the Department of Energy and the American Society of Mechanical Engineers, and is recognised as a teacher of fluid sealing technology throughout the world.
H. Bicker, Senior Vice President, and J. Brennan, Past President, of the Master Plumbers Association led the trade representation at the Belfast College of Technology Apprentice of the Year Competition. The winner of the plumbing prize was Nicholas McWilliams of Lisburn Tech.

Coolheat Ltd. of Lisburn, (Tel: Lisburn 76228) have been appointed Northern Ireland agents for Netaline Air Distribution Products Ltd. whose products include the Netaline flexible duct.

Chairman and Director of F. B. McKee & Co. Ltd., Mr. Desmond McKee, has been appointed to the Board of the Northern Bank Ltd.

Doherty Ross & Armstrong, agents of Showerlux (UK) Ltd. introduced the 1981 range at a trade show in the Drumkeen Hotel. Mr. Bob Bowler, General Manager of Showerlux previewed the Shower Tower, a system of shower and bath enclosures to match the latest sanitary ware colours. Also present were Mr. Seymour Armstrong and Mr. Don Ross of the host company.

The Construction Industry Training Board have announced that it is prepared to offer a limited number of one year scholarships for young people interested in a career in the construction industry to take a full time course in Building Engineering Services (heating and ventilating) leading to the qualification of the Technician Education Council.

The courses will be in Belfast and will provide basic training to help prepare students for employment as technicians in the industry.

Application will be considered from those with four GCE "O" levels which should include Mathematics and English.

Successful candidates will receive £20 per week with a travel and accommodation allowance where applicable. Forms and details are available from: Construction Industry Training Board (NI), ITB House, Glenmount Road, Church Road, Newtownabbey.

The Belfast Architectural practice of Ferguson and McIlveen has once again received a commendation from the Royal Institute of British Architects in this year's annual awards.

In 1975 the company received the commendation for the design of their own offices at Beechill on the outskirts of Belfast. The 1981 award is for their design of the new Woodlands Presbyterian Church at Carrickfergus, Co. Antrim.

The project architect was Mr. John Baird.

Mr. Leo Curran formerly Director of Harland & Wolff Ltd. and who has lately been a director of British Shipbuilders Ltd. has purchased the Camac Transport Company acquiring its entire issued share capital from the Blackwood Hodge Group.

Camac is one of the largest independent haulage and warehousing companies in Ireland.

B & M Heat Services of 40 South Street, Newtownards, have increased their portfolio with the acquisition of the agency of Barber & Colman range of air distribution equipment of diffusers, grills and acoustics.

To mark the 150th Anniversary of the British Association for the Advancement of Science, the Ulster Museum was chosen by the Society as the venue for their Ulster Bank Lecture when G. Long, Ph.D of the Energy Technology Support Unit of the Department of Energy spoke on "Renewable Sources of Energy".

The Northern Ireland Economic Council have issued a report — Strangford Lough Tidal Energy. In doing so they have examined afresh the possibilities of harnessing the powers of the Lough to generate electricity.

Cost of the scheme would be in the region of £300 million which in itself may prove in these days of money shortage, sufficient to kill the scheme at birth.

The immediate reaction of the various environmental bodies was to point out the danger to the bird and fish in the Lough for which it is world famous.

These two factors, plus the excess capacity at Kilroot, may result in the report finding, like so many others, a resting place on some dust laden shelf.

Visiting the recent Heating & Ventilating Exhibition in the Burlington Hotel, Dublin, one could have found only one Northern Ireland firm. P & D MacFarlane Ltd. of Ridgeway Street, Belfast. Dougal MacFarlane led the team on the stand which was concentrating on the ITT Reznor range of gas fired heaters. Mr. MacFarlane expressed himself as well satisfied with the two-day show.

The Northern Ireland Branch of the Institute of Domestic Heating Engineers held another of their gold outings at the Malone club. The sponsors were the Heating & Plumbers Merchants Assoc.

Ian A. Kernohan, Balloo Industrial Estate, Baloo Way, Bangor, Co. Down has been appointed Irish Distributor for Faral tropical high output radiators. The radiators have a variety of colours and surfaces stove enamelled are of lightweight individual sections of die cast aluminium.

"Savell O Hicks" Memorial Lecture and Lunch

It is the intention of the Northern Ireland Section of the Institute of Energy to honour the memory of a foundation member of the Section and an office bearer for 20 years by promoting the "Savell O Hicks" Memorial Lecture and Lunch.

The Section has been honoured in the fact that Sir Derek Ezra, Chairman of the National Coal Board has agreed to give the lecture which will take place in Belfast during February 1982.

Following the lecture, a lunch will be held which is expected to attract a number of distinguished guests on what should be a unique occasion.

Institute of Energy, Northern Ireland Section — Programme

22 Oct. — Lecture, 7.00 p.m., Ashby Institute, Belfast. 'Water Treatments for Air Conditioning Water'. Speaker: Dr. Alan Marshall (Dearborn Chemicals).

3rd Dec. — Lecture, 7.00 p.m. Ashby Institute, Belfast. 'Laster for Industry — A New Energy Source'.
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Telex: 32360
established in 1964 to manufacture expanded polystyrene in Northern Ireland, and since that time has grown steadily with the increased use of thermal insulation materials.

Its activities can be divided basically into two areas, one for polystryene board and one for packaging.

Expanded polystyrene (EPS) boards are used in the building industry for thermal insulation of roofs, walls, and floors, and are manufactured in three grades to comply with the standards laid down by the EPS Association.

Springvale Polyproducts also bond expanded polystyrene to a wide range of materials commonly used in the building industry, for example felt, insulation board, plasterboard and decorative plastic laminates.

The company also manufactures a wide range of in-house and custom packs and mouldings used in the packaging industry. EPS's cushioning properties make it the ideal medium for items such as music centres, television sets and electronic games, through to fish boxes and crash helmet liners.

Springvale was a founder member of the package moulders group of the EPS Association.

Mr. Alec Cooke, managing director of Springvale said, "As leaders in the field of expanded polystyrene manufacture and application in Northern Ireland, we see this contract with Shell as greatly strengthening our position in the market. In addition it will allow us to bring the energy-saving benefits of the Shell dry cavity wall insulation system to the homes, factories and offices throughout Northern Ireland. Springvale Polyproducts was
To recap, Table 1 gives us a general view of where we have obtained coal since 1961.

<table>
<thead>
<tr>
<th>Year</th>
<th>United Kingdom</th>
<th>United States</th>
<th>Poland</th>
<th>Czechoslovakia</th>
<th>Germany</th>
<th>Belgium</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961</td>
<td>1,123</td>
<td>200</td>
<td>191</td>
<td>-</td>
<td>113</td>
<td>142</td>
<td>3</td>
<td>1,772</td>
</tr>
<tr>
<td>1965</td>
<td>429</td>
<td>335</td>
<td>343</td>
<td>-</td>
<td>136</td>
<td>5</td>
<td>-</td>
<td>1,268</td>
</tr>
<tr>
<td>1970</td>
<td>162</td>
<td>48</td>
<td>927</td>
<td>1</td>
<td>20</td>
<td>1</td>
<td>39</td>
<td>1,198</td>
</tr>
<tr>
<td>1971</td>
<td>166</td>
<td>38</td>
<td>759</td>
<td>-</td>
<td>13</td>
<td>2</td>
<td>43</td>
<td>1,021</td>
</tr>
<tr>
<td>1972</td>
<td>128</td>
<td>15</td>
<td>680</td>
<td>16</td>
<td>11</td>
<td>-</td>
<td>44</td>
<td>797</td>
</tr>
<tr>
<td>1973</td>
<td>130</td>
<td>1</td>
<td>585</td>
<td>22</td>
<td>15</td>
<td>-</td>
<td>45</td>
<td>879</td>
</tr>
<tr>
<td>1974</td>
<td>130</td>
<td>-</td>
<td>663</td>
<td>7</td>
<td>34</td>
<td>-</td>
<td>45</td>
<td>879</td>
</tr>
<tr>
<td>1975</td>
<td>179</td>
<td>-</td>
<td>475</td>
<td>-</td>
<td>7</td>
<td>-</td>
<td>18</td>
<td>679</td>
</tr>
<tr>
<td>1976</td>
<td>113</td>
<td>-</td>
<td>462</td>
<td>-</td>
<td>12</td>
<td>.5</td>
<td>9.5</td>
<td>597</td>
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<tr>
<td>1977</td>
<td>169</td>
<td>-</td>
<td>658</td>
<td>-</td>
<td>8</td>
<td>13</td>
<td>6</td>
<td>854</td>
</tr>
<tr>
<td>1978</td>
<td>175</td>
<td>-</td>
<td>601</td>
<td>7</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td>783</td>
</tr>
<tr>
<td>1979</td>
<td>216</td>
<td>214</td>
<td>706</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>31</td>
<td>1,167</td>
</tr>
<tr>
<td>1980</td>
<td>256</td>
<td>398</td>
<td>482</td>
<td>7</td>
<td>-</td>
<td>-</td>
<td>95</td>
<td>1,231</td>
</tr>
</tbody>
</table>

It is interesting on examining these figures to see the general trend. Table 2 shows us in graph form the decline of coal as a fuel up to 1976, when our total imports were 597,000.

<table>
<thead>
<tr>
<th>Period 1961-1980</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tons</td>
</tr>
<tr>
<td>1961</td>
</tr>
<tr>
<td>1965</td>
</tr>
<tr>
<td>1970</td>
</tr>
<tr>
<td>1975</td>
</tr>
<tr>
<td>1980</td>
</tr>
</tbody>
</table>

With the impact of the rise in price of oil and the general decision taken politically to diversify, our energy requirements at a national level, we find that since 1976 coal imports have continued to rise and the figure for 1980 at 1,231,000 tonnes compares favourably with the previous second highest figure, that of 1965 at 1,268,000 tonnes. There are a number of reasons for these coal imports. Firstly, as I stated earlier there was the political decision to shift from oil to coal. Secondly there was the decision by large industrialists not to be too dependent on one source of supply. Hence we find that Cement Limited in their new plant at Limerick decided to use coal as the basic fuel. We also see the ESB who up to the decision to use coal depended on money in the previous months since 1976 to have looked at coal for their new Money Point power station and this has an effect on coal imports. Another reason is the increase in coal for the domestic consumer. The decision in 1979 to form a separate Department of Energy and prior to that decision by Minister O’Donohue to grant aid the installation of coal burning back boiler grates and fires were considerable aids to the coal industry. As a result, this has seen a dramatic increase in the number of back boiler grates or dual fired systems incorporating solid fuel. Such has been the impact that sales of oil heating fuels declined by 40% last year (1980). As a result it is important for us to know where in fact we are sourcing our coal. If we are diversifying our of oil and into coal a steady and constant supply of coal is required and the national supply must be politically stable. As a nation we must not find ourselves in the same position as we found ourselves in obtaining oil supplies after 1973.

In 1961 the United Kingdom was our primary source of supply. The graph shown on Table 3 shows how great is the decline of our coal imports.
from the United Kingdom since 1961. From 1,123,000 tonnes the United Kingdom declined to 113,000 tonnes in 1976. There has been some resurgence and in 1980 the amount of coal imported from the United Kingdom stood at 256,000 tonnes. However, this has been mainly due to the use by Cement of U.K. coal for their Limerick plant. It is debateable whether the United Kingdom can ever become a major supplier to the Irish market, the main reason being price.

Up to very recently our other main coal imports came from Poland. The graph as shown in table 4, shows the rise in coal imports from Poland from a low base to a position whereby in 1970 they were almost our major supplier. Since then Polish supplies have had a chequered career and in the last few years are on the decline. This would seem to be due mainly to the development of political problems. It would appear that this year the position is going to be worse.

The main development in new coal import supplies is from the United States. In 1973 only 1,000 tonnes was imported, yet in 1980 the United States account for 32% of all our coal imports. This is shown in Table 5.

It would appear that in the future, most of our coal imports are going to come from the United States. The large oil companies have in recent years acquired major coal manufacturers and have invested a considerable amount of money in coal developments. The main problem at the present moment with regard to coal imports is a logistic one but there is no doubt in the next few years this can be overcome. Large coal super tankers will be available and would appear that the USA will become a primary source of our coal imports. However, the balance as it stands on Table 5 in 1980 is an admirable one, whereby Ireland as a nation is not only depending on any one source of supply. If we could only achieve in oil it would be a very satisfactory situation.
Dimension O may be reduced depending on boiler length

Ideal Britannia boiler with stoker (hopper model)

Dimension C may be reduced depending on boiler length

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DOI: 10.21427/D78D97
Using the accepted method of comparing costs of different fuels on the basis of cost per useful KWh., Hugh Clyne, Principal Scientific Officer, Energy Services, IIRS, has made the comparison of different fuels very simple. Although cost alone is not the only consideration as such things as reliability of supply, ease of handling and storage, maintenance etc. also play a major part in the selection of a fuel.

At the moment there is not much of a difference between oil and solid fuel central heating, much depending on the grade of fuel used and the efficiency of the appliance the fuel is burned in. So with an efficient room heater or cooker burning turf, a figure of 1.81p per useful kWh could be gained, a similar appliance burning house coal would have a value of 2.11p per useful kWh and an oil fired boiler using 35 sec gas oil would have a costing of 2.77p per useful kWh. Looking at the figures for house coal again it can also be seen that the less efficient open fire with a high output back boiler would have a costing of 2.9p per useful kWh.

This latter costing goes to prove the long held theory that much of our energy goes up the chimney in the form of smoke and the results of the Government sponsored competition for the best Irish-made multi-fuel appliance has been long overdue.

Looking at gas it can be seen town gas is at the moment very much out of the game with a figure of 6.07p per useful kWh at 75% efficiency. Although it is expected that natural gas will be available in Dublin in the next two years it is very unlikely that its price will be any lower than oil or solid fuel and in fact all the early indications are that the price will be at least 10% higher than competitive fuels.

To sum up the situation at the moment it would appear that it is in the best long-term interests of the country to use non oil based fuels for domestic central heating but in the short term some people may find oil cheaper or at least competitive to run and all we an do is hope that natural gas prices will not be so high as to put it out of the reach for domestic heating.
# Comparison of Energy Costs

## Domestic Fuels

<table>
<thead>
<tr>
<th>Fuel</th>
<th>No.</th>
<th>Unit of Supply</th>
<th>Average Price per Unit (IRE)</th>
<th>Gross Calorific Value (kJ/kg)</th>
<th>Delivered Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>IRE/GJ</td>
<td>p/kWh</td>
<td></td>
</tr>
<tr>
<td><strong>Peat</strong></td>
<td>1</td>
<td>M/C Turf</td>
<td>26*</td>
<td>14421</td>
<td>1.80</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Briquettes, Baled 80</td>
<td>41*</td>
<td>19306</td>
<td>2.12</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Briquettes, Loose</td>
<td>38*</td>
<td>19306</td>
<td>1.97</td>
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<tr>
<td></td>
<td>4</td>
<td>Briquettes, Retail</td>
<td>515</td>
<td>19306</td>
<td>2.13</td>
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<tr>
<td><strong>Coal</strong></td>
<td>5</td>
<td>House Coal</td>
<td>96.07</td>
<td>29773</td>
<td>3.23</td>
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<tr>
<td></td>
<td>6</td>
<td>Continental Anthracite Peas</td>
<td>139.48</td>
<td>32099</td>
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<tr>
<td></td>
<td>7</td>
<td>American Anthracite Nuts</td>
<td>122.55</td>
<td>30936</td>
<td>3.96</td>
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<tr>
<td></td>
<td>8</td>
<td>Phurnacite</td>
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<td>9</td>
<td>Extricate</td>
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<td>10</td>
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<tr>
<td></td>
<td>12</td>
<td>Kerosene</td>
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<td>46400</td>
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<tr>
<td><strong>Gas</strong></td>
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<td>Bottled Butane</td>
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<td></td>
<td>14</td>
<td>Dublin Gas: Two Part Tariff</td>
<td>0.633**</td>
<td>17697 kJ/m³</td>
<td>12.63</td>
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<tr>
<td></td>
<td>15</td>
<td>Full Rate</td>
<td>0.736**</td>
<td>17697 kJ/m³</td>
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<tr>
<td><strong>Electricity</strong></td>
<td>16</td>
<td>Night Space Heating Rate</td>
<td>0.039</td>
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<tr>
<td></td>
<td>17</td>
<td>Domestic Rate, Unrestricted</td>
<td>0.064</td>
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<td>18.33</td>
</tr>
</tbody>
</table>

* Average price countrywide, including cost of delivery.
** Prices for electricity and town gas exclude standing charges — unit costs for electricity and gas current fuel cost variation.
*** Prices for electricity and town gas exclude standing charges — unit costs for electricity and gas current fuel cost variation. Prices include for delivery in the Dublin area only.

---

Percentage Increase in last 3 Months: 0 0 0 9.7 17.9 0 13.7 0 8.5 5.7 0 0 0 23.4 27.5

DOI: 10.21427/D78D97
# Comparison of Useful Energy Costs Domestic Heating

## Useful Costs (p/kWh) for Different Appliances

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Form</th>
<th>Delivered Cost</th>
<th>Roomheater, Freestanding Boiler, Cooker</th>
<th>Open Fire with High Output Back Boiler</th>
<th>Open Fire</th>
<th>Flued Gas Room Heater</th>
<th>Boiler/ Burner</th>
<th>Electric Fire</th>
<th>Storage Heater</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>p/kWh</td>
<td>Efficiency 45% - 55%</td>
<td>Efficiency 30% - 40%</td>
<td>Efficiency 20% - 30%</td>
<td>Efficiency 75% - 82%</td>
<td>Efficiency 65% - 76%</td>
<td>Efficiency 100%</td>
<td>Efficiency 50%</td>
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<tr>
<td>Peat</td>
<td>M/C Turf</td>
<td>0.65</td>
<td>1.14</td>
<td>1.18</td>
<td>2.17</td>
<td>1.62</td>
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<tr>
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<td>Briquettes, Baled 80</td>
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<td>1.38</td>
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<td>2.37</td>
<td>1.77</td>
<td>3.55</td>
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<td>Briquettes, Retail</td>
<td>0.77</td>
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<td>House Coal</td>
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<td>American Anthracite Nuts</td>
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<td>Phurnacite</td>
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<tr>
<td></td>
<td>Grade A Anthracite</td>
<td>1.71</td>
<td>3.80</td>
<td>3.11</td>
<td></td>
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<tr>
<td>Oil</td>
<td>35 sec. Gas Oil</td>
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<td>3.20</td>
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<td></td>
<td>3.78</td>
<td>3.28</td>
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<tr>
<td>Gas</td>
<td>Bottled L.P.G.</td>
<td>3.65</td>
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<td></td>
<td></td>
<td>4.87</td>
<td>4.45</td>
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<td></td>
<td>Town Gas: Two Part Tariff</td>
<td>4.55</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>6.07</td>
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<tr>
<td></td>
<td>Full Rate</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>7.0</td>
<td>6.07</td>
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<td>Unrestricted</td>
<td>6.4</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.4</td>
</tr>
</tbody>
</table>

**NB**
1. Use manufacturers recommended fuel for each appliance.
2. Efficiencies quoted are seasonal efficiencies where Seasonal Efficiency = Conversion Efficiency x Utilisation Efficiency.
3. Delivered energy costs quoted above are for conditions stated on IIRS Comparison of Energy Costs sheet.

Published by ARROW@TU Dublin, 1981
Build for the future with Coal

1 Roomheater
Whole house heating from a living fire behind a glass door.

2 Back Boiler
Heat 5 rooms and all the hot water you need from one open coal fire.

3 Gravity feed boiler
Elegant coal burners for whole house heating that need minimum attention. Choice of other independent boilers.

4 Cookers
Many of today's solid fuel cookers heat radiators as well.

or Interlinking
The traditional coal fire can now be interlinked with other hot water radiator systems reducing your heating costs substantially. And there's plenty of coal in the world!

Contact your coal merchant or Coal Information Services, 18 D'Olier St., Dublin 2. Tel: 776246
Instaheat

Instaheat Ltd. will be shortly announcing full details of a number of new distributorships for heating and allied products. The main products are the French Ideal Standard gas, oil and solid fuel boilers and the Juno Buderus cookers, fires and heaters. These new products will greatly add to the existing range of Parkray, New World and Rexco smokeless fuels.

The latest range of Parkray roomheaters have a new style appearance and an extended range of colours. The outputs remain the same as the older range but the new model references are GIL, G, GF and HIGL, G and GF.

To ensure that there will be enough of the right fuel available for Parkrays, Instaheat are also stocking a smokeless processed coal called Rexco. This is a well known fuel in the UK and is very suitable for roomheaters but can also be burned in cookers, boilers and open fires. The fuel is distributed through approved dealers throughout Ireland or direct from Instaheat.

Unidare

Unidare launched earlier this year the first of their new solid fuel stoves, the 3 Star General. The "General" is expected to have a significant impact on the Irish market as it is designed to replace the highly inefficient open fire. Along with its new standards of efficiency, in room heating the "General" will provide domestic hot water and heat up to four radiators. A significantly Irish feature of this Unidare stove is the fact that it burns turf most efficiently. Bord na Mona worked closely with Unidare in the development of this feature.

In addition, the "General" can burn coal and anthracite, smokeless fuels and wood.

The outer case is constructed from mild steel sheet, treated with high temperature proof paint. The door is fitted with heat resistant glass.

The firebox air intake is controlled by a sliding mechanism. By this means the burning rate can be kept to a minimum and the stove will then remain alight during the night. The front door hinges down for easy loading and access to the removable ashtray is via the lower panel.

Units may be fitted into sound existing fireplaces and the installation should comply with British Standard CP 403.74.

Heating Distributors

Heating Distributors Ltd. have a wide range of solid fuel appliances to choose from, in particular they have the very popular Trianco Redfyre range which includes the House Master which is an anthracite gravity feed domestic hearth boiler available in four colours and can be supplied in either the inset or free standing types. What must be one of the most efficient boilers at the moment is the Trianco TR G45 + G60, G80, G100 and G120 range of solid fuel gravity feed boilers, this has proved to be one of the most popular boiler over many years.

Also from Trianco comes the TRH room heater with three models, three colours and outputs from 25,000 to 45,000 btu/h. Heating Distributors also can supply ceramic lined insulated chimneys or twin wall S.S. lined chimney from Parkabeast. To see these and many other products call to 145-147 Richmond Rd., Dublin 3, or telephone 375144/5 for further information.

Jøtul

Jøtul woodstoves have become a popular alternative and/or additional method of home heating since they were first introduced to this country by David Couper of Tyrellspass, Co. Westmeath four years ago. Now, as a result of consumer demand, special water heating kits have been developed for two of the most popular models — No. 1 and No. 6 — as well as for No. 118 and the new System 17. The kit consists of a copper boiler installed in the stove's firebricks and, provided that the stove is used...
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/hr to 604,000 btu/hr

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

CHAPPEE 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.

Tony Smith or Frank Loughran at 376051, Lomand Avenue, Fairview, Dublin 3. Liam Woodgate or Dave Cummins, Tivoli Industrial Estate, Cork. Tel: (021) 500166.
correctly, sufficient domestic hot water for an average sized family should be provided. David Couper is also distributor for the Swiss designed Tiba central heating cooker which will burn wood, turf or coal, and which can be converted to oil or gas by the addition of another unit. It will meet the domestic hot water requirements of most households as well as providing central heating, depending on the model, the smallest model has an output of 50,000 btu/h, while the largest has an output of 84,000 btu/h.

Fire Master

This is the boiler designed to obtain the utmost from any fire. Note how the cranked flueway retains the hot gases as long as possible to extract maximum heat before passing up the chimney.

Removable door giving unrestricted access to flueway. Regular cleaning will prevent the formation of excessive soot and tar deposits which would otherwise result in loss of efficiency. This feature is now available on the 16" and 18" models with inset or underfloor fires.

A combination of Firemaster boiler and fires could provide full space heating for a big room, domestic hot water through a 25-30 gallon cylinder and four radiators even more, if no domestic hot water is needed.

Every Firemaster fire gets the maximum efficiency from all recommended solid fuels. It is, of course, approved for smokeless zones. As for trouble-free comfort, few systems could compare with it. The fire can be allowed to burn overnight with minimum attention. The Superdraught de Luxe, an underfloor-draught fire fits neatly into almost any existing or new fireplace up to 20" high.

Installation fuss is down to a minimum; there will be no need to damage the present tiled hearth. And don't worry for a second about that 'underfloor draught' label; the Superdraught can even be installed in homes which have solid floors. In fact, ash should only need to be removed twice a week.

Further information from Paramount Distributors Ltd.

Glow-Worm

C & F Ltd. of Mill Lane, Palmerstown have announced that they are now in a position to supply Glow-Worm boilers for use on LPG. Glow-Worm who are the biggest manufacturers of gas boilers in Europe manufacture and produce back boilers, wall hung and floor standing gas boilers. Initially, C & F who stock the complete range of Glow-Worm boilers for use on Town Gas, will be offering wall-hung and free standing boilers only on LPG. The range available which will give outputs of from 38,000 btu/h to 100,000 btu/hr is as follows:

- In the wall-hung category there are three versions:
  - Space-Saver 38 balanced flue and conventional flue.
  - Space-Saver 50 balanced flue and conventional flue.
  - Space-Saver 75 balanced flue and conventional flue.

- The floor standing range comprises:
  - Glow-Worm 45/60 balanced flue and conventional flue.
  - Glow-Worm 65/80 balanced flue and conventional flue.
  - Glow-Worm 85/100 balanced flue and conventional flue.

- The wall hung space-saver models are particularly suited to apartment block heating and the floor standing Glow-Worm range is more applicable to the traditional home heating market.

C & F Ltd. can be contacted at 264 98/264917/265821.

Samat DF

Built in heavy gauge refractory steel and, if required, fitted with incorporated domestic hot water cylinder of 33 gallons capacity. The firebox for the pressure jet oil burner may also employ a forced air
gas burner. It is conceived to be adaptable for all types of burners: oil, gas.

The large solid fuel incorporated firebox can simultaneously, with priority for such a combustible, burn wood, coal, coke and rubbish.

It can also be used as an incinerator. The water circulating fire bars assure:
- Maximum calorific recuperation.
- Complete resistance to any distortion.
- The primary air for the solid fuel firebox is controlled by an electro-magnetic flap (valve).
- The domestic hot water cylinder is easily removable for inspection and contains two safety factors. The cylinder is completely lined eliminating any corrosion. It is worked on the gravity circuit. It can be fitted with an electric immersion heater, assuring hot water in summer when the boiler is not employed.
- Delivered completely assembled, prewired and adjusted, thus permitting easy, quick and low cost installation.

- Double aquastat which chooses automatically the priority source of fuel and maintains the water at the required temperature. This principle allows the two fireboxes to relay automatically, the ignition of the solid fuel wood, coal or rubbish, being assured by the oil burner.
- The electro-magnetic valve channels the air to the solid fuel firebox and maintains the exact quantity of air for the combustion. It is controlled by the aquastat and also by a thermostat which limits the flue gas temperature, thus eliminating any danger of overheating.

Further details from John R. Taylor Limited.

Coal Information

Coal Information Services, an alliance of coal merchants throughout Ireland, was created to provide a unified and high standard of service to customers and potential customers for coal. Amongst the many free services provided by CIS are:- a telephone information and advisory service to the public; sales and technical advisers; a home economy service to give talks and demonstrations to women's organisations and give practical advice on operating appliances in the

The Janitors

https://arrow.tudublin.ie/bsn/vol20/iss10/1
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DOMESTIC BOILERS

The Coal Mobile showroom is now a familiar sight. On the road virtually every week of the year, the Coal Mobile is bringing the latest developments in coal heating to every town in Ireland. Well equipped with appliances and literature, the Coal Mobile showroom is there to answer all questions on coal heating.

Every year, in the main cities and towns, Coal Information Services mount public exhibitions displaying the most modern cookers and heating appliances. Entitled "Cooker Spectacular and Heating Appliance Exhibitions", they have proved to be an outstanding success with overflow attendances everywhere. Expert on the spot advice is a feature of these exhibitions.

To meet anticipated inevitable movement to coal in industry CIS has accumulated wide knowledge of boiler plant and ancillary equipment as well as capital and running cost comparisons. Latest developments in World solid fuel industrial technology (ref. International Energy Agency) form part of the free consultancy service available to Irish industry. Coal Information Services, with its head office in 18 D'Olier St., Dublin and a branch office at Eagle House, 1r. Glanmire Road, Cork, represents Irish coal importers around Ireland.

Cork: Sheehan & Sullivan, Suttons, Tedcastle McCormick.
Dublin: Coal Distributors Ltd.
Dundalk: Connick Cooper & O'Rourke.
Galway: Donnelly's.
Limerick: Tedcastle McCormick, Suttons.
Sligo: R & LW Hunter.
Tralee: Robert McCowen.
Waterford: Samuel Morris (Bridge St.), Samuel Morris, Tedcastle McCormick.
Wexford & New Ross: Staffords.

Keddy

Keddy have added a backboiler option to the Keddy Superfire. The
DOMESTIC BOILERS

Rio-Sime

The Rio-Sime gas boiler has a strong c.i. boiler body and is equipped with an atmospheric stainless steel burner. A completely wet combustion chamber, which avoids radiation losses, giving a high efficiency which reduces the gas consumption. Boiler operation is totally quiet. The standard dimensions of the casing, the built-in draft-wood (for boilers up to 26,000 Kcal/h), the built-in circulation pump, make possible the installation of this elegant appliance in a white casing, easy and quick in any room. This modern gas boiler can, of course, work at any water temperature without mixing valve. To obtain safety of working and to reduce breakdown possibilities only top quality controls have been chosen for this boiler. Moreover, every boiler is tested for operation, ater and gas tightness before being packed.

Standard version (ST): Gas fired c.i. boiler in sections, max. working pressure 4 bar, manifold with stainless steel burner, pilot burner, piezoelectric ignition, gas valve (thermoelectric safety, pressure governor), doublestat (control and safety).

Complete wiring with plug and switch (220C 50Hz). Hydrothermometer, drain cock, enamelled white jacket fitted on the boiler, draft-hood for 9-26,000 Kcal/h built-in, for 31-45,000 Kcal/h separated (aluminium).

The boiler is protected with a polyethylene bag and a wooden crate, draft-hoods for 31-45,000 Kcal/h in separate cartons.

Sime Boilers are also available in oil fired versions.

For further information contact Hevac Ltd.

Stanley

The Stanley cooker was first manufactured by Waterford Ironfounders in the 1930s and, since then, it has become a household word in Ireland; it is the leading solid fuel cooking appliance for many years. As before, the new Stanley 80 Series is a durable cast iron construction and it burns any type of solid fuel. The Stanley Super 80 has a total output of 73,000 btu/h gross; nett to water 47,000 btu/h. This represents a 50% increase in central heating capacity over the previous model. All models have even heat cast iron ovens with ample space for roasting and baking, and a large working top incorporating both boiling and simmering plates, the surface of which are machine ground for maximum heating efficiency. Each model also has a handy storage compartment.

Another new feature is the hob height which ensures an uninterrupted working surface when fitted with modern kitchen units and the styling in two-tone vitreous enamel enhances kitchen decor. The Stanley provides constant hot water. Heat shields made of cast iron are produced as standard equipment with central heating units, and these can be hooked on the face of the boiler to regulate output to suit the needs of the particular conditions or to reduce heat during the summer months, when cooking and hot water only are required.

The Stanley is manufactured in Ireland by Waterford Ironfounders Limited, a TMG company. The first Stanleys were made from pattern suited for floor molding until 1951 when the foundry was modernised and mechanised for the first time. Waterford Ironfounders was taken over by the TMG Group in 1974 and since then has been totally re-equipped. Investment in the company by the TMG Group in plan and machinery has totalled £3 million since 1978, making it today one of the most modern and efficiently equipped foundries in the world. Waterford Ironfounders employs 400 people in the factory at Bilberry.

Chaffoteaux

Part of the Chaffoteaux range is the Corvic 45. Of all the gas boilers on the market why choose a Corvic 45? What is so different about Corvec boilers that makes them the installers choice? Their proven reliability, easy installation and fuel saving...
Would it help to talk to someone?
If you are lonely, depressed or suicidal, phone, visit or write to:

THE SAMARITANS
Dublin 01-778833
Cork 021-21323
Galway 091-61222
Limerick 061-42111
Waterford 051-72114

To those who may wonder how inflation effects a voluntary organisation, it may well do to consider The Samaritans.

The above advertisement identifies The Samaritans. In 1980 the Dublin branch received 40,000 contacts, 6,000 which were new callers. The cost of the operation in 1980 was £22,000, voluntarily subscribed.

The cost in 1976 was £13,000.

The Samaritans would be extremely grateful if any firm would donate a small portion of their publicity to the organisation. It could be a bonus spot on radio, an occasional newspaper ad, a bus shelter site, a television slide or a financial contribution.

If interested please write to:
DON, PUBLICITY OFFICER, SAMARITANS, 66 SOUTH WILLIAM ST. DUBLIN 2.

The callers are from every walk of society, the young, the old, the rich, the poor. They may be members of our own families.

As the stresses of society increase more people are seeking help.

The Dunsley Enterprise

Match the flicker of a living fire with a solid economy of solid fuel central heating with Dunsley.

The Dunsley Enterprise Fire and boiler unit. Designed for high efficiency solid fuel home heating. Modern new design gives large area for water heating. Capable of heating 5 or 6 radiators (122 sq.ft. of radiator surface), plus domestic hot water. Easily installed and easy to maintain. Large ashpan cuts down cleaning problems.

Whole home central heating from a real open fire

Leaflets giving full details on Dunsley appliances are FREE on request. Write to:
Dunsley Heating Appliance Co. Ltd., Fearnought, Huddersfield Road, Holmfirth, West Yorkshire HD7 2TU.
Heating your home is so expensive.
Oil, electricity, even smokeless fuel can rob you—just to keep your house warm.
That's where the Rayburn Coalglo can help.
It burns the cheapest, most economical fuel available; coal.
Unlike old-fashioned fires, it's fully enclosed, delivers enough energy to heat up to seven radiators, your living room, give you all the hot water you require and burn constantly overnight.
And by adding a roomstat and timeclock, (not supplied) the Coalglo operates virtually automatically—another advantage over old fires.
The Coalglow is available in a choice of four colours and as a free standing model or with a wood effect surround.
If you have a hearth in your home, you can convert to the new Rayburn Coalglo and save a lot of money you're now paying on your heating, because it burns coal, burns smoke and saves money.

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TANEY DISTRIBUTORS LTD.
UNIT 4, RIVERSDALE INDUSTRIAL ESTATE,
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BALLOO INDUSTRIAL ESTATE,
BALLOO WAY,
BANGOR, CO. DOWN.
TEL: 62841/55233.

DOMESTIC BOILERS
Two models of the Corvec 45 are available.
The balanced flue model is supplied with an outlet which terminates on an outside wall. Where there is no suitable outside wall, an open flue model is available which can be connected to an existing flue within the building.
Because Chaffoteaux et Maury have been making water heating appliances for over 60 years, and wall-hung gas boilers for the last 32 years, you can be confident that Corvec boilers will give you efficiency, reliability and best of all — long life.
Quantity production in one of the world's most advanced manufacturing plants, guarantees constant quality control, technical innovations and competitive prices.
Further information from Taney Distributors Ltd.
DOMESTIC BOILERS

Euro Fuelmaster

Manufactured by Euro Engineering in Dublin, the Fuelmaster can be fired by cardboard, paper, wood — in fact anything that is combustible.

Backed by the Irish Goods Council and with the Guaranteed Irish label, the Fuelmaster has been approved by the Institute of Industrial Research and Standards. Today, it is used in hotels, manufacturing industries, shops and many high waste businesses.

John Byrne, Managing Director of Euro Engineering is happy to outline in detail, the advantages of the Fuelmaster system. "It comes down to cost", he states. "A multi-fuel system which can burn waste and at the same time switch into an oil or gas system is a cost-efficient heating system."

The system has two

GAS BOILERS EX STOCK

28,000 btu/h • 45,000 btu/h
60,000 btu/h • 130,000 btu/h

Efficient
Fully Approved
Reliable
Town Gas, LPG or Natural Gas
Compact
Lightweight
Wall Hung
Balanced Flue

40-60 btu/h output Towns Gas or LPG, balanced flue instant heat high efficiency.

Contact:
TANEY DISTRIBUTORS LTD.
Unit 4, Riversdale Ind. Est. Bluebell Ave., Dublin 12.
Phone: 508120/520436 Telex 24147
automatic dampers and a timing device which can automatically ignite the boiler to heat up premises before a work day begins. The system is designed for maximum fuel efficiency.

Byrne is his own marketing manager and even now says he can't catch up on the £45,000 worth of orders he landed over the last year. Already the expansion of the business is making it necessary for the Company to move from it's Barrow Street works to a 22,000 sq. ft. factory on Ballydine Industrial Estate.

**Multifuel Heaters**

Soaring oil costs and yet more unrest in the Middle East recently combined to further enhance the sales of solid fuel domestic appliances. These peaked a couple of years ago, aided by the last Middle Eastern crisis and by the provision of grants for solid fuel conversions. At that time the demand was really too much for the industry to handle. The present healthy demand for solid fuel equipment looks as if it is here to stay and an increasing number of house-holders are keeping their options open by investing in multifuel appliances. These are appliances that will burn anything from turf, the current best energy buy, to the natural gas that, hopefully, will be more widely available in a couple of years time.

It is widely recognised by the trade and, as a consequence of extensive advertising, by the public, that Multifuel Heaters Ltd., of James' Street, Dublin, have the answers for the efficient use of a wide range of fuels in the same appliance. The unique down-firing system, which burns smoke and volatiles efficiently while leaving a long passage for heat transfer, has been applied with conspicuous success for a number of years to their two front running appliances, the

---

**QUADRANT ENGINEERS LTD**

**Buderus Domestic Oil Fired Boilers**

**Buderus Domestic Duel Fuel Boilers**

**Riello Domestic Oil Burners**

ALL AVAILABLE EX STOCK

**Other Quadrant Products**

- *Buderus Industrial Boilers.*
- *Buderus Thermoglaze Calorifiers.*
- *Buderus Radiators*
- *Chromalux Electric Space Heaters*
- *Euroflex Flexible Connections*
- *Wing and Andrews Heating Equipment*
- *Riello Industrial Burners.*
- *Happel Conectors*
- *Triple-E Fuel Additives*

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Heating Distributors Limited

Trianco Redfyre
Solid Fuel Range


TR: G45 + G60, G80, G100 & F120 solid fuel gravity feed central heating boilers.

T.R.H. Room Heater
3 Models - 3 Colours
25,000 - 45,000 btu/hr
Inset & Free Standing

Parkabest Twin Wall
Stainless Steel Lined Chimney

Part of our extensive range available from your local merchant or on view at

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Flues available in 5", 6" & 8" I.D.

Flues available from 5" I.D. to 16" I.D. Larger sizes available on request.

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The Solid Fuel Central Heating

6mm Steel Boiler Guaranteed for 5 years.

Highest Position (Summer)

Adjustable Grate

Lowest Position (Winter)

Thermostatically Controlled Air Damper

Insulated Bolster Lid

Extra Large Oven

Division Plate for Tirolian Double Draft

Flue Pipe Connection Side-Rear-Left-Right

Cleaning Door

FEATURES

• Outputs up to 70,000 btu/h
• Two Colours
• Designed for Irish Conditions
• Completely Brick Lined
• Extra Large Cooktop
• Ultra Modern Design
• Two Sizes Available
• Nationwide Service

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Importer:

MICHAEL VAUGHAN TRADING LTD.

Eamon Duggan Industrial Estate, Trim, Co. Meath.
Tel: (046) 31167/31302, Telex: 31825

Please send me details of the TIROLIA wood and coal burning ranges.

Name: ____________________________

Company: ____________________________

Address: ____________________________

Tel: ____________________________

FARM FACTORY

WOOD AND STRAW

- P. O. + H. O. WASTES RECYCLED

Passat now offer complete automatic waste shredders and stokers. Models available up to 6 million Btu/h. These new models are revolutionary for small and middle sized industry.
DOMESTIC BOILERS

Conerva and the Gaelwood. Three different authorities, including the British National Coal Board, have shown peak efficiencies for the Conerva in excess of 80%. This appliance, the first solid fuel brick central, is the most economical way to heat a small dwelling, in terms of installation and of running costs. In the last few weeks it has twice been exhibited by the National Coal Board as specialised British exhibitions.

The Gaelwood 65/90 boiler gives equally impressive results. Recent tests witnessed by the IIRS showed an efficiency, on the same boiler with a normal flue, of 81.75% burning gas oil, 82% burning smokeless fuel and a peak figure of 79% burning coal. These figures were considered to be so remarkable that duplicated instruments were used by two different engineers to avoid any possible error. Another interesting point was that the maximum output of the appliance was well in excess of the figure claimed by the manufacturers (unlike many foreign competitors!). The Gaelwood is equally happy on turf, briquettes or dry wood and another interesting feature of this series of tests was that the boiler ran for twenty four hours without refuelling, using coal, and at the end of the officially witnessed 24 hour test the output was still in excess of 27,000 btu/h at a combustion efficiency of 75.5%.

Both the Gaelwood and the Conerva are widely used in new housing as well as the existing market, there is a high output version of the Conerva, giving 30,000 btu/h to water as well as space heating, this is particularly suitable for small bungalows, while the Gaelwood can take care of most larger dwellings.

Another, very popular, product of this forward looking company is the Centrafire 16" and 18" high output boiler, which is believed to be the only such boiler with pre-heated secondary air. The company also handles appliances from other manufacturers, they hold the sole franchise for Esse cookers and they also supply De Dietrich cookers and kitchen boilers.

A design and advisory service is operated, this is of especial value to builders, and the company, sited at 179 James' Street, particularly welcomes trade callers and are happy to supply direct to the trade. Other new products are in the pipeline and we may expect to hear a great deal more of Multifuel Heaters.

The contacts are Deryk Morris or Michael Walsh, sales, while the technical end is the responsibility of a very old friend of this publication, Bob Couchman.

Tirolia Ranges burn anything. As energy prices increase, you can cook and heat your home with wood, coal, paper, garbage or whatever, and save money. In addition, because of Tirolia's technical advances, more energy is used from your fuel than from ordinary solid fuel ranges.

Tirolia's major goals in the development and manufacture of these ranges are to achieve maximum efficiency and energy savings for you. The Tirolia ranges employ the time honoured Bavarian double draft system, assuring maximum efficiency in the combustion of all types of fuels. Stoves D5N, D7N and D9N have an adjustable grate so that the quantity of fuel being burned at one time can be varied according to the

 Vaughan

Supplies of energy, such as natural gas, oil and electricity are no longer dependable. How will you cook without them? With a Tirolia range, you will always be able to cook and heat your home.

In an effort to conserve energy Gerkros Boilers have designed their fire front which converts the open fire into a room heater.
demands of the season. In summer the iron grate can be raised up and in winter can be dropped down thus changing the volume of the firebox. Under the solid steel range top is an especially designed asbestos basking that will assure a tight seal and no false drafts into the range. The fire box and the ash box doors are also sealed with a tight fitting asbestos gasket again to assure no false drafts.

PJ Matthews

PJ Matthews carry a large range of central heating equipment including the Ideal Standard and San Giorgio range of domestic heating boilers. Included in the Ideal Standard range is the Marquis solid fuel boiler. It is suitable for a wide variety of solid fuels, competitive running cost, thermostatically controlled and efficient, designed for reliability and ease of operation, smart modern appearance adn approved under Domestic Solid Fuel Appliance Scheme in the UK.

Marquis solid fuel boilers are available in two carefully selected output ratings that cover the needs of the majority of homes. They provide central heating and indirect hot water supply.

The Marquis has an attractive designed white stove enamelled casing. The thermostat control is conveniently located on a control panel mounted on the top of the unit. The fuelling and ash pit doors are readily accessible behind the casing door, the back of which houses the tool for operating the rocking grate and a small fire rake.

Ideal O-DE

The Ideal O-DE solid fuel domestic boiler has already proved itself as a safe, reliable, and efficient boiler. Situated in the kitchen it has an attractive finish in mottled grey vitreous enamel and offers a choice of back or side tappings.

The Ideal O-DE not only provides up to 25 gallons of hot water per hour if required but can also be used as an open front fire, thereby adding extra warmth to the kitchen. Fuel costs are economical and the burning rate is easily controlled by use of the slide damper. Ease of access to the boiler makes refuelling and servicing trouble-free.

Ideal Rondo

This successful firepot style of boiler is capable of providing up to 25 gallons of domestic hot water per hour, and keeping the kitchen warm at the same time. Designed to fit most modern kitchens, it is available in one standard finish with a white stove enamelled top plate and smokehood. Excess time or money is not wasted at the point of installation because of the speed and ease in which it can be accomplished. The Ideal Rondo incorporates a simple rocking grate and dumping device which speeds up refuelling and servicing.

Ideal Falcon

The range of Ideal Falcon oil fired boilers is designed to heat larger homes and smaller commercial premises. There are twelve boilers from 5 to 16 -section sizes, varying in output from 25.4 kW (87,000 btu/h) for the five-section boiler, to 115 kW (394,000 btu/h) for the 16-section boiler. The boilers are comprised of small, compact sections, giving
You'll warm
to a real fire

The Unidare
3★ ★ ★
GENERAL
wins the cold war
on every front

New standards
of efficiency in room
heating replacing
inefficient open fires.

★

Produces domestic
hot water and
radiator heating.

★

Especially suitable
for turf briquettes,
turf, coal, anthracite
and other
smokeless fuels.
No need to rely on
one fuel source.

★

This is the Boiler designed
to obtain the utmost from
your fire. Note how the
cranked flueway retains
the hot gasses as long as
possible to extract
maximum heat before
passing up the chimney.
The removable flue plate
gives complete
unrestricted access to the
inner flueway for cleaning,
enabling the boiler to
maintain its efficiency and
performance throughout the life of its installation.
Now available in 16” & 18” with inset or underfloor fires.

Flueway cranked to retain heat as
long as possible before passing up
chimney.

Removable door giving
unrestricted access to flueway. Regular
cleaning will prevent the formation of
excessive soot and tar deposits which
would otherwise result in loss of
efficiency.

Firemaster

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Published by ARROW@TU Dublin, 1981
DOMESTIC BOILERS

high efficiency to water and a flue gas exit temperature of 260°C to 300°C (500°F to 572°F).

Boiler bodies are supplied pre-assembled and are accompanied by a boiler casing and a matched pressure jet oil burner suitable for use with Class D.35-sec. oil.

San Giorgio

The San Giorgio range includes the Omnia and the Compact models.

The Omnia boiler is designed to operate with oil, gas or solid fuels. The combustion chamber is large and allows the use of coke or anthracite coals. Grids and bars are removable. The Omnia boiler is supplied packed in three pieces:
- the assembled heating body complete with mazut and coal doors, bars, grids, draught butterfly valve, flue outlet and steel counterflanges
- the fiberglass insulated orange lacquered jacket
- the control panel including: thermometer, dual thermostat, on/off switch and terminal box.

The Omnia boiler is highly efficient and therefore satisfies the present energy saving requirements.

The Compact boiler is designed for the combustion of oil or gas fuels from 20,000 to 160,000 Kcal/h. The Compact boiler is highly efficient and therefore satisfies the present energy saving requirements.

The combustion regulator (¼" dia) is supplied on request.

The Compact boiler is designed for the combustion of oil or gas fuels from 20,000 to 160,000 Kcal/h. The Compact boiler is highly efficient and therefore satisfies the present energy saving requirements.

Provided with a cut-out door, the boiler accommodates any type of burner. The boiler is supplied packed in three pieces:
- the heating body assembled with the flue opening, furnace door and steel counterflange
- the fiberglass insulated orange lacquered jacket
- the control panel (optional) including: thermometer, dual thermostat, on/off switch and terminal box.

The last two items are packed in cartons.

IF CENTRAL HEATING IS BURNING A HOLE IN YOUR CUSTOMER'S POCKET, GIVE HIM A

GAELWOOD

The Gaelwood multifuel boiler combustion system is so advanced that it will burn wood, coal, peat, gas, oil, and even rubbish. Or he may prefer the Conserva "core-type" warm air system boiler, as approved by the NCB, which burns all kinds of solid fuel.

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GAELWOOD
Multi-Fuel Boiler

CONSERVA
Solid Fuel Warm Air Boiler

The only thing it won't burn is his money!
An Approach to Coal and Ash Handling Systems

By John Hoey, Managing Director, Thermoplant Engineering Ltd.

PART TWO

The actual engineering design of the boiler feed hopper and feed method to the boiler itself, is also of paramount importance. The angles of repose of the hoppers and the methods of assisting the coal flow is vital and design must be undertaken by experienced personnel. It is not sufficient to add vibratory motors to the system, to aid the flow of coal, as these in turn, if used incorrectly will only ensure packing of the coal in the hopper. Modern design techniques allow for a free flow of coal, irrespective of moisture conditions and ensure that it is not necessary to place a man on a full time basis with a hammer to beat the side of the hopper every time it became apparent that there was a shortage in the coal feed to the boiler. The "smallpoxed" pattern on the site of many coal hoppers are an indication of this problem. Proper design should totally eliminate this.

Ash Handling
The requirement is for a simple system which will enable the ash to be removed from the boiler with the minimum labour content and also prevent infiltration of air to the back end of the boiler. The modern fire tube and water boiler can now be fitted with ash drop tubes, which allow the ash to be easily handled. The basic system is to allow the ash to fall into an ash receptacle mounted on wheels, which can be removed and emptied, as required. An isolating valve is fitted to the ash drop tube to provide an air seal while the ash receptacle is being removed. This system is suitable for small boilers, where labour is always available. The normal maximum capacity of the ash receptacle is 12 hours, so that if the boiler is on a 24 hour operation, late evening or early morning attendance is required. A full automatic system, using Macawber Denseveyor equipment is available. This system in-

<table>
<thead>
<tr>
<th>Boiler size</th>
<th>B.T.U. x 10^6/hr</th>
<th>4</th>
<th>8</th>
<th>12</th>
<th>16</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal consumption</td>
<td>tonne/day</td>
<td>1) For 8 hour day @ 90% load</td>
<td>1.42</td>
<td>2.85</td>
<td>4.27</td>
<td>5.70</td>
</tr>
<tr>
<td>Daily Coal Consumption</td>
<td>2) For 24 hour day @ 75% load</td>
<td>3.56</td>
<td>7.12</td>
<td>10.65</td>
<td>14.24</td>
<td>17.80</td>
</tr>
</tbody>
</table>
VERTICAL STORAGE AND
AUTO-TIPPER SYSTEM

FILTER

TO BOILER FEED HOPPERS

VERTICAL HOPPER

COAL DELIVERY
PIPE

AUTO-TIPPER

DENSEVEYOR

Figure VIII

The conveying pipeline passes in series through the boiler ash conveying chambers to a single remotely located Ash and Grit Storage hopper.

Air supply for the system originates from normal factory air supply or the air compressor plant installed for the Denseveyor Coal Handling plant, or an independently installed air compressor.

The operating condition and cycling sequence of each ash unit is displayed at a central control console where manual override control is provided.

The grit conveying system operates in a similar sequence with the exception that the ash breaker is not installed. Operating information is displayed with the Ash System Display Centre.

A number of these systems have already been installed in Ireland and are working very satisfactorily. Figure VII shows an installation at Irish Nurseries Ltd. in Sallins fitted to a 15,000 lbs/hr steam boiler. This system needs no attention, as it is completely automatic. The ash is pumped to a storage hopper, from which it can be removed by truck to a dump or sold as infill. (See Figure IV).

This system is the cleanest available. A filter vent is fitted to the top of the hopper and ensures that no environmental dust problems can occur.

For cast iron sectional boilers, the standard method is to scrape the ash out to the front into a small hopper. This is unavoidable for the small boilers. It is possible to raise the boilers and install a Macawber ash unit, but the economics would not be justified, except on the larger boilers.

**Coal Storage**

Apart from the live coal storage requirements, as detailed earlier, there is a requirement to provide longer term coal stocks. The simple method is to have a coal yard, in which the coal is stored. If space is available, this is fine, except in built up areas where environmental problems with dust may occur.

The alternative is to use vertical storage. Vertical storage, while more expensive at first sight, has many advantages. Firstly, it requires less ground space and secondly it is cleaner and eliminates all dust problems. The Macawber system can be used very effectively for vertical storage. Coal can be diverted to the vertical hoppers and fed back to the Macawber system as required to feed the boiler feed hoppers, as outlined in Figure VIII. In addition if ground conditions do not allow for the construction of a pit, a new but effective item of equipment is the Macawber Auto tipper. The auto tipper can receive a full 20 ton truck load of coal, which it then lifts into the vertical position and feeds the Macawber unit, which in turn feeds the vertical storage hoppers or the boiler feed hoppers. Again the objective is to minimise the handling of the coal, eliminate all coal dust and provide a flexible but automatic system.

The autotipper is shown on Figure VIII.

**General**

The author has attempted in the above to give a general outline of the types of system available and also to indicate that the old problems of coal handling and ash handling have been
eliminated. Modern methods allow for systems which are fully automatic, have considerably lower maintenance costs than the old systems and have a very high degree of reliability. The economics of coal firing compared with oil have not been touched on, as this was outside the brief of the paper. However, when it is realised that these economics are realisable and that in addition the coal systems are acceptable, the overall prospects for industrial coal usage must be attractive to budget conscious engineers and management.

Figure VI

1. Accumulation
Fine ash and clinker is allowed to accumulate above the closed Dome Valve. Fine material falls through the stationary Ash Breaker and larger lumps are stored above. When adequate clinker and ash is gathered the level probe signals the Dome Valve to open and the Ash Breaker to start.

2. Breaking
The Ash Breaker continues cycling to deposit ash and broken clinker through the Dome Valve into the conveying chamber where it is allowed to build-up through the Dome Valve to the ash breaker.

3. Conveying
While the Ash Breaker is preparing the material for conveying and the conveying chamber becomes full, the Dome Valve will close and initiate a conveying cycle. High pressure air enters the conveying chamber in a controlled manner that produces a Dense-Phase conveying action. During Breaking approximately six conveying cycles take place until the accumulation of material above the Ash Breaker is consumed.

MACAWBER ASH HANDLING SYSTEM

1982 will be the 21st year of publication for H&V News and as part of our 'coming of age' celebrations we are promoting an important new exhibition which the major emphasis will be on gas but will also include building services. The exhibition will be held in conjunction with a one day conference and the venue will be the Burlington Hotel, Dublin, and will run from the 6th to the 8th (inclusive) July 1982, opening times 11am to 8pm daily. Gas in its many forms, as a source of energy will play a major role in the future of our industry and this exhibition will play a vital part in informing everyone involved of the developments that are associated with the increased use of gas.

Further details of the show are available from our sister company, ITTEx Ltd., 57 Main St., Blackrock, Co. Dublin, Tel: 885001.
head is inserted into the clamp opening and screwed clockwise until it reaches the copper pipe. The cutter is then ready to make an absolutely water-tight joint. But it should be remembered that the section of the pipe which is cut only bends backwards and does not break off loose inside.

The De Luxe Self-Drilling Tap is finished in chrome on brass and is available from CHS (Ireland) Ltd.

Robinair Multi-Lead

The Robinair Division of Kent-Moore U.K. Limited has recently announced the introduction of a new probe for their current and earlier models of multi-lead thermometers. The new probe has been developed to suit ‘Binder’ fittings, known as model 30072 it is 15 ft. in length including handle. The new probe may be specified at time of ordering of the complete instrument, the prices of which include two leads or as a separate spare part.

It is envisaged that the new ‘Binder’ style probe will increase still further the popularity of Robinair temperature testers, particularly for air conditioning applications. For further details of this, and other Robinair quality service products, contact RSL Ltd.

Satchwell Display Module

With the latest module to be added their Keyboard 700 control system for all air-conditioning and heating systems, Satchwell Controls Systems Limited is giving the building services manager the facility to check up on his system from his own office. Called the MPD Multi-Point Display, it has been produced in response to the industry’s requirement for an indicator which will show, on demand, up to seventeen temperatures and three humidity levels occurring at that time wherever the sensors are sited. Several MPDs can be clustered together to extend the number of

Last year over half the industrial warm air heaters sold in the U.K. were manufactured by Powrmatic.

It’s a statistic we’re very proud of. What concerns us however is that when people talk of Powrmatic they talk of warm air heaters.

There’s a lot more to us than that. Besides warm air heaters we can offer a whole range of heating equipment that covers most commercial and industrial applications.

To get the complete picture post the coupon and indicate which systems interest you. We’ll send you our free colour literature and prove to you that there’s a lot more to us than statistics show.
NEW PRODUCTS

measurements.

It is expected that the MPD will be used in two quite different situations. In the plant room it will be sited with other, matching, function modules in Satchwell’s Keyboard 700 range, forming part of a comprehensive monitoring and control system which is suitable for application of any type of heating, ventilating or air conditioning installation. Here it is readily accessible just where it is needed by, for example, maintenance staff or the building manager when he is carrying out fine adjustments to the installation.

The MPD is equally suited to the role of remote indicator, perhaps in the building manager’s office, so that he can reassure himself that conditions in all areas are as they should be.

The MPD function module is the eighth in the keyboard 700 system, which now performs all the functions necessary for the complete monitoring and control of a comprehensive heating or air conditioning installation.

Further information from John Coffey, Satchwell Control Systems Limited, 20 Store Street, Dublin, (Tel: Dublin 724926).

Eurenco/ Galglass Tanks

Eurenco have recently introduced a range of glass coated and galvanised liquid storage tanks.

Both of these types of tanks are in use in many industries, including water storage for fire protection, effluent treatment, brewing and potable water storage.

The galvanised tank has been approved by the fire officers committee the reference being T21.

The standard range extends from 13m³ capacity to 700m³ in eighty four different diameter/height combinations.

The tanks consist of a mild steel cylindrical shell of bolted construction, on a waterproof reinforced concrete base with a rigid type roof.

New Heat Pump Package

The latest heat pump package to be announced by Walker Air Conditioning Ltd., combines high efficiency with high capacity. Designed for rooftop installation in commercial and industrial applications the Carlyle 50Q016 has a nominal cooling capacity of 44 kW, and nominal heating of 45 kW.

Stand features include heavy duty semi-hermetic compressors with positive lubrication, discharge muffler, vibration isolators, crankcase heater and internal motor protection; Chronotemp.
NEW PRODUCTS

manufacturedUniversal Gully just twelve months ago at the Building Exhibition in the RDS, Dublin, Marley Plumbing have now perfected an integral 'O' ring socketed PVC sewer and soil pipe. The new pipe and other additions to the Marley range were introduced at a trade reception and presentation in the Burlington Hotel recently which was attended by a large number of consultants, contractors and merchants. By eliminating the need for a separate coupler the new Marley pipe is quicker and easier to install and therefore more economical in use. Lengths of the integral socketed Marley pipe are simply and permanently connected to each other with the aid of a rubber 'O' — ring seal built into the cleverly designed coupling end of each section.

Marley Launch PVE Sewer and Soil Pipe

Following the successful launch of their Irish designed and manufactured Universal Gully just twelve months ago at the Building Exhibition in the RDS, Dublin, Marley Plumbing have now perfected an integral ‘O’ ring socketed PVC sewer and soil pipe. The new pipe and other additions to the Marley range were introduced at a trade reception and presentation in the Burlington Hotel recently which was attended by a large number of consultants, contractors and merchants. By eliminating the need for a separate coupler the new Marley pipe is quicker and easier to install and therefore more economical in use. Lengths of the integral socketed Marley pipe are simply and permanently connected to each other with the aid of a rubber ‘O’ — ring seal built into the cleverly designed coupling end of each section.

Now you've got a choice! WICU® thermally insulated copper tubing available in 3 applications and full range of sizes.

WICU®-extra for hot water service lines and central heating systems.

WICU®-plus for cellars, shafts and outside walls.

WICU®-standard the well-proven tube with profiled interior for general use.

WICU®-click preformed plastic covers with snap button closure for quick insulation of tube joins.

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https://arrow.tudublin.ie/bsn/vol20/iss10/1
DOI: 10.21427/D78D97
NEW PRODUCTS

Marley, leaders in the rainwater field are pleased to announce that manufacture of the widely used PVC “Flowline” rainwater system, on show in the Burlington, will begin shortly in the Marley factory at Lucan.

Ever conscious of the demand for maintenance free building products, Marley have added a new dry verge system to their existing PVC facia, soffit and bargeboard system. These well proved systems which were on display in the Burlington Hotel are rapidly gaining in popularity with specifiers and house builders.

A well illustrated brochure covering the new products, folded to A4 size, will form a useful 17” x 23” wall chart when opened out.

For additional information on Marley products contact Dudley Foster at Dublin 280691.

Combustion Air Trim Control

A new combustion air trim control system for small and medium sized oil or gas fired boilers with mechanically positioned air/fuel ratio controls has been introduced by the Thermox Instruments Division of AMETEK, Inc. The microprocessor-based system, tradenamed AIR-MIZER II, uses measurements of oxygen or a combination of oxygen and combustibles to continuously ‘tune’ the air/fuel ratio of the boiler combustion process. Up to the introduction of this system, for both measurement, only very expensive systems could control from both oxygen and combustibles. For many installations, payback period can be as little as one year or less.

The AIR-MIZER II system is an ideal fuel saving retrofit for most boilers rated at 400 horsepower and up. The system may be economically feasible if the boiler is consuming more than IR£3,500 of fuel each month.

A basic AIR-MIZER II system uses an oxygen analyser to continuously monitor the effect of boiler variables such as oil viscosity, gas density, air temperature and humidity, fuel heat value, etc. The optional combustibles sensor detects incomplete burning, thus taking the guesswork out of the decision of where to set the oxygen setpoint. The field proven WDG-111 sensor (over 5,000 successful installations) uses a zirconium oxide cell which gives precise, rapid and reliable oxygen readings without the need for sample conditioning. A recently developed proprietary catalytic combustibles sensor provides significant improvements in sensitivity, stability and sensor life expectancy over previous types. Whenever combustibles in the flue gas rise above an acceptable and pre-set limit, the controller automatically overrides the oxygen ‘trim’ control signal and causes the actuator to increase the air supply to the combustion source until the higher concentration of combustibles is reduced to pre-set limits. At this time the oxygen-based ‘trim’ system resumes control.

Additional information on the AIR-MIZER II Trim Control System is available from: Foss Electric (Ireland) Limited, Sandyford Ind. Est., Leopardstown Rd., Foxrock, Dublin 18, (Tel: 953301 Telex: 24316).

Deltaclima AHU’s

A new generation of Deltaclima air handling units up to 15 nominal TR capacity 6,000 cfm has been announced by Delta RA Ltd.

Deltaclima, formerly Paracon, now offers a redesigned cabinet layout giving the downflow configuration with rear horizontal discharge being available as an alternative. Controls are located on a slide out panel behind a small access door, so designed as to require minimum clearance to the front of the unit and thus corridor siting can easily be achieved. The access door houses the indicator lights for steady state and various functions. Control schemes are available in two basic formats: full electronic systems incorporating Staefa controls are supplied where close and modulating control for cooling/heating/humidification/dehumidification are required.

Multi-circuit direct expansion cooling coils are fitted and match the Deltaclima CCU curved coil and VCU/HCU standard condensing units. Applications for chilled water are becoming more numerous and these air handlers can be supplied with suitable cooling coils and modulating controls.

The heating options are electrical and LPHW as standard, and it is interesting to note that both are located separately from the cooling coil on a horizontal slide arrangement. Further information from Glowtherm Ltd.
The "COALMISER" Shell boiler range is offered in single and twin furnace designs for steam or hot water duties up to 13600 kg (30,000 lb/hr)/7620 kW (30,000,000 Btu/hr).

This range of coal fired boiler plant embodies unrivalled design features and quality of construction for firing a wide range of fuel using current firing techniques including sprinkler, chain grate and coking bed devices.

The larger "COALMISER TWIN" embodies an "original" design concept in wet back construction enabling one half of the boiler to be shut down, avoiding stress and increasing turn down capability.

The entire "COALMISER" range includes as standard:

- large furnace proportions
- low overall heat transfer
- large diameter smoke tubes
- low gas side pressure losses
- smaller electrical motors and reduced noise levels
- automatic de-ashing
- total gas and water side access including unique fully adjustable hinged front and rear doors
- large steam space volumes for quick response to varying load demands
- unique internal water circulation to avoid stratification and thermal shock on hot water boilers.

Fully automatic matched fuel feed and ash removal systems are offered to provide complete boilerhouse schemes.

B & E Boilers Ltd
Easthampstead Road
Bracknell, Berkshire
England RG12 1NP
Tel. Bracknell (0344) 21341

Other products in the B & E range include the European steam and hot water boiler for duties up to 16300 kg (36,000 lb/hr)/12300 kW (36,000,000 Btu/hr) and the Windsor steam and hot water boiler for duties up to 5400 kg (11900 lb/hr)/3520 kW (12,280,000 Btu/hr).

Both ranges are suitable for gas or oil firing.
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**CHAPPEE**

Domestic: Duel fuel boilers
55,000 to 250,000 btu/h
Industrial: 300,000 to 5 million btu/h
Also full range of Francia Hoval steel panel radiators.

**Allen Ygnis**

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400,000 - 24 million btu/h
Steam Boilers
250 - 2,400 lbs/h
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**Sime**

"Rio" Domestic and Commercial oil fired boilers
60,000 - 604,000 btu/h
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60,000 - 400,000 btu/h

**Radiant Superjet**

Blown Gas Burners
60,000 - 24 million btu/h

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Gas fired overhead infra-red heaters
26,000 to 140,000 btu/h. LPG or towns gas.

Also solid fuel handling equipment, fluidised bed boilers and incineration.

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