PRODUCT REVIEW:
Pressure Vessels and Storage Tanks

ALSO IN THIS ISSUE
• NATURAL GAS AND THE DOMESTIC HEATING CONTRACTOR
• BTU GOLF OUTINGS
• INDUSTRIAL ENERGY COSTS
• COMBINED HEAT AND POWER AT HARP
• WATER TURBINES
• COAL DISTRIBUTION – DL'S ENERGY REPORT
WHAT DOES 1982 HOLD FOR SERVICES?

Looking back on a year that brought hope to the industry in the form of the announcement of the Dublin/Cork gas pipeline the question that is on everyone's mind is what in these inflationary times will 1982 hold for the Building Services industry? With the present government policy of trying to bring down the national debt, spending in the public sector is at a minimum and so it is not to be expected that any further major contracts will get the finance to go ahead in the near future. Industrialisation though slow is still going ahead and electronics factories with their need for air conditioned environments have proved a boon to the Industry. The domestic sector has settled down to a more normal level of business and there are some rumours in government circles that with the announcement of the results of the Multi Solid Fuel Stove Design Competition the grant for conversion to solid fuel will be reintroduced.

We must be ever on the watch for change and we must be prepared to go with it when necessary because it is only by keeping in touch with the everchanging demands and needs of Industry that the Services Industry can hope to survive and prosper.

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SUCCESSFUL CIBS EVENING

A very successful and well attended technical evening was recently held by the CIBS in the Engineers Club, Clyde Rd., Dublin. The subject of the evening was Project Management in Building Services, and the speakers were as follows: F. Browne, Robinson Keefe, and Devane; J. Ballance, J. J. Ballance Management Consultants; M. Greene, Construction Industry Federation and A. Kavanagh, I.D.A.

Each member of the panel presented his own case on the need for project management, together with any pitfalls and feedback.

The meeting took the form of a forum where matters of common interest to Architects, Consultants, Engineers and Contractors were discussed to the mutual benefit of all concerned. In fact the greater part of the evening was taken up by a discussion session.

This Technical Evening was sponsored by Finheat Limited and the first pint of the evening was free.

Temprite Services Double Combination

Temprite Services Ltd. of 48 Hardwicke Street, Dublin 1, tel. 780184/780304 are sole agents in Ireland for: comfort cooling and close control for Airwell Air Conditioning; Comfort Coolers from France whose range includes room airconditioners, split systems, split heat-pumps, roof top packages, vertical packages. They can now offer the ultimate in close control airconditioning for hospitals, computer rooms, creameries since their appointment as D.C. Computair Hiross Distributors.

Up to now Temprite Services have been actively engaged in the supply of Airwell equipment in Ireland. They have always realised the tremendous market potential for a totally packaged close control and energy saving airconditioning equipment and can now offer:

1. Hiross Packaged Water Chillers from 2 TR — 25 TR and over air cooled or water cooled.
3. Energy Saving Computer Room Airconditioning systems.
4. Suspended Floors.
5. Closed Circuit Cooling Towers.

Coolair Contract

Following the installation of Daikin water chillers at the new Drogheda telephone exchange, Coolair Ltd. has been awarded a further contract at the identical exchange in Dundalk.

The contract covers the supply of Daikin water chillers and Airedale Downflow packaged air conditioning units, complete with in-built controls and control panels.

Saving with Spirax Sarco

Engineers, energy consultants, members of senior management and purchasing personnel representing many areas of industry in the Dublin area took part in a trade evening and discussion dealing with all aspects of energy conservation at the Burlington Hotel recently.

Organised by Spirax Sarco Limited of Cheltenham, one of the world’s leading developers and manufacturers of energy saving equipment, the occasion attracted around 80 participants. One of a series of technical evenings being run this year by Spirax Sarco, the event provided industrialists with the opportunity to discuss their energy considerations at length with experts from the company, and also with each other. Also, they were able to see at first hand a selection of Spirax Sarco products being demonstrated.

Many leading companies and organisations, including Aer Lingus, Eastern Regional Health Board,
Walker Cool Aer Lingus Computers

No modern airline can operate without the extensive use of computers, and computers, in turn cannot function unless the environment in which they operate has closely controlled levels of temperatures and humidity.

To ensure that their national airline can operate their computers in the optimum conditions needed, Walker Air Conditioning have supplied three packaged air conditioning units for the new Aer Lingus computer room extension at Dublin airport.

The new computer room, which operates 24 hours a day all year round to control reservations and administration worldwide, as well as providing a reservations service to other airlines, is served by three packaged computer room air conditioning units, each with a capacity of 1STR, supplying conditioned air at a rate of approximately 8,000 cfm. Each of these units is matched with a remotely sited Carlyle 09DD air cooled condenser, to maintain conditions of 72°F ± 2°, 50% rh + 5%.

The air conditioning units operate on the downflow principle, utilising the raised floor as a supply air plenum. Air is drawn through the top of the units, cooled or heated, humidified or dehumidified and filtered as required, and distributed under pressure through the floor grilles, strategically located around the computer bases. Built in standby is provided by each unit's dual circuit direct expansion system.

Solar Energy System from Westinghouse

Westinghouse Electric Corporation's advanced energy systems division (AESD), based at Large, Pennsylvania, has been awarded a contract to design, install and test a demonstration solar photovoltaic energy system for the roof of the Citicorp Centre in New York City. Solar photovoltaic technology converts sunlight directly to electricity.

Westinghouse has seven plants in Ireland, manufacturing a wide range of electricity related products.

Under its contract, Westinghouse will provide a system consisting of 573 square feet of silicon solar cells, storage batteries, a weather station, a computer data acquisition system and equipment to convert the d-c electricity produced by the solar cells to a-c.

Fiddler on the Roof

Remember him? Remember all that messing about on the roof cutting awkward shaped holes that more often than not leaked afterwards.

Well all that's a thing of the past. Thanks to Roof Units.

Our soaker sheet range is the largest in Europe. Almost 100 of them. And between them there's a design to match practically every corrugated roof profile you can think of.

And some you can't.

So just how do you get your hands on them?

Our nationwide network of stockists has them in stock. But remember, they're only available when you specify Roof Units.

So stop fiddling about. And start using Roof Units soaker sheets.

We stay on top because we never let you down.
His Subject is:
Industrial Insulation Systems

Of the ten different types of pipe insulation which is most suitable for use in the following circumstances?

(A) A food factory with hygiene standards.
(B) Maximum operating temperature of 130°C.
(C) A need for insulation with superior fire resistance.

Access to All Major World Manufacturers of insulation helps our consultants to specialise in the technology of one area but also to have a general knowledge of all insulation systems.

They will never be 'Masterminds'—they are kept too busy answering questions to sit in one chair for too long!

Thermal Insulation Distributors Ltd.

KYLEMORE INDUSTRIAL ESTATE, KYLEMORE ROAD, DUBLIN 10.
TELEPHONE 267619/267600 TELEX 30887
IDHE Biennial Convention

Proof is proof is necessary that the IDHE are alive and well and still very much involved with the business came in the form of their very successful Biennial Convention held recently in Jurys Hotel, Dublin. Over 70 delegates attended on the day and they were treated to six excellent papers on different topics which are of concern at the moment, notably, natural gas and heat pumps. The “star turn” of the day was Paddy Belton of Belton Engineering who gave a very interesting and above all entertaining paper on small water turbine generators.

Let us hope that the conference was a good omen for the future of the IDHE and that more events of the same calibre will follow.

SPONSORS

The IDHE wish to thank the following sponsors without whom their biennial convention would not be possible:

- Dublin Gas Co, Barlow Heating Ltd, Bord na Mona, BP (Ire) Ltd, Burmah Castrol, Calor Kosangas Ltd, Coal Information Services, ESB Domestic Advisory Sect., Ergas Ltd, ESSO Teo, Heiton and McFerran, Irish Shell Ltd, P J Matthews Ltd, Multifuel Ltd, Precision Heating Ltd, Quadrant Engineers Ltd, Rental Rad, Sanbra Fyffe, J R Taylor Ltd, Veha Ltd.

Lawlor — O’Gorman Link

It is understood that Liam Lawlor has sold his shares in Hall-Thermotank Ireland Limited, the refrigeration engineering company, and has negotiated to purchase substantial shareholdings in an existing commercial and industrial refrigeration company which is thought to be O’Gorman Refrigeration based at the Dublin Industrial Est., Glasnevin.

Dawe to Sell STI Gas Detectors

Dawe Instruments Limited has concluded an agreement with the French Company S.T.I. (Sciences Techniques Internationales s.a.) to act as exclusive agents for the United Kingdom and the Republic of Ireland.

Dawe will now offer the comprehensive range of S.T.I. gas detection and monitoring equipment in addition to their well established ultrasonic leak detectors and steam trap testers. These instruments, together with a range of stroboscopes and vibration measuring meters form a comprehensive range of diagnostic test instruments.

S.T.I. has established a worldwide reputation for supplying sophisticated instruments designed to detect and monitor flammable gases in industry, mining, offshore installations, etc.

Duro-Dyne in Stock

Dan Chambers Ltd who are distributors for the Duro-Dyne range of duct work accessories have announced that a comprehensive range of flexible connectors, vane, self-adhesive insulation hangers, damper blade kits and regulators, drill screws, portable pin spotters and girder clips are now available ex-stock.
IOP District Council Set Up

The Institute of Plumbing has its inaugural meeting of the Irish District Council recently in the Shelbourne Hotel.

The IOP was founded in 1906 in Britain, however it is now a world wide organisation with the objective of developing the industrial and technical areas of the plumbing industry.


Membership of the Institute is limited to those with suitable technical and professional qualifications and relevant industrial experience. The Institute collaborates with manufacturers in the introduction of new products and is assuming an increasingly important role in the technical development of building services in particular plumbing.

The Institute has published a number of important technical books and papers all of which have become standard reference material.

With the inauguration of the Irish District Council which will cater for the country as a whole Irish members will now have a vehicle by which their technical and professional interests will be catered for. Details of future activities will be announced shortly.

IDHE GOLF OUTING AT BODENSTOWN

* Above: Memories of the summer of '81 at the Heating Distributors Ltd., IDHE Golf outing in Bodenstown G.C. Pictured L-R Owen White, Kevin Hicks, John Berkery, Shay Kieran, of Heating Distributors the sponsors and Kevin Byrne.

* Right: Also at the IDHE, golf outing at Bodenstown were this happy group of golfers.

Fire and Safety Consultants

A new company has been formed — Fascon Limited, which will specialise in training personnel in the many facets of Fire Drill Procedures and Fire Prevention.

The company's offices are located at Greenmount Industrial Estate, Harold's Cross Road, Dublin.

Since the Safety in Industry Act (1980) became a law it is now mandatory that every company must keep a General Register and have a fully trained fire drill team on its staff, who are completely au fait with the various aspects of fire prevention.

Nowadays, unions will insist upon the right of the worker members of safety committees and safety delegates to periodically implement inspections of one place of work. If it is then felt necessary representations on behalf of the committee can be made to a Factory Inspector. Consequently it has now become imperative for management to provide thorough Staff and Management Training in the many skills of Fire Fighting as well as Safety within industry.

With these very objectives in mind, the newly formed Fascon Limited, which will be trading as Fire & Safety Consultants have introduced a series of advisory seminars. Three widely experienced speakers will address the broadly based attendances from industry.

An AnCO grant can be obtained under the Technical Assistance Grants Scheme and applications should be made direct to AnCO.

Further information from Fascon Limited at Greenmount Industrial Estate, Harold's Cross Road, Dublin 12 or Tel: 710191/710270.
An energy recovery system, designed and installed by Alexis Martin Airconditioning Ltd., who have recently set up business in Ireland, is helping the Tonbridge and Malling District Council in the UK to keep the running costs of the new Larkfield Leisure Centre in Kent to an absolute minimum.

**Colt and Honeywell Link**

The keys to successful energy saving are effective control and fast playback on the equipment used.

Now Colt International and Honeywell have joined forces to provide Colt heating and ventilation systems with the very latest in control technology.

To complement their own energy saving Wastemaster Heating and Ventilation Systems and to radically improve the performance of existing installations Colt International are now marketing the new Honeywell Micronik 100 Optimiser System. "With 'Wastemaster' already cutting our customers' heating costs in half, the less than two year expected pay back periods and the further energy savings from the Micronik Optimiser mean Colt Systems now make even better business sense" comments Colt Marketing Director, Martyn Wylie.

Centred on a hardworking micro computer which continuously monitors time and temperatures, the Micronik 100 maintains optimum working conditions in offices and factories alike by starting and stopping heating equipment and controlling airflows — exactly when needed.

It learns from experience too — dramatically shortening warm-up periods and advancing heating shutdowns to precisely match the weather and thermal characteristics of individual premises. The system can be programmed for up to 12 months with manual override for special requirements — so valuable energy is not wasted on empty buildings.

The efficiency of boiler systems, warm air heaters, radiant heaters, steam plant and ventilation systems can all be improved by applying the know-how built in to every Colt Wastemaster System. The Company claim that they are able to cut heating bills so as to recover the capital investment within two years for almost all companies with heated premises.

Terrain rainwater systems. They're designed to go up fast — so you spend less time up a ladder.

Because they're dry-jointed UPVC systems incorporating deep, rubber seals, they're light, strong and easy to fit. You don't even need lubricant.

Our systems are full of useful, timesaving ideas. Like letting you make offsets from standard bends and off-cuts of pipe.

Or like our brackets, which fit securely with a single screw.

And Terrain rainwater systems look even better from the ground than they do up a ladder.

Available in 3 colours — grey, black and white, in both half-round and square section, Terrain rainwater systems are every bit as good as our soil and waste and underground drainage systems.


**UNIDARE TERRAIN**

SOIL WASTE RAINWATER UNDERGROUND

Systems for Professionals.

IHVN, November 1981
**Crane Promise Big Fuel Savings**

At a reception and lecture in the premises of Pump Services Ltd. in Rathfarnham, Dublin, Arthur Woodward of Crane Ltd promised very substantial savings in fuel costs with the use of the Crane C.B.A. condensate recovery and booster system. The system is briefly described as a patented, unique, fully closed condensate recovery and booster system which is installed as a simple extension to existing return systems to save fuel and money and to provide a rapid return on investment.

Looking at Fig. 1 with valve 'A' closed, valves 'B' and 'C' open and with the C.B.A. operating, the return system is fully closed.

Condensate is induced from the process and into the C.B.A. from where it is pumped directly into the boiler. Since there is no flashing to atmosphere, there are no heat losses and the boiler is fed at much higher temperature.

No vapour loss means that all the good quality condensate is recovered and re-used as boiler feed and the need for cold water make-up is drastically reduced.

Considering an example of a process exhausting 10,000lbs/hr of condensate at 80lb/ft² at which pressure the condensate is at a temperature of 324°F (162°C), the following comparison can be made.

Every 11°F (5.6°C) increase in feed temperature reduces fuel consumption at the boiler by 1%, in this example fuel consumption is reduced by at least 12%.

Should the C.B.A. be out of commission for maintenance, the operation of the process continues without interruption. The closing of Valves 'B' and 'C' and the opening of valve 'A' allows the existing vented system to be used as a standby facility for the short time which it takes for the maintenance to be completed.

We hope to publish a more comprehensive article on the system in a future issue.

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**Europipe '82**

Europipe 82 — the European Exhibition & Conference for the Construction and Maintenance of Pipelines in Switzerland from 19-22 January, IPDCA, the International Pipe Line Contractors Association and HEPCA, the Hot Enamel Pipeline Coatings Association, both Paris-based, endorse the exhibition’s objectives.

C.B.A. the Confederation of British Manufacturers of Petroleum Equipment, are sponsors of the British national group of exhibitors.

For information regarding the seminar, please contact Oyey International Business Communications Ltd., 11-13 Norwich Street, London EC4A 1AB, telephone number 031-242 3473.

**CIF Weekend**

As part of their 50th Anniversary celebrations, Concrete Products of Ireland Ltd., were sponsors of a Federation Weekend reception for members and guests of the CIF in the Limerick Inn Hotel recently.

Other Weekend activities included a Fashion Show for the ladies; a Coach Tour to the Cliffs of Moher; the annual Golf Competition for the Federation Cup and other prizes; the CIF Presidents (Mirette Corboy) Reception and the Annual Dinner.

---

Air conditioning equipment specialists Coolair Limited of Tallaght have appointed Mr. Eunan McGlynn as sales representative in the company’s new Energy Management Division. He joins Coolair with extensive experience in the computerised equipment field and will be responsible for the full range of Barber & Colman Energy Management Systems in the 26 counties.

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DOI: 10.21427/D7RX23
A Condensed Guide to MANOTHERM activities

THOMMEN CALIBRATOR EM

Type EM 421
410 x 260 x 230 mm
approx. 8 kg

Indep. from mains Separate power supply 24V D.C.

West WE 01 process controller

96mm square metal case.
PD+PI control action.
Limit comparator & controlling output option.

Barksdale piston pressure switch
for pressures up to 315 bar.

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Platon ‘M’—valve.
Air operated miniature control valve
for automatic control of most media.

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Telex: 24789

Kilcoolishal, Little Island, Cork.
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Telex: 32360
Irish Visitors to Vaillant Complex

A group of Irish engineers, contractors and journalists recently visited the Remscheid factory of the German boiler manufacturer Vaillant, the visit being arranged by Vaillant's Irish agent Martin P. Derby & Associates Ltd. The Irish party toured the very large and modern factory which is the only one of a number owned by Vaillant, the Remscheid factory specialising in the manufacture of gas water heaters and the Vaillant Combi gas central heating boiler and instantaneous water heater.

The group travelled out from Dublin on the first day of the three day trip and spent the next day in the factory and in Vaillant's training centre which has a large selection of working appliances. The social side of the trip was not forgotten and in the evening the group travelled into Cologne to sample the sights and of course some of the beer that Cologne is also very famous for. With an early start the following morning everyone was surprised to find the ground covered in snow but this soon cleared and the group was taken to a large residential area where a number of the Vaillant Combi units were installed. After inspecting the installations the group were then taken to the airport for the return flight. The entire trip was organised very efficiently and much time was devoted to discussion of the Combi boiler which has features that are new to Ireland. It is a wall-hung gas central heating appliance with a boiler for central heating and separate instantaneous domestic hot water supply. Suitable for central heating systems of open or sealed type up to a total pressure fo 2.0 bar and flow water temperatures of up to 90°C.

Combi is a multi-gas appliance with electronically controlled output, thermo-electric flame failure defect, temperature limiter, hydraulically controlled water deficiency valve, gas solenoid valve, gas quantity regulator, multi-gas burner, ready-for-connection wiring in the control box, electric main switch, vitreous enameled casing, built-in draught diverter, compression fitting for gas, flow and return connections.

The central heating section has electronically controlled heat output, flow thermometer, pressure gauge, thermostatically controlled flow switch, automatic bypass, recirculating pump with automatic air vent, built-in expansion vessel, central heating switch.

Domestic water is heated in the built-in and insulated heat exchanger. Electronically controlled outlet temperature, summer/winter switch.

By means of the electronically controlled central heating flow temperature, the output of the appliance is automatically adjusted to the amount of heat required at any given time. A built-in automatic bypass makes the combi-heater independent of the minimum amount of recirculating water in the central heating system. On the domestic hot water side, the temperature is also controlled electronically. Extremely small outlet rates are possible.
### Comparison of Useful Energy Costs

**Commercial/Industrial Fuels**

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Delivered Cost (p/kWh)</th>
<th>Solid Fuel Boiler Efficiency 65% - 75%</th>
<th>Gas or Oil Fired Boiler or Air Heater Efficiency 65% - 75%</th>
<th>Storage Heater Efficiency 90%</th>
<th>Electric Heater Efficiency 100%</th>
<th>Directly Fired Gas Heater Efficiency 90%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M/C Turf</td>
<td>0.65</td>
<td>1.00</td>
<td>0.87</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Crushed Turf, Loose</td>
<td>0.57</td>
<td>0.88</td>
<td>0.78</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Crushed Turf, Sacked</td>
<td>0.77</td>
<td>1.18</td>
<td>1.03</td>
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<tr>
<td>Briquettes, Loose</td>
<td>0.71</td>
<td>1.09</td>
<td>0.95</td>
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<tr>
<td>Brickeens</td>
<td>0.60</td>
<td>0.92</td>
<td>0.80</td>
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<tr>
<td>Coal</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Industrial Smalls</td>
<td>0.71</td>
<td>1.09</td>
<td>0.95</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Oil</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Gas Oil, 35 sec</td>
<td>2.08</td>
<td></td>
<td>3.20</td>
<td>2.77</td>
<td></td>
<td></td>
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<tr>
<td>Light Oil</td>
<td>1.88</td>
<td></td>
<td>2.58</td>
<td>2.24</td>
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<tr>
<td>Medium Oil</td>
<td>1.61</td>
<td></td>
<td>2.48</td>
<td>2.16</td>
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<tr>
<td>Heavy Oil</td>
<td>1.53</td>
<td></td>
<td>2.35</td>
<td>2.04</td>
<td></td>
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</tr>
<tr>
<td>Gas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dublin Gas, Commercial Tariff</td>
<td>4.63</td>
<td></td>
<td>7.12</td>
<td>6.17</td>
<td>5.14</td>
<td></td>
</tr>
<tr>
<td>Industrial, Inner City over 2000 Therms</td>
<td>4.68</td>
<td></td>
<td>7.2</td>
<td>6.29</td>
<td>5.2</td>
<td></td>
</tr>
<tr>
<td>75 lb. cylinder L.P.G.</td>
<td>3.58</td>
<td></td>
<td>5.51</td>
<td>4.77</td>
<td>3.98</td>
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<tr>
<td>Bulk L.P.G.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>0 - 3 tonnes</td>
<td>3.31</td>
<td></td>
<td>5.09</td>
<td>4.41</td>
<td>3.88</td>
<td></td>
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<tr>
<td>4 - 20 tonnes</td>
<td>2.90</td>
<td></td>
<td>4.46</td>
<td>3.87</td>
<td>3.22</td>
<td></td>
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<tr>
<td>20 - 50 tonnes</td>
<td>2.67</td>
<td></td>
<td>4.11</td>
<td>3.56</td>
<td>2.97</td>
<td></td>
</tr>
<tr>
<td>50 - 100 tonnes</td>
<td>2.48</td>
<td></td>
<td>3.82</td>
<td>3.31</td>
<td>2.76</td>
<td></td>
</tr>
<tr>
<td>over 100 tonnes</td>
<td>2.38</td>
<td></td>
<td>3.62</td>
<td>3.13</td>
<td>2.61</td>
<td></td>
</tr>
<tr>
<td>Electricity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Night Space Heating</td>
<td>3.9</td>
<td></td>
<td>4.33</td>
<td></td>
<td>8.2</td>
<td></td>
</tr>
<tr>
<td>Flat Rate of Charge</td>
<td>8.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unrestricted Space Heating</td>
<td>8.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Maximum Demand, H.T. (10 kV) 1000 kW load</td>
<td>4.86</td>
<td></td>
<td>4.86</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Maximum Demand, L.T. 500 kW load</td>
<td>6.89</td>
<td></td>
<td>6.89</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** Efficiencies quoted are seasonal efficiencies where Seasonal Efficiency = Conversion Efficiency x Utilisation Efficiency. Delivered energy costs quoted above are for the conditions stated on IIRS Comparison of Energy Costs sheet.
## Comparison of Energy Costs
### Commercial/Industrial Fuels

<table>
<thead>
<tr>
<th>Fuel</th>
<th>No.</th>
<th>Form</th>
<th>Unit of Supply</th>
<th>Average Price per Unit (IRE)</th>
<th>Gross Calorific Value p/kWh</th>
<th>Delivered Cost IRE/GJ p/kWh</th>
<th>Percentage Increase in last 3 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peat</td>
<td>1</td>
<td>M/C Turf</td>
<td>tonne</td>
<td>26^1</td>
<td>14421</td>
<td>1.80</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Crushed Turf, Loose</td>
<td>tonne</td>
<td>23^1</td>
<td>14421</td>
<td>1.59</td>
<td>0.57</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Crushed Turf, Sacked</td>
<td>tonne</td>
<td>31^1</td>
<td>14421</td>
<td>2.15</td>
<td>0.77</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Briquettes, Loose</td>
<td>tonne</td>
<td>38^1</td>
<td>19306</td>
<td>1.97</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Briquettes</td>
<td>tonne</td>
<td>32^1</td>
<td>19306</td>
<td>1.66</td>
<td>0.60</td>
</tr>
<tr>
<td>Coal</td>
<td>6</td>
<td>Industrial Smalls</td>
<td>tonne</td>
<td>58^2</td>
<td>27912</td>
<td>1.97</td>
<td>0.71</td>
</tr>
<tr>
<td>Oil^3</td>
<td>7</td>
<td>Gas Oil, 35 sec</td>
<td>litre</td>
<td>.222</td>
<td>45500</td>
<td>5.79</td>
<td>2.98</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Light Oil</td>
<td>litre</td>
<td>.188</td>
<td>43400</td>
<td>4.66</td>
<td>1.68</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Medium Oil</td>
<td>litre</td>
<td>.182</td>
<td>42900</td>
<td>4.47</td>
<td>1.61</td>
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<td>10</td>
<td>Heavy Oil</td>
<td>litre</td>
<td>.175</td>
<td>42500</td>
<td>4.24</td>
<td>1.53</td>
</tr>
<tr>
<td>Gas</td>
<td>11</td>
<td>Dublin Gas,</td>
<td>100 cu. ft.</td>
<td>.645</td>
<td>17697 k.J/m^3</td>
<td>12.87</td>
<td>4.63</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Commercial Tariff</td>
<td>100 cu. ft.</td>
<td>.651</td>
<td>17697 k.J/m^3</td>
<td>12.99</td>
<td>4.68</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>L.P.G.5, Propane</td>
<td>34 kg cylinder</td>
<td>17.91</td>
<td>50242</td>
<td>9.95</td>
<td>3.58</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Bulk L.P.G.5</td>
<td>litre</td>
<td>.231</td>
<td>50242</td>
<td>9.19</td>
<td>3.21</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>0 - tonnes</td>
<td>litre</td>
<td>.262</td>
<td>50242</td>
<td>8.19</td>
<td>2.90</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>4 - 20 tonnes</td>
<td>litre</td>
<td>.189</td>
<td>50242</td>
<td>7.42</td>
<td>2.87</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>20 - 50 tonnes</td>
<td>litre</td>
<td>.173</td>
<td>50242</td>
<td>6.88</td>
<td>2.48</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>over 100 tonnes</td>
<td>litre</td>
<td>.164</td>
<td>50242</td>
<td>6.52</td>
<td>2.36</td>
</tr>
<tr>
<td>Electricity</td>
<td>18</td>
<td>Night Space Heating</td>
<td>kWh</td>
<td>.039^4</td>
<td>10.83</td>
<td>3.9</td>
<td>23.4</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>Flat Rate of Charge</td>
<td>kWh</td>
<td>.082^4</td>
<td>22.78</td>
<td>8.2</td>
<td>22.7</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>Unrestricted Space Heating</td>
<td>kWh</td>
<td>.082^4</td>
<td>13.50^6</td>
<td>4.86</td>
<td>28.9</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>Industrial Maximum Demand, H.T. (10 kV)</td>
<td>kWh</td>
<td>.082^4</td>
<td>18.58^7</td>
<td>6.69</td>
<td>28.9</td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>Over 1000 kW load</td>
<td>kWh</td>
<td>18.58^7</td>
<td>6.69</td>
<td>28.9</td>
<td></td>
</tr>
</tbody>
</table>

1. Average price countrywide, including cost of delivery.
2. Includes an allowance of IREs/tonne for delivery.
3. Prices listed are maximum quoted by leading suppliers — lower prices may be negotiated with oil suppliers in particular circumstances.
4. Standing charges for electricity and towns gas not included — unit costs for electricity and gas include current fuel cost variation.
5. Typical prices from main suppliers.
6. Assuming a load factor of 80%, a ratio of 60/40 day to night units and a power factor of .95.
7. Assuming a load factor of 30%, a day/night ratio of 75/25 and power factor of 0.95.
The Harp Lager brewery at Dundalk have pioneered a heat and power installation which is the first system of its kind using diesel power in Ireland and combining the provision of heat and power with a single source. The source in this instance is a relatively new design of diesel engine, the MB275 range, manufactured by Mirrless Blackstone (Stockport) Limited, a Hawker Siddeley company based at Hazel Grove, Stockport. This engine runs on an economical grade of residual fuel for which it has been specifically designed.

Although the diesel engine is acknowledged to be one of the most efficient methods of converting fuel into electrical power, the rate of efficiency is usually only around 40-42%. In the Harp Lager installation heat is recovered from the engine exhaust and cooling systems and used productively to give an anticipated thermal efficiency of around 82%. This considerable improvement in fuel utilisation is the result of careful planning and design and called for a high level of consultation and co-operation between the engine builders and the engineering staff at Harp.

The installation is based upon six-cylinder Mirrless Blackstone MB275 engine directly coupled to an A.C. generator with an output of 1600 electrical kilowatts. This power is used in the brewery for normal production processes and for chilling the lager for its cold maturation process. The fully automatic mode of operation meets the stringent requirements of the Electricity Supply Board for paralleling and load sharing. Continuity of supply can be maintained should there be any interruption of power from the public grid and surplus power which cannot be utilised within the brewery can be exported to the grid, thereby earning additional revenue.

Heat is recovered from the engine exhaust gases by means of a specially designed boiler. This produces high grade steam for use in the brewing process. Lower grade heat from the engine cooling systems is used to heat water. This water is collected in a large, well-insulated thermal storage tank to be used as required for normal services within the brewery complex.

The benefits accruing from improved fuel utilisation in this type of combined heat and power plant will be shared by both company and nation alike. Other companies will probably wish to investigate the advantage of a similar system tailored to their own individual requirements.
Successful Heat Air Exhibition

Despite the change of name a couple of years ago to the Heat Air Exhibition the Northern Ireland Sections of the Institute of Energy Balmoral Exhibition continues to be known as the "Heat & Power Show".

The Alexander Hall had to have an extension to hold the fifty-odd stands, which with the new decor, provided by the promoters W.H.C. Industrial Promotions Ltd., proved to be a setting for an attractive and successful exhibition.

Mr. Bob Jordan, Chairman of the Northern Ireland Section welcomed the Minister of State, Mr. David Mitchell who opened the Exhibition. The Minister congratulated the Institute on promoting the Exhibition and announced that Belfast was on the short list of cities from which one would be chosen for a C.H.P. scheme.

The exhibition had a slow start on the Monday but by Thursday the build up of visitors had stepped up to the point where stand holders were having difficulty dealing with the visitors.

All sections of the heat and power industry were represented with a special emphasis being made on energy conservation.

The fuel industry was represented with stands for L.P.G. by Calor, Ergas and Flogas. Solid fuel had the Nation Coal Board, John Kelly Ltd., while the Northern Ireland Electricity Service had their usual attractive stand.

The merchant trade was well represented with O.B.C. Ltd., Aerocrete Ltd., while Heating Controls & Devices Ltd. had one of the largest stands in the exhibition.

It was interesting to note the preponderance of solid fuel equipment on show. Glass fronted stoves and magazine boilers were to

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The Janitors are coming.

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Published by ARROW@TU Dublin, 1981
be seen on a number of stands. Adamwood Boilers Services Ltd. used their stand to present to the visitors their new connections with Saacke for whom they have been appointed Northern Ireland service agents and at the same time they had on display the new Saacke solid fuel industrial boiler unit.

I.E.S. Industrial (Ireland) Ltd. had a steady stream of visitors to inspect the new Hamworthy coal/oil burner which was on public display for the first time. It could be said that this exhibit was the highlight of the show.

Official bodies were represented by the Dept. of Commerce who drew attention to the new Coal/Oil Grant system and to their fuel efficiency service, while the Construction Industry Training Board let the training facilities they have available be known to a wide audience.

Insulation stands were for double glazing with Omaglass Ltd. and Viscount Double Glazing Ltd., house insulation was displayed by M.P.I. Ltd. and Strangford Insulation Products displayed their wide range of general products.

This Heat & Power was the fifth covering a period of ten years and it must be pleasing to the organisers to find that more than sixty per cent of stands were occupied by companies who had taken part in all five shows.

The fact that such a high percentage of exhibitors see their way to returning to Balmoral each year seems to answer the question as to whether it pays to take part in their shows, but on the other hand the Heat & Power has built up a special atmosphere of its own and this year was no exception.

Mr. David Penny, President of the Institution of Mechanical Engineers paid a three day visit to Northern Ireland. During the visit Mr. Penny visited a number of industrial concerns including De Lorean, Shorts, and Gallahers. He also visited the N.W. of the Province where he was received by the Mayor of Coleraine.

ULSTER NEWS

CONSERVE ENERGY WITH PENSOTTI

CAST IRON BOILERS – OIL, GAS OR SOLID FUEL

P4N Series – 90°/91° Efficiency Natural Draught

Outputs 690,000 - 1.7 million Btu/h
Virtually self-cleaning – unique design ensures minimum deposits
(for highest efficiencies, manufacturers recommend cleaning once a year).

The P4n is but one of a large range of Pensotti Boilers. Range from 88,000 Btu/h (25 Kw) to 2.8 million Btu/h (825 Kw). 88,000 Btu/h to 1.3 million Btu/h available ex-stock from heatmerchants

Heatmerchants (Athlone) Ltd.,
Deerpark Road, Athlone.
Tel: (0902) 2194, 4120, 4135.

Heatmerchants (Kilkenny) Ltd.,
Industrial Estate, Hebron Road, Kilkenny.
Tel: (056) 21209 (3 lines/)(0409) 5983, 5998.
Telex: 80068
Mr. Penny concluded his visit by attending the Branch Annual Dinner at the Conway Hotel which was presided over by the Chairman, Professor Gordon Blair.

Dr. Alan Marshall assisted by Dr. Copper both of Dearborn Chemicals addressed the Northern Ireland Section of the Institute of Energy on the subject of the “Treatment of Cooling Water”. In addition to dealing with the cause and cure of the fouling of cooling towers, the speakers also dealt with the treatment of cooling water for air conditioning particularly relative to the recent outbreaks of Legionnaires Disease.

Allaway Acoustics long established in the environmental field have appointed as Northern Ireland Agents the Environmental Supply Ltd. of Connswater Industrial Estate, Belfast. Allaway’s products include acoustic louvres, enclosures, duct silencers and anti-vibrating equipment.

Enquirers should contact Des Collins at Belfast 54429.

Modern Tool Energy Control Division, Belfast Road, Lisburn, have become appointed dealer and applicator for 3M energy control products. The Scotch tint films and blinds have been widely used in commerce, industry and homes for reducing heat transmission, glare and for safety.

In addition Modern Tool will be handling the new secondary glazing system developed by 3M. Highly efficient and at low cost Magnatherm fixing eliminates screws. Clear rigid panels which are easy to remove for cleaning are used and literally “click” back into place when required.

The Belfast Association of Engineers, the oldest engineering association in Northern Ireland, now in its 90th year has elected the following office bearers: President — J. Moore; Senior Vice President — H. George; Junior Vice President — W. Irvine; Immediate Past President — S. Ashmore; Honorary Secretary — Miss M. Crossland; Honorary Treasurer — W. Irvine; Committee Members: C. Hicks, W. Downey, T. Green, R. McKeown, G. Dickson, J. Blom, M. Cleeland, F. Henderson and R. Hewitt.

Aerocowl Marketing Ltd., 288 Newtownards Road, Belfast, have announced a new version of the Aerocowl combined flue terminal and ventilator. The new fixing.
system consists of a steel clamping ring which fits around the outside of the chimney by means of four fixing screws. A guard cage has also been incorporated to prevent birds entering the flue.

Springvale Polyproducts Ltd. in conjunction with Shell Thermocomfort Ltd. introduced to a gathering of architects, consulting engineers and Local Authority officials their new dry cavity wall insulation system. Two demonstrations were held in the Province, one in the Drumkeen Hotel, Belfast, and one in The Silver Birch Hotel, Omagh.

The Belfast Association of Engineers started their 91st year with a lecture by Mr. Zdenkovic of Camco Ltd. on the subject of "Gas lift as one of the artificial methods of filling oil wells".

The Glen Dimplex Group of Newry, Co. Down, manufacturers of electrical heating equipment and now one of the largest in Europe, has announced a joint venture with Burco Dean also manufacturers of electrical domestic products.

As a result Burco will transfer all manufacture of cookers and gas convectors, under licence to Glen Dimplex.

Glen, established in 1973 to manufacture electric radiators has had a steady growth and now with acquisitions has six manufacturing units in the UK and Ireland employing 1,200 people.

Disappointing results have resulted in a decision to stop drilling in the Geothermal well at Larne, Co. Antrim.

The borehole was part of a U.K. programme in the search for alternative energy. While hot water was found it was not sufficient in quantity or quality to warrant commercial development.

Mr. Eric Priestley has been appointed Managing Director of Cawoods the Northern Ireland solid fuel and oil distributors.

A call has been made by the Deputy Lord Mayor of Belfast for all those with the influence to use it to support the city's application to be considered as one of the cities for the development of C.H. & P.

Talks have been held with the N.I. Branch of the District Heating Association and other interested parties in an effort to present to the consultants and government bodies a strong case for this form of heating.

The Minister of State, Mr. Adam Butler, met the Belfast City Council to update them on the North-South gas link possibilities. It seems that talks are still going on and that it was impossible to give any indication of what was going to happen. However at least one councillor is talking very optimistically and the Belfast Gas Dept. have issued a note to their consumers asking them not to panic and to hold on for a little longer before making any firm decision.

Sermet (NI) Ltd., 11 Lisburn Street, Hillsborough, have become agents for the Beeston Boiler Co. (Successors) Ltd. Beeston, of course, have been famous for very many years as manufacturers of the
Robin Hood range of cast iron sectional boilers.

The British Gas Approval with Certificate AE1/81/21 have approved the latest model of the Aerocowl combined flue terminal and ventilator for use with gas fired boilers.

The Worcester Engineering Co. Ltd. have appointed Billy Harper as their new Northern Ireland sales and services engineer. Prior to joining Worcester, Mr. Harper was with the Nu Way Heating Ltd.

Over the last couple of years, Worcester have steadily been increasing their share of the Northern Ireland domestic boiler market both in the solid fuel and oil field.

In the National Energy Manager of the Year competition, Mr. Trevor Foster, Energy Manager at the B.P. oil refinery, Belfast, has received a special commendation. The scheme was a complex one of heat recovery to reduce the amount of fuel used in process heaters.

Test runs indicate that for a total capital investment of £550,000 an estimated saving of £381,000 per year giving a pay back of about 1 1/2 years with an estimated fuel saving in fuel fired of 23 per cent.

Quantity Surveyors McCarthy Lilburn & Partners have moved to Aldergate House, 13 University Road, Belfast, BT7, another mover being J. Clark & Partners who are now in 2A Park Drive, Bangor.

Senior partner John Neil of John Neil & Partners, Eglantine Ave., Belfast, has retired but will still be available to the practice in a consultancy capacity. The practice was founded some 20 years ago by John Neil.

Mr. Mitchell McDade becomes senior partner.

Barking Grohe have introduced a new range of lever action taps on a specially developed valve.

Full details are available from the local distributors Keartland, Robinson & Butler Ltd., 255 Lisburn Road, Belfast.
Andy Gallagher
Area Manager – S. Ireland
Thorn Heating Limited
Factory D2
Chapelizod Ind., Est.
Dublin 20
Phone: 264001
THORN
A member of The Them Group
Tel: (Home) 051-77166

D.C. Compute Air Ltd.
Air Conditioning Contractors and Complete Computer Room Outfitters
Telephone: 821765
Foxes Grove
Shankhill Co. Dublin
David J. Roome
Managing Director

R.S. WHITE LTD.
Brian W. Keating
MANAGING DIRECTOR
Water Treatment & Filtration Engineers
Heating & Cooling Equipment Supplies
Telephone (01) 693144
Telex 33301
The Crescent, Donnybrook, Dublin 4.

IBS IRISH BUILDING SERVICES LTD.
DISTRIBUTORS OF
Unitrust Support System
Linadapter Support System
Thresher Red
Cable Ladder
Cable Trays
Binder Test Plugs
Hit Clip Fastenings
Egraflex Pipe Suspensions
Sheet Cable Equipment
Holofib Metal Decking
Thorsman Fixing Systems
Pipe Clamps, Clips & Brackets
Dovetail Slot & Brick Ties

WALKER AIR CONDITIONING
Gerald Ross
SALES
Walker Air Conditioning Limited
Dublin Industrial Estate,
Finglas Road, Dublin 11.

clean-line REFRIGERATION LTD.
NOEL MAY
Managing Director
94 Meath Street, Dublin 8. Tel: 710776/317186

H.R. Holfeld (Hydraulics) Limited
2-4 Merville Road, Stillorgan
Dublin, Ireland, Europe
Telephone 01-952091 (24 hours)
Telegrams HOLFELD Dublin
Telex 24482EI, 25156EI

EDWARD D. CAHILL
Sales Manager
12 Waterpark Close,
Carraigline, Co. Cork
Tel. (021) 882113

Scanglo International Ltd.,
Newcastle West,
Co. Limerick
Tel. (069) 62277
Telex: 28101

Patrick G. O’Connor
Senior Technical Representative

HOLFELD PUMPS

et al.: H & V News

Published by ARROW@TU Dublin, 1981
An Ammonia Transfer Vessel manufactured by Whessoe (Ireland) Limited for Nitrigin Eireann Teoranta, Arklow. Design was to BS 5500 — 1976. The vessel is 2.7 metres diameter by 17 metres long. Design pressure 240 PSIG and test pressure to 368 PSIG.

Whessoe (Ireland) Ltd. Jamestown Road, Finglas, Dublin 11. Tel: 342222 Telex: 25496 WHSO EI
PRODUCT REVIEW: Storage Tanks and Pressure Vessels

Future Looks Secure

As the process of industrialisation gathers momentum in Ireland, energy consumption grows every year and the need to import more oil and LPG increases. This, balanced with the need to conserve energy in all processes from water treatment to the handling of condensate, calls for the use of energy efficient storage i.e., the use of materials with low thermal conductivity in the materials of construction and as insulation. Even our young natural gas industry will need vast amounts of storage facilities and this, together with the need to make us as independent as possible with large stocks of other fuels, will make the future of the tank and pressure vessel industry safe for some years to come.

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

Finheat

The choice of a suitable sectional tank is primarily dependent upon site conditions in relation to the volume of storage needed. The most economical tank is one constructed from plates 1,220mm sq. with flanges arranged externally.

Braithwaite sectional tanks are site bolted but they can also be welded site. Depths of tanks do not usually exceed four plates, but deeper tanks can be specially designed.

Tanks can be enlarged in length, width and depth as storage demands increase. Care must be exercised that foundations and supports are suitable for any additional loads that may be induced. The scope of Braithwaite sectional tanks can be increased by the use of special plates, baffles and division plates.

For the rare occasions when an externally flanged tank cannot provide a required capacity at a particular site, a tank with externally flanged side plates and internally flanged base plates or with internally flanged plates throughout can be supplied. Depths of tanks so constructed should not exceed three plates.

In addition to its obvious merits in relation to the configuration of tanks the sectional method of construction enables transportation costs to be kept to a minimum and for apparently uneconomic and unsuitable location to be efficiently utilised for the storage of liquids.

The standard shop finish for Braithwaite Tanks is one coat of non-toxic black bituminous primer, this is intended to protect the components during transit. It is essential that tanks and structures be painted as soon as possible after assembly.

Site painting is not always necessary for galvanised tanks.

Further information from Finheat Ltd.

Sermet

There is an ever increasing demand, for a simple means of providing bulk storage of water and other liquid materials. The pressed steel sectional tank manufactured by the "Horseley Bridge unit of NEI Thompson Ltd", is meeting this demand.

Since 1880 when their forerunners, Thomas Piggott & Co. Ltd. took out the original patent, the bolted and sealed plate tank, in its various modified forms, has long since become a standard form of tank construction which others have imitated, and has been supplied to most countries of the world.

Consisting of a basic 4' or 1 metre square bolted plate with stays and cleats, the sectional tank can be constructed to provide storage of fluids from 200 to over 1,000,000 gallons.

The unit concept aids batch production methods, keeping price and delivery within a competitive range. Plane, train, helicopter, ship, truck, camel or mule — the relative smallness and light weight of sectional tank components means that they can be transported by almost any method to the most inaccessible sites.

Components can be manhandled into a restricted tank room at the top of a building and assembled there, or lifted by simple or sophisticated means to the top of a structural tower to provide elevated storage, or built...
on the ground.
Once in position, the Horseley Bridge sectional tank can be assembled quickly and easily from simple erection instructions by unskilled labour using only hand-tools. The sectional tank can be extended, reduced in size or even taken down and re-used elsewhere.
Some alternative inplant treatment of plates and components includes galvanising, coloured nylon coatings, and epoxy resin painting. The use carefully chosen protective finishes reduces maintenance considerably and enhances general appearance. Details of these special finishes are available on application.
Because of its incomparable but simple bolted modular concept with its inherent advantages, sectional tank sales have continuously increased.
All materials comply with the latest amendments of British Standards BS 1564 — 1975 Type 1.
Further details from Sermet Ltd.

Hydro-Pac

Hydro-Pac Systems Ltd., manufacturer of tanks, copper cylinders and prefabricated plumbing packs, has just introduced two new cold water storage tanks.
Manufactured from high density polyethylene in accordance with BS 4213, both the Hydro Tank PR15 and PR16 have been designed primarily to overcome space limitations in modernisation and improvement projects.
Mounted on a galvanised steel supporting tray and supported with galvanised steel bands the PR16 has a capacity of 227 litres. Its unusually small base area (52cm square) makes it ideal for installation in confined spaces such as beneath modular kitchen units. The PR16 can be supplied with an 18 litre expansion tank for indirect heating systems if required. Its sister unit, the PR15, features a larger area (59cm square) but at 89cm is 18cm shorter enabling it to be sited where more head room is required. Feed capacity is 227 litres with an optional expansion capacity of 13 litres.
For further information, please contact: Hydro-Pac Systems Ltd., 100A High Street, Banstead, Surrey. SM7 2NN. Telephone No. Burgh Heath 59424/5.

Tank Engineering

Tank Engineering Ltd. are a recently formed Irish Company based in Dublin. Their main aim is to provide highly professional service and products to the Irish liquid and bulk storage and associated markets. They can provide the client with a complete professional service, from

A 250,000 Horseley Bridge pressed steel tank installed at a height of 90 feet for process water.

The PR 15 from Hydro-Pac Systems Ltd.
Whatever Your Liquid Storage Requirement
FINHEAT Has the Answer With
BRAINTWAITE Steel Sectional Tanks

Sectional Tanks
- Ability to store almost any liquid
- Adaptable to special requirements
- Reliable & Strong
- Easily transported
- Unlimited range of capabilities
- New protective finishes

Economical, easy to erect, dependable, versatile and strong the Braithwaite Sectional Tank has all these features and many more. If you have a liquid storage requirement call Finheat for a speedy answer.

Exhibiting at HVAC Show, Burlington Hotel, September 1st, 2nd.

FINHEAT LIMITED
17 Usher's Island, Dublin 8. Tel: 778109/778120/728431 Telex: 30751

EURENCO TANKS

Sectional water tank modular design. 1m x 1m and 1m x ½m panels. Erected by our own trained personnel.

Eurenc/Galglass liquid storage tanks. F.O.C. approved. Galvanised or glass lined. 13m³ cap to 700m³ cap in 84 different diameter/height combinations.

EURENCO SALES LTD
106 The Coombe, Dublin 8. Tel: 755557 Telex: 24147

Published by ARROW@TU Dublin, 1981
the completion of the civil works associated with tank installation right down to supplying all valves, hydrants, and piping.

Tank Engineering are the Irish agents for "Sunbridge Liquistore" the design of which provides tanks of capacities ranging from 40m³ (8,800 gallons) to 1300m³ (286,000 gallons). The standard range of tanks has diameters ranging from 3.82m to 15.28m and heights from 3.6m to 8.3m. Non-standard sizes of tanks are available to meet clients' special requirements.

"Sunbridge Liquistores" which are aluminium sectional tanks are fitted with an open top Butyl membrane bag fabricated from 0.75mm thick Butyl rubber of hot vulcanised construction, the properties of which make it an ideal material for the storage of water and many other bulk and liquid commodities, including effluent, most chemicals and acids and dry goods of various types. For sump liners, 1.50mm thick Butyl sheet is used when required.

Tank Engineering Ltd., 30/33 Market Arcade, South Great Georges St., Dublin 2, Tel: 712380 Telex: 30271.

**PRODUCT REVIEW: Storage Tanks and Pressure Vessels**

**Eureno**

Eureno 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 combination.

The tanks consist of a mild steel cylindrical shell of bolted construction, on a waterproof reinforced concrete base with a rigid type roof. The construction of the tank offers a useful advantage that the replacement of a damaged plate can quickly and easily be replaced, another advantage is that should the tank need to be relocated it can be dismantled and re-erected with very little damage to the panels, angles and ancillaries.

The construction of the tanks is carried out by their own experienced site personnel.

The 'Eureno' industrial tank has been designed to incorporate a modular system using metric sizes in common with EEC countries. The materials used are the most technically advanced glass reinforced plastics commonly known as S.M.C., precision manufactured in matched metal tools. The S.M.C. is compression moulded at high pressure and under

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*An Ammonia transfer vessel manufactured by Whessoe (Ireland) Limited for Nitrigin Eireann Teoranta, Arklow. Design was to BS 5500 — 1976. The vessel is 2.7 metres diameter by 17 meters long. Design pressure 240 P.S.I.G. and test pressure to 360 P.S.I.G.*

[Image of a storage tank with the text: "EURENO"]

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Exhibiting at HVAC Show, Burlington Hotel, September 1st, 2nd.

FINHEAT LIMITED
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Agents in Ireland:
Burlington Engineering Ltd. Unit T4, Stillorgan Industrial Park, Stillorgan, Co. Dublin. Tel: (01) 952193

Published by ARROW@TU Dublin, 1981
closely controlled temperature conditions and offers an accurate and consistent product with properties unequalled by hand or spray laminating processes. The panels U.V. stabilised and pigmented to pale blue/grey to BS 5252 18 B 19, require no maintenance or special protection, and therefore are not subject to the damage that results to painted or plastic coated steel tanks during installation. The modular design incorporates two sizes of panel, one metre square or half by one metre. Fixing is by bolting externally or internally. If externally bolted the tanks can be erected in confined space provided 500mm is allowed around the outside of the tank. The shape of the completed tank can be infinitely varied although, in general, the two metre deep tank offers the most economic installation. Tanks may be installed on plinths, piers, underground, lofts or towers. If necessary erection staff are available from Eurenco. Further information from Eurenco Sales Ltd.

PRODUCT REVIEW: Storage Tanks and Pressure Vessels

* The Eurenco Galglass tank.

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Flow chart diagram showing liquid to water plate heat exchange.

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Coal Distribution

We recently examined the supply situation with regard to coal supply and we gave a rough outline as to the influence on the Irish coal scene of Coal Distributors Limited. We saw how their influence extends way beyond their Dublin base. We noted that they have shareholding in distributing companies in all the major cities and towns in the 26 counties.

CONTROVERSY

There has recently been some controversy over C.D.L. and the orders of the Prices Commission, but in the meanwhile, how is the normal Joe Soap getting his coal and has it any bearing on the present row, the answer is yes.

The basic structure of the coal trade has remained unchanged over a period of many years since the last majority of coal consumed is imported the main firms are naturally located at sea ports. Coal importing is carried on in twelve different ports around the country. Two ports in Northern Ireland, Derry and Warren Point also supply the Irish market. The two main ports of importation are Dublin and Cork and between them account for an excess of 60% of total imports. The channels of distribution take the following form:

Bellmen are generally small one lorry operators who get their supplies from the importer and then deliver to their own customers. The usual procedures tell the bellmen to go to the importers yard to take delivery of his coal. There are 100 bellmen who are members of the Coal Suppliers Association. Bellmen are very much dependent on the importers who supplies. In times of scarcity the importers give preference to supplying their own domestic customers first. With the result that the bellmen cannot supply their customers. The position of bellmen in the market varies throughout the country. There are few bellmen in Cork whereas in Limerick they are very important, in Galway there is to our knowledge, only one bellman. All importers to a greater or lesser extent deliver coal direct to the domestic customer. In Dublin this forms 28% of C.D.L.'s business. In Cork deliveries account for an average of 30% of the importers business.

DIRECT DELIVERY

Wholesalers take large quantities of coal from the importer and they sell to retail distributors, bellmen, retail outlets and on a delivered basis to final customers such as domestic users and industrial concerns. Some wholesalers have their own bagging plants and supply retail outlets with the small pre-packaged bags of coal. Retail outlets, such as supermarkets co-op stores, hardware stores are involved in the retailing of small pre-packaged bags. Small supermarkets in the poorer area of Dublin and in flatland have large volume sales of coal. The residents of these areas cannot afford to or have not the space for large amounts of coal and therefore find these outlets very useful. Importers sometimes sell to other importers, this can happen when an importer runs short of stock. Some firms who are classified as importers but only import part of their requirements are also supplied by other importers.

In the most recent National Prices Commission Report (No 109 Aug/Sept '81) CDL and the Prices

CONSOLIDATION

Commission seem to have settled their differences with the proviso the NPC will monitor bellmens prices but what ever distribution and pricing structure is settled with the Cork-Dublin gas pipeline on its way, the Dublin coal trade have another winter or two to consolidate its position in the domestic heating market. The industrial sector is a more long term objective and will take a number of years to see the fruits of any effort put in by CDL's industrial dept. over recent months.

MULTI SOLID FUEL DESIGN COMPETITION WINNERS

The winners of the Multi Solid Fuel Stove Design Competition organised by the National Board for Science and Technology on behalf of the Department of Industry and Energy, have been recently announced.

There were two categories, 1. closed inset stove, and 2. stove with no size limitations. Joint winners of category 1 were Bob Couchman of Multi Fuel Heaters Ltd., and Nick Marchant of Kilkenny Design Workshops, each received a prize of £2,500. Nick Marchant also won joint 1st prize for category 2 with Brian Stephens of Metcalfe and Associates they both received £2,500 as their prizes.

The runners up received prizes of £1,000 in each category, they were Aynsley Brown of Wavin Pipes and Eamonn Byrne of SIM TEO.

H&V News hope to have full details of each of the winning designs for our next issue.

H&V News November 1981
NEW PREMISES FOR HRP WALKER

• Discussing the range of Iseon compressed gases were (left) Jim Anderson, Managing Director, Walker Airconditioning Ltd. and Brian Delaney.

• Tony Madden (left) HRP Walker talks to Frank Marden of Ranco about the control range available for heat pumps from Ranco.

• Our picture shows (L-R) Brian Hunter, General Manager of the HRP Walker Division of Walker Airconditioning; Richard Alger, Marketing Director, HRP Walker; and David Watts, Marketing Manager, Searle.

• Garry Holmes discussed the Robinair range of special service tools with Geoff Adams of Robinair.

The HRP Walker Division of Walker Air Conditioning Ltd. have recently moved their Dublin base to new premises in the Dublin Industrial Estate, Glasnevin. We present here a pictorial report on the reception given on the day of the official opening.
Froling—a hot little number that will burn just about anything.

The slim, elegant Froling is ideal as a domestic, commercial or consumer central heating boiler.

The Froling has a relatively small appetite and will consume just about any combustible material, including refuse...and give off big heat and big advantages.

A single-chamber down burning system which contributes to greater heat efficiency.
Top loading for safety and convenience.
A design that’s kind to the environment.
A burner that gets rid of waste and refuse, while giving off big heat. Ideal for Industrial and Commercial use.

Don’t just take our word for it. Call into Thermo House and see for yourself.

Froling—the neat little boiler with big advantages.
Generating Your Own Electricitv with Small Water Turbines

by P. Belton, Managing Director, Belton Engineering Co.

I believe that there are thousands of small hydro sites in this country, the most obvious being the old corn mills. The advantage of these sites is that the civil engineering work has already been done, all that remains is to clean up existing head and tail races. In passing I would like to pay tribute to the remarkable work done by the old millwrights.

There is another large group of sites which the old millwrights were unable to exploit — I refer to the small stream flowing down a hillside (it might have a 'head' of 30, 50 or 100 feet). It was not practical then to construct a water wheel large enough to take advantage of the 'heads', but now you can lay the turbine pipe-line up the hillside and it is possible to get considerable power from very small volumes of water.

MAJOR OPERATION

The third group of sites are those of the large rivers. These are mostly 'low head' sites (5-10 ft). For example, at Tarmonbarry — between Longford and Roscommon — there is a naviga­tion wier on the river Shannon. The head at this wier is 7ft 10ins. If there were series of low head turbines installed here each m$^3$ per sec. would produce about 25 H.P. Of course this is a job for the E.S.B. Now that I have mentioned the E.S.B., I would like to make some comments about their work in this area. At the moment they are engaged in carrying out surveys on the large rivers with a view to hydro development. This is a very time consuming operation because flow measurements and levels have to be taken over a prolonged period. All this information must be accurately recorded, the potential of the site is then evaluated and decisions taken. It must be appreciated that the carrying out of these surveys throughout the country is a major operation.

I would also like to point out that the E.S.B. are prepared to buy current from private individuals whose sites have a potential of over 15 kW. They would of course specify the generator to be used and give any advice needed.

If a person has a site with a potential of over 15 kW he can get helpful advice from the E.S.B. on how to develop it. From my experience, I can honestly say that in the field of hydro development the E.S.B. are definitely playing a large part and are to congratulated on their efforts.

I am often asked 'What power can a turbine produce'? This is a question which is difficult to answer, because the power of a turbine depends upon the potential of the site, where it is installed, volume of water and 'head'.

In any small hydro development, by far the most important element is the potential of the site, because you can always get a turbine but you cannot always get a site. Therefore, if you have a suitable site, it is a very valuable asset.

SEQUENCE OF EVENTS

I would like to outline the sequence of events leading up to the sale of a turbine. A potential client writes to us stating that he has a site and asking the price of a turbine. Our reply would tell him how to measure the width, depth and velocity of the stream and 'head' available. He would also have to state if the bed of the stream is smooth or stony. When we receive this information we can calculate the shaft power available on the site and the price of the turbine. If the site had a head of 30 ft. and a flow of 2 C.F.S., this would produce a shaft power of 5 H.P. approximately. The price of the turbine erected in correct elevation in the clients prepared site, would be £700. If he is interested, I would make an appointment and inspect the site — one must examine all the features of the site and check if the client has taken full advantage of the potential head. When the deal is concluded sketch plans will be drawn up showing the work involved in developing the site — the client will then undertake this work — while we commence work on designing and building the turbine. We then deliver the turbine and place it in the correct position on the site very important, because with the impulse turbine the runner must be placed above tillower level. The client will now complete the concrete work. Three weeks after this work is completed (when the concrete is set). We then commission the turbine — this is a crucial time — it is the moment of truth — because if the turbine does not produce the 5 H.P., you have failed, and if it does you...
have succeeded. You will see from the foregoing that the sale of a turbine is a very involved operation. It is an operation where one's judgement is always 'on the line', one which will tolerate no mistakes — if you make mistakes you have to pay for them.

You will note from the foregoing that the actual building of the turbines represents only about 50% of the work involved. There is an ongoing relationship between the client and manufacturer. If at any time the client has problems he should be able to get free advice from the manufacturer.

We would prefer it if an electrical contractor undertook the job of installing the generator, wiring and changeover switch. We would of course, co-operate fully with contractor.

INTERESTING FACTS

I would like to draw your attention to some interesting facts about water turbines:— A water turbine unlike an internal combustion engine — will take no overload. If a turbine is over-loaded its rev and output will drop.

If a client had a site with a 40 foot 'head' and he wanted a 50 H.P. turbine that would take a 10% overload, he would in fact require a 55 H.P. turbine. There is no such thing as 100 H.P. turbine. But there is such a turbine as a 100 H.P. turbine on a 50 ft. head. It would take approximately 24 C.F.S. and it would have a definite size and shape.

For example a small Pelton wheel operating on a 1000 ft. head and taking approximately 14 C.F.S. would give 100 H.P. A spiral cased 'Francis' turbine operating on an 80 ft. head and taking approximately 15 C.F.S. would give 100 H.P. A low head open type vertical 'Francis' operating on a 5 ft. head and taking approximately 240 C.F.S. would give 100 H.P. (68 D). All the above are 100 H.P. turbines but they are completely different; for example, the 100 H.P. Pelton wheel could be 5 cwt. while the low head 'Francis' could be 5 tons weight. So for a given H.P. 'the higher the head the cheaper the turbine — the lower the head the dearer'.

I would like to say a few words about calculating the potential power of a stream.

Select a point on the stream where its width and depth are fairly regular, here measure the width and depth and note if the bed is smooth or stony. At the same point mark out a distance of say 20 ft. along the bank, then throw in a marker upstream (a bottle half full of water) check the time it takes the marker to pass the measured 20 ft. you can then calculate the speed of the stream in feet per second.

The volume is calculated as follows:-

| Width of stream | 5 ft. |
| Depth | 1 ft. |
| Bed smooth velocity | 2 ft. per sec. |
| 5' x 1' | 5 sq. ft. |
| 5' x 2' | 10 cubic ft. |

To allow for friction losses on the sides and bed of the stream, you multiply by a factor of 8 for a smooth bed or .6 for a stoney bed e.g. 10 x .8 = 8 cubic ft. per second (C.F.S.)

If you found that the 'head' available was 15 ft. and you had calculated the flow at 8 C.F.S. The power is then calculated as follows:-

Total power of site — WQH

Where:-

W — weight of water per cubic ft | 62.3
Q — number of cubic ft. per sec | 8
H — Head in feet | 550 lbs per sec | 1 H.P.

Therefore:

62.3 x 8 x 15 - 13.59 H.P.
550 — 100% 

As the efficiency of small turbines is 70%-80% we multiply this figure by .75

13.59 x .75 — 10.19 HP

This means that the power available from a turbine on this site would be approximately 10 H.P. When you allow for losses in the generator and belt drive the output in kW is about ⅔ of the shaft H.P. of the turbine. Therefore a turbine output of 10 H.P. would produce slightly over 6½ kW.

FINANCIAL ASPECTS

The price of our Crossflow turbine suitable for this site would be £1,200. A generator should cost approximately £500. The site work, wiring and miscellaneous expenses about £1,300. Total £3,000. This would be an installed kW cost of slightly less than £500.

One kW (24 kWh) is worth about £1 per day, 6½ kW is worth about £6.50 per day. The stream should be able to maintain this output for about 200 days of the year, therefore, the unit should produce about £1,200 of electricity per year, this would mean a 'payback' period of 4-5 years.

The average 'pay back' period of a small hydro plant should be 7-8 years. The cost per installed kW depends upon the site:- High head - low cost; Low head - high cost. If the cost per installed kW is going to be more than £1,000, it might be advisable to reconsider the project. I believe the Government should be asked to give some assistance towards the capital cost of native systems (Solar, Wind and Water). It could be done by way of grant or interest free loan.

We can build a range of 'Crossflow' turbines with rotor widths from 3 ins to 36 ins, they are fitted with manual control. Our 24", 30" and 36" models have dual chambers. Each chamber has independent manual control. The current price range is from £700 to £2,500.

For heads of over 25 ft. the standard unit would have to be modified by fitting heavy duty rotor and shaft pressure gauge. This would involve some increase in price.

Travelling around the country I have noticed that more than 50% of the potential sites are 'low head' sites i.e. 4 ft. to 10 ft. As you know the vertical open type 'Francis' turbine is suitable for these sites. They are normally controlled by a set of movable 'guide vanes'. This arrangement requires a considerable amount of linkages and stay bolts.

We have developed a 'control' system which employs alternative fixed and movable guide vanes. This development is covered by Provisional patent (Fire no. 1204/80 — Irish Patents Office). This development means that the turbine can be made from mild steel, using the steel fabrication method. The alternate fixed 'guide vanes' are welded in position, this gives a very strong structure. By using alternative movable guide vanes you reduce linkage parts by almost 50%. This raises the possibility of using a mechanical governor. At the moment I am looking for a suitable site for this turbine or enable engineers to carry out tests upon its efficiency, characteristic curves etc. If these tests are satisfactory this turbine would have a great potential because geometrical similar turbines could be built up to quite considerable H.P.'s.

I will conclude by stating that I believe that people today know less about water power than their ancestors knew sixty years ago. I believe something should be done to remedy this situation.

IHVN, November 1981
BTU GOLF

Burmah/Castrol BTU outing at Hermitage

Hendrons outing at Newlands

• Declan Hughes, Pat Kavanagh and Paddy Walshe at the Hendron golf outing.

• Presenting a decanter to Paddy Walshe (left) at the Hendron Bros. golf outing at Newland GC were Vincent Hendron (right) and Michael Hannon.
Pipe Clip Range from Thorsmans

Thorsman & Company Limited, leading specialists in trunking and fixing systems, are now marketing a full range of pipe clips. Three types of clips are available — Microbore, Snap-on and Hinged.

The Thorsmans range of pipe clips is designed to provide a strong and dependable fixing for pipes from 8mm to 28mm diameter. Made in strong polypropylene, they will withstand high pull-open loads and temperatures up to 100°C.

The Thorsman Microbore pipe clip is unique in that only one clip is required to fit 8mm, 10mm and 12mm heating pipes. Larger diameter piping is offered the choice of snap-on and hinged pipe clips, both designed to fit 15mm, 22mm and 28mm copper tubes.

By introducing these additional pipe clips, Thorsmans are following their policy of offering a comprehensive range of high quality fixing products.

Zone Control Valve

Investment is numerically controlled machine tools and subsequent improvements in production techniques are allowing Satchwell Control Systems to reduce the trade price of their Zonemaster controller for terminal units. This, coupled with the introduction of a 4-port valve giving a substantial saving in installation cost, makes the Zonemaster one of the most cost-effective zone controllers on the market.

Zonemaster, an electronic proportional control system for terminal units, is suitable for application with almost any type of air conditioning system, for example, fan coil, induction and VAV units, and dual duct mixing boxes. Now the end user can have a lower cost modulating controller which gives accurate control of zone temperature and therefore more comfortable surroundings. There is the additional benefit that the more accurately the temperature in an area is controlled, the less energy will be needed to maintain a comfortable level.

Zonemaster incorporates a comprehensive range of controllers, detectors for room temperature and pressure, auxiliary units for two step control and system override functions. The range also includes control valves and damper actuators.

The adaptability of the Zonemaster system has made the product particularly attractive to the overseas market, which has so far absorbed the majority of Satchwell's output. Another selling point is the long stem and plug travel of the 2-port and 3-port valves already available within Zonemaster; the new 4-port valve incorporates a bypass balancing restriction which will give improved system regulation and also has the same long (0.375 inch (¾ inch)) travel as the other valves, so that there is minimal risk of blocking by foreign bodies. In most cases this gives another bonus, in that only one strainer is needed per circuit, and not one per valve, as is frequently required if valves with a shorter plug travel, and therefore smaller orifice, are used.

Further information from John Coffey, Satchwell Control Systems Ltd., 20 Store St., Dublin 1, (Tel: 724926).

Indola Humidifier

When the air your breath is too dry you feel it. This can readily occur in the winter when the central heating is on and it is cold outside. Modern houses are well insulated, may have double glazing and then the central heating is liable to result in air which has insufficient moisture for comfort. This dry air will draw moisture from plants, furniture and, yes, from you. This leads to a feeling of discomfort, dry throat and a feeling of loss of moisture.

The Indola LB-21 humidifier sees to that the air in living or bedrooms does not become excessively dry. It uses the cold evaporation principle. With this method a fan draws air through a filter mat which is kept moist and the air is thus humidified. The built-in quiet fan then blows it out into the room through the top of the machine. An important advantage of doing it this way is that overheating is impossible and the air will not actually take up more moisture than a certain maximum percentage. By contrast there is no such control with machines that use the heat evaporation or the atomising type humidifier. With cold evaporation there is no visible vapour and there are no chalky deposits on the furniture. It is also very economical to operate and will run for 100 hours on one battery.
NEW PRODUCTS

kilowatt.
A humidifier must be quiet and the LB-21 is almost silent. Although so quiet the machine is quite powerful and will cope with rooms up to 90 m$^3$ in size.

Technical Data
Capacity: for rooms up to 90 m$^3$;
Voltage: 220 - 240 V 50 Hz
Current Consumption: 10 watts
Height: 185 mm
Width: 260 mm
Depth: 260 mm
Colours: Brown, black and white satin finish

The Indola LB-21 has been designed to make refilling easy. The water tanks is detachable so you can take it to the tap. This eliminates the risk of spilling water on carpets and floors when the machine needs to be topped up.

Further information from Irish Industrial Supplies Ltd.

Take a Bath in Paris
The Paris from Heatons brings to the bathroom a new standard of luxury styling at an economic price.

Designed for to-days bathroom, the Paris is the perfect choice for either new installations or for modernising an existing bathroom.
The Paris takes a fresh look at bath design, and its original lines are more than just decorative. The gently sloped back rest provides comfortable support for the bather and the elegantly fluted shelves hold the soap conveniently close to hand. The twin grips are available in chrome or gold plated and they are specially formed to provide a safer grip for wet hands. The graceful counter top at the foot of the bath offers luxury tap hole options not usually available on the standard sized baths. Left or right hand tap holes or special drillings for three piece bath mixers can be supplied to special order. Baths will be supplied with two centre tap holes unless otherwise specified.

Air Damper Motor
Landis & Gyr recently introduced an air damper motor with a reversible synchronous motor, type SQN10. They have been designed for use with oil and...
gas burners of medium capacity.

The air damper motors are especially suitable for use with oil burner controls type LAL and gas burner controls type LFL, from Landis & Gyr, as the limit and auxiliary switches of the motors are prewired for checked air damper operation.

All the components of the motor are mounted on a robust base plate and are protected from dust and water by a sealable black plastic cover. The driving spindle is provided with sinter bronze bearings.

A marking on the rear face of the driving spindle is visible through the cover and serves as a position indicator. The damper position can be seen when the motor and the damper have been correctly connected.

Solar Heat Application Controller

The E38-5000 is an electronic controller designed to activate or de-activate an electrical circuit when a temperature difference exists at two points in a fluid circuit.

A typical application for this control is on a solar heater, sensing the temperature at the collector and at the water storage tank. When the collector temperature exceeds the storage tank temperature by a preset figure, typically 5°C, an electrical circuit is energised, thereby activating a circulating pump thus transferring solar heat into the water storage tank.

The E38-5000 is the forerunner of a series of controls by Ranco for the solar heating industry.

DC ComputeAir

D.C. Compute Air Ltd., have launched there new chiller range on the Irish H&V trade. These units were originally designed for use with three close control air conditioning system and range from 10-84kW. All chillers also have the capacity to produce hot water at 65°F at no extra cost. All units are available in aircooled or watercooled versions.

D.C. Compute Air are also introducing a new range of heating and cooling coils and condensers. These produces have now been added to the production line of the Hiross factory in Ireland. D.C. Compute Air Ltd., who are their sole distributors see a good future in these markets.

For further details please contact D.C. Compute Air, Foxes Grove, Shankill, Co. Dublin.

Trianco TGC anthracite gravity feed commercial/industrial hot water boilers

5 models-90 to 265kW
(300,000 to 900,000 Btu/h)

Trianco gravity feed boilers have the most efficient and economic means of extracting optimum energy from anthracite. The fuel automatically gravitates to the fire bed — the fire literally feeds itself — and the burning rate is governed by a thermostatically controlled forced draught fan which rapidly brings the fire to maximum burning rate when full output is required. When demand is satisfied, the fire idles under controlled natural draught.

The TGC range of commercial gravity feed boilers is the latest in the long line of Trianco solid fuel products and continues the tradition of economic and reliable units engineered to the standard and quality for which the company was granted the Royal Warrant.

Full details from Sole Agents

JOHN KELLY LTD.

AGENCY BRANCH

23 Station Street, Belfast, BT3 9DA.
Tel: 57481 — Telex: 74644

Published by ARROW@TU Dublin, 1981
An open day was recently organised at the Hiross Millex factory at Drogheda. This was the first time that the factory was opened to the trade and was a special occasion as the manufacturing processes are unique and are a closely guarded secret. The purpose of the visit was to establish Hiross as a market leader and to highlight that it is a local manufacturing company involved in air conditioning equipment and heat pumps.

On the day of the visit to the factory a coach was laid on from Dublin for those attending the function and brought them back on the return journey.

The sole distributor of Hiross products is D.C. Compute Air Ltd. and a network of local agents is now being set up throughout the country. In Dublin Temprite Services Ltd. and Redbro Ltd. are the local agents while in Cork Staunton Refrigeration look after Hiross interests.

The main topics of the day were heat pump applications and the complex applications that Hiross equipment is ideally suited for. The Hiross factory covers 60,000 sq. ft. and had been built with future development in mind as the company not only supply the home market from Drogheda they also supply the other seven Hiross factories with certain equipment.

One of the most recent developments that Hiross has been associated with is the 'Super Saver' energy conservation system. It is said to save 70% of the normal running cost of an air conditioning plant by closely monitoring the required amount of energy and then only supplying what is needed. There are three units being utilised by the IIRS under the direction of Jim Lennox and results so far come up to every expectation.
Natural Gas and the Domestic Heating Contractor

by Tony O'Leary, M.Sc. Applications Engineer, Dublin Gas Co.

The impending arrival of Natural Gas in the Dublin area is of major significance to the Domestic Heating Contractor, as it foreshadows the introduction of new heating equipment and new work practices, but in return, offers new opportunities for the expansion of the Contractor's business. The purpose of this paper is to highlight the principal changes Natural Gas will bring to the Domestic Central Heating scene from the Contractor's point of view and to assist the Contractor in preparing for these changes.

Natural Gas Compared with Towns Gas
The composition and characteristics of towns gas and natural gas are given in Appendix 1. To the contractor, the most significant differences are likely to be:

- **Calorific Value**
The C.V. of Kinsale Natural gas is more than twice that of G5 towns gas. Hence for a given thermal input to an appliance the gas supply pipework may be smaller than that for towns gas. Pipe-sizing tables, abstracted from BS: C.P. 331: Part 3: 1974 may be used for sizing natural gas or towns gas supplies. It can be seen that for the same pressure drop (0.4" w.g.) a boiler with a thermal input of, say, 100,000 Btu located about 60 ft. from the gas meter, would require a 1" gas supply for towns gas but only a ¾" pipe for natural gas.

- **Dryness**
Natural gas is supplied dry, therefore provision for the collection of condensate is not required. However, as the existing mains "dry out" dust particles will be more easily entrained in the gas stream. To prevent damage to valves etc., filters will be required. Filters may be installed by Dublin Gas at the meter but, if this is not the case a filter should be installed at the boiler. The filter should trap particles greater than 250 microns.

- **Pressure**
Natural gas appliances are generally designed for higher working pressures than towns gas appliances (5-8 in w.g. N.G., 1½ - 3 in W.G.T.G.) although some very recent natural gas appliances have been designed for lower pressures (2-3 in w.g.). All appliances must be adjusted to the manufacturer's stated pressure.

- **Combustion**
The combustion characteristics of Natural Gas are significantly different from those of towns gas.

- **Air Requirement**
For the same thermal input, a natural gas appliance will require about 10% more combustion air than a towns gas appliance.

- **Limits of Flammability**
Natural gas will only burn in a concentration of 5-15% gas in air, compared with 4-40% for towns gas. Hence the need for close control of primary and secondary air.

- **Light-back and Lift-off**
Natural gas has a lower flame speed than towns gas therefore natural gas burners were originally designed to prevent the occurrence of lift-off, while towns gas burners were designed to prevent light-back. Most modern burners will operate on either gas provided the gas pressure and injector size are to the manufacturer's specification.

Products of Combustion
Appendix 2 shows the air requirements and products of combustion for towns gas and natural gas. As may be seen the principal differences lie in the combustion air requirements and the water vapour contents of the flue gases.

The lower water vapour content of natural gas flue products results in a slightly lower dew point than for towns gas products. Towns gas as presently distributed contains only traces of sulphur (0.15 P.P.M.) (as does natural gas) hence acid deposition by condensation is not a serious problem now, nor will be in the future. It is interesting to note that appliances are now being developed in which the water vapour in the products of combustion will be allowed to condense, and the remaining flue gases discharged at close to ambient temperature, hence yielding a substantial increase in overall thermal efficiency. This is only possible because of the absence of sulphur in the flue products.

However, condensation in the flues from conventional appliances is, at best, a nuisance, and should be avoided.

Work Standards
Because of the impending arrival of natural gas, Dublin Gas has been taking a fresh look at its installation standards and are revising them where necessary. Our principal sources for references are the Draft Building Regulations, British Standards Institution, IIRS recommendations, The Institution of Gas Engineers and, where appropriate, British Gas recommendations. Taken with our own experience, the resultant Dublin Gas Codes of Installation Practice set a reasonable standard for satisfactory installation of all gas appliances. Set out below are those provisions likely to be of interest.

### Typical Composition of Gas as Presently Distributed

<table>
<thead>
<tr>
<th>Constituent</th>
<th>CO₂</th>
<th>CO</th>
<th>H₂</th>
<th>N₂</th>
<th>CH₄</th>
<th>C₂H₆</th>
<th>C₃H₈</th>
<th>C₇H₈</th>
<th>C₉H₈</th>
<th>CnHₘₙ</th>
</tr>
</thead>
<tbody>
<tr>
<td>% by Vol.</td>
<td>17.9</td>
<td>4.8</td>
<td>60.4</td>
<td>2.0</td>
<td>5.7</td>
<td>3.9</td>
<td>1.0</td>
<td>0.16</td>
<td>4.14</td>
<td></td>
</tr>
</tbody>
</table>

### Calorific Value

- Gross 17.9 MJ/M₃ net 15.73 MJ/M₃.
- Relative Density (Air = 1) — 0.57.
- Wobbe No. 24.03 MJ/M₃. Weaver
- Flame Speed Factor — 43.6.

### Appendix 1

<table>
<thead>
<tr>
<th>Constituent</th>
<th>CH₄</th>
<th>C₂H₆</th>
<th>C₃H₈</th>
<th>CO₂</th>
<th>N₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>% by vol.</td>
<td>99.4</td>
<td>0.2</td>
<td>0.1</td>
<td>0.1</td>
<td>0.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CV gross</th>
<th>39.2 MJ/M₃. CVnet 35.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>MJ/M₃</td>
<td>S.G. 0.58. Wobbe No. 49.8</td>
</tr>
<tr>
<td>MJ/M₃</td>
<td>Flame Speed 0.36 M/S.</td>
</tr>
</tbody>
</table>

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to affect the domestic heating contractors working methods. Central Heating Appliances
Where possible, Dublin Gas prefer to see room-sealed (balanced-flue) appliances installed, as problems with condensation, downdraft etc., are immediately avoided. An obvious exception to the preference for room sealed appliances is the gas-fire/back boiler combination.

Before installing any appliance it is advisable to check with the supplier that the appliance has been approved for use on natural gas by a recognised body (Watson House, D.I.N., N.F. etc.) and is set up to burn natural gas. Appliances supplied or approved by Dublin Gas will have been tested by ourselves, in addition to holding other recognised approval.

Location and appliance and flue.
The following locations are not permitted:
Any appliance in a garage, or under stairs (unless it is in a separate fireproof compartment with no access or ventilation from the garage or stairs and with access and ventilation from outside.
Open-flued appliances in bathrooms, bedrooms, bed-sitting rooms or any space containing a shower or bath.

A room-sealed appliance may be fitted in any internal space, provided the requirements for the location of the terminal are met (see next paragraph). Openflued appliances may be fitted in toilets or cloakrooms provided ventilation is supplied from the outside air.

Balanced flue terminus should be located on a clear expanse of wall, not less than 2 ft. from any corner, and at least 1 ft. below any openable window. Where a balanced-flue terminal is located less than 2 ft. beneath a plastic gutter, the gutter should be protected by an aluminium strip 5 ft. long. Terminals located less than 6 ft. above the ground should be protected by a suitable wire guard. Uninsulated external open-flue pipework should not normally exceed 15 ft. in length. The flue pipe diameter should normally be the same as the flue outlet connection at the appliance. The flue should terminate 3 ft. above gutter level, and not within 10 ft. of any operable window at the same level.

The suitability of any compartment for the installation of any appliance should be checked with Dublin Gas before installation of the boiler.

Conversion of Existing Boilers
Conversions should be treated as new installations regard to location of appliance, flue, etc. This means that if an appliance is fitted in a location that is not permissible for a new appliance it must not be converted to gas firing unless modifications are made such that the location, flue, etc., meet the requirements for a totally new gas installation. For example, it is not permitted to replace an oil-fired burner fitted to a boiler in a garage by an equivalent gas fired burner unless the boiler is enclosed in a compartment as specified in first paragraph of Location of appliance and flue section.

Heating Systems
Conventional Systems
For conventional small-bore and micro-bore systems there is little to be said that the Contractor does not know about, other than that where the system incorporates reasonable standards of safety and efficiency Dublin Gas will provide a connection, if gas is available in the vicinity.

Dual Boiler Installations
A recent arrival on the central heating scene is the dual boiler system, usually incorporating a wrap-around solid fuel boiler with an oil-fired boiler. The principal feature in the interconnection of a gas and solid fuel wrap-around boiler is the provision of dual cold feeds, open vents, cylinder coils, pumps and isolating valves to ensure safe operation of either or both boilers. This is the arrangement Dublin Gas prefer for the installation of a gas boiler, or the replacement of an oil-fired boiler, for use in conjunction with a solid fuel boiler.

Where it is required to replace a wrap-around boiler without the installation of a second boiler the simplest solution is to install a firefronted gas-fired backboiler.

Note that where an external chimney or a chimney located on the outside wall of a house is used to flue a boiler a chimney liner may be required. The market for Natural Gas Central Heating.
The Present Position
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to make itself felt through increasing Naphtha prices and resulting in escalating gas prices, to such an extent that the number of new houses being equipped with town gas central heating is small. One area where town gas still finds a ready market is in private flat developments where the absence of fuel storage problems associated with other fuels enables the present fuel cost disadvantage to be overcome.

**The Position in 1991**
The rapid growth of the city linked to the competitive price at which natural gas is expected to be sold leads to predictions of a six-fold increase in current gas sales by 1991. The domestic central heating market will play a major role in this expansion. Large-scale penetration of both the new housing and existing housing sectors are expected to result in the present number of gas-fired central heating units being increased by a factor of four. In summary, the number of gas-fired central heating units installed in the 1980's will run into tens of thousands.

**Central Heating Appliances**
The market for gas central heating appliances can be divided into three areas:-

(i) Conversion of existing systems to gas firing.
(ii) New systems in existing houses.
(iii) New systems in new houses.

Conversion of existing systems
Basically there are two types of systems to be converted, (a) wrap-around boilers and (b) free-standing oil-fired boilers.

Wrap around boilers can conveniently be replaced by gas fire/back-boiler systems. The popularity of gas fires some years ago suggests that a considerable number of people are prepared to forego the pleasure of an open fire for the convenience of a gas fire. The greater output of a gas-fired back-boiler (40,000 Btu/h) enables further use of the heating system to be achieved than with a wrap-around boiler. This should be an incentive to convert, as should the possibility of the introduction of complete automatic control of the system. Conversion of oil-fired boilers with pressurised burners is also a relatively simple matter, provided the boiler is in a suitable position and conversion in situ is permissible. However, the boiler manufacturer should be consulted with regard to the suitability of a particular gas burner and in all cases the gas burner should be approved by a recognised Approvals Body. Dublin Gas have completed some tests on a converted welded steel oil boiler, and found that there were only marginal changes in boiler combustion efficiency and output.

Where it is not possible to convert a boiler because of its location, the boiler will have to be moved. If this is not feasible, because of costs, suitable flue location etc., an alternative might be to install a freestanding or wallmounted room-sealed gas boiler, as the range of permissible location of these appliances is wider than that for open flued appliances. Modern wall-mounted boilers are compact and relatively inexpensive but have the disadvantage that in many cases gravity circulation to the cylinder is not possible, either because of the location of the boiler or because there are only two connections at the boiler.

New Systems in Existing Houses
These present few problems, as the range of boiler types and outputs will be extensive. The principal requirements for the contractor will be to ensure that he is up-to-date on the range of equipment available, that approved equipment is used and that he is familiar with installation standards as set by Dublin Gas at that time.

New Systems in New Houses
Because of the variety of house types being built it is expected that many types of boilers and systems will be installed, including dual boiler systems. However, the wall-mounted and free standing room sealed boilers are expected to predominate, largely because of cost factors such as the elimination of a separate boiler flue and the flexibility in location.

One system which has not been discussed in this paper is warm-air heating. Many thousands of these systems were installed by the late sixties and early seventies. A well designed system is effective and unobtrusive but it must be said that poor design and spiralling fuel costs have rendered this system unpopular today. However, it may still be that well-designed warm air systems have considered cost advantages over wet systems, and it is this aspect that Dublin Gas are investigating at the moment. Hence a return to the installation of warm-air systems in new houses may not be ruled out.

A factor which may have an important influence on all heating systems is the advent of the low energy-demand house. This type of structure may not be too far into the future as Legislation and consumer awareness forces up the standard of house insulation. The effect to the Contractor will be that the instantaneous heat demand will be reduced and therefore smaller boilers and heat emitters will be required than are used for heating similarly sized houses at the present. To meet this demand, wall-mounted boilers are presently available with outputs in the region of 15-30,000 Btu/h, for use in small, low energy houses and flats.

**Summary**
From the technical point of view the advent of natural gas should not prevent the contractor with any great difficulties, the principal changes from traditional practice being in the possible reduction of gas supply pipes, the need for filtration and the adjustment of appliances to higher working pressures.

With regard to work standards, the revision of Codes of Practice in Dublin Gas will mean more consideration to the location and ventilation of gas appliances will be required. In some cases previously permissible locations are now prohibited while in other cases the reverse now applies. This aspect is particularly important with regard to the conversion of appliances from other fuels.

There is little doubt that the position of gas-fired central heating in the central heating league will rapidly improve, and, if the experience in Britain may be taken as a guideline it is possible that within a very few years gas firing will be first choice for new central heating installations, where gas is available in the area.
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Dimension C may be reduced depending on boiler length

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