6-1-1978

Irish H & V News

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Recommended Citation

doi:10.21427/D7T702
Available at: https://arrow.dit.ie/bsn/vol17/iss7/1

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Aubrey Fogarty Associates
High Output Back Boilers—Do’s and Don’ts

Despite the many warnings issued within the trade itself and indeed to the public via “scare” stories in the nationals with regard to the incorrect installation of high-output back boilers, unscrupulous installers continue to exist with the result that an unacceptable number of systems are still connected up in an incorrect manner. In a specially commissioned article beginning on page 7, Hugh C Maguire and William G Penrice look at some of the dangerous situations which have arisen and then proceed to explain what should and should not be done when installing a high-output back boiler – and why.

Holpak Success Story

Having recently broken into the British market with their Holpak booster sets, H R Holfeld (Hydraulics) Ltd., have now gone further afield and appointed agents in Saudi Arabia, Iran and the United Arab Emirates and have also taken a stand at an exhibition coming up in Bahrain in November (page 12).

Solar Energy

In this the second and final part of IHVN’s look at solar energy in Ireland, John Cash, lecturer in thermodynamics at Bolton Street College of Technology and Chairman of the Solar Energy Society of Ireland, reviews his work on utilisation of a passive approach and John Haslett reports on work being done on solar modelling in TCD (page 14).

Refrigeration at IhVex ’79

With the inclusion of a refrigeration sector in the forthcoming IhVex, the exhibition will now provide a comprehensive display of all the important features that go towards the creation of the ideal environment. For full details with regard to space available, etc., see page 24.

Project Profile in Limerick

The Analog Devices BV factory on the Raheen Industrial Estate, County Limerick, is the subject of this month’s project profile. Because of the nature of the work carried out there, the job called for the provision of strict environmental conditions and J N & G Traynor & Partners were chosen to tackle the problem (page 34).

Shortage of Skilled Labour

Craftsmen lacking knowledge of the basic fundamentals of the contracting industry are what Tom Finlay, MEBSCA chairman, sees as the major problem facing his Association at present. The Mechanical Engineering & Building Services Contractors Association (formerly the HVCA) are seriously concerned about the situation and suggest a return to the earlier education system whereby an apprentice spent all his time on the job with his “master” and then studied at night. Mr Finlay also calls for a change in the system of payment because of the long delays experienced by contractors in many cases (page 36).

Slump Finally Behind Us?

If the size of this month’s review of the commercial and industrial boiler market is anything to go by, the slump is well and truly behind us and, while the expected boom might not yet be upon us, it is certainly anticipated. Those involved, either as distributors/agents or manufacturers, are reluctant to talk about their expectations but this cautious attitude fails to conceal their optimism. We begin our review with a look at the various developments in boiler design over the last 50 years and follow it with comprehensive coverage of the many types of unit now available (page 38). We also take a look at grilles, louvres and ducting which, while not being nearly as large as the boiler feature, indicates a comparative upturn in this sector (page 26).
Now that we've taken inches off them, oil-fired boilers never looked better.

Meet the new generation of Thorn oil boilers—the new P55/65 and the new P70/90. They're small in size. But really big on performance. The P55/65 is only 300mm (approx. 11¾") wide and the P70/90 450mm (approx. 17¾") wide. They're the most compact oil boilers of their output on the market, indeed smaller than many gas boilers of the same output. You don’t have to see the pump on these models either. Available in kit form, it disappears neatly into the boiler casing if you want it fitted inside. Installation couldn’t be simpler. And there’s one more thing that’s noticeable by its absence—noise. Decibel rating on the P55/65 and P70/90 is really low. These new boilers are fully automatic pressure jet units. They can be fitted with a programmer and in the event of overheating, a built-in safety device shuts down the burner. Maintenance? A quick and easy job, annually.

Together the two boilers cover the output range 55,000 - 90,000 Btu/h (19.05kW - 26.3kW).

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£40m Platin Plant Opened

The major extension to the Cement Ltd, works at Platin, Co Meath, was officially opened on 8 June by Desmond O'Malley, TD, Minister for Industry, Commerce and Energy.

Regarded as one of the largest construction projects ever undertaken in Ireland, the extension represents a capital investment in the economy by Cement-Roadstone of £40 million. Taken in conjunction with the existing plant at Platin, which was completed in 1972, the entire Platin project cost a total of £55 million.

In design and construction, the Platin extension incorporates the best of what is available anywhere in the world today in the areas of cement-manufacturing technology, pollution control, automation and despatch facilities. The project was designed to ensure conformity with the most stringent international standards for control of pollution. In fact, some £6 million of the total expenditure was devoted to equipment for the elimination of dust emission.

The Industrial Development Authority which gave a grant of £4 million towards the building of the Platin extension has given a grant of £2 million to the magnesia project.

J G Pettit & Co were the civil engineering consultants to the project while M F Kent & Co Ltd, was responsible for the electrical installation. The main £6 million civil contract was handled by Ascon.

Paul, the Dublin-based consortium which built Platin one. The contract for structural steel works was awarded to the Irish Structural Steel Consortium.

These, introduced at the end of 1975, are now said to figure prominently in specifications and the company claims that it has captured a major share of the market. The units incorporate the Nu-Aire patented asymmetric mixed flow impeller (to reduce noise at the blade frequencies) and include features that are regarded as extras on other brands.

The range now available from Nu-Aire (Ireland) comprises - Mark Ten mixed flow roof extract units; Solo Series 2 - roof extract units; Solo Series 2 - wall extract units; Twin Fan roof extract units; Twinfan inline extract units; Mark five centrifugal extractor units; Kitchen extractors; Supply units; Twinfan controls and Window/wall units.

Further details are available from Nu-Aire (Ireland), Ltd, The Enviromental Centre, Creighton Street, Dublin 2, (Tel: 713060).

Iraq Deal for Mahon & McPhillips

Mahon & McPhillips, Kilkenny have just won a £800,000 contract for a water treatment plant in Iraq. Details of the type of plant to be erected are not yet clear as Jim Campbell, the company's representative, is at present in Iraq finalising details.

The manufacturing of the plant will commence on Mr Campbell's return and is expected to take at least a year to complete.

Mahon & McPhillips will then supervise the commissioning of the new plant, which is expected to be completed by 1980.

Brand Name Change

By substituting the 'Flair' brand marking for 'Aristo', the name previously used in Belgium, Germany and Holland, Midland International Ltd of Bailieborough is to rationalise the marketing of its bathroom products in EEC countries.

The change, which becomes effective this month, means that Midland International's products will now be sold under the 'Flair' name in all markets.

At present, over 80% of Midland International's output is exported principally to the UK where the company operates through its Liverpool-based subsidiary.

Sales to Benelux countries, the company's second largest export market, are currently running at 47% ahead of target.

A helicopter from Irish Airworks sprays fertilizer on the outer embankment of the upper reservoir at the ESB's pumped storage station, Turlough Hill, Co Wicklow. A surface of 20 acres was sprayed in this way and the whole job was completed in less than one hour. The man-made upper reservoir, which can hold 500 million gallons of water, is over 2,200 ft above sea-level and a good grass-growth helps both to beautify the area and to minimize the erosive effects of high winds at this altitude.

IHVN, June 1978
in Ireland for Bestobell Acoustics, a multinational company involved exclusively in acoustic control.

Products available from SPL Sound Protection Ltd, include acoustic enclosures and personnel cabins; flexible enclosures and cabins; a range of isolation absorption and damping materials; attenuators and louvres and a complete range of suspended ceilings which can incorporate additional sound absorption if required.

The new company operates from 18 Fitzwilliam Square, Dublin 2, (Tel: 767684/762748).

New Company
A new wholly-owned Irish company, Master Air Co Ltd, has been formed to manufacture and market a complete range of Airhandling products, including heating, cooling, humidifying and dehumidifying units. In addition to their main activity, they are also manufacturing fibre-glass roof units which can incorporate, propeller, axial flow or centrifugal types of fan units to meet a wide range of applications.

Despite being recently established, the company is already busy with orders under the direction of Pat Nolan, who is well known and widely respected in the H&V industry. Mr Nolan told IHVN that they are extremely pleased with their progress to date and the very favourable response from the trade.

One of their first orders, which was for Wyeth Ireland Ltd, Askeaton, Co Limerick, was to manufacture and deliver six heating, ventilating and airhandling units ranging in duty from 5100 m³/h to 14600 m³/h. These units were completed within a total of five weeks from the time the order was placed.

During our visit to Cian Park, Drumcondra, where the factory is situated, we met the other Directors of Master Air. Tom Wheelen, who is the Sales Director, has previously worked in consultancy, contracting and sales for several years. His knowledge in the field of airconditioning system applications and expert advice to clients in the design and selection of suitable plant for a particular project is a big plus for this new company as well as a bonus for potential customers.

Vincent Garvey, a graduate in Engineering from Trinity College, is Technical Director. His main functions are in the design, selection and testing of all components appertaining to the company's products.

Garvey who has vast experience in troubleshooting in on-site problems, has undergone extensive service training courses in America and will be utilising his experience and know-how in providing a first rate back-up service for all company products and services.

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IhVex 79 represents a unique opportunity to promote to the entire Irish heating, ventilating, air conditioning, refrigeration and environmental trade. With this one-stop specialised buying exhibition the third IhVex breaks new ground with a major development, for the 79 event will broaden its industrial content: special emphasis on refrigeration will greatly increase the Exhibition's significance. Energy saving will be given special emphasis and will be reflected in the presentation of pump development, advanced insulation materials and techniques, heat recovery systems and controls for energy optimisation.

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of the four directors is Peter McDermott who is Works Director and is perhaps the lesser known of the group to the H&V industry.

He was actively involved and responsible for the manufacturing of fibreglass roof units to the trade and has now undertaken the responsibility of Works Director in the manufacture of the complete range of Master Air products.

Mr Nolan told IHVN that they will be introducing their products to consultants, architects and contractors with the aid of a comprehensive catalogue which will be available by mid-July.

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**Exporting Business Materials**

Coras Trachtala and the Building Materials Federation recently held a joint afternoon seminar on "Exporting Building Materials" attended by some 50 representatives of Irish manufacturers. The seminar, the first of its kind, was prompted by the sharp competition now being faced in the domestic market from foreign suppliers whose own industries are virtually stagnant - building output in Britain, for example, fell a further five percentage points in 1977 with little prospect on an improvement in 1978.

Robert Purdew, Chief Executive of the UK National Building Agency, said that the recession in Britain had caused several manufacturers to cease trading or reduce output with little likelihood of a return to full strength, suggesting possible openings for imports.

John George, Chief Executive of the London Building Centre, foresaw "a sweet, but short recovery" for the British building industry, which would level out after 1980.

Fitted kitchens, bedroom and bathroom furniture is polarising to the top and bottom ends of the market, while in the £40-50 million radiator market there is still insufficient capacity to meet demand following last year's eight-week BOC strike.

Houses of 90 sq m will be the norm which, with new insulation standards, will require a maximum heating input of only 3.4kW. No UK manufacturer is producing units to suit this market, so both Irish and British designers/producers are starting from the same base.

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**New Firm to Make Pipe Fittings**

An American company, Precise Metals and Plastics Incorporated of Pennsylvania, is to occupy the IDA's advance factory at Oldcastle, Co. Meath and production of injection moulded pipe fittings will commence next month.

The project has an employment potential of 40 persons at full production. A new Irish company, Vanguard Plastics (Ireland) Limited, has been formed and will operate as a direct subsidiary of Precise Metals and Plastics.

The pipe fittings, made under licence to Du Pont, will be exported. The fittings will be used on equipment bringing supplies of natural gas to industrial and domestic consumers in Britain. Quality and reliability demands on the equipment are high and the technology involved in meeting these standards is highly specialised. A training programme for workers is, therefore, being established in conjunction with AnCo.

British Gas is the major customer for these fittings at present, but Du Pont is seeking new markets in France, Italy, Holland and Germany. This could lead to an expansion of the Irish plant. Other suitable new products being developed by Du Pont for the offshore gas industry will also be manufactured in the Oldcastle plant.

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**Copper Piping on Ration to Suppliers**

As a result of the continuing very high demand for copper piping, manufacturers have introduced a rationing system to provide for equitable distribution of supplies, according to the latest Materials Supply Position quarterly report from An Foras Forbartha. Demand for copper piping are reported to be 20 – 30% higher than during last year and each month customers are being allocated quantities 20 – 30% greater than their average monthly deliveries in 1977. This system is to ensure that all merchants receive some copper piping each month.

Most materials are reported to be available ex-stock or with short delivery periods.

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**Irish Management Institute agm**

The 24th agm of the Irish Management Institute took place on 24 May. Ian Morrison was appointed President of the institute for a two-year term of office. A former Chairman of the IMI, Mr Morrison succeeds Mr M.J. Dargan.

The new President, who is Chief Executive of the Bank of Ireland, was first elected to the Council in 1967. He served as Vice-Chairman from 1972 to 1975 and Chairman from 1975 to 1977.

Patrick Hayes, Managing Director, Henry Ford & Son Ltd., and Mark Hely Hutchinson, Managing Director, Guinness Ireland Ltd., continue as Chairman and Vice-Chairman of Council for the remainder of their two-year terms of office, which expire in 1979.

Mr M.J. Dargan and Professor W.J. Louden Ryan were elected Honorary Life Members of the Institute.

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**Tel. No. Changes**

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Finheat: 778120/778109
Heiton McFerran (Steel Division): 516588.
THE FITTING OF HIGH OUTPUT BACK BOILERS AND THEIR CONNECTING UP

Hugh C. Maguire, FCIIB, FIDHE, FRSH, MASHRAE and William G. Penrice, MIDHE.

Despite a large number of serious accidents in recent times because of the incorrect installation of high output back boilers, many systems continue to be connected up in a dangerous manner. In this comprehensive article, which compliments a similar feature IHVN ran in a previous issue, we examine the “do’s and don’ts” of this operation and highlight the less obvious danger areas.

The cost increases in fuels has produced a very definite public swing towards coal, with a subsequent demand for some means of getting that something extra from the coal fire. The result is a phenomenal increase in the sales of high output back boilers, as they are termed, with an unfortunate proliferation of firms and individuals getting on the “installation bandwagon”, very reminiscent of the bad old days of oil fired domestic heating.

Regretably, a very large percentage of the installations are very badly done, while some are even dangerous. Before the war, nearly all heating installations were single pipe, gravity circulated (thermo-syphon) systems fed by hand fired boilers. Their design called for certain “musts” in the way of vents, cold feeds, and means of heat dissipation from the boiler. The reasons for these norms were understood, and everybody in the industry just took them for granted and ensured that they were employed.

With the advent of thermostatically controlled firing by oil or gas, the safety factors were not so important because an oil or gas fired installation could not, like solid fuel, overheat, with its associated problems. So, by degrees, the safety factors were whittled away and short cuts became acceptable. People who entered the industry at this stage have accepted these methods as being correct standard practice, and are now applying them to back boiler installations. Hence the problems and dangerous situations which have arisen.

It must be realised that the omission of a “heat leak” or an installation that restricts the thermo-syphon circulation which, it must be remembered, is reduced considerably as the cylinder reaches maximum temperature, produces the following action. Low pressure will build up in the boiler and it will begin to steam. If the steam cannot escape, or if its escape is restricted, it will push the water back out the return pipe, leaving the boiler empty, when the metal can get very hot. When the steam condenses, the water will rush back into the boiler, and the bottom seam will crack. Water and steam will burst out into the fire and blow it around the room. Should the mains be air or steam locked, pressure will continue to build up until the boiler, or something, bursts.

The following practices will lead to the position just described.

(a) Taking the flow and return straight off the boiler, and dropping them down under the floor;
(b) Making the cold supply from the tank straight into the vent;
(c) Using 15 m.m. pipe for the primaries;
(d) Not bracketing the pipes correctly, so allowing dips in long horizontal primaries;
(e) Not big enough pipes for extensive primary runs, or runs having many changes in direction;
(f) Fitting valves on primaries which could be inadvertently closed; and
(g) Taking branches off primaries to serve radiators.

It is now necessary to return to the methods and rules which were applicable to the old hand fired installation, since a back boiler is a hand fired boiler. The main difference between solid and other means of firing is that, once a solid fuel boiler is lit, the fire will continue to burn until the fire on the grate is consumed. Furthermore, while the rate of burning can be controlled, it is not automatic. Therefore, the heat produced in the boiler, must be capable of being dissipated by thermal means. Reliance cannot be placed on a pump, since it is liable to failure, due to mechanical or electrical breakdown.

The problem of heat dissipation must be handled in a number of ways. The best method is to use the tappings on one side of the boiler for a straight up down flow and return to an indirect cylinder. The vent can then be taken from the highest point on the connection into the cylinder while the cold feed is brought into the

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Published by ARROW@DIT, 1978
primary return at the boiler. There must be no dips in the primary flow and the least restriction to circulation. No valves whatever should be fitted on these pipes. The minimum primary and vent pipe size is 20 mm (¾") with 15 mm (½") cold feed in copper pipe.

The ideal layout is not always possible, and it is most often necessary to run horizontally to reach the indirect cylinder due to the consequent introduction of changes in direction. It is sometimes also necessary to drop the return below boiler level. If this is the case, then the primary pipes should be increased in size to overcome the added resistance to circulation; 25 mm (1"), or, even 32 mm (1¼"), may be required and the size should be calculated to ensure positive circulation. The opposite tappings on the boiler can then be used for the heating circuits, which can be either small bore or microbore (figure 1).

In either event, no connections should be taken off the primaries to serve radiators. The heating should be independent from the cylinder, and be by forced circulation. The pump should, if at all possible, be fitted above floor, where leaks can be seen, and it can be readily maintained. If not, a trap should be made and the client advised. It can be inserted on either the flow or return and since it is not in line with the feed and expansion tank, the full head can be used to reduce pipe sizes.

Where the chimney breast is not suitable for pipes to be taken out either side, it may be possible to take the connections for the heating around in the space behind the boiler and out through the chimney breast on the same side as the primary connections. All pipes in the roof space or carried under the ground floor should be insulated, including microbore piping to reduce to a minimum the waste which is quite high, relative to the output of most back boilers.

The feed and expansion tank should be properly supported with a stopcock on the cold supply and the overflow carried outside the roof. The overflow should not be fed into the CWS storage tank, or, as is quite common, the tank mounted over the CWS tank with only a hole cut for the overflow to drop into the CWS tank. This practice is bad as it hides the overflowing and will lead to discolouration of the CWS and corrosion.

The use of the four tappings on the boiler is not always possible and very often only one set can be used. In this event, a quite safe and satisfactory installation can be carried out by taking 25 mm (1") pipes from the boiler through the breast, and then teeing off with 20 mm (¾") primaries (or bigger if required) to the cylinder and continuing in 20 mm (¾") to serve the heating, as shown in figure 2. The cold feed can also be connected into the primary return.

Where domestic hot water is not required, and only a service to a few radiators, a heat leak is still always necessary, and it must also be by thermo-syphon circulation. This cannot be provided by installing a header of a minimum of 1.85 sq m (20 sq.ft.) heating surface over the boiler with 20 mm (¾") connections and no valves, see figure 3 and 4.

A very real problem situation is where the cylinder is only slightly higher than the boiler, and some distance away, as say, in a bungalow. It is possible to serve such an installation, as shown in figure 5, where the flow is carried into the roof space and returned under floor, but certain precautions must be taken.

Since the circulating gravity pressure is a function of the heights of the flow and return, and the difference in temperature between it, must be remembered that the temperature of the return will vary between point A and the cylinder, and the cylinder and point C. The absolute minimum size would be 25 mm (1") with a possibly bigger diameter.

The primaries must be insulated to reduce the heat loss to a minimum, or else the boiler will not provide sufficient heat. The section of main in the roof between A and B must slope up to the point of take off of the vent to make absolutely sure that air locking cannot take place. The vent can be taken off anywhere along AB but the main must slope up either way to it. It is preferable that the cold feed be taken direct to the boiler and not to the primary return at the cylinder. This type of installation can theoretically be carried out irrespective of the horizontal distance, but obviously, if the run is very great, then the pipe size will be correspondingly great and therefore the heat loss will also be too great for the boiler to handle.

The fitting of the back boiler can now be examined — Before installation, it is essential to ensure that:

1. The chimney is in sound condition and free from cracks or other faults, which might allow leakage of fumes into the house;
2. The chimney has been swept clean immediately prior to installation;
3. Check for timber below hearth. The hearth must be fireproofed and conform to current building regulations, ie, no timber within 18" in any direction from the centre of the fireplace opening.

Prepare the fireplace recess (builders opening) to a minimum width of 50 mm (2") clear all round for the type of unit that is being installed. Make opening through side of chimney breast for the pipe connections.

The preparation of the fireplace opening is very important to accommodate a second flow and return connection and also to insulate the back boiler. In the case of large openings, such as old ranges etc, these should be built up as required. Standard 460 mm (18") wide and 355 mm (14") deep builder openings should be enlarged. In the case of existing surrounds, and where it is not possible to remove the surround, an opening should be made above the surround about 305 mm x 305 mm (12" x 12") to give access into the fireplace opening.

First, form a concrete plinth in fireplace opening allowing for the tiled hearth, plus 15/20 mm (¾"/¾") for bedding down the tiled hearth. Offer up the surround to the chimney breast. Line up the back boiler with the back edge of the fire opening in the surround, allowing 10 mm (3/8") for asbestos rope joints between the back edge of the fire opening and the front faces of the boiler. The surround must be let into the plaster wall. Having positioned the back boiler, a good tip is to make a mark around the base of same, so that it is easy to bring the back boiler back into position should it move.

Remove the surround and make the pipe connections from the back boiler, through the side of the chimney breast. Never reduce the pipe size from the boiler through the
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breast, as air will be trapped in the boiler. These pipes should be sloped up for the same reason. Pipe size reduction should be on the vertical runs.

You are now ready to build in the back boiler. Check the positioning of the boiler. Infill the back and sides of the boiler with Vermiculite of Micafl granules, which can be mixed through with mortar: 6 parts vermiculite to 1 part cement mix. The infill around the boiler is of paramount importance, as it:— (a) allows for the expansion and contraction of the boiler; (b) insulates the boiler from the structure and subsequent loss of efficiency; and (c) facilitates any subsequent removal.

Now insulate the pipes and fill in the hole at side of chimney breast using bricks (not concrete blocks) — bricks make the job a little easier to negotiate the pipes at the side of the chimney breast.

Using a mortar mix (4 to 1), build up from top of back boiler and gather into the chimney forming a flue 230 mm x 230 mm (9" x 9") making sure there are no cavities left that would hold soot. The sides of the flue should be parged very smoothly up into the chimney. This part of the job is very important, to ensure a free passage for smoke into chimney. All excess mortar should be cleaned away from the damper assembly, to ensure smooth operation of same. This operation must be gas tight.

It is essential to protect the back of the surround above the fire opening against the hot products of combustion. Any cavities behind the legs of the surround should be filled in with mortar. This can be done by using a preformed lintel (otthyood) or by forming same with the infilled blue bangor slate (not asbestos) as shown in figure 6. The tapered edge of the lintel should be slightly above the top of the fire opening. The face of the chimney breast above the lintel can then be filled in.

Make an asbestos rope joint 15/18 mm (½"/5/8") between the front faces of the boiler, the lintel and the back edge of the fireplace opening in one continuous length. To do this, wet the rope thoroughly and squeeze off surplus water, then secure to the front faces of back boiler and across the tapered edge of the lintel. Water glass or fire cement is ideal for securing the asbestos rope. The surround should be now offered snugly into rear of the surround, in order to protect it from the hot products of combustion. Fire cement should be smeared liberally to the asbestos rope to complete the seal.

Any cavities behind the legs of the surround should be filled in with mortar. Finally, the tiled hearth can be laid — the bedding down of the hearth is of extreme importance, a good mortar mix is required (3 to 1) if the hearth is not bedded properly, serious damage could occur to the structure of the hearth from the intense heat of the fire. The joint between hearth and surround can be made good with fire cement or grout.

In the case of all night burning fires, the fire front should be screwed to the hearth, as per manufacturers instructions, and properly sealed.

The foregoing description of the method of fixing the fire is, of course, subject to the fire manufacturers specific instructions, but is in accordance with Code of Practice No CP 403.
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IHVN, June 1978
From a small garage in Stillorgan employing two people to an office complex and two workshops employing over 100 people is the success story behind the establishment and growth of the H R Hofeld Group of companies over the last 20 years.

The company was founded in 1949 by Mr Hofeld whose main background was in the textile industry but, because of his extensive contacts on the Continent, particularly in Germany, it was not long before they diversified and won a number of important agencies in the pump and industrial boilers sectors.

H R Hofeld continued to expand down through the years, so much so that it was necessary to form three separate firms in 1971. These were Hofeld (Engineering), Hofeld (Machinery) and Hofeld (Hydraulics).

When H R Hofeld (Hydraulics) was first formed, there was a staff of 23, which has since been increased to 42. The office staff operate from 10 Merville Road, Stillorgan with a separate assembly plant directly across the road. There is also an additional assembly plant in Cabinteely. However, plans are in hand for the occupation of one large unit at the Sandyford Industrial Estate from which all operations would be directed.

At the Stillorgan plant, the company assembles domestic shallow well pumping sets – the Waterpak and Jetpak. In the Cabinteely plant they deal with their main agency – Grundfos Pumps.

Mr McConnell, the company Sales Director, acknowledges that their main strength does in fact lie in the Grundfos of Denmark range which comprises domestic and industrial heating circulators, booster and boiler feed pumps and submersible borehole pumps. However, other agencies they are involved with include Sulzer Brothers of Leeds who at present are making the boiler feed pumps for the ESB; Lee Howl of Tipton – water and sewage pumps; Calpeda of Italy – chilled water, condensed water and general industrial units; Crown UK – oil transfer pump systems; Simon Warman, UK – slurry and abrasive handling pumps for quarries and mines; LOEWE of Germany – waterpak piston pumps and Silentia accelerators and twin pumps; Simon Hartley – effluent treatment plant; and Homa – submersible sump pumps.

At the Cabinteely plant Hofeld assemble the Grundfos centrifugal pumps. Types CP and CR. These are then incorporated into the Holpak packaged booster sets. Also assembled at Cabinteely are the Grundfos submersible pumps for industrial requirements. If any other specific pump is needed from the Grundfos range, then it is imported directly.

The Waterpak and Jetpack range are made and assembled in Stillorgan. Originally, back in 1954, Mr Hofeld assembled the first Waterpak in his garage and reached a peak in the middle 1960s of 2500 units a year. Mr McConnell estimates that the total number of Waterpak and Jetpaks now made totals some 50,000.

As part of the company’s forward looking policy, they insist on a visit from the sales managers of each of their principals at least once a year and in return either Mr McConnell or Mr Hofeld visit factories and workshops.

Before Hofeld undertake any new agency they send their Service Manager to the particular factory on a familiarisation course. In the case of Grundfos, technicians were sent over to Denmark to learn how to assemble the pumps in order that they would be able to carry out an efficient assembly and repair service. In addition, Grundfos helped Hofeld by organising an annual trip to the Denmark factory of selected clients who are transported in the Grundfos private jet. Another important contribution by Grundfos is the assistance they give to Hofeld during the HVEX trade show.

While Hofeld would claim to have a major share of the H&V market, especially in the industrial heating and package booster set market, they are keenly aware of the increasing competitiveness that each new year brings. Contractors who tend to play one off against the other for the lowest prices are another factor that is making life increasingly difficult for the market and, according to Mr McConnell, makes it even harder for companies like Hofeld to provide the comprehensive service they like to operate.
However, Holfeld's future is becoming more and more orientated towards the export market and with the help of Coras Trachtala in 1975, they decided to look for agents in the UK for their Holpak booster sets. But it was 1977 before they in fact appointed an agent. This was Lee Howl of Tipton and Mr McConnell is quick to point out that this arrangement has proved most beneficial to Holfeld. "Our exports" he says "though starting from a small base, are now showing a 300% growth on this time last year".

Having broken into the British market Holfeld have now gone further afield and appointed agents in Saudia Arabia, Iran and the United Arab Emirates and, to boost their efforts in the Arab countries, they will be exhibiting for the first time at the November trade show in Bahrain called "Arabbuild".

The company recently took part in the IEVAC exhibition in Birmingham and early results are most promising. "This was a new departure for us" says Mr McConnell. "We found a tremendous interest in our Holpak from foreign and UK consultants and received specific enquiries from Germany, Kenya and the Arab countries. Orders have been placed against some of these enquiries."

"Certainly we are greatly encouraged by the results of our participation at Hevac and particularly by the favourable comments concerning the quality, design, standard of workmanship and compactness of the Holpak sets."

The present level of production is a far cry from that of Mr Holfeld's early days and now, with the proposed move to new premises next year, coupled with the company's enthusiastic workforce and progressive outlook, H R Holfeld (Hydraulics) looks set to become one of Ireland's major exporters.
Solar Energy – Utilisation Aspects of Passive Approach

In this the second, and final, part of IHVN's look at research development work in Ireland on solar energy, John Cash, Lecturer in Thermodynamics at Bolton Street College of Technology and Chairman of the Solar Energy Society of Ireland, explains his work on utilisation of a passive approach; and John Haslett, reports on work being done at TCD.

The first approach towards energy conservation in a new building will, of course, be taken by the designer in specifying higher insulation levels, in reducing glazing areas and in adopting measures aimed at lower ventilation losses. Further steps may be taken such as the use of insulating shutters and, particularly in the case of dwellings, by making use of solar radiation to offset the heating requirements of the building. Here the designer will pay consideration that the control system is well orientated with windows arranged to maximise solar gain during the heating season.

In order to offset heating requirements by means of casual gains, a more basic approach is that the control system is the building structure itself. In this country, as everybody is aware, solar radiation is of a most intermittent nature. To take one example a south-faced single-glazed window can suddenly change from a heat loss of the order 100 W/M² to a heat gain as high as 600 W/M². Significant solar gain may also vary in duration from a few minutes to several hours. If the area of glazing in a room is large, unacceptable conditions may arise in this part of our well-insulated building due to (a) a general rise in temperature despite adequate controls and (b) a high environmental temperature because of the intense radiation stream.

How the construction of the building affects indoor conditions may be appraised by considering the behaviour of a well-insulated lightweight structure, such as a caravan, on a spring day of low air temperature and significant solar radiation. If the windows are closed the temperature rise will generally be rapid and may be excessive, leading to such manoeuvres by the occupants as drawing the blinds (reducing the energy input) or opening the windows (dumping energy by increased ventilation) or by a combination of both. Another response may be the removal of some clothing so that the occupant is comfortable at a higher operating temperature in the room.

These responses mean that the available energy is not being fully utilised. In the first two cases this is obviously caused by restricting the energy input or by dumping it. In the last case, if 18°C is an adequate indoor temperature for customary clothing levels then operation at a soporific 25°C is not essential. (It may also be regarded as undesirable if a reasonable degree of mental alertness is assumed necessary during daylight hours). The energy which is used to maintain indoor temperatures at unnecessarily high levels could be used to provide adequate temperatures over longer periods, thus offsetting to a greater extent the heating requirements of the building.

The polar extreme to the lightweight structure with significant solar gain is the massive structure with small solar gain. Examples of the latter are those traditional churches and classic Irish cottages whose thermal response to fluctuating energy inputs is minimal.

This then indicates that some form of internal thermal storage is required to absorb the variations in energy input. As suggested by the foregoing, one method is to have thermal capacity in the fabric of the building. Conventional construction technology of cavity walls with insulation in the cavity does provide thermal storage and this can be further increased by the use of solid ground floors (with perimeter insulation), solid internal walls, concrete intermediate floors and the use of concrete roof slabs.

Procedures are available from air conditioning practice which enables the designer to estimate with reasonable confidence the response of a room to fluctuating energy inputs of different types. The simplest and probably the most useful at the design stage, is known as the "admittance procedure" of which the following is a brief simplified review.

(Further information may be obtained from...
The objective is to estimate the peak (or minimum) temperature in a room due to fluctuating energy inputs. These may be due to any internal source such as heaters, occupants, lighting, television, cookers or other apparatus. Solar energy inputs are also included but are treated in a slightly modified manner. The fluctuating input is assumed to have a fundamental sinusoidal variation with a period of 24 hours, i.e., the pattern of energy inputs repeats every 24 hours.

The procedure consists of (a) Calculation of the average temperature rise above the mean ambient temperature — due to the average energy input, and (b) Calculation of the temperature increase above the average — due to the fluctuating input.

The calculation of the average temperature rise ($\Delta t$) is based on the well-known equation:

$$ q = UA \Delta t $$

Whence,

$$ \Delta t = \frac{q}{UA} $$

Here, $q$ is the average heat input, $U$ is the thermal transmittance (U-value) and $A$ is the area through which the heat flows. In the actual calculation all of the areas of the enclosure with their corresponding U-values as well as ventilation rates are taken into account.

The calculation of the temperature increase ($\Delta t$, INC) above the average temperature rise is handled by a similar equation with a thermal property known as the "admittance" replacing the transmittance:

$$ \Delta t_{\text{INC}} = \frac{q_{\text{INC}}}{Y_{\text{av}}} $$

Here, $Y_{\text{av}}$ is the average admittance of the room surfaces and $q_{\text{INC}}$ is the increase in heat input above the average, i.e., the magnitude of the fluctuation in energy input. Again, in actual calculations of short-wave radiation with some heating effect at the glazing itself. When this radiation is absorbed at the room surfaces a portion will enter the fabric of the room while the remaining fraction (called the "Surface factor") is considered as part of the fluctuating energy input to the room in a similar manner to the other sources previously discussed. The surface factor depends on the surface admittance and varies from about 0.3 for high admittance surfaces to nearly unity for low admittance surfaces. This means that where solar energy is the fluctuating energy input there may be a range of 30:1 in the magnitude of the temperature response, depending on room surfaces.

Referring to the examples previously mentioned, the caravan may be termed an enclosure of low admittance which will have a rapid response to any energy fluctuation, whereas the church is a high admittance enclosure with little response to fluctuations in input. The first will heat up and cool down rapidly while the second will do so only slowly. This obviously raises the question of the use for which the building is designed. If it is to be used on an intermittent basis, a low admittance structure with an effective control system is desirable. Care must be taken that solar gain is not excessive. Buildings which are occupied for long periods or which require high minimum temperatures either for comfort or the avoidance of such problems as condensation may be high admittance and can successfully utilise fluctuating solar energy inputs.

Solar radiation entering a room can create uncomfortable conditions by virtue solely of its intensity and despite otherwise low indoor temperatures. One solution to this problem is to arrange windows with emphasis on vertical panels rather than horizontal, thus creating areas of shade in
the room. Another solution, with wider applications, is the utilisation of solar walls which will increase the amount of solar energy admitted but will do so in a less intense, smoother and, if desired, controlled manner. (The latter mode is desirable in lightweight structure).

A solar wall in a cavity wall with a transparent outer leaf, the outer leaf still fulfils its traditional function of keeping water off the inner leaf but in addition allows solar radiation to be absorbed on the blackened surface of the inner leaf. Some of this energy will enter the building, the remainder returning to the outside. The fraction of the incident solar radiation that does enter is called the “solar gain factor” and depends principally on the degree of insulation, if any, in the inner leaf - the lower the insulation, the higher the solar gain factor with a typical maximum not much higher than 0.5. The wall will, of course, also be characterised by its thermal transmittance. As an example, a simple solar wall consisting of a 200 mm dense concrete block inner leaf and a single-glazed outer leaf will have a solar gain factor of 0.4 and a thermal transmittance of 2 W/M²K. This might be compared with single glazing only, with a solar gain factor of 0.8 and a thermal transmittance of 5.6 W/M²K.

Solar walls may be classified by the following scheme: Outer Leaf - number of transparent sheets and type of transparent sheets; inner leaf - level of insulation, position of insulation, thermal capacitance, and passages for fluids; and cavity - sealed, unsealed (with or without control), insulating devices, and moveable insulation.

Increasing the number of transparent sheets in the outer leaf will decrease the thermal transmittance (of importance in periods without solar radiation) but will not significantly increase the solar gain factor because of the additional transmission losses introduced by each sheet. It might be noted here that only the outer transparent sheet need have weather resistance.

Insulating the inner leaf will decrease both the thermal transmittance and the solar gain factor, the first being advantageous, the latter the reverse. The position of the insulation will not affect

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these two factors but will result in different dynamic behaviour, is the behaviour of the wall during the course of a single day. There will be a greater attenuation of temperature fluctuations when the insulation is placed on the cavity side of a substantial inner leaf.

The thermal capacity of the inner leaf will affect only the dynamics of the wall. At one extreme, an inner leaf consisting of a metal sheet will respond nearly instantaneously with temperatures fluctuating widely to peaks as high as 70°C. On the other hand, a concrete slab will severely attenuate temperature fluctuations and will introduce long time lags (of the order of six hours for the wall previously quoted). This phenomenon has considerable significance in that the peak solar input is shifted to the evening which for dwellings is usually the period of greatest occupancy. Water may also be utilised in the inner leaf either in passages or in separate containers as in the well-known wall of Steve Baer.

If a heavy inner leaf is insulated on the room side, greater control of heat admission may be obtained by passing a fluid (air or water) through the leaf either by natural convection or by forced convection. (This latter scheme is a movement away from a purely passive approach). With these methods heat may also be transferred to other rooms in the building. The Trombe wall is a modification of this system where air from the room is allowed to circulate through the cavity. This system has disadvantages in that heat losses to the outside wall are greater in the convection mode and soiling of the transparent leaf will take place over a period of time.

Insulating devices, such as "honey-comb" insulation, and moveable insulation will significantly improve the performance of a solar wall at the expense, however, of increased complexity, first cost and maintenance.

In general, I believe solar walls of different types have considerable potential in the utilisation of solar energy by buildings of both heavy and light construction. In my opinion they are economic at present costs and interest rates. In their exploitation the designer must consider thermal movement of the inner leaf and the possibility, in the simplest types, of excessive heat input during summer.

References


Solar Energy Modelling in Trinity College

John Haslett reports on research work by Trinity College Dublin which is supported by the EEC, IIRS and NBST, and is directed by Professor F. G. Foster. Mr Haslett, the principal investigator, has been assisted by P. Monaghan, F. Hand, M. Reilly and a number of post-graduate students.

Since 1975, the Statistics and Operations Research Laboratory (SORL) of Trinity College, Dublin under the direction of Professor F. G. Foster has been involved in research concerned with the prediction, by mathematical modelling, of the long term thermal, and hence economic, performance of solar thermal energy systems. This paper reviews this research, its objective and role, and the conclusions drawn from it.

Currently the level of interest in solar energy (and other renewable energy sources) is high. However, the applied research effort is relatively new. In Ireland, for example, the IIRS has the only detailed panel testing facility and even they are only now installing a properly monitored solar heating system. Only when a variety of such systems have been running for some time in various parts of the country will it be possible to evaluate the contribution of solar energy to the overall energy picture of Ireland.

In such circumstances mathematical modelling can do a great deal to anticipate the results of much more expensive and long term physical modelling and to expand the usefulness of such few results as are currently available, both nationally and internationally. It can, of course, never provide a real alternative to the experience gained by practical and applied research with actual systems. However until such experience is much more widely available, mathematical modelling will continue to be a central research tool in the subject.

The research at SORL concerns the development of such a tool for the analysis of systems for collecting and storing solar thermal energy.

Such a system, used for the part provision of domestic hot water, is shown schematically in Figure 1. It consists of (a) solar panels, (b) an energy store unit, to which energy is transferred from the radiation-heated panel by means of a circulating fluid and (c) a distribution system for passing this energy, as required, to the user. The simplest storage unit is that implicit in Figure 1, a tank of preheated water. Other units include sensible heat storage in rock beds and latent heat devices. The distribution system is at its simplest in a domestic hot water application, and is more complicated than shown when the system is used to provide energy for both spaces and water heating. It always includes an auxiliary heater to guard against the possibility of a run of poor days. The overall system is thus regarded as a fuel-saver and its long term effectiveness is measured by the total amount of energy saved by the system over its life time.

The purpose of the models considered by SORL is to predict these long term savings as a function of the system type, the parameters of that system (such as panel efficiency characteristics, its area, the mass of the storage unit and the size of the domestic energy demand) for given meteorological conditions. This information

![FIGURE 1 - A Schematic Solar Water Heating System]
is a vital input to any further studies of cost effectiveness and optimisation.

The problems in modelling such systems are (a) the highly variable climatic conditions and in particular the variability (diurnal, seasonal and erratic) of insolation; and (b) the highly interdependent, and sometimes non-linear, relationship between system variables, by virtue of the way in which the system is controlled.

These problems often invite the use of detailed computer simulation involving an actually observed meteorological sequence. This is a costly procedure for it involves large amounts of data and a considerable amount of computation. A typical procedure is to use one year of hour-by-hour meteorological data on (at minimum) ambient temperature and diffuse and direct radiation (that is, at least 26,380 data items). This effectively rules out useful systems modelling for most people and leaves it in the hands of very few researchers to carry out, and disseminate, the results of the modelling.

An alternative, and arguably far more important procedure by virtue of its accessibility, is as follows:— Global insolation per annum per square metre in Ireland — 100 kWh (approx); Overall system efficiency — 40% (say); Estimated savings per annum per square metre — 400 kWh.

This is not however sufficient for the easy determination of the factors affecting overall system efficiency, nor for any detailed system research.

The modelling effort in SORL has therefore been concerned in the main with the methodological aspects of modelling. The aim of this effort is to make much more efficient and accessible the mathematical models for the fairly detailed estimation of long term performance. The procedure developed to do this involves summarising the 26,280 data items above by very few statistical summaries (means and variances) and the use of probability techniques to solve the system equations given these summaries. The required data base may thus be made available in a simple table. The computational procedures can easily be handled on a mini computer or even on a large programmable calculator.

The research has not, however, been solely confined to methodological questions. Systems for providing part of the energy requirements for domestic hot water are already being sold in Ireland, and a large market has been developing in the last couple of years in the USA and in West Germany. How would such systems perform in Ireland? Recent reports, based on the models developed at SORL, have discussed this in some detail.

A typical system performance curve is shown in Figure 2. It is seen that
performance is an increasing function of collector area, but that a five-fold increase in area does not imply a five-fold increase in savings. It is also seen that there is little point in increasing the storage volume to much more than 1 - 1½ days demand. It can also be shown, for example, that system performance is relatively insensitive (within reasonable limits) to changes in collector orientation, collector heat capacity and the effectiveness of the storage insulation, but more sensitive to the heat recovery factor of the panel and to the presence or otherwise of a heat exchanger between the panel and the store. This latter may be important by virtue of the need to protect against freezing.

On this basis Hugh Clyne of the IIRS has indicated that the optimum system on the basis of an assumed installed cost of £100/sq m for panels, is 2-3 sq m allied to a 200 kg store, saving, over a 20-year lifetime, 230% of its installed cost. Such a system would be operating at about 40% overall efficiency.

Space heating systems are also being considered, although not yet in the same detail as above. Such a system is shown in Figure 3. The main choice in the design of such a system is whether to use air or water as the panel cooling fluid. Air collectors have fewer corrosion problems and no freezing problems. The storage usually involves the heating of a rock bed by passing the cooling air through the bed. The distribution system in this case will often also involve hot air. Figure 4 shows the estimated performance of such a system.

It will be noted that there is not much improvement in performance for storage sizes beyond 6 mm. For water cooled panels involving a hot water storage, the equivalent optimum is about 2 mm. However, air cooled systems seem to be somewhat more efficient (about 14%) than systems cooled by water.

Current research involves the extension of the models already developed to cover parameters so far ignored (thermal leakage from the store) and systems not yet dealt with in detail, for example, the air cooled systems above and systems involving heat pumps. Some work has also been started on wind energy systems.

References:

NEW PRODUCTS

New Approach to Boiler Cleaning

Until now, the cleaning of the primary and secondary surfaces of boilers has been commonly undertaken by manual brushes, vacuum cleaning, or spraying liquid chemicals into the combustion chamber. Often a combination of all three methods has been required - a costly exercise if a satisfactory end result is to be obtained. Combining the advantages of these various approaches, the new Teco AR55 from Chem-Therm Ltd, Chobham, Surrey, overcomes their operational limitations and considerably reduces labour time through its overall efficiency.

Designed for the simultaneous mechanical/chemical cleaning of all internal boilers surfaces and tubes, the TECO AR55 comprises a single and easily transportable unit incorporating a vacuum cleaner, pumping system and lance assembly, complete with accessories for removing deposits from awkward corners where brushes cannot reach.

For chemical treatment, all the internal parts of the boiler are treated with a diluted solution of Chem-Therm's Teco 12 formula - either sprayed on to the surfaces or circulated through the smoke tubes. The vacuum cleaner container can serve as either the reservoir for the diluted chemicals when used for recycling or spraying operations, or as a deposit collector in the normal way.

The deposits dissolved by the powerful Teco 12 solution are vacuumed up and filtered, the particulate residue being collected for disposal while the liquid is pumped back into the system for re-use. No loss of liquid is involved in the process. Suitable for 240 volt 50Hz single-phase operation, the system is said to be easy to use, makes no unnecessary mess and ensures that a minimum of soot and dust escapes into the atmosphere.

Further information is available from Chem-Therm Ltd, Ava House, 98-100 High Street, Cobham, Surrey, GU24 8LZ.

MULTI-STOREY AIR CONDITIONING

A new concept in air conditioning equipment for use in large multi-storey buildings has been announced by Lennox Industries Ltd. At the heart of the system are novel water-cooled condensers installed at each floor level, considerably reducing the ductwork previously necessary.

Known as Multi-mod, the new system has been developed to meet the special requirements of multi-storey structures, which only have a restricted roof area in relation to their total volume.

The Lennox answer is a compact, water-cooled condenser which takes a minimum amount of floor space, containing two hermetically sealed Lennox compressors. The condensers have removable heads for mechanical cleaning, but in some applications a closed circuit cooling tower will be the way to remove waste heat.

Air distribution within the building can be done by straightforward Lennox fan coil units, or by special fanpowering mixing boxes, which have balanced dampers to vary
the proportions of supplied and recirculated air to suit various conditions. Heating for either system can be by electric resistance elements or hot water coils.

By using individual supply units, zoned control of heating and cooling is made simple. The number of zones is limited only by the needs of the designer and practical considerations. If the mechanical services room is located against an outside wall, a Lennox Power Saver can be fitted to utilise outside air for cooling. Although the Multi-mod system is highly flexible and can provide a high standard of zoned conditioning, the components are relatively simple to install. A brochure describing the Multi-mod concept and data sheets covering the equipment can be obtained from Lennox Industries Limited, P.O. Box 43, Lister Road, Basingstoke, Hants.

Trox Slot Diffusers

New simplified Trox diffuser showing the internal height saving over previous models of up to 9 mm.

Features of the new Trox ALS slot diffusers of particular interest to installers are said to be its easier fixing methods to speed alignment and fastening.

Internal redesign includes hit and miss volume control integrated with air flow straighteners. Result is a 9 mm height reduction and a saving in production costs and weight.

Performance of the new diffuser is identical to previous models. The styling of the ALS range, and its suitability for horizontal deflection or vertical discharge, allows it to be incorporated into either ceiling or wall mounted and to be featured or blend unobtrusively with the decor. Standard finish is pre-anodised which gives the face a clean, natural appearance.

Further information is available from Redbro Ltd, Landscape House, Landscape Road, Churchtown, Dublin 14, (Tel: 989922).

NEW PRODUCTS

SOLUS POWER VENTILATOR

Solus Building Products Ltd are a subsidiary of Solus Teo – perhaps better known in Ireland for the manufacture of light bulbs. A new product, the Solus Power Ventilator, has just come on the market from Solus Building Products which offers a wide scope for system design. The close fitting cowl and clean neutral finish ensures unobtrusive installation, making the unit particularly suitable for new building specifications. Fan performances have been carefully selected for both commercial and industrial applications.

THORN LAUNCH NEW OIL BOILER RANGE

Thorn Heating have introduced a new pressure jet oil boiler range covering heating outputs from 55,000 Btu/h to 90,000 Btu/h. There are two models available the P55/65 and P70/90. Both of these are of exceptionally small dimensions being only 11½" (300 mm) and 17½" (450 mm) wide respectively thus making the new models the most compact oil boilers on the market.

The boilers have been designed for kitchen installation and blend with modern kitchen decor, taking up a minimum amount of space. They are topped by a smooth working surface at the same height as standard kitchen units.

All the units are said to be exceptionally quiet in operation and will burn either gas, oil or kerosine. They are designed to comply with the higher efficiency standards recently introduced for oil boilers.

One of the great advantages of the new Thorn P range is the ability to be able to build the pump within the boiler casing. Similarly, the neat Thorn programmer is available for fitting in the control panel.

Outputs are as follows:

- P55/65: 55,000 Btu/h (16.0 Kw) on gas oil; 55,000 Btu/h (19.0 Kw) on kerosine;
- P70/90: 70,000 Btu/h (20.5 Kw) on gas oil or kerosine; 85,000 Btu/h (24.9 Kw) on gas oil; 90,000 Btu/h (26.3 Kw) on kerosine.

Details are available from Andy Gallagher, Bellview, Mullingar, (Tel: 044 80104).
Trade Gap?

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To ease the difficulty of the gas industry the Department of Commerce have announced that they are to give a grant of £3 million to pay the revenue deficits of the undertakings. There are a number of conditions which the industry is to observe if the grant is to be paid.

Mrs Alice Burnison and her staff welcomed as guests a number of their customers and consulting engineers at the opening of the new premises for O.B.C. Ltd. Built on the platform of what was the old York Road Railway Station, the single span stores and offices present the very latest for the handling, storage and distribution of heating equipment.

In addition to the guests, representatives of Thorn, NuWay Benson, Danfoss, Powermatic, Boulter, Trianco, Stelrad among others had on display their latest products. O.B.C. is part of the well known Wolsey Hughes group, which has wide interests in the heating field with premises throughout the UK and has been operating in Belfast since the early sixties.

Mr R. Lee of J H Shaw & Co Ltd was the guest speaker at the recent meeting of the District Heating Association NI Branch. Mr. Lee spoke to an interested audience on the guarantee and insurance scheme of the Pre Insulated Mains Contractors Association.

Instrumentation was the theme of the trade show and exhibition organised by D D Butler Ltd in the Culloden Hotel. On display were instruments capable of measuring temperature, water flow, gas analysis, pH, dissolved oxygen, in fact practically every form of measurement including also bulk solid measurement and control by probe or displacement. D D Butler Ltd specialise in the merchandising and servicing of the products of the George Kent group, which includes such well established names as George Kent and Foster Cambridge.

The annual report of the Department of Industrial Science has been received and among the details of the work of the department which includes such things as work on graffiti removal, high temperature head transfer, we hear of the work of their fuel efficiency department.

The test team which is completely mobile has visited a number of industrial plants and as a result of their recommendations some figures of substantial fuel savings have been achieved.

The report and details of the service are available from the Department at Comber Road, Newtownards, Co. Down.

Mr Burton Allen, Managing Director of Potter Cowan & Co (Belfast) Ltd must be feeling really pleased with himself, following the success of his exhibition in the Culloden Hotel. Taking over the complete Stewart suite, Mr Allen invited 30 of the top manufacturers of electrical goods, with whom his company trades, to join together to produce an exhibition of equipment which has not been equalled for some years.

On display there were cookers, domestic equipment, switchgear, ductwork, control equipment, in fact the complete facade of the electrical industry, with such names as Sunbeam, Belling, Simplex, Glen, Horstman, Allen West, to mention but a few. Each

At the IDHE (NI Branch) annual dinner held in Newtownards were (from left) P. Johnston; B. Page; S. Maxwell; Ian Morrison (Chairman); R. Best; and W. Hunter.

Also at the dinner were J. McVicker; J. Furlonger; R. McCullough; H. Bicker; and J. Brown.

Published by ARROW@DIT, 1978
stand was manned by representatives of the various companies.

The exhibition which lasted for two days attracted a large attendance and not only did the visitors have an opportunity to inspect a wide range of equipment but they were also able to partake of the generous hospitality of the sponsors.

Congratulations are more than justified to all concerned.

Mr. Gerald Atkins has returned to Northern Ireland and has set up a consultancy service to be known as Total Building Services, with the present address at Bridge Road, Helens Bay, Co. Down.

John Kelly Ltd, shipowners and coal importers, announce the appointment of Mr. F. R. McBride to the board of directors of their recently acquired company, IES Industrial (Ireland) Ltd., engineering and industrial technical agents, 81 Rosetta Road, Belfast and 42 Dawson Street, Dublin.

Mr. McBride, with a long experience in the industrial and domestic energy field is a chartered engineer, a senior fellow of the Institute of Fuel, past chairman and honorary secretary of the Northern Ireland Section, a member of the Institution of Mechanical Engineers, a member of the committee of the Northern Ireland Branch, and a fellow of the Institute of Petroleum.

He was awarded the M.B.E. in the recent Birthday Honours.

The Northern Ireland Branch of the Institution of Domestic Heating Engineers had as chief guest at their recent Annual Dinner Mr. Stanley Maxwell who has had long connections with the building industry both as a journalist and in public relations.

Mr. Ian Morrison chairman of the branch welcomed guests from both the North and South at this popular function which was once again held in the Strangford Arms Hotel, Newtownards.

We believe that Wm. Coates & Co Ltd have now moved into their new office and workshop complex at Mallusk Glengormely.

Hadden Heating Services Ltd have moved to new premises at 207 Belmont Road, Belfast 4.
allows them to capitalise to the full on their exhibition investment.

As organisers of a number of highly successful trade and public exhibitions in this new complex, ITTEX will be bringing their wide experience to bear as organisers of IhVex '79. Not least is the high level of presentation possible in the modern Simmons-court facility where ITTEX employs a number of special features including a unique elevated bar/viewing feature (see illustration, page 24).

IhVex '79 will also employ the full-size theatre style auditorium which immediately adjoins the exhibition area and can seat 450. This will be used for the seminars and lectures now being organised to coincide with the exhibition.

The extensive catering facilities at the new IhVex venue with restaurants overlooking the exhibition area, will again be used to operate the highly successful luncheon scheme under which several hundred exhibition visitors – nominated by exhibitors on special lists supplied by them to the organisers – are invited each day to dine as guests of IhVex.

The timing of IhVex '79 is also an opportune. Having followed the industries it serves through its cyclical fortunes from good times in 1975 to relative depression for its 1977 outing, IhVex '79, will provide the single greatest marketing opportunity of what must at least approach a boom year.

The exhibition publicity, through a comprehensive and widespread campaign, is designed to focus the attention and attract all possible trade and industrial visitors.

Display advertising will feature the exhibition in trade, commercial and financial publications while posters, showcards, correspondence stamps and advertising slugs will be among the aids aimed at securing a high quality attendance.

All foreseeable standard display needs can be adequately accommodated, including arrangement for furniture hire, stand cleaning, telephone, and other services to suit individual needs.

To assist exhibitors in both time and cost, an attractive shell stand scheme is being arranged. Mandatory for all perimeter positions, occupants of central sites may also take advantage of this facility if required.

Many of the previous exhibitors have already booked up for the forthcoming show, most of them with increased space. Details of the sites still available, including cost, can be obtained from John Butterly, ITTEX, 11 Ely Place, Dublin 2, (Tel: 763385).

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Central Heating is still very cheap to run even with today’s rising fuel prices when you have a TARM combination central heating boiler. TARM boilers are so designed that simply, opening one door and closing another you can switch from oil to solid fuel heating. The TARM has proven that you can heat your house for as little as 50p per 24 hour day, based on average 1200 sq ft house in Dublin. The Tarm is completely automatic as the heat-increases the dampers close, thereby controlling the rate of burning and the amount of fuel used.

TARM have a boiler to suit everybody, from the tiny F.T.C. to the wonderful O.T. type. The FTC is 34 inches high, by approx 20 inches square will fit in any boiler house or back of garage, can be put in a kitchen. One stoking lasts all night, average stoking every 6 hours.

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Grilles and registers, single and double row.

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Sightproof grilles for relief, transfer and circulation.

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Glasflex for Metallic Ducting

Glasflex is claimed to be an economically priced and light weight flexible duct suitable for both low and high velocity ventilating and air conditioning systems.

It may be used to carry both cold and hot air and, coupled with its outstanding flexibility and ability to withstand repeated flexing without damage or kinking, makes it an ideal choice for many applications.

On site the installation team value its time saving features of compressibility — said to be down to approximately 25% of its extended length when making connections in confined spaces — and the ease with which end joints may be secured using Zone lightning banding and duct sealant or Zone duct tape.

Glasflex is supplied in standard lengths of 15 or 20ft — but by simply screwing one end into the other and sealing the joint with Zone duct tape, a flexible duct of any length can be completed in minutes. Likewise, shorter pieces of like diameter may be joined together to avoid wastage.

A pre-insulated version of the standard Glasflex flexible duct is also available.

Grilles to Suit All Applications from Biddle

The ‘V’ type grille from Biddle is assembled from pressed sheet steel units 2” wide and up to 71½” long. Each unit consists of a series of steel vanes set at an angle of 45° into vertical support bars. These units are then assembled side by side and their return edges are spot welded together. A surrounding fixing margin completes the grille.

The construction of this type of grille enables it to be made in a great variety of shapes and sizes and permits the widest opportunities for its application. The maximum standard sizes are 44” wide and 71½” high or 92” wide and 44” high (fixing margins extra). Smaller sizes are available in increments of 2” wide and ¼” high.

Standard fixing margins are 1¼” wide but margins can be any width in excess of 1”. Margins are drilled 3/16” dia. holes at approximately 6” centres.

‘S’ type grilles offer a good free area and can be fitted with a screw operated damper control if required. The standard finish is grey infra red dried enamel primer to BSS 2660 colour code 9/100. Biddle ‘S’ type grilles are suitable for a wide variety of applications and represent a really serviceable grille at a most economical cost.

Further information is available from Unimack Ltd., James’ Place East, Lower Baggot Street, Dublin 2. (Tel: 789570) Telex 4147.
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SATURN MARK 2 PRESSURE JET OIL FIRED BOILERS.
Rating 60-90,000 B.T.U. HR.

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Top Flue Outlet.

75% Efficiency.

Attractive Insulated casing optional.

Length: 15" (38)
Width: 15" (38)
Height: 36" (91)

Connections 2-1" Flow and Return Connections are provided on either side of the Boiler.

For further details contact:—

P.H. Ross Ltd.
16/18 Old Cabra Road Dublin 7. Tel: 309666/309303.
The Zone multi-blade duct damper is of a new and unique design in which the dimension of the top blade is varied, allowing the damper casing to be fabricated to any specified width and height while maintaining the maximum internal free area with the blades in the open position. The undesirable loss of free area which occurs with excessive extension of the top and bottom landing angles need now no longer be accepted.

The 9" deep damper casing is constructed from 16 gauge galvanised sheet steel with 1½" flanges formed at each end ready for purchaser to match drill. This permits withdrawal on site with the blades in the open position, in accordance with the HVCA specification.

The "Veeform" damper blades constructed from 1mm thick section combine rigidity with an overlapping and interlocking edge seal and are carried at 6" (152.4 mm) centres on ½" (12.7 mm) diameter zinc plated mild steel spindles running in nylon bearings. The bearings are provided with an internal collar to ensure accurate spacing of the blade ends from the inside face of the casing.

The Zone internal linkage system incorporating zinc plated mild steel arms with nylon trunnions and pivots is used for both parallel and opposed blade dampers ensuring freedom from corrosion and years of trouble free service.

Both parallel and opposed blade dampers are supplied with the blade setting controlled by either a die cast aluminium alloy lockable quadrant assembly for hand control or with a link arm when the damper is to be electrically or pneumatically operated.

A motor mounting stool is provided as standard when the damper is to be power operated.

Motor, ancillary linkage and pneumatic actuators are not normally provided.

Further information is available from Woodside Engineering Ltd., Grand Canal Harbour, Dublin 8. (Tel: 780152).

Vent-Axia Range

Armstrong Autoparts now have the full range of AVA accessories ex-stock. These accessories complete the range of products and provides even greater flexibility in solving all kinds of ventilation problems.

Accessories ex-stock include: Roof plate assemblies (for flat or pitched roofs), soaker flange sheets to suit most profiles of corrugation, wall plates (fixed and removable types), egg crate grilles, non vision door grilles and external weather louvres, PVC flexible ducting in sizes 102 mm, 178 mm, 229 mm, 254 mm, and 406 mm and the corresponding worm drive clips.

Adaptor kits for splitting Vent-Axia fans to accommodate a large fixing thickness between the two are also available. Four core white PVC cable is supplied in minimum lengths of 5 m.

Details on other AVA accessories can be obtained on request.

For technical information or advice contact Vent-Axia Division, Armstrong Autoparts (Ire) Ltd., Camac Close, Emmet Road, Inchicore, Dublin 8. (Tel: 781700).

Comprehensive Greenwood Selection

Greenwood's Lloydaire range of linear grilles and registers are designed for wall, cill and ceiling applications especially where continuous lengths of grilles are required as part of an architectural feature for heating, air conditioning and ventilation systems.

The four designs available comprise two grilles, the GL100 and GL100/15 with 0° and 15° deflections of the face bar, and two registers, the GL100 D and GL100/15D with the same deflection but fitted with...
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Tel: 0293 26062.
The Netaline range of top quality extruded aluminium registers and grilles combine clean modern lines with efficient performance.

Single and double deflector registers, eggcrate and linear strip grilles, external louvres, circular and square ceiling diffusers, linear slot diffusers, volume control dampers - they're all available in various sizes to meet all requirements.

Further details, prices, and catalogues can be obtained from Dan Chambers Ltd., 3 Echelin Street, off James Street, Dublin 8. (Tel: 720448/784953).

A selection from the Netaline range of external louvres.
New Ceiling Grille from Barber & Colman

Barber and Colman Ltd., manufacturers of the world’s most extensive range of air distribution equipment, has introduced a revolutionary new ceiling grille — the continuous line diffuser, Model CUD.

Launched recently on the Irish market by Coolair Ltd., distributors of Barber and Colman equipment in Ireland, the new grille delivers the same volume of air per foot run as a conventional four slot diffuser and is designed to produce one way or two way air patterns.

Ideally suited for use with variable air volume systems (VAV), a major advantage of the new CUD grille is that air flow can be throttled down to complete shut-off without dumping taking place — thereby avoiding uncomfortable environmental conditions.

The new grille, which underwent extensive laboratory testing before release, is available from Coolair Ltd., Unit C, Cookstown Industrial Estate, Tallaght, Co. Dublin (Tel: 511244).

FINHEAT

CONCENTRATE ON SPEEDY DELIVERIES

Finheat Ltd, who are now entering their third year as suppliers to the trade of heating and ventilating equipment, can look back with pride on their performances over the past two years.

As sole agents/stockists for the full range of Myson/RCM grilles, diffusers, damper and registers, they claim to be fast becoming the sales leaders in that field due mainly to the policy of the company and the quality of the product.

The Myson/RCM grille is easy to identify in that it is the only argan-arc welded mitred corner constructed grille available with a silver grey stove enamel finish. This particular finish eliminates the visibility of corner joints and ensures the rigidity of its construction.

Myson also does a range of secondary duct dampers which are particularly useful for controlling air flow rates in small duct sections such as branch ducts or plenum connections. Types JOD and JRD can be used for controlling the air flow rate from terminal boxes positioned above a ventilated ceiling. All units, except JRD, can be supplied with fusible links to give a limited amount of fire protection.

Finheat’s policy has always been to carry the maximum stock to suit demand and this policy has proven them right time and again which is mirrored by the response they are receiving from their customers, and on special specified contracts, they are fast gaining a name for themselves for speedy deliveries. These factors, together with the full support of Myson Group Marketing Ltd, ensure that Myson/RCM grilles will have an ever increasing demand in the future.

Further information is available from Finheat Ltd., 34 Watling Street, Dublin 8. (Tel: 778120).

GRILLES

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Further Details
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This month’s project profile moves outside the Capital and looks at a smaller but nonetheless interesting scheme undertaken by J N & G Traynor & Partners on behalf of the Shannon Free Airport Development Company in Limerick. It comprised the provision of specialist services for the extension to the prestigious Analog Devices BV factory on the Raheen Industrial Estate, designed by architects and structural engineers Thomas Garland & Partners.

J N & G Traynor & Partners, with a staff of nine, is a predominantly family concern, founded by Noel Traynor in the early 1970s after a long and varied career with Hadens and McCann Ltd. In 1974 he was joined by Gregory Traynor and his two daughters and son, Noel Junior, have since become staff members.

The extension to the Analog factory, with the exception of the first floor offices, is air conditioned throughout. Five packaged roof mounting cooling units provide air to assembly, engineering ground floor offices and dining room areas, and obviates the need for costly air conditioning equipment plant rooms.

Vinyl backed fibreglass ductwork provides a lightweight solution to the perennial problem of supporting sheet steel ducts from a purlin and deck type roof structure, and simultaneously gives excellent thermal and acoustic insulation.

In the assembly area, air is supplied through high capacity circular diffusers, and is returned through recessed purpose made fluorescent lighting fittings, thereby reducing the sensible heat gain in the conditioned space and, at the same time, providing an integrated and aesthetically pleasing ceiling pattern. At the design stage it was felt that the sensible cooling load in the assembly area would increase rapidly, reducing the need for reheat, and so electric heater batteries were chosen in the cooling/ventilation/heating sequence. Elsewhere, LPHW reheat batteries were used, with three port diverting valves and electric controls.

The dining room has an all outside air system. Air from this area is extracted from the kitchen and the operation of the air handling unit is interlocked with the kitchen extract fans and safety cut-out buttons on the kitchen equipment. Electrode type steam generating humidifiers with reverse polarity descalers were used to provide humidification throughout. Ducted mechanical extract ventilation is provided to the conference room and toilets. The first...
floor offices have a conventional one pipe LPHW radiator system, with individual thermostatic control.

A 878 Kw packaged steel LPWH boiler was installed in tandem with an existing boiler to serve radiator and heater battery circuits. The heating system is pressurised.

Domestic hot water for kitchen and toilet facilities is by two 1,350 litre vertical copper calorifiers. A 9000 litre GRP sectional cold beneath the kitchen area. Standby immersion heaters are installed with each calorifiers. A 9000 litre GRP sectional cold water storage tank is located on the roof and serves the new extension.

The high electrical process load necessitated running three large feeder cables in parallel to the new extension from the existing main switchboard. Conventional self-contained emergency lighting and manual fire alarm systems are provided in addition to basic electrical servers. A small goods lift serves the first floor kitchen area.

The overall appearance of the project is a bright and clean one, where the services play an unobtrusive part in maintaining a pleasant working environment.

Permission for photographs courtesy of Analog Devices B.V.; Main contractor: J Brennan & Co, Galway; Air conditioning contractors: Climate Engineering Ltd, Dublin; Electrical contractors: Boylan Electrical Co Ltd, Limerick; Plumbing contractors: Keehan Heating Ltd, Limerick.
Tom Finlay, the present Chairman of the Mechanical Engineering and Building Services Contractors Association, has been in the industry now for more than 50 years. In that time he has seen many developments which he believes have been to the benefit of the industry but he still hankers after the old basic methods whereby an apprentice to the plumbing trade came out of his time as an expert on nearly every aspect of the building trade. Not that he is knocking the present-day methods of training and education but he feels that finishing students lack that “in depth” appreciation of the industry that was common in his day.

From serving his time to the plumbing trade in Haydens he moved on to H.A. O’Neills and later back to Haydens again. Moving up the ladder he eventually reached the position of Manager – a prestigious position at that time as O’Neills were undoubtedly one of the biggest and best known companies of that era.

In 1946 however, with the co-operation and backing of two friends, the present company, of which he is now Managing Director, was set up. This was FKM Ltd, (Finlay, Kelly and Monaghan). Mr Finlay and Mr Herbert Kelly still work at the company but Mr Francis Monaghan died shortly after he retired in 1962.

The company has grown from a small beginning to such an extent that it now has a workforce of 180 operating from offices and a large workshop at 93 Ranelagh Road. Today, FKM concentrate all their energies on the industrial sector as Mr Finlay feels that there is no money to be made in the domestic sector because of high prices and overheads.

He has been chairman of the Mechanical Engineering and Building Services Contractors Association for the past eight years. Until last year, it was known as the Heating, Ventilating and Contractors Association but, according to Mr Finlay, this title was slightly outdated. “With all the new concepts and specialists coming into the trade,” he says, “we decided that we needed a name change to suit the professions and skills that were involved, hence the MEBSCA.”

The main function of the Association, according to Mr Finlay, is to inform the members and the trade of present day trends, disputes that may arise, prices of materials and services required. “We also look for such things as wage stability,” he says, “originally, before the National Wage Agreement came into effect, we dealt with the unions directly. But nowadays, we tend to concentrate on our own domestic and internal matters such as travelling time, country money and other minor matters that are not dealt with by the NWA.”

Regular meetings are held and Mr Finlay is critical of those contractors who do not avail of these opportunities to turn up and keep abreast of the immediate problems that beset all main contractors. Council meetings
The question of dealing with apprentices, their work and their education is another subject that takes up the attention of the Association and is a subject that Mr Finlay feels quite strongly about. Meetings take place quite often with An Foras Forbartha recently that supplies of copper piping, in particular, are being rationed. "Well," he said, "we have no problems getting copper piping. We do have a slight problem with specialised equipment such as special valves but otherwise we find no shortage in the basic materials needed."

Despite the fall-off in contracts last year he reports that business is on the way up again and that there is no shortage of work in the immediate future. This he hopes will bring back a stability to the trade and do away with the practice whereby some contractors had to cut their costs to the minimum and forego profit in order to survive.

The lack of skilled labour is the Association's main worry today. Mr Finlay foresees a shortage in the near future and is none too happy about the present day apprentice who is coming into the trade. Not that he doubts their educational background, but he firmly believes that when they have served their time they still lack the basic fundamentals that the old time apprentice had at the end of his five year term.

"Today's consulting engineers are demanding a far higher skill in their specifications, far higher than AnCO are capable of teaching. I think it was a mistake to cut the term of apprenticeship from five years to four."

Links are also maintained with the UK and Europe. The MEBSCA are information members of the HVCA (UK) and are represented on the Commercial Contractual Committee. Discussions with these two groups take in current trends and developments, materials etc. They are also members of the Genie Climatique International which just recently held their annual convention in Sweden and at which Mr Finlay attended.

"We discuss the trends and difficulties within the industry and how it affects various countries in such matters as standards and contracts," he says. "We have had a disagreement for some time with the GLI here in Ireland and the UK we have a system of nomination which is not practised on the Continent. This means that an architect can nominate a sub-contractor, thus making him a nominee contractor to a builder who in turn has various privileges in the sense that money given to the contractor is trust money and it cannot be spent by the main contractor, so offering protection to the sub-contractors if he goes into liquidation. With the exception of the Danes, the Continentals do not apply this system.

Membership of the MEBSCA for any prospective contractor is based on a simple criteria. He must be in the business for at least two years and supply evidence of the number and type of contracts and their values in order that some assessment of his credentials can be made.

Most of the members tend to be those specialising in the larger industrial type of work and according to Mr Finlay, that accounts for about 90% of the main contractors in Ireland. Those in the smaller categories of contractors tend to join the Irish Domestic Heating Engineers.

Turning to problems that face the home market, Mr Finlay is not too worried about the present situation although when IHVN suggested to him that there were shortages of materials, he disputed this. We referred him to a statement by An Foras Forbartha recently that supplies of copper piping, in particular, are being rationed. "Well," he said, "we have no problems getting copper piping. We do have a slight problem with specialised equipment such as special valves but otherwise we find no shortage in the basic materials needed."

As for the "cowboy operators," Mr Finlay is happy about the present standards operated by all the main contractors and doesn't feel that the "fly by night" installer cause them much concern. "They do however," he says, "cause a problem for the smaller contractors because of poor standards, but this is a problem for all trades, especially the electrical trade. People get what they pay for, but I can understand people wanting a job done cheaply because of the price of materials and the time to be paid for the workman," he added.

While the MEBSCA rarely have direct Government contact, in the past they have met officials from the Health and Education Departments over certain contract clauses which the group were unhappy about. But, according to Mr Finlay, they always have found the officials to be "very reasonable." For the future, he believes that no Government can legislate for the MEBSCA. "It's a matter for ourselves," he concludes.

What he sees as being most important for all his members is the ending of the long delays concerning "retention money". In the past this practice has caused serious hardship to many members of the MEBSCA, but recently, after much lobbying, they managed to get the 10% figure reduced to 3%.

The MEBSCA would like to see a shortening of time that allows bills to be paid from the main contractor to the sub-contractor. "What's happening," Mr Finlay says, "is that there are three parties involved, mechanical consultants, quantity surveyors and architects. All have a say before payment certificates are issued and even then the clients payment, when made, goes first to the main contractor and we are left at the end of a long process with no means of knowing where or when our money is going to be paid."

He wants to see some system whereby a short circuit of this delaying process can be brought about. He quite rightly points to the fact that all suppliers will only allow a 30-day credit system. In the meantime, the contractor has to pay his overheads, wages, etc., despite the fact that somebody else has got his money. However, architects, will apparently now endorse certificates if requested and Mr Finlay sees this as at least some step in the right direction. How much progress can be made as a result of this remains to be seen.

EXECUTIVE MEMBERS OF THE MEBSCA

Chairman: Mr T. Finlay, FKM Ltd., 93 Ranelagh Rd., Dublin 6.
Mr T. Lynskey, T.E. Lynskey Ltd., 103 Rosemount Ave., Artane, Dublin 5.

secretary@ihvn.ie
http://www.ihvn.ie

Published by ARROW@DIT, 1978

IHVN, June 1978
Hoval boilers are fast becoming the top choice where low cost and high efficiency are necessary. They range in output from 240,000 to 16 million Btu/hr and many of them are specially designed to fit into small areas where space is at a premium. For example the Hoval ST 2000 boiler is only 31⅛” (790 mm) wide, and yet it has an output of 2 million Btu/hr. With an impressive pedigree as one of Europe’s best selling boilers, Hoval have the international technical competence to maintain their leadership. And not only in boilers. Hoval have also made a name for themselves in calorifiers, pumps and pressure vessels.

**Hoval ST** boilers are available in eight models covering heat outputs from 290 to 1466 kW (1 to 5 million Btu/h). A very narrow and robust forced draught boiler, Gas or oil fired.

**Hoval SR** boilers from 88 to 367 kW (300,000 to 1,250,000 Btu/hr) with domestic-hot water outputs from 200 to 700 gal/hr can be supplied for conventional heating or as combination units with calorifiers. Narrow, compact and chimney independent, Gas or oil fired.

**Hoval TKD-RR** boilers offer ten outputs from 586 to 4,700 kW (2 to 16 million Btu/h up to 150 psi). Higher ratings can be quoted for specific applications, Gas or oil fired.

**Free-standing design** F type calorifiers are available as free-standing units and can be used in conjunction with any make of boiler. They have been installed throughout Europe in domestic, commercial, industrial and local authority buildings. Their quality, economy and simplicity-of-installation have been proved over and over again.

1. Economical and low-cost elimination of all combustible waste in Hoval Incinerators using the non-polluting Hoval process.
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7. Savings by eliminating the need for environmental protection facilities thanks to the special non-polluting combustion process. Emission values are below existing or anticipated law enforced regulations.
INCREASED EFFICIENCY REDUCES RUNNING COSTS

Fifty years ago, the term shell type boiler was synonymous with Cornish and Lancashire boilers. Today, both these type of boilers have passed out of use and almost out of memory. These boilers were simple in design, rugged in construction and had an expectation of life of 30 to 40 years. Essentially, they consisted of a cylindrical body pierced from end to end by one or two tubular flame tubes. They were basically inefficient and, during the 1920s, the first economical boilers with internal smoke tubes made their appearance. These were the forerunners of the sophisticated packaged units which are universally used today.

Over the past few years the boiler industry has seen the rationalisation of shell boiler design and component parts. Inherent in this rationalisation is the advent of many innovative features, many basically good but some undesirable, these in the main being at the cost of the customer by way of lack of access to component parts, resulting in the loss of many maintenance facilities, together with high running costs – deterioration of efficiencies.

In many instances hot water boilers are mere innovations of steam boiler designs and vice-versa, thus malfunction of combustion and water circulation technique is effected to a large degree. Many boilers of such design with either the steam space flooded and operated as hot water units, or the shell diameter reduced to the minimum around steam internals. In the first instance, an unnecessarily large volume of water is present in the top part of the shell.

The combustion side of the boiler is affected by the pressure and temperature at which it operates. Many instances can be quoted where a steam boiler design of say 100 p.s.i.g pressure has been used for a low pressure hot water installation of 180°F low temperature. The mean operating temperature differences of are vastly different and this, coupled with a larger volume of water, leads to low back and temperatures which are accelerated by poor water circulation. If heavy fuel oils with high sulphur contents are being fired in burners with large turn down ratios, this serves to add to the rapidity of boiler failure.

Modern shell boiler designs now employ high furnace combustion intensities and high heat transfer ratios. These are now as high as 300,000 BTU per cu ft per hour and 15-17 lbs of steam per ft of heating surface respectively. This demands critical control of feed water treatment because of the high heat transfer rates within the furnace and boiler heating zones. Consequently upon the high heat transfer rates now used, overall boiler size for a given output is greatly reduced.

However, because of the reduction of heating surface, the pressure loss across the flue gas passages have increased significantly over the years and because of this, the fan fitted to the burner requires to be much larger to overcome the increased resistance. The motor to drive the fan must also be increased, resulting in increased electrical power requirement.

The reduction in the ratio of boiler output to physical sizes has also put considerable emphasis on good design to ensure proper water circulation within the boiler itself. In hot water boilers, it is important to provide for diversion of incoming water away from hot heating surfaces, thus overcoming cold spotting and thermal shock.

Good boiler design must ensure that the circulation system within the boiler is such that stratification, cold spotting and thermal shock are avoided. It is also important that the boiler will have the ability to handle wide differences between flow and return temperatures and the head loss within the unit is kept to a minimum. It should be remembered that stratification can take place, not only from the top to bottom, but also from front to back within a boiler.

Many devices have been tested over the years in an attempt to ensure optimum performance in this area. Any device fitted must compliment the natural circulation path. Generally, a dispenser pipe runs along the boiler shell for between half and two thirds of its length and from this pipe water

A typical example of an installation comprising Danks boilers.
MIDCOM RANGE FROM GOUDEI

MIDCOM steam (or hot water) lances are constructed of heavily finned tube specially made to give high rates of heat transfer over their entire surface. They are extremely robust to give long, trouble-free service and are flanged for mounting to the tank. Each lance is hydraulically tested to 600 p.s.i. at works before despatch and a test certificate supplied free of charge. When selecting a Midcom lance of either type SL or SLT, it is recommended that the lance should be almost the full length of the tank, to give even heating of the tank contents. The heat output on steam will then be adequate to raise the oil from cold to storage temperature in a few hours if necessary.

As the heat losses from storage tanks vary considerably from summer to winter, the heating surface must be sized to cope with most severe conditions and also be capable of heating a cold tank to working temperature in a few hours. Thermostatic control of the heater is necessary to avoid overheating of the oil and consequent heavy sludge formation. The Midcom SLT heaters have Spirax Sarco steam thermostats fitted on to their header flanges, to minimise installation work. The fitting of multiple type SLT heaters to large bulk oil storage tanks will give adequate and even heating. An oil draw off connection can be provided on the flange if required. With installations used for seasonal heating it may be necessary to install additional electric tank heating for start-up purposes. A suitable range of Midcom electric heaters are available.

The typical duplex steam/electric "Lineflo" unit has been designed to overcome the various problems of oil heating and pumping. It provides burner manufacturers with a fuel that is heated and pumped at the burning temperature and pressure, direct from the fuel storage tank(s).

The use of such a unit, pumping oil through small bore insulated and traced pipework to the burner, reduces very considerably installation costs, in fact, savings in excess of 50% are said to be possible. Extra space is available in the boilerhouse where normally oil heating and pumping equipment would previously have been installed.

With this system, any oil spillage during maintenance is confined to the oil storage compound, allowing extra clean boiler-houses, essential in food factories etc. The unit incorporates patented temperature control arrangements assuring even outlet temperatures even under widely varying load conditions. Single or duplex filters are fitted as standard on the suction side of the pumps and fine mesh strainers can be supplied on the oil outlet if required. All electric and steam heating surfaces are external to the oil storage tank and can easily be removed if necessary, without draining the storage tank(s).

Information on the entire Midcom range is available from Goudie Boiler Services Ltd., 129 Applewood Heights, Greystones, Co. Wicklow, (Tel: 875142), who act in the Republic on behalf of G W Monson & Sons who are the agents for the whole of Ireland.

Tepor 2-4 Boilers

High-performance "Tepor 2-4" boilers have been planned for dual operation with fuel oil and gas oil as well as with coal. The fuel/gas oil type is equipped with a special furnace door making it possible to install any kind of burner without any need of special device.

The standard equipment of coal operating boilers is as follows: furnace door; breast; fire grate; and fire-bars. Combustion air automatic control gear is also available on request. The changeover from liquid to solid fuel and vice-versa is easily achieved by the use of a special furnace door connection facility.

The instrumentation panel includes: boiler thermometer and boiler and safety thermostat, manually operated in compliance with TUV standards. These instruments are cabled and supplied with a special sheathed cable for connection to the burner. Sizes range from 100,000 to 1,000,000 Btu.

Further information is available from Mark Plumbing Ltd., 17 Mark St., Dublin 2. (Tel: 772994).

The Nu-Way Benson vertical model Airheater, WH88 from Mark Plumbing.

Chappee Boilers from Dockrells

Dockrells carry a full range of Chappee cast iron sectional boilers, ranging from 60,000 Btu/hr to 650,000 Btu/hr in their warehouse in Ballymount. These boilers are very well established and are made in France by Societe General de Fournier and have been sold on the Irish market for over 20 years.

Further information is available from Dockrells of Ballymount Cross, Clondalkin, Co. Dublin. (Tel: 500822).
Announcing the Introduction of

Lamborghini Products to the Irish Market

Mild Steel Boilers SP 35/141 35,000 K Cal/h – 141,000 K Cal/h.

Steel Heating Plant FB 30/40 30,000 K Cal/h – 40,000 K Cal/h.

Air Heaters LG 26/750 26,000 K Cal/h – 750,000 K Cal/h.

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The Rio C1N, 1N and 2N cast-iron boilers have been designed to operate with fuel-oil or gas, with perfectly balanced combustion and very high output.

Suitable for medium-power installations, the shape and volume of the combustion chamber have been designed to take all types of burner, fuel-oil or gas. The heating part, with assembled elements, the result of very long experience, are in special cast-iron, a great material highly resistant to corrosion, thus guaranteeing a robust and long life.

The combustion chamber takes maximum advantage of the radiation from the burner flame. Gases from combustion are channeled through a thermic exchange circuit to the starting channel and the chimney.

Such rational use of the fuel results in very high yields. The front doors, which are hermetically sealed, are easily detached for inspection and complete chimney-sweeping of the boiler.

The two-colour plating, elegant and modern, is made of fired-enamel steel-plate. It is insulated and incorporates the controls.

The dual-purpose C1N boiler presents the ideal solution for central heating and the production of hot water at a low running cost. It is a direct descendant of the 1N series and offers the same advantages and guarantees.

Equipped with a 4-way mixer sluice allowing for the partial or total exclusion of the heating circuits, the dual-purpose boilers are delivered fully assembled and factory-tested. This is important as it saves time during installation. An elegant and functional panel includes the regulation and safety controls, for easy use.

Specially designed for inclusion in the group, the tank produces abundant very hot water. Its accumulation capacity, together with its large exchange surface, enable it to supply heavy demand and to regain high temperatures very quickly, because it is permanently fed by the primary circuit, which irrigates it before feeding the heating network. For this reason there is no point in providing a priority device for sanitary hot water.

Further information is available from Hevac Ltd., London Ave., Fairview, Dublin 3, (Tel: 373796).

**Simplicity from Cradley**

The Cradley "Steampacket" boiler incorporates many well-known features including simplicity, easy access to fire tubes and combustion zones, generous facilities for water side inspection, full complement of robust mountings, and safety controls complying with latest requirements.

The "Steampacket" is manufactured in sizes up to 25,000 lbs steam per hour from and at 212 degrees Fahrenheit and is suitable for oil and gas firing. These units are also available for hot water operation, either as fully flooded or steam cushion units.

Sizes up to 1500 lbs per hour are built for a standard pressure of 100 lbs, per square inch, and larger sizes for 150 lbs per square inch. Higher pressures can be offered when required.

The packaged unit is complete; it only remains for the purchaser to supply and erect a suitable chimney, connect the steam main and the usual services before setting to work.

Cradley still manufacture a range of vertical multi-crosstube boilers; vertical multitubular boilers for outputs up to 4,000 lbs per hour. These can be supplied packaged, or dismantled for installation on site.

Further information is available from GW Monson & Sons, 18 Ballyblack Rd., Newtownards, Co. Down. (Tel: 912350).

**Riello Technicians Trained at Own School**

Riello has been making burners for 50 years. Now, as regards both output and number of employees, the company deems to be the leading burner-maker in all Europe.

Riello has also reached the maximum level of integration, as in its factories are also produced most of the components and accessories of the burners, ie pumps, control boxes, thermostats, transformers, solenoid valves, and recently, electric motors (under AEG licence).

These components, every one of them intended for a particular type of burner, are studied by highly skilled designers and constructed according to the most up-to-date techniques.

Moreover, the rigorous choice of materials, the continuous, accurate checks carried out in all stages of production and the final tests, give the best guarantee of high quality of Riello burners.

To this high standard of production, Riello adds an efficient and widespread sales and service organisation, that has been well established in Italy for many years and is being extended more and more to cover foreign markets.

Within Riello a school has been in operation for the past 30 years, where technicians and those entrusted with installing the burners attend instruction and refresher courses, which are open not only to Italians but also to workers from abroad. There is, therefore, a continuous inflow of new and well trained engineers into the service organisations.

Riello burners, in addition to supplying more than half the Italian market, are at the present time exported to over 40 foreign countries.

The burners are designed and constructed according to the most up-to-date international standards and have been approved by all the leading institutes.

Further information is available from Quadrant Engineers Ltd., Green Street East, Dublin 2. (Tel: 771411).
Gerkros Boilers are now the sole distributors of Lamborghini products in Ireland and have now set up a service centre for the maintenance of Lamborghini burners. Gerard PN Crosse (a director of the company) underwent an intensive course in Italy on the application for use in furnaces of high back pressures with results said to be exceptional for burners of these dimensions.

Construction, installation and inspection is said to be simple, with each burner pre-wired, for the set up only one operation being necessary: air calibration.

There is also a range of burners for use in furnaces of medium pressurisation and in depression.

The Lamborghini range of SP mild steel boilers were developed expressly to satisfy the needs in the field of civil heating of small and large consumption.

The latest technical solutions have been incorporated to obtain a high yield of combustion that exceeds even 90%. In addition, criteria of functionality, robustness and silence, which give these products the first places among the most qualified competitive products, have been kept well in mind.

In combined models the large surface area of exchange of the boiler allows it to have a very short reloading time, while its capacity permits it to satisfy the need for hot water even at demanding times.

The boiler body is in thick electro-soldered steel, perfectly inspectable by means of a large anterior door which can be opened in two directions, complete with a fire painted coating and finished in rock wool to protect against leakages. The storage cylinder is dismountable and constructed in thick steel finished internally with special material to protect against corrosion.

Efficiency is guaranteed by the coupling of the boiler-burner; oil and gas, expressly designed one for another.

Further information is available from Gerkros Boilers (Tipperary) Ltd., Unit 8, Rathcoole Shopping Centre, Main St., Rathcoole, Co. Dublin. (Tel: 589043).

Versatility of Design

One of the largest ranges of boilers manufactured is that of Allen Ygnis Boilers Ltd. The complete series of low cost packaged hot water boilers, suitable for use in low, medium and high pressure systems are available in 19 individual sizes ranging in output from 4 million Btu with working pressures up to 150 psi.

Designed for either gas or oil firing, they are supplied as matching units and have operating efficiencies between 81% and 83%. Nu-Way burners are utilised as standard and the basic boiler design is on the established Ygnis pressurised combustion principle whereby the first two passes take place within the combustion chamber itself, the reversing flame causing the gases to enter and re-enter the high temperature flame zone before making a third and final pass through the fuel tubes around the shell periphery.

The versatility of the design allows for horizontal and vertical flue take-off from the back of the boiler and comes complete with right hand or left hand front door opening. The instrumentation and control panels are built into the casing, the control panel incorporating a wide range of facilities including multi-boiler sequences, control and time clock and specialstat systems.

Further information is available from Hvac Ltd., Lomond Ave., Fairview, Dublin 3. (Tel: 373796).

By introducing the first packaged boiler range into Great Britain in 1954, GWB set a trend in design and manufacture that drastically changed the boiler market. A survey of the first Powermaster installations, which have been in use far longer than many other packaged boilers, proved them to be exceedingly dependable and highly efficient.

The analysis confirms that the Powermaster maintains efficiencies in the order of 83% with the burner requiring only infrequent cleaning.

The ability of these units to maintain high efficiencies is obviously of paramount importance when one considers that on average a boiler, in one year alone, could burn fuel equivalent to approximately 50% of the original cost of the complete boiler and its installation.

The changing world fuel situation is a critical factor when selecting a boiler as seasonal demands, unforeseen increases in prices and even industrial disputes can stop production. Therefore, the type of burner used on the boiler must be capable of simple and immediate change from one fuel to another and be extremely efficient at all times. The Voriflow burner, which is integral with the Powermaster, is capable of all these things, being specifically designed to match the boiler.

One-source responsibility is given with Powermaster and Voriflow equipment, this guarantees the utmost satisfaction simply by the fact that they are completely designed, constructed and serviced from the GWB factory.

Further information on the entire GWB range is available from Hendron Bros Ltd., Glen Tolka, PO Box 298, 144 Richmond Rd., Dublin 3. (Tel: 376061).
Announcing the Introduction of

**Lamborghini** Products to the Irish Market

G12 – G75 Oil Burner 122,400 K Cal/h – 765,000 K Cal/h.
PN 20/130 Heavy Fuel Oil Burner 215,600 K Cal/h – 1,372,000 K Cal/h.
PG 12/130 Overpressure Oil Burner 122,000 K Cal/h – 1,530,000 K Cal/h.

- **APPLICATION** — In furnaces of high pressurization, with high volumetric thermic load, with inverted flames and in any case where a particular penetration of combustible glass is required. They are also perfectly adaptable for depression furnaces.
- **SIMPLICITY** — In construction, installation and maintenance. The burners are monobloc type and prewired. For the set up only one operation is necessary: air calibration.
- **AUTOMATISMS AND SAFETY FOR ALL MODELS** — A cyclically programmed electronic panel, with printed circuit and photoresistant probe. The starting cycle is composed of preventilation, preignition and postignition. The amount of combustible sent to the nozzles is dependent upon the correct position of the air shutter.
- **SERVICE AND WARRANTY** — Assured by the Lamborghini Organization and their local Agents.

For further information contact:

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three-pass cast iron boiler for oil or gas

Output Rating: 225–725 Mcal/h, 262–843 kW 900,000–2,900,000 BTU/h

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For further information contact:—

Goudie Boiler Services Ltd.

129 Applewood Heights
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Tel: (01) 875142
Providing Both Packaged and Free-Standing Models

The success of the Robey 'Lincoln' and 'Lintherm' boilers is based on more than 120 years experience. In the middle of the 19th century Robey produced their first steam engines and as steam raising requires boilers, so Robey started to develop their own technology. So successful were they that they added boilers to their product range. Their early products were modelled on the Lancashire and Cornish boiler design, but they introduced a two pass return tube economic boiler as early as 1890 and gradually concentrated their production on these models after World War 1.

The Robey Lincoln and Lintherm range cover duties from 3,000 lbs/hr up to 60,000 lbs/hr for the production of both steam and hot water. These units have been installed in companies that are household names such as Fisons, Tootal, Courtaulds, Pilkingtons, and the BSC as well as mills, breweries and hospitals. The export market has not been neglected and Robey has won great respect in many different countries, from Australia to Zaire.

The Lincoln range comprises three pass wet back shell boilers — Duty 3,000 lbs/hr to 60,000 lbs/hr from and at 100 degrees C; and three pass wet back twin furnace, twin combustion chamber shell boilers — Duty 15,000 lbs/hr to 60,000 lbs/hr and at 100 degrees C.

The Lintherm range is made up of three pass wet back shell boilers — Duty 3,000 lbs/hr to 15,000 lbs/hr from and at 100 degrees C.

Both Lincoln and Lintherm models can be supplied for use with oil, gas or dual fuel firing.

Finally, the Coaltherm range includes three pass wet back boilers of single or twin furnace design according to duty and for coal firing — Duty 3,000 lbs/hr and 25,000 lbs/hr from and at 100 degrees C.

All these models are available as packaged or free standing units.

Further information is available from SL Combustion Services Ltd., Laherdane, Ballyvolane, Cork (Tel: 021 51411) and SL Combustion Services Ltd., 158 Castleragh Rd., Belfast, (Tel: Belfast 59282).

Advantage Lies in Construction

Dantherm heats the air direct — no water is required. The warm air heater supplies instant heat and the air reaches even the farthest of corners. The required temperature is reached in only 20 minutes.

The Dantherm heater is fully automatic, supplied with remote control station with day and night thermostats and time switch. This ensures that the heater provides heating when needed. The direct automatic heating and accurate temperature control are the reasons for Dantherm's economic heating. Dantherm Model KA and KAL are free standing and horizontal suspended models respectively. These models heat outputs range from 29.3 Kw (100,000 Btu/hr) to 293 Kw (1,000,000 Btu/hr). The installation is very simple, just connect to mains electrical, flue, and gas supply.

Air heaters are basically of a very simple design, but Dantherm's real advantages are in its unique construction. The aerodynamic shape of the combustion chamber and the special assembly technique, without welding, eliminate all internal tension in the construction, caused by thermal expansion and contraction, and because the combustion chamber is produced from high heat resistant stainless steel, there is no risk of burning through.

The very high efficiency of the Dantherm heater — up to 90% — is obtained because of the special design of the heat exchanger. A large number of tubes, set at an angle of 45° bring the flue gasses into turbulence, so that the heat contained in the gasses is effectively convected through the surfaces of the heat exchanger.

The heater is built up around a chassis consisting of sheet metal profiles assembled into a very sturdy and strong unit by means of silumen corner pieces. A cylindrical inner heat shield prevents heat radiation to the outer surfaces of the heater. The cover panels are given a robust and durable surface by an impact proof stove enamel, burned on at a temperature of 4000°F. Furthermore, all the sheet metal used in the heater is protected by a phosphatisation which gives a very high degree of rust proofing.

The main fan is a double inlet centrifugal fan, which, with the motor, is mounted on vibration dampers and connected to the heater by an asbestos connection. This ensures very quiet and vibration free operation.

Further information is available from Hendron Bros. Ltd., Glen Tolka, PO Box 298, 144 Richmond Rd., Dublin 3. (Tel: 376061).

Cleaning and Maintenance Specialists

Dufferin Industrial Services, the longest established Belfast-based company, provide a complete cleaning service to the heating, plumbing and allied industries including a full chemical cleaning and hydra blasting service and extensive experience in high pressure water washing and jetting. The Dufferin Industrial Services provide a full 32 counties service and are the main cleaning contractors to the Irish Sugar Company.

Further information is available from Dufferin Industrial Services Ltd., 141a Snugville Street, Belfast BT13 1NF, (Tel: 084 743388).
B & E Boilers Ltd. of Bracknell, Berkshire – a member of the Richarsons Westgarth Group of Companies – is one of the larger manufacturers of shell boilers in England. Its design team has produced four separate and well-established boiler ranges, the European steam and hot water and the Windsor steam and hot water, all noted for their advanced design features, and high quality of workmanship and materials. The company’s reputation for reliability and fuel economy has helped to secure orders in many industries and institutions throughout the British Isles, and in the expanding industrial areas of the world.

With over 40 years’ experience in the heating industry, B & E Boilers is able to provide a comprehensive service to the industry, including maintenance and a heating advisory service, and can offer boilers for hire on a long or short-term basis.

An extensive pressure vessel and general fabrication manufacturing facility is also available constructing vessels to stringent standards, such as BS 1500, 1515, 5500 and ASME 8. Vessels of various sizes up to 4.5m (14’ 9”) diameter and 11m (36’ 1”) long can be handled adequately.

The B & E Boiler range extends from 200 Kw – 9,000 Kw (680,000 – 30,000,000 Btus/hr) for hot water and from 340 Kg – 13,600 Kg (750 – 30,000 lbs/hr) for steam. Burners of the pressure jet or rotary cup modulating type are offered for firing fuel oils from 35 secs. to 3,500 secs. Natural gas, town gas, coal, or turf fired designs are also available.

The European steam boiler – a three pass full wet-back economic packaged boiler suitable for firing all grades of fuel oil and/or natural gas, a solid fuel fired series is also available. Designed to meet the demanding standards of public authorities and industrial users, both at home and abroad, it is offered in varying heat transfers, from 31.75 Kg – 48.75 Kg of steam per sq.m. of heating surface (6.5 to 10.5 lbs of steam per sq.ft. of heating surface).

The European hot water boiler – a three pass full wet-back boiler suitable for firing all grades of oil and/or gas – a solid fuel fired series is also available. Designed for low, medium or high temperature hot water applications, the boiler is equipped with a special internal water circulation device which minimizes stratification and promotes the flow of water within the shell. Wide flow and return differentials are easily handled. Like the European steam boiler, it is also offered with varying heat transfers.

The Windsor steam boiler – a low cost treble pass boiler suitable for firing all grades of fuel oil or natural gas. It incorporates the well-proven reverse flow furnace design principle. The range is complementary to the European steam boiler, embodying many of its user features and providing a compact and accessible design.

The Windsor hot water boiler – a low cost treble pass boiler, suitable for firing all grades of fuel oil or natural gas. It also incorporates the well-proven reverse flow furnace design principle in which two gas passes take place within the furnace turning at the front end into a single bank of smoke tubes. The boiler has good access, low combustion intensity, low running costs and is fitted with a special internal water circulator designed to minimize water differentials within the shell and to obviate thermal shock. It is neat and compact and, like all B & E Boilers, occupies minimal floor space.

Further information is available from Henry R. Ayrton Ltd., The Cutts, Derrimagh, Dumnurray, Belfast and Mr. E.H. Siddall (assisted by Mr. P. Tiernan), 174 Ballinclea Heights, Killiney, Co. Dublin (Tel: 852412).

**Newly-Designed Casings**

The Chappee range comprises cast iron sectional boilers with newly designed castings, specifically for gas and oil firing for increased efficiency. Made of SGF special cast iron, the CM Chappee boilers are supplied in separate sections for assembling in situ.

All boilers have an insulated jacket of specially treated sheet metal, lagged with mineral wool containing a pre-cable operating panel comprising a regulation aquastat, safety thermostat, a thermometer, on/off switch and various control signals.

The general signs and high exchange rate of the range reduce the floor space required in relation to the output delivered. Access for cleaning and maintenance are provided through special access doors. The complete ranges go from 600,000 Btu/hr up to 4.4 million Btu/hr.

Further information is available from Hevac Ltd., Lomond Ave., Fairview, Dublin 3, (Tel: 373796).
There is good news for users of electrically-operated gas shut-off valves – Dewraswitch-Asco have expanded their range of Gas Corporation Approved solenoid valves to include 1" and 1¼" pipe sizes.

The new valves, designed to give high flow at low pressure drop, are fitted with integral strainers and inlet and outlet pressure tappings. They comply with British Gas Corporation standards for Class I valves, and in so doing, complement the existing ¾" to ¾" range of Dewraswitch-Asco gas valves.

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Telephone: Cradley Heath 66003/5 Telex 337024
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18, Ballyblack Road, Newtownards, Co. Down,
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but if we were unscrupulous, cared more about the profit margin and cut a few corners, especially in the quality of materials we use, we could do better.

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CM 3P With Heat Exchanger 600,000 btu/u to 1.8 million btu/h

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For Further Information Contact Brendan Bracken or Tony Smith.
Lomond Avenue, Fairview, Dublin 3.
Phone: 373796 Grams: HEVAC. Telex: 5827.
Offices also at Cork and Belfast.
Making Conversion from Hand Firing Simple

Beeston Robin Hood cast iron sectional boilers are designed to burn solid fuel and, with the addition of suitable combustion equipment, oil and gas. All units are manufactured with no waterway below the fire-door opening so that conversion from hand firing to gas or oil can be carried out without the necessity of changing the front section.

The boilers are suitable for use with the following fuels: — Gas cokes, furnace cokes, low temperature carbonised fuels, anthracites and hard coals can be used on all hand fired boilers.

Small bituminous coal can also be used in conjunction with suitable mechanical stoking equipment. Boilers ordered for use with mechanical stokers are sent out with platework prepared for the type of equipment chosen.

Gas oil (935 secs) and light fuel oil (200 secs) can be used on the sectional boilers in conjunction with suitable oil burning equipment. Heavy fuel oils may be used where suitable oil burning equipment is available. As with mechanical stokers, boilers ordered for use with oil burning equipment are sent out with platework prepared for the type of equipment chosen.

Natural gas, town gas, liquified petroleum gas and liquified petroleum gas mixtures can be used on all Robin Hood sectional boilers when fitted with the appropriate gas burning equipment. These boilers are also sent out with platework prepared for the type of equipment chosen. For larger commercial premises Beeston have created the Dukeries range of oil and gas-fired heating units. Through their development of a patent intersection joint, they have made it possible for the combustion chamber to operate under positive pressure conditions. The result is a level of heat transfer and a degree of space saving which is exceptional.

The Rufford is one of the boilers from this range, with a capacity of up to 800,000 Btu/h. In each Rufford boiler the combustion chamber is surrounded by a waterway, which makes installation quite straightforward. There is no need to insulate the foundations against downward heat transfer. Neither is a brick base required, because each boiler is supplied with a steel cradle.

Because the Rufford design is based on the use of a number of individual boiler sections, a great number of different boiler capacities are available to meet the broadest range of user requirements. There are, in fact, seven versions of the Rufford, ranging from 200,000 to 800,000 Btu/h.

Further information is available from Brooks Thomas, Naas Rd., Dublin 12. (Tel: 783422).

Designed for Installation Irrespective of Boiler Room Location

The advanced design of the TKD-RR boiler embraces all the features necessary for clean combustion, sustained high efficiency and long life. Its compactness and chimney indeendence make it suitable for installation without undue restriction on size or on the location of the boiler room. All necessary instrumentation for the control of the boiler is incorporated.

The circular combustion chamber and circular secondary pass tubes of increased wall thickness permit high operating pressures. The combustion chamber of the open fronted reverse-flow type is proportioned to ensure good combustion on flame recirculation principle. The hinged front door allows easy access for fire side and burner head maintenance. It can be arranged to open to right or left.

The Hoval TKD-RR can be gas or oil fired depending on customers' requirements and services available. A burner of the chosen fuel is supplied with the boiler for mounting on the door.

Combustion is on the "over pressure" principle, the burner fan pressurising the combustion chamber. This enables the boiler to operate independently of chimney pull and even against back pressure.

In systems where stand-by facilities and extreme flexibility of output are necessary multiple unit installation is simplified. The use of a Hoval high output calorifier enables the boiler application to be extended to cover domestic hot water production.

Full service and maintenance facilities are provided by a worldwide network of Hoval service engineers. Hoval's own commercial and technical departments are always pleased to advise on any technical problems.

Further information is available from James Gleeson & Co Ltd., 79 O'Connell St., Limerick (Tel: 061 45573).

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Buderus Lollar 55 Complies with All Requirements

The Buderus Lollar 55 sectional boilers are ade of high grade cast iron, and suitable for pressurised operation with oil and gas burners. Their design and operating characteristics meet the requirements of the German Standard Specification DIN 4702. They have undergone extensive heating and performance tests and bear the DIN registration number on the boiler data label.

The combustion chamber gases are partly recirculated in the corruged combustion chamber and allow a high CO2 content to be obtained. The gases from combustion pass through the secondary heating zone which has fins to increase the heat transfer and then into the smoke hood. Baffles are provided in the passages for even distribution of the gases.

Covers are provided at the front to facilitate cleaning. The hinged furnace door allows access to the combustion chamber. A steel insert plate is fitted in the hinged door for attachment of the burner. This plate is delivered undrilled. The hinged door is arranged to carry refractory which must be moulded to suit the burner head. Refractory tiles are placed below the burner head to help dispose of oil spillage.

The sections are jointed with a boiler cement which is spread in the inner sealing grooves. After the boiler sections have been assembled and hydraulically tested, a plastic over-pressure compound must be applied. All plate coverings must be sealed with asbestos rope.

Short tie bars facilitate assembly of the sections and assure good and lasting tightness. All sections have been ensuring equal weight distribution and easy assembly.

The blue enamel boiler jacket with thermal insulation reduces radiation losses. The boiler jacket panels are easily fitted after assembly of the boiler and pipework, and can be removed for boiler maintenance without disturbing water and other connections.

Further information is available from Quadrant Engineers Ltd., Green Street East, Dublin 2. (Tel: 771411).
In 1947 the first Fulton steam boiler was constructed by Lewis Palm, the founder of Fulton Boiler Works in New York State. Since then over 40,000 boilers have been manufactured and distributed all over the world.

The principle is a simple 2-pass design with a top firing burner. Fulton’s unique vertical tubeless design without coils or tubes saves money, fuel and floor space. The power burner designed and manufactured by Fulton for top performance and efficiency, delivers a spinning flame down the length of the furnace. The hot gases from the flame are carried upwards in the secondary flue passage, over the convection fins which are welded the full length of the vessel. These fins transmit the remaining heat into the outer side of the water vessel, resulting in a 2-pass even heating of the water. A combustion and thermal efficiency of over 80% guarantees low cost operation.

As all Fulton boilers are totally assembled in the factory, they are fully tested before despatch, resulting in considerable savings to clients on installation and commissioning charges.

The Fulton steam boiler has been the first choice of most people in the public service industries for years because of its high efficiency, simplicity of operation, low maintenance cost and fully automatic safety controls. Fulton steam boilers, oil fired or gas fired, are available in the following sizes:

<table>
<thead>
<tr>
<th>Model</th>
<th>Output Lbs Steam Per Hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 HP</td>
<td>140</td>
</tr>
<tr>
<td>6</td>
<td>210</td>
</tr>
<tr>
<td>8</td>
<td>280</td>
</tr>
<tr>
<td>10</td>
<td>350</td>
</tr>
<tr>
<td>15</td>
<td>525</td>
</tr>
<tr>
<td>20</td>
<td>700</td>
</tr>
<tr>
<td>30</td>
<td>1050</td>
</tr>
<tr>
<td>50</td>
<td>1750</td>
</tr>
<tr>
<td>60</td>
<td>2156</td>
</tr>
<tr>
<td>80</td>
<td>2850</td>
</tr>
<tr>
<td>100</td>
<td>3600</td>
</tr>
</tbody>
</table>

Electric steam boilers and flash steam boilers are available in eight models ranging from 9 Kw to 60 Kw giving a steam output from 30 lbs per hr to 200 lbs per hr.

APV-Desco (Irl) Ltd., with branches in Dublin, Limerick and Newtownards are sole agents for the Fulton range of steam boilers in Ireland. Throughout a long association with Fulton, they can offer a wealth of expertise and experience to clients, plus the full range of Fulton boilers from stock. Spares and service are available on a 24-hour, 7-day basis and service and maintenance contracts are available to all clients.

APV Desco, in addition, carry a stock of all the necessary items for a complete installation. They offer feed tanks, condensate tanks, pumps and piping, valves and fittings mounted on a common angle iron stand. This ensures that, provided all services are available in the boiler house and the boiler is in position, the installation and commissioning can be carried out in just a few hours. Blow down tanks for all models are available if required.

Further information is available from APV Desco (Irl) Ltd., Galvone Industrial Estate, Limerick. (Tel: 061 45211).

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**Nu-Way Benson Oil-Fired Pressure Jet Burners**

The Airheater WH88 vertical model oil-fired pressure jet burner from Nu-Way Benson is arranged for on/off operation, with a control system to BSS 799. This fully automatic system incorporates a photo-cell flame failure device. Manual reset overheat protection together with a warning light is also provided. The fan and limit control ensure that no cold air is blown on start up. An override switch is fitted to give continuous operation for summer cooling.

Manufactured from high quality heat resisting stainless steel with a large surface area and volume to ensure long life and low surface temperature, it incorporates a pressure relief door and flame viewing window.

The heat exchanger is made from mild steel, of tubular construction designed to give maximum heating surface with lowest possible resistance to gas flow. The combustion chamber and heat exchanger are flexibly mounted to prevent distortion.

The outer casing is constructed in mild steel sheet, finished in durable stove enamelled paint. A steel heat shield, which is air cooled, also forms part of the construction.

Warm air is provided by a centrifugal fan at the base of the unit and discharged through four nozzle outlets, each louvred, and capable of rotation giving full control of air distribution. Units for ducted installation are provided with a flange outlet.

Further information is available from Mark Plumbing Ltd., 17 Mark St., Dublin 2. (Tel: 773994).
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Model C20 80,000 BTU's

Model WH60 200,000 BTU's
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The Hogfors 20/25 series are cast iron boilers meeting the central heating requirements of medium size buildings, including schools, office blocks, municipal buildings, hotels, apartments and department stores. They are designed for oil or gas firing, but are adapted for coke, peat and wood. Hogfors 20/25 boilers are available in eleven different sizes, output 60 – 800 Mcal/h. They are delivered either ready assembled or in sections. Hogfors 20/25 series are natural draught boilers (under pressure). Hogfors boilers are constructed from high quality cast-iron of good corrosion resistance. Solid fuel firing equipment sold with each boiler.

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Dunphy Success Story

Dunphy Oil and Gas Burners Ltd was established in 1966 as a service organisation operating in the North of England. The organisation was founded by Mr Malcolm Dunphy and his father, the late Edward Dunphy, as a partnership.

Some two years later a limited company was formed and new burner designs, innovated by Malcolm Dunphy, were produced. Within the next two years, due to the high technology within the company, national service facilities and advanced engineering, Dunphy made rapid inroads into the burner market, supplying equipment to the majority of the British and Continental boiler manufacturers. During this growth period, the company built a new factory with a modern laboratory for development of new equipment and also for burner/boiler matchings. During the early 1970's exports to Europe and Africa grew to what now represents approximately 30% of burner production at the Rochdale factory.

The success story does not end here. Development over the last two years is now bearing fruit, and a totally new range of burners has just been introduced to the market. Dunphy believe the new burner design to be the most advanced of its kind anywhere in the burner industry throughout the world.

The new series of burner (the “T” series) is manufactured to a very high degree of engineering, and this has meant that the complete factory has been re-equipped over the last 18 months with new high precision machines. This coupled with further factory extension and improved amenities for their employees, has established Dunphy Burners as one of the most progressive companies in the industry.

An example of the type of unit now available from the company is the Dunphy CDF series dual fuel burner range. These units were designed to meet the new demand for interruptable gas and auxiliary fuel burners, minimising any risk of plant shutdown, due to failure of fuel supplies. A particularly important asset to hospitals, power stations and process plants, where continuous operation is of prime concern.

The burner range has been developed over the past few years, after extensive research and field trials. It is based on a combination of the CB series oil and the CG series gas burners — both proven machines. The CDF series dual fuel burners are suitable for firing all types of boilers, viz sectional, shell, water-tube and air-heaters, available for firing against boiler-resistances up to 24 ins. 

Northern Engineering Concentrate on Packaged Shell Type Boilers

Northern Engineering Industries Ltd., is a major British engineering group of companies. The group is involved in the supply of mechanical products including shell boilers; water tube boilers; pressure vessels; cranes; marine equipment; road tankers and many others. The group also supplies electrical products including transformers; motors; generators and switchgear.

NEI Thompson Cochran Ltd., is a wholly owned subsidiary of NEI Ltd., and is primarily concerned with the manufacture of packaged shell type steam and hot water boilers. The company has been established for over 100 years and has an international reputation in its product field.

The shell type boilers manufactured by NEI Thompson Cochran cover the range of 115 - 30,000 kg/hr for steam boilers and 0.125 - 15.0 million Kcal/hr. for hot water. The boilers can be operated on oil, gas combination, or gas only. The maximum operating pressure for the steam boilers is 25 Bars and superheaters can be readily incorporated to suit particular requirements.

In addition to manufacturing the boilers themselves, the company also manufactures most of its own valves, fittings, and a substantial proportion of the combustion equipment. Their boilers are widely used in process industries; hotels; laundries; district heating schemes; hospitals and many other applications. The boilers are used in almost any circumstance where steam, or hot water is required for a manufacturing process, or for heating purposes.

The company operates a policy of continuous development and product improvement. The business of supplying energy in the form of hot water, or steam, is unlikely to change in basic concept in the near future. This does not mean that the company is in any way complacent, as it is always seeking better manufacturing methods and designs. To this end they maintain a research and development unit to ensure that NEI Thompson Cochran Ltd., remains at the forefront of shell boiler technology.

Further information is available from Clarke Chapman Ltd., Thompson Cochran Division, 42 Sundrive Rd., Dublin 12. (Tel: 971006).
DANKS FAVOUR 
SOLID FUEL

Danks of Netherton have been manufacturing boilers for a long time and with steady growth in knowledge, experience and technological skill are now said to be a leader in their field.

Danks oil and gas fired shell boilers range from 5000 to 70,000 lbs/hr, of steam or the equivalent duty in hot water. These are the metric range and there is an important recent installation of four 63,000 lbs/hr, units at the Asahi synthetic fibres plant at Ballina, Co. Mayo.

The company believes strongly that solid fuels have a vital and long lasting part to play in Europe’s economy and have devoted their attention to the efficient use of coal, peat, wood and agricultural wastes in boiler plant. The range of solid fuel fired shell boilers extends to 30,000 lbs/hr, and of particular interest to potential users in Ireland is the turf fired unit: a number of these are in operation in the country, mostly with health boards, so the customer can be assured that Danks has full knowledge of this fuel, its characteristics and the techniques to be employed.

With much attention being devoted to energy conservation, Danks are active in the two related fields, the use of waste materials and products as fuel and the conversion of heat energy in waste gases to useable energy in hot water or steam. Many waste materials are potentially valuable fuels, and they may be in the solid, liquid or gaseous state. Generally, each introduces a special problem either of handling or of pollution, but when this is overcome one has a cheap fuel to burn instead of an expensive one and often there is an additional saving from the elimination of waste disposal costs.

For outputs and pressures that are beyond the scope of the shell boiler Danks of Netherton have a range of packaged water tube boilers equally available for oil, solid fuel or gas firing and for waste heat applications.

The boiler range details are as follows:--

**Metric** -
- 5000-70,000 lbs/hr - 5-70 million Btu/hr - fuel: oil, gas or dual fuel;
- Metriccoal - 3000-30,000 lbs/hr; 3-30 million Btu/hr - fuel: coal, turf, wood;

**Water tube** - up to 150,000 lbs/hr;
- pressure up to 900 psi - fuel: oil, coal, gas, wastes;
- Waste heat - Purpose designed for each application, shell or water tube.

Further information is available from RS White Ltd., The Crescent, Donnybrook, Dublin 4. (Tel: 693144).
WEISHAUP GAG AND OIL BURNERS

Weishaupt is Europe's leading burner manufacturer. With its Research and Development Institute and its modern rationalised production methods, the company has a decisive influence on developments in combustion technology.

The Weishaupt programme includes oil, gas and dual fuel gas/oil burners with single, two stage, sliding two stage and modulating regulation. The burners are fully automatic forced draught burners. They burn light, medium and heavy fuel oils and all usual types of gas. A complete range from 80,000 to 60,000,000 BTU/h. Control panels are available specially matched to each burner. In addition there is a wide range of accessories.

For Complete Sales and Service Contact Sole Irish Agents

JAMES GLEESON & CO LTD

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Bracknell, Berkshire, RG12 1NP
Tel: Bracknell 0344-21341
Telex No. 847540
from the manufacturers in Sweden.

The Amanda series 500, 600 and 700 range from 80 - 720,000 Btu/hr. and all models are available with solid fuel conversion kits. These boilers with small changes have been on the Irish market since 1964 and have acquired a solid reputation for quality. The Tasso T, F, and VH boilers are the most logical development in pressurised cast iron boilers. All have cylindrical combustion chambers with three passes and the front of the boilers swing back to give complete access to the combustion chambers.

Overpressures on the 1,000,000 to 3,000,000 VH series range from 5 mm to a maximum of 32 mm. This low overpressure, together with the fact that the boiler passes have no fins and are generous in size, means that not only is cleaning very simple, with the front of the boiler swinging back, but the intervals between cleaning are longer than with most overpressure boilers. Tasso recommend that a flue thermometer with an additional pointer be incorporated in the boiler instrument panel. The pointer is set at 50 degrees C above the temperature of the unit when installed and, when the flue temperature reaches the pointer, the boiler requires cleaning. These instruments, both capillary and direct reading, are available from Precision Heating, together with Odest CO2 combustion kits.

A list of all the major European boilers in all sizes with the recommended Bentone burner and correct nozzle sizes and firing details can be had from Precision Heating Equipment, Church Road, Santry, Dublin 9, (Tel: 374300).

Danstoker Ranges Feature Modern Designs

The Danstoker hot water boiler type VB for a max. operating pressure of 5 a to is a modern cylindrical steel boiler of combined furnace and smoke tube type. A gastight design, 100% water cooled, effectively insulated, and covered by blue plastic-coated steel sheet. The Danstoker VB boiler is also available as a fully operational packaged unit, including: two stage burner for gas oil or gas; a control panel; and trimix double shunt valve for regulation of flow temperature and shunting of return water, or alternatively fitted with an electrically driven shunt pump.

The main components are carefully matched to achieve trouble free operation with maximum efficiency and combustion, ensuring the lowest possible air pollution. The BV boiler unit is compact, requires little space and is presented in an attractive modern design.

The Danstoker hot-water boiler type VHE is a combined furnace/fin-tube 3-pass boiler, with a dome-shaped fire box and open bottom, suitable for firing with solid fuel or gas or a combination of both.

The VHE boiler is a steel boiler of dependable design, manufactured on the basis of proven constructions — many years' experience — and adaptation to up-to-date principles. It is an all-welded construction, made of approved-quality steel. All welding is done by certificated welders. The standard type of the VHE boiler is designed for an operation pressure of 50 psi, relative pressure. It also has a cladding of steel plate with a blue plastic coating which requires no maintenance.

The hot water boiler type VE-H is a combined flue-furnace and smoke tube boiler, designed for combustion of liquid or gaseous fuels. It has a plain flue-furnace and water-cooled reversing chambers. High efficiency and low fuel consumption are achieved by the design, which ensures complete combustion and maximum utilization of the radiant heat within the flue-furnace, while the smoke heat is utilized during the two smoke-tube passes.

The VE-H boiler is mounted on two closed boiler saddles which can stand on a low plinth, directly on the floor. It is fully insulated with mineral wool mats covered by a blue plastic coated steel jacket, which requires no maintenance. The boiler is delivered with all the necessary connections, flanges and counter-flanges which, first of all, means quick installation and low maintenance costs. It is easy to clean and, like the whole Danstoker range, has an attractive modern appearance.

Further information is available from John R. Taylor Ltd., Naas Rd., Dublin 12. (Tel: 783255).

Published by ARROW@DIT, 1978
Buderus

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  * and Dual Fuel operation.

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BROOKS THOMAS
Naas Road, Dublin 12, Telephone 783422.
Contouramic: a Unique Configuration of Vanes

Airmovers, the natural ventilation units manufactured by Argosy Fenton, are of galvanised sheet metal construction though there are also optional materials which include protected metals and aluminium.

All types of roofs can be catered for and standard features include an improved baffle design which results in a 7% higher efficiency; 2.8 sq.m. of free opening provided by each standard unit; sturdy construction, yet light in total weight; dampers that open automatically with parting of fusible link, venting fire, smoke and gases; improved curb design; one-piece, tight-fitting metal or translucent dampers; low contour – only 545 mm high; and a self-locking hand crank at floor level which opens and closes the dampers. Power controls are also available.

One of the latest additions to the Argosy-Fenton collection is the new Contouramic range which is claimed to be the only unit of its kind on the market. A unique configuration of vanes on the steel roof mounted units allows air out but does not let the weather in. The design also allows light in and can transform dark factories.

In addition, the company manufactures a complete range of powered roof ventilators, propeller fans and centrifugal units available as direct drive in sizes from 7" to 12" and 14" to 36" belt driven.

Further information on all of these products is available from Finheat Ltd., 34 Watling Street, Dublin 8, (Tel: 778120).

Corvec Flexiflame Modular Boilers

The new Corvec Flexiflame 70 and 105 modular boilers have been developed by Chaffoteaux Ltd. from the highly successful Corvec Flexiflame 35. These boilers are designed for installations where modulating output is a requirement and comprise two or three standard Flexiflame elements connected together in one casing. Total boiler outputs are respectively 260,000 and 390,000 Btu/h (76 and 114 kw) derived from the standard element of 130,000 Btu/h (38 kw).

The elements are mounted vertically above each other providing a high output to floor space ratio, in the case of the ‘105’ of 100,000 Btu/sq.ft. (317 kw/m²), which is of particular advantage in boiler houses of restricted size and changeover installations where the out-
See for yourself why we sell more fire-tube steam packaged boilers than all our UK competitors put together.

Quite apart from Burns, Gretna Green and beautiful countryside, the area around Annan in Dumfriesshire houses the main manufacturing plant of one of the world's leading exponents of boiler engineering.

The name, as you may have guessed, is Thompson Cochran.

And, in an extension to the kind of customer service you'd expect from the company that outsells all its competitors, we've decided to let you see for yourself just why our Annan works is regarded as the most modern and efficient boiler-making plant in Europe.

Visit us soon to see the level of engineering expertise and capability that goes into each and every Thompson Cochran boiler. Compare our manufacturing facilities, research and development commitment and general standard of work with others in the field.

Reflect on the fact that you're unlikely to get better delivery or value for money, anywhere.

To arrange the whole convincing experience, contact your Thompson Cochran Regional Manager or simply fill in and post the coupon below.

To: Mr. R. F. K. Taylor, Director, NEI Thompson Cochran Limited, Newbie Works, Annan, Dumfriesshire.

I'm interested in a visit to your Annan Works. Please contact me to arrange a suitable date and time.

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COMPANY ____________________________

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TC178
put of existing plant rooms may have to be substantially increased.
Mounting on the roof is another possibility deriving from the units’
light weight and compact dimensions.

The Corvec Flexiflame 70 and 105 are provided with flanged
water and gas manifolds to allow simple connection of a second or
subsequent boilers, and Chaffoteaux can provide mating flanges as
accessories to the basic boiler. Each boiler has an integral common
flue and is contained in a compact cabinet that allows easy access
for installation and maintenance.

Two new features are incorporated to improve boiler efficiency
at less than full loads, and to simplify design and installation pro-
cedures. Each element of the boiler is provided with its own pump
and automatic valve, designed to minimise the flow of water through
those elements not under fire. In a conventional boiler, water flow
is maintained irrespective of burner output or load: so, minimising
the water flow through unfired heat exchangers means improved
boiler efficiency at less than full outputs.

A second new feature is the use of a monotube water flow
arrangement. Each element of the boiler is provided with a pump
adequate in size to overcome frictional resistance of the associated
heat exchanger, the elements being connected in parallel to a single
water flow pipe flanged at each end to permit simple connection to
the system. Thus frictional losses in the boiler can be ignored when
considering system pump sizing for new installations; or changeover
situations where pump sizes may not be known.

Each boiler element comprises a tinned copper, finned tube heat
exchanger; an all-gas burner available for town, natural and l.p. gases;
and a differential-pressure water section which ensures that no gas
can flow to the main burner until the associated pump is operated.

Dimensions of the Flexiflame 70 and 105 are: width, 28.1
in. (0.71 m); depth, 19.7 in. (0.50 m); height over the flue manifold,
(‘70’) 70.7 in. (1.8 m), (‘105’) 94.4 in. (2.4 m). Weights of the units
are: (‘70’) 287 lb. (130 kg), (‘105’) 397 lb. (180 kg).

Further information is available from Chaffoteaux Ltd., Concord
House, Brighton Road, Salfords, Redhill, Surrey.

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Phone 645966
Colin Howes has been appointed Group Marketing Manager for Midland International Ltd of Bailieborough, manufacturers of Flair bathroom products.

Mr Howes previously held various marketing appointments in the UK building, tools, hardware and garden industries with Turner and Newall, Thomas Tilling and Spear and Jackson where he was Marketing Director.

He is a member of the Institute of Directors, the Institute of Marketing and the Industrial Marketing Research Association.

Hevac Ltd have announced the appointment of John A Hoey as Chief Executive following the resignation of Ray Hennessy.

Mr Hoey joins the company from Memory Business Machines where he was managing director. Previous appointments were with the Wilson Group and Aer Lingus where he held senior engineering and management positions for many years in Ireland and abroad. Mr Hennessy is expected to announce his details of his own plans in about a month.

Sean Cormican, Secretary and Financial Controller of Coal Distributors Ltd and parent company Consolidated Holdings Ltd, has been co-opted to the board of directors of both companies.

A graduate of Queen’s University, Belfast, Mr Cormican has been with Hevac Ltd since its formation in 1973 prior to which he was in the mining industry in South America.

Cross Refrigeration (Ireland) Ltd, a member of the Cross Group of Companies, has appointed Richard Ellis as service manager, Dublin. Mr Ellis, who originally joined the Cork headquarters of the Group, has been with Cross for 12 years.

The Jefferson Smurfit Group have appointed Patrick J Wright as Divisional Managing Director (Designate) of Smurfit Distributing Division. The Division includes the following companies: Kilroy Bros. Ltd; Bush (Ireland) Ltd; Murphy Rentals Ltd; GH Sales Ltd; Walker Air Conditioning Ltd; Gordon Howson Ltd; and JC Holland Ltd. Mr Wright was formerly Managing Director of Odeon (I) Ltd, and Irish Cinemas Ltd, and prior to his present appointment was personal assistant to Michael WJ Smurfit, Chairman of the Smurfit Group.

Sean Cormican, Coal Distributors.

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The recently launched Irish manufacturing company, Master Air Co. Limited have pleasure in offering a quality Airhandling unit to Consulting Engineers, Architects, Contractors and the trade in general.

ADVANTAGES

**Buy Irish** -
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For further details or price quotation please contact:
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