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H & V News

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The period of peak demand for electricity at present is between 5 p.m. and 7 p.m. daily. If you can alter your use of electricity to times outside this period, you can avail of non-peak rates and save money. These non-peak rates are (a) night rate and (b) off-peak day rate.

**Saving with Night Rate**

The night-rate offers cost-saving advantages where storage type heaters are suitable. Storage type heaters take in heat at night when cheap electricity is available and release it when needed during the day. Storage heating is, in fact, the ideal choice for commercial premises. It is cheap to instal; clean in operation and requires no space for fuel storage.

The night-rate also applies to insulated water storage cylinders and other electrical services.

**Saving with off-peak space heating rate.**

You can benefit from this specially reduced rate if your premises are heated by any type of electric heaters other than storage radiators. This rate is specially suitable for premises where supply interruption during peak hours (at present 5 p.m. to 7 p.m. in winter time) is acceptable. If your premises are used on an occasional or casual basis then this rate may be right for you.

**Saving with off-peak waterheating rate.**

Another cost-cutting rate is that which covers waterheating. This rate is particularly suitable where a peak time interruption of electricity supply (at present 5 p.m. to 7 p.m. in winter time) would not affect productivity.

Advice and literature available at E.S.B. Service Centres.
Cover picture courtesy of Chloride Shires.

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NEXT MONTH

Next month H&V News reviews

- Domestic Boilers
- HVN Looks at a bit of History — The Hydraulic Ram
- Storage Tanks and Pressure Vessels
IHVEX — ALREADY 65% ADVANCED BOOKED

IHVex — Ireland’s building services exhibition and Ilectra — Ireland’s specialist electrical engineering exhibition are to run concurrently next February in the R.D.S.

The two shows will be together for the first time giving a unique opportunity for everyone engaged in the services industry to see the latest developments and trends in both mechanical and electrical equipment. It is also more than just a chance to see equipment it represents a coming together of these allied but separate businesses and gives an opportunity to discuss mutual problems and examine where the new electronic technology is leading to in both businesses. One of the signs of this union of the businesses is the Chartered Institution of Building Services Conference which is to highlight the practical energy problem faced by the mechanical and lighting building services engineers.

The Institute of Domestic Heating Engineers are also having their bi-annual conference during the show.

65% Booked by the End of August

The Organisers of the show are very pleased with the bookings so far and in fact at the time of going to press almost “65% of the space has been booked for IHVex.” As an indication of the numbers involved the following is a list of those who are committed to take a stand at the show: Reconair Ltd, Dan Chambers Ltd, R S L Ireland Ltd, Tradfire Ltd, Consort Ltd, Runtalrad, Quadrant Engineers Ltd, Maynell Valves Ltd, Anderson & Martin Ltd, K B Combustion Ltd, Cementation, Westinghouse, J J Ventilation, ESB, Gleeson & Co Ltd, Brooks Thomas, Wilo Engineering, Bartol, HCP Ltd, EIA, Weldmoore Ltd, Food Industry Supplies Ltd, Ridge Tools,
DON'T JUST SIT THERE...
Anyone can tell you that '81 is going to be a difficult business year. We can tell you how to do something positive about it. IhVex — Ireland's Building Services Exhibition and ILECTRA — Ireland's Specialist Electrical Engineering Exhibition — run concurrently next February in the R.D.S. They represent the single most effective marketing opportunity in '81. Which is why we suggest you clip the coupon opposite for further information and current stand availability.

Since the first IhVex in the early 70's there has never been a more appropriate time than now for an exhibition serving the Building Services Industry as IhVex so comprehensively does.

Dramatic changes have occurred in the type of fuel being used for generating heat and electricity. With an increasingly realistic view being taken of the life of oil supply, manufacturers of heating, air conditioning, refrigeration and allied equipment have concentrated on energy conservation methods and solid fuel burning appliances.

IhVex '81 offer the first opportunity for the industry in Ireland to look at and discuss the many new types of equipment and systems that will be necessary for its survival in the future within the context of a major exhibition. Many questions are being asked of the future — has fluidised bed combustion been fully developed? Has the heat pump a future in Ireland? Will the change over to solid fuel in domestic heating cause massive air pollution? These and the many other questions raised can only be answered by the manufacturers and IhVex offers a perfect setting to put the facts to the entire Building Services Industry.

A major national conference in conjunction with IhVex '81 will examine the viable energy options from the viewpoint of their practical application to the Building Services Industry.
In response to a sustained strong demand from the trade, we are pleased to announce the major opportunity of 1981 to promote the entire Electrical Engineering Industry in Ireland at ILECTRA 1981. This major development sees the fourth ILECTRA now firmly established as a major take place in the prestigious Royal Dublin Society’s Exhibition Halls to run in a separate Pavilion but concurrently with IHVex, Ireland’s Building Services Exhibition.

The Electrical Engineering Industry will again find in ILECTRA 1981 a cost-effective marketing platform at this specialised event, and as with all ITTEX organised exhibitions ILECTRA 1981 will provide the exhibitor with an opportunity to show goods in an impressive setting and in an atmosphere conducive to the best reception of your product by the customers you most want to meet.

**VENUE:**
Immonscourt Exhibition Complex,
Royal Dublin Society,
Ballsbridge, Dublin 4.

**DATES:**
Tuesday February 17,
Wednesday February 18,
& Thursday February 19, 1981

**OPENING TIMES:**
Tuesday 11 am – 8 pm
Wednesday 11 am – 8 pm
Thursday 11 am – 8 pm

Please forward me details of available exhibition space. We would be interested in a site of approximately . . . . . . . . . sq. ft.

Please contact me to make an appointment to discuss, without obligation, IHVex + Ilectra ’81

Return this coupon to:

**I TTEx**
Irish Trade & Technical Exhibitions Ltd.
5/7 Main Street, Blackrock, Co. Dublin, Ireland.
Telephone: (01) 885001
The responsibility of being best means innovating with a purpose

And sometimes that means continuing development work well beyond just getting the insulation right. With pipes and ducts for instance, the finish which goes on to the insulation is a critical factor in its performance. So we have spent the last two years developing a finish we know to be quite unique. One which matches today's demanding standards.

It's called Fibreglass Class 'O' and is now available on FRS 950 pipe insulation and on Flexible and Rigid Duct insulation. For indoor services, away from the risk of mechanical abuse, it offers this range of unmatched benefits:

- It meets the requirements of a Class 'O' surface as laid down in Building Regulation E.13 1976.
- It achieves Class 1 spread of flame when tested in accordance with BS 476: Part 7: 1971.
- As a vapour barrier, it prevents condensation on chilled pipes and ducts without further treatment.
- It requires no decoration and the white surface can be cleaned with water or mild solvents.
- Unlike canvas, it is not subject to rot or ageing.

Class 'O' is an innovation that pays off in three ways—simpler specification for the consultant, simpler stocking for the merchant and contractor, and simpler application for the operative. Class 'O' provides in a single finish all that's needed for hot and cold pipes and ducts, in both exposed and concealed environments. And that cuts time, trouble and costs for everybody.

A good example of innovating with a purpose—by a company that accepts the responsibility of being best.

FIBREGLASS
the best way to say insulation

A spokesman for ITTEX Ltd the organisers of the show said that "with bookings coming in at the rate they are at the moment we will be booked out by the middle of October."

Further information may be had from ITTEX Ltd at 5/7 Main Street, Blackrock, Co. Dublin, tel: 885001.

**Hennessy Special Spares Available**

R. J. Hennessy & Co Ltd are to open new premises in Lomand Ave, Fairview, Dublin, where they will continue to expand their heating spares company by offering a wider range from stock for all kinds of industrial, commercial and domestic oil and gas burners. There has been a need for sometime for this kind of service which speci-alizes in popular first line spare parts only. Hennessy's policy is to supply parts either from stock or by use of his genuine special delivery service, parts can be had from all over Europe or the UK in 24 hours. The trade counter can be contacted at 373753 or after hours emergency service at 450367.

**IDHE COURSE**

The Institute of Domestic Heating Engineers have announced details of their Associate Membership Diploma Examination Course to be held as usual in Bolton Street School of Technology, Dublin. The course is two years duration and is held two evenings a week.

The course covers all aspects of Heat Transfers, Combustion, Systems, Controls and in particular the changes that have come about in the industry since the return to solid fuel as the major fuel for new installations.

Further information can be had from: College of Technology, Bolton St., Dublin 7, tel: 749913 and the course reference is E60.

**Flair and Fourways**

The launch of Fourways marks a further step in the service offered to the trade by Midland International Ltd. of Bailieborough, Co. Cavan, manufacturers of Flair bathroom and home improvement products.

Whilst Flair will continue to deliver fortnightly to each area of the country -- and weekly to North, Central and South Dublin -- Fourways will be able to offer a 24 hour service in Dublin and 48 hours elsewhere for the whole range of Flair products in all colours.

The Flair distribution policy, price and discount structure remains unchanged -- the Fourways service represents a significant additional benefit.

**Pumpservices LTD**

Willbrook Rd, Rathfarnham, Dublin 14. Phone 903371
HOT-LINE ANNOUNCED

A new hot-line telephone information service (Tel: 376666) was announced by the Minister for Energy, George Colley, during a visit to IIRS last month. The Minister was reviewing the progress of the National Energy Conservation Programme launched last year at the request of the Government as part of IIRS’s Leadership Role in Energy Conservation. The new “Hot-Line” will provide both industry and the general public with immediate information and advice on energy matters and is housed at IIRS.

The Minister also announced that he had asked IIRS and An Foras Forbartha to establish new thermal standards for office buildings, commercial buildings and factories. He would be consulting with the Minister for the Environment to determine where such standards needed to be made mandatory.

IIRS are currently preparing 15 specialized booklets covering particular aspects of energy use showing how savings can be achieved. They will be published within the next six months and 4,000 copies of each booklet would be distributed free. Suitable for the office or plant manager, they will cover such matters as insulation, the use of control systems for energy saving and flash steam recovery. Leaflets, posters and stickers to encourage energy conservation are also being prepared by IIRS.

A new Energy Conservation Award Scheme was also announced. Five separate competitions will cover the industrial and commercial sectors, the home, the farm and energy-saving inventions. Judges for these competitions will be drawn from various institutions, including IIRS.

The Minister toured some of the energy-related services of the IIRS, including the EEC-aided Solar Research Project, the National Boiler Testing Service, the IEA Biomass Information Service and the new Energy Hot-Line Telephone Information Service.

Dublin Smoke Levels Increases

The switch from oil to solid fuel over the past year has resulted in an increase of 15 per cent in the level of smoke in Dublin City. It has also meant a reduction of 12 per cent in the level of sulphur dioxide.

These figures were revealed in the annual report from Dublin Corporation’s environmental pollution unit. They show a reversal in the downward trend in smoke-pollution levels over recent years, bringing the city back to the 1974/75 winter levels. The report, in fact, points out that the movement towards solid fuel usage could lead to difficulties in complying with certain proposed EEC values in smoke levels, especially if coupled with adverse climatic conditions.

On the other hand, the switch-over to solid fuel has contributed to a reduction in the atmospheric level of sulphur dioxide which is one of the pollutants associated with oil burning.

The burning of solid fuel in open fires is one of the main contributory factors in the increase of smoke levels.

Mr. George Colley, T.D., Minister for Energy visited IIRS to review the progress of the National Energy Conservation Programme. He also toured some of the energy-related services of the Institute. Picture shows (left to right): Mr. Cormac Gordon, Manager, Energy Service; Mr. Colley; Mr. Martin Cranley, Director-General; Mr. T.J. Quinn, Assistant Director-General at the Solar Energy Research Project.

Coolair Ceiling Systems

With a growing demand for fully integrated ceilings, a new diffuser designed specifically to integrate with various ceiling systems and so become part of the ceiling suspension grid, has become available on the Irish market through Coolair Limited of Tallaght. Manufactured by Barber & Colman, for whom Coolair are sole Irish distributors, the new system is suitable for integration with lay-in, concealed grid or snap-in tile ceiling types.

The ceiling grid is built up from a series of individual interlocking members which includes live and dummy diffuser sections and main and cross tee sec-

P.S. John is recovering at the moment from a mishap on the tennis court and is nursing a very sore leg. Best wishes for a speedy recovery.
Carlyle from Walker is energy efficiency

1. The unbeatable range of energy miser heat pumps
2. Heat reclaim reciprocating chillers featuring double bundle condensers
3. Multi-compressor water chillers giving lower part load running costs
4. Moduline and Modubox VAV systems with inherent self-balancing savings
5. Unikal computer programme analysis to assist you in selection of the most energy efficient system

Walker Air Conditioning

Published by ARROW@DIT, 1980
The July BTU golf outing was held in Howth GC. The day was sponsored by B&E Boilers and on a day of indifferent scoring the following were the victors on the day.

Over winner — Brian Farrell.
Class 1 — 1st: Michael Devoy; 2nd: Michael Wyse.
Class 2 — 1st: Mike Askey; 2nd: John Ennis.
Class 3 — 1st: Des O’Gorman; 2nd: A. Synnot.
1st 9 — 1st: Bernard Sweeney; 2nd: Terry Gleeson.
2nd 9 — 1st: Tony Delaney; 2nd: Joe O’Reilly.
Visitors 1st: Matt Reilly; 2nd: Garry Stewart; 3rd: Mark Rogers.

The overall winner of the B & F sponsored BTU golf outing in Howth, centre Brian Farrell, (left) Pierce Ternan of B & F Boilers and BTU golfing society’s captain Peter Johnston.

IIRS Seminars

The Institute for Industrial Research & Standards recently announced two further seminars that may be of interest.
1) Industrial Waste Heat Recovery, 2 October, 1980, Gersham Hotel, and
2) Efficient Operation of Water and Effluent Treatment Plant, 2 December, 1980, Burlington Hotel.

For further details write to: Industrial Education Officer, IIRS, Ballymun Road, Dublin 9. Telephone: 370101 ext. 343.

Instaheat New Home

Instaheat Limited and Whitkil Limited have moved to new premises at Newtown Industrial Estate, Coolock, Dublin 5. These premises are combined offices, showrooms and stores. The telephone numbers are 477711 (3 lines) 474907 and 474820 but they will have no telex for approx. two months.

The new address is as follows:
Instaheat Limited,
Instaheat House,
Unit C3,
Newtown Industrial Estate,
Coolock,
Dublin 5.

I’m sure that the investment in these new premises and combined facilities will ensure a quicker and better service to all their customers. Good luck in your new abode.

Ed.
Two new sole distributorships for the 32 Counties for specialist pumps have been won by the Allied Products Division of Walker Air Conditioning Limited, Dublin. They are for Drouard in-line circulating pumps manufactured by Paris based Moteurs Drouard and for Howard stainless steel rotary pumps manufactured by Howard Pneumatic Engineering Co. Ltd., of Eastbourne.

"These two additional product lines, which complement our Girdlestone Pumps distributorship, give us a complete offering in quality pumps" said Walker Sales Director, Michael Juckley.

The Drouard in-line circulating pumps are particularly suitable for applications in the heating, ventilating and air conditioning market. Pumps are of the canned rotor type and are available in single or twin pump sets. Capacities range from 1 to 50m³/hr at temperatures of up to 110°C. Drouard also have a bronze pump suitable for secondary hot water.

The Howard pumps are for specialist applications within the food, dairy, pharmaceutical, brewing, chemical and textile industries. Capacities range from 100 to 10,000 gallons per hour in sizes from ½ up to 4". They are available with many useful optional extras including steam jacketing and pressure relief valves.

The Drouard and Howard pumps, like Girdlestone Pumps, are available in Ireland only from the Allied Products Division, Walker Air Conditioning Limited, Dublin.

A selection of the Drouard in-line circulating pumps and Howard rotary pumps available from Walker Air Conditioning Limited.

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**SLOW, SLOW QUICK, QUICK SLOW.**

You're looking at the new Eurofoil cased axial fan from Roof Units.

The reference to tempo isn't a throwback to your ballroom dancing days, but to the way the Eurofoil waltzes through a wide range of variable speed settings. All at the flick of a switch. A distinct improvement on the limited alternative of varying impeller blades favoured by the competition.

With a double flange and a range of sizes from 300mm-1000mm, we can't think of an application Eurofoil couldn't cope with.

For good measure, an epoxy resin is electrostatically bonded to the metal to give a tough, long lasting finish. And then the whole unit is painted to showroom standard.

Eurofoil is driven by the breathtaking external axial flow rotor motor. And the whole unit comes pre-assembled and packed in one carton ready for installation. In fact, the only thing about Eurofoil that won't take your breath away is the price.

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**EUROFOIL**  
Cased Axial Fans.  

Please send me literature on Eurofoil fans.

Name  
Company  
Address

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**roof units**  
Peartree Lane, Dudley DY2 0OU  
Telephone Brierley Hill (0384) 74062  
Telex 335696 RUNITS G

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Published by ARROW@DIT, 1980
The annual report of An Foras Forbartha contained a very comprehensive section on energy conservation, some of which was published earlier in the year in HVN but the conclusions reached were of immense interest to the H&V industry. Recognising the importance of establishing a comprehensive data-base to guide the formulation of energy conservation policies, particular attention has been given by An Foras Forbartha during 1979/80 to establishing patterns of energy use in Irish houses and road transport, and establishing the potential for energy conservation.

Surveys of heating and occupancy patterns show that the temperatures of centrally heated Irish houses (roofs, walls and windows) is estimated by An Foras Forbartha as 9% of domestic energy consumption or 3% of national primary consumption. Because of the higher temperatures of centrally heated houses, maximum national energy savings the least expenditure would be achieved by concentrating on improving the insulation levels of these houses, most of which are also of relatively recent construction. Analysis undertaken by An Foras Forbartha of the cost-effectiveness of a range of domestic insulation measures shows the absolute cost-effectiveness of the least expensive and simpler “do-it-yourself” measures, such as cylinder lagging and attic insulation, as well as weather stripping.

The potential energy conservation from a general programme aimed at upgrading the insulation levels of all existing Irish houses (roofs, walls and windows) is estimated by An Foras Forbartha as 93% of domestic energy consumption or 3% of national primary consumption. Because of the higher temperature of centrally heated houses, maximum national energy savings the least expenditure would be achieved by concentrating on improving the insulation levels of these houses, most of which are also of relatively recent construction. Analysis undertaken by An Foras Forbartha of the cost-effectiveness of a range of domestic insulation measures shows the absolute cost-effectiveness of the least expensive and simpler “do-it-yourself” measures, such as cylinder lagging and attic insulation, as well as weather stripping.

Comparisons of private estate housing completed in 1976 and 1978 indicate encouraging trends towards improved insulation levels in new houses, especially in roofs and floors.

Surveys undertaken by the Institute of domestic heating systems indicate that while open fires with back boilers are the standard in recently completed local authority houses, oil-fired radiator systems continue to constitute the dominant (53%) heating systems in recently built private estate houses. The installation of solid fuel central heating systems is, however, increasing more rapidly than oil-fired systems, especially outside of Dublin.

Further to this the studies undertaken by An Foras Forbartha indicate that while switching from oil to solid fuel would save oil imports, it could increase domestic energy consumption (5% nationally or 30% for a house with full central heating) unless the occupants are prepared to tolerate a reduction of 1 to 3°C in house temperatures. If systems with an efficiency of 50% or more are used, the change-over could reduce annual heating costs by as much as one quarter or £90 per household. In particular, however, with the systems of lower efficiency the major impacts of switching from oil to solid fuel heating are likely to be a saving on oil imports together with greater security of fuel supplies for domestic heating rather than any marked reduction in energy consumption.

### Hunter Waste

**Fittings**

Waste fittings in push-fit black polypropylene have been introduced by Hunter Plastic Industries Ltd to complement their black UPVC soil and vent systems.

The black PP waste fittings include couplers, bends, tees and brackets in 36 mm and 43 mm sizes, have push-fit jointing and incorporates the improved Hunter seal. Solvent cement must not be used. Connection to soil pipe systems is by the use of boss pipes or insert bosses provided.

Hunter products are available through Ward & Goldstone (Ireland) Ltd, Cork Plastics Ltd, and W H Martin Plastics Ltd.

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**Braithwaite in Belfast**

Braithwaite & Co. Structural Limited have appointed McCraig Collim Limited of 6-8 Greenwood Avenue, Belfast BT4 3JJ, as their agents, for the sale of Pressed Steel Tanks in Northern Ireland.

This move complements the recent agreement with Finhaat Limited of 34 Watling Street, Dublin 8, to promote the Company’s products in Southern Ireland.

Pictured left to right: Charles H. Clayton, Manager, David Brown Case; Jim Heffeman, President, Lighthouse Club; Terry Ellis, winner from David Brown Case; Dennis Campbell, Managing Director, Ingersoll Rand Ltd.; Padraig McGarrigle, David Brown Case at the Lighthouse Club golf outing at Hermitage.
Sean Kennedy Retires

Sean Kennedy, Group Marketing Manager of Wavin Pipes Ltd, has retired after 20 years service with Wavin. Mr Kennedy was responsible for opening up overseas markets for the company's products, as well as promoting the company in Ireland. His travels took him to Australia, the Middle East, Africa and the West Indies.

New Factoring Outlet

Fourways is a new Irish subsidiary of the wellknown international factoring organisation and is a member of the Graham Group. They will hold stocks in Ireland of a wide range of

Reconair-Denco Miller Link Up

Denco Miller and Reconair Ltd have recently concluded a distributorship agreement, this agreement coincides with the launching by Denco Miller of an improved range of equipment — close control air conditioning applications — which is based on their long established and highly successful equipment range. The new concept of construction allows all models in the range to be taken through a standard size door and reduces time spend in assembling equipment. It also has the advantage of accepting additional units to cater for increased duty without the necessity to stop an existing unit.

25 years have now passed since Denco Miller installed their initial purpose built computer air conditioning plant and with the signing of the new agreement Reconair have placed an order for six units for a Government Department project. In regards to service, Reconair will be obviously handling all new orders but they actively peruse existing equipment installations to ensure the equipment is operating correctly and will hold a large stock of spares at their Dublin, Galway and Limerick offices to back up and service requirements.

L.R. WOOD MOVE TO INCHICORE

L R Wood Ltd., of Pearse Street and Lenwood Cash & Carry of Farkview, off Westland Row, are moving to No. 8, Goldenbridge Industrial Estate, Inchicore, Dublin 8.

The Goldenbridge Industrial Estate is situated only 1½ miles, as the crow flies, from Pearse Street, and is along side the Grand Canal which is very accessible for city and country customers and with ample parking space. The move is expected to take place shortly, more definite date will be announced when known.

Robey Reliability

When reliability and quality are required Robey are chosen again and again.

"In most instances your early delivery requirements for packaged boilers can be met from our extensive stock programme."

Robey

S.L. Combustion Services Ltd., Laherdane, Ballyvolane, Cork. Tel: Cork 501411.
S.L. Combustion Services Ltd., 158 Castlereagh Rd., Belfast BT5 5FT. Tel: Belfast 59282.

Published by ARROW@DIT, 1980
The new company will service department stores, hardware merchants, kitchen specialty shops and the building trade. This means that the public need not have delay in obtaining from stores and obviates the need for retailers to tie up money in stocks.

Their range includes: Gaggenau — built-in kitchen equipment; Eastham — built-in and self-assembly kitchens; Eastham Burco — kitchen appliances; Hygena — self-assembly kitchens; Grovewood — kitchens; Fordham — bathroom accessories; Flair — bathroom products; Bartol — building drainage products; Carron — stainless steel sinks.

Fourways can be contacted at Fourways Home & Leisure (Ireland) Limited, 18, 3/4, Unit 18, Clondalkin Industrial Estate, Co. Dublin, tel: 593166.

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**Coal Research in Ireland**

The European Coal and Steel Community has decided to help finance research into the possible extended use of low grade native coal by the ESB for the generation of electricity, using the fluidised bed technique to burn the coal.

The Community has approved a grant of £80,000 towards the research which is to be carried out at the NIHE in Limerick. The money, and a grant of £25,000 from the National Board for Science and Technology, will be used mainly to investigate the burning of high sulphur anthracite from the South Leinster coalfield.

This follows a previous grant from the EEC for research into the use of low grade "crow coal" in the Arigna area. This research has resulted in the Minister for Energy approving, in principle, the building of a 45MW station at Arigna and the extended employment of coal miners in the area.

Work will go on at the NIHE under Dr. John Bannard and Dr. Mike Pomeroy, who have had considerable experience in the coal industry and on fluidised bed combustion research in Britain. The Limerick Institute has extensive, well-equipped workshops and laboratoriees, and a good selection of monitoring and analysing equipment.

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**Boilers from Bray Chromalux**

Bray Chromalux Limited, the Leeds-based specialists in industrial process and space heating equipment, market high quality packaged electric hot water boilers and steam boilers. The former are designed for use in systems involving commercial and industrial heating, domestic water heating, swimming pool heating and dishwasher boosting, while the steam boilers are ideal for use with baking ovens, autoclaves, sterilizers, humidification, plating tanks, jacketed vessels, platers and preses.

Both boilers are of completely packaged design and the simple connection piping and wiring save costly installation charges. The boilers are compact, thus saving floor space, and are quiet and safe in operation.

Quadrant Engineers Ltd have been recently appointed agents for Bray Chromalux.
Millwheel at UCG

Old millwheel systems are to be used to generate electricity for lighting and heating two new office and laboratory blocks at UCG.

University College, Galway, has bought two disused flour mills on the River Corrib, which flows through the city centre, and college experts are designing generating turbines which will be powered by the river to combat oil costs.

A spokesman for UCD said: "I am not sure yet how powerful the new generator will be, but we hope to use water power as the prime mover.'

Under the Galway city's draft development plan a major emphasis is to be placed on preserving city waterways and all millwheels and millraces.

Heatmerchants

Talking to Heatmerchants Ltd in Kilkenny recently they tell me that their Ber­ton Canada series boiler is selling very well for them through their Athlone as well as their Kilkenny outlets. The boiler is a multifuel unit with two separate combustion chambers which are highly efficient in operation. Apart from the high efficiency the boiler has a further plus which is a quality finish to the casing, so you have a unit that not only preforms well, it looks well. Apart from the Canada boiler Eamonn Walsh tells me that Heat­merchants are also marketing a Mercure boiler, Metaloterm flues, Cosy tube pipe insulation, Baltur oil and gas burners and also the Enterprise cooker. Heatmerchants seem to have the market very well covered and Eamonn Walsh or Larry O'Neill will be only too pleased to give you further information on their product range.

Energy Saving at Buckleys

Our photograph shows Brendan Scanlon of F. & T. Buckley discussing the new system with Adrian Ryan of Pioneer Radiant Products Limited.

F & T Buckley of Robin­hood Road, Dublin have recently completed the installation of a new heating system in their general showrooms. The heaters are of the overhead radiant type which are manufactur­ed by Pioneer Radiant Products Limited of Ken­mare. Because each heater is controlled individually and produces an instant uniform spread of heat Buckleys expect to be able to cut their heating bills by at least 50% in the coming heating season.

"We had seen this system used in many other appli­cations and considered it to be the most efficient and practical method of large area heating available" said Mr. Brendan Scanlon who is Manager of the store.

New Walker Dehumidifiers

At a recent exhibition in Dublin Walker Air Condition­ing took the opportunity to introduce the WalkAir range of condense driers (dehumidifiers). These units are manufactured by Dantherm and marketed under the trade name Walk­Air in the U.K. and Ireland by Walker Air Condition­ing. The units have capaci­ties ranging from 25 litre/24 hours to 300 litre/24 hour and are suitable for applica­tions in the building, electronics, brewing, timber, paper and textile industries.

Part of the new Walkair range of de humdifiers from Walker Air Conditioning Ltd.
The Economic Scene and Our Problems

Once a year the President of the United States goes on television and radio to present his "State of the Union" message. It is highly probable that that message this year contained little good news, as from what we know of American politics and industry it is having difficulties.

If one was asked to present a similar message on behalf of the heating industry in Northern Ireland, the message would contain little good news.

The cut back in private housing development has practically been 90% and of course this has a serious effect on the amount of work available to the domestic trade. In the Belfast area many of the firms are depending on the extension of clean air zones and Housing Executive work.

Those who are lucky enough to get private work are having to be very competitive in their pricing, though the work is of quite a high standard particularly in the provision of luxury bathrooms and kitchens.

The worst major industrial projects is indicated by the number of firms which price work when it comes out to tender and the same applies to semi-commercial work such as schools, offices etc. One small contract recently, of about £9,000 value, had even seen firms competing fiercely.

A second problem which is now arising is that of cash flow. It is safe to say that many supplier's are carrying immense credits.

The cost of money lying out, is a serious matter today and frankly few people in this industry can afford it. Already there are rumours circulating of both suppliers and contractors being in difficulties and there is no doubt if the suppliers decide to move to reduce their outstanding credits then some contractors may go out of business.

The secret is, of course, to control cash flow. Credit control is essential to modern business large or small, contractors and suppliers would be well advised to set up such a unit within their organisation.

It should be remembered that the setting up of credit control does not cure the problem, particularly if the figures received from it have no bearing on the exact situation at the time of discussion.

Recent experience indicated a situation where in a certain company, the three months figures were being discussed, revealing a serious situation. Investigation disclosed that the figures being discussed while presented at the end of the month, were in fact three weeks old and the actual situation at the time of discussion were indeed very much worse than the figures under discussion.

One would like to offer a solution to the problems, but one must accept that the heating trade is unfortunately caught up in the general recession and under such conditions the only advice that can be offered is to be careful.

Contractors and suppliers should both in turn ensure that their clients are of sound financial structure, neither should they allow credit to become extended — remember the old adage the three month debt starts in the second month.

The Commercial Products Division of Potterton International recently announced the appointment of Ballentine Watson Ltd as their agents in Northern Ireland. Martin Watson has been involved in the heating trade for several years in contracting and consulting and will bring his wide experience of this market in partnership with Stuart Ballentine to continue to develop sales and service of the product range.

The Avon One and Two series of oil-fired cast iron sectional boilers from 160,000 to 680,000 Btu/hr together with the Conway and Isis range from 500,000 to 3,200,000 Btu/hr, will continue to be available through our appointed distributor stockists.

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With most activities in the heating industry in Northern Ireland being confined at this time of the year to either the golf course or lying beside the swimming pool in some sunny clime we are this month directing our interests in two main directions, one, seeing our problems, the other an assessment of modern heating as seen by the ultimate customer.

Let us deal with the second — first. During the summer months, there was held an Energy Conservation Competition for schools. The UK was divided into areas and the winners were to be invited to London to receive their prizes and meet such people as Magnus Pike. One of the finalists was Castlereagh College of Further Education who though not being the eventual winner, certainly enjoyed the trip, particularly as it coincided with the Northern Ireland - England game at Wembley, which of course saw the visitors winning.

The N.I. Energy Managers Group decided to sponsor the competition locally and to award prizes for the local area winners.

The winner of the Senior Group was Friends School Lisburn, represented by Keith Pratt.

In his submission, Keith presented a paper containing his thoughts as to how energy conservation could be achieved at his school and in the design and administration of school heating generally.

Keith, not being involved at this stage in any of the activities relative to either heating or its design has been able to look at the problem with a clear and unfettered mind, and while all his ideas may not be "commercially" practical there are many which are worthy of consideration by both planners and administrators.

It is for the foregoing reasons that we present and we believe you will find interesting the paper "Energy Conservation in School Heating" by Keith Pratt.

Conservation in School Heating
by Keith Pratt

The theme of this project is energy use in the school environment. This topic is of great importance in an era where energy resources must be more efficiently used. The most relevant aspect of energy use in the school environment is the technique of energy conservation. Thus much of this project deals with practical conservation measures and their importance to the school environment.

Energy in the Classroom

The most significant form of classroom heat-loss is through draughts. More rigorous draught prevention is...
thus necessary to limit draught circulations within classrooms. A greater degree of tapping around door and window edges provides a cost-effective solution to one form of heat loss.

A common situation in many schools is the accidental measure of leaving classroom windows overnight. The resulting heat-loss causes discomfort to the following morning’s class, and also encourages excess demand on the school heating system. Such situations might be made less frequent by the development of a system regulating the degree to which windows could be opened and the number and position of such windows. Any relevant safety factors would have to be considered — but some scheme out to be applicable to future classrooms.

The positioning of radiators or similar heating devices must also be borne in mind when considering draughts. Ideally, they should be situated such that the convection current which they create do not have a significant degree of intersection with draught causing windows and doors. With the common standardization of classrooms within school buildings, a standardized classroom heating system with optimum radiator positioning would be a very worthwhile exercise for future school buildings.

Light is the next major factor to be considered in classroom energy use. The most fundamental idea for energy use reduction is the introduction of fluorescent lighting in every school classroom. Considering the long period for which classroom lights are usually on, the fluorescent system is much more economical, yet providing a source of light of excellent quality. Four fluorescent tube lights provide sufficient light for the average classroom, with a saving of around 70% on the previous bulb lighting.

At present, the heating system for many schools is based on an oil boiler heating water which flows through classroom radiators. In view of the fact that it would be impossible to radically change the existing system, I have decided to make some suggestions as to how it might be made more effective. Research indicates that radiator dimensions should be quite long and relatively narrow (perhaps 0.4 x 1.5m).

Their positioning ought to be determined with respect to draught considerations. Also, the procedure for a reflective foil or paint surface on wall behind the radiator would reduce heat loss to the supporting wall. This technique is a basic application of reflection of Infra-Red radiation.

Classroom windows provide another area for investigation. Generally speaking, heat loss (through windows) during cold weather is considerable. However, it is unlikely that a cost effective replacement for glass is to be found because of the well advanced techniques of glass production which maintains its relatively low cost. A balance must be struck between heat loss through windows and the value of light penetration through windows. Thus there would appear to be little reason for changing the present glass content of classrooms.

Although not economically viable in present schools, the use of double glazing for windows in schools to be built in the future is a worthwhile measure. Reduction of both heat loss and noise are viable assets to the

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school environment, and a likely cut of 10% of heat loss would result.

A further consideration for the design of future schools are the dimensions of rooms and buildings. As heat loss is through the surface area of these units, the most efficient volume: surface area ratio ought to be used. Adopting this idea would involve the design of cubic shape — perhaps architects are becoming more energy conscious! However, individual classrooms could not adopt the cubic design because of the impractical height of rooms and consequent wasted heat. Ceilings could perhaps be lowered 20-50cm in conventional classroom design with a significantly reduced volume to heat.

All these schemes lie very much in the hands of the designers of our future generations of schools, but provide a useful appreciation of the scope for various energy conservation methods.

Having taken several measures to reduce heat loss it is also worth considering one necessary form of heat loss — ventilation. Ventilation can be in many forms, beginning with simply an open window and progressing to a fully automatic ventilation system. In future schools a system of ventilation not unlike that found in the air conditioned office blocks of USA could be incorporated in our schools. Fresh clean air could be circulated through classrooms through wall vents and extractor vents in the ceiling would remove the stale air from the classroom. The advantage of such a system is seen in that if a heat exchanger is used, the stale hot air may give up a significant heat delivery throughout a school. Fresh clean air could be possible to predict that future effective and easily installed and energy savings have a double door system which could assure most efficient use of ventilation not unlike that found all over the world.

In an effort to reduce energy loss in my school, several measures have been taken of which perhaps the most mundane, yet highly effective has been in the adapting of school doors. All outer doors are now on spring hinges so that they cannot be left open, and major entrances to buildings have a double door system which helps reduce heat loss. These methods have been successful — the are cost-effective and easily installed and maintained.

The topic of conversation appears in almost any discussion of energy conservation. Most schools have adequate roof insulation, and as energy costs rise many more may install cavity wall insulation. Both of these well developed schemes are proven in their ability to help conserve energy and would thus be attractive to the schools energy conservation efforts.

Insulation is not merely restricted to the concept of additional low conductivity media between wall surfaces. Indeed, the materials of which buildings are made may well be developed to an extent where structures will be designed with greater insulating capacity themselves. Such developments lie in the hands of our structural engineers and material scientists, but there would appear to be scope for worthwhile investigation. Ideally, one may envisage walls being of a sandwich of layers of materials with various energy conservation attributes. Insulating layers alternating with metallic reflective surface to reduce loss of Infra Red radiation.

Thermostatic control devices have gained commercial success and provide an obvious technique applicable to the school environment. As with many of the measures discussed, they are most economically adopted by new schools buildings. Thus regulated temperature would avoid wasteful excess heat. In my school a simpler measure has been to cut off all heat to the boarder pupil accommodation during the day, with a significant energy saving. It is possible to predict that future thermostatic control systems might be computer-linked. With the impact of microelectronics, many more schools may have computers. Thus their integration into the energy conservation effort would be in monitoring heat delivery throughout a school. Perhaps a timetable linked system could assure most efficient use of classrooms such that those not in use have an automatic shut-down of heat and lighting. The computer system ought also to yield valuable data for the school relating costs, efficiency, finding faults, monitoring heat supply and demand and thus enhancing overall efficiency.

With an emphasis on energy conservation, it also important not to forget the aspect of recycling of heat in the school environment. As previously mentioned, air ventilation systems provide scope for this scheme. Also, the recycling of waste water heat ought to be possible. A form of heat exchanger could be used whereby hot water could be pumped through a heat exchanger with cold fresh water, helping to raise the cold water temperature which could be further heated in a conventional boiler. Such systems might have scope on a limited basis for school kitchens and laboratories.

At present the majority of schools are effectively limited to basic energy conservation techniques. The use of higher grade (and more efficient) fuels and careful maintenance of boiler systems are an example of the type of schemes which are most easily employed — in fact, they have been successfully adopted in my school. Much of the prospective field for conservation demands further refinement before it is viable for school and public use, but inevitably future schools must be prepared to employ the maximum number of conservation measures.

Alternative Energy Sources
As oil supplies come to an end over the next few decades, synthetic fuels, coal and nuclear power, would appear to be the most important types of power that will be used in Great Britain. Solar power is not really viable because of the limited amount of sunshine experienced in Britain. The photoelectric conversion of solar energy by the solar cell method is a possibility for an additional source of power. The cell uses semiconductor principles to generate electricity when exposed to sunlight. They are useful because they function even on overcast days, but as yet they are very expensive.

A more realistic possibility to complement a school's energy system may be found in wind power. Much parts of Britain experience a sufficient wind condition throughout the year. The system is attractive for school use because the majority of schools have quite high buildings which provide suitably exposed locations for a windmill device. Consequently the windmill could be used with a small generator to assist in the production of electricity for a few classrooms in a building. Much fruitful research has been carried out investigating the windmill concept, and many well-tested designs provide scope for a reliable system of value to a school environment. The basic requirement for design are that the windmills be unaffected by changes in wind direction, have automatically adjusting sails for variable wind speeds and the capacity to survive violent weather conditions. Advanced design of such systems have been completed, thus providing a lucrative future energy source in the school environment.
Sweden is situated in the “belt of westerly winds” which means that, to begin with, there is enough wind energy that can economically be tapped. Analysis of the meteorological data established that across some 12,000 square km — mostly along Sweden’s picturesque west coast, in the province of Skåne (south), on the islands of Öland and Gotland (off the east coast) and in parts of the province of Upland — the winds blow at least 7 meters per second during half the year at a height of 100 meters above the ground.

Another crucial factor — Sweden’s potential wind energy is greater in the winter than in the summer. This also happens to be precisely the time of the year when Swedes use the most electricity in valiant efforts to brighten up days where the sun comes up around 9.30 am and barely manages to get above the horizon before plunging the country back into night at about three o’clock in the afternoon.

An equally important consideration, and in the end analysis perhaps the determining one, is that because wind power can be conveniently plugged into Sweden’s electricity grid, it is acceptable to the utility companies. The utilities’ flirtations with wind are due to the fact that it can be used in conjunction with the country’s vast installed hydroelectric capacity. Since around 70 percent of Sweden’s electricity needs are met by hydropower and distributed in a nationwide grid, this means simply that Sweden does not have to develop expensive and complicated storage technologies for capturing the wind when it blows for use when it doesn’t. Wind turbines can be cranked up intermittently when there is wind, thus conserving water. The advantage and problems of this system have not all been nailed down yet, but the scheme appears to be economically attractive.

Professor Marshall Merriam of Berkeley points out that an electric utility with some hydro capacity in its system is in a substantially better position to use wind-generated electricity than one which does not, given the same amount of wind energy available in both cases.” That observation has not been lost on Sweden’s State Power Board, which supplies about half of the country’s electrical needs. Many of Sweden’s other 17 utility companies, most of which are private, are also interested in the prospect of having some wind powered electrical production in their networks.

Since current data suggests that horizontal-axis wind turbines with two blades stand the best prospects for development on a large-scale basis, NE’s first experimental unit, erected by Saab-Scania’s Aerospace Division in 1977, is a horizontal-axis machine with a generating capacity of 63 kW. The machinery pod or nacelle as NE terms it, is perched atop a concrete tower 23 meters high. Situated at Kalkugnen on the Baltic coast near the town of Alverkarleby (a two hour drive north of Stockholm), the mill has been operating for around 1500 hours.

The Kalkugnen wind turbine has been misrepresented in the Swedish media as using more energy than it produces. However, no one has analyzed the running data to find out if that statement is true. Even though the windmill is connected to the local electricity grid, NE’s Lars Eriksson explains that as purely a test facility “it is not intended primarily to produce electricity.” Rather, its value is in the data derived from the turbine construction and countless component tests; data which NE is now using to produce its megawatt prototypes.

So far, two different rotor hubs and one set of blades have been experimented with. Next, two new sets will be tested. The latest set of blades, made by Saab-Scania, is constructed of carbon-fibre-reinforced plastic (CRP) — a material that is very strong and lightweight.

The windmill also bristles with strain gauges: on the blades, the rotor hub and the shaft. Stress studies conducted by DOE on the 100 kW wind turbine at Clayton, New Mexico (USA) have turned up some interesting comparative data. The Clayton wind turbine’s blades, operating for 2,000 hours and producing 200,000 kWh of electricity, have chucked up 5 million heavy stress cycles. This means litle by itself, but when compared to an average aircraft wing’s cycles, the picture comes into dramatic focus. During a normal day, an airplane’s wings go through a mere 800 cycles of heavy loads. The blades on the Clayton wind turbine experience experience 25,000 — 85,000 heavy cycles every day. That is why, as Marshall Merriam observed, a windmill is actually an example of a fatigue testing machine. The gyroscopic forces at work on the blades and all the machinery parts are enormous. And the unit must be able to hold up. A failure in the materials could flying metal and concrete in all directions.

Like most modern windmills, in the Kalkugnen turbine is a downwind machine. This allows the possibility to yaw freely in the wind, which gives simplicity in design but high gyroscopic forces. An upwind turbine needs a strong, redundant yaw drive. Building windmills like the old-style Dutch machine would mean that they wouldn’t have time to adjust to rapid changes in the wind’s direction and velocity.

Environment studies carried out at

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Kalkugnen have turned up no particular problems. US studies have shown that birds have a marked preference for not turning themselves into instant minced meat by flying pell-mell into the blades. Likewise, noise levels seem to be quite acceptable. And there have been no ultrasound problems to date.

The Prototype phase of NE's programme is now in full swing. By 1981, two large-scale prototypes of 2 — 4 MW each will be in place. Bids for the construction of these two turbines were submitted to NE at the end of October 1978. Two separate contracts are expected to be awarded soon. Five companies are in the running: Götaverken, Kockums Varv, Karlskronavarvet (all ship building and/or offshore companies), Karlstads Mekaniska Verkstad, and Swedewind.

Swedewind is actually a combination of Saab-Scania's Aerospace Division and Stal-Laval (makers of turbines for hydroelectric stations, gears and so on).

According to the preliminary specifications, these big prototypes will be two or three bladed, have hub heights of 70—100 meters off the ground, and turbine diameters of 70—90 meters. They will begin to produce electricity in a 6 meter-per-second wind and will continue to operate up to a wind speed of about 21 meters-per-second. It is known that one of the wind turbines will be placed on the island of Gotland, and the other will probably end up somewhere in Skåne.

Besides the construction and operation of these megawatt turbines, the second stage of the program will also include further meteorological studies, figuring out how best to integrate the turbines into the power grid, the implementation of environmental and safety measures and, of course, a hard-headed look at mass production possibilities.

The third and last stage in this part of the programme will be a full-scale evaluation of the mountains of data that will be produced from the construction, testing and operation of the megawatt prototypes. This three-year period will involve a highly critical assessment of the performance of the prototypes and a brass tacks costing of future systems. It should be pointed out that energy analyses have already demonstrated that wind power units pay off energy-wise in less than a year, if they function properly.

NE must have the necessary ammunition by 1984 in order to present its case for wind to the Government. Depending on the outcome of the evaluation period and the political climate, Sweden's Parliament will make a decision in 1985 on whether or not to continue with the wind energy programme (or to what extent it must be trimmed). If the go-ahead is given, Sweden could have 100 megawatt-sized turbines feeding power into the electricity grid by 1990.

If all systems are go for wind power in Sweden, after the year 2000 it is feasible that this northern country could have around 3,200 large wind turbines producing about 32 TWh (terawatt hours) of electricity per year. NE calculates that this will mean an annual output of 10 GW per machine, certainly not an unrealistic figure given Sweden's favourable position vis-à-vis the wind and the availability of sites. It is already beginning to look as if one of the answers to Sweden's energy problems just might be blowing in the wind.
Michael McDonagh, chairman of the Republic of Ireland branch of the Chartered Institution of Building Services.

The CIBS is a professional body of engineers and Michael McDonagh is one such professional.

His approach to his everyday work and CIBS affairs is dominated by his dedication to the business, he is also a strong family man and has an avid interest in golf. He is a man who prefers to get things done with as little fuss as possible but is not afraid to speak out when it is necessary to do so. These qualities make him an admirable choice for chairman of the local branch of the CIBS after his election at the recent AGM. Michael's involvement with CIBS is not new as in fact he is a founder member of the then IHVE in Ireland but more of that anon.

Although born in Cork and having spent some of his earlier days there it is with Dublin that Michael has the greater affinity. It was during his school days that he made the decision to get involved in a specialised area of engineering and the opportunity came when he was attending O'Connells School in Dublin. At the time Matthew Hall, the large UK contractors, had an office in Dublin and they had a policy of recruiting mainly from two schools, Belvedere was one and O'Connells was the other and it was during one of these recruiting drives that Michael was first introduced to the building services industry. He liked what he saw as it seemed exactly what he was looking for and so he spent the first seven or eight years of his working life working on heating and plumbing installations in hospitals, schools, churches and a little industrial work. It was then the post Noel Browne era in Irish politics and many hospitals and sanitoriums were being built so much so that at that time Ireland was ahead in experience of the UK in building hospitals and providing the services to these buildings. After the hospital boom Matthew Hall closed down its Dublin operation and Michael went to Haden's also in Dublin at the time and it was during this time that Michael continued his engineering education in London as he had already started studying in Bolton Street College of Technology in Dublin. He had an agreement with Haden's that they would sponsor his time in the National College for Heating, Ventilating, Refrigeration and Fan Engineering in London and he would return to work for them in Dublin. Also attending the college was Paddy Clonan, another founder member of the IHVE in Ireland. Paddy at the time was actually putting himself through college and I'm sure that there is another story to tell of the year or two Michael spent with PJ in London. As a matter of interest Michael and Paddy were possibly the first two Irishmen to attend the college on a full time basis. Some time after returning to Ireland Haden's office also closed down and after a short spell with H A O'Neil, Michael then joined the consultancy practice of Varming Mulcahy Reilly Associates. This time in Michael's career was very valuable as he gained vast experience in design of all types of systems for industry as well as universities and
many other projects.

After approximately 13 years in VMRA Michael then moved back into contracting as a director of L Lynch Co Ltd. It was about this time that Michael's predecessor as CIBS Chairman, Seamus Homan also left VMRA to go into contracting. Some lean years followed for the business as a recession set in but over the last seven or eight years the business has expanded and working on the basis of some own designed work, a wealth of design and installation experience has made L Lynch & Co Ltd one of the leading contractors in the country.

Looking more closely at Michaels association with the CIBS/IHVE he can claim links with an Irish association that goes back further still and that was to the Irish "Hot Air Club" of which he and others like Paddy Clonan, Brendan Meegan, John Doyle and Ted Bourke were founder members. It was partly through the club that the IHVE came to Ireland and has happily grown to the size it is today.

Many changes have occurred in the business over the years including the change of title from the Institution of Heating & Ventilating Engineers to the Chartered Institution of Building Services. This has been brought about by the Institution becoming chartered and so all members have been reassessed as to their status in the Institution. This re-assessment has now been completed and of course the lighting engineers have joined the Institution making it a truly building services body. This link with the 'heaters' and 'lighters' is one of the things that Michael has sought for many years and now this hope has come to fruition. Other aims are that for the next year or two papers presented at technical meetings will have a practical approach and one of the leading subjects will be computers in the industry. On education Michael says that "the profession must keep up with standards in other professions and so the levels go up and up but it is essential that we keep ahead and not lag behind to ensure we supply qualified engineers to meet the demands of the future."

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<td>Wyse &amp; Ballantine Ltd</td>
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Index compiled from information received from suppliers. Please notify us on any omission so we can correct it in the next issue of the index.
LOOK FOR
THE MARK
of Guaranteed Quality Sewer

Marley Pipes and Fittings comply fully with the Department of Local Government Specification 1977. The presence of this mark on Marley products is an assurance that the goods have been produced and tested in accordance with this specification.

Write or telephone for full information.

Marley Plumbing
Manufactured in Ireland and marketed by MARLEY Flooring and Plumbing Ltd., Lucan, Co. Dublin. Telephone: 01-280691.
Plumbers and builders' merchants will welcome the news. Sanbra Fyffe is back to full production with original Irish Instantor couplings. The range extends to around 300 parts for connecting either copper or polythene tubing. Irish made, they're as good as you'll find — anywhere — if not better. We're back on the shelves and on the move.

**Sanbra Fyffe**

*Everything on Tap For Plumbers.*

Ireland's sanitaryware market is now worth some £14 million, and in the bath sector acrylic baths account for some 12 per cent of the total and as much as 70 per cent of the luxury market.

These percentages are growing steadily but there is still some resistance by specifiers. John Wardle of the UK Plastic Bath Manufacturers Association outlines a forthcoming European Standard and argues that it is time for old prejudices to be laid to rest.

Plastic baths, the volume manufacture of which started in Britain in the 1950s, are now finding increasing popularity in Europe, where the market is expected to require over five million units in the future. British manufacturers are acknowledged leaders in this technology, and there has been a national standard in BS4305 for many years. After pressure from the Plastic Bath Manufacturer Association through the British Standards Institution, a new European CEN standard is being formulated to guard against inferior products. This new standard is expected to come into force in about 12 months' time. Of all the European standards laid down by the European Committee for Standardisation, this could be the first complete one for baths.

The standard will cover performance, rigidity, quality, and general matters. To a large extent it will be based on British quality standards and practice. ICI, with its Perspex brand, is also backing it.

Improvements over recent years, and the public's acceptance of the product, have had a significant effect on the market so that today about 55% of all baths sold in the UK are made of acrylic. Public acceptance now goes without question so that today home improvements, private estate development and some local authorities are specifying nothing else. The one big area remaining must be at the specifying end of the market, and in local housing schemes.

Old prejudices can die hard among some professionals, and many of Britain's municipal building contracts still have standards which set them apart from the private sector. In some cases these standards are higher, in others lower.

If colour is important, it is interesting that the bulk of white baths are sold to specifying authorities. Is this because it has always been this way? Is there a fear of colour? Is the price, or just a need to standardise for baths, basin and toilet, or is there still non-acceptance of a few of today's plastic materials? This hardly seems likely when one considers the quantity of plastics currently being specified in the building industry.

In the '50s and early '60s, when acrylic baths were first introduced in volume, they seemed to be the answer to many people's prayers. Unfortunately, lack of development and knowledge, and in some cases over or under specification, caused problems in use among some specifiers who in those days were most enthusiastic. It is sad that these early problems and prejudices have stayed with some of them over the years although the reason for the original discontent has long been eliminated.

Today a BS4305 acrylic bath from a reputable maker will not give problems in service. A look through the manufacturers' catalogues, and a talk with the sales and technical personnel, should satisfy most specifiers as to the style, quality and appeal which has been achieved over recent years. The climate is now right for those with a prejudice to take a new look at what these manufacturers have to offer.

The acrylic bath is one product where Britain leads the world. Our standards are high, our export potential is tremendous, and those who still hold prejudices should take a look at the new designs, standards and manufacturing methods. They should also consider the other advantage of lighter weight, easier installation, and relatively simple minor accident repair instead of complete replacement.

Some specifying authorities have used acrylic baths for many years and here are comments from two of them. First, E.J. Wilson, principal plumbing and heating officer for Manchester direct works dept: "We have found Perspex baths suitable in all respects. I
If all bathrooms are the same, why do more people choose ours than any other?

The superlative quality of Armitage Shanks.

Armitage Shanks make beautiful bathrooms. Quality bathrooms with an extra splash of colour and an added touch of style. You can choose your own, very individual suite from our Armitage Shanks range, right now. And make your bathroom the beautiful place it ought to be.

Armitage Shanks (Ire) Ltd.
South Quay, Arklow, Co. Wicklow. Telephone: 0402-2415.
Dublin Sales and Distribution Centre,
Cookstown Industrial Estate, Tallaght, Co. Dublin.

Published by ARROW@DIT, 1980

IHVN News, September 1980
believe we were the first UK authority to install them in quantity as long ago as 1961. The early benefits of price, with substantial reductions in fitting costs, mainly because they can be fitted by one man instead of two, plus a reduction in the number of back injuries, and the fact that they have lived to their early promise, makes them the accepted standard as far as we are concerned. We do, however, insist on 8mm, and correct installation is important.”

W.G. Sutton, works manager of the direct works division of the City of Oxford, says “We have use Perspex baths for the past 8 years and installed about 500 of them. We find them cheaper than either cast iron or pressed steel, and they don’t suffer the disadvantages of enamelled surfaces. They are easy to clean and, if scratched, can easily be brought back to showroom condition, but we do give our tenants instruction on care and maintenance. Another factor is ease of handling. It takes one man to install, which is further cost saving. They have a high-quality finish, a wide range of colours and models, and a choice of thickness. “The manufacturer we buy from has a good cradle which gives very good support. Tenants also say they like them as they save on fuel costs, not needing the same amount of hot water because the material is naturally warm to the touch. The only faults we have ever had were small hairline cracks and some distortion near the waste, which resulted in eight baths needing replacement.”

Is the prejudice which is still apparent in some quarter really justified? Is there a love/hate relationship with acrylic baths, or so some specifiers need either more information or more convincing? It is likely acrylic’s present market share will increase significantly over the next few years. (An investigation into the long-term behaviour of acrylic baths was undertaken by Heinz Gotz in 1975, and copies are still available from ICI).
flush mechanisms are another great improvement on the waterfall effect of former times!

Recently we have seen new interest in the decorated ware popular in Victorian times and, one day, our taken-for-granted loo may be as colourfully patterned as any antique chamber pot. But one thing is certain; this is the only resemblance between the two forms of sanitary provision there is likely to be!

Shaw's
The name of Shaw's of Darwen Ltd., is well known as a manufacturer of extruded frost-proof tiles and sanitaryware. The company has experienced problems over the last twelve months or so but the good news now is that the Concrete Masonry Group, which is based in North Wales, has now acquired assets of Shaw's of Darwen Ltd., and that manufacture of the Shaw Twintile range of extruded vitrified frost-proof wall and floor tiles will continue in the established sizes and colours, both for outdoor and indoor applications, they also intend to revive the Faience, Terra-Cotta and Sanitaryware side of the business. B O'Gorman Ltd of 10 Sutton Park, Dublin 13 is the Irish agent for Shaw's of Darwen Ltd.

K M Reynolds
K M Reynolds Limited, have over the last year been concentrating more on the distribution of plumbing and ancillary products. As a result of this they have been rationalising their position within the hardware field to cope with the rapid expansion they have experienced in plumbing over the last few years. They have moved to a new warehouse, encompassing showrooms and offices, which will enable them to consolidate their position further.

K M Reynolds Limited are the Agents and Sole Distributors for such names as: Ideal Standard; Pilkington Tiles Limited; Du Bois & Co Limited; Omega Plastics Limited; Ekco Plastics Limited; ONI Metalworks Limited; and Olfa Seats Limited.

K M Reynolds Limited, sole distributors in the Republic of Ireland for Omega Products also announced the introduction of the new shower tray, which is a foam-free multi-purpose tray which will cater for fitments from 28" to 31". This should be welcome news from the fixers and merchants alike.

Further information from: K M Reynolds Ltd., Bath Avenue, Dublin 4. Tel: 685079.

Ideal Standard
The Michelangelo range by Ideal Standard has brought a new sculptured quality to bathroom furniture in Eire. Ideal Standard in the UK with headquarters in Hull, is part of a European organisation, and the Michelangelo design had previously won wide acclaim in other European countries.

The Michelangelo is available in six fashion colours and white, including four colours, Kashmir Beige, Sorrento Blue, Harvest and Bali Brown, which are the latest on the fashion colour bathroom scene, as well as the established Penthouse Red and Penthouse Blue.

Paolo Telche, who created the Michelangelo range, is a leading Italian designer. With the range he has produced shapes which have flair and feeling, appealing consistency of form and practical good sense — a combination of which Italian design has become famous.

The quality and styling of the Michelangelo "collection" epitomises the comprehensive range of vitreous china bathroom furniture offered by Ideal Standard to meet all requirements.

Ideal Standard also market a range of plastic bathroom tubs. It includes the ultra-luxurious Nagoya; the

We know you'll see our point of view — that SHIRES make Bathrooms... Beautiful. You can specify SHIRES Luxury Suites — our Allegro, Symphony with Balmoral, or stock the show-stopper — the corner bath Eros.

Have you seen SHIRES five new eye-catching colours — the duotone Rosette Gold & Rosette Lilac, Burgundy & Kashmir Beige. You'll be turned on.

Taps, Mixers & Water Fittings — called DA VINCI, yes! like the Italian master. Shires too have an international appeal for style.

CHLORIDE SHIRES IRELAND LTD.

Newtown Industrial Estate, Coolock, Dublin 5.

Phone 471514
The Idealblend range is made to a high standard of design and engineering and Ideal-Standard claim the same qualities for the Jetline range of conventional fittings, and the Idealmix range of thermostatic showers.

The conventional Jetline range comprise pillar taps, for both baths and wash basins, monoblock and three-piece wash basin mixers, with either swivel or fixed spout, a monoblock bidet mixer for over rim supply and a three-piece bidet mixer for flushing rim and spray, as well as a roll-mounted bath mixer with shower attachment.

The valve assembly in all Jetline mixers and pillar taps has a non-rising spindle and is sealed with two ‘O’ rings which give a longer-lasting seal than the traditional gland packing.

Ikealmix thermostatic showers and mixers are precision made, accurately controlled units of modern design which give particularly neat installation. Their high quality manufacture and finish are combined with easily-understood operation and reliable performance.

Ikealmix units have two controls — one to select the temperature, the other to determine the water flow rate. All models are fitted with safety stops which prevent the control being accidentally turned to a temperature that could cause scalding. A further safety benefit in the Idealmix range is that if, for any reason, there is a failure of the cold water supply, the flow is very quickly shut down.

Ikealmix showers will operate on water heads of down to one metre in favourable conditions, but a head of 1 1/2 metres, or more — obtainable in almost every home — is recommended. This means, therefore, that Idealmix showers are suitable for all domestic installations, as well as other applications.

The thermostat mechanism operates on the bi-metallic principle and the design facilitates the replacement of the thermostat cartridge should this be necessary.

All Idealm-Standard bathroom brassware fittings are available in either chromium or Karatclad hard gold plate finish.

Further information from K. M. Reynolds Ltd.

Twyford Silver Fox, the new colour launched this Spring from Twyford Bathrooms of Stoke-on-Trent, is expected to lead the way in the spring.
The new Silver Fox an attractive smokey grey as seen here in the new Supersteel twin-grip Luna bath, Astral hand washbasin, Norwood WC. Radiant ceramic accessories by Twyfords — towel ring, mirror, soap holder, shelf, toilet roll holder and toilet brush holder. All fittings Aztec by Twyfords.

upsurge in colour conscious bathroom sales.

Already well established in the market with four new fashion colours (Alpine, Cameo, Sandalwood and Mink) replacing others, Twyfords’ Silver Fox is the fifth, in a five colour marketing exercise, carefully researched amongst housewives. “We feel that fashion has a very strong influence on sales, which is backed up by market research, and happily by market results. We are convinced that Silver Fox has all the right elements, which is why we are launching it now”, said Mr H F H Barclay, Chairman of Twyfords.

Two new additions to Twyfords ranges for the Spring are Slate, a silver grey for Colorarmour shutterproof glass shower screens and enclosures, made especially to tone with Silver Fox and the new Luna bath — a Supersteel bath with elegant cast grips.

The Saflo Taps manufactured by Sanbra Fyffe offer an exciting breakthrough in tap design and construction. The heart of the breakthrough lies in a rubber diaphragm and its associated components, a precision moulding in synthetic rubber. The diaphragm has a unique profile which as well as sealing off the entire headworks combines the function of a normal tap washer. ‘O’ Rings and their tricky replacements are eliminated, so are the conventional glands and their periodic adjustment. Few taps, if any, have as light and positive an action as the Saflo Performance Tap and it can be justifiably claimed that they are virtually tamper-proof. Saflo fittings are manufactured to comply with the exacting British Performance Standard BS 5412 1976. Available from builders and plumbers merchants throughout the country.

Santra Fyffe

We've got the range
Water, oil, caustic solutions, degrading agents, inflammable gases and vapours — they all present the installer of industrial immersion heaters with problems. Problems that Santon have already solved.

We've got the expertise
Installing is your job. Providing you with the right immersion heater is ours. Our expertise will help you give your customers the right heater every time.

We've got the service
Stocks of standard industrial immersion heaters are held by Charles Nolan & Co. (Ireland) Ltd who will give you advice on specification and installation problems. For further details contact the electrical engineering specialists.

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Couplings are manufactured entirely in Dublin and are available in a full range consisting of 278 different items. The quality is unsurpassed and the fittings can be used for jointing Polydor vault sleeve and flanged insert. There are no substitutes for the genuine Irish made instanter couplings and they are available throughout the country.

Royal Doulton
In line with the increasing consumer demand for a streamlined bathroom with ducted plumbing, Royal Doulton Sanitaryware is offering two new vitreous china products. The Victory washbasin and the Arena back-to-wall WC take up less space than conventional items, and form an attractive co-ordinating system. The new Victory washbasin, 560mm x 430mm has been designed along the lines of the successful Victor washbasin, and can be set in the counter top or wall-hung. The low-flushing Arena WC, 400mm high, was previously available with high cistern only. The strong back-to-wall washdown pan with concealed piping, besides taking up less space, ensures that cleaning is easy and prevents any possibility of the harbouring of germs.

Armitage Shanks
The Armitage Shanks Group manufactures a wide range of luxury bathrooms and has recently introduced three new colours, Caspian, a deep greeny-blue, Sable, a muted grey, and Pompadour, a warm pink. The new Mayfair range of basin, wc and bidet in these colours is proving popular. Another exclusive luxury suite, the Versailles, a 22 ct. gold filigree design fired on the popular Avocado colour, and available on the existing Kensington basin, wc and bidet, is also in demand when money is not a problem.

As one of the world's largest manufacturers, Armitage Shanks also provides a wide range of vitreous china, fireclay, stainless steel and associated products for specialist needs. These extend from post mortem tables to baby baths for hospitals. The company's products have been chosen for the new Letterkenny, Tralee and Beaumont hospitals.

In addition, it manufactures special units and fittings for laboratories, the handicapped, marine applications, anti-vandal ware, to mention but a few.

Fordham Plastics
The range of Fordham Plastics bathroom products will be distributed throughout Ireland by Fourways. The range includes Acrylic baths, thermoplastic cisterns, shower trays, basins and bath bars and panels.

The Palmyra bath is manufactured from 8mm acrylic sheet and is supplied with twin chromium plated hand-grips. Extra width (800mm) gives additional bathing area. The Stellar bath is manufactured from 5mm acrylic sheet and is full reinforced. It incorporates many distinctive design features such as well defined soap trays, die-cast hand-grip and sloping arm rests. There is also an anti-slip area for over bath showering. The Europa bath, manufactured from 3mm acrylic sheet is fully reinforced. It incorporates many distinctive design features such as a reclining back and slip resistant shower area.

Fordham Plastics manufacture a comprehensive range of cisterns, made from high impact polystyrene. For example, the ultra slim 'flush panel' which only as a 1.14m projection lends itself to all type of bathroom scheme especially where there is limited space.

The universal 'Sprite' cistern is one cistern to suit every purpose and can be supplied with right or left hand, side or bottom feed,
Michelangelo is from the drawing board of Paolo Tilche of Milan... and the U.K. ceramics plant of Ideal-Standard.

The result of Anglo-Italian co-operation—a quality range of design related bathroom furniture which shows awareness of the times. Michelangelo by Ideal-Standard is an extensive range of wash basins, loo and bidets. You have the choice of floor standing or wall mounted loo and bidets and a choice of size of washbasin—63cm, 70cm or a full metre in width. You can see the possibilities of Sorrento Blue (illustrated). Alternative colours are Bali Brown, Harvest, Penthouse Red, Penthouse Blue and also White. All with chromium or gold plated fittings.

*The Italians have a word for it: Magnifico.*
One of the new Flair Flexi-Fit bathpanels — ‘Eclipse’ BP7 adaptable to fit standard baths.
B.A.C. Introduce
"Mini-Split"
AC Systems

Brennan Airconditioning Limited, 60 Cookstown Industrial Estate, Tallaght, Co. Dublin, announce the introduction of their “mini-split” air conditioning system for down market economical comfort cooling of small shop units and offices.

The “mini-split” air conditioning system comprises an elegant indoor fan coil console and an outdoor fully weatherproofed air cooled condensing unit. The two components are connected by a simple system of refrigerant pipe-work.

The fan coil unit is contained in an aesthetically pleasing indoor console manufactured from fine grain teak veneered wood sides, “Skinplate” external finish. An aluminium discharge grille is located in front or on top of the console, thus enabling the unit to be positioned at low, medium or high levels. The console contains a slanted evaporator coil, drain pan, twin centrifugal blower with direct drive 2 speed motor, and an electric heater with an output of 2.5 KW (8,500 BTU/hr). The “mini-split” lends itself to either comfort cooling from one unit to a more sophisticated system utilising more than one unit from a single condensing unit of a larger size. Perhaps the most important attribute of the “mini-split” is that it does not require extensive structural work and avoids any loss of natural light which occurs with many conventional room air conditioners.

Further information can be obtained from: Brennan Airconditioning Limited, 60 Cookstown Industrial Estate, Tallaght, Co. Dublin, (tel: 514711).

High Pressure Jetting

Efficient clearing of long runs of heavily silted large diameter pipelines by high pressure water jetting is now possible with the Rior HD65 jetting trailer which has been introduced by Wards Flexible Rod Co Ltd. The Rior HD65 will clear sewers up to 18 in diameter at reduced man hour costs and minimal fuel costs. It has been developed to produce more flow of water and at a higher pressure than other comparable machines and also incorporates a hydraulically retractable hose. This is because of the increased pulling power of the retro jet which would make manual retraction unduly laborious. A hydropump has therefore been fitted that is simply operated by a clutch lever giving variable speed of retraction.

A patented high pressure three piston Triplex pump gives a flow of 80 litres/minute at a working pressure of 80 bar, and is designed to give efficient working with long life. Stainless steel drive gear runs in an oil bath and the three pistons, with specially manufactured packings, even out-pulsation to a negligible degree giving constant high volume jetting with a quiet and faultless action. Moving parts have been kept to a minimum so that the pump requires almost no maintenance.

Further details, and demonstrations if required, available from: Kenneth Lee Ltd, Martin’s Row, Chapelizol, Dublin 20.

New Fans from Finheat

Bifurcated Axial Flow Fans are available and particularly suitable for high temperature applications. They are also particularly suitable for handling moisture laden air and for many other industrial applications.

Three specific types are shown, limited by their temperature:

(1) Standard temperature unit — suitable for temperatures up to 70°C consisting of a bifurcated steel casing, aluminium impeller, normally a Class ‘F’ motor.
(2) High temperature unit — suitable for temperatures up to 200°C. This is constructed to the same standards as the normal temperature unit with the exception that the motor chamber is fully insulated.
(3) Extra high temperature unit — suitable for a maximum temperature of 300°C.

This range would have a steel impeller, heavily insulated motor chamber and the motor shaft would be fitted with an aluminium cooling rotor.

Size range 300 — 600mm.

Belt Driven Fans

Where the application requires the motor to be outside the airstream best driven units can be supplied. Normal maximum operating temperature of these units is 60°C, but for special applications, higher temperatures can be accommodated.

Typical applications are paint spray boots etc. etc.

Initial selection for size and approximate kW can be obtained by using the standard selection curves for direct driven axials. However, final selection should be referred to Finheat Ltd.
Central Station Air Handling Equipment

by Michael Buckley* MCIBS

Introduction:
Factory assembled central station air handling units are generally one of the first items of air conditioning equipment selected after the cooling load estimate has been completed. In the selection process a chilled water or refrigerant level is established and this in turn dictates the conditions under which the refrigeration equipment must operate. It is important therefore, because of its effect on other system components, for us to understand what central station air handling equipment is and how it should be selected and applied. For simplicity we will refer to this equipment as air handling equipment or units in the balance of the text. There is a wide variety of air handling equipment available, which ranges from small factory assembled units, handling approximately 900 to 2,500 cfm, with capacities of 2 to 5 tons, which may be used with the supply and return plenum or duct work to the large component selected units which handles up to 70,000 cfm or more with capacities up to 180 tons or more. Beyond this some manufacturers will provide custom built air handling units almost as plant rooms on the roof.

General Discription and Application
A.R.I. Standard 430 defines central station air handling units as, “factory made encased assembly consisting of a fan or fans and other necessary equipment to perform one or more of the functions of the circulating, plenum, heating, cooling, humidifying, de-humidifying, and mixing of air, but which does not include a source of heating or cooling. This device is capable of use with ductwork of total static resistance of at least a quarter of an inch water gauge”.

Under this broad definition spray coil equipment would fall into the category of central station air handling units. However, spray coil equipment falls outside the scope of this article and the emphasis will be on air handling equipment using extended surface coils for the cooling and heating functions but without sprays.

Central station air handling units are classified as draw-through units or blow-through units. In draw-through units the fan draws or pulls the air through the cooling coil, heating coil and other components in series, and discharges it from the fan outlet as a single condition. These units are available as either horizontal or vertical types. This arrangement is also described as zone unit. However, zone control can be accomplished by other means external to the units, such as re-heat or volume control.

The blow through unit is commonly referred to as a multi-zone unit and is classified as blow through as the fan is located up-stream from the cooling coil etc., and blows or pushes the air through the coils.

The basic air handling unit, either blow through or draw through consists of three factory fabricated sections or casings which may be assembled in a variety of arrangements. These components consist of a fan for circulating the air, a cooling coil to provide cooling and de-humidification, and a condensate fan to collect and facilitate drainage of condensate from the coil. Various accessories can then be added for individual requirements.

Unit casings are normally constructed from sheet metal panels on angles or channels, some units are fabricated of cold rolled steel and require painting to control corrosion. Those constructed from heavy gauge mill galvanized sheet, are not normally painted as they are adequately protected from corrosion.

Fan and coil sections are normally insulated internally with at least inch of fire resistance media. All casings on the leaving or down stream side of the cooling coil require insulation to prevent condensate on the panels. A spray coatings of plastic on the exposed surface of the insulation is desirable to prevent erosion of flaking of those areas that are exposed to high velocity air. The condensate or drip pan which often serves as a bottom panel for the fan and coil section are in some cases, on the coil section insulated with one half inch of water proof cellular structure, foamed plastic like styrofoam. This insulation is securely fastened on to the pan and is needed to prevent exterior sweating due to cold condensate which is collected from the cooling coil.

On draw through units, the condensate pan is on the negative pressure side of the fan. A liquid leg and condensate trap or liquid seal is required to prevent hanging up of condensate in the pan and to eliminate leakage of air through the condensate drain in the unit. The minimum height of the liquid leg to maintain a water seal and still drain the condensate pan depends on the negative pressure of the unit.

A condensate leg is also necessary on a blow through unit to prevent air leakage from the unit through the trap. The liquid leg must be on the leaving side of the trap and sufficient height must be provided to offset the pressure in the unit.

Cooling Coils
Cooling coils are designed for use with chilled water or with evaporating refrigerant (direct expansion or DX). They are available in varying row depths, fin spacing and type of fin design and material. For example, cooling coils may vary from 3 to 12 rows in depth, but 4 to 6 rows are most common occasionally 8 rows are used. Fins may be of spiral type where the fin material is would helically, and a copper or aluminium tube, or plate fin, where the tubes are inserted through thin plate material. The fin material for either type may be aluminium or copper. Fin spacing ranges from between 7 to 14 fins per inch. Aluminium fins are used most extensively, but copper fins have a limited requirement on applications where water is sprayed on the coil or when a coil is exposed to corrosive materials in the air stream such as hydrogen sulphide, sulphur dioxide or carbon dioxide.

Normally an increase in the numbers of fins per inch is more
Cooling Coil Performance
The first step in the selection of an air handling unit is to determine the basic unit size. This is the function of the required coil or dehumidified air quantity as determined from the load estimate and the velocity of the air across the face of the coil. Usually the smaller unit size would be selected where the face velocity does not exceed the maximum face velocity where moisture carry over into the ductwork becomes a problem.

Carlyle use the apparatus dew point (ADP) method of coil selection for both direct expansion and chilled water coils. This selection method, provides an evaluation of the air side and refrigerant side performance based on the ADP, bypass factor and grand total heat required to satisfy the design conditions. When selecting the cooling coil it is necessary to 1, check the air side performance, and 2, check the refrigerant side performance. The required air side performance under given loading conditions is known from the load estimate and is same whether chilled water or direct expansion coil is used. Refrigerant side performance involves determining the refrigerant temperature in the case of a DX, or determining the water quantity of the given entry chilled water temperature in the case of a chilled water coil. The entering chilled water is generally fixed, based on the most economical chiller performance. After the unit size has been determined, the rows of cooling coils and fins per inch required to match the designed psychrometrical conditions must be determined. A coil must be selected that has a bypass factor approximately equal to that on the load estimate. If the actual bypass section of the coil on the selected face velocity varies more than +/- 8% from the bypass factor used at the load estimate, an adjustment to the de-humidified rise, and dehumidified air quantity should be made. If the designer selects a coil with a bypass factor lower than the value in the cooling load estimate, less dehumidified air is required and vice versa. As the bypass factor decreases, the dehumidified rise increase and the dehumidified cfm decreases. Decreasing the dehumidified air quantity reduces the required duct sizes, may reduce the fan horsepower, and in some further cases, may permit the use of a smaller air handling unit.

Fan Characteristics and Performance
Since the fan is a part of the basic unit, when an air handling unit’s size is selected, fan selection is limited to the number of fan sizes available for that unit size, which generally is not more than 3 or 4. To enter fan ratings, we know the required air quantity and the static pressure the fan must produce. If the total static pressure is required it can be determined by adding the resistance of the various unit components to the external resistance of the air distribution system. Centrifugal type fans are used almost exclusively in air handling units and these may be either forward or radial backward curved type. The backward curved blade fan may be either the included blade or the aerofoil type. Forward curved blade fans are generally used in air handling units since they operate at a substantially lower rotating speed that the backward curved type and hence have less noise. The fan scroll is more compact and the fan wheel, shaft and bearings may be of lighter construction than is required for backward curved fans. However, there are many instances in high capacity high pressure application, and the backward curved fans have better performance and efficiencies than the forward curved fan, and for this reason many manufacturers offer both types.

Diagram No. 1 illustrates the four basic type of fans used in central station air handling units.

If we look at two performance curves for a typical backward and forward curved fans, the plot shows efficiency in break horsepower versus air quantity at a constant rpm. There is one significant point that we can pick off these curves immediately. For the backward curved fan the horsepower curve rises to a maximum and then drops off and is said to have a non-overloading characteristic. In contrast the forward curved fan the housepower continues to rise, and this type, therefore is considered as overloading. When these fans are enclosed in a cabinet the selection range is immediately reduced as indicated on diagram No. 1. Within this limited selection range, the horse power of the backward curved fan runs throughout the selection range — the same as for the forward curved fan. For every selection, the maximum horsepower for either of these fans within the required operating range must be checked. This check shows us what size motor must be used. It also shows us that the motor we have selected will not be overloaded when operating within the design operating range, and it must be understood that since the normal selection range of the fan horsepower does continue to raise, that manufacturers are unable to publish the limit horsepower at a given speed.

When the efficiency of these types of fans are compared it can be seen
that the backward curved fan has a high peak efficiency that the forward curved type. The backward curved fan however, has a wider efficiency variation in the selection region, where it is applied to air handling units. Where we super imposed these efficiency curves we can see what actually happens. In certain areas of selection, the backward curved fan would have a higher efficiency where as with others the forward curved fan has a higher efficiency. This can be more easily seen by making a typical comparison from published fan data. Diagram No. 2 shows us fan horsepower versus the cfm at 2” and 3” total static pressure. The solid line is for the forward curved fan, the dotted line is for the backward curved fan. Shaded areas show where backward curved fan horsepower is better and cross hatched area show where the forward curved fan horsepower is better. For the two units selected in the range of 1600/1800 cfm for 2 inches TSP, backward curved fan horsepower is slightly lower. From 1800 to 2000 cfm, efficiencies are almost identical and from 2000/2500 cfm the forward curved fan efficiency is better. A change in static pressure also effects performance. With an air quantity of 21,000 cfm at 2” TSP, the forward curved fan would be most efficient, and 3” TSP the backward curved fan is best. This plot compares only two types of fans for one particular size air handling unit. Only by actual comparison of air handling unit fan performance for a specific application is it possible to determine whether one fan type is better than the other.

Summarising this comparison of forward curved and backward curved fans, it should be remembered that:

1. Forward curved fans for the same operating conditions run at slower speeds than backward curved fans.
2. In air handling units forward curved fans require smaller diameter wheel than a backward curved wheel at a given operating condition.
3. Separate backward curved fans have non-overloading characteristics but when they are put in a casing there selection range is limited. In many instances this results in a condition where the house power increases continuously within the cfm range of the unit; therefore, it should not be assumed that the fan is not overloading in all situations. All selections should be checked to ensure that the motor selected will not be overloaded.
4. Separate backward curved fans have high peak efficiencies than forward curved types. When applied to air handling units however, the average efficiency of the backward fan over the selection range may be equal or less than forward curved. Only through an actual comparison at the required operating conditions, can the most efficient fan for a given application be determined.

Unit Accessories
Most air conditioning jobs today require more than just the three basic air handling units components. Means for heating, cleaning and humidifying the air as well as a means of controlling room air conditions are desirable for air handling units, and therefore a number of accessory components are available which may be used to provide these three functions.

Accessories can include heating coils, of various types, including pre-heat or tempering coils, and reheat coils or in some cases chilled water coils can be used as heating coils where there is a very definite seasonal factory involved. Other accessories include filters, which can be of the panel, bag, roll or absolute type pending upon application. Face and bypass damper sections are a further accessory, which permits air to bypass the cooling coil only or both the cooling and reheat coil for part load control. Steam pan, spray, atomising or steam grid humidifiers are some of the options offered by most manufacturers.

It is felt that each of these accessories is important enough not to be covered in this initial article, but perhaps to be covered at a later date, under accessory performance for air handling units as a separate article.

No matter what the requirements are for central station air handling units, they must be able to:

- Provide air movement.
- Cool and dehumidify air.
- Provide heating or tempering of air.
- Provide air filtration.
- Permit control of space temperature and humidity.
- Provide means of mixing outside and return air.
- Provide humidification in winter.

Summary
In this presentation on central station air handling equipment, unit components have been discussed and their arrangement and accessories, have been noted. Coil performance and some guide lines and recommendations on the applications of air handling units have been covered. The types, performances and characteristics of forward and backward fans was detailed. Two or more fan sections are usually available for a particular air handling unit and one should not be generalise about advantages and disadvantages of one types of fan versus another type without a specific application, as only by analysing each situation can a designer determine which fan is the most advantageous.

Only by following good application practices and exercising sound judgement can the designer select and design the air handling equipment that would best meet the individual system requirements.
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C & F Ltd

An answer to energy saving at low cost may save prospective customers of C & F Ltd of Dublin many thousands of pounds and make an immediate contribution to energy saving during the coming heating season. The recent appointment of C & F Ltd as distributors for ITT Controls in Ireland has enlarged their product offering and created new opportunities to make moneysaving recommendations. Stated simply, their new philosophy is that before considering expensive options to save energy such as double-glazing, cavity wall and roof insulation, which may cost many thousands of pounds; look first at savings which can be achieved for a very modest outlay by updating the control thermostat and having it professionally fitted. In other words, tackle the energy consumed at source, by ensuring that the thermostat is controlling accurately and therefore reducing any tendency to overheat the premises and waste energy. Their new range of ITT room thermostats, type RT, could make a significant contribution to total energy-saving in the home and commercial premises and the cost compared to the various forms of insulation is insignificant. They do not however, decry insulation, but simply offer their range as a practical first step.

For commercial premises the ITT Controls Thermo-Time Regulator is also available fitted into a weathertight box. A neat low-cost solution to the problem of empty dwellings during a winter holiday for example, is the ITT Control antifrost thermostat, type GAF2 which monitors rapid falls in external temperature to switch on the heating system before a freeze-up. The type GAF2 is used as an outside sensor for both domestic and commercial central heating, can be professionally added on to existing systems and is suitable for depots, garages and domestic premises. C & F Ltd see all of the foregoing as valuable contributions to low-cost energy conservation.

III.

The Fischer and Porter DC1 4000 system being introduced to Ireland by I.I.L. is a complete family of standard microprocessor-based products which can be used in all industries for process control of continuous or batch operations. As recently appointed Irish stockists of Honeywell temperature controllers and multipoint recorders I.I.L. will be displaying this range with their own temperature probe range. The new range of E.I.L. pH and dissolved oxygen instruments including their novel 7130 "Touchdown DO Meter". On show also for the first time in Ireland will be the specialist range of pressure measuring instruments and chemical seals of pressure measuring instruments and chemical seals from WIKA of Germany — the largest selling gauge manufacturer in Europe. The Avo and Megger Range of Instruments, which need little introduction to Irish Engineers will also be displayed while one of the record current recorders will be continuously monitoring power consumption on the stand. I.I.L. are introducing also the new range of hand held tachometers on their exhibit.

Food Industry Supplies

Kane-May Limited have added two new and important digital thermometers to their family of pocket-sized measuring instruments, the K-M 2002 and the K-M 2008. These instruments have received BASEEEFA approval which also covers European certification re-
I INSTRUMENTS & CONTROLS

Kane-May digital thermometers.

requirements to IEC/CENELEC/EN 50014, which allows for the use in a flammable or explosive environment. The K-M 2002 has a range of -30°C to +200°C, and the K-M 2008 has a range of -30°C to +800°C. The instruments are housed in strong, impact resistant ABS cases which have a clear 12.5mm LCD display. These features, coupled with a long battery life averaging six months, make both instruments ideal for on-site use. K-M 2002 and K-M 2008 will carry indelible labels denoting the BASEEFA certificate number, and a wide selection of Intrinsically Safe probes will be available for different applications.

For further details and information please contact: Food Industry Supplies Ltd.

J J Sampson

The market for radiator thermostats increases every year. Their popularity results from the fact that fitting a thermostat to every radiator in a central heating system is the only cost effective method of capturing 'free' heat gains from the sun, people and appliances, thereby saving fuel and improving comfort. The radiator thermostat, independently preset by the users, automatically adjusts the load to the radiator thereby maintaining a constant room temperature. The fuel saving potential is indicated by a 1°C reduction in room temperature resulting in a saving of 8% of that room's heating costs. To meet the aesthetic and energy conservation needs of this market, expected to expand rapidly during the 1980's, Danfoss have introduced a range of new radiator thermostats.

Two versions of the new radiator thermostat are available: the S series for domestic systems; the N series for commercial applications. Both versions, available in built-in and remote sensor types, are

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Danfoss S series radiator thermostats are suitable for fitting into existing and new domestic systems, the overall dimensions of the valves minimising the replacement work necessary.

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A special reinforced version of the N series RAVL radiator thermostat is available for spaces which have random or public occupation.

Valve bodies for the new Danfoss radiator thermostats are available in angle and straight patterns with 10mm, 15mm and 20mm connections. In addition, twin-entry valve bodies are available, with 10mm connections, for microbore heating systems.

Popular versions of the Danfoss S series RAVL radiator thermostats are supplied in individual bubble packs suitable for all aspects of marketing, to all sectors of the heating industry.

The aesthetic appeal of the new Danfoss radiator thermostats styling will be extended to cover the complete range of Danfoss radiator thermostats.

---

**Manotherm**

Revue Thommen AG from Waldenburg/Switzerland, well-known over the world in the field of pressure measuring, testing and control equipment for industry and laboratory, is filling an important gap in the market, with their new pneumatic-electronic measuring case type EM.

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Fans Division
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CAT 1 - an extensive stock range of double and single inlet blowers.
CAT 2 - blowers built from stock components to meet special requirements.
CAT 3 - tailor made fans designed to meet the most demanding specifications of equipment designers.

Aidelle Division
Our Aidelle division specialises in ventilation for domestic, commercial and industrial premises. Aidelle is well known for its leading range of Loovent extractor units and has recently introduced an attractive range of recessed wall fans. These use the extra power of centrifugal impellers for more effective ventilation.

The division also manufactures a range of flue boosting and dilution equipment for gas-fired boiler installations.

The Aidelle Division is handled by McKenna Distributors Ltd.

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**INSTRUMENTS & CONTROLS**

The construction of this new calibrator is based on the proven measuring case OM 321, with Thommen Micromanometer Type 18A (±0.25%) or Type 19A (±) variable bellows, hand pump, pressure switches etc., which is supplemented by a Multitester (±0.5%). This instrument functions with 220V or 110V supply as well as independent from mains. The Multitester allows measuring and simulation of current, voltage and resistance. The separate transformer and the Ni-Cd cooling batteries incorporating the wide ranges of low-limit functions can be effects using this unit.

The electronic line 500 are the latest addition to their range. With these units most control configuration can be fulfilled and on considering the fact that the AX-500 room detector/ controller is no longer that a normal room stat one appreciates C.E.M's market conciousness. Control of mixing box, heating and cooling batteries incorporating low-limit functions can be effected using this unit.

Commercial users are catered for with the production of weather compensators, optimisers load shedders designed to ensure economic system operation.

Baber Colman Company the American corporation are control manufacturers since 1927, producing pneumatic, hydraulic, electric, solid state components and systems.

Reconair rely on Baber Colman for the supply of pneumatic controllers and have installed and commissioned a number of substantial system to date.

The range of energy management Barber Colman offer the Econ-VI automation systems designed to maintain a comfortable building environment. They report plant conditions, equipment malfunctions, security and safety alarm. System control consists range from the AS-9100 designed to operate under continuous supervision control to the AS-9400 available with formal standard programmes. Stop-start-cycle off, 2 automatic limit comparison 3 elapsed run time records 4 maintenance cost management.

Optional features are: intercom, time display slide projection, lighting bank, printers and telephone line.

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**HEAT METERING SYSTEMS**

Fluid flow rates are measured by the most appropriate method - e.g. by turbine metering, differential pressure transducer or non-intrusive ultrasonic techniques. These temperature and flow signals are fed to the Computer Module which produces the appropriate instantaneous heat flow or power signal in standard form (for indication, recording and/or integration as required.) Multi-loop units also available.

Solid-state electronic Computation Modules ensure the highest reliability and accuracy, plug-in modules give the added advantage of easy maintenance, interchangeability and system flexibility.

Also available a range of flue gas analysers CO2 & O2 together with a full range of combustion & efficiency monitoring instrumentation.

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**now manufactured in Ireland**

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DOI: 10.21427/D7HH69
Irish Industrial Supplies

Sangamo time clocks offer a complete range of time clocks, both for domestic and industrial applications.

Sangamo time clocks can be supplied to perform the following operations:
- Simple "on-off" operation;
- Change over contacts for use with mini-valves;
- Early "on"; early "off"; one hour dials; three hour dials.

All the above switches can be fitted with solar dials and also can be supplied with 36-hour spring reserve. The S611/2, illustrated in our advertisement, is fitted with half day omitting device.

Central heating programmers have become more popular within the last few years, and Sangamo have now introduced two new low cost programmers to their range. They are manufactured using printed circuit boards and the latest assembly techniques, and as a result the number of component parts has been cut by about half.

Extensive market research brought in comments and criticisms about programmers already on the market, which have been taken into account. The aim was to make them easier to use and simpler to clean as well as being better looking.

The above range of switches are available from most Electrical wholesalers, importers and distributors: Irish Industrial Supplies Ltd.

Measurement Control & Automation

Measurement Control & Automation Limited, is an Irish independent and owner managed company set up in 1972 to provide a consulting, marketing and servicing organisation dedicated to process control and instrumentation engineering. Since its inception the company philosophy of operation in this strictly defined area has been rigidly adhered to, with the result that they now proudly boast that they have achieved leadership in this field without digression, or active involvement in other engineering disciplines. To this end the engineering personnel are all nationally recognised men whose total commitment is to the field of operation in which we work. The company pursues a programme of continuous training and up-

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Range of Products

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Published by ARROW@DIT, 1980
The Measurement Control & Automation Flue gas analyser provides reliable and continuous quantitative analysis of the concentration of CO₂ and gives a continuous output which may be recorded and also displayed in local or remote analogue or digital indicators, thus providing at all times a knowledge of the CO₂ content of the flue gas.

Other applications include the continuous monitoring of CO₂ in fruit stores and the output signal can also be used for control or alarm purposes.

Flue Gas Analyser
The determination of the percentage of volume of the Carbon Dioxide concentration in flue gas is an approved and reliable guide to the efficient combustion of fuels used in industrial steam-raising plant and other heating or drying processes.

A deficiency in the supply of combustion-air to the furnace allows unburned volatile elements in the fuel to be discharged into the atmosphere.

Higher rates of excess combustion-air allows otherwise useful heat to be carried away through the stack.

Both of the above conditions produce a lowering of the efficiency of the boiler or plant, thus requiring a greater fuel supply than would otherwise be necessary.

The Measurement Control and Automation 2000 Series flue gas analyser provides reliable and continuous quantitative analysis of the concentration of CO₂ and gives a continuous output which may be recorded and also displayed in local or remote analogue or digital indicators, thus providing at all times a knowledge of the CO₂ content of the flue gas.

The analyser utilises the thermal conductivity principle and a sample of the gas to be analysed is passed by a small pump in a continuous low-flow stream over a heated tungsten filament while a second filament, identical to the measuring filament and sealed in clean air, is used as a reference.

Other applications include the continuous monitoring of CO₂ in fruit stores and the output signal can also be used for control or alarm purposes.
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as a manufacturer of heating for the industries of Britain.
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they make up one of the most
impressive and comprehensive
collections of industrial heating
that you’re likely to find.

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got lots of space to heat, our best
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Contact R. Hutton, Area Manager (Ireland), 42 Wesley Lawns, Sandyford Road, Dublin. Tel: Dublin 681355.
What do you find behind De Dietrich boilers?

Behind each De Dietrich boiler, you will find the thoughts and ideas of many experts - the ideas and suggestions of professional designers, consulting engineers, combustion engineers, heating contractors and builders. All these people contributed to the design of our boilers. Backed up by De Dietrich's 100 years experience of casting boilers and their reputation in foundry work (the quality of De Dietrich cast iron is at least 10% above international quality standards).

Behind De Dietrich boilers, you will find CLYDE; a large established organization of engineers covering Ireland, who know all about combustion engineering and who are happy to provide knowledgeable advice and service.

The result of this collaboration is technical perfection, maximum output for minimum fuel consumption, ease of installation and maintenance, quick and reliable service.

De Dietrich: a complete range of boilers from 50 to 1,300 Kw.