Irish H & V News - April & May Combined

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Conservatories à la Powrmatic

IhVex Review
GUESS WHO’S LAUNCHING
THE BEST NEW VENTILATION SYSTEM IN THE COUNTRY

Would you believe the number one industrial warm air heating manufacturer?

Think about it.

All that experience of industrial atmospheres. It's a good foundation for designing industrial ventilation.

And we believe we've designed what is truly the best new industrial ventilation in the country, backed by some of the best installers in the business.

It covers most industrial applications, with a whole selection of input and extract units.

There are proven, well-balanced polypropylene fans. Fans that are driven by powerful, European standard motors, class F insulated to withstand higher running temperatures.

Motors that are resilient rubber mounted in our Pownervent units for smoother running.

The ducting is a new, modular design, made extra sturdy by all welded flanges that are pre-drilled for easier, more versatile installation.

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These are just a few of the features that cause us to think our system is the best new ventilation in the country.

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Your new ventilation system sounds quite good.
Please send me details
I'd like to become a Powrmatic installer

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powrmatic
De business in the right atmosphere

29 v.5.79
IN THIS ISSUE

Problem Solving in D'Olier Street

BTU Golf Outing

"An exceptionally good turnout" is the report on the first BTU golf outing held late last month and sponsored by B&E Boilers. See page 9.

IhVex Review

Although IhVex attendance figures did not reach the organiser's expectations, sales were buoyant.

Winner of the IhVex visitor draw for a two-week holiday in Greece was Mr John Burke, (Speidel and Partners, Leeson Close, Dublin, Quantity Surveyors). A review of the Show starts on page 10.

Product Feature:
Pumps and Circulators

With industry making unparalleled demands on liquid fuels, the role of pumps and pump systems is becoming increasingly important. For the options that are available and the companies who will supply them, see page 44.

CIBS Awards

Last month Brian McGuire and John Harris shared top honours in the first CIBS Student Awards presentation. An edited version of Mr Harris' paper "Design of Industrial Steel Chimneys" starts on page 54.

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Published by ARROW@TU Dublin, 1979
The nuclear leak in the USA last month means that Ireland's nuclear programme will be put back by at least two years. According to one of the country's leading authorities, Dr R J Nichol, deputy director-general of the Institute for Industrial Research and Standards, "The possibility of a nuclear leak has increased greatly as a result of Pennsylvania and it might even appear that the possibility of us going over to this source of energy is now very remote."

"It has been a very influential incident. It has had a considerable effect on people's thinking, no matter what the pro and anti lobbies may make of it. And many of the fears it has aroused and the issues it has raised will have to be dealt with before we decide to go ahead". This, he said, would mean an inquiry taking at least two years. According to Dr Nichol, who is pro-nuclear, the country had three short or medium term options in energy provision: nuclear power; coal as an adjunct to, or alternative to, oil; and natural gas in addition to nuclear power or coal.

Nuclear power reduced the threat to national security as it substituted a new fuel, uranium, and allowed the stockpiling of several years consumption of uranium in a small space, he said. Stockpiling coal was not practicable and in an oil crisis, coal would come under pressure both in price and availability. This left only two options — nuclear power and natural gas.

The findings of an inter-Departmental inquiry into the town gas industry, are likely to be available this month. (The results were promised for September last). Announcing the inquiry 12 months ago, The Minister for Industry, Commerce and Energy, Mr O'Malley, blocked an allocation of Kinsale Head gas to the Dublin Gas Company. Instead he granted it to the Cork Gas Company with the proviso that they paid energy-related prices. The Minister also made a significant allocation of 72 cubic feet per day available to the ESB in Cork, suggesting, however, that if other more suitable users of the gas could be found, the ESB should be prepared to forego its allocation.

In the same statement, the Minister put the onus of finding new customers for the gas on Bord Gais Eireann and the Industrial Development Authority. Since then, however, Cork Gas Company has failed to negotiate a price with BGE, and, so far, the only customer to indicate a definite interest in using Kinsale gas has been a German shower manufacturing company.

It is understood that when the Gas Company and BGE met for negotiations following the Minister's directive, BGE was told that the company could not afford to pay the top price for natural gas. Since then, despite promptings from BGE, the Gas Company has failed to submit an alternative offer.

If, however, the Minister goes ahead with his plans for a phased withdrawal of the gas subsidy, the immediate effect will be an increase in gas prices both in Dublin and Cork. In the case of the Dublin Gas Company, only another natural gas find, could keep prices down. For Cork consumers, the probability is that a change-over to natural gas will not necessitate a costly change in equipment, as the gas will be converted to town gas before being fed into the system.
Take me to your Leader

Should he be in search of air conditioning and refrigeration equipment, he'd be taken straight to Walker Air Conditioning. Because Walker Air Conditioning — your local Carlyle distributor — is the leading air conditioning equipment supplier in Ireland, in Scotland and in northernmost England; and because Carlyle, with over 4000 different products, is itself the world's biggest and best-selling range of air conditioning and refrigeration equipment.

For top quality products backed by top quality pre- and after-sales service throughout Ireland, in Scotland and in northernmost England, make straight for the leader: Walker Air Conditioning.

Walker Air Conditioning Limited

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Belfast: 9a Cherryhill Road, Dundonald, Belfast BT16 0JH  Phone: Dundonald 5235  Telex: 747681
Glasgow: Washington Road, Unit 10B, Abbotsinch Industrial Estate  Paisley PA3 4ET  Phone: Glasgow 887 0551  Telex: 779406

A member of the Jefferson Smurfit Group
IRISH FIRMS WIN NEW ESB CONTRACTS

An Irish firm ABM Ltd, Rathcarrin, Co Meath have linked up with a German company, PHP, Cologne, to provide a wagon marshalling plant and belting systems for peat handling at the ESB's generating station at Lanesboro, Co Longford.

LMH Engineering of Arklow, have also received an order from the ESB to provide blending bunkers at Shannonbridge and an option for a similar plant should it be required at Lanesboro.

Both contracts are believed to be worth one million pounds and Dr J Kelly, Chief Engineer of the ESB, has indicated to Irish firms that there are further contracts about to go on the open market for the Moneypoint coal-fired station in Co Clare.

The company have already ordered two, new, 300-megawatt boilers, costing £40 million, from the American company, Foster Wheeler Corp of New Jersey. The boilers, which can be adapted to burn either oil or gas in the event of any off-shore finds, indicates the Board's intention of diversifying their fuel resources and lessening their dependence on the uncertainty of oil imports.

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‘Waste’ Seminar in Cork

A seminar entitled "Today’s and Tomorrow’s Wastes - Management Technologies and Environmental Quality" is to be held at the Silver Springs Hotel, Cork, on May 21st and 22nd.

Sponsored by the National Board for Science and Technology in association with An Foras Forbartha, the Institute for Industrial Research and Standards and An Foras Taluntais, the conference will review research and developments on municipal, agricultural and industrial wastes.

In addition to a number of leading Irish authorities on the subject, guest speakers will include Mr P Lieben, Environmental Directorate, OECD, Paris; Dr L Klein and Dr Ph Bourdeau, EEC Commission, Brussels; Mr K Hovland, A/S Volund, Denmark; Prof B J Wixson, University of Missouri; Dr R L P Berry, National Anti-Waste Programme, UK; Dr M G Norton, Ministry of Agriculture Fisheries and Food, UK and Mr R Aspinwall, Aspinwall and Co, UK.

Further information and bookings can be made by contacting Grainne Ni Uid, National Board for Science and Technology, Tel: 683311, Telex: 30327.

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Engineers

Set Pace

For

Graduate

Employment

A scheme designed to promote employment of graduate engineers, has just been launched by the Institute of Engineers of Ireland.

Known as "The Sponsorship Approach to Charter Engineers", the new training programme encourages young engineers to follow an organised course which incorporates a two year training period followed by two years experience in a responsible position under the guidance of a sponsor. Upon the successful completion of the programme, by the student, the Institute will confer the title "Chartered Engineer" (C Eng). Sponsorship for the project include amongst others - CIE, Bord na Mona, ESB, Office of Public Works, Gay Kenny and Partners, G V Tierney, and Varming Mulcahy O'Reilly.

In announcing the training scheme, Lucas Collins, President of the Institute, said that "the prospects for employment and career advancement for graduate engineers employed in Ireland is increasing and will continue to do so up to the end of the 1980's. However, the number of engineers in this country is below the European average (1.5 engineers per 1000 population in Ireland compared to 5.3 as the European average; Sweden rates highest with 10.7) and it must increase if we are to have economic progress".

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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.
Satchwell Re-Enter Irish Market

Two years after they closed their Dublin offices, Satchwell Control Systems Ltd have decided, as part of their £16.1m expansion programme, to re-enter the Irish market. According to Satchwell’s Ken Hurst, Special Projects Manager, the decision at that time to close the Dublin office "was possibly a mistake." However, he left no doubt in anybody’s mind that it was now a company policy "to attack the Irish market."

Recognised as one of the largest British companies specialising in the manufacture and installation of automatic controls for heating, ventilating and air-conditioning installations throughout the world, Satchwell is part of the GEC group and GEC’s, Dermot Spain emphasised that they would be establishing a full comprehensive range of all equipment available.

During Satchwell’s two year closure, Temperature Control Services acted as their distributors.

In keeping with their policy of "short line" communication, O’Gorman (Ireland) Ltd held an informal cocktail reception at Sachs Hotel during IHVex. Guests included company clients, contractors and manufacturers, both local and from overseas.

In greeting his guests, (many for the first time since he’d become managing director following the takeover of O’Gorman (Ireland) Ltd from the W H O’Gorman Group in the UK), Mr J Heaphy confirmed reports that the company was planning to expand its overseas markets.

"In conjunction with other sections of the Heaphy Group of companies," he said, "plans are well advanced for expansion and included a monetary and payment management headquarters in Cairo to handle current contracts and enquiries in the eastern Mediterranean and Middle East where the organisation’s construction and fitting out divisions are already involved in a number of major projects.

Mr Heaphy further added that with the rapid technological advances taking place there was no reason that Irish companies could not compete successfully in the international marketplace alongside well established European organisations.

Irish Offshore Activity Increases

Irish participation in offshore activity rose from £3.5 million to £12 million in 1978, according to the annual report of the Irish Offshore Services Association (IOAS). Although the number of wells to be drilled in 1979 would be down on the 1978 figure, Mr Colm Brennan, Chairman, IOAS, was confident for the future of the industry, particularly following the oil find off the West Coast by Phillips.

During the past year, 19 new members were enrolled in the Association, and this expansion enabled them to present a comprehensive range of goods and services to the exploration companies in Irish coastal waters.

The Secretary also reported, that in 1978, the IOSA established a weekly newsletter detailing rig positions and current offshore news, negotiated with the Department of Industry, Commerce & Energy in respect of 28 applications to the oil scholarship fund and attended, the Europec ‘78 exhibition. Due to the continuing postal dispute, the elections of officers to the body for 1979 has had to be postponed.
An export order worth more than £65,000 has been placed with Midland International Ltd by Draps et Cie of Brussels. The order follows Midland's participation on the Draps stand at the recent Bati Bouw Exhibition in Brussels.

Commenting on the order, Midland's Group Marketing Manager, Colin Howes, said: "we are delighted that our decision to actively market our products directly in Europe is proving so successful. And we are confident that 1979 will see Flair products firmly established on the Continent."

Finheat Ltd are to exhibit their full range of products at two venues during May. On the 17th, the company open a one-day exhibition in the Great Southern Hotel, Galway, followed on the 18th by one in Cork at the Silver Springs Hotel. Senior personnel from all of Finheat's agencies will be in attendance and 'personal' invitations are now being distributed.

Seiscom Delta Exploration Inc, the US geology analysts have purchased specialised Airedale air conditioning equipment for their new headquarters in Dublin.

The office, which will serve as the company's Eastern Hemisphere headquarters, will process geophysical data from most of the major petroleum areas of the world. The air conditioning plant, which serves the computer room, comprises of three independent Airedale Downflow DF10 units with a total heat extraction rate of 105.5 kw. Monitored by one central control panel, each unit has dual refrigeration circuits providing inherent stand-by facilities.

Minex Ireland '79, Ireland's first international exhibition on mineral exploration, will take place in the Cork showgrounds from July 10-12. The show has already generated a great deal of interest among companies engaged in supplying the offshore and mining industries, and the organisers expect a "bumper" show.

Over IRE7 million was paid out in claims for burst pipes and water damage this winter. According to JRD Balbirnie, outgoing chairman of the Federation of Insurers of Ireland, the figure is only an indication of the volume of extra business that resulted from the terrible winter conditions earlier this year.

Whessoe (Ireland) Ltd have been awarded a £75,000 contract for the design, supply and erection of diesel oil bulk storage capacity at Riyadh power station. Erection material and specialist equipment has been shipped from Dublin and Whessoe Ireland's erection crew will fly to Riyadh this month to commence site erection. Work is due for completion in August next.

The CIBS annual golf outing and ladies evening will be held on Friday, May 18th at the Hermitage Golf Club, Lucan. Tee-off time is 12 to 3, with dinner arranged at 8 for 8.30.

Further information and bookings can be made by contacting either Michael Buckley at 300844 or John Doherty at 768354.

C&F Ltd have just moved to larger premises in the Glenside Industrial Estate, Mill Lane, Palmerstown, Dublin 20. Telephone numbers remain the same: 364917 and 364898.

'tGET WELL SOON' wishes to Europair's Tony Kinsella who's been confined to hospital for eight weeks following a recent automobile accident. Tony's car fared considerably better in the mishap, damages being a mere £10.

Cross Refrigeration Ltd has completed the installation of a 30,000 cu ft low-temperature cold store at the Musgrave frozen food centre on the Cookstown Industrial Estate.

The unit, the latest in a series of major contracts completed for Musgrave by the company.

Some people say we're old fashioned...

but if we were unscrupulous, cared more about the profit margin and cut a few corners, especially in the quality of materials we use, we could do better.

If we had more unskilled labour and fewer craftsmen we could join the big league.

But then we tend to think that the out-dated virtues of truthfulness, reliability and a job well done pay in the end...even in the boiler business.

It's certainly worth tuppence to find out why, when people say we're old fashioned...

We agree!
The new heating system recognises the fact that air temperature alone does not represent an index of comfort. The Andrews Weatherfoil Environmental Heating System is designed to control the ratio of convective and radiant heat inputs. By installing heat exchangers in the void of the suspended ceiling, the air and radiant temperatures are therefore linked allowing effective control of environmental temperature to be achieved in the air sensing thermostat. It is claimed that the system offers a reduced energy consumption of 8% over a conventional heating system. The system can be used with any recognised suspended ceiling and gives a room with minimal vertical and horizontal temperature gradients and consequential reduction in draughts.

The system comprises the Andrews Weatherfoil purpose designed C44 fan coil unit and secondary fan unit, both located in the void, thus ensuring an absence of pipe work etc below ceiling level. Hot water from the boiler is circulated to the C44 units which produces warm air in the void, this in turn warms the ceiling tiles to provide the radiant heat input. The ceiling void is at the same time used as a reservoir of warm air for the convective heat input supplied by the secondary fan vent. The heater battery may be used either with LP or MP hot water.

Irish Bridge Ltd the Belfast firm, which is heavily engaged in pipework contracts for North Sea developments, have appointed Mr Peter McCormick chairman of the company. Mr McCormick was formerly head of the Department of Commerce - Offshore Supply & Development branch.

Mr Will Law has resigned from Marol to take up a position as sales representative of Servol Lubricants Ltd, the Northern Ireland castrol industrial distributors.

The American company - CLABIR - Corporation of Connecticut, in conjunction with the N.I Development Agency are to invest new equity in the Belfast based Everton Engineering Co. Everton, formed many years ago by a local businessman, concentrate on heavy fabrication and ductwork for industry and power generation.

Clair are concerned with extending their expertise manufacturing ability into the off-shore fields and intend using Everton as their European base. More than 100 new jobs are anticipated. Mr Alex Cormack will remain as Managing Director of the company.

John Kelly Ltd - fuel distributors and heating equipment agents and distributors, have announced the retirement of their chairman Dr. D. Rebeck; his replacement is Mr Powell Brett, who has been a director of the Group for some time.

Mr W Devlin, Managing Director of John Kelly Ltd, becomes Chairman of a number of associate companies within the group including IES Industrial (Ireland) Ltd., agents for boilers, air conditioning equipment. Mr R Patton, recently manager of the heating and agency division has been transferred to Howdens Ltd, Larne to become a director of that company. Mr Peter Weston has joined the company as manager of the heating and agency division.

The MacLaren Division of ITT Controls, based in Glasgow, have appointed Joe Taggart, Scottish area sales manager. Mr Taggart will also have responsibility for residential controls and gas valves in Northern Ireland and Eire.

McNaughton Blair, builders and plumbers merchants, have announced the appointment of Mr Desmond Bonnar to the Board of Directors.

Ergas (NI) have appointed as general manager for their Northern Ireland operation Mr. Will S. McKee, who will be based at the company's head-quarter at Craigavon.

Mr. McKee has been with the Moygashel group for the last 15 years; his most recent appointment being that of sales manager of Moypark (NI Sales).

Furtherance of the "Save it" campaign is evident in the announcement that the Energy Division of the Dept of Commerce, 64 Chichester Street, Belfast have copies of three films and information kits dealing with energy saving in industry, now available to commercial and industrial organisations.

The films, each about 20 minutes long, are "Furnace Management" "Burners for Boilers" and "Heating and Ventilation in Factories".
Cold weather and postal strikes don't deter the true "duffer" and 56 enthusiasts teed off at the BTU's first outing held at Newlands Golf Club in late April. According to Liam Stenson, newly elected Captain, not only was there a particularly good turnout of members for the event which was sponsored by B&E Boilers, but scores were particularly high.

Overall winner for the day was Des O'Sullivan, Clyde Systems, who topped the list with 39 points. Others who scored well include:

Class 1: Winner — Tony Gillan, Glow Heating Ltd (11), 36 pts; 2nd — Tony Jennings, Anthony Jennings & Son (7), 36 pts;
Class 2: Winner — Liam Stenson, Irish Building Services Ltd (12), 39 pts; 2nd — Eamonn McGarrattan, McGarratt & Kenny Ltd (12) 39 pts;
Class 3: Winner — John Ennis, Redbro Ltd (17) 38 pts; 2nd — Liam Dillon, City Building Supplies Ltd (20) 34 pts;

Committee members for the year are: Captain: Liam Stenson, Irish Building Services Ltd, Hon Sec: Eddie Egan, IDA, Treasurer: Des O'Gorman, City Building Services Ltd.


Visitors: Winner — Frank Lawlor, C J Ryder & Co (19) 37 pts, won on back 9; 2nd — Fred Tucker (16) 37 pts;
1st 9: Winner — Joe O'Reilly, Pump Services Ltd (8) 20 pts; 2nd — Larry Gilmore, McMullan Bros Ltd (10) 19 pts; 2nd 9: Winner — Tony Delaney, Contractor (5) 19 pts;
2nd — Garvin Evans, J Garvin Evans Consultants, (21) 18 pts.

Outings for the remainder of the season are:

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<td>Hermitage GC (Ladies Night)</td>
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Hugh Siddall, B&E Boilers congratulates Tony Gillan, Glow Heating Ltd, on winning the Class One category. BTU Captain Liam Stenson looks on.
Brilliant and burners — in particular the new Buderus Econamic which uses up to 15% less heating energy than other boilers was featured predominantly at Quantum Engineers. Discussing the new boiler with Graham Jordan (C), Andrews Industrial Equipment, and Tony Wilson (R), Triple E (UK) Ltd was Michael Davies (L) Quantum Engineers.

"Radiators — this time the Rustal variety — attracted a number of visitors to Rustalab. "Products are custom built" a stand executive said, "and during the past winter demonstrated their resistance to bursting in severely cold conditions."

Pat Keene and Bill Trefrey (L and C). Rustal, explain some product features to Sean Sweeney (R).

Thermometers, thermocouples, pressure gauges and switches — all were on display at Manutest. Taking a look at the new Burndown catalogue were Bob Gilbert (L) and Brian Hurry (R). Manutest, while Roger Beesley (C), Burndon, looks on.

"Designed to reduce solar heat through glass by 78% and eliminate glare, the films are already in extensive use throughout Ireland," a Heathfield representative, Jack Gleson (R) said. "Explainning the films' application to E. P. McDermott (L), a Heathfield General Manager, Gerry Muldoon.

David Cooper (R). Jotul, makes a point to Richard Martin (L) about his range of woodburning stoves, which are gaining widespread popularity. Grantfield also distribute Theo solid fuel cookers which can be instantly converted to oil or gas.

Golden Jubilee celebrations were in hand at James Gleson's who were showing a wide range of pumps, including the ZK model which is suitable for simultaneous oil/solid fuel (grain) waste incinerators and burners. Discussing the company's range with Denis Smith (C), Heavit, and Paul Sanders (R) Heavit, are Jack Gleson (L).

"Keep (it) Cool is what Southern Refrigeration is all about, and the company had an extensive range of items from Acrokoel water coolers to Saturn Hudson Borge Warner on show. Checking a query on a specification sheet were (L-R) Dennis O'Leary, Kelly Refrigeration and G P Gillis, Sales Director, Southern Refrigeration.

Filters — be they high efficiency ultra, fine dust or the 'TS' were the emphasis on the Lawa display. Their SR welding flame extraction system, which is available either as a 'ring man' operation for up to 1000 welders or as a mobile unit for 2-3 welders, also attracted a good deal of attention. "What's the market today do you think?" Sam Percy (R), Lawa's UK Division Sales Manager, asked, while John Carroll (L) and Ben Keemey (C), Glaeotherm directors.
**IhVex - Sales Bouyant But Crises Hinder**

No matter where the blame can be placed — the postal strike, the bus ‘go-slow’, the cold Spring weather or the petrol crisis — attendance at IhVex was not up to the organiser’s target. Those that came though bought and bought well; one company, Danks of Netherton for example secured two major contracts on the eve of the opening of the show which was almost twice as large as IhVex ’77.

"The postal strike quite obviously played havoc with our preparations," John Butterly, IITEX Organiser, admits. "At relatively short notice we had to drastically revise our promotional plans and in the time available I feel they were as effective as could be reasonably expected.

"While attendance was up on IhVex ’77 by some 15% we did not realise our expectations," he said. "Over the show opened, we received a good deal of coverage in the newspapers, and the fact that it was on the ‘9 O’Clock News’ the opening night certainly helped I think."

Butterly, who was born in the Maxecon and Westgarth range manufactured by George Clark Engineering, is delighted with the way the Show has been presented. There are plenty of people on the stands to answer your queries, and there is also none of this pushing and shoving that you encounter with a lot of exhibitions. It’s well laid out, and I’m glad I made the trip!

For those that did, the exhibition was well worthwhile, and new products and new agencies abounded. O’Gorman (Ireland) Ltd, for example, used the exhibition to announce that they’d been appointed agents for Cole air chillers and Keep-Rite range domestic and commercial water boilers, which are manufactured by George Clark and NEM of Newcastle on Tyne, both in the Republic as well as in Northern Ireland.

On the new products front, James Gleeson, who were celebrating fifty years in business, introduced the Hoval pyrolytic waste incinerator. The machine not only saves fuel and the cost of waste storage and removal, but it provides an energy alternative which is becoming increasingly important in these days of oil and petrol shortages.

Waste removal was also the emphasis on the Scandinavian Imports stand which was introducing a range of waste heating equipment manufactured by Kongskilde Benelux BV in Holland. Kongskilde’s all-burner gas-oven particularly got good reception from the trade, as did the Thermobile space heaters which range from 20,000 to 80,000 Kcal. Thermobile differs from its competitors in three basic areas: the handle is removable, with a 150 mm diameter x 75 mm wide forward curved impeller, powered by a ½ h.p. single phase motor running at 2,800 rpm. The chassis is made of welded tubular steel and epoxy resin painted. Accord-

"The exhibition went very well for us, and we met many new customers" Euro Pumps Ltd.

so that the inlet can also be heated; the unit is a monotube, and it has a quick release burner which allows for rapid repair (in less than 10 seconds) should the need occur. The unit is ideal for drying, heating, thawing and frost-protection and a selection of accessories including thermostats, pipes, hoses, etc are available.

For those concerned with fume extraction, particularly in the welding industry, the Luwa system bears looking at. The unit is easy to install; one section goes outside, the other — a filter unit — inside which is moved to the area required by special couplings. The fan is totally enclosed and has a power requirement of 1.1 KW per welder; the turbo compressor extracting 100m³/h of air per welder.

Air circulation was also the emphasis at McKenna (Ireland) Ltd who were showing their new range of Portvent ventilation units particularly suited for small industrial premises. The unit is a direct drive centrifugal fan, ranging from 3 to 40 hp, are weatherproof, and all components easily accessible. Temperatures are easily adjustable from 15°C to 7°C and capacity control is available on all units.

On the Flakt stand, the new KDA units were featured predominately. Covering an air flow range up to 34m³, the model has 12 sizes and over 24 different unit sections avail-

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**Minister Opens IhVex**

The Minister for the Environment, Mr Sylvester Barrett, TD, pulling the switch on a Hoval incinerator during the opening of the IhVex ’79, with Mr Jack Gleeson, Limerick, Hoval’s Irish Agent. The smokeless incinerator operated throughout the exhibition.
"New agencies" was the message on the O’Gorman (Ireland) Ltd stand as the company introduced Cole liquid chillers and Keep-Kite domestic and commercial packaged air conditioning units. Looking at part of the Cole machine are (L-R) W Bingham, Consort Coolair; T L McGrath and J M Heaphey, W H O’Gorman.

A member of the Cross Group, Coolair showed an extensive range of air conditioning equipment — from Daikin centrifugal water chillers to Vepulp air handling units. Discussing one of Coolair’s products are (L-R) Greg Trevenor, J N & G Traynor and Partners, John Lawlor, Coolair and Sean Rice, De Beers.

Boilers of the Gerkos open-fire, Reliance and Lamberghini type were all on display at Gerkos Boilers. Explaining the motor to Eddi Mulcahy (R) is Jim Dally (L), Dublin Manager of the Tipperary based company.

Epiromark stainless steel flues (class 1 and 3) were the topic of discussion between Mr and Mrs R N Hayes and John O’Neill (C), Tradifire. The company also supply Hymes cylinders which carry a 25 year guarantee.
Northern Presence

"Going to Dublin for the Show" took on a new meaning when a large number of Ulster heating trade representatives visited IHVex. The exhibition, also attracted a number of Northern based companies who have interests in the South.

The Northern influence was soon apparent. At the entrance to the hall there was a Robey Lincoln boiler, stopping on its way to a customer, to allow George Stewart and the staff of S. L. Combustion Ltd to extol its virtues to potential customers.

Further up the hall, Ian Robinson was in charge of the IES Industrial (Ireland) stand complete with Peerless pumps, Fram filters, Maxeon boilers and introducing their recently appointed southern representative Sean Halligan. It was a pleasure to meet Gordon Ruxton, a well known figure again, and he along with his Northern Ireland representative, Kevin Delargy were introducing their Flakt range of air conditioning equipment. Norman Gordon was to be found on the Consort stand with the company's new range of tools specially designed for the heating trade.

Castlereagh Sheet Metal Ltd. displayed their complete range of oil fired boilers and air heaters together with their new domestic back boiler, while, further up the hall, Passad had their multi fuel units lined up for inspection together with their high output radiators.

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As the week progressed, the hotel lounges and hosteleries resounded to the sound of Ulster voices. Included among the visitors were Barry Shaw (Coolheat), Bill Totter (Wil Tad), John Doyle (J. Doyle), H McFadden (Sermet), J Lowry (Powermatic), J McVicker (McNaughton Blair Ltd), and M Paterson (Gallaher Ltd) to mention but a few.

According to James Anderson, Managing Director, Walker Air Conditioning Ltd "too much money was spent on a few stands and these over-shadowed the others. The quality of the stands, in general, though was very high". For future exhibitions, he suggested the Continental exhibition concept, ie of standard shell-units being used which would mean that no one exhibitor would dominate the displays.

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Refrigeration and air conditioning equipment, controls and specialised tools from such manufacturers as Beter, Yellow Jack, Ranco and Robinair were on show. A major attraction was the company's range of pumps. Also on display were the work of some of the newer companies, including JR Johnson, Cool Products; Jerry McDonagh, RSL, and G N Collerocks, Refrigeration Spares (Manchester) Ltd.

"At the wheel" — Paddy and Paul Donnellan (L-R) showed a sample of the type of engineering — from chimney sections to oil line and steam heaters — that is capable of producing at Concord Engineering Co.

Air conditioning products also featured widely on the Hull Thermotank stand, with emphasis being placed on a model of a new Hull screw compressor. Inspecting one of the items in more detail are Deryk Hayward, Refrigeration Appliance, and Tom Doolan, (R), Hull Thermotank.

A comprehensive range of insulation products including ceramic materials such as the rope above — which can withstand temperatures up to 1,400°C — are sold by Insulation and Services Supplies Ltd. Technicians, taking a look at the range, are J Davis, Kerlame, and John Mould, Insulation and Services Supplies.

The Tirol 7, which has been especially designed to cater for the Irish market, is central heating boiler which its agents, Parasol Central Heating, are sure will provide a break-through in the heating cooking field. Explaining the company's products to Mr and Mrs Brian Jennings are (L-R) T Keenan and George Bennett (R), Parasol.

A cast iron fired boiler, manufactured by Neva, which has an efficiency rating of 85% attracted a good number of visitors to Euro Pumps. The company are also agents for Jowey burners and Euro Pumps industrial and domestic circulating pumps. Jimmy Lees, Hill Foster Ltd, Pat Whitten of Pressmon Ltd, and Jim Blatherwick, Euro Pumps, (L-R) discuss the range.

A heater which burns all types of waste oil (plus, of course, diesel, paraffin and hydraulic oil) attracted a large number of visitors to Scandinavian Imports. Manufactured by Kongsildike, the All-Oil heater was one of a range of space heaters ranging from 2,000 K Cal/hr to 12,000 K Cal/hr, which the company produces. Photo shows Kongsildike's Bill Gelzantine (C) and Scandinavian Imports' John O'Reilly (R) with Gordon Henderson and Sean Walsh (R and 2nd R).

HR Holfeld will have a new addition to their Grundfos range of pumps this year. An in-line heating pump, it will be available in either single or twin versions up to 100 mm pipe size. Discussing the entire Holfeld range are (L-R) Donal McConnell and George Birley (H A O'Neil).

Don Conney, (L) ESB, and the Minister for Environment, Sylvester Barrett, TD, (R) have a look at the Centrol System which heats water at night, using off-peak electricity, and stores it for the following day.
Successful IDHE Convention a Highlight of IhVex '79

More than 120 heating contractors, engineers and consultants attended the Institute of Domestic Heating Engineers' fifth biennial convention held last month during IhVex. Theme of the one day meeting was "Environment and the Heating Engineer" which dealt with chimney design, codes of practice affecting the installation and interlinking of solid fuel appliances, protection against freezing of central heating systems and heat pumps and their application in the domestic field. Convention chairman was Hugh C Maguire, Consulting Engineer.

In his opening address, the Minister of State for the Environment, John O'Leary, TD, referred to the many sources of energy that have been examined by State and Semi-State bodies but added that no economical alternative had, as yet, been found. The main emphasis on the energy situation by the present government he said, is for conservation in the form of increased insulation standards to be enforced by law shortly.

With regard to district heating systems, the Minister stated that because our experience had been an unhappy one, he did not see a future for this form of heating in this country. This statement was challenged later by Mr Jim Maher, Coal Information Services Ltd, who argued that district heating had worked well for many years on the Continent; he could not see why the system could not be adapted to Irish conditions.

Papers were presented by: R Harvey, Europe Selkirk Metalbestos Ltd on chimney design: Emphasis was put on the vital part that insulated chimneys play in reducing heat loss from boilers, the effect of low temperature corrosion in boilers and how best to avoid it;

J Anderson, Walker Air Conditioning on heat pumps: An in-depth study of heat pumps showing in detail their design and operation.

Mr Sheppard's lecture on 'Corrosion and Prevention in Central Heating System' caused considerable discussion among IDHE members, and for those readers who were unable to attend, we re-print it in full below. Papers from the other speakers will appear in future editions of the magazine.

The modern circulating hot water central heating system is a long and noble pedigree stretching to early Roman times and possibly beyond. The techniques of design and installation of the modern systems have evolved from both modern engineering theory of heat transfer, thermal losses, mass transport etc. and sound practical experience in plunging systems over many decades. In considering corrosion in central heating systems, I have no doubt that my comments will not be news to most people with experience in the trade. The factors which contribute to corrosion are generally well appreciated, but what I hope to do is to throw some light on the reasons why these factors operate and, in understanding them, consider what preventative measures can be devised.

Domestic central heating systems are composed of a variety of materials: thin steel radiators, steel or copper pipe work, brass valves and galvanised or fibreglass tanks. Any review of corrosion must take into account this variety of materials, the chemical nature of the water, and other factors such as water temperature, flow rate and impurities in the system.

Principles of Corrosion

In a central heating system using radiators, the metal most at risk is steel. All corrosion processes consist of two half-reactions, an anodic (oxidation) reaction such as:

Fe → Fe²⁺ + 2e⁻ and a cathodic (reduction) reaction to complement this and provide a chemical and electrical balance. In acidic waters, the cathodic reaction is predominantly hydrogen evolution:

2H⁺ + 2e⁻ → H₂

whilst in neutral and alkaline waters in the presence of dissolved oxygen, oxygen reduction can be the predominant cathodic reaction:

2H₂O + O₂ + 4e⁻ → 4OH⁻

Both these reactions can occur at different rates in near neutral waters.

Each half reaction is reversible, and there is an associated, unique electrode potential at which equilibrium occurs. The potential of corroding steel will be somewhere between the equilibrium potential for the anodic and cathodic reactions. The departure from equilibrium of the anode will govern to a large extent the corrosion rate. The two cathodic reactions described above are clearly pH dependent, and the ranges of potential and pH at which soluble iron and iron oxides can form is well documented. Similarly, the variation of corrosion of iron with pH in water is established and varies little within the range pH 4-10. When pH is the only controlling factor, since most naturally occurring waters will have a pH within this range then the pH as such of the water need not be regarded as too important in corrosion of the steel radiators and pipework in the system.

In addition to the above reaction, there is another which can result in the removal of iron ions (i.e. corrosion) with the formation of magnetite and hydrogen gas. This is the Schikorr Reaction:

Fe + 2OH⁻ → Fe(OH)₂ + H₂

3Fe(OH)₂ → Fe₃O₄ + 2H₂O + H₂

This is a very important reaction as far as central heating systems are concerned since the magnetite (Fe₃O₄) precipitates as a black sludge and the hydrogen must then be vented from the radiators. The reaction is rapid at very high water temperatures even in the absence of dissolved oxygen. Furthermore, the reaction is catalysed by traces of copper in solution to such an extent that it can occur at water temperatures generally experienced in domestic heating systems.

The possibility of galvanic corrosion should also be considered. This occurs because each metal has a unique equilibrium electrode potential and, when coupled together, create an emf which generates current used in the corrosion process. The metal with the more negative electrode potential corrodes preferentially at a rate dependant on the relative surface areas of the two metals. In central heating systems, copper (pipes and cylinders) is "noble" and might be expected to preferentially corrode the mild steel of the radiators. However, galvanic reactions are controlled by the cathodic part of the overall corrosion reaction, and if this can be controlled then mixed metal effects may not be so serious.

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Visitors, or exhibitors for that matter, in search of ice cubes didn't have to go further than Hammond Refrigeration. Focus of the stand was the Scotsman automatic cube machine which requires neither plumbing nor waste connections. Discussing the new machine as well as others supplied by the company were (L-R) Brian Martin, Hammond Refrigeration, Pat Mahon, Shaw and Johnson Ltd, and Michael Stewart, Hammond Refrigeration.

Newcomers to Invex, S L Combustion Services showed a selection of products from their range of Robey boilers—fired either by oil, gas, duel fuels, coal or other solid fuels. Robey also manufacture waste heat boilers which can be designed to suit the available energy source. Taking a moment to chat with Pat Walsh, (L) Invex, are Eva Fisher (c) and Herbert Wright (R), S L Combustion.

Michael Cullen and Kevin de Largy (L-R) discuss some of Flakt's new range of air handling equipment including the new KDA range of units which incorporate five alternative methods of heat recovery.

Tool demonstrations were the highlight of the Consett Rothenberger stand which included a complete range of products from torches to tube extractors, flame protective mats and pastes. Tony Burgess and Alan Sparrow (L-R) discuss filling a customer's order.

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The cathodic reaction is very important in corrosion control. If this can be eliminated or severely restricted then the overall corrosion reaction is also restricted. It was seen above that such low pH values as to cause serious problems with hydrogen evolution because of the first cathodic reaction mentioned are not generally found. The main and most important of the possible cathodic reactions of concern is the reduction of dissolved oxygen in water. Clearly, if oxygen can be eliminated from the water, then one of the half-reactions involved in corrosion is eliminated, and the result should be a dramatic fall in corrosion rates.

In recent times, the corrosion of central heating panel radiators has been examined. Tests have been made by the British Gas Corporation and the British Non Ferrous Metals Research Association on behalf of interested parties such as copper tube and panel radiator manufacturers. The more important findings are summarised below.

AERATION

When the experimental systems were filled with water and completely de-aerated, it was found that, after nine months' operation at a temperature of 150°F, the inside surfaces of the radiators remained either reflective or were covered with very thin films exhibiting interference colours. This was true in all test rigs or in tests with steel radiators and copper pipework. This confirms the suggestion above that eliminating oxygen from the water at moderate temperatures virtually eliminates corrosion.

Tests have been carried out with different degrees of aeration by injecting oxygen into the system and noting the results. Under conditions of slight aeration (measured oxygen contents of 0.1ppm) in systems including steel pipework, formations of black powdery magnetite collected in the bottom flow channels of the radiators. No pitting corrosion occurred. Calculations based on the amount of magnetite formed suggested that most of the injected oxygen must have reacted in the boiler rather than the radiators. However, where radiators were connected by copper pipes (under these conditions of slight aeration) surfaces were generally corroded with brown oxide layers composed of magnetite and some hydrated ferric oxide FeO(OH) after 150 days. Powdered deposits collected in the flow channels and very careful removal from the radiator surfaces revealed the presence of copper oxide Cu2O or metallic copper. It was calculated that 99% of the injected oxygen had been used in the general corrosion process. Pitting corrosion had occurred at the top of the radiators and the rate of pitting was estimated at 0.2 - 0.3 mm/yr. When the test rigs were deliberately over-pumped (31/min) to give an oxygen concentration of 0.3ppm, very heavy corrosion occurred with the production of encrusted oxides (a feature of corrosion by aerated water), black magnetite deposits, and some deposition of calcium carbonate from make-up water. There was severe pitting which generally occurs at the crevice points between the spot welds in the radiator sides and concentrated towards the top of the radiators.

Electrode potential measurements have been made on the inside surfaces of radiators, and it has been confirmed that there is a potential gradient from top to bottom of the radiator. This is explained by a variation in oxygen concentration: increasing amounts lead to increasing degrees of polarisation of the cathodic oxygen reduction reaction which will increase both corrosion potential and corrosion current. Theoretical considerations by Belgian researchers suggested that pits do not grow at potentials more negative than -640mV (nhe). Tests showed that, under slight aeration, the radiator surfaces had a potential of -620mV whereas, under aerated conditions, the radiator surfaces had a potential of -790mV.

The conclusions from these controlled tests are that, under constant conditions of temperature, flow rate, etc., the corrosion rate in environments of mild steel radiators is the degree of aeration of the water. Corrosion pits formed in both the absence and presence of copper in aerated waters, and galvanic effects only exacerbated the corrosion in aerated conditions. When dissolved oxygen in water is present in amounts greater than 0.1ppm, corrosion will occur. Distribution will be such that pitting will appear initially at the top of radiators, and, because of the differential aeration, cells arising at crevices will occur at the spot welds between flow channels. The presence of these crevices, and inherent part of many panel radiator designs, is not significant when the water is sufficiently de-aerated.

TEMPERATURE

Temperature of the water can have a significant effect on corrosion of steel. In aerated water, when oxygen reduction is the most serious rate controlling reaction, the corrosion rate increases with temperature up to about 80°C. Above this temperature in vented systems, corrosion rate decreases as the solubility of oxygen in water decreases and oxygen is bubbled off. However, in pressurised systems, this oxygen has nowhere to go. It, therefore, remains in solution resulting in a linear increase in corrosion rate with temperature. In deaerated systems, increasing temperatures can cause increased corrosion via the Schikoor reaction. This leads to excessive venting of radiators and accumulation of magnetite deposits in radiators and pumps often leading to blockages.

FLOW RATES

Flow rate can have a pronounced effect on corrosion of mild steel as an increase in flow will heighten the supply of oxygen to certain areas. Also in acidic conditions, increasing flows will speed up removal of corrosion product thus enhancing attack. However, in deaerated conditions, neither of these factors should be important as the flow speeds normal in most central heating systems. Similarly, in temporary waters the temperatures and flow rates encountered in constant systems there is not likely to be significant corrosion of copper tubes.

WATER COMPOSITION

As already discussed, by far the most important factor in...
Walker Air Conditioning distribute some 4,000 Carlyle air conditioning products throughout the British Isles. One of the newest items in their range is the Carrier refrigeration unit which Malcolm Marshall (C) Carlyle, was explaining in more detail to Jim Anderson (L) and Tom Bodel (R), Walker.

Jim Lavery (L) explains one of Hi-jet’s cleaning processes to Joe Cusack (C) while Tony O’Brien (R) Hi-jet looks on. Affiliated to Contract Cleaners, Hi-jet specialise in high pressure water jetting equipment for such operations as descaling of boiler tubes, turbines and condensers.

New radiators from Francis Heval, the Chuppens cast iron boiler and York heat pumps were just a few of the products appealing for the attention of Heval’s visitors. Catching a moment’s breath before rejoining their colleagues were Heval’s Managing Director, John Hoy (L) and Manager of the Air Conditioning Division, John O’ Sullivan (R).

Kevin Breen and Tony Gibson (L-R) discuss the selling points of an item in the S.W Curty’s range of metering equipment for temperature, level, humidity, pressure and flow control.

Peers Tierman, Ken Todd and Hugh Stadel (L-R), B and E Boilers, are deterred by one of their two boilers ordered by the Southern Health Board. Rated 10,000 lph/hr at 100°C, the boiler was fully packaged complete with James Proctor LTD stoker for turf firing.

Special equipment is no longer necessary.” Jack Shields (R), Baritol, tells Terry (L), Carrier Engineering, while Bill Ross (C), Baritol, looks on. The new 1.25 inch CE 200 boiler system is for use on either 15 or 22 mm copper pipe which is used in domestic water or central heating systems.

Patrick Quinn and John Sullivan (L-R) have a look at the Pioneer Radiant Products’ new brochure which explains fully the many industrial and commercial gas burning appliances (in particular the infra-red radiant gas heaters) which they produce in Kenmare.

‘It’s very well-built.,’ Harry Megarry, (R), Megarry Engineering seems to be telling Gurry Doonan (L).
water composition — as it relates to corrosion — is the degree of aeration. Factors such as dissolved copper ions and pH within the range 4-10 have very little significance in the absence of oxygen. The remaining factor to be considered is hardness. With the variety of waters found in Ireland, deposits of hardness salts, which will occur almost entirely on the boiler heating surfaces, should not lead to any serious problems. However, if excessive make-up water is required, or, if the initial fill is very hard, the deposit can interfere with heat transfer through the boiler walls and lead to “singing” of the boiler caused by nucleate boiling under deposits.

DISSOLVED OXYGEN AND ITS ELIMINATION

Domestic heating systems are almost always filled initially with mains water and contain, therefore, almost saturation levels of dissolved oxygen. As the system is heated, some oxygen may be dispelled and vented out from the radiators or through the vent pipe; the remainder will be available for corrosion. However, this corrosion will use up all the available oxygen over the first month or so and also the volume of vent gases will correspondingly reduce. The oxygen in the initial fill, therefore, need not be of concern. The main corrosion prevention requirement is to prevent re-aeration, and this might arise in a number of ways:—

(i) Overpumping leading to aeration by cascading into the feed and expansion tank;
(ii) Leaks from the system allowing aerated make-up to enter;
(iii) Wrongly located pumps leading to negative pressures thus drawing air into the system;
(iv) Make-up due to excessive evaporation from the expansion tank.

Clearly the conditions under which aeration of the water may occur are all influenced by design and the quality of the installation of the system. It is precise attention to these matters which are most effective in preventing corrosion.

CORROSION INHIBITORS

The use of corrosion inhibitors in domestic central heating systems is unusual. However, they do not have their uses, especially if the system is known to suffer some slight aeration, which cannot be rectified by other means. It has been asserted that the oil films remaining on the steel surfaces of radiators will prevent corrosion. However, it has been established that, whilst the presence of oil films with de-aerated water may affect distribution, it has no effect on the overall corrosion rate which remains low in any case. In aerated waters, no oil films were found on radiator surfaces even when a substantial oil and grease deposit was initially present. The oil films are quickly undermined and lifted by the corrosion products. Oil films, therefore, have no protective effect against corrosion.

Chemical additives, on the other hand, do have an inhibiting effect depending on their nature. The most useful inhibitor for domestic heating systems is a mixture of sodium benzoate and sodium nitrite. Tests show that in slightly aerated systems this type of inhibitor will result in negligible corrosion for a period of about 5 or 6 months after which the nitrite constituent is depleted.

Obviously inhibitors do have a place in corrosion preventive measures but they do become depleted. Therefore, in terms of domestic installations in the long term, they provide no substitute for good design and correct installation to ensure the exclusion of all dissolved oxygen from the system.

CORROSION IN DOMESTIC WATER SYSTEMS

Part and parcel of the heating system is the secondary domestic hot water pipework and cylinder handling aerated hot water. Factors which affect corrosion of modern copper pipe in domestic systems are almost entirely connected with water composition. Within the normal ranges of chemical composition of water, certain combinations of the individual constituents can lead to pitting corrosion. Generally high sulphate, sodium and dissolved oxygen with low chloride, nitrate and pH levels can result in pitting, the severity of which depends upon the particular combination found. In a domestic water which is capable of taking copper ions into solution, such as header tanks, will be at risk since copper will deposit on the zinc and, by galvanic action, lead to rapid perforation. One particular problem worth noting is the rapid failure of domestic copper cylinders in certain areas of south Dublin and south Co. Dublin. In all cylinders examined from these areas, the failures have resulted from corrosion fatigue cracks propagating through the cylinder wall at a point adjacent to the seam. There has been slight general pitting on the cylinder walls, but this of itself would not cause serious concern about short cylinder life. However, at the seam there is an abrupt change in wall thickness (by a factor of 4) which resulted in a rigid seam which acted as a bellows in normal everyday use. Consequently, high flexing stresses occurred adjacent to the seams at the change in section. When there is a corrosion pit at that point, a corrosion fatigue crack soon develops and can rapidly propagate through the cylinder wall.

One practical answer to this problem is to prevent the initial pitting on the cylinder walls. This can be done by changing the water composition which may be impractical from a local authority point of view or alternatively by preventing pitting through our understanding of the corrosion processes involved.

Copper, depending for its corrosion resistance, on the formation of a particular form of oxide film. It has been established that in pitting waters another film develops which is not fully protective. Furthermore, there is a known electrode potential above which the unprotected film forms and below which the protective film occurs. One solution to the problem then lies in artificially depressing the electrode potential of the copper cylinder to a value at which the protective oxide forms. This can be done by the galvanic action of aluminium and a rod of the same material installed in the cylinder before it goes into service. This will ensure freedom from pitting and subsequent corrosion fatigue. The aluminium corrodes away preferentially but the protective oxide once formed is stable and the sacrificial rods do not require replacement.

WATERMISER LTD

TECHNICAL SALES

Due to planned expansion, Watermiser are looking for an experienced Technical Sales Representative for Ireland. The right person will have some knowledge of cooling systems but more importantly must be self-motivated. Good salary, company car plus usual benefits. Results will be rewarded. Interviews will be held locally. Write in the first instance to:

Ron Syme,
WATERMISER LTD.,
Tower Works, Stoneygate Road,
Newmilns, Ayrshire, KA16 9AJ.
or
Box No 57
5/7 Main St., Blackrock, Co. Dublin.
New Heating Units From Lennox

Lennox, brand leaders in residential gas heating equipment in the USA, have just launched their HV and HVRA outdoor heating and ventilating units on the Irish market. According to Fred Evans, Lennox European Marketing Manager, the range is based on a modular system, which makes them particularly suitable for supermarkets or industrial applications where areas which need either to be heated or ventilated, can vary considerably.

The range consists of eight models made up from a number of standard sized modules. The modules contain gas-fired heat exchanger or alternatively hot water coil, supply fan sections, air filter sections, recirculation air fan section and fresh air intake dampers. A heat reclaim section using a glycol-charged system can also be incorporated to reclaim heat from the exhaust air (RA models only). Additional flexibility can be included by adding a direct expansion evaporator coil connected to a condensing section as required.

Units are designed for roof installation with bottom handling of supply and recirculation air. Supply air can also be taken from the end of the cabinet if desired. The cabinet is constructed of heavy gauge galvanised hot-dipped steel with removable panels which permit complete service access to the interior of the cabinet. The heat exchanger section of the cabinet is lined with thick fibreglass insulation.

Gas heating modules have a Duratube heat exchanger consisting of a cylindrical tube and drum construction which permits normal heat element expansion and contraction without metal fatigue. The design also results in a high input to the heat surface ratio. There is a low resistance to air travel and it is easy to clean. All heat element surfaces are of a cylindrical section with removable panels.

For hot water heating modules, Lennox have installed a hot water coil which is available with a three-way modulating valve; the coil is constructed of non-ferrous material with aluminium fins mechanically bonded to copper tubes. The three-way valve is a solid state type ensuring a fast response time. A secondary pump can be incorporated in the manifold circuit if required. Globe valve and shut-off valve are fitted as standard. The coil is pressure leak tested. Factory installed freezestat terminates power to damper motor closing OA damper, opens valve and starts pump (if used) to ensure water circulation during freezing conditions. The freeze protection circuit is manually reset.

An evaporator coil with ripple edge aluminium fins machine fitted to copper tubes can be added to the same module as the washable slab air filters. The coil is supplied with an expansion valve ready for connecting to a remote air cooled condensing unit from the Lennox HS6 or HS7 series. As an alternative to the evaporator and remote air cooled condensers, a chilled water coil can be incorporated. The chilled water coil follows the same mounting details as the evaporator coil.

Supply and recirculation fan modules as well as fresh air/exhaust units are also available.

The Lennox units, manufactured in Basingstoke, are shipped completely assembled, piped, pre-wired and ready to install. In addition, units are test operated at the factory. An installer has only to locate the unit, connect the duct work, power supply and gas connections and then commission the equipment in accordance with Lennox installation, operating and maintenance instructions.

For further information contact, C&F Ltd, Unit 1, Bridge Road, Chapelizod, Dublin 20, (Tel: 364917).

Additions At Pump Services

Wilden Pumps, BAC Klemfa ball valves, and the Timeplan datalogger have recently been introduced to Pump Services' range of equipment.

Wilden pumps are air operated, double diaphragm units which are particularly efficient for the handling of a variety of liquids, slurries, powders and solids.

Compressed air is applied directly to the liquid column separated by elastomer diaphragms. This balanced load removes the mechanical stress from the diaphragms to allow high heads and thousands of hours of diaphragm life.

The pumping volume is controlled by easy air valve adjustments, from a few gallons per hour to over fourteen thousand gallons per hour with the same unit. A by-pass valve is not required. The pump stops when discharge pressure equals air inlet pressure and the pump can run dry indefinitely without damage.

Joe O'Reilly, Sales Manager and John McLaughlin, Sales Engineer, Pump Services, examining a working model of a Wilden air operated, double diaphragm pump which the company have recently launched on the Irish market.
NEW PRODUCTS

Pumps are available with wetted surfaces in aluminium, cast iron, 316 stainless steel and Hastelloy "C". Diaphragm materials available are neoprene, buna "N", nordel and viton.

The Wilden pumps are used widely in the construction, industrial processing, brewing, pharmaceutical, pulp and paper, paint and petrochemical industries.

The BAC Klemfa range of carbon and stainless steel ball valves are manufactured and designed in Holland and Spain and used widely in chemical and processing industries. Available in two, three and fourway porting; the valves are designed to meet OCMA fire safety standards.

For the motor industry, Timeplan have designed a datalogger for use with commercial type petrol pumps. The unit itself is housed in a kiosk and picks up signals from the actual fuel pump from which the driver fills his vehicle. It is simple to operate at a relatively low cost and the datalogger carries a one year guarantee.

For further information, contact Pump Services, Willowbrook Rd., Rathfarnham, Dublin 14, (Tel: 903371).

A.P.V. - Desco Provide Inspection Service

A P V - Desco (Ireland) Ltd are to expand their operations and have set up a new division which will provide an inspection service for both pressure vessels and pipelines. The division will be based in Dublin.

The company's new division will be able to carry radiographic examination of welds on site or in the factory. As well as being able to supply all the necessary equipment required for the taking and processing of radiographs, APV - Desco have invested heavily in the training of specialist personnel skilled in the use of his equipment. X Ray for quality control in welding is now increasingly used in Ireland, and with an extensive background in the welding of stainless steel and other alloys, APV - Desco can provide a wealth of experience in the interpretation of weld radiographs and in the identification of welding problems.

The inspection services division will also provide an inspection and repair service for users of glass lined vessels. There are now a large number of these vessels in use in Ireland, particularly in the chemical and pharmaceutical industries. APV - Desco personnel have also been trained in the inspection of the glass surface for defects and in their repair.

Further information from: APV - Desco (Ireland) Ltd, Long Mile Road, Dublin 12. (Tel: 503566).

Specialist staff from APV - Desco Inspection Services setting up to X-Ray a weld.
FLAIR LAUNCH NEW RANGE

Flair have launched an extensive new range of shower products, comprising overbath and modular shower enclosures plus a newly-designed shower cubicle, on the British and Irish market.

According to Colin Howes, Director, MI Plastics Ltd, and Group Marketing Manager, Midland International Ltd, "with this new Flair range, stockists can now offer a shower enclosure at every level while still holding only a very limited stock of basic units."

In a three-wall tiled alcove, Flair have developed a pack which comes complete with, a folding door, runner tracks, aluminium door jambs, sealant and fitting accessories. For corner areas, a system with one or two polystyrene side panels, plus all necessary fittings and accessories is available.

For smaller bathrooms, Flair have also introduced an overbath shower enclosure suitable for all standard-size imperial and metric baths. The overbath model comprises two by-pass sliding doors designed to fold away when not in use plug a folding end panel all manufactured in shatterproof polystyrene and fitted with towel rail and inside grab handle.

For their cubicle range, Flair have just introduced the CF/3. The unit differs from existing company models in so far as the water panel can be fitted on the left or right side so that spray is directed inwards rather than towards the door or curtain.

For further information, contact Midland International Ltd, Bailieborough, Co Cavan, (Tel: Bailieborough 82).
Computerised A/C Units from DC Compute Air

A new energy saving air conditioning unit is now available for the Irish and English markets from DC Compute Air.

Based on a new concept of the glycol system, the units, the coils of which are manufactured by Millex at their new factory complex in Drogheda, combine a rad cooler with a chiller which heretofore has not been possible. The system works on a temperature scale which is controlled by a small solid state computer. The computer automatically operates the chiller unit intermittently when the temperature rises above a certain preset point. Below this preset level, free cooling is obtained from the outside air by heat transfer through the rad cooler.

The savings on running costs are “phenomenal”, DC Compute Air report, and on a standard 15 tonne a/c unit operating under normal conditions, they amount to 50%. (See diagram).

Further information is available from DC Compute Air, Foxes Grove, Shankill, Co Dublin.

NEW INSULATION PRODUCTS FROM MOY

Moy Insulation Ltd have recently launched Insulwall, a new form of thermal insulation for interior wall.

The product consists of a pliant bonded mat of long, fine, glass fibres of exceptionally good tensile strength and handling properties. Type N is plain, type VB is faced on one side with paper which acts as a vapour check. Vapour resistant greater than 28 MNS/g.

Insulwall has a thermal conductivity of: 0.038 - 0.040W/mK at normal building temperatures; fire safety regulations give it a Class 1 rating (surface of very low flame spread) when tested in accordance with BS 476: Part 7 : 1971. It is non-combustible when tested in accordance with BS 476: part 4 : 1970.

The product which will not rot, smell, or sustain vermin, is available in rolls measuring 25 mm x 1200 mm x 24 m.

Further information may be obtained by contacting: Moy Insulation Ltd., Ard Finnan, Clonmel, Co. Tipperary. (Tel: 052-21122).

CPI Introduce Foam Filled Concrete Pipes

With the increasing emphasis on insulation these days, CPI Ltd have introduced modular solid and hollow foam filled concrete blocks. Made from washed and graded aggregates, sand, and Irish Portland cement, the concrete thoroughly mixed and vibrated for compaction. The blocks are then steam cured to ensure full hydration, air dried for 28 days, and then the cores are filled with foam, Urea formaldehyde, to provide insulation.

The blocks which have co-ordinating dimensions of 450mm x 200mm x 100mm (actual of 440mm x 190mm x 100mm), are manufactured to comply with the conditions in IS 20 - 1974 Concrete Building Blocks.

Further information is available from Concrete Products of Ireland Ltd, Laraghcon, Lucan, Co Dublin. (Tel: 280691).
INTERVIEW

PROBLEM SOLVING IN D'OILIER STREET

Donal McAleese is what business study manuals these days call a "professional manager." Conceptually elusive though that may be to the layman, the term is perhaps best described in McAleese's own words: "I'm interested in problem solving, in going into a company and ironing out their difficulties."

His credentials for the textbook label are impressive, so too is his "track record". A chartered accountant by training and education (he has a BA and B Comm from UCD), McAleese started his career in the textile industry, moving into life assurance nine years later. After a further nine years, he became a merchant banker and, just over a year and a half ago, the Chief Executive of the Dublin Gas Co.

The job facing McAleese in D'Olier Street certainly wasn't enviable. The company was old (more than 150 years to be precise) and steeped in tradition (it's first chairman was Daniel O'Connell) and new management techniques were needed. Difficult though those might be to implement, they were minor issues compared to the difficulties which had been to a large extent perpetuated by the oil crisis of 1973/74. Oil prices (in particular napha) had "gone through the barrier" and the company's suppliers were looking for an increase. A lengthy court action ensued and, despite predictions to the contrary, the oil company won their case. Saddled with massive court cases and back-payments, not to mention a general economic slowdown, the company was forced to cut back their staff. The issue, understandably, was a proverbial "hot potato", more so than most perhaps as overtime was practically considered a "matter of course". With tighter restrictions on capital and manpower, expansion programmes slowed down, so too did orders for new equipment.

Clear-cut though the problems might have been, the solutions (aside from a heavy Government subsidy, which has since been reduced by 25%) were not. McAleese's answers were not automatic, and after less than twenty months in the Chief Executive's chair, many are still to be implemented.

Feedstock prices remain the crux of the situation, McAleese maintains, and though the company has actively looked for supplies of natural gas (the Kinsale gas/oil fields to name but one source) they have, until now, been able to obtain them. "Fortunately, the Government is more aware of our problems now than they ever were," McAleese says, "and just last year undertook a major study of the entire industry; the results of which are expected some time later this year."

In the meantime, McAleese admits that the company is working on the assumption that natural gas will not be available for the next five to seven years. Faced with such grim realities, the company is

'The Government is more aware of our problems now than they ever were'

https://arrow.tudublin.ie/bsn/vol18/iss4/1
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currently examining the economics of alternative sources of energy. They also are investigating and testing new methods which will make their plants more efficient, either through new machinery, a more effective distribution system, or new processes such as "backfeed" which produces gas at a lower calorific value and only "enriches" it at the last minute with feedstock.

Such "problem solving" exercises clearly are what interests McAleese, and he speaks intently and avidly about them — even such minor incidents as the gumming trouble in Dun Laoghaire earlier this year appeal to his "solution" psyche. According to McAleese, the gumming trouble was a combination of three factors; extremely cold, almost Arctic weather conditions, humidity in the Dublin/Bray mains, and gas which had not been seasoned enough. "The company was exceptionally busy the day before, just as in 1974 when a similar incident occurred," he explains. "In fact, it was our second busiest day on record." Because of rapid consumption, the gas being produced wasn't up to its normal standards. The shorter the period in the holder, the less chance the gas had of being properly cleansed of its impurities. With the exceptionally cold weather, the impurities in the gas began to crystallise, turning into wax when they reached the cooker; it the flow of gas into the appliance was blocked. "The days immediately following the freeze-up were chaotic," McAleese admits, and "during the five day period that it took to eliminate the problems, we made 2,000 service calls at no charge whatsoever to the consumer. We even had to call in extra staff to work evenings and had fitters from other parts of the city to help. We handled it well though, I thought."

A similar loyalty is evident in his comments concerning a recent article in "Hibernia", written by Mairin de Burca, hitting at the number of gas leaks in recent months within the city. McAleese disagrees heartily with the author. "Our record for gas leaks and explosions is well within the tolerance of our European counterparts," he says, adding that the city has a "leakage team" which has been specially trained to handle such situations should they occur. Regretably through, he admits, leaks or explosions will occur. "There are 1,500 miles of mains under Dublin City alone serving some 160,000 consumers. With those types of figures, he argues, an occasional breakdown is inevitable, the law of averages alone indicates that. McAleese also finds fault with Ms de Burca's implication that the company has as much as a 10% loss of gas from its domestic gas meters. There is a loss, he agrees, but asks where does it come from? There are the odd (and he stresses the word "odd") faulty meters. There is the person who knows how to successfully "steal" gas from the pipe leading into his house, and there is also some loss in the distribution system. If the figures Ms de Burca is quoting is attributed to the latter, he remarks, "it's far more in the region of 5%, not 10%, making it comparable with levels accepted by international bodies and authorities as normal."

Loquacious though he may be on matters pertaining to the company, McAleese is extremely reticent about discussing his private life, his hobbies, his likes and dislikes. He is kept busy though, and besides his gas company appointment, he holds a number of managerial and directoral positions amongst them the chairmanship of Irish Intercontinental Bank and the vice chairmanship of Braid's. His family (he's married and has five children ranging in age from 12 to 23) keep him fairly active; so too do a number of charities and the occasional round of golf which he admits, somewhat sheepishly, to having a handicap of nine.

He's a complex man in many respects. Perhaps he needs to be — the tasks set before him are seldom simple.

The Institute of Domestic Heating Engineers (Irish Branch)  
Fifth Biennial Convention — Wednesday 4th April 1979  
Environment And The Heating Engineer

The Committee of the Institute of Domestic Heating Engineers (Irish Branch) would like to take this opportunity of extending their appreciation for the support and sponsorship of the following Companies and Organisations (listed below in alphabetical order) without whose support the above Convention would not have been the success that it was:

- Alliance & Dublin Consumers Gas Company
- Barlo Heating Limited
- Bord Na Mona
- B.P. Ireland Ltd
- Burmah Castrol (Ireland) Ltd
- C.H.S. (Ireland) Ltd
- Coal Information Services Ltd
- Electricity Supply Board
- Esso Teoranta
- Irish Shell Limited
- McMullan Bros Limited
- Runtalrad Limited
- Sanbra Fyffe Limited
- Veha Limited

The Committee would also like to extend their deep appreciation for the time and effort spent in preparing and presenting papers at the Convention, to the following speakers:

- Mr R. Harvey, Marketing Manager for Europe, Selkirk Metalbestos Ltd., London
- Mr J. Maher, Managing Director, Coal Information Services Limited, Dublin
- Mr G. Byrne, Technical Adviser, Coal Information Services Limited, Dublin
- Mr D. Cooney, Electricity Supply Board, Dublin
- Mr W. Sheppard, Director, Corrosion Prevention Services, Co. Dublin
- Mr J.B.S. Anderson, Managing Director, Walker Air Conditioning Ltd., Dublin

Finally, the Committee would like to thank most sincerely the Convention Chairman, MR H. C. Maguire and the organisers of the IHVEX Exhibition — in particular Mr John Butterly — for their help and assistance, which was most invaluable.

W. G. Pemica  
Hon. Secretary

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SMALL IS BEAUTIFUL...

... says Joe Brennan, sitting confidently in his chair as Managing Director of the Brennan Group of companies. What he really means is that the Brennan Group, consisting of Brennan Controls Ltd; Brennan Airconditioning Ltd; Brennan Maintenance Services Ltd; and LC Distributors Ltd, maintain close personal contact with all their customers. In return, they are confident that the quality of their products and maintenance service is quickly recognised throughout the industry.

From their well stocked warehouse and spacious offices at 60 Cookstown Industrial Estate, Joe and his wife, Lillian, started their new group of companies last September on the philosophy that "Unless we are 100% sure it will work, don't take an order". Their commitment to this policy is further emphasised when Joe admits, with firm conviction, "Our equipment is not the cheapest, but it is the best".

Despite the formation of the new companies, Joe Brennan is no Johnny-come-lately to the industry. Having qualified in London with a HND and being a member of various bodies, such as AM Inst R — AMASHRAE — AM BIM, he went to work for Billman Electromation, recognised at that time as one of the most successful UK companies dealing in automatic control systems for heating, ventilating and air conditioning.

With a rapidly growing economy in Ireland in the late 60's and a need for qualified specialists to assist in the country's growth, Joe decided to return home. He took up an appointment with Walker Air Conditioning in 1969, but a life-long ambition to be his own master kept nagging away at his soul. Consequently, with Lillian's full support, he made the plunge and started up his own business in 1970. His reasons for being his own boss stem from the fact that he felt he had a lot to offer the industry. And with the restriction of "having somebody looking over my shoulder removed", it would lead him to develop his own style of business and expertise within the industry.

The birth of the Brennan Group is a milestone in Joe's career, but it came at a time of stiff competition, and one must ask what has the Group to offer that isn't already there? Without any hesitation, Joe states, that, apart from his own good personal contacts built up over the years, he believes that he has probably some of the most prestigious distributorships within the trade. McQuay Europa; TA Controls; Havnes Coils (Kettering) Ltd; Vapac Humidifiers; Wolfe Air Handling; VersaTemp Heat Recovery and Jenks Ltd to name a few. But the greatest asset he sees for the Group and any prospective customer is that he is able to offer, from the initial enquiry, full engineering design services, supply of equipment, commissioning facilities and, with his maintenance company, a guarantee of full back-up service.

Joe sees the development of Brennan Maintenance Service Ltd, not just as a separate identity. It is also a company that will develop by itself to maintain complete buildings as well as installations supplied by either Brennan Controls or Brennan Air Conditioning. To this end, he reports that within the past few months they have acquired commissions to maintain three complete buildings in the semi-State sector. The necessity for this company, Joe claims, came about because of the unusually high volume of business concerning faulty equipment and the need for maintenance. The breakdown of equipment comes about primarily because of a lack of "quality workmanship" in the initial installation stages.

No contract is undertaken by the Brennan Group without the full back up of engineering and architectural design in consultation with the prospective client. Joe believes that it is important to "get it right from the beginning". Too often in the past he has discovered that contracts awarded on a "pinch penny" basis have led to heavy maintenance bills in future years. Most of the problems of bad workmanship, Joe claims, derive from the old problem of price cutting. He believes most vehemently that this price cutting must stop. Customers are downgrading themselves on the initial equipment installation by simply buying "less reputable products. They hope to possibly get a trouble free run for a few years, whereas with a bit of thought, the purchase of quality equipment compiled with expert advice,
Supply and Extract fans for wall mounting, duct mounting, or roof mounting — from 100 cfm to 2000 cfm.

Heat Recovery Systems From

Transfer your unwanted heat to the cold side of your building and conserve energy.

Full details available from

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the client could have, at least a ten year trouble free operation."

Too often in the past, consumers have had to face high maintenance bills because of their lack of education and knowledge in choosing the right equipment. The Brennan Group believe that in acquiring the services of Tony Murray, as their Senior Commissioning Engineer, and Paul McDonald, as Group Administration Office Manager, they can offer to the trade the highest possible skilled and technical advice.

Talk is cheap, the saying goes. How does any company in the industry these days manage to claim that they only deal in quality equipment and only take orders unless "they are 100% sure they will work?" The answer for the Brennan Group lies in LC Ltd. This part of the business is run by Joe's wife, Lillian Carey, and it distributes tissue and janitorial items to the wholesale trade. Quite simply it is the "Bread and Butter" section of the Group, and, because of its success, Joe states that he is in the fortunate position of being discerning in choosing contracts for the Brennan companies.

Joe and Lillian believe that they have embarked on a successful venture with their new group of companies. With the right blend of experience, skill, commitment and willingness to serve the industry, they are only too ready to meet any challenge, any assignment.

Joe also represented his native County Cavan in all grades of football. In this world of ups and downs, he admits that he has stood by him the test of time within the industry. Hopefully for Joe and Lillian the road to success will be strewn with smoother times.

---

**VAPAC HUMIDIFIERS LTD**

Available from Brennan Airconditioning Ltd is the range of Vapac Humidifiers.

The Vapac Electronic Steam Humidifier is a newly developed and internationally patented product which is the outcome of many years of research into producing a humidifier which completely overcomes the problems of operating on widely differing water supplies. Vapac is equally suitable for operation on 'soft' or 'hard' water, or even water of low conductivity.

Humidification is merely the addition of water vapour to the air and one of the simplest methods of doing this is the addition of steam. Because as steam, moisture is most readily absorbed by the air, because there is no carry-over of dissolved hard water solids which, in an atomising humidifier, may be precipitated as a white dust deposit in the controlled area.

WHY STEAM?

Because as steam, moisture is most readily absorbed by the air, because there is no evaporative cooling of the air, there is no additional load on the heating system. Because the process is almost isothermal, there is a negligible increase in dry bulb temperature.

WHY AN ELECTRODE BOILER STEAM HUMIDIFIER?

No water pre-treatment is necessary.

- Water vapour generated is always pure.
- Fire risk is minimal as the unit cannot function without water present.
- The humidifier is normally positioned outside the conditioned space and always external to the supply air ducting.
- Maintenance is minimal and extremely simple.

THE VAPAC CONTROL SYSTEM

The Vapac Electronic control system regulates all functions affecting the operation of the electrode boiler. As a result the steam output of the cylinder remains constant, at any set output level, throughout the life of the steam cylinder.

The system automatically compensates for wide variations in supply water pressure and quality and optimises the cylinder life for prevailing conditions.

WHY VAPAC?

Humidification is merely the addition of water vapour to the air and one of the simplest methods of doing this is the addition of steam.

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**Brennan Airconditioning Limited**

Carolanne Carew, Senior Commissioning Engineer, and an apprentice.

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**L C Distributors**

The newest company to emerge from the well known Brennan Group is L C Distributors. Under the steady hand and watchful eye of Lillian Carey, the Managing Director, it proposes to supply disposable and handled products to all sectors of the retail and janitorial outlets. Operating from 60 Cookstown Industrial Estate, Tallaght, the company has its own transport facilities, thus ensuring that delivery dates are met to the customer's satisfaction.

At the outset a restricted range of fast moving products will be stocked by the new company. But as interest grows it is intended that a multiplicity of wide ranging products will be available.

It is a well known fact that the market for the products in the disposable field is vast and, by the nature of things, very competitive. Lillian, however, reckons that with attention to detail in buying and by running a stream-line organisation, she will fulfill customer requirements at keen rates.
Adaptable Air Handling Units

This is one of many unit arrangements we can offer. Our range covers:
- Vertical and horizontal fan coils from 800 to 8,000 cfm air volumes.
- Class I units for 2,000 to 40,000 cfm air volumes.
- Class II units for 20,000 to 127,000 cfm air volumes.

The products are specifically designed to help you solve your air handling problems. They provide maximum flexibility in unit size, shape and configuration to cover not only the straightforward situations but also those where space is at a premium or where stringent specifications apply.

For air handling equipment that meets your needs, contact us, the specialists.

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Reasons like robust design, reliability, flexibility and fast delivery (from stockists throughout the country).

Maximum performance in the minimum space from RAF, for package units or air systems. Diameters in the range 160mm to 1450mm, and a volume range 300m³/hr to 150,000m³/hr.

Just four examples from a complete range of standard and specialist fans, and radial fan ancillaries. Whatever your reason, call BAC for full information.

Radial & Axial (Fans) Limited

The Abbey Mill, Abbey Mill Lane, St Albans, Herts.
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cooled condensing units, self-contained rooftop units, packaged terminal airconditioners, air-to-air packaged heat pumps and split-system pumps.

Our range of compressorised equipment available from McQuay is large by any standards and includes Packaged Liquid Chillers suitable for remote air or water cooled applications, Self-contained Air Cooled Packaged Liquid Chillers, a choice of open drive or semi-hermetic reciprocating compressor sets and remote air-cooled condensing units for split system installations. An extensive range of fan coil units, central station air handling units, air cooled condensers, cooling towers and packaged rooftop equipment is also available.

A COMPLETE AIRCONDITIONING SERVICE

Based in a new complex in Tallaght, Co Dublin the Brennan Group offers a service second to none. Design services, engineering know-how and technical advice, commissioning and after-sales facilities and a comprehensive stock of packaged units and machine spares.

We also offer you a wide range of airconditioning equipment which contains some of the most efficient machines available today. Equipment having high operational energy efficiency ratios (E.E.R.) and co-efficient of performance. Remember, the higher the E.E.R the lower your operating costs and energy requirements.

Brennan Airconditioning Ltd can supply you with energy conscious airconditioning equipment which has been designed to meet the requirements of our industry today and in the future.

HAYNES COILS (KETTERING) LTD

For many years now Haynes Coils (Kettering) Ltd have been a major force in their manufacture of:

- Air Cooled Condensers, Low noise and residential types
- Vee Series, Large Air Cooled Condensers
- Heavy Duty Product Coolers, Floor and Ceiling
- Wall Mounted Unit Coolers
- Air Cooled Condenser Units
- Water/Glycol Coolers
- Heavy Duty Floor Coolers
- Display and Storage Cabinet Coolers
- Baudelot Water Coolers
- Spray Washed Cooling Coils
- Evaporative Condensers

The application of these products is very diversified indeed.

- The duct mounting, airconditioning and heating
- Air Handling Units, Airconditioning and Heating
- Process Cooling and dehumidifying
- Reheat Condensers
- Heat Reclaim from external air
- Low Temperature Cabinets
- Heat Holding Rooms
- Blast Freezing
- Water Cooling by air
- Environmental Test Chamber Cooling
- Fruit Cooling and Preserving

Coils

The tubes are all 94 seamless copper especially made for coil production. Standard gauge is 0.5 mm wall thickness except for HEAVY DUTY applications where 0.9 mm wall thickness is used. The tubes are mechanically expanded into the fins. The fins are 0.25 mm thick and made from tempered aluminium. The fins are ribbed for strength and to give air turbulence with minimum of resistance and unrestricted condensate drainage. Die formed collared holes are made to give a rigid bond to the tubes. The collars are especially formed to slide the fins at 4-12 fins per inch.

The casing is made from galvanised steel, flanged and bolted to form a rigid assembly suitable for duct or frame mounting. The tube end plates have die formed collared holes to support the coil tubes. Drip trays covering the coil and bends as well as connections are fitted to duct mounting coils.

The coils are fitted for the cooling and heating medium used to give optimum performance with lowest pressure drop. The return bends are capillary brazed with silver bearing copper alloy. Connections are sized to suit the duty and are brazed into copper headers.

All coils are pressure tested with compressed dry nitrogen under water.

The casing is treated with cold galvanizing on welds, etc and a final coat of aluminium paint is applied. To special order or for corrosive conditions epoxy resin paint is applied on a special primer.

Water/Glycol Closed Circuit Coolers

This universal type cooler can be installed in upright or low silhouette positions without modification.

Simplicity in design enable basic models to be built up in combinations to cover almost any capacity and installation size.

All models are available in three noise ranges.

- Standard, highest capacity, lowest cost.
- Low Noise Level with high capacity.
- Residential, lowest noise level for critical installations close to areas where noise can be a serious nuisance.

As with the coils detailed above the casings and coolers of these "DRIKOOLLERS" are the same high standard of manufacture.

The fans are made from tough polypropylene and are all aeroflow section propeller type on die cast hubs. The fans are especially selected for their efficient non overloading trouble free operation and matched to the driving motors. The impellers are keyed and screwed to the motor shaft.

Standard European foot mounting merie T E F C motors are fitted to all models. Class "B" or "F" insulation is standard and all motors are wound for 220/40 Volt or 380/420 Volt 3-phase 50 cycle operation. Weatherproof terminal boxes are fitted.

Each fan is enclosed in a close mesh guard to comply with most public authority requirements. The guards are finished in a P.V.C coating.

To cater for a wide range of duties and flow rates the coils are all individually circuited to obtain optimum results with frictional losses between 5 and 15 ft lb.

Units can be supplied complete with:

- One or twin water circulating pumps.
- Isolating and control valve.
- Bile thermometer and pressure gauges.
- Air and gas purging device.
- Air and gas accumulator/ expansion vessel.

Air Cooled Condensers

As with the "DRIKOOLLERS" all Air Cooled Condensers feature the refinement and technical excellence as specified above.

Naturally, the condensers are also available in three types depending on noise level requirements. Also available as an optional extra is solid state fan speed control and fan off cycling for multi-fan units.

Floor and Ceiling Mounted Coolers

Amongst the Haynes Coils range there is a Cooler to suit almost any conceivable application. In large cold stores we recommend using ceiling mounted "draw thru" units blowing air at high level above the product. This method drastically reduces capital costs for ducting and enclosures.

For small rooms "draw thru" or "blow thru" units may be used depending on the product, its method of stacking and the shape of the store.

Blast Freezing requires "draw thru" units with high power fan motors. Air flow arrangements should be carefully selected to present short cycling. Once again, coils, casing, motors and fans are of the extremely high standard which we have come to expect from Haynes Coils (Kettering) Ltd. and Brennan Airconditioning Ltd.

All models can be either four or six fins per inch and fin spacing of two or three per inch can be supplied up to a maximum of 10 rows deep. Coolers have proved very satisfactory down to temperatures as low as minus 40°F (-20°C).

The pitch angle is selected for the appropriate duty. The fans are nonoverloading and motors are all rated above their peak horse power.
ENGINEERS! GET THE BEST DEAL

We urgently require the following experienced staff:

Sales Engineers for our Airconditioning and Controls companies.

Applications Engineers for our Airconditioning and Controls companies.

Service Engineers for our Service Company.

All applications to:

brennan group of companies

60 Cookstown Industrial Estate, Tallaght, Co. Dublin. Phone: (01) 514711/514008

Haynes Coils (Kettering) Ltd

"FC" RANGE Product Coolers

"VEE SERIES" Air Cooled Condensers

The Universal Heavy Duty Coolers have been designed to afford the engineer with a standardised pre-engineered range to cover the widest field of applications. The choice of fin spacing, blow through or draw through fan arrangements and motors rated for free discharge or ducted systems are just a few of the features which give these Units their appeal.

The coils are circulated for R12, R22 or R502 refrigerants and incorporate electric, hot gas or water defrost systems. The Units may be ceiling or floor mounted as standard by using alternative brackets.

Contact Sole Irish Distributors

brennan airconditioning limited.

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Tallaght co dublin

Phone: (01) 514711
The latest product from the McQuay line of packaged water chilling equipment designed specifically for energy conservation.

To prevent freezing of the impeller tips to the fan ring a sheathed heater element is wrapped around the ring and securely fastened.

Defrost is normally electric but water or hot gas is also available.

All further details may be obtained from Brennan Airconditioning Ltd, 60 Cookstown Industrial Estate, Tallaght, Co. Dublin.

TEMPERATURE LTD

As Brennan Airconditioning Ltd have always been an extremely energy conscious organisation it is small wonder, therefore, that one of Britain's leading manufacturers of Heat Recovery Systems, Temperature Ltd., are doing a joint venture on the Irish Market.

We are, of course, speaking of the new universally acclaimed Versa-Temp system. Versa-Temp offer a well engineered and economic solution to the task of providing good quality air-conditioning. Above all it has the virtue of simplicity, which means less design and installation work for the consultant and the contractor and fewer complications for the user and maintenance engineer.

So that these advantages may be fully realised a guide on the Versa-Temp system has been prepared to assist those concerned, whether designer, installer, or operators. How this guide is applied is, of course, left to the discretion of the engineer responsible for the whole of the Building Services, having regard to the particular application.

System Advantages

1. Individual control of each unit or group of units.
2. Immediate response to user adjustments. Room temperature can be varied between 16 and 28°C.
3. Low running costs.
4. Simple, compact perimeter services, two uninsulated water lines, a condensate drain line and electrical connection. No vapour seal problems.
5. Reduced plant room space and ceiling space.
6. Easy to select, install and service, saving design and site work.
7. Ideal for conversion. Existing two pipe water system may possibly be re-used.
8. Versa-Temp units can become tenants responsibility, reducing rents and relieving owner of the trouble rising from break-down of central refrigeration plant.
9. Fire isolation is easier, because there is a minimum penetration of fire compartment walls.

REVERSE CYCLE HEAT RECLAIM

One of the first large organisations to realise the advantages of the reverse cycle heat reclaim was Seebord (South Eastern Electricity Board) in their new office complex at Guilford. The Board were anxious to be able to maintain the various offices at differing temperatures depending on the occupants need. No other system of heat reclaim offered such versatility as did the Versa-Temp.

There are other numerous installations of this type of energy saving air-conditioning system installed not only in the United Kingdom but there are a number presently being installed in Ireland.

Just another example of the energy conscious Brennan Group from whom all details may be obtained.

T.A. CONTROLS LTD

The striking progress during the past two decades in various branches of science and engineering has created an expanding demand for automatic controls. Simultaneously with this practical development a rapid advance in its theoretical study has taken place. The new science needed appropriate technical terms, and its specific terminology for automatic control technology has been evolved. A summary of the more important terms used in automatic control theory and their application to T.A. Controls Ltd is given below. We feel that this may be useful as designers of heating, ventilating and air-conditioning plant now appreciate that it is a technical necessity as well as being in their clients best interest and their own to progress the design of the plant hand-in-hand with that of its associated control system.

In order that the correct decision of the overall plant design may be taken speedily it is necessary to have in a readily accessible form a wide variety of information on proven controls application practice. There is no better place to obtain advice on both control and plant than from the Brennan Group of Companies in Tallaght.

Choice of Control Equipment

The choice of the automatic control equipment depends on the standard of performance required. However, it is not sufficient to judge a controller by the sensitivity of its measuring unit. This factor, which depends on several mechanical and electronic conditions is generally very small and does not allow anticipation of the fluctuations of the controlled condition before the plant is in operation. The length of the recovery time, storage capacity, the transfer and transmission lags are all factors which have to be taken into account when choosing the appropriate controller.

For the operation of a motor starter, obviously only an on/off controller will be suited, irrespective of the characteristic of the installation. For control systems with small recovery time and considerable thermal inertia (i.e., a central heating plant) a floating or integral controller suffices in most cases. For control systems with small thermal capacities i.e. air-conditioning plants, only a proportional controller with or without compensation will give satisfactory control.

As the control equipment is chosen before the plant is in operation there is seldom accurate data available on which the choice of the controller could be based. We draw on the vast background of experience gained with similar installation in many parts of the world.

We strongly recommend consultation with our experienced control engineers specialising in this field when planning an installation, to assist in choosing the appropriate equipment.

Due to space limitations it is not possible to give full details of the range of equipment available from Brennan "Controls" Ltd and T.A. Controls Ltd. other than to point out that anything from simple room thermostats to a fully centralised data logging control system is available.

SOLAR HEATING

Again due to the energy conscious policy of the Brennan Group it is not surprising to find that they are offering Solar Heating Systems as well.

QUESTION No. 1

Did you know that every second here on earth we receive a quantity of solar energy that is 24,000 times greater than the entire world's total energy requirement.

QUESTION No. 2

Why do we not make use of this vast amount of energy?

The Sun Never Runs Dry

All energy consumed on earth originates indirectly from the sun. Wind, waves and precipitation are phenomena that result primarily from solar radiation. Without sunlight there would be no plants, no trees and no wood. And without sunlight there would be no possibility of the formation of oil, coal or gas.

But the sun itself is only an enormous potential source. Every second, the earth receives a quantity of energy in the form of solar radiation that is 24,000 times greater than the entire world's energy requirement. And we can be certain that the sun will continue to shine with the same intensity for at least another 10 billion years.

In other words there is every reason for us to attempt to utilise solar energy more directly. The fact is that the use of solar energy is nothing new. Solar water heaters were being used in America as long ago as the 1920's. And relatively great advances were made in the 40's and 50's in the field of solar energy technique. But as long as both oil and coal are expensive sources of energy, nobody really made a serious comprehensive effort to use solar energy.

We no longer have any choice. Oil, coal and gas now account for about 98% of the world's total energy supply and we know that these sources will run out in the not too distant future. We also know that we cannot continue to burn fossil fuels at a steadily increasing rate without incurring serious environmental consequences.

And we know that nuclear power - apart from the fact that it is an uncertain energy source in several respects - will also have had its day within one or two hundred years in terms of modern nuclear techniques.

In contrast Solar Energy is infinite, measured in human terms. It is also highly accessible from an environmental point of view. Solar energy will undoubtedly play aprominent role in the future.
plant room mounting and are available as direct coupled or belt driven.

**Roof Units**

These are available in either propeller type, centrifugal fan type, mini and natural draft.

The vertical jet unit is either propeller or axial flow fan and this unit is also available in a backward curved centrifugal version.

**Centrifugal Fan Units**

These are designed for duct mounting or wall mounting and are all belt driven.

**Propeller Fan Units**

These are designed also for duct mounting or wall mounting and are direct drive.

**Mini Curb Mounted Unit**

The VES range of Mini Roof Units has been specifically designed to cover a range of duties between 100 and 700 cfm as economically as possible. Models are available for input or extract on schemes where very small quantities of air movement are required, i.e. bathrooms, lobbies, etc.

The substantial Zintec coated sheet steel cowl and upstand are finished in grey hammerdot paint.

**CR Series — Roof Mounted Centrifugal Fan Units**

The VES roof mounted centrifugal fan unit has been designed to extract or supply a wide range of air quantities, quietly. Unit casing is constructed from a natural finish aluminium sheet. Flange mounted forward curved multi-vane centrifugal fans with resiliently mounted motors are fitted in the casings. Motor speeds on the larger models do not exceed 960 rpm and on smaller models do not exceed 1,350 rpm to give quiet running. The cowl may be hinged forward on the base to give interior access for installation, wiring and maintenance.

**Duct Mounted Propeller Fan Unit**

The VES range of duct mounted propeller fans are intended as an economical means of moving quantities of air through ducting, etc where the resistance is low and noise is not critical, i.e. semi-industrial and commercial applications. The smaller units being also suitable for offices, toilets, etc. The casings are manufactured from substantial Zintec coated sheet steel with angle iron flanges at each end. The grey hammerdot enamel finish is standard. These units are designed for operation without duct work or very low resistances. Units giving an F I D air quantity are available up to 16,500 cfm.

**BE Series — Duct Mounted Centrifugal Fan Units**

The VES Duct Mounted Centrifugal Fan Unit has been designed to extract or supply a wide range of air quantities, quietly. Unit casing is constructed from substantial Zintec coated sheet steel finished in grey hammer tone enamel. Flange mounted forward curved multi-vane centrifugal fans with resiliently mounted motors are fitted in the casings. Motor speeds on the larger models do not exceed 960 rpm and on smaller models do not exceed 1,350 rpm to give quiet running. Access doors are fitted on both sides to give interior access for installation, wiring and maintenance.

**Filter Section — Series BEF**

The ‘BE’ Series of Duct Mounted Centrifugal fan units is available with an additional filter attachment. The 2" fibre glass disposable filter cells, which are side withdrawal, are non-hygroscopic and flame retardant with a gravimetric efficiency of 95% on Test Dust No. 2, at a maximum operating velocity of 500 feet per minute. Spare filter cells are available ex-stock.

**Small Air Handlers Series AH**

Once again utilising the versatility of the BE range of fans and BEF filters Ventilating Supply Company have evolved a small Air Handling Unit having duties of 170 cfm up to 3,000 cfm. The heating section can be either hot water, steam or electric.

Cooling coils can also be supplied for use with either chilled water or direct expansion. The Cooling Coils all have condensate drains fitted into the tray located at the bottom of the coil.

Mixing boxes are also available with fresh air and recirculated air supplied fitted with multi-blade damper arrangement for either manual or automatic operation.

**CW Series Wall and Mounted Centrifugal Fan Units**

The VES Wall and Window-frame Centrifugal Fan Unit has been designed to either extract or supply a wide range of air quantities, quietly. Each unit is constructed from natural finish aluminium sheet and fitted with multi-vane centrifugal fan with resiliently mounted motor. Motor speeds on the larger models do not exceed 960 rpm and on smaller models do not exceed 1,350 rpm to give quiet running. Front weather cowl removable to provide interior access for installation, wiring and maintenance is a standard feature.

**Thermecon Units Heat Savers**

The VES range of Thermecon Units has been designed to meet the need for an unobtrusive and economical heat-conserving device for installation into factory areas.

Units are available from 2,600 cfm to 6,800 cfm with heating capacities of 85,800 BTU/hr. up to 224,400 BTU/hr.

**Fan Speed Regulators**

Almost all the VES fan units can be fitted with VMRD speed regulators which offer infinitely variable fan speed regulation within the range of 20% to 100% of full speed. Fan speed is set by a rotary control fitted on the front panel of the regulator. Also fitted is a miniature circuit breaker to provide on/off switching and overload protection for the fan. To compensate for varying site voltages and system resistances a preset control is accessible for minimum fan speed tuning. The solid state control module is suppressed to the GPO requirements of BS 800. The dimensions of the regulator are 7" high x 6" wide x 3" deep. The finish is an attractive light grey colour with silk screen facia.
THE LAW AND BUILDING SERVICES DESIGN

SECTION II

Note: No mention is made of noise levels in the Offices Premises Act (No 3 of 1958) or to the power of the Minister to make orders governing noise levels under this Act except a general reference to the health of those employed.

SI No 235 of 1973 Factories (Noise) Regulations, 1975

4-(1) "A person shall not be exposed to a sound pressure level of such intensity and duration as is likely to cause him harm."

6 The boundaries of an area where people are employed and where the sound pressure level exceeds 90 dBA shall be marked with a barrier or warning notice.

7-(1) A person employed in such an area shall not be exposed to a sound pressure level in excess of 90 dBA unless "(a) the duration and level of exposure is controlled so that its cumulative effect is unlikely to cause harm, or
(b) ear protection is provided which effectively reduces to a level, which is unlikely to cause harm, the sound pressure level at each ear of the person."


The noise level at certain pre-determined points shall not exceed 93 EPN dB for a craft weighing 34 x 10^3 kg (lowest weight) or above 108 EPN dB for a craft weighing 272 x 10^3 kg. Refer to Chicago Convention for definition of EPN dB and the location of testing points.

Draft Building Regulations

Sound Insulation

J.1. This regulation applies to all dwellings Party Walls Reduction of Airborne Sound

J.2. The sound energy absorbed within a wall which separates two rooms will be regarded as inadequate where the sum of the difference for all frequencies between the reduction achieved and the reduction desired (see Column 2-(1) of table) is greater than 23 dB

Alternatively the wall can be constructed as detailed in part I of schedule 12 of the regulation so long as it extends for 460 mm or is attached to a flanking wall of a particular construction detailed in the regulation.

### Sound Energy Required to be Absorbed Within a Structure

<table>
<thead>
<tr>
<th>Frequency (Hz)</th>
<th>Airborne Sound Reduction in dB</th>
<th>Impact Sound Transmission Sound Pressure Level (dB) desired in room &quot;B&quot; (see text)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>40</td>
<td>63</td>
</tr>
<tr>
<td>125</td>
<td>41</td>
<td>64</td>
</tr>
<tr>
<td>160</td>
<td>43</td>
<td>65</td>
</tr>
<tr>
<td>200</td>
<td>44</td>
<td>66</td>
</tr>
<tr>
<td>250</td>
<td>45</td>
<td>66</td>
</tr>
<tr>
<td>315</td>
<td>47</td>
<td>66</td>
</tr>
<tr>
<td>400</td>
<td>48</td>
<td>66</td>
</tr>
<tr>
<td>500</td>
<td>49</td>
<td>66</td>
</tr>
<tr>
<td>630</td>
<td>51</td>
<td>65</td>
</tr>
<tr>
<td>630</td>
<td>51</td>
<td>65</td>
</tr>
<tr>
<td>800</td>
<td>52</td>
<td>64</td>
</tr>
<tr>
<td>1000</td>
<td>53</td>
<td>63</td>
</tr>
<tr>
<td>1250</td>
<td>55</td>
<td>61</td>
</tr>
<tr>
<td>1600</td>
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<td>59</td>
</tr>
<tr>
<td>2000</td>
<td>56</td>
<td>57</td>
</tr>
<tr>
<td>2500</td>
<td>56</td>
<td>55</td>
</tr>
<tr>
<td>3150</td>
<td>56</td>
<td>53</td>
</tr>
</tbody>
</table>
3 Floors Airborne and Impact Sound

(1) This regulation applies only where a dwelling is below not above a floor

(2) Airborne Sound
The sound energy absorbed within a floor will be regarded as inadequate where the sum of the difference between the reduction achieved and the reduction desired (see Column 2-(2) of table) is greater than 23 dB.

Impact Sound (personal interpretation)
Where noise originates in a dwelling "A" and is transmitted through a party floor to another dwelling "B" the difference between the sound pressure level measured in dwelling "B" and Column 3 of the table shall not exceed, when totalled for all frequencies, 23 dB. Otherwise the floor shall be regarded as unsatisfactory for these purposes.
Alternatively the floor can be constructed in accordance with part II of schedule 12 so long as it is bonded to every wall which gives it support, in the case of a concrete wall, or in the case of a timber floor is bounded on at least three sides by walls with a mass of not less than 415 Kg/m² and flanked in accordance with the details in the regulations.

(3) The same regulations apply as for "Airborne Sound" (3.3 (2)) above, where a dwelling is above a floor except that the transmission of airborne sound only is required to be limited and the alternative specification shall be part II or part III of schedule 12.

J.4. Sound transmission measurements and valves shall be determined in accordance with Sections Two A and Three A of B.S.S.2750:1956

Safety in Industry Bill 1978

13. This bill makes provision for regulations to limit the noise levels in a factory where they are "likely to injure the hearing or otherwise adversely effect the health of persons employed."

SECTION III
Lighting Electrical Standards & Lifts

Office Premises Act No 3 1958

12-(I) "sufficient and suitable lighting" shall be provided so that:

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INDUSTRIAL INSTRUMENTS LTD.,
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AND SALES OFFICE
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I.H.V.N., April/May 1979
(b) unsuitable shading, or
(c) unsuitable placing of light sources or positions of work, discomfort or injury from glare or from reflection of light in the eyes of the worker."

Factories Act 10 '55

14-(1) Effective and suitable lighting whether natural or artificial shall be maintained in every part of the factory in which persons are working or passing
(3) "All glazed windows and skylights used for the lighting or workrooms shall, so far as practicable, be kept clean on both the inner and outer surfaces and free from obstruction"

Shops and Conditions of Employment Act No 4 of 38

55-(3) "In every part of a shop in which persons are employed to do shop work, suitable and sufficient means of lighting shall be provided and every such part of such shop shall be kept suitably and sufficiently lighted."

SI No 3 1972 Factories (Electricity) Regulations 1972

These regulations deal with the control of electricity in factories from the point of view of the safety of those employed. Among the aspects dealt with are switches and circuit breakers, control of machinery, working on electrical apparatus, and electric welding. Certain of the provisions are likely to be of interest to Electrical Contractors, among them regulation 26-(I)

26-(I) "The occupier shall make and ensure the effective carrying out of arrangements for the testing by a competent person appointed by him of all parts of each circuit upon the completion of every new installation and every major alteration to an existing installation as regards each of the following, namely:
(a) verification of polarity,
(b) the conductance of the earth conductors and earth plate or earth rods,
(c) the effectiveness of the earth loop impedance,
(d) the effectiveness of every earth-leakage circuit breaker, and
(e) the insulation resistance of every circuit.

MINES

SI No 51 1972 Mines (Electricity) Regulations 1972

This instrument applies the regulations of instrument No 3 of 1972 to Mines.

SI No 123 Mines (Explosives) Regulations 1972

This instrument deals with the danger of explosions within mines and the electrical installation.

SI No 222 of 1969 Industrial Research and Standards (Section 44) (Electrical Appliances) Order 1969

This instrument refers to the necessity for earthing all electrical appliances (intended for domestic use, with voltage in excess of 100v and with flexible cable) and for colour coding and labelling of three wires of such a flexible cable.

SI No 196 1959 Office Premises (Standards of Lighting) Regulations 1959

This regulation sets out the minimum lighting level required in office rooms as detailed in the following table. I have added a further column; the recommendations of the I.E.S. code for lighting are also given.

<table>
<thead>
<tr>
<th>S.I. No.196</th>
<th>S.I. No.196</th>
<th>I.E.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>lumens per</td>
<td>lux</td>
<td>Code</td>
</tr>
<tr>
<td>square foot</td>
<td>lux</td>
<td>lux</td>
</tr>
<tr>
<td>General clerical work measured at the desk</td>
<td>15</td>
<td>150</td>
</tr>
<tr>
<td>Drawing board work measured at the board</td>
<td>20</td>
<td>200</td>
</tr>
<tr>
<td>Drawing Office — general</td>
<td>15</td>
<td>150</td>
</tr>
<tr>
<td>Non clerical work in offices measured at the floor</td>
<td>7</td>
<td>70</td>
</tr>
</tbody>
</table>

SI No 32 1959 Office Premises (Sanitary Conveniences) Regulations 1959

5-(2) Effective provision shall be made for lighting the sanitary convenience.

Lifts

SI No 182, 1956: Factories (Report of Examination of Hoists and Lifts) Regulations 1956

This regulation sets out the official form to be filled in by the inspector when examining a hoist or lift and is in short a check list of possible deficits

Draft Building Regulations '76 (see app 6)

Lifts for Dwellings

F4-(1) "Where the floor at the entrance door to any dwelling is four storeys or more above the floor at the entrance to the building and the building contains two or more dwellings access by means of one or more passenger lifts shall be provided to within one storey of the entrance door to every dwelling."

(2) In a building of between four and seven storeys in height at least one lift shall be provided for every 70 dwellings. At least two lifts shall be provided in dwellings of eight or more storeys.

(3) Every lift shall be provided with means of ventilation, two systems of artificial lighting powered from normal and emergency supplies; and an alarm signal capable of being heard outside the lift well.

The lift motor room shall be ventilated, artificially lighted and fitted with anti-vibration and noise insulation.

Lighting:

F12—(1) Every habitable room, bathroom, w.c., watercloset, entrance lobby, hall, passageway and stairway terminal landing shall be provided with at least one terminal point for lighting.

Landing lights must be provided with two way switches.

13-(3) Power points shall be provided as follows:
(a) 3 in one living room
(b) 1 in each other habitable room
(c) 2 points in addition to the cooker control unit in the kitchen
(d) 1 power point in the entrance hall and 1 in the upper landing.

F13-(1) "power point:" "means an electricity socket outlet which safely provides a current of 13 amperes by means of a ring or radial circuit."

Safety in Industry Bill 1978

29,30 This bill proposes to amend and update the Factories Act (1955).

These sections deal with the regular safety inspection of cranes and hoists and states that no "lift or hoist shall be taken into use ... for the first ... unless it has been tested and thoroughly examined by a competent person and a certificate of such test and examination specifying the safe working load of the lift or hoist has been obtained."
PEOPLE

Satchwell Control Systems Ltd have appointed Ray Williams as area manager of their newly re-opened Irish office. The company will be based in the GEC offices in Hendrick Street and will have a staff of two service engineers and one draughtsman.

ICI Ireland Ltd have announced two new appointments in their plastics and chemicals divisions. Mr F M Cunneen is to become plastics manager in addition to his existing management responsibilities for building products, personnel and public relations, while Mr C C G Brennan has been asked to head the chemicals department. Mr Brennan is also the chairman of the Irish Offshore Services Association.

Stewart Roche and Brian Hunter have been appointed directors of Walker Air Conditioning.

Thirty-year-old Roche, joined Walker Air Conditioning as an accountant in November 1976 and was promoted to Company Secretary six months later. He now becomes Financial Director as well. Educated at Munger College, Limerick, Roche is an associate of the Institute of Chartered Accountants in Ireland.

Appointed to the Board of the UK company, Hunter, 29, joined Walker's Belfast office in 1974 as a Sales/Application Engineer. Two years later, he became Manager of the branch responsible for the entire operation in Northern Ireland.

Finheat Ltd have appointed Mr John Brennan, who was formerly with Chubb Ireland Ltd, to their Technical staff. Brennan will be primarily responsible for equipment which Finheat will distribute to the process side of the industry.

Due to an organisational restructure, the Institute for Industrial Research and Standards have announced the appointments of three assistant director-generals. Mr G P Sweeney, up to now director of the technical information division, has been named assistant director-general, Information Technology Group, Mr T J Quinn, formerly director of the engineering division, becomes assistant DG of the Manufacturing Technology Group and Mr F Moran, the former director of the science division, has been appointed assistant DG of the Process Technology Group.

Mr Pat Byrne has been appointed Sales Engineer for Coolair Ltd. Previously, Mr Byrne was a Sales Engineer with Compute Air Ltd.
Warm air heating is not just for factories, homes or office blocks, it can also be used in conservatories as the unit recently installed by Powrmatic in Killiney shows.

To step into the new conservatory at the home of Italian businessman, Roberto Pietrocola, is a revelation. It's been specifically designed for entertaining with tasteful furnishings, rare and tropical plants and well laid-out rock gardens, the necessary constant warm environment being provided by an externally installed Powrmatic EA 600,000 Btu/h oil-fired industrial type warm air heater.

In principle, the conservatory is a totally-glazed building with dwarf walls to three sides and full elevation to the rear. The client's request was to maintain the interior at a design temperature of 15°C against 0°C externally with a facility to raise the internal temperature to 22°C in 20 minutes by the use of a manual override switch.

As the conservatory is to be used 24 hours per day, it was decided that a special unit would have to be designed to fulfill the heating requirements. Because of the heat loss from the large amount of glazing, the heater unit would need to be of industrial dimensions. This meant, however, that if the unit was allowed to operate on normal starting procedure, there would be a noise problem. Therefore, it was decided to utilise the main fan assembly of the heater at a constant input performance and control the heat output by use of capillary duct stats which would directly switch the burner assembly.

To overcome the various site problems, the contractors decided on an externally installed Powrmatic EA counterflow warm air heater as the only practical solution. By doing so, a 100% recirculation facility could be utilised with a manual override facility to promote a proportion of fresh air, should this be required during summer-time.

The ductwork was, by necessity, fixed beneath the floor slab of the conservatory in a trench excavated by the builders. Ductwork was provided both in rectangular and circular section. Upon completion of the installation, and prior to the finish screed being laid, all ductwork was insulated with polystyrene slab to rectangular section and two inch fibreglass to the circular section. Termination of the outlet ducts was by the utilisation of linear floor diffusers capable of taking traffic up to invalid chair proportions.

Again, due to noise and vibration transmission problems, the return air ductwork, approximately six metres in length and insulated with Barrafoam insulation, was positioned in one gable end of the conservatory. To prevent vibration transmission noise, the return air ductwork was isolated from the conservatory framework by flexible duct connectors.

The entire installation was completed with a mains control panel giving run and fail conditions on the main fan assemblies, high and low fire conditions on the main burner and run and trip conditions/lock-out on the control box assembly. All of these functions are repeated on a panel positioned in the main hall of the house so that at any one time any condition could be read without entering the conservatory. The final control +/- 2°C is provisioned by a high/low limit capillary duct stat positioned in the centre of the return air duct to give fully automatic control of the burner assembly.

The externally-mounted Powrmatic EA 600,000 Btu/h oil-fired industrial type warm air heater which maintains the interior of the conservatory at a design temperature of 15°C against 0°C externally.
AIR QUALITY IN THE BELFAST AREA SINCE 1955

Belfast Council has maintained surveillance of certain air pollutants for the past 23 years. With the introduction of the Clean Air Act Northern Ireland in 1964, efforts directed at the abatement of smoke and air pollutants increased. Mr K H Lynes, Chief Environmental Health Officer, Department of Environment for Northern Ireland reported on their progress at an air pollution seminar organised by the National Board for Science and Technology.

When the Belfast Corporation began to monitor air pollution in the city there was minimum legislation to help achieve any major reduction of air pollution. The Public Health (Ireland) Act of 1878 provided only for control of excessive smoke from certain furnaces and of black smoke from non-domestic chimneys. Efforts though were made by the staff of the Health Department within these limits and some progress to contain the more serious pollution emissions was made. London suffered the 1952 “smog” and the Beaver Committee on Air Pollution finally reported in 1954 on the need for much more effective laws to deal with what was recognised as a serious pollution and health problem. A decision was, therefore, made in Belfast to monitor pollution so that health or detrimental effects could be examined and, possibly, demonstrated, future comparisons made and any improvements subsequently achieved assessed with some degree of accuracy.

In 1954, seven monthly deposit gauges to measure particulate fall-out with associated lead dioxide instruments to measure sulphur dioxide were installed, and in 1955, a daily instrument to measure smoke and SO2 on a volumetric basis was installed in the city centre at College Street. Six daily volumetric instruments were added in 1959; two more in 1961; another in 1962 and a further one (making 11 in all) in 1969. In 1972, three stations were dropped leaving eight which is the position today. As volumetric monitoring increased the deposit gauges and lead dioxide instruments were withdrawn.

The geographical siting and selection of individual sites were supervised by the Warren Spring Laboratory and, since 1955, the results from all stations in the city since 1959. I am satisfied that, even with the variable numbers of stations at different times, the figures are not significantly affected and are broadly comparable - sufficiently so for the purpose for which we use them. Further, I have used averaged Winter figures (1 October - 31 March) as giving a better basis for comparison than yearly averages. Summer figures are often too low to allow adequate assessment, particularly for smoke, which arises mainly because of the drop in domestic coal usage.

<table>
<thead>
<tr>
<th>Station</th>
<th>College St only</th>
<th>Average Belfast Stations</th>
<th>College St only</th>
<th>Average Belfast Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1955</td>
<td>300</td>
<td>300</td>
<td>300</td>
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Alongside the City Council monitoring of air pollution, the electricity service (now the Northern Ireland Electricity Service - NIES) has been monitoring SO2 in the Belfast area since 1957 at nine stations using lead dioxide candles to assess the effect of two coal-burning power stations at East and West Twin islands in the Belfast harbour area.

The East Twin Station has been there for many years and the West Twin Station was commissioned in stages from 1954-1958. Because of the proximity of the Sydenham Airport, the chimney heights of the higher stacks were 40 feet less than was recommended if a decision had been made purely on health and amenity considerations. It is not suggested, however, that this has made a very significant difference to the total figures for SO2 recorded in the city since the station was commissioned.

The NIES has recently decided to change from lead dioxide candles to volumetric measurement of SO2 which will make their results more readily comparable with those of the City Council. However, so as not to lose the value of annual comparisons, they will continue to operate the lead dioxide instruments for some years yet.

The measurement of smoke and SO2 at the various City Council stations since 1955 are shown in Table 1 and at Figure 1 (from 1959) and Figure 2 (College Street only from 1955).

Except for a fairly substantial rise in readings for 1977 (so far unexplained) and other slight reversions, the smoke concentrations show a steady drop over these years with a reduction more recently to between one quarter and one third of the figures for 1959 to 1964 when the Clean Air Act (NI) was introduced.

The figures for SO2 show a similar trend downwards over the years with occasional reversions but have only shown a reduction of half or less than half of the figures for the late 1950s and early 1960s. During this period there was a very substantial change in the pattern.
of fuel use, both domestically and industrially, and a considerable improvement in home heating standards, partly due to increasing affluence and partly to the growth of smoke control areas in and on the outskirts of the city, were noted. The total quantity of fuel used rose substantially and oil consumption increased dramatically.

Crawford, in his examination of the Northern Ireland position in the national survey of smoke and SO2, shows that in the winters of 1967-68 and 1966-67 Belfast occupied roughly a half-way position in respect to smoke pollution in comparison with larger cities in the United Kingdom. This occurred even though the domestic provisions of the Clean Air Act (NI) 1964 had not then been applied and, that Northern Ireland had a very high consumption of bituminous coal per head of population as compared with other regions of the United Kingdom.

Crawford raised the theory that Belfast's geographical position in a valley may have contributed to this relatively satisfactory situation. He demonstrated a similar situation in relation to the figures for SO2 which, he considered, added weight to the favourable geographical factor. However, later in the paper he counselled caution in this interference as the effects of the "valley situation" were not fully understood.

Stimulated by the Air Pollution Monitoring Management Group set up by the Department of the Environment, on which Northern Ireland is represented at government and local government level, Warren Spring Laboratory introduced additional monitoring of air pollutants in 1976. Sulphates, in particular, and a wide range of elements have been monitored at a small number of sites throughout the United Kingdom. Belfast was one of twenty sites chosen for this extended survey which was supervised at local level by the Belfast City Council Health Department for a two-year period, the assessment of results being carried out at Warren Spring Laboratory.

National Survey figures for particulate matter and SO2 have been very valuable in stimulating the attack on air pollution in towns and cities and the figures will continue to be used for this purpose. Their general value though is declining as town air becomes cleaner, and it may well be necessary to review and modify our approach to national and local monitoring of air pollution in the future.

The Effects Of Air Pollution Controls

As has been mentioned, legislation to control air pollution in Northern Ireland prior to 1964 was inadequate and directed only at certain industries. Nonetheless, the Belfast Health Department carried out a vigorous inspection and enforcement policy, allied to one of fuel efficiency based mainly, at that time, on stoking techniques. The figures for smoke in Table 1 show that this had a slow but definite value in reducing air pollution.

The Clean Air Act (NI) 1964 introduced a requirement for new industry and commerce to provide chimneys of sufficient height to disperse pollutants; notification of furnace installations (or alterations) to the District Council and special requirements regarding grit and dust arrestment. A penalty became applicable if "dark smoke" (defined) was emitted. The enforcement of these provisions by the Public Health Inspectorate led to a significant drop in smoke concentration in 1965 and a dramatic and sustained drop subsequently. Action by the Health Department regarding smoke was, of course, aided by the change taking place from the burning of coal to oil in many industries and a greater use of electricity. Enforcement procedures, always preceded by warnings and stimulation to improvement of fuel efficiency, were an important feature of this period. Thousands of timed observations of smoke emission (with follow-up visits) were made and it is now rare to see a smokey industrial chimney in the Belfast area. Tribute must also be paid to the Alkali Inspectorate of the Department of the Environment who during this period, have, done a great deal to improve air quality by their control of special processes such as power stations, chemical works and mineral works under the Alkali & Works Regulation Act 1906.

The 1964 Clean Air Act also contained very valuable provisions dealing with smoke control by which delineated areas are dealt with by...
government approved "orders" and domestic conversions (to relatively smokeless systems of home heating) are grant-aided by the government and local authority. The local authority is the prime mover in any action taken and is also responsible for supervision of the conversions and the subsequent maintenance of the area as smokeless. Domestic smoke accounts for most of the particulate pollution in town air and is considered to cause up to 80% of this form of pollution at present.

It was the intention of the Belfast authority to cover the western and the south-western sides of the city with smoke control areas as a first step. Unfortunately, circumstances made continuation of this policy untenable and a change was first made to the city centre and then to areas in the east of the city working towards the south.

To date, some 20,000 premises (almost all domestic) have been included in smoke control orders in the Belfast City Council area out of a total of approximately 11,000. Because legislation in Northern Ireland came later than in Great Britain, the proportion of conversions is much lower and the cost of conversion to smokeless installations has risen considerably. Domestic smoke remains the most widespread though and the important air pollutant and smoke control by area is the cheapest and most effective single action to clean the air.

In Northern Ireland, there is a very significant difference in the pattern of fuel choice in smoke control areas - smokeless solid fuel being much more popular compared with Great Britain. Whilst Belfast still has much to do in the extension of smoke control, many areas of new buildings are already fitted with approved smokeless appliances under legislative controls and more and more privately-owned houses and commercial premises are changing to smokeless forms of heating. The task is not, therefore, quite so formidable as the figures quoted may suggest but there can be no complacency: Tables 3, 4, 5 and 6 show that, on a regional basis, Northern Ireland is still well behind most areas of the United Kingdom in reducing atmospheric smoke and SO2.

I realise that it is becoming more difficult and much more complex to assess the health benefits which accrue from air pollution controls in factual terms. It is sufficient though to see the benefits in amenity. There are the obvious reductions of atmospheric filth, less fog and smog, greater penetration of sunshine, clean sheep, clean hedgerows, and buildings which stay clean when cleaned. I am also convinced, unscientific though this observation may be, that there are health benefits - certainly when we define health as did the World Health Organisation as: "A state of complete physical, mental and social well-being and not merely the absence of disease and infirmity".

No-one who worked in the Sheffield area, as I did, when it was known as "Old Smokey", and goes back to see it now since vigorous air pollution controls have been successfully applied, needs to know scientific or measurable evidence of the benefits of air pollution control. They are there for all to see and appreciate, and I feel we must continue our progress towards a cleaner atmosphere with no less enthusiasm than has been evident over the past two decades.

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The figures given are the average of the concentrations of all the smoke sites in operation within a region in a particular year. Consequently the tables can only be updated annually.
# COMPANIES SUPPLYING PUMPS AND CIRCULATORS

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In a world where industry, as never before is making unparalleled demands for liquid organic fuels derived from hydrocarbon processing, the role of pumps and pump systems has taken on an increased significance.

Despite having been hit with staggering increases in production and distribution costs over the past ten years, and with apparent, though perhaps limited availability of coal and domestically produced peat, the demand for oil continues to rise. Even though nuclear energy continues to stare us in the face as the one logical alternative, current government policy and public opinion combined, contribute no more than to stave off its ultimate introduction into this country.

The entire subject of energy is of course, enormously complex, as well as confusing, but it does go to the very heart of our industry. After trying to digest all the arguments and counter-arguments, opinion is that between now and the end of this century at very least, we will be continuing to rely on liquid organic fuels as a basic source of energy. What is more, these fuels will be made available, no matter from where, and no matter at what cost, whether it be the Middle East, Offshore Europe, Africa, South America, or even Mexico, where now enormous crude deposits are being developed. As the value of liquid fuels continues to increase, the equipment for handling them will become more critical, and as the product becomes more expensive, the cost of equipment for transporting, storing and pumping, will become of secondary importance.

The following synopsis is intended as a guide to the commercial rotary positive displacement types on the market to-day. Let's examine them.

**BASIC TYPES:**

There are four basic types in the single rotor pump class, and a further four basic types in the multiple rotor class.

**VANE**

In this type, the vane, or vanes, which may be in the form of blades, buckets, rollers, or slippers, co-operate with a cam to draw fluid into, and force it from the pump chamber. These pumps may be made with vanes in either the rotor or stator, and with radial hydraulic forces on the rotor, balanced or unbalanced. The vane-in-rotor pumps may be made with constant or variable displacement pumping elements. Fig. 2 a vane-in-stator constant displacement unbalanced pump.

**PISTON**

In this type, fluid is drawn in and forced out by pistons, which reciprocate within cylinders, with the valving accomplished by rotation of the pistons and cylinders relative to the ports. The cylinders may be axially or radially disposed, and arranged for either constant or variable displacement pumping. All types are made with multiple pistons, except that the constant displacement radial type may be either single or multiple piston. Fig. 4 illustrates an axial constant displacement piston pump.

**FLEXIBLE MEMBER**

Here the fluid pumping and sealing action depends on the elasticity of the flexible member or members. The flexible member may be a tube, a vane, or a liner. See figs. 5, 6, and 7 respectively.

**LOBES**

With this type fluid is carried between rotor lobe surfaces from the inlet to the outlet. The rotor surfaces co-operate to provide continuous sealing. The rotors must be timed by separate means. Each rotor has one or more lobes. Figs. 8 and 9 illustrate a single and three-lobe pump respectively.

**GEAR**

Here the fluid is carried between gear teeth, and displaced when they mesh. The surfaces of the rotors co-operate to provide continuous sealing, and either rotor is capable of driving the other.

External gear pumps have all gear rotors cut externally. These may have spur, helical, or herringbone gear teeth, and may use timing gears.

Internal gear pumps have one rotor with internally cut gear teeth meshing with an externally cut gear. Pumps of this class are made with or without a crescent shaped partition. Fig. 10 illustrates an external spur gear pump, and Figs 11 and 12 show internal gear pumps with, and without, the crescent shaped partition.

**CIRCUMFERENTIAL PISTON**

In this type, fluid is carried from inlet to outlet in spaces between piston surfaces. There are no sealing contacts between rotor surfaces. In the external circumferential piston pump, the rotors must be timed by separate means, and each rotor may have one or more piston elements. In the internal circumferential piston pump timing is not required, and each rotor must have two or more piston elements. Fig. 13 is an external multiple piston type pump.

**SCREW (SINGLE)**

In one type, fluid is carried between rotor screw threads and is displaced axially as they mesh with internal threads on the stator. The rotor threads are eccentric to the axis of rotation, and this type is illustrated in Fig. 14. Another type of single screw pump is shown in Fig. 15. This type depends upon a plate wheel to seal the screw, so that there is no continuous cavity between the suction and discharge.

**SCREW (MULTIPLE)**

In this type, fluid is carried between rotor screw threads and is displaced axially as they mesh. Such pumps may be timed or untimed. Fig. 16 illustrates a timed screw pump, Fig. 17 an untimed screw pump.

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Walker Air Conditioning Ltd last year formed a new division specifically responsible for distribution and after service of condensate recovery equipment and liquid pumps manufactured by Girdlestone Pumps Ltd.

Girdlestone's range is extensive and includes: Seal range — Designed for continuous operation under arduous working conditions, the seal range has an output — up to 27m³/hr against heads of 45 m; suction performance — excellent low NPSH performance requiring only 0.3m with reduced output; materials — cast iron, gunmetal and stainless steel; design — shaft overhang from front bearing to impeller, reducing vibration and seal wear. Available at bare shaft pump, direct coupled pump or motor pump.

URF range — Extremely versatile, these pumps offer the maximum of standardisation with the minimum number of components. Points of special interest include: output — up to 400 m³/hr and heads of 107m; suction performance — excellent low NPSH performance, with the ability to operate under cavitating conditions with the minimum of damage to the pump; materials — include cast iron, ni-resist, gunmetal, bronze, alumini um, monel and a wide range of carbon and stainless steels; applications — suitable for most industrial, chemical and marine applications, especially where operating conditions are arduous, shaft sealing is a problem, or NPSH availability is limited.

USM range — One of first company's to introduce motor pumps to the UK in 1929, Girdlestone's USM range includes: output — up to 400m³/hr and heads of 107m; suction performance and materials identical to URF range; applications — general service duties and for incorporating on plant where weight and space must be kept to a minimum.

Hi range — Manufactured to comply with ISO 2858, this range of pumps is still undergoing development to ensure that all the latest design features are incorporated. Points of special interest are: output — up to 250 m³/hr, against heads of 125m, outputs of up to 950 m³/hr are available but not as a standard pump; suction performance and materials — similar to above; applications — back pull out pumps are under increasing demand from a number of industrial applications, particularly chemical and marine where above average servicing is anticipated.

For further information contact Walker Air Conditioning Ltd, Dublin Industrial Estate, Finglas Road, Dublin 11, (Tel: 01-300844 or in Belfast: 084-885234).

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Consolidated Introduce Metric Coupled Pumps

Type MC (metric coupled) pumps are cradle mounted with flexible coupling and the pumps and driver are mounted on a common baseplate.

Back pullout design allows the pump to be completely inspected without disturbing the pipe-work enabling ease of service to the casing, impeller and stuffing box. Precision machined fits assure positive alignment of shaft with stuffing box cover and pump casing.

The balanced closed impeller is designed for high efficiency and low noise level. It is dynamically balanced and smooth vibration-free operation and hydraulically balanced to reduce stuffing box pressure and minimise thrust loads on the bearings. The impeller is keyed to the shaft and secured with a lock nut, preventing the impeller from becoming loose if rotation is reversed.

Cast in mounting feet puts the support under the centre of the casing, transferring pipe loads directly to the foundation. This design provides maximum rigidity to prevent distortion and misalignment.

Being precision ground throughout provides rugged support and low deflection at the impeller and the stuffing box. Unique design on Type M units allows the use of a standard metric motor.

Type MC deep stuffing box accommodates packing as the standard design. Four rings of packing and a lantern ring are contained with a solid one piece gland. Optional stuffing box arrangements on the Type MC are packed box with external flushing and mechanical seal. A mechanical seal is standard construction on the Type M.

Heavy duty ball bearings are properly pre-greased for the bearing life while standard flange mounted metric motors for BS 3979 (IEC 72) are used for the Type M.

Further information is available from Consolidated Pumps Ltd, Knockmeenagh Road, Newlands Cross, Clondalkin, Co Dublin, (Tel: 593471).

Hydro-Jet Unit Range Extended

The ‘Hydro-pak’ range of pressurised water supply units, manufactured by Pullen Pumps Ltd, has been radically extended with the addition of both intermediate and larger models with increased capacities of up to 1000 gal/min and increased heads of up to 500 ft. These improvements have been achieved by the integration into the overall package of both Pullen ‘HV’ (high head) and ‘KH’ (high output) pumps.

The six further units have been added to the ‘Hydro-pak’ range which is now available in a total of 12 sizes.

The Hydro-pak is packaged in concept and designed to provide a completely pressurised water supply. It comprises either two or three close coupled centrifugal pumps, interconnecting pipework, together with valves, membrane tank and control panel. Smaller and lighter than conventional pressure sets, the design techniques employed eliminate the need for an air compressor and its associated controls, thus reducing both capital and running costs.

The Hydro-pak is similar in operation to conventional packaged pressure sets in which an air cushion is supplied by a compressor that replaces air lost by absorption overcoming the problem of air-locking, while automatic re-commissioning is an additional feature.

Two systems are available to meet differing customer requirements. The first is a two pump duty and standby system in which both pumps are sized to provide the maximum demand and where the function of each pump can be interchanged. The second is a three pump
PUMPS & CIRCULATORS

duty, back-up and standby system which also contains the same flexibility. The duty and back-up pumps are sized to provide the maximum demand when in joint operation and the standby pump is sized to provide 50% of this.

Further details are available from MCW, 9 Wynnfield Road, Rathmines, Dublin 6 (Tel: 976729).

Unidare Launch Stork pumps

Unidare Limited designed and manufactured its first pumps during 1953 and used the brand name 'Aquadare' a name which is still associated with their present range of pumps.

In order to cater for the individual who required water for domestic use only, or on a small farm, Unidare designed and manufactured in 1957 a ½ h.p. centrifugal jet pump. As a deep-well system it was suitable for wells down to 50 ft. As the majority of wells bored during those days were less than 80 ft. deep this 'Aquadare' range of pumps was suitable for MO requirements.

In 1962, Unidare designed and manufactured three new sizes of pumps, i.e. a ¾, 1 and 1½ h.p. pump and motor unit were separate and mounted on a common baseplate with V-belt drive. These new pumps extended Unidare’s maximum operating depth down to 160 ft. with larger capacities available, thereby catering for the larger farming communities, horticulturalists, schools, hotels, etc.

In 1972 Unidare manufactured and introduced to the Irish and overseas markets the 'Supercell' diaphragm pressure tank, which is still available, incorporates a patented Butyl rubber diaphragm with a sealed-in compressed air cushion and eliminates the need for an air charging device.

In 1974 Unidare redesigned their ½, ⅔ and 1 h.p. improving their outputs and maximum depth ranges by some 20-30 ft. To meet the demands for larger pumps they in 1976, redesigned their 1½ h.p. unit, designed and manufactured a 2 and 3 h.p. pump. The 3 h.p. extended their depth range down to 300 ft with operating pressures up to 100 p.s.i. Unidare also introduced at this time their range of Aquacell diaphragm pressure tanks.

Unidare presently manufacture a range of pumps in sizes ¾, ½, ⅔, 1, 1½, 2 and 3 h.p. as follows:

1. Centrifugal pumps.
2. Shallow-well centrifugal jet pumps and automatic pressure water systems.
3. Deep-well centrifugal jet pumps and automatic pressure water systems.

Capacities available range from 100-2,500 gallons per hour at operating pressures from 15-30 p.s.i. to 80-100 p.s.i.

At the IHVex exhibition Unidare introduced a new range of domestic and industrial circulating pumps, in addition Unidare have recently been appointed distributors of Stork tractor, liquid manure and wash down pumps. This latest addition to the Unidare range will extend their involvement in supplying pumping equipment to the farming community.

Further information can be obtained from Unidare, Finglas, Dublin 11, (Tel: 771801 Telex: 5141).

UNIT 2 PUMPS NEW FOR MYSON

New to the Myson pump scene is the two speed 'Unit 2'. Suitable for LPHW central heating systems, it will replace the 'L' series which had eight different models.

The Myson 'R' range with 1½” flanges is available in three models, suitable for single or threephase electrical supply with an option of bronze construction. This range is designed for the light industrial market with the 'MSK' range, which has models from 2” to 6” covering the larger industrial market. Myson also supply twin 'MSK' models with equal or unequal units, shallow or deep well pump sets, in-line booster pumps and submersible units from ½ to 3 h.p.

Further details available from Myson Ireland Ltd, Parkmore Industrial Estate, Long Mile Rd, Dublin 12, (Tel: 509075).
Unidare pumps do exactly what we've designed them for — pump water all day, all night, year in year out, all over Ireland. It's their reliability backed by our Service — the kind of service that can only be given to an Irish manufactured pump. So when you want to pump, pump, pump, pump — get Aquadare.

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AWARDS

John Harris and Brian McGuire are the joint first prize winners in the CIBS’ first student awards scheme. Each wins £150. "Judging was particularly difficult", a CIBS spokesman said, "because of the great deal of work a number of students had put into their projects. When it came to a final decision, we felt that both John Harris, for his paper "Design of Industrial Steel Chimneys" and Brian McGuire, for his thesis "Water Treatment" deserved top winning recognition and therefore awarded them both first prize." A Cosgrove received third place honours for his work on energy conservation. An edited version of Mr Harris’ paper appears below. Mr McGuire’s will appear in the next issue of H&V News.

The correct design of chimneys and flue systems is essential to the satisfactory operation of fuel burning plant. At first sight, a chimney is a very simple device however it is only when its function is closely studied and understood, that its complexities can be appreciated and its effect on the ultimate performance of the plant can be assessed.

If a chimney is to satisfy all requirements, the viewpoint of at least four people must be considered:—

the architect who frequently desires a chimney of low height which will not spoil the appearance of his building;

the fuel or heating engineer, who is primarily concerned with the cross sectional area sufficient to pass the volume of waste gases produced by the fuel in burning, and the draught or back pressure that will be created under operating conditions;

the civil engineer, whose interest lies in the method of construction and the materials to be used; and

the public health inspector, who requires a chimney of sufficient height to disperse waste gases while giving an acceptable dilution at ground level and ensuring that the downwash of the waste gas plume around adjacent buildings is avoided.

The function of the chimney is to conduct gases to a safe height and to maintain their temperature while doing so.

Industrial Steel Chimneys

Engineering Side:

The widespread use of steel in chimney construction has raised problems which make the chimney a vulnerable component of any boiler plant. Corrosion, with its attendant problem of smut emission, can take place in a very active form when the acid produced in the combustion process is allowed to condense on the metal surfaces. In an ordinary steel chimney, the high thermal conductivity of the walls results in a relatively low metal temperature which can fall below the acid dewpoint, thus promoting these corrosive conditions. Over the years, the increasing efficiency of boiler plant and a consequent reduction in flue gas temperature has aggravated the problem to such an extent that avoiding action has had to be taken on a general scale.

Acid dewpoint conditions vary with the percentage CO2 in the gases. Fig 1 shows that even a marginal change can have a major effect on the acid dewpoint temperature.

The problem is inevitable one of temperature. Consider, for example, an ordinary chimney. The high heat transfer rate not only causes the gas temperature to rise rapidly towards the top of the chimney, but the metal temperature is, at each point, much below that of the gas. Now effective insulation of the chimney wall reduces both the temperature drop and keeps the temperature of the inner metal surface much closer to that of the gas. The metal temperature therefore remains above the dewpoint throughout the length of the chimney. A well-known insulated chimney is the Dibore which consists of a double skin made of mild steel with a 0.625 inch air gap filled with two sheets of aluminium foil. The inside of the outer skin and the outside of the inner skin are painted with a heat resistant aluminium paint thus four reflective surfaces are provided.

Heavier gauge structural steel is utilised on the outside shell and a lighter gauge inner covering is designed to expand freely by means of expansion flanges at 15 ft. intervals up the height of the chimney. This construction has a thermal efficiency of about 20 per cent more than the original aluminium clad flue.

It would be wrong to believe that the insulation of a chimney only prevents smut and corrosion. A higher average gas temperature in the chimney, for example, increases the natural draught, which combined with a higher velocity at the top of the chimney allows the gases to be ejected to a higher level in the atmosphere.

The cool outer surface of the metal also ensures longer life to paint finishes, and, of course, the chimney keeps much cleaner on the inside and does not require frequent sweeping.

It must be realised though, despite all the benefits of an insulated chimney that not all have been built this way. There are, in fact cases where protection must be provided for an existing chimney which is still in good condition.

A very effective treatment takes the form of aluminium cladding which can be applied while the chimney is still in service. This calls for 16SWG aluminium cladding sheets pre-rolled to just over half the circumference of the chimney. When these are placed around the chimney with their longitudinal edges overlapping, a 1/4" air space is left between the sheets and the chimney proper. At the circumferential overlap, a clamping band is fitted while at the top of the chimney a capping ring of heavy gauge aluminium is fitted. This ring drops down over the outside of the cladding and also fits closely onto the inside of the chimney proper. Experience in the operation of insulated chimneys over a number of years has provided ample proof that there is little, if any, measurable corrosion of the steelwork in such cases. With any type of chimney, some condensation may be expected during the warming up period and trouble may occur. The inner skin of the insulated chimney though heats up very quickly and so minimizes this. If, however, the temperature of the gas at the base of the chimney does not rise above the dew-
point, problems will arise, no matter how efficient the chimney insulation.

The major source of trouble, though, is the turn down factor. With light loads, not only is the temperature of the gas lower at the bottom of the chimney, but its lower speed causes its temperature and that of the metal to rise more rapidly towards the top of the chimney.

If, the gas speed is sufficiently low at the top, outside air is drawn down into the chimney at the periphery, while hot gases are rising at the centre. This process is known as inversion, and, along with other factors, it can bring the metal temperature down below the acid dewpoint if the design speed of the gas is not high enough. Inversion can occur at a gas speed of around 10 ft/sec, so that full load speeds have to be of the order of 60 to 80 ft/sec or even more to avoid it. This calls for quite an appreciable fan pressure. By fitting a cone shaped reducing section at the top of the chimneys, inversion can be avoided. But again allowances have to be made for the increased pressure required under full load conditions.

Another point to note is that if gases are discharged into the chimney above the base, the lower section of the chimney should be isolated. This can be achieved by fitting a closing plate across the section below the inlet, otherwise violent turbulence would cause a significant loss of heat through the wall and a corresponding drop in gas temperature.

One final point which applies only to multiboiler installations. Trouble can arise when one or more boilers is not in use. Therefore, in order to maintain high gas speeds, the chimneys should be divided to provide a flue passage connected to each boiler. If the chimney is of the double skin type, unequal expansion troubles are overcome by having the inside skin flexibly mounted at the flanges as already described. The divisions themselves can be arranged to give any required proportioning of the cross sectional area and they can themselves be insulated by various methods.

The Environmental Side

Insulation of chimneys received its main impetus when it became customary to operate lower temperatures at the

Design Pointers

(1) The volume of flue gas to be handled must be assessed realistically for both maximum AND minimum load.

(2) Unless chimney gas efflux velocities are maintained above a minimum value, depending upon the wind condition across the chimney outlet, downwashing of flue gases will occur on the leeward side. Clean Air Act Memorandum on Chimney Heights stipulates minimum full load efflux velocities of 6m/s for natural draught and 7.5m/s for fan forced or induced draught installations.

(3) The turn-down of load which can normally be catered for with mechanical draught can be up to 6:1.

(4) Where square or rectangular flues are used, the effective area for calculation purposes is taken to be the area of the circle or "ellipse" that can be enclosed within the square or rectangle.

(5) On plants incorporating "on-off" burner equipment, the effective area of the flue should not be less than that provided by the appliance manufacturer.
(6) When the chimney height required by local authorities would create a greater draught than is necessary to maintain constant pressure conditions in the combustion zone, the draught should be controlled by a furnace pressure controller or a damper — preferably of the venetian blind type. The former is the most positive and effective form of draught control.

(7) Total friction loss in the flue system is the summation of all the pressure drops, including loss through the appliance where appropriate. ALL straight lengths, bends, changes of section, changes of gas flow direction, and discharge loss at chimney terminal MUST BE ACCOUNTED FOR.

(8) Friction loss at discharge depends upon the square of the velocity. A chimney fitted with an insulated truncated cone, having a final diameter equal to HALF the chimney diameter, would have an energy loss at discharge FOUR TIMES AS GREAT as an equivalent chimney without a cone.

(9) Friction losses can be reduced by ensuring that the system is:
- Free from sharp bends or turns
- Flues are inclined upwards at an angle of NOT LESS THAN 135° to the chimney entry.
- Similarly, flues from multiple appliances entering a common header should be inclined towards the gas flow.

(10) Heat loss in a flue system depends mainly on the materials of construction. The selected construction must maintain the INNER SURFACE TEMPERATURE AT THE CHIMNEY TERMINAL above the acid dewpoint temperature of the waste gases. Heat losses from a chimney are related to the OVERALL heat transfer coefficient, which embraces the external and internal film coefficient, and the thermal conductivity of the chimney layer.

(11) Flue gas temperatures are normally quoted by boiler manufacturers and may vary between 330 and 450°F. (With acid dewpoint in the region of 280 to 285°F, the task of designing a steel chimney becomes formidable on a back end temperature of 330°F.)

(12) The most widely used standard specification for steel chimneys is BSS 4076 which allows a structural deflection limit of 6 inches per 100 ft.

(13) Design velocities at full load should be as HIGH as possible and it is common practice to operate on (40 to 50 ft/sec). At low load it is preferable to maintain the velocity at not less than 12.15 ft/sec.

(14) The aero-dynamic stability of the chimney must be considered. Should the height-to-diameter ratio exceed 10:1, the fitting of an anti-oscillation device such as the helical strakes developed by the National Physical Laboratory should be investigated.

(15) Accelerator or Truncated Cones:
- Accelerate flue gas velocity at low loads.
- Prevent inversion.
- Sometimes win a reduction in chimney height.
- Beware too much resistance on the induced draft fan and inadequate additional velocity benefit to make the cone a worthwhile proposition.
- Some boilers operate on high flue gas velocities and their flue diameters can be kept down to a minimum, but the higher the velocity the less practical is the proposition of fitting an accelerator cone.

- Any cone proposed for increasing flue gas velocity at LOW loads must always be carefully considered for its effect on available fan power at FULL load.

From talking to design engineers, I have found that it is imperative that the chimney designer knows all the facts at the design stage. If he is provided with this information, he will design to combat the problems of an installation. Inadequate detail can mean an incorrectly designed chimney which could possibly reduce the operation life with considerable cost involved.

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