IRISH H&V NEWS
OCTOBER 1979

INSULATION —
Thermal and Sound

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1979
The Thorn oil boiler’s got nothing on it for garages and outhouses.

Now the highly successful range of Thorn oil boilers can be a real working proposition in those more out-of-the-way places.

Garages and outhouses have now come within the range of Thorn oil heating simply by removing our boiler’s smart outer casing. Leaving you with the highly efficient inner workings.

The only thing that’s cheapened is the price.

There’s a Riello burner. Which speaks for itself. A performance that’s as impressive as the conventionally-cased model. All providing lots of warmth and lashings of hot water.

And the nice thing about it is you don’t have to make a performance out of putting it all together.

The electrical centre’s easy to connect. The maintenance is easy too. Just once a year.

And you’ve got the total backing of Thorn service and after-sales. With spares readily available here in Ireland.

Get yourself warmed to Thorn.

The Thorn range of oil boilers are fully-automatic pressure-jet units with outputs up to 120,000 Btu/h.
IN THIS ISSUE

Energy Conservation and Water Treatment

Heatair '79

Formally known as the Heat and Power exhibition, Heatair 79 was a very successful show for The Institute of Energy who sponsored it and W.H.C. Industrial Promotions Ltd who promoted it. On show were the latest in steam and hot water boilers, burners and control equipment. A total of 50 stands represented over 500 companies for the story and pictures see page 35.

Insulation

This months products feature is on Insulation both sound and thermal and looks at the array of products now available on the market.

The Law and Building Services

Coinciding with this month's feature on insulation Ben Costello looks at the law and insulation and how buildings may or may not comply with regulations even after insulating certain parts of the building see page 16.

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IHVN NEWSDESK

INSULATION COMPANY OPENS MUNSTER OFFICE

Sheffield Insulations (Ireland) Ltd. has now opened a new sales office in Cork City. The office at 11 South Mall, will provide architects, building contractors and engineers in Munster with an advisory and order centre for a wide range of insulation material. The manager of the new Cork office is Gerry Higgins, who was formerly on the marketing staff of Fibreglass Ltd. His assistant is Patricia McGrath.

Although only set up in 1976 Sheffield Insulations (Ireland) Ltd. has grown to become the largest independent stockist and distributor of insulation products in Ireland, supplying products from major insulation manufacturers both in Ireland and abroad. In addition to supplying insulation material Sheffield Insulations now has a Contracts Division which was established last month and which is equipped to tackle a wide range of insulation problems in business and industry. Already this division has been awarded a substantial contract from the E.S.B. for attic insulations.

Chief Executive of Sheffield Insulations (Ireland) Ltd. is Donal Scannell, who has had considerable experience of the insulation industry in Britain and Ireland. He heads a total staff of 40, most of whom are employed at Sheffield’s headquarters in Dublin. Another Sheffield Insulations office, this time in Galway will be opened in October.

ACEC New Plant

The Electricity Supply Board awarded an order to Whessoe (Ireland) Ltd. for sea-water pipework for Aghada Power Station, Cork, covering the manufacture, supply, delivery and erection on site. 10mm and 15mm plate was used. The pipes are used for conveying sea-water at a very special paint finish to the internal surfaces is essential. Value of the contract was £100,000.000, Whessoe also supplied pipework for Great Island Power Station, Wexford.

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PLUMBING’S GOLDEN GIRL

Almost 300 young men and women from fourteen countries throughout the world took part last month in the Silver Jubilee International Apprentice Competitions held in Cork. This was the second time for the competitions to be held in Ireland, the first being in Dublin in 1963. Competitions were held in thirty-four different trades with the Irish team of twenty-four young apprentices putting in their best ever performance in the competitions taking one gold medal in the house wiring section, seven bronze medals in the electric welding, industrial wiring, bricklaying, plasterwork, carpentry, automobile mechanics and cookery trades, honourable mentions in the press toolmaking and turning sections and one diploma of merit in joinery.

Michigo Iwama was the first girl ever to compete in the plumbing section of the International Apprentice Competition.

Twenty year old Michigo is the first girl to take part in any of the heretofore male dominated trades in the Olympics of Work and Technique.

Throughout the competitions the spectators gallery above the plumbing work shop was always full with visitors queueing to view Japan’s tiny track suited entrant at work which only added to the pressures of International Competition.

One of a family of two girls Michigo always wanted to follow in her father’s footsteps as a plumber. On leaving school she joined the firm of Mr. S. Yamada where she is at present serving her apprenticeship. Earlier this year she competed in Japan’s National Apprentice Competitions and won the gold medal. Mr. Yamada said that he was very proud of Michigo winning the gold medal but also of the fact of her working at the trade as very few girls in Japan opt for any of the hard trades in areas which are normally looked on as men’s work.
SANBRA FYFFE
SAFLO
SETS A NEW STANDARD IN TAPS

The old British Standard BS 1010 laid down dimensional control of pillar taps. Performance is the heart of the new BS 5412 which replaces it. SAFLO, the first diaphragm tap in Ireland has been designed and produced by Sanbra Fyffe to BS 5412 and many exacting mechanical and hydraulic characteristics are embodied in these stylish new taps to give superb performance and ease of maintenance. Not surprising that these quality Irish taps have been approved by Dublin Corporation. You’ll approve of them, too!

5-fluted acrylic control is virtually tamper-proof and shaped for non-slip opening and positive closure.

The precision flow-straightener delivers a controlled jet of water.

The rubber seating washer combines with a flexible diaphragm and flange in a one-piece moulding. This seal completely isolates the tap mechanism from the water.

Sanbra Fyffe Ltd.
Conex Works, Santry Avenue,
Telex 5325.
Levis Filters
To Start Again

In 1968 Robert Levis of Levis Engineering in Cork, developed and patented the revolutionary Levis Filter that uses foam rubber instead of sand as a medium. One of the principle features of the Levis Filter is the unique cartridge replacement system that enables a badly fouled Filter Foam on a Mark 111 Levis Filter (rate of filtration 15/20 thousand gallons per hour) to be changed within an hour, greatly reducing factory down time and production losses. In the late 1960’s and early 1970’s over 40 of these filters were sold in Ireland to Factories, Hotels, and Farms but the unfortunate death of Mr. Levis in the early 1970’s caused production of the filters to cease. Last year however, the Fluid Dynamics Group of Blackrock, Co. Dublin were approached and asked if they would wish to re-commence the manufacture of Levis Filters and Levis Filtration Ltd. has been formed as a result of this.

I.D.A. Grants
With the assistance of the I.D.A. research and development programme a prototype unit has been manufactured and alternatives to the current Mild Steel Construction investigated.

Quotations for over £30,000.00 worth of filters have been submitted in the past 3 months including units for export and the new Company is hopeful of receiving at least one order for the Mark 111 Duplex Filter Packages it is now offering. The Company offers a mobile testing service that enables on site testing of potential clients waters to enable the optimum foam pore size to be chosen for each application. Sizes range from a filtration capability of 2,000 gph to 20,000 gph.

Further information from Levis Filtration Ltd, 36 Sweetman Avenue, Blackrock, Co. Dublin, (Tel: 888134)

BTU Match Play Final Weekend

Originally the match play final was to be played in Wexford GC but due to bad weather the entire weekends golf was transferred to Rosslare GC, so much for "the sunny south east". The result of the final was Tony Jennings beat Eddie Reynolds 2 and 1 on the Friday (Aug 31st). The following days golf at Rosslare at which only 14 holes were played resulted in the following: 1st Frank Summers, 26, 2nd Liam Stenson, 26, 3rd Eamon Cullen, 26, 4th Eddie Reynolds, 24, 5th Leo Lynch, 23, 6th Gerry Barker, 23, 7th Dennis Browne, 22, 8th Des Bindley, 22, 9th Peter Reynolds, 20, and 10th Eddie Egan, 20.

BTU Golf Outing At Hermitage

Veha Radiators Limited sponsored the fifth BTU golf outing of the year at Hermitage GC. Fifty eight players teed off and the first dozen or so were caught in bad morning weather, but that cleared up later and the rest of the day was reasonable golfing weather. The overall winner on the day was Des Ryan who ended up 3 clear of the field with 40 points (18 handicap).


(Left to right): John Pickerill, Director Veha Ltd., presenting a portable TV to the overall winner Des Ryan at the BTU Golf Outing at Hermitage G.C., congratulating Des is BTU Captain Liam Stenson.
Pictured prior to their departure for Niederbronn in France are a party of thirty-nine members of AHL staff and contracting firms who install De Dietrich solid fuel cookers. The trip involving an intensive two day course at the De Dietrich plant, was jointly sponsored by Associated Hardware Limited and De Dietrich themselves. The AHL group represents 44 independent hardware stores throughout the country and distributes the range of De Dietrich solid fuel cookers in Ireland.

### COAL BURNING TO BE STUDIED IN SWEDEN

The Swedish State Power Board is to conduct an in-depth investigation into the best means of solving the environmental and health problems inherent in the burning of coal. Sweden must greatly increase her consumption of coal if she is to reduce her dependence on oil, but this presupposes that the risks involved in such a step be solved in advance, it is stated. The project — dubbed KHM — is scheduled for completion in 1982. The Board will be assisted by other power companies, local authorities, and other interested parties. Sweden's current consumption of coal is of the order of 2.3 million tons annually but is expected to increase many times over by 2000. The additional volumes in question would mainly be used in district heating plants, in the pulp & paper sector, steelworks, etc.

It is envisaged that the project will result in solutions to problems associated with the air, water, and ground pollution occasioned by the burning of coal and in the handling and storage of soot and clinker. The study will therefore encompass five component projects centering, respectively, on transportation, combustion, waste, environmental effects, and health effects. The project will be conducted in consultation with the Environment Protection Board, the Board of Occupational Safety and Health, and the National Industrial Board. With the current swing to coal in Ireland a close eye should be kept on the progress of this report.
LENNOX DROP 'SMALL DOMESTIC'

In a surprise announcement today, Basingstoke HVAC manufacturers Lennox Industries Limited stated their intention to phase out manufacture of their smaller domestic warm air heating units to make increased production capacity and improved customer service available for their commercial and industrial ranges.

"We certainly haven't lost interest in the domestic market", said Lennox Managing Director Don Munson, "and we shall still continue to offer larger units and 'total comfort' systems for high-grade housing. However, the enormous success which we have enjoyed this year with our commercial and industrial heating, ventilating and air conditioning ranges — and particularly the recently launched modular 'HV' range — has put quite a strain on our production facilities.

After existing and planned orders are fulfilled, Lennox will phase out gas-fired domestic air heater models GR6, G33R, G43R and G31R, but will continue to provide full spares and warranty back-up in line with British Gas Approvals requirements.

Lennox is distributed in Ireland by C. & F. Ltd.

Bord Na Mona

The heating ventilating and air conditioning control system at the Bord-na-Mona headquarters, which was damaged recently by fire, is to be completely refurbished by T.C.S.

VENTAC SOUNDS GOOD

Ventac & Co. Limited in conjunction with Sound Attenuators Limited recently held a Lecture on Noise and Vibration Control, in the Green Isle Hotel, Dublin. The Lecture was presented by Alan Fry, BSc., ARCS.A.Inst.P., Technical Director of Sound Attenuators. The first half of the Lecture covered such subjects as duct borne, break-out, and generating noise in H & V low velocity and high velocity systems, and was illustrated with slides. The second part of the Lecture illustrated the control of vibration in fans, chillers, diesel generators, etc., and was very well demonstrated using small enclosures and an out of balance motor, anti-vibration mountings and a visual indicator to show the noise reduction achieved by various enclosure and mounting methods. Rather than concentrating on the pure theory of the subjects the lecture had a great deal of practical content, and Alan Fry comes out as one of the best lecturers we have heard on this particular subject in a long time.

DIRECTORY HEATING AND ENERGY SAVING

Conservation in the domestic sector was the key to energy saving in Ireland, said Gerry Duggan a speaker at the District Heating and Energy Saving Symposium sponsored by the Royal Danish Embassy in co-operation with the Energy Conservation and District Heating Association of Ireland. The venue was the new Arts Building in Trinity College Dublin a very modern setting for a subject which may play a vital role in our future heating patterns. Mr. Duggan went on to say that 1/3 of the energy input into the domestic sector was lost and this situation could not be allowed to continue for much longer. In his opinion one of the best methods of reducing this enormous loss is to use central boilers to heat our towns and cities using the Danish experience and develop district heating schemes.

A number of other speakers also presented the case for district heating including Mr. P. Kelso Robinson, Chief Engineer, Northern Ireland Housing Executive and speakers from Denmark who could call on experience going back to the 1920's.

One thing became clear during the symposium and that was that District Heating could be suitable for Irish conditions providing that the government was willing to invest capital in the project.

FIRE FOR IRISH MARKET

The Swedish-built Keddy Superfire, a feature fireplace complete with flue, is to be distributed in Ireland by Dublin builders providers, C.P. Gloroney Ltd.

This fire has a 90 per cent efficiency, the manufacturers claim. It features separate ducts for the intake of cold air and the outflow of hot air and C.P. Gloroney, who are marketing it in six styles, see it as one option for owners of houses built without fireplaces.

Also marketed now by the same company in Ireland are three French-built Godin heating stoves — a compact room heater and two larger models suitable for various types of out for various types of out-houses and huts, according to the distributors.

DIRECTORY ADDITION

Following our Refrigeration directory in the August edition Cross Refrigeration have asked us to point out the following: That they are exclusive distributors for Craig-Nicol, Reeco and Colrock, and also that they share distribution rights for Foster with two other companies in this country.
HOME HEATING SYSTEMS AND INSULATING CONFERENCE

An extremely well attended conference was held in the Burlington Hotel Dublin on the 25th September last on the subject of Home Heating Systems and Insulation. The conference was jointly sponsored by the Institute for Industrial Research and Standards and the Construction Industry Federation. The main aim was to demonstrate the practical options available to architects, builders, and engineers which will enable them to meet both legal requirements and consumers’ demands.

There were seven speakers at the conference and the subjects spoken on varied from insulation to solid fuel heating systems and a very detailed paper from Hugh Clyne of the IIRS on the options in the domestic heating fuel market was also presented.

In conjunction with the conference a small exhibition was organised in the hotel and a selection of heating and insulation products were on display.

The evening was rounded off by more social activities for which we are truly grateful.

Pictured at the joint Inst. Industrial Research and Standards Construction Industry Federation Conference at the Burlington Hotel, Dublin were (left to right): Raymond Duffy (President C.I.F.); Ray Burke T.D. Minister of State at the Department of Industry Commerce & Energy, who opened the Conference and T.J. Whinn Assistant Director General I.I.R.S.
HENDRONS GOLF OUTING

A turn out of 60 golfers enjoyed a good day's golf at Newlands G.C. recently. It was a high scoring competition with P.B. Walshe winning a TV set, with a handicap of 18 winning on 38 points on the last three from Jack Agnew.

The Results were as follows.

Class 1, 0 - 13
1st C. Browne Jnr (7) 37 points on back 9 (prize: silver tea service) 2nd Liam Stenson (11) 37 (prize: blender)
Class 2, 14 - 17
1st Owen Tansey (15) 36 points on back 9 (prize: set of tables) 2nd Eddie Egan (14) 36 points (prize: digital clock radio)
Class 3, 18 upwards
1st Jack Agnew (20) 38 points (prize: Radio Cassette) 2nd Dick Doyle (18) 35 points (prize: grill)
Front 9
Frank Du Barry (22) won on last 6 (prize: silver dish)
Back 9
Dennis Ryan (20) (prize silver dish).
Best Gross 75
Jimmy O'Neill (4)

BLUE CIRCLE
— DIA
— NORM

Blue Circle Supplies Ltd have announced that they are distributors for Dia-Norm radiators in the Republic of Ireland except in Donegal county. In a statement from Mr. P.M. Crawley, a Director of Blue Circle, he pointed out that as the radiators were manufactured in the company's factory in Donegal they were Irish made.

Stocks are available from Blue Circle stores at Galway, Dublin and heating stockists throughout the country.

Further information from: Blue Circle Supplies Ltd. John F. Kennedy Drive, Naas Road, Dublin 12, (Tel: 506618) Telex: 31693

Death
Of
Former
Chairman

Armitage Shanks Group regret to announce the death on the 17th September of Mr. C. Kenneth Stott who was closely involved with the development of Armitage Ware, subsequently Armitage Shanks Group, for fifty years until his retirement in 1974.

He was Chairman of the company for twenty five years prior to his retirement and subsequently has been President of the Group.

Kenneth Stott will be remembered by many friends and colleagues in the ceramic sanitaryware industry for his outstanding sense of duty and his genuine humility and friendliness towards others.

INTERBUILD '79

Hall 3 is the place for the services engineer at the Interbuild exhibition to be held at the NEC Birmingham Dec 2-8 this year. In hall 3 will be exhibitors from the air conditioning, heating, plumbing and integrated environmental services industries and such names as Armitage Shanks, Bartol, Chloride Shires, and Trianco Redfyre will be launching new products on the market at the show.

Further information from: Interbuild Ticket Office, 11 Manchester Square, London W1M 5AB, Tel: 031 486 1951 Telex 24591 Montex G

HEATONS ESTABLISH IRISH SALES NETWORK

In line with their current sales drive, Heatons Bathrooms Limited of Rotherham, have negotiated a new Distributor/Stockist arrangement to improve sales, service and distribution of the company's full range of baths and associated fittings in Ireland.

Ferguson (Ireland) Ltd. of Trench Road, Mallusk, Newtownabbey, Co. Antrim, will carry large stocks of Heatons products for the benefit of merchants throughout Northern Ireland. Sales and service in Southern Ireland will be handled by Kenneth Lee Limited, Unit A20, Ballyfermot Industrial Estate, Ballyfermot Road, Dublin 10, as wholesale distributors of Heatons products to the total merchant trade.

This latest move by Heatons has been prompted by a steadily increasing volume of sales in Ireland during the past 18 months supported by market research into future sales potential.
ARE PLEASED TO INTRODUCE THEIR NEW GUARANTEED IRISH MULTI FUELED BOILER.

"THE EURO FUELMASTER"
Solid Fuel/Oil Boiler

* Meets highest British & Continental standards ie BS 693 & 24-40.
* Burns all types of fuel - Antricite, Coal, Turf, Logs, Coke & Oil.
* Constructed from 6 mm high quality steel plate.
* Pressure tested to 5 ATUs 60,000 BTU/h solid fuel or 77,000 BTU/h oil.
* 50 mm high density insulation for maximum thermal efficiency.
* Suitable for ANY leading make of oil burner unit.

Now available in Dublin from Chadwicks Monsell Mitchell & Tradfire
Also available countrywide through any of Chadwicks 9 Provincial Branches
Shannon Effluent Plant

One of the most modern effluent treatment plants in Ireland has been installed at Shannon. Costing in the region of £2 million, and assisted by the EEC Regional Development Fund, it is designed to cater for a future Shannon Town population of 25,000 and an Industrial Estate workforce of 10,000. The modern industrial and domestic sewerage treatment works is located at Tradaree Point, on the Estuary, three miles from Shannon Town. The plant has been commissioned by Shannon Development and the entire project has been completed on schedule by an all Irish team. This week the Minister for the Environment, Mr. Sylvestor Barrett, T.D., together with the Clare County Manager, Mr. Joseph Boland, visited the site and was shown over the project by Mr. Frank McCabe, Chairman, Shannon Development Company. The treatment works consists of two separate processes, one system to treat the domestic sewerage from the town, and the second to cater for the industrial effluent from the Estate. A feature of the new Shannon project is the 550 metre long welded steel pipeline, with a protective concrete lining, through which the final effluent is discharged into the deep water channel of the Estuary.

Main contractors for the treatment works were P.J. Walls (Dublin) Ltd., while Mahon & Phillips of Kilkenny were the Mechanical sub-contractors. Consulting Engineers were T.A. Garland and Partners, Dublin and the Institute for Industrial Research & Standards played an important role in the overall project.

HEATING & INSURANCE

The following notice has appeared in the daily newspaper,

"Industrial or commercial firms making changes in existing heating arrangements or in provision of insulation should inform their Insurance Company or Broker. Such changes, whether involving structural alterations or otherwise, would affect the validity of an insurance policy unless agreed with the Insurer."

Issued by the Federation of Insurers in Ireland.

Has a number of recent explosive situations anything to do with this notice.

BSI KITEMARK FOR FIBREGLASS

Fibreglass Limited is among the first companies to fully satisfy the requirement of the new British Standard for loft insulation in dwellings. The recently introduced standard BS 5803: Part 1 covers mineral fibre insulation mats. The standard, which was introduced after the widest possible consultation, requires a mineral fibre loft insulation mat to satisfy a large number of rigorous tests including non-combustibility, lack of settlement and non-promotion of corrosion of metal surfaces.

But the most important test is for R value, which is the thermal insulation divided by thermal conductivity. This is a real step forward because R values bring together in one unit the factors affecting a material's insulation performance. The larger the R value, the better a material's ability to insulate.

CLEAN ZONE SYSTEMS

The Howorth Exflow Clean Zone air conditioning system for operating theatres, currently the most advanced development in the prevention of airborne infection during surgery, has now become available in Ireland through T.C.S. and Mottershead, Market Development Manager of Fibreglass Limited says, "We have been advocating the R value concept for over two years. It not only simplifies the calculation of heat losses but also permits the purchaser to see straight away how good the material is at doing the job it was bought for. We view this move as a valuable progression towards the better control of insulation standards that are necessary as fuel gets more expensive by the minute".

Further details of this equipment moving towards the factory inspection facility are available from onlooking students, and it is not affected.

Another advantage is an in-built low speed facility for the fans, which reduces the energy when the theatre is not in use.
Powrmatic have done it again.

Not content with creating the best range of industrial air heating there is, they've gone one step further with a brand new range of 8 unit heaters offering heat output from 60,000 - 320,000 Btu's.

There's the GUH 60, 80, 100, 140, 160, 190, 240 & 330.

All units can be specified either axial fan for freeblowing or centrifugal fan for ducted applications.

The resulting 16 model variants offer a comprehensive choice for practically all suspended or wall mounted installations.

So ask for our literature and you can be one up too.
At the CIBS reception before the annual dinner were (left to right): Tom Reynolds, CIF; Michael Marsden, President CIBS; John O'Leary, Minister of State at the Department of Environment and Seamus Homan, CIBS Chairman Republic of Ireland Branch.

The annual CIBS dinner had both its serious and humorous sides with a tighten up our belts type speech from the Minister of State at the Department of the Environment, John O'Leary when he spoke of oil shortages and energy conservation and in contrast the well known show business personality Niall Tobin responded to the chairmans toast by entertaining with his wit, humour and recital of Brendan Behan stories.

Michael Marsden, President of CIBS announced that the third part of the CIBS Energy Conservation code will be launched shortly and that the first year of the CIBS Corporate members examination has had more students in Dublin than in the rest of the world.

Seamus Horan Chairman CIBS Irish Branch announced a programme of CIBS activities for the rest of the season and also announced the winners of the Texaco awards for students.

Part I Prize went to Paul Fitzgerald of Delap and Waller.

Part II Prize went to James Barker of the Gas company.

The following are the forthcoming events planned by CIBS:

**Thursday Nov 22nd**

Technical Meeting on Services in commercial buildings and their maintenance from the developers and managers point of view.

**Tuesday Jan 29th 1980**

All Day Seminar in the Irish Management Institute on Energy Management and Conservation in buildings, this will coincide with the launch of the new Energy Codes.

**Thursday Feb 21st 1980**

An evening of Education and Training in the Engineers club 22 Clyde Road, Dublin 4

**Saturday 8th March**

Technical visit to Cork Regional Hospital.
SERVICE DEAL FROM ATLAS COPCO

A NEW maintenance and repair deal on a fixed price for up to ten years, which was last year introduced by Atlas Copco (Ireland) Limited for users of its rotary screw compressors, has been extended to cover the company's D and E type piston machines and air dryers.

The package — called Serviceplan — contains three options: basic diagnosis, routine preventative maintenance and full maintenance and repair. Companies opting for the total plan hand over full responsibility for maintenance to Atlas Copco.

Serviceplan was first introduced in December last year; it extends for five years on the Atlas Copco GA oil-injected machines and for ten on the company's Z(ZA & ZR) type oil-free compressors. A complete rebuild of the compression unit is included in the cost of the total plan.

Prices are fixed but inflation-linked, as they are subject to adjustment in line with the BEAMA contract index.

COOLAIR ORDER FOR BAGHDAD

An export order for the supply of air conditioning grilles to a major shopping centre development in Iraq has been awarded to Dublin air conditioning specialists Coolair Limited. The Barber & Coleman grilles, which Coolair distribute in Ireland, are to be installed at the 150,000 sq. ft Mansoor Shopping Complex in Baghdad. Climate Engineering of Dublin are the air conditioning contractors on the project.

L.P.H.W. Perpetual Trophy

Association football received a major boost when the L.P.H.W. Perpetual Trophy competition was revived this year. The creme de la creme of soccer players in the H&V industry took to the field and battled all summer to determine who had the top team in the industry.

The final was fought between the teams for P J O'Reilly's and Modern Plant, in a close game the final victors were the Modern Plant team. All was not lost for O'Reilly's as I'm sure I saw Ciaran Casey chatting to Johnny Giles who I'm sure was not there for the good of his health. Will there be some big transfers in the offing? Watch this page for the news as it comes in. The final score-line was Modern Plant 4, P J O'Reilly 2.

The teams were as follows:

Modern Plant

P J O'Reilly

The sponsors of the Perpetual Trophy were Quadrant Engineers and other sponsors were Redbro, MCW, Hale Heating Services, Lowara, HR Holfeld, and Veha Supplies, the committee wish to thank all these sponsors and everyone else involved in the competition making it the most successful one to date.

Still smiling but a little sad the vanquished P J O'Reilly Team at the LPHW presentation.

(Left to right): Ciaran Casey (P J O'Reilly) handing over the LPHW Perpetual Trophy to Eugene Martin (Modern Plant).

Winners of the LPHW Perpetual Trophy the Modern Plant Team.
A Vise-Grip plier is an adjustable wrench. It can fit all sizes, standard and metric. It’s a portable clamp with a wire-cutter. It’s a super pliers that locks! Get Vise-Grip locking pliers. It can do more jobs — easier and faster — than any other hand tool.

Available in three sizes.
5" £3.59
7" £4.16
10" £4.50

Recommended Retail Price

VISE-GRIP®
The first name in locking hand tools

VISE-GRIP is a trademark of Petersen Mfg. Co., U.S.A.

Mr. P.J. McDonald, has been appointed Financial Director of Brennan Air-conditioning Ltd; Brennan Maintenance Services Ltd; Brennan Controls Ltd; and L.C. Distributors Ltd. All companies within the Brennan Group.

Paul, who was, Chief Accountant has had a long association with the H. & V. Trade.

Michael Monaghan has been appointed to the board of Hall-Thermotank Ireland Ltd.

The following have been appointed to the board of directors of Heiton McFerran Ltd. Mr Roger Hermon and Mr Charles Craig. Mr Malcolm McDonald has been appointed to the board of directors of John Myles Ltd — a subsidiary of the Heiton Holdings Group.

Tony Madden has been made responsible for sales for the new HRP Walker Branch of Walker Air Conditioning Limited, Dublin. He first joined Walker in 1971 and in his new position, which he takes up immediately, he reports to Managing Director Jim Anderson. He has extensive experience of the refrigeration trade and his Carlyle product knowledge will be of value to the new operation which, besides wholesaling all the big brand name refrigeration and air conditioning components and refrigerants previously available from HRP Ireland Limited, will also be offering the Carlyle 5 series open compressors, window units and split systems.

Mr. Pat McCluskey has been appointed Application Engineer with Brennan Air-conditioning Ltd.

Pat has recently returned from America where he worked for many years with some of the major companies involved with the Airconditioning Industry. He brings with him a vast knowledge and experience of Refrigeration and Air-conditioning.
HRP Walker
An unfamiliar name for many familiar brands.

Isceon refrigerant, DWM Copeland condensing units, Myson coolers and condensers, Teddington thermostats and expansion valves, KMP driers, Imperial Gould Servicing Tools, Aspera compressors and condensing units, Watsco line valves, LEC condensing units and compressors, Ranco controls, Danfoss compressors and condensing units, Armaflex insulation, Yorkshire Imperial copper tube and Sabroe components.

All these top quality products are now available from HRP Walker, a Branch of Walker Air Conditioning Limited, following the acquisition of the assets of HRP Ireland Limited.

The best products: the best service: HRP Walker.

Harmonstown Road, Artane, Dublin 5.
Telephone Dublin 336046 and 316056

HRP Walker, a Branch of Walker Air Conditioning Limited, a member of the Jefferson Smurfit Group.
THE LAW AND BUILDING SERVICES DESIGN

SECTION VI
Housing — Construction, Thermal Insulation and Services

(By Ben Costelloe)

Three documents are considered in this section; these are:
1. The Corporation of Dublin, Bye Laws with respect to the Construction of Buildings (1949)
2. Outline specification for the Erection of a Grant Type House
3. Draft Building Regulations 1976

In the past two decades several housing and planning acts have been passed by the Oireachtas. The 1966 and 1970 housing acts in particular have dealt with the provision of grants depending on the number of rooms and the extent of services provided. Further sections consider dwellings for the elderly which was itself the concern of a government report in 1968. "Reconstructed houses fitted with a bathroom were entitled to other grants. Both these acts have, however, been extensively amended in recent years and the current legislation should be consulted by those seeking accurate information.

The housing acts are not considered in this report except to mention the definition of overcrowding laid out in the 1966 act (No 21). A room is overcrowded if "the free air space in any room used as a sleeping apartment, for any person is less than 400 cubic feet" (11.1 m³). "the height of the room if it exceeds eight feet being taken as eight feet for the purpose of calculating free air space". A room therefore which measured 1.8 m wide, 2.2 m long and 2.4 m high is overcrowded and cannot be used as a bedroom. This sets a limit to the dimensions of the so called "box room" characteristic of the modern semi.

Dublin Corporation Bye Laws (1949)

Wall Cavities

8(3)1 The cavity shall through out be of a width not less than two inches (50 MM) and not more than six inches (150 MM)
(3)(VI) The cavity shall be unventilated; shall be provided with adequate means of seepage outwards beyond the outer face of the wall, and shall extend downwards not less than 9" (225 MM) below the level of both damp proof courses.

This regulation has obvious implications for insulated cavities where in some cases the insulation bridges the cavity.

This bye-law makes little specific mention of services except in connection with chimney flues and above ground drainage.

47. "No flue shall be connected with more than one fireplace or heating apparatus. Provided that a flue may be used for more than one fire if such fires are in the same room or enclosed space."

48. "Unless as otherwise expressly provided in these bye-laws no flue shall be less than seven and a half inches across (187 mm) in every direction."

49. "The inside of every flue forming part of a chimney (except a flue solely for use in connection with gas fire or geyser, and the flue of a
furnace chimney shaft erected in accordance with the provisions of bye-law No.55) shall be lined through out with fireclay or stone ware not less than three quarters of an inch thick, or other equally suitable incombustible material.

Outline Specification for Grant Type House

Section 7 Plumbing

7.1 Service Pipe

Incoming service pipe to the 15mm diameter laid in trench 600 mm deep or otherwise suitably protected against frost, and connected to internal stopcock.

7.2 Cold Water Supply

From stopcock take 15 mm cold supply direct to sink with branch to high pressure ball valve in service tank. Capacity 225 litres for 3 bedroom houses or 360 litres for 4 or more bedrooms or as required by local authority. Tank to be covered and adequately supported over a partition where possible and at such height as to ensure proper working of the system. Provide 22 mm overflow from tank to discharge externally. Connect to service tank 50 mm over bottom of tank and take 22 mm feed to 150 litre hot water cylinder to I.S. 161 with 22 mm branch over top of cylinder to bath and 15 mm connections off wash hand basin and W.C.

7.3 Hot Water Supply

An adequate water heating apparatus must be provided and fitted in accordance with manufacturers instruction. Flow and return pipes, where appropriate, shall be as recommended by the manufacturer of the heating apparatus. A 22 mm copper or stainless steel expansion pipe to be taken from top of cylinder to discharge over service tank with a 22 mm do. branch to both and 15 mm connections off for was h hand basin, sink etc.

7.4 General

7.4.1 Fit full way stopcock on cold feeds from service tank and fit draw off cork at lowest convenient point of system. On no account should a stop cock be fitted on an expansion pipe.

7.4.2. Copper pipe to be not less than 18 gauge hard drawn.

7.4.3 Plastic pipes to I.S. 123, 134, or 135 where used shall be fixed at least 75 mm clear of hot pipe runs. Pipes shall be fixed in straight lines as far as possible, properly jointed with patent fittings and adequately supported and secured with proper pipe clips.

7.4.4 Storage tanks and pipes to be insulated against frost where necessary.

7.4.5. Where other domestic water heating systems are used they shall be completely designed and installed.

7.5 Pipes shall not be jointed within the thickness of a wall.

9. Electrical Installation

9.1 Electrical installation shall be in accordance with the "National Rules for Electrical Installations" obtainable from the Electro Technical Council of Ireland and shall have, in suitable locations, at least (a) one lighting outlet in every room, landing/stairway hall and corridor (b) one socket outlet in every bedroom; and three singles in every bed room. Two singles in the kitchen excluding any cooker point. One in each other habitable room, entrance hall or landing.

Conduit shall be used where cable is buried in plaster. Joists shall not be notched: where necessary the cable shall be taken through holes bored in centres of joists.

13 Ventilation

13.1 Every habitable room, kitchen, and scullery shall have an opening window area of not less than one twentieth of the room area, ventilated directly to open air.

13.3 A ventilated lobby shall be provided between any W.C. apartment and a living room, kitchen or scullery.

13.6 Garages must have permanent ventilation

14 Thermal Insulation

The standard set out in this section came into force on 1st July 1979. They are identical with the requirements of the Draft Building Regulations but "shall be regarded as recommendations only, pending the introduction of National Building Regulations" in so far as the whole building, external wall and external parts of intermediate floor is concerned.

Examples of forms of construction giving an acceptable U value for roofs and ground floors are:

- "Pitched roof of slates or tiles on battens on sarking felt — 100 mm of glass fibre laid on polythene vapour barrier over plaster slab ceiling or alternatively laid over foil backed plaster slabs."

- "Ground floors — 25 mm polystyrene 1m wide laid under floor slab and abutting outside walls."

Draft Building Regulations

Thermal Insulation

This regulation applies only to small domestic buildings and other residential buildings.

4.4 The calculated whole building U value of a dwelling shall not exceed 1.25 W/M²°C. See schedule II and paragraph H4 for details of the method of calculation.

H.3 The following are the maximum allowable U values

| External Wall | 1.1 |
| Party Wall | 1.7 |
| Floor between a dwelling and the external air | 1.1 |
| Average ground floor in contact with the earth | 0.6 |
| Roof including any ceiling to the Roof, any roof space and any ceiling below that space | 0.4 |

See extensive schedules for details.
### TABLE I

<table>
<thead>
<tr>
<th>Heat Transfer Medium</th>
<th>Area</th>
<th>Glass</th>
<th>Area x U 50% (a)</th>
<th>Area x U 50% (b)</th>
<th>Area x U 35% (c)</th>
<th>Area x U 35% (c)</th>
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</thead>
<tbody>
<tr>
<td>Roof</td>
<td>560</td>
<td>224</td>
<td>224</td>
<td>257</td>
<td>529</td>
<td>1799</td>
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<tr>
<td>Floor</td>
<td>560</td>
<td>336</td>
<td>336</td>
<td>336</td>
<td>336</td>
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<tr>
<td>Walls</td>
<td>756</td>
<td>832</td>
<td>832</td>
<td>983</td>
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<tr>
<td>Glass</td>
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<td>4234</td>
<td>529</td>
<td>1799</td>
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<tr>
<td>TOTAL</td>
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<td>5626</td>
<td>3962</td>
<td>2632</td>
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### Whole Building U value

<table>
<thead>
<tr>
<th>Area</th>
<th>U</th>
<th>A x U</th>
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<tbody>
<tr>
<td>2.13</td>
<td>1.50</td>
<td>1.3</td>
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</table>

By far the most significant requirement of these standards as far as commercial and industrial buildings are concerned is the limit to the overall U value of 1.25. If a four storey office building is considered with the following dimensions 14 M wide, 14 M high and 40 M long with:

(a) 50% single glazing of external wall
(b) 50% double glazing of external wall
(c) 30% double glazing of external wall

The table above (Table No. 1) gives the calculated overall U value of the building where the structure has the maximum U values permitted by this standard for roof, floor, and walls. As shown the area of glazing as a percentage of the external wall area would have to be reduced to about 30%, and double glazed if this requirement were to be satisfied.

Where houses are concerned, however, the overall U value of 1.25 is more easily achieved. Houses seldom have a glazed area above 25% and can usually be brought within the 1.25 figure with a wall "U" value of 0.8, (e.g., two 100mm concrete block walls with 25mm polystyrene and a cavity). Double glazing the windows could improve the overall U value of the typical semi to about 0.9 which is an improvement of 28% on the legal minimum standard. (See Table 2 and diagram).

### TABLE 2

<table>
<thead>
<tr>
<th>Typical Semi Detached House (See Sketch)</th>
<th>Area</th>
<th>U</th>
<th>A x U</th>
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<tr>
<td>Roof</td>
<td>48</td>
<td>0.4</td>
<td>19.2</td>
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<tr>
<td>Floor</td>
<td>48</td>
<td>0.6</td>
<td>28.8</td>
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<tr>
<td>Walls (15mm polystyrene with cavity)</td>
<td>77</td>
<td>1.1</td>
<td>84.7</td>
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<tr>
<td>Glass (single inc. doors)</td>
<td>19</td>
<td>5.6</td>
<td>106.4</td>
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<tr>
<td>TOTAL</td>
<td>192</td>
<td>239.1</td>
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<tr>
<td>Whole building U value</td>
<td>1.24</td>
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<tr>
<td>Roof</td>
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<td>0.4</td>
<td>19.2</td>
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<tr>
<td>Floor</td>
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<td>0.6</td>
<td>28.8</td>
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<tr>
<td>Walls (25mm polystyrene with cavity)</td>
<td>77</td>
<td>0.8</td>
<td>61.6</td>
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<tr>
<td>Glass (single inc. doors)</td>
<td>19</td>
<td>5.6</td>
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<td>Whole building U value</td>
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<td>Glass (double inc. doors)</td>
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<td>TOTAL</td>
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<td>174.2</td>
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<td>Whole building U value</td>
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<td>Glazed 50%</td>
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M* Companies marked thus are merchants and may supply a number of different types of insulation.
Thermal and Sound Insulation

Thermal insulation of buildings has three functions: to reduce the consumption on energy, control condensation, and improve comfort standards. In the present energy crisis the first function of insulation has taken a vital role in our efforts to reduce dependence on imported energy sources. In a recent report published by the Institute of Industrial Research and Standards on energy savings in housing it was revealed that almost one-third of the energy used in the Republic is consumed in the domestic sector and that the use of better insulation methods in both new and existing houses can reduce the demand for energy by as much as 55 per cent.

In the UK earlier reports from the Department of Energy show that the domestic sector use 26 per cent, a slightly lower figure than in the Republic but understandable as the industrial sector is so large in Britain. Acting on these reports governments in both countries decided to start energy conservation in the domestic sector immediately by bringing into force new insulation standards for all new local authority and grant-aided houses. Irish regulations came into force on July 1st of this year, somewhat later than in the UK where the Building Regulations have been in operation since 1976.

From July 1st 1979, all new grant-aided houses and those for which a certificate of reasonable value is required will have to comply with the following insulation standards of maximum "U" values:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Roof</td>
<td>0.40W/m²°C</td>
</tr>
<tr>
<td>Floor</td>
<td>0.60W/m²°C</td>
</tr>
<tr>
<td>External wall</td>
<td>1.10W/m²°C</td>
</tr>
<tr>
<td>External parts of intermediate floor</td>
<td>1.10W/m²°C</td>
</tr>
<tr>
<td>Whole building</td>
<td>1.25W/m²°C</td>
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</tbody>
</table>

The rate at which heat passes through any particular combination of cavities, surfaces and materials in a building’s structure is called the U value, or thermal transmittance coefficient, and is defined as the number of watts transmitted through one square metre of structure for each degree Celsius temperature difference between the air on each side. The lower the U value, the better the insulation standard.

Any material to have a good insulation property, with the exception of reflective insulating material, must have a low density and is fibrous of cellular in form with an open or closed cell structures. Examples of this are mineral fibre blankets and cellular plastic sheets which rely on entrained air for their insulating properties. Other examples which come to mind are lightweight blocks and certain types of rigid slabs, both combining certain structural properties and insulating values. In all these cases the resistance to heat flow is strongly related to moisture content and dry density; as water is a good conductor of heat, wet or damp insulation loses its capacity to resist heat flow. Apart from rising damp or a leaking water pipe, moisture may penetrate insulation by simple condensation. To protect the insulation material from condensation it is vital that a vapour barrier is provided between the room air and the insulation as it is the moisture in the air condensing on the surface of the material that causes the trouble.

In the general fabric of a building other considerations must be taken into account with insulation, such as ease of fixing, surface finish, thermal movement, fire hazard and, of course, cost. It is often easy to incorporate an insulating cavity in a wall and this can be in some cases more effective than certain forms of insulation which may be difficult to fix.

Cold bridges often occur at lintels, doors and window jambs where the warm air inside a building looses its heat through poor insulating material to the colder air outside. As the regulations mentioned earlier call for an overall U value of 1.25 maximum these areas must not be overlooked when “designing in” insulation to a building. Special care must be taken with these cold bridges as they are potential sites of condensation and mould growth.

While on the subject of condensation it is interesting to note that
Thermal and Sound Insulation

problems associated with condensation are on the increase in recent years. This appears to be due ironically to an improvement in living standards and changing social patterns. Washing machines and tumble dryers are some of the main culprits in modern kitchens causing an increased moisture content in the air; also to blame are flueless gas and paraffin heaters.

Condensation does not only form on wall surfaces but can occur within the structure where the temperature drops below the dew point beneath the surface. This is called interstitial condensation and can saturate insulation material, considerably reducing its effect. To combat this problem vapour barriers are fixed to the warm side of the insulation material to prevent condensation forming on the insulation, ensuring that all joints are as leak-proof as possible. It is almost impossible to avoid condensation totally but it can be reduced by thermal insulation, heating and controlled ventilation.

Typical heat losses from an existing uninsulated house

<table>
<thead>
<tr>
<th>Component</th>
<th>% Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>10%</td>
</tr>
<tr>
<td>Draughts</td>
<td>15%</td>
</tr>
<tr>
<td>Floor</td>
<td>15%</td>
</tr>
<tr>
<td>Roof</td>
<td>25%</td>
</tr>
<tr>
<td>Walls</td>
<td>35%</td>
</tr>
</tbody>
</table>

As can be seen from these figures, the greatest areas of heat loss are the roof and walls so these are the areas where the main insulation efforts should be.

Apart from thermal insulation of buildings to keep the heat in, another application of insulation is to keep the heat out, as in a cold store. Ireland's economy is heavily dependent on food exports, especially meat, and the entire process is dependent on low temperature storage. This has caused the supply of cold storage equipment in this country to become a flourishing business as refrigeration gives the producer a great degree of control over the ups and downs in supply and demand.

In years gone by cold stores were insulated by vacuum seals and insulation material such as cork, but now the newer insulation materials such as polystyrene and polyurethane encased between layers of sheet metal are used to construct modular sections or panels which are fixed together to form a complete unit. These modules are normally 4ft wide and 3 to 5" thick, the advantage being that they are impact resistant and of course, fire proof.

Sound Insulation

Very high levels of sound can damage hearing and if prolonged can seriously affect general health of the listener. Lower levels of sound heard by but not wanted, and not under the control of the listener can cause irritation and be a nuisance. This unwanted sound is generally referred to as noise. Minimum standards of sound insulation are primarily in response to conflicting developments in living patterns and construction. The wider use of noisy appliances and machines is a result of the extensive use of lightweight materials and methods of construction.

Any attempt to legislate for minimum standards of sound insulation will encounter difficulties because the reaction of different people to the same sound can vary considerably. Our sense of hearing also responds more readily to sounds at certain frequencies than sounds of the same intensity at other frequencies. Regulations aim to achieve a reasonable standard of sound insulation so people are not seriously disturbed and do not in turn cause disturbance by their normal activities.

Surveys indicate that traditional methods of construction give levels of insulation that are generally acceptable. However, because of the different responses to sounds at various frequencies, unlike thermal insulation, it is not appropriate to give simple average insulation values for various elements of the structure. Instead, the insulation requirement is specified for a number of frequency bands at regular intervals across a given frequency range.

The following are some of the terms and definitions used in relation to sound insulation.

Frequency: the number of "waves" or fluctuations of sound pressure which occur in a given period. The metric unit for frequency is the "hertz" (Hz) (one hertz is equal to 1 cycle per second).

Decibels: (dB): units used to measure and express sound energy and sound pressure levels. Sound pressure could be directly expressed in newtons per square metre but measured in this way the pressure variations which can be heard as sound range.
The new thermally insulated dry-lining from

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9.5 mm Gypsum wall board facing, fire resistant, easy to fix and finish, grey or manilla face, no drying out

Permanent adhesive bond

Styrofoam® IB effective insulation and water vapour check

Direct fixing by adhesive; alternatively can be nailed or screwed direct to wall or to prefixed timber battens

* Cuts Cost  * Reduces Construction Time  * Easy to fix and finish

* Ideal for New homes, upgrading existing buildings, loft conversions, internal partitioning.

Details of local stockists available from:

Sheffield Insulations
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11 South Mall, Cork. Telephone: 500244

https://arrow.tudublin.ie/bsn/vol18/iss8/1
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from 1/10,000 of 1N/m² to 100N/m². In addition to its complexity dividing this range into equal units (a linear scale) would not give an accurate indication of the relative loudness of different sounds as heard. The decibel, however, is based on a logarithmic scale which means the difference between units are not equal steps but regular proportional steps, this approximates closely to the way sound is heard and gives a manageable scale for a wide range of sound pressure levels.

A successive doubling of sound intensity is heard as an increase in loudness of roughly equal steps. The range of audible sound is about 130dB; a 1dB increase is a barely perceptible change in loudness; 2dB is a significant difference, and 3dB a memorable difference. Doubling or halving the energy corresponds to an increase or decrease of 3dB.

Some typical sound levels in decibels taken at a common frequency of 1,000 Hz are:

- 0dB — the threshold of normal hearing
- 30dB — a whisper at 1 metre
- 40dB — a quiet office
- 60dB — normal speech at 1 metre
- 140dB — threshold of pain

Sound insulation is the decibel reduction which can be attributed to a particular part of a building which is between the sound and any other location.

The sound insulation value of a construction is a fixed ratio, for example a construction giving an average insulation value of 20 dB will reduce a sound of 80 dB to 60 dB, or 40 dB to 20 dB.

Sound levels are sometimes expressed as dBA this refers to measurements made using the ‘A’ scale of a sound level meter. This weights the dB rating of a sound by a "frequency factor" to counter the difference of apparent loudness as heard between sounds at the same intensity but at different pitches.

Southern Chemicals

The present energy shortage places a major responsibility on architects, because the choice of materials can play a vital role in helping to cope with the national crisis.

Insulation is the most effective and viable option to offset the effects of lack of oil for domestic heating. Of all insulation products available expanded polystyrene is possibly the best in terms of effectiveness, viability and ease of installation.

Expanded polystyrene manufactured in Ireland by Southern Chemicals Ltd., of Askeaton, Co. Limerick, is marketed under their brand name Aerobord, which has become the generic term for expanded polystyrene in the country.

In the past 20 years, Southern Chemicals have developed many different insulation systems, which if properly used can reduce heat loss through the fabric of a building by as much as 60 per cent. For houses with cavity walls, the Aerotie system is highly effective. This system uses 40mm sheets of tongued and grooved Aerobord held in place against the inner leaf of the cavity by a patented tie. This tie also prevents moisture crossing the cavity through means of a drip-point.

To reduce heat escaping through the floor, 25mm of Aerobord should be placed under the screed. This not only insulates but also gives the floor greater resilience. To insulate a flat roof, the Aerodek system is ideal. This necessitates laying large sheets of Aerobord on top of the roof and finishing with a layer of gravel. The Aerodek system incorporates a permeable layer of Aerobord which allows water to drain off, thereby eliminating the danger of water lodging under the Aerobord.

For the insulation of existing houses two effective methods can be used. The Aerodry system fixes Aerobord to the external wall surfaces and applies an attractive weatherproof finish. By equalising interior and exterior wall temperatures and eliminating dramatic changes in temperature between day and night, summer and winter, Aerodry protects the fabric of the house itself and eliminates condensation. The system consists of a primus base, portland cement, Aerobord sheets, glass mesh reinforcing and a quartz finish. Aerodry cuts heat loss through the walls by 75 per cent in the case of 9" hollow block walls and by 50% on 11" cavity walls.

An alternative method, this time treating internal surfaces, if the Aerogyp dry lining system comprising plasterboard backed by Aerobord. The system uses aluminium battens to fix it in place, the Aerobord running behind these battens to eliminate the risk of cold bridges. Aerogyp ensures quick thermal response and helps eliminate condensation. A U-value of 0.57 can be achieved on an 11" hollow block wall using a 40mm layer
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Thermal and Sound Insulation

of Aerobord.

The Government recently introduced a minimum insulation standard for houses, setting a U-value of 1.1. For a negligible increase in outlay involving thicker insulation material this U-value can be reduced to 0.57, giving double the insulating strength.

The increased awareness by the Government of the need for adequate insulation is also reflected in the comments by the Minister for Industry Commerce and Energy in a recent RTE interview. The Minister decried the increased use of the cavity block in house building and indicated that sometime in the near future steps may be taken to reduce its continuing use.

Further details from Southern Chemicals Ltd., Askeaton, Co. Limerick, (Tel: 061 92103).

Thermaline

Coolag roofboard is among the best insulating products available on the market today, particularly where the emphasis is on high in emphasis is on high insulation requirements. having a K-Factor of 0.02 W/M/C° offers the best and most economical means of insulating roofs. Coolag roofboard is a rigid polyurethane foam faced with roller coated bitumen on glass fibre. For use with built up felt on metal, concrete or timer roof structures.

Heraperm non-combustible, rigid, roof insulation boards is formed of flame-extended, hermetically sealed beads of Perlite water-proofing agents and binders. It is featherlight, permanent, vermin and mildew resistant.

Thermaline, a rigid insulation board offers excellent thermal insulation properties with a pleasing finish at an economical price. Thermaline has decorative white coated aluminium foil laminated to polycystyanurate foam on one side with clear aluminium foil on the reverse side. Both faces will give a Class 1 surface spread of flame rating under BS476 part 7.

Caucso blaze-shield D C/F is a unique blend of mineral fibres asd cementitious binders designed for general thermal insulation installation as well as fire-proofing and acoustical insulation. It does not normally require a primary adhesive or a sealer coat, and can usually be applied (by one-coat spray) from floor level.

Full details are available from Thermodag Ltd., Robinhood Road, Naas Road, Clondalkin, Co. Dublin, (Tel: 507491).

Moy Insulation

In keeping with its policy of constant development of new products, Moy Insulation Ltd. have introduced Purlinspan, a faced insulation specifically designed for use with single skin metal roofing in factory or warehouse application. Purlinspan is a glass fibre mat developed in America by the Celotex Corporation, is a highly efficient thermal insulation due to its exceptional low thermal conductivity. Incorporating an isocynurate foam core and a reinforcement of glass fibres, Double-R is lightweight, extremely rigid and resistant to damage during on-site handling.

Three types of Double-R are available:

Roofing Grade, with bituminous felt facing on both sides for use under asphalt or built-up felt roofing systems, meets Factory Mutual approval requirements for Class 1 insulated steel roof deck and BS476 Part 3 ext. FAA.

A typical roll of Crown 75 insulation from Fibreglass Ltd.

Lining Grade, for use as an exposed lining for walls and ceilings in industrial and agricultural buildings, is faced on one side with textured aluminium foil with a washable decorative white vinyl coating and with reflective aluminium foil on the other.

Foil-Faced Grade has an aluminium foil facing on both sides and has been developed to provide an efficient layer of thermal insulation behind lining boards or in any other concealed application.

Both Lining and Foil-Faced Grades comply with the requirements of BS476, Part 7 (1971), surface spread or flame Class 1 and with BS476 Parts 5 and 6 (1968) fire propagation and ignitability — Class O.

Further details from Moy Materials Ltd., Greenhills Industrial Estate, Walkinstown, Dublin 12, (Tel: 500033, 502490).
Irish Insulation

Irish Insulation (1974) Ltd. is a specialist company involved in the supply and erection of low temperature rooms. The company was initially formed in 1970 by managing director Pat Beirne as a sister company of Irish Refrigeration to provide a complete cold storage package to industry (refrigeration plant plus cold storage erection). In 1974 both companies merged with Hall Thermotank International which was later to merge with the APV group of companies, thus from a small beginning Irish Insulation has grown to become one of the leaders in the field of cold storage erection in Ireland.

As the structure of the company has changed through the years, so also has the method of cold storage erection. Whereas ten years ago, all low temperature rooms were constructed by fixing slabs of polystyrene insulation to a block wall structure, the trend nowadays is moving towards prefabricated modular polyurethane panel erection. While the main advantage of the modular panel is the excellent insulation value of the finished room, another major factor is the speed and ease of erection, which reduces the time involved by at least a factor of four. Part of this is due to a reduction in the time consuming builders work associated with conventional insulation as block walls are no longer required. Panels are erected either inside or outside a steel structure with external cladding (if panels erected inside steel structure) and roofing the only additional work involved.

Irish Insulation (1974) Ltd. has erected several of these stores in recent years, some of which have been a complete package insulation, ie site excavation, foundations and insulation, while others have involved supply and erection of cold store only.

While the majority of cold stores being built to-day are of the modular panel construction, the company is still involved in conventional polystyrene insulation which on occasion is the system most suited or still preferred by a particular company. As well as cold storage erection, the company is also involved in hot and cold pipe insulation, erection of suspended ceilings and supply and erection of low temperature doors.

Major cold stores from 120,000-850,000 sq ft which the company have erected during the past two years include AMP, Bagnelstown; Foyle Meats, Derry; Norish Food City, Lough Egish; North Kerry Co-Op, Listowel; Ballyclough Co-Op, Mallow; Golden Cow Dairies, Portadown; Carrigean Cold Stores, Waterford; Gland Supplies, Dun­gannon; and Portion Foods, Dublin.

Further details from Irish Insulation (1974) Ltd, Main Street, Rathcoole, Co Dublin, (Tel: 589219).

CPI

Manufactured under closely controlled factory conditions by Concrete Products of Ireland Ltd, modular hollow foam filled structural concrete blocks are now available to the construction industry. The hollow blocks are filled with foam urea formaldehyde and are manufactured from washed and graded aggregates, sand, and Irish Portland cement, thoroughly mixed, vibrated for compaction, steam cured to ensure full hydration, and air dried for 28 days before use.
Thermal and Sound Insulation

Blocks are manufactured to comply with the conditions in IS20 — 1974 Concrete Building Blocks.

Block designation is either Type A or Type B, and dimensions are co-ordinating 450 x 200 x 100 mm, (actual 440 x 190 x 100 mm), or co-ordinating 450 x 225 x 100 mm, (actual 440 x 215 x 100 mm).

Comprehensive strength is 10.5 N sq mm and using the foam filled hollow block in the following wall constructions these U values are obtainable.

(a) 275mm cavity walls of 100 mm inner leaf foam filled hollow, 50 mm cavity, 100 mm outer leaf solid block, normal plastered finish inside and outside — U = 1.06.

(b) 275 mm cavity wall of 100 mm inner leaf foam filled hollow, 50 mm cavity, 100 mm outer concrete facing brick, normal plastered finish inside — U = 1.02.

(c) 275 mm cavity wall of 100 mm inner leaf foam filled hollow, 50 mm cavity, 100 mm outer leaf foam filled hollow, normal plastered finish inside and outside — U = 0.78.

Further details from Concrete Products of Ireland Ltd, Lucan, Co. Dublin. (Tel: 280691).

Cape Insulation (Ireland)
The name Cape in Ireland is synonymous with high quality insulation and roofing products. In addition to the well known range of Rocksil mineral fibre products, Cape can also offer a wide and varied selection of roofing materials to meet all specifications.

These include Fesco (Perlite) Board which was used in the Fieldcrest and Wilton Hospital projects. Owens Corning Fibreglass roofboard was used on the AIB headquarters in Ballsbridge and also on the Burlington Factories around Ireland.

The latest additions to the product ranges are asbestos cement cladding and slates. The cladding offers an extra wide cover width of 1.086 metres, thus reducing fixing time. The big 6" corrugations, which allow rain to flow freely from roofs, the range of accessories and the wide selection of colours further enhance their appeal.

For information on all these products, contact Fergus O'Connor, Cape Insulation (Ireland) Ltd, St Pancras Works, Mount Tallant Avenue, Dublin 6, (Tel: 960222).

Fibreglass
Fibreglass Limited produce a wide range of roof insulation suitable for every type of domestic, industrial, commercial and agricultural building. The roof of a domestic dwelling is the cheapest and easiest area to insulate and gives the greatest return on capital. Other benefits can include reduced heating costs, smaller heater systems, improved comfort and reduced risk of condensation.

The correct thickness for any application is the Economic Thickness of Insulation (ETI) which is that thickness of insulation which gives the greatest capital saving when costs and fuel savings are evaluated over a period. This standard varies according to heating standards, cost of fuel, location of dwellings and type of insulation. The minimum thickness needed for houses with Parker Morris heating standards is 80mm. For houses with C.I.B.S. heating standard the current ETI is 100mm. Thicknesses of 140mm and 160mm are used for bungalows, special heating requirements and special systems, e.g. old persons' dwellings and where electric central heating is used.

Fibreglass Crown 75 has been developed to meet the demands of the housing market. It is light, easy to handle and install. Its resilience ensures the full specified thickness. Compression packed Fibreglass takes up less space in transit and storage. It is robust and has a high tear-strength.

Crown 75 is supplied either in widths to suit standard joist centres, thus ensuring a tight fit, of in widths up to 1200mm for draping over the joists. It is essential not to block the eaves and so prevent adequate roof ventilation.

Industry uses a large percentage of the nation's energy and a significant part of this provides space heating. Insulation reduces fuel costs and can achieve capital cast savings on heating plant. Utilisation of existing heating plant can therefore be sometimes extended, condensation risks can be reduced and comfort is increased because of warmer surfaces and can lead to improved productivity.

The roof of any building is more often than not the major source of heat loss. In factory buildings in particular, the roof normally has its greatest surface area in relation to the rest of the building structure.

A new easily-fitted, lightweight insulation panel for use in new and existing industrial buildings has been developed by Fibreglass Limited.

Factoryliner is an integral, rigid, stable Fibreglass Crown slab faced with a white PVC and is specifically designed for use in under-purlin linings, suspended ceilings and sheeted walls. It can be accommodated in existing buildings which cannot bear the weight of a conventional lining system and gives a thermal performance up to 11% better than conventional underlinings.

For further information contact Fibreglass Limited, 21 Merriion Sq. North, Dublin 2. Tel: 767060.

Sheffield
After twenty-one years of supplying materials for projects at home and overseas, Sheffield Insulations have become expert in a wide range of insulation and building materials. Sheffield Insulations' experienced consultants can advise on every aspect of insulation, lining and roofing. This service is offered completely free and without any obligation. Remember, we are completely independent of any manufacturer to ensure our recommendations are totally impartial. With a permanent stock-holding of materials, and a network of depots and sales offices you are never far from supplies.

All products are available for rapid reliable delivery in our own fleet of specially designed containers and vehicles. Insulated linings, suspended and acoustic ceilings, fire protection, partitioning and the insulation of plant and equipment, can be provided through Sheffield Insulation Contractors, or we will be pleased to recommend specialist contractors to help you with your contract.

Further information from Sheffield Insulations (Ireland) Ltd, 1/11 Upper Grand Canal Street, Dublin 4, (Tel: 689099 Telex: 30619) and also at Galway and Cork.
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Europair House, 3 Ardee Road
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Tel: (01) 975747
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Water Treatment and Energy Conservation

At a recent symposium on industrial water treatment held in the prestigious Berkeley Court Hotel in Dublin, over 75 delegates heard from some of the foremost experts in the field of water treatment. The symposium was organised by Portals Water Treatment. Irish water treatment engineers would also know them as Permutit-Boby, and the topics covered were: Water Treatment and Energy Conservation, Process Developments and Service Support.

The following is part 1 of the paper on Water Treatment and Energy Conservation which was presented by David Hunter, Overseas Sales Executive of Permutit-Boby and part 2 appears next month.

In recent years changes have occurred in the design of low and medium pressure boilers for industrial use. These changes have been brought about by the desire to improve the thermal efficiency of boiler installations, i.e. to enable more steam to be produced from less fuel.

Characteristics of Modern Boilers

Modern steam raising boilers in this category are characterised by their small water content, small steam space, and extremely high rates of heat transfer. Any hardness or scale-forming solids in the feed water are deposited on smaller surface areas, with a consequent risk of burning out tubes, whilst the dissolved solids concentrate in the water in the boiler at a higher rate than was the case with earlier types of boilers. Modern boilers also show less tolerance towards corrosive gases such as dissolved oxygen and carbon dioxide.

The normal requirements for steam is that, leaving the boiler it should be dry, saturated and free from any solids which might contaminate the process or damage steam lines, condensate lines, etc. The quality of steam leaving the boiler is dependent upon:

1. The rate at which steam disengages from the surface of the boiler water.
2. The nature and concentration of the dissolved solids in the boiler water.
3. The velocity of the steam across the surface of the boiler water as it flows towards the outlet.

The following comparison of an earlier design of boiler (Column 'A') and a modern boiler (Column 'B') illustrates the importance of the above points in relation to steam quality.

<table>
<thead>
<tr>
<th></th>
<th>'A'</th>
<th>'B'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steam Capacity — Kg/hr</td>
<td>4,500</td>
<td>4,500</td>
</tr>
<tr>
<td>Operating Pressures — Kg/cm²</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Steam disengagement velocity — m/sec</td>
<td>0.80</td>
<td>2.39</td>
</tr>
<tr>
<td>Average steam velocity over water surface — m/sec</td>
<td>0.73</td>
<td>3.73</td>
</tr>
</tbody>
</table>

These figures indicate that the steam disengagement area in the modern boiler has been reduced by a factor of three and the steam space volume by a factor of five. Under modern boiler operating conditions the amount of boiler water which will be dragged out of the surface of the water with the steam is obviously greater. As the steam velocity across the surface of the boiler water is greater in the modern boiler, there will be less chance of the drops of boiler water regaining the boiler water surface before leaving the system.

If steam is required at a pressure substantially below design pressure, it should be obtained by installing a pressure reducing valve in the steam line.

Operation of the boiler at a pressure below the design pressure will cause an increase in the volume of steam produced and increases in steam disengagement velocity and steam velocity across the surface of the boiler water with the consequent danger of carry over of boiler water with the steam. In order to maintain the design steam purity, the boiler manufacturer should be asked to advise what reduction in the dissolved solids concentration is necessary or what reduction in steam capacity is necessary in order to maintain the design steam disengagement velocity.

Because of the reasons stated in the preceding paragraphs, serious consideration must be given to the supply of water treatment plant capable of providing the necessary quality of boiler make-up water by removal of hardness or dissolved solids.

External treatment of the feed water is, however, not sufficient to prevent corrosion of the boiler surfaces etc. Dissolved oxygen must be removed from the feed water either by mechanical deaerating or chemical treatment. Also alkaline conditions should be maintained in the boiler in order to keep a protective film of oxide on the boiler surfaces etc.

Boiler Blowdown

In deciding what treatment of the make-up water is required, it is first of all necessary to establish that the boiler makers recommended limit of concentration of dissolved solids in the boiler water can be maintained with a reasonable level of blowdown.

The amount of boiler water blowdown can be established from an analysis of the proposed treated water by applying the following formula:

\[ B = E \times S \]

where, \( B \) = blowdown expressed as % of evaporation
\( E \) = 100 units of evaporation
\( S \) = dissolved solids in boiler feedwater as ppm
\( C \) = limiting concentration of dissolved solids in boiler water as ppm

In estimating the concentration of dissolved solids in the feedwater, allowance must be made for the dilut-
ion effect of any recovered clean condensate and also any increase in dissolved solids due to the addition of conditioning chemicals to the feedwater.

The maximum amount of continuous blowdown permissible is that above which the boiler cannot deliver its rated output of steam at design pressure, and experience suggests that this point is reached when the blowdown exceeds 10% of the evaporation.

As stated above, one of the characteristics of any modern boiler is that the dissolved solids in the feedwater must be restricted to a limit dependent on the boiler design, if pure steam is to be obtained with freedom from tube deposits, etc. There is, therefore, a case for the removal of hardness or the partial/complete removal of dissolved solids from the make-up water using Base Exchange Softening, Dealkalisation/Degassing/Base Exchange Softening and Demineralisation, respectively. In the case of low pressure boilers it is not economically feasible to do other than soften our partially remove the dissolved solids from the water, but for boilers operating at pressures in excess of 15 Kgf/cm², complete removal of dissolved solids, including silica, from the make-up water is advisable. As complete demineralisation is the most important of the above mentioned processes, it will be dealt with in detail. However, for the sake of completeness, a brief description of the Base Exchange Softening and Dealkalisation processes are given below.

Base Exchange Softening

In this process the water to be treated is passed through a bed of cation exchange resin containing replaceable sodium ions. During passage through the resin bed, the calcium and magnesium ions in the raw water which are responsible for the scale formation in boilers are exchanged for non-scale forming sodium ions.

When the exchangeable sodium ions on the resin have been replaced by calcium and magnesium ions, the resin is exhausted and must be regenerated. A solution of sodium chloride is injected through the bed and the calcium and magnesium ions are displaced from the resin by sodium ions from the sodium chloride solution. The resulting solution of calcium and magnesium chlorides is discharged to drain. The resin is thus converted to the original sodium form and after a short rinse to remove traces of calcium and magnesium chlorides, the unit is returned to service for a further softening cycle.

Dealkalisation

Partial demineralisation may be achieved by the dealkalisation process followed by degassing. The process employs a weak acid cation exchange resin which is regenerated with a dilute acid solution, thus placing exchangeable hydrogen ions on the resin which after a short rinse to remove excess acid etc. selectively exchanges them for the alkaline hardness. The increased carbon dioxide concentration which is formed is removed by passing the water through an atmospheric degassing tower against a counter-current of low pressure air. If permanent hardness is present this may then be removed by base exchange softening.

Demineralisation

The simplest form of demineralising plant consists of a cation exchange resin stage in which all the dissolved solids are converted to their corresponding acids, and an anion exchange resin stage in which these acids are removed. If silica removal is required the anion stage will contain a strongly basic resin, or if the silica is to be removed in a subsequent stage the anion stage may contain a weakly basic resin.

Whichever type of anion exchange resin is used, the two-bed system of demineralising cannot be expected to produce a treated water essentially free from dissolved salts if the original dissolved salts in the raw water are not completely converted to their corresponding acids by the cation unit.

Cation Exchange Units

Strong Acid Cation Exchange Resin

Any shortcomings in the performance of the cation unit of a two-bed system resulting in the presence of unchanged metal cations in the treated water from this unit, must inevitably result in the presence of these metal cations in the final treated water from the anion unit. Therefore, the first essential in designing a two-bed demineraliser is to ensure minimum "cation leakage" from the cation unit.

The hydrogen form cation exchange resin can be charged into the operating column with every ion exchange site carrying a hydrogen ion. When raw water is passed through this resin the exchange of hydrogen ions for the metal cations in the water will be complete, and there will be no cation leakage until the column is exhausted. The end of the run will be signified by a breakthrough of metal cations and a corresponding reduction in free acidity.
At this stage, a very large proportion of the exchange sites will be in the calcium, magnesium, or sodium form. In order to put the resin back into the hydrogen form, it is now treated with mineral acid with the object of promoting the following reaction in a direction from left to right: in a basic cation exchange unit the regenerant acid flows in the same direction as service flow, i.e. downwards (this is normally known as co-flow regeneration).

\[
\begin{align*}
\text{E} & \quad \text{Ca} + 2\text{HC}1 \quad 2\text{EH} + \text{CaCl}_2 \\
\text{E} & \end{align*}
\]

This reaction is reversible, and the extent to which it will move from left to right will depend largely on the amount of acid that is used for regeneration. It is virtually impossible even with the use of a large excess of acid, ever to put the resin back fully into the hydrogen form. The best that can be done is to convert as much of the resin as possible back to the hydrogen form when economically practicable amounts of acid are used. We therefore have a situation that even after regeneration, the resin bed still contains a significant amount of calcium, magnesium, and/or sodium ions, and it is the sodium ions which are responsible for any "leakage" which may occur. The conditions of the bed can be pictorially illustrated as shown in Fig. 1.

When the raw water is passed into the top of the cation exchange column, which of course is largely in the hydrogen form, the mineral salts are converted to the corresponding acids almost completely and the acidity thus formed travels down the column until it encounters ion exchange sites which are in the calcium, magnesium, or sodium form. Within the limits of concentration normally found, the amount of acidity is not high enough to push the relatively tightly bound calcium and magnesium off the resin but the sodium is relatively loosely bound to the resin. Even low concentrations of acidity are able to push sodium ions off the exchange sites, hydrogen ions going on in their place. Thus sodium ions will appear in the treated water.

The amount of cation leakage which will occur is a function of (a) the completeness of regeneration, i.e. the amount of acid used for regeneration, (b) the level of acidity produced in the top part of the column, i.e. the amount of sulphate, chloride and nitrate in the raw water, and (c) the ratio of sodium to other metal cations remaining on the column after regeneration, i.e. the ratio of sodium to other metal cations in the raw water.

It should be noted that the concentration of bicarbonate alkalinity in the raw water does not directly influence the amount of leakage, since the carbonic acid produced by the following reaction is not strong enough to push either calcium, magnesium or sodium ions off the resin.

\[
2\text{EH} + \text{Ca(HCO}_3\text{)}_2 \quad \text{E}2\text{Ca} + \text{H}_2\text{CO}_3
\]

As can be seen from Fig. 2 the leakage is initially high, drops to a minimum, and then rises again. The initial leakage is due to sodium being pushed off the resin, this occurring until most of the displaceable sodium has appeared in the treated water. At this point the column is practically exhausted, and the breakthrough of sodium from the raw water subsequently occurs. The quality of the final anion treated water will depend on the amount of leakage due to (a), (b) and (c) above.

The theoretical answer to cation leakage problems is the use of counter current regeneration (CCR). If, after downward regeneration which leaves the column in the condition shown in Fig. 1, the water to be treated is passed upwards through the regenerated bed, any sodium pushed off the lower part of the column will be taken up by the almost fully regenerated top part. In practice, because of the physical difficulties of passing water upwards through a column of ion exchange resin at conventional flows without seriously expanding the bed, it is usual to regenerate upwards and run downwards. Fluidisation of the resin bed during upflow regeneration is prevented by the use of air pressure on top of the bed. The use of air for holding down the bed has considerable advantages with regard to efficiency and cost over the use of water for the same purpose.

Backwashing of the complete bed of ion exchange resin in a CCR unit is normally neither necessary nor desirable. Backwashing is usually carried out only for the top part of the bed by water introduced through a distributor situated just below the surface of the bed. The distributor also acts as a collector for the spent regenerant solution/air and the rinse water. Fig. 3 shows the relevant features of a CCR unit.

To summarise, the use of CCR produces the following benefits:

a) Higher treated water quality when compared with quality from a co-flow plant — see Fig. 2.

b) Required water quality achieved with lower regeneration level than for co-flow regeneration.

Wash water consumption less than co-flow requirements.

d) Waste water minimised by the use of air to hold down bed.

**Weak Acid Cation Exchange Resin**

As described previously under the heading 'Dealkalisation', this type of resin may be used as one stage in the demineralisation of a water with a high alkaline hardness concentration. One of the advantages of this type of resin is its high regeneration efficiency.

**Anion Exchange Units**

**Strong Base Anion Exchange Resin**

Strong base resins because of their high basicity have the ability to remove carbon dioxide and silica as well as the mineral acids produced in the cation stage. When the resin is employed in a two-bed system, it is normal to place a degassing tower between the cation unit and the anion unit and pass the water through it against a countercurrent of low pressure air in order to remove the carbon dioxide.

Because the strong base resin behaves as a true anion exchanger, any neutral salts in the decationised water
resulting from cation leakage will be converted to the hydroxide form on passing through the bed.

\[ \text{NaCl} + \text{ROH} \rightarrow \text{RCI} + \text{NaOH} \]

In addition to producing a high conductivity in the treated water, any significant amount of sodium hydroxide formation in the strong base column will tend to inhibit the ability of the resin to remove silica. It is therefore almost axiomatic that for good quality water from a strong cation/strong anion system, cation leakage must be reduced to a minimum.

**Weak Base Anion Exchange Resin**

Weak base resins are capable of removing the mineral acids produced by the cation unit, i.e. \( \text{HCl}, \text{H}_2\text{SO}_4 \) and \( \text{HNO}_3 \), but not weak acids such as carbonic acid and silica. Their use is in providing process water in situations where the presence of carbon dioxide and silica is unimportant, or with reference to boiler feed applications as one stage in a multi-stage process in which it is being employed to remove most of the acids from the water prior to one or more polishing stages.

Resins of this type have a high regeneration efficiency.

**Mixed Bed Units**

If a strong acid cation resin and a strong base anion resin are mixed together, the result is a "Mixed Bed". With the cation resin in the hydrogen form and the anion resin in the hydroxide form, an almost infinite number of cation/anion series is produced with the leakage from each successive pair being taken up by the next pair. The result is a treated water with an extremely low dissolved solids content and a correspondingly low conductivity which can approach, in certain circumstances, the theoretical minimum conductivity of 0.038 \( \mu \text{S/cm} \).

There are three areas in which the mixed bed process can be employed:

a) The mixed bed alone removes the total anions and silica from a raw water.

b) the mixed bed follows a counter current cation unit and anion unit removes significant concentrations of sodium, carbon dioxide and silica.

c) the mixed bed follows a CCR cation unit and strong base anion unit and is required to remove 1 ppm maximum solids.

It is not the purpose of this paper to discuss the treatment of raw waters (a) by the mixed bed process. The paper is more concerned with the use of the mixed bed process in (b) and (c), i.e. as a polisher of water which has already been substantially demineralised by a suitable two stage process with the object of producing the highest possible final treated water quality.
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A MEMBER OF THE RICHARDSONS WESTGARTH GROUP
From the moment the Minister of State Giles Shaw MP declared Heatair 79 open, one had a feeling this was going to be a successful show.

The opening programme took three parts with the Chairman of the N.I. Section of the Institute of Energy, C.J. Monaghan welcoming the visitors, Mr. Shaw opening the exhibition stressing in his speech the need for energy conservation and congratulating the Institute on promoting the exhibition. A special visitor was Dr. Symmonds, President of the Institute who thanked Mr. Shaw.

Following the official opening the Hon Secretary of the Institute conducted the Minister on a tour of the stands following which the official party together with the Committee of the Institute and the President of the Royal Ulster Agricultural Society were the guests of Mr. Bill Caughey, organiser of the Exhibition, to lunch.

The Exhibition held in the Alexander Hall was a colourful sight, with the hall carpeted in deep brown, flowers surrounding the stands, all topped with snow white gauze.

Every corner of the Hall was packed and due to pressure four extra stands had to be erected in areas usually devoted as press space and lounge area for visitors, making a total of fifty four stands.

The exhibits covered a wide range of products from the open fire to the large industrial boiler, the kitchen fan to full air conditioning equipment, the domestic pump to massive water boosting sets and so there was something for everybody.

Particularly pleasing to the sponsors was the number of principals who had travelled from outside the Province to support their local agents, for example John Kelly Ltd introduced their new Wilo Pump Agency with the support of the German Sales Director.
and her, yes her, technical engineer; Satchwell's had the support of their Publicity manager, while Robey, Hoval & B&E Boilers, all had a "senior executive from the works".

I.E.S. Industrial had on display a 100 KVA generator supplied by Auto Diesel and a Clayton Generator again supported by representative of the principals, while on the National Coal Board stand, Coal Board Engineers explained the modern methods of burning and handling coal. Other fuel interests were represented by the N.I. Electricity Service, who explained the various tariffs and heating equipment available.

The uneasy situation of the gas industry no doubt explained the interest being shown in the stands of Calor Kosangas and of Ergas as people search for a replacement to their present gas supply.

Particular interest was being shown in the Dept of Commerce stand where staff were busy explaining the various grants available to industry for Energy Conservation.

Mid Ulster Engineering caused a surprise on their stand when they introduced their new large capacity back boiler, but even more so with their Gravity Feed Magazine Boiler, which obviously was of great interest to contractors.

Similar interest was being shown on the stand of Castlereagh S.M. Co Ltd, who also introduced their new Gravity Feed Magazine Boiler. Rumours had been circulating for some time that Castlereagh were about to enter this field and the organisers were pleased that Castlereagh had chosen the exhibition to launch their new product.

Unidare, one of the regular supporters of the Exhibition, introduced their new range of S.A. super thin storage radiators along with their well known range of products. J & T Ballentine (Sales) Ltd, chose the exhibition to announce the

Looking at the Ideal Standard range were D. Puryis, Director Northern Region O.B.C., D. Davidson, Tech. Sales Manager, Mrs. A. Burnison, N.I. Branch Manager and J. Dobson, Showroom Supervisor, all O.B.C. Ltd staff.
new product range of the Zenith Electric Co Ltd for whom they had just been appointed N.I. Agents.

Saacke Ltd, the well known oil burner manufacturers occupied the Wil Tot stand together with other companies they represent such as Yar-Way, Combustion Chemicals, Hyproval and F. Baun Ltd, to mention but a few.

One of the busiest stands was that of Sermet, with boilers, pumps and air conditioning equipment and Jim McFadden busy dealing with inquiries.

It is impossible within this space to cover all the stands but one thing was certain that the exhibitors did not find time hanging about, even the late night found people still asking questions at nine o’clock at night.

However there is more to a bi-annual exhibition than plodding round stands, there is the fun of meeting old friends. For example the pleasure of meeting Pat Hulme again, still the old Pat, bubbling over with ideas. Another visitor, Tom Anderson formerly of Co. Antrim Education looking fresher than ever, Sammy Beggs down from Ballymena for the day, Tom Webb over from Scotland to help out in the Wil Tot stand.

The exhibition week was not all work, as during the week a number of firms held their own evening parties for example Runtal-rad, John Kelly Ltd, P & D MacFarlane, Sermet were all known to have their little "do’s" while over one hundred exhibitors and guests attended the Exhibition Dinner Dance in the Culloden Hotel where the only formal part was a very brief welcome to those present by the Chairman Mr. Monaghan.

Thursday night saw the end of a hard week but successful week for the exhibitors and an enjoyable but fruitful week for the visitors.

Proof of the success of Heatair 79 is that already stands have been reserved for 1981.

At the Exhibition Dinner Dance were D. Davidson and Mrs. A. Burnison of OBC with P.R. McBride, Hon Secretary, Institute of Energy.

The P&D Macfarlane Ltd Party at the Dinner Dance, T. Baxter, Mr and Mrs Scott, D Macfarlane, Miss Neeson and D. Smith.
"Experts in Controls" that D.P. Butler & Co. Ltd. on their stand were T. Garner (Sales Engineer), B. Bulloch, (George Kent Ltd), Mrs. D. Butler, D. Butler and H. Hughes (Sales Manager, D.D. Butler).

Discussing Permutit equipment on the Henry R. Ayton Ltd stand were R. Ferguson, (Sales Manager, Houseman), B. Mann, Service Engineer, W. Yule, Vaughan Mech, and S. Mitchell, Sales Engineer.

On the Satchwell Control Systems Ltd stand were N. Grant, Manager, Belfast, K. Hirst, Home Sales Manager, A. Higgins, Service Supervisor, E. Carson, Sales Engineer, all examining the Satchwell Optimiser system.

Discussing the Radiator market were T. Walsh, (Director) Runtalrad Ltd, C. Mulligan, (Irish Trube Rollers Ltd), G. Leslie (B.S.S. (NI) Ltd) and G. Hayes, N.I. Sales Manager Runtalrad.

The smiling faces on the S.L. Combustions Ltd, stand were G. Bridcut, G. Stewart, and V. Lindsay, all of S.L. Combustions.

One of the busiest stands at the show was the Smeret (NI) Ltd stand. On the stand when our photographer called were H. Nicol (Hospitals Authority), D. Stathers, (D. Stathers & Co), J. McFadden, Managing Director, Smeret Ltd, J. Hunter, R. Hedges, and R. McCartney.

Ian Wright, Stelrad Group, G. Wright, Pump Services General Manager, I. Fenton, Vaughan Mech., and J. Ferguson, Pump Services, were photographed on the Pump Services Ltd stand.

The I.E.S. Industrial (Ireland) Ltd team for the duration of the show were K. Allsworth (Auto Diesel Braby), P. McDonald, (Clayton Steam Gens), P. Watson, (Finlay Packaging), and J. S. Robinson (Managing Director, I.E.S.).

On the A.K. Webster (U.K.) Ltd stand were F. Frederick, Sales Director (Webco) and J. Murnin (J. Murnin & Co.).
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Sole Northern Ireland agents for the U.S. made Jordan Sliding Gate Valves are Measurement Control & Automation Ltd of 8 Grosvenor Place Carrickfergus, Co. Antrim who specialise in instrumentation & process control equipment.

Manufacturers of the Flair range of shower & bathroom equipment, Midland International Ltd have appointed Co. Down man Mr. Colum Kearney production manager of their Bailleeborough plant.

Saithwell Services of Motherwell manufacturers of domestic central heating controls have appointed Mr. Ken Seaman Sales Manager for the Company's Northern Region which includes Ireland in his territory.

Mr. Seaman was previously with Thorn Heating.

The Wellington Park Hotel was the venue chosen by Potter Cowan Ltd for their trade show. Consultants, contractors & engineers from industry and local authorities were welcomed by Mr. Burta Allen Managing Director.

It is with regret that we announce the death of Mr. "Johnny" McCausland. Mr. McCausland had worked in the heating & plumbing trade for practically 50 years. He joined William Willis & Co., now known as Willis Heating & Plumbing Ltd., Dublin Road, Belfast as a boy of 14 & remained with them until his death some 48 years after. To his wife & family we express our sympathy.

Mr. Eric McBride represented Northern Ireland at the recent Energy Managers Conference in London, where the managers gathered to hear an address by the Minister of Energy — David Howell.

Following the meeting, Mr. McBride stated that the Minister had made it clear that he expected everyone to co-operate to ensure a minimum reduction in oil consumption of 5%.

The Minister also explained that if everyone played their part, it would avoid the need of expensive legislation and that industry & domestic consumers should do all in their power to conserve energy irrespective of the type of energy involved. Attention was drawn to such things as efficient combustion control, heat transfer, insulation, automatic temperature control all of which could contribute to conservation.

Mr. McBride also drew attention to the many services offered by the Dept. of Commerce which could be of assistance to those in industry who wished to achieve the target.

It is with regret that we write of the death of W.H. Leech founder of the well known firm of heating & ventil-
End of an Era

The long awaited statement by the Secretary of State regarding the possible building of a link gas line between Ulster and Scotland has now been made.

The decision was about to be announced by the Labour Government at the time the general election broke and in view of this the announcement was postponed, though the general leak was, at that time, that there would not be a gas link.

Once the election was over a new administrator took office, the supporters of the gas link became active again, no doubt hoping that there might be a change of mind. However this was not to be so and any chances there were, were killed for once and for all when the Government announced that there was no money available for a link and any money that was available would be used for an orderly run down of the gas industry in Northern Ireland.

So ends an era; an era which brought light to our streets, light to our homes, convenient cooking to the masses, in fact an era which in many ways revolutionised our way of life. The gas industry in Northern Ireland had close ties with Scotland, in the fact that over the years many of our Gas Managers came from that country, maybe that is why the Golf competition was such an integral part of the Irish Gas Managers Annual Conference.

The gas industry was for many not work but a way of life and throughout the country we had enthusiastic gas engineers and managers struggling over the years to keep open gas plants that were not inefficient but also economic, but these were men of pride and defeat did not come easily to them.

What happens now?

Following the Governments announcement, representatives of the various gas undertakings held a series of meetings and it would appear that the decision is for each undertaking...
to make its own arrangements for the future.

It is most likely that for the smaller undertakings the application of L.P.G. may be able to solve some of the problems. However the larger installations particularly Belfast have a serious problem in front of them.

In the case of Belfast, we have a large underground mains distribution system, serving many thousands of cooking units, considerable heating plants, while in the city centre there has been considerable use of gas by large stores and office blocks.

If a decision is made in favour of a complete close down of the gas producing plant, which will affect many thousands of consumers, then it is only to be expected that the consumer will then in turn expect financial assistance in he has to convert his appliances for a different type of fuel.

It is possible that the misfortunes of the gas industry may provide financial harvest to the heating and plumbing trade in the way of conversions, but we will have to wait a little time yet to see what way "the cookie is going to crumble".

One can assume with a degree of certainty that the misfortune of the gas industry will be to the benefit of the L.P.G. industry. Already there are indications that many gas users are considering switching to L.P.G. In addition the rising cost of fuel oil is also having a beneficial effect on L.P.G. Sales.

Earlier we stated that through the Northern Ireland Gas Industry, there were many people of great character, who had been facing adversary for years, and we will not be surprised to see some of the undertakings survive though in a different form.

---

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Danks manufacture boilers that utilise a wide variety of fuels, so you can choose the ones most suitable to your needs. Whatever the fuel you wish to burn should talk to Danks who can offer boiler plant for easily available and environmentally acceptable coal and gas, oil, turf, agricultural residues and waste products.

Whatever the size of your Company, whatever your steam or hot water needs, you can still join the big names who rely on Danks of Netherton.

---

Pictured at the Thorn/I.D.H.E. Golf Outing at Royal Belfast. (From left): Mr. R. Coid; R. Best; I. Morrison, and G. Edwards.

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They will burn most types of coal, wood logs and dry peat. The oven will bake and roast to perfection because of the unique wrap-around flue-ways and is large enough to cook your Christmas turkey. All models have a hot plate for fast boiling or slow simmering.

All parts in contact with hot gases are of high-quality cast iron or enamelled steel. They are corrosion-proof and make cleaning easier.

The spacious drawer will accommodate pots and pans, or can be used for storing and drying peat, or a plate warmer.

The built in boiler provides 48,000 BTU/hr which will heat the living area of a family house and also provide continuous hot water for baths and washing up.

The cooker can be operated for up to 14 hours without stoking.

The Clyde is ideal for farms and regions where solid fuels are easily available. A unique feature is the adjustable fire box which provides heat as required. Low output for hot water in the summer or high output for central heating in the winter snows.

As the Lohberger-Standard-Double-burning-Boiler has two separated combustion chambers, the running is extremely simple.

a) The oil – or gas-burner can be connected on the left or right side, the control is made by a thermostat through which the desired boiler-temperature is ensured.

b) burning solid fuel like timber, coal, coke, and all sorts of baulable waste, the firing in the solid fuel chamber is made through the combined heating and dirt door. Fueling can be made from the front as well as from above.

When fueling from above timber can have a length of 80 cm to 1 meter. This is why the SA-D is best suitable, when waste wood, large cartons, fruit boxes etc are available. Through a fire-controller the passage of air can be regulated in a way, that the boiler output is adjusted to the different warmth demands at constant flow temperature.

The boiler body of the Lohberger-Standard-Double-burning-Boiler is made of steel ST 37-2. The outsides and insides of the boiler-body are supplied with heat-standing anti-rust varnish. The isolation-cover is varnished red on the outside, the massive cast iron doors are varnished black. A control panel which is made ready for connection as well as the following fittings, ready for operation: boiler thermometer, controller thermostat, security thermostat, cut in and cut out for boiler, working control-lamp are supplied.

Further information from: Clyde Systems Limited, John F. Kennedy Road, Dublin 12, (Tel: 01 507844). Telex: 4321.

Cyclops Portable Thermometers from Manotherm

Land Pyrometers Ltd., announce an addition to their range of non-contact temperature measuring instruments. Land's first portable hand-held infra-red thermometer, Cyclops, has been developed from systems which have been proved in use in fixed installations over many years.

Cyclops works by detecting and focusing energy radiated from the surface of the object to be measured. It provides an accurate measurement of the temperature of a target viewed through the instrument's lens at a distance by displaying a digital temperature reading in the visual field of the target.

Further information from Manotherm Ltd., The Control Centre, 4 Walkinstown Road, Dublin 12. Tel: 504025 Telex: 4467.
NEW PRODUCTS

Venomise — the New Economy Time Control from AMF

With energy conservation never being more important than it is today, AMF International Ltd., announce the introduction of the new VENOMISE to their range of time controls. Specifically aimed at the domestic immersion heater market, the Venomise offers strict control over immersion heater energy consumption. It gives heating only when its wanted — and not when its wasted. With simple on/off tappets for economy setting of adjustable switching period and a unique feature — the one hour hot water boost tappet (yellow) for complete hot water flexibility, timed only for when it is actually required. There's a 16 amp D.P double pole side mounted on/off switch providing total isolation, without affecting the timing operation, in line with wiring regulations. A manual advance control on the top provides programme change and complete override features. The time of day pointer is illuminated to indicate immersion heater power on only. The clock is self starting synchronous motor driven frequency controlled. And the operating voltage is 200/250 volts. 50Hz. Optional extras are additional tappets for greater switching flexibility and a ‘day omission’ system.

The new Venomise makes a significant contribution to energy conservation by immersion heater users.

Solas Filters from Walker

Risks of fire at sea are reduced by a new product available from Walker Air Conditioning Limited of Dublin. A range of SOLAS (Safety of Life at Sea) duplex fuel filters for ships' engines has been recently introduced by Vokes Limited, for whom Walker are distributors throughout Ireland. On some earlier filter designs, failure to observe the correct servicing procedure could result in spillage of fuel and risk of an engine room fire. The SOLAS range of compact filters incorporates a special safety device which prevents accidental removal of the filter bowl which is in operation and so eliminates the risk of fire through oil spillage. The filter, which has been approved by the Department of Trade and Industry, can be engine mounted and the filter cartridges can be easily replaced without disturbing the pipework. The filters give full flow operation without bypass arrangements.

New Colt ‘Intelligent’ Temperature Controller

The wall mounted Colt Optimiser shown in the photograph is a microprocessor based controller for up to six 230 kW warm air heaters, with a potential 1 pay-back period of less than a year. The unit takes the weather conditions into account before starting the heaters. Therefore the pre-heat period necessary before work starts is cut to a minimum. When the unit is controlling its maximum load of six 230 kW heaters up to 10 gallons of fuel a day can be saved.

Further information from Colt International Ltd, 28 Main Street, Bray, Co. Wicklow, (Tel: 863260).
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