

7-1-2008

### BS News

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# bs news

building services news

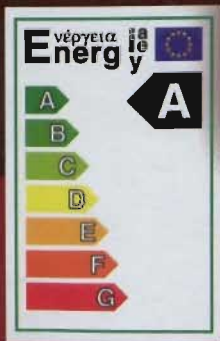
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## opinion

### Now for Good News!!

Yes, there is plenty of good news out there, contrary to what many of the so-called expert economic commentators would have you believe. Strange how the most high-profile commentators talk the talk *ad nauseum* but seem to have never walked the walk. They pontificate about how small to medium-sized business should be run when they have never had the courage to go there themselves.

Anyway, here's to the good news. This issue of *bs news* is proof positive that, despite the relative downturn from the incredible high of recent years, building services is still a vibrant, dynamic market segment. With energy costs and sustainability supposedly at the root of all the world's economic woes, building services is tackling the problem head on. Hence the proliferation of technologically-advanced, innovative products and system solutions now coming to the market at an ever-increasing rate.

This trend is evident throughout the entire contents of this month's journal, from the news pages right through to our regular features and product review profiles. *Designing Building Services* is a detailed technical analysis of how solar shading influences the ventilation strategy, while *Underfloor Heating* is a 14-page special portraying just how sophisticated this industry sector has become.

We also unveil a new monthly series called *Plumbing Matters* while the *BTU Report* and *Another Side Of ...* clearly demonstrate that people in the industry still know how to relax and enjoy themselves.

Be aware and conscious of what's happening in the marketplace ... but keep it in perspective.

## trade news + product information



Pat McGrath, CEO PM Group (centre) pictured with His Excellency, the Irish Ambassador to Singapore, Dr Richard O'Brien, as he receives an honorary scroll from Mr Yeoh Keat Chuan, Executive Director, Biomedical Sciences, Singapore Economic Development Board

### pm opens new asia pacific headquarters

Engineering, architectural design and project management firm PM Group has opened new Asia-Pacific headquarters in Singapore to spearhead its expansion in the region where it has already secured major contracts for Wyeth, Novartis and Glaxo SmithKline.

Pat McGrath, PM Group CEO said: "We have been delivering world-class project and construction management services in many countries to date, including the United States, Russia, Poland, Ireland and the UK. The opening of our new headquarters in Singapore is a sign of the confidence we have in our own business and the confidence we have in future growth opportunities in the Asia Pacific region".

The contracts won over the last 12 months were in association with strategic integrated services partner, M+W Zander. The combination of PM's world-class process capabilities and M+W Zander's local knowledge and expertise is seen as a very attractive solution by clients looking to deliver strategic projects.

### standard controls system wins major fms contract

Standard Control Systems (SCS) has signed a major contract with Italian giant Permasteelisa to supply and install a dedicated facade management system at Grand Canal Square in Dublin. Both companies have worked together before on major projects and Sean O'Toole, SCS General Manager, cites McCann Fitzgerald's head office on Sir John Rogerson's Quay in Dublin as a significant example.

Subsequent to that project Permasteelisa and SCS were chosen to provide a solution for Arup's new head office on Ringsend Road in Dublin. "These systems provide new challenges for us" says O'Toole, "where full integration with the building energy management system (BEMS) and the use of intelligent, addressable blind motors are called for.

"Solar shading and natural ventilation technologies are another growth area for us. It is for this reason that we have devoted so much time and effort in establishing a team of expertly-qualified personnel who specialise in these disciplines".

Contact: Sales Department, Standard Control Systems.

Dublin— Tel: 01 - 429 1800; Galway — Tel: 091 - 753 270; Cork — Tel: 021 - 455 5671;

email: [info@standardcontrol.ie](mailto:info@standardcontrol.ie)

### walker joins itt water & wastewater

ITT Water & Wastewater Ireland has appointed Alan Walker Service Engineer to strengthen its Dublin team. He joins following various roles in Ireland and the USA.

Alan originally qualified as an electrician in 2003 and has extensive electrical installation experience along with a good knowledge of electronics. He also brings with him expertise in water treatment installation.





## ● Revolutionary new VRF generates up to 4kW of electricity whilst heating or cooling

If you're short of electrical power and looking for an innovative green solution, the new ECO G Power, a gas driven VRF system from SANYO, could be the answer. A revolution in air conditioning design it is the first VRF system that can supply heating, cooling, hot water and now electricity!

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## trade news + product information

### selfbuild masterclass

Brian Corry and his colleagues at Self Build Ireland — who run shows in Belfast, Galway, Waterford, Dublin and Cork — have introduced another innovative initiative called SelfBuild MasterClass which will be unveiled at the forthcoming show at PuncHESTOWN, Co Kildare, which runs from Friday, 5 September to Sunday, 7 September. Opening hours are 12noon to 7pm on the Friday and 11am to 6pm on Saturday and Sunday.

However, the first SelfBuild MasterClass will be held on the Saturday morning and will commence with breakfast for all participants, followed by a series of illustrated talks on:—

- Money Matters (budgets, mortgages and insurance);
- The Site (planning rules and regulations);
- Managing the Build (contracts, waste and sustainability);
- Design and Construction Methods;
- Systems and Services (energy, heating and automation).

Whether their intended house is large or small, modern or traditional, eco-friendly or wired for the latest sound systems and information technology, the choices and options facing self-builders are enormous. The idea with MasterClass is to help visitors learn and understand more about these subjects.

In launching this initiative Clive Corry of SelfBuild Ireland told *bs news*: "We noticed that visitors to our shows seek out a lot of information which exhibitors often don't have time to give them. Equally so visitors are reluctant to take time out during the show to attend seminars. So, the MasterClass sessions will now be held before each show opens.

"We invite very knowledgeable and experienced experts to give the talks. The programme takes delegates through the whole building process, including all the important issues they need to know about and which will help them to make the right decisions for their own build."

Delegates who wish to attend the MasterClass can book online at [www.selfbuild.ie](http://www.selfbuild.ie)

Contact: SelfBuild Ireland. Tel: 048 - 9751 0570.

### mark advanced centrifugal fan coils

The latest range of advanced centrifugal fan coils from Mark Eire come in a choice of seven units and three design versions — FCV: vertical cabinet; FCO: low or horizontal cabinet with frontal section; and FCI: without cabinet for vertical/horizontal built-in installation.

The cabinets are manufactured from galvanised steel and painted beige, while the finned heat exchangers are made of aluminium and copper pipes with air venting. The inner support structure is of galvanised steel.

All the units feature long-life synthetic regenerative air filter, a noise-free fan unit with multi-speed controls, and electronic controls which can be remote on the wall or mounted in the cabinet.

Optional extra fittings include single-heat exchanger (heating only); high-performance heat exchanger; low-temperature cut-out stat; on/off valves kit for main and additional battery; fresh air damper; weather grill; air circulating grill; legs for floor assembly; and air delivery and recovery fittings on demand.

Contact: Mairead Twomey, Mark Eire. Tel: 026 - 45334; email: [mtwomey@markeire.com](mailto:mtwomey@markeire.com)



## trade news + product information

### new walseley commercial division

Walseley Ireland's new division, Walseley Ireland Commercial, will provide a total solutions approach to large-scale projects in Ireland. Its brief is to consolidate and develop existing commercial sales among its three main brands — Brooks Group, Heat Merchants and Tubs & Tiles.

Shane Colleran has been appointed National Sales Manager for the new Division and he will manage a five-strong team providing nationwide coverage through a company-wide strategy for larger commercial customers and projects.

Current projects include The Village in Adare, Limerick for McInerney Homes and the Milltown Institute for Duggan Brothers.

Contact: Shane Colleran, National Sales Manager, Walseley Ireland Commercial. Tel: 090 - 642 4035; email: shane.colleran@heatmerchants.ie



The Walseley Ireland Commercial team — Mark Doherty, Account Manager Eastern Region; Annette Nolan, Sales & Support Administrator; Shane Colleran, National Sales Manager; Niamh Walshe, Sales & Support Manager; and Jason O'Connor, Account Manager, Munster.

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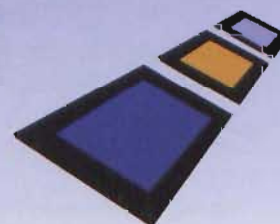
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Standard Control Systems



## trade news + product information

### digital pressure gauge from manotherm

The DPG-200 digital pressure gauge from manotherm has a precise +/-0.25% full-scale accuracy and is ideal for applications such as level control, pump control, process control and compressor control.

The 4-digit display will reduce the potential for errors in readings by eliminating parallax error commonly produced with analogue gauges. It is packaged in a durable extruded aluminium case designed to meet NEMA 4X(IP66).

The unit is powered by 12-24 VDC/VAC and contains two alarm set points, along with a 4-20 mA process output. A 4-button keypad allows easy access to features such as backlight, peak and valley, auto-zero and conversion of the pressure points.

Contact: Bob Gilbert, Robert Gilbert or Conor Stead, Manotherm. Tel: 01 - 452 2355; email: [info@manotherm.ie](mailto:info@manotherm.ie)



### cylon siteguide intuitive touchscreen technology

Cylon SiteGuide is a stand-alone touchscreen front-end for UnitronUC32 Building Energy Management Systems. This intuitive 7" colour touchscreen incorporates unique user-friendly navigation based on three easy-click buttons that allow any type of user to become expert with limited training.



The SiteGuide menu structure is flexible, facilitating the creation of building-specific interfaces that are intuitive to the end user, while the wide screen displays clear and readable graphical data logs. Once the Cylon SiteGuide is configured with the Communications Controller it will automatically read the menu structure from the Communications Controller and display it.

SiteGuide is also secure — any menu can be password-protected, preventing access to sections of the menu structure by unauthorised users. It can be panel-mounted for local supervision and is stylish enough to be wall-mounted in any office environment.

Contact: Richard Gladney, Cylon Controls. Tel: 01 - 245 0500; email: [richard.gladney@cylon.com](mailto:richard.gladney@cylon.com)

### LG & siemens enter global partnership

LG and Siemens have exchanged a memorandum of understanding "for cooperative development of commercial air control solutions, hence the ensuing businesses". The agreement takes immediate effect.

LG foresees its new partnership with Siemens resulting in a diverse client base, from both the commercial air conditioning and total solutions markets.

President of LG Electronics DA Company Air Conditioner, Mr Hwan Yong Nho (right) said: "The agreement has given LG the right ground to further grow and expand in the global heat pump market. We expect to gain a diverse client base for both the commercial air conditioning system and the total air control solutions market."



## trade news + product information

### daikin & energy master cement relationship



Joe McLoughlin, General Manager, Energy Master with Richard Smith, Area Sales Manager and Claire Mulqueen, Consulting Sales Engineer, Daikin Europe (Ireland Office); and Gerry Somers, Technical Director, Energy Master

Daikin, supplier of renewable energy products and ac equipment and Energy Master, a leading supplier of renewable energy solutions in Ireland, have strengthened their trading relationship with the introduction of Altherma, one of the first inverter-driven heat pumps in Ireland.

The Altherma system is suitable for both new-build and retrofit applications and makes a significant contribution towards achieving higher BER-ratings. These are already mandatory for all new dwellings — domestic or commercial — and will be mandatory for all existing dwellings when offered for sale or letting on or after 1 January 2009.

Contact: Menno Roos, Marketing Manager, Energy Master. Tel: 068 - 23864; email: [menno@energymaster.ie](mailto:menno@energymaster.ie)

### sheehy joins ecocem

Garret Sheehy has been appointed Business Development Manager at Ecocem. He joins the company from IDA Ireland where he worked from 2000-2008, the first three year's of which were spent in the Authority's Chicago office.

In his new role at Ecocem he will be responsible for identifying new international business opportunities, and identifying plant locations for Ecocem's continued expansion.



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## trade news + product information

### water leak detector from manotherm

The Series WD2 water leak detector from Manotherm detects leaking water and sounds an alarm before the leak turns into a costly mess. It relies on the electrical conductivity of water to change the resistance across the two contacts located at the base of the enclosure.



Models WD2-BP1 and WD2-BP2 are stand-alone, battery-powered units and are provided with audible and visual alarms, plus low battery warning. Model WD2-BP2 also includes a solid-state relay output.

There is also another model in the range, the line-powered WD2-LP, for applications that require an external 24v AC/DC power supply. It features both audible and visual alarms, along with an SPDT relay output.

Contact: Bob Gilbert, Robert Gilbert or Conor Stead, Manotherm.  
Tel: 01 - 452 2355; email: [info@manotherm.ie](mailto:info@manotherm.ie)

### lowara fire-fighting boosters

Lowara's GEN Series booster sets have been designed to meet and exceed the requirements of the European Standard EN 12845, the uniform standard for fire control and sprinkler systems. It specifies the requirements and recommendations for the design, installation and maintenance of sprinkler systems in buildings and industrial plant.

Lowara's GEN Series offers specifiers and installers of commercial, municipal and residential buildings access to a reliable, flexible and regulation-meeting fire-fighting system. The GEN Series of fire-fighting booster sets includes models with one or two electric or diesel service pumps, and some with jockey pumps for adapting to the specific requirements of each application.

The Series also includes the Lowara SV Series multistage vertical pumps; Lowara FHF and SHF Series end-suction pumps; and Lowara DFHFE and DSHFE Series diesel engine pumps. Optional features include self-test mechanisms and recirculation devices.

Contact: Terry Murray, Lowara Ireland. Tel: 01 - 452 0266; email: [terry.murray@itt.com](mailto:terry.murray@itt.com); [www.lowara.com](http://www.lowara.com)

### northern ireland's tallest building

Northern Ireland Minister for Social Development, Margaret Ritchie, was on hand recently to mark the beginning of the above-ground construction at the Obel Development in Belfast, with Aran Blackburne, Director of Karl Properties, developer of the scheme, and Eamon O'Hare from O'Hare and McGovern, contractors for the above-ground construction. The landmark mixed-use scheme will include the 28-storey Obel Tower, which will be Belfast's tallest building at 88.31 metres.



## trade news + product information

### dunne elected IPFMA chairman

Chartered valuation surveyor Tom Dunne, FSCS FRICS MIPFMA FIAVI, has been elected Chairman of the Irish Property & Facility Management Association (IPFMA) for the year 2008/2009. Previously vice-chairman and an active member of the IPFMA before that for many years, he is the Head of the School of Real Estate and Construction Economics at the Dublin Institute of Technology, Bolton Street, Dublin.



Tom is a former President of the Society of Chartered Surveyors (SCS) and is currently serving on the International Governing Council of the RICS (Royal Institution of Chartered Surveyors). Since 2004 he has also chaired the Private Residential Tenancies Board (PRTB) – the statutory body providing dispute resolution services to residential landlords and tenants.

In his inaugural address Tom cautioned against cutbacks by businesses in property and facility management in the current poor economic climate. "Clearly, as economic conditions deteriorate, the coming year will be challenging", he stated. "Nevertheless, the last several years have seen the creation of a substantial number of buildings and facilities. These will continue to need management by professionals.

"Indeed, in a harsher economic environment where there is a need for a greater emphasis on efficiencies, better management of buildings and facilities will become increasingly important. Often in difficult times a ready option is to cut deeply into the budget for property and facility management. Property and facility managers are, however, extremely conscious that this can be short-sighted. It will inhibit the performance of a business when the recovery comes around and we would caution strongly against this approach".



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# CORGI Loses Role as Administrator of Gas Installer Registration Scheme in UK

With mandatory registration of gas installers in Ireland to be implemented on 1 January 2009, the process to appoint the Gas Safety Supervisory Body to administer and oversee the scheme is now at an advanced stage. The Commission for Energy Regulation (CER) is currently considering the various applicants for this role and, in this context, recent developments in the UK are extremely relevant.

The Health & Safety Executive (HSE) oversees the UK regulatory process and just recently it announced that, following a detailed procurement process, it had selected Capita (the professional and support services "Top 100" company) as its preferred bidder to run the new registration scheme for gas installers from 1 April 2009. The only other serious contender was the current incumbent CORGI who has been administering the scheme since it was first established in 1991.

The seeds for change were first sown in 2006 when a HSE review of the domestic gas safety regime identified a case for change. An investigation found that stakeholder criticisms of the existing gas installer registration scheme which had evolved over time had some foundation. Hence the decision to embark on a procurement exercise to select a provider to run an innovative new scheme for a five-year term.

At the Invitation to Tender (ITT) stage, the competition

narrowed to two strong bidders — CORGI, the incumbent, and Capita. According to a statement released by the HSE, the main differences between Capita and CORGI lay in their approaches to introducing innovation to the scheme, promoting gas safety, promoting a new brand, delivering efficiencies and the continuous improvement required.

The new scheme has a modern, sustainable structure which will enable greater competition in the future, together with *safeguards to prevent the provider from taking undue commercial advantage of its position*. The scheme is set to deliver a suite of changes to refocus and improve consumer gas safety while also simplifying the regime, and securing best value for money for installers. How this element unfolds will be of particular interest to installers in Ireland.

## Key features of the new scheme

The new registration scheme will be subject to a concession agreement between HSE and the new provider for a period of five years. In exchange for approving the provider to run the scheme and collect registration fees, the provider agrees to deliver a range of services and commits to delivering a number of outcome-based annual or quarterly key performance indicators (KPIs) in the interests of gas consumers and gas installers. Failure to achieve the KPIs will trigger the service credit

mechanism which gives rise to financial consequences.

The structure of the new scheme will address concerns of some industry stakeholders that the current arrangements risk anti-competitive behaviour. It will operate on a financially-transparent basis with stronger governance arrangements and clear accountability in how gas installer fees are used. It will also be ring-fenced from other commercial activities and there is a whole range of measures in the contract to prevent the new provider taking undue commercial advantage of its position.

Details of the concession agreement will be finalised over the coming weeks with a view to agreeing it by September 2008. Transition to the new scheme will take place over the following months so that the new scheme can begin in April 2009.

Once that process is completed, stakeholders in the proposed scheme for Ireland would do well to study the fine detail of the final agreement. While a separate jurisdiction, there are bound to be vast sections of interest to, and with a relevance for, the Irish scenario. It is opportune that this process in the UK has occurred at a time when we here in Ireland are about to implement a registration scheme of our own. Let's not be precious about making our own mistakes but instead learn from theirs.



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# Another Side Of ...

## Jim Fogarty

**J**im Fogarty is widely known and respected as the founding director of Environmental Design Partnership (EDP), one of Ireland's leading mechanical and electrical consultancies. However, few people are aware of Jim's standing as one of Ireland's foremost horse whisperer and gentling specialists.

A horse whisperer is a horse trainer who adopts a sympathetic view of the motives and needs of the horse, based on modern equine psychology. The term goes back to the early 19th century when an Irish horseman, Daniel Sullivan, made a name for himself in England by rehabilitating horses that had become vicious and intractable due to abuse or accidental trauma. His techniques were adopted by others, especially in the US, and they now form the cornerstone of all modern-day horse whispering techniques.

Jim Fogarty has had a passion for horses for as long as he can remember. He learned to ride without any tuition but, in his early teens, sought professional schooling under the guidance

of the famous Iris Kellet, with whom he became great friends. He rode out of the Kellet stables for many years, competing at top-class level in everything from hunter classes through to showing classes, dressage and cross country.

However, while unable to ride because of a back injury in the early 1990s, he began to take a serious interest in coaching riders and the training of horses. He studied under Iris Kellet and it was at her stud, Daffodil Lodge Stud, that he first met the legendary American horse whisperer Monty Roberts. After that he was hooked.

Over the next decade he undertook extensive studies, gaining qualifications and accreditation at the highest level in all relevant equestrian disciplines. He travelled extensively throughout Europe, the UK, Russia and America, constantly studying and observing different ways of training and handling horses.

Throughout this learning process Jim discovered that he has a natural affinity with horses. He has used this, along with his studies, to develop his own

distinct and innovative ways of working with confused and difficult horses ... not to mention confused and difficult riders! As a result he is now one of the foremost experts in Ireland when it comes to addressing behaviour and confidence issues in horses and riders alike.

As an active rider Jim always had a keen interest in competition and, in developing his whispering and gentling skills, he ensured that they were compatible with his coaching skills. In dealing with competition horses his objective is to improve the quality of life of the horse while, at the same time, providing enhanced performance — and even enjoyment — for both horse and rider. Ironically, many of the rider coaching techniques he has developed very often help prevent problems arising with horses in the first instance.

Most of the individuals featured in this column treat the "other" activity they are engaged in as their hobby or retreat from business. With Jim Fogarty it is different ... horse whispering and gentling comes across as his *real side* ... not his *other side*





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# designing BUILDING SERVICES

## how improved solar shading influences the ventilation strategy

With growing intensity in building design as a direct product of our drive for a more sustainable built environment, the building form is arguably the most important environmental aspect of any building. The external envelope is the skin of the building and creates the climatic boundary conditions.

The art of shading is an important aspect of the energy performance of a building and must be considered relative to the specific needs of the façade (Figure 1). This article looks at the impact on solar cooling load per unit floor area by adjusting both the glazing specification and the shading solution and how these affect selection of a suitable ventilation strategy.

The better the performance of the external façade at limiting solar load, the lower the



Figure 1 — Example of a combination of shading devices to suit different requirements

probability of space overheating in natural ventilation modes and the lower the demands on any mechanical ventilation or cooling system. In Ireland, commercial/public buildings contribute to 15.2% of the total energy demand with 8% of this attributed to cooling requirements and up to 16% attributable to ventilation fans and controls. A more efficient façade solution can help reduce these values substantially and improve our overall energy dependence in Ireland.

### Fenestration Assessment

Based on the regulatory requirements of the 2006 TGD Part L and the work involved in limiting the risk of solar overheating, it is imperative for the building services engineer to be involved in the fenestration design at the concept stage to help establish acceptable climatic boundary conditions resulting from the building envelope's environmental performance.

The size of windows on sun-exposed façades has by far the largest influence on room cooling needs, being an order of magnitude greater than all the other room heat gains combined (Figure 2).

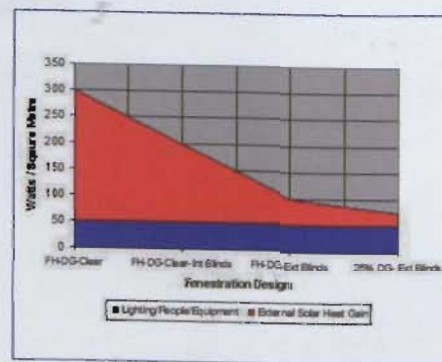


Figure 2 — Typical total cooling load range

Full-height un-shaded clear double glazing introduces a room heat gain of the order of 250 W/m² (floor area) in a perimeter lightweight room, arguably too great even for mechanical cooling to counteract. An optimum window size for minimising solar gain and providing adequate daylight is frequently in the range of 20% to 40% of the internal area of sun-exposed walls; with a gain of between 50 and 75 W/m² (floor area), this is still greater than the sum of the other room heat gains.

Shading, therefore, should be considered for all buildings but is a prerequisite when aspiring to a passive design solution. Figure 3 outlines some typical target percentage areas for sun exposed glazing on each orientation. The building services



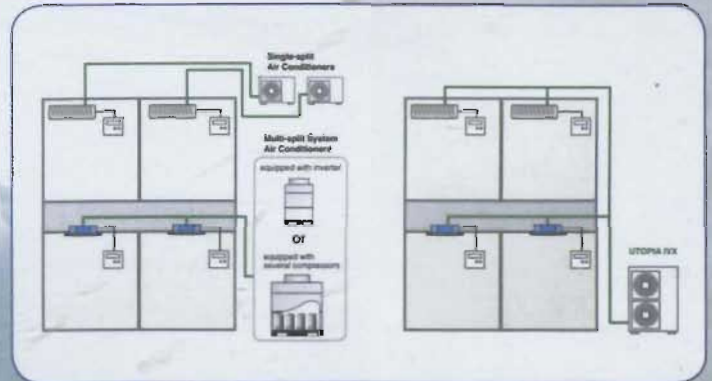
## Utopia IVX Technical Description

### New Extended Range

The Utopia IVX — which has been extended significantly with the addition of new models — is a very efficient product boasting an extremely high COP of 4.24 (8HP models) and is a further development on its predecessor which was presented with the “Shoene Taistou” (Energy Efficiency Award) by the Japanese government. The unit uses a horizontal discharge twin fan design, allowing for a more efficient use of floor space. It is now available in 7kW, 10kW, 12.5kW, 14kW, 20kW, 25kW and 30kW models.

### Greater Installation Flexibility

The IVX changes the way we think about twin, triple and quad split configurations and is the perfect choice for installations requiring individual unit control but have no need for the piping length capabilities available with more expensive VRF systems.



- Compact and Lightweight
- Minimum use of refrigerant
- Wide operating range down to -15° cooling and -20°
- Individual unit control
- Award winning Energy Efficiency – High COP of 4.24 (8HP models)

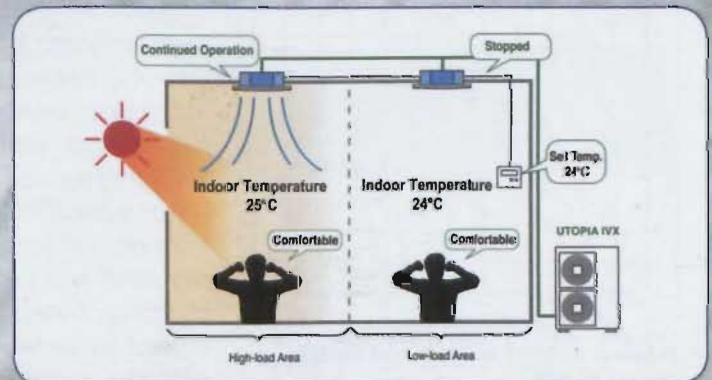
# Utopia IVX

RAS—12HRNM (12Hp / 30kW)



### More Efficient Control

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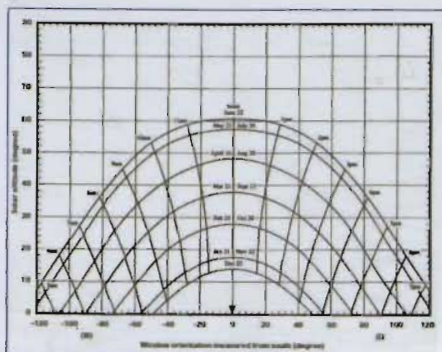
# how improved solar shading influences the ventilation strategy

Orientation of Opening	Max Allowable Area (%)
N	50
NE/NW/S	40
E/SE/W/SW	32
Horizontal	2

**Figure 3 — Recommended maximum allowable glazing areas**

engineer can utilise the calculation procedures available in CIBSE TM37 (UK Part L2A) and appendix E of TGD Part L for evaluating the architectural concept and the building envelope's indirect impact on the ventilation strategy that must ultimately be chosen.

Informed, appropriate radiation intensity values should be utilised when deciding on the incident radiation on each orientation as this will have the foremost impact on the theoretical cooling loads and reduction in intensity. All latitudes have specific solar azimuth and altitude angles at different times of the year and it is important to select values as close as possible to local conditions. TM37 uses CIBSE Guide A-Table 2.30 solar radiation values and these tend



**Figure 4 — Solar azimuth and altitude angles at 52N**

to be higher than those stated in 2006 TGD Part L, (Figure 4).

### Solar Shading Techniques

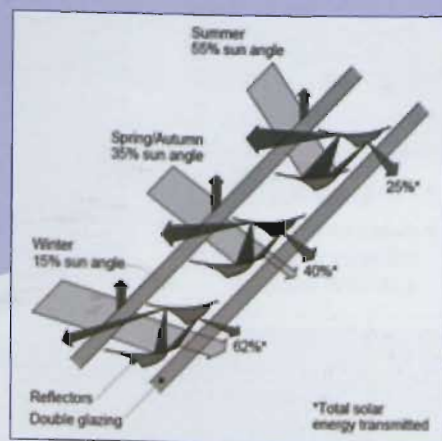
Shading is important for three reasons — to reduce solar overheating; to reduce glare; and to provide occupancy privacy. Broadly, shading can be divided into external and internal shading devices, and now also, solar control glass.

External shading measures are relevant for heavily-glazed elevations, in particular south-facing. Simple overhangs can be highly effective at blocking high-angle summer sun while allowing access to lower azimuth sun angles in winter months to maximise passive heat gain. That said, awareness of the effects of glare should be considered here also (Figure 5).



**Figure 5 — Example of external louvre solutions**

Furthermore, the use of this shading technique often creates a "design worst case" in September, when the increased low-angle solar window exposure is not sufficiently offset by lower outdoor air temperatures, resulting in a need for additional shading. Mid-pane louvers can adapt to seasonal azimuth and altitude changes (Figure 6).



**Figure 6 — Seasonal performance of mid-pane louvres**

Only sophisticated external louvre systems are really effective at controlling both solar gain and sun glare. Where both heat and glare are important, a hybrid approach is often best, with an overhang, light-shelf or heat-mirror glazing to control summer heat, and internal blinds for glare.

Internal shading measures such as horizontal blinds and intermediate blinds may be more suitable to sensitive planning situations and can give good shading performance. They can also provide good glare reduction, privacy and user control. Another effective alternative is the performance of the glazing itself and reflective films.

There are two broad types of glazing commercially available — absorbing glass which is body-tinted and reflective glass which has a special coating. However, currently these glazing types cannot adapt to seasonal changes and, in specifying glazing that is effective in restricting solar gain, will do so all

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\*Provided the existing pipework meets current legal requirements regarding pressure rating of R410A.



# how improved solar shading influences the ventilation strategy

year round, thus eliminating the potential for passive winter solar gain which can be beneficial to reducing heating demand.

Advanced glazing types are now available that can reduce the risk of overheating while still allowing sufficient light transmittance. These glass types have a spectrally-selective coating that reflects infra-red radiation while admitting visible light.

Electrochromism, another advanced glass shading solution, provides a change in the spectral transmission characteristics of a material by the switching of an electric current across it, thus changing its chemical structure. Due to the development of thin film coating techniques, electrochromic materials have been used in glazing solutions to control and vary the amount of light and heat they transmit by the use of an electric charge. Other chromogenics involve photochromism and thermochromism, though the discussion of this field of science is beyond the scope of this article.

Depending on the complexity of design, typical costs of shading devices can range anywhere from €300 to €1500 per sq m of glazed area. Consequently, great care should be taken when preparing cost appraisals at the concept stage.

In order to assess the solar cooling load reduction in utilising different shading solutions, the designer can carry out an

Shading System	Best Orientation	R TST		R DT
		Summer	Winter	Diffuse
Clear DG	-	1	1	1
Overhang	S	0.55	0.84	0.61
Light Shelf	S	0.51	0.78	0.52
External Louvre	H	0.28	0.45	0.32
Tinted Glazing	SEWH	0.71	0.68	0.49
Heat mirror glazing	SEWH	0.66	0.63	0.79
Reduce window area	ANY	0.5	0.5	0.5
Mid Pane Venetian	NSEW	-	-	0.32
fixed mid pane louvre	H	0.37	0.9	0.6
Venetian blind	ANY			

Figure 7 — Typical TST (g-value) values for shading devices

assessment based on a calculation utilising the total solar transmittance value (TST) of the glazing and the resulting effective g-value of the combined façade design, including glazing and shading devices. The effective g-value is the resulting value of TST when the normal glazing TST (g-value) is adjusted using conversion factors for the shading solution employed (Figure 7).

The effective g-value takes consideration of the effect orientation will have on a device's performance and allows a range of characteristics to be modified such as overhang depth, external louvre angle, blind reflectance, etc. Further reference should be made to CIBSE TM37 for an in-depth explanation of this procedure.

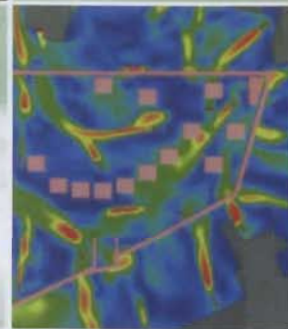
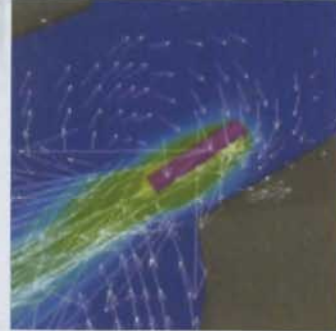
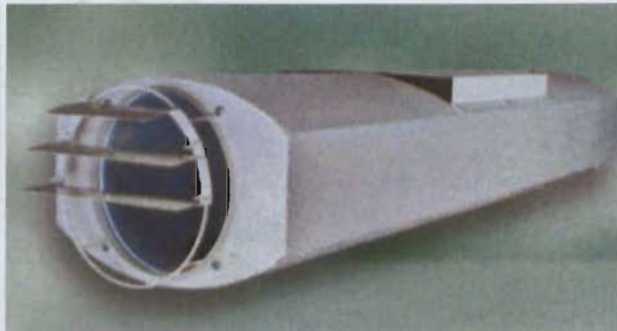
### Direct Cooling Load Reduction

The type of shading selected will influence how effective a natural ventilation strategy is in controlling operative temperatures in the occupied spaces. CIBSE recommends limiting the total space cooling

load to between 30-40W/m<sup>2</sup> if the intended space is to have no mechanical cooling or ventilation, with passive cooling being effective at cooling loads of 50-90 W/m<sup>2</sup>.

For instance, allowing a combined 25W/m<sup>2</sup> cooling requirement for lighting, people and small power/IT, average solar cooling loads would need to be as low as 10-15W/m<sup>2</sup> for a natural ventilation solution, this being lower than the Part L requirements. Furthermore, this cooling load would need to be the upper limit for the season in order to keep within CIBSE and BRE guidelines for exposure to excessive temperatures.

In order to demonstrate the effect solar shading can have on space cooling loads a hypothetical office space was reviewed using CIBSE TM37 calculation procedures. The space was orientated along a north-south axis, being easier to treat for solar impact, with the north and south facades substantially longer than east/west. Typical glazing heights were 2.0 metres (Figure 8).



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# how improved solar shading influences the ventilation strategy

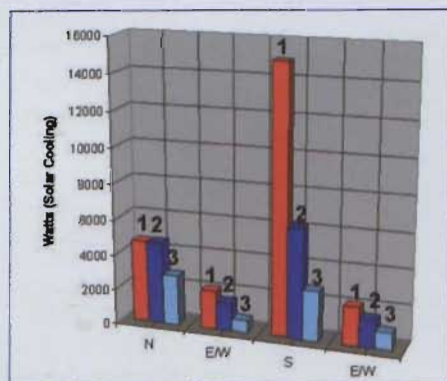


Figure 8 — Direct cooling load reduction for differing configurations

The first facade strategy was a simple solution with solar control glazing on all facades with a TST (g-value) of 0.6. This resulted in an average solar cooling load of 42W/m<sup>2</sup>, non-compliant with Part L and too excessive for a naturally-ventilated space.

By introducing a fixed external overhang (0.8 D/H ratio) on the south facade and external passive louvers at a 45° inclination on the east and west facades, the solar cooling load was dropped to 24 W/m<sup>2</sup>, making it compliant with Part L and coming close to an acceptable total cooling load for the use of a natural ventilation strategy as the total load, including internal gains, would be 49 W/m<sup>2</sup>.

In addition, by improving the TST (g-value) of the glazing from 0.6 to 0.4, replacing louvers with mid-pane blinds on the east and west facades and reducing the south-facing glazing by approximately 20m<sup>2</sup> (27%) while retaining the south facing overhang, the solar cooling load was further reduced to 10 W/m<sup>2</sup>. This was more than sufficient for designing a passive cooling

solution. **Figure 8** highlights the total solar cooling load reduction for each solution on each facade.

It can be seen that each facade must be addressed independently to find a strategy that works. Also, solar overheating calculations are normally averaged over the period of exposure throughout a day and should not be used for detailed peak-cooling load estimations.

### Breakdown of Contribution to Solar Cooling Load

Looking at the breakdown of the total solar cooling load incident on the occupied space based on the orientation can help the engineer focus on the specific facades that are the major contributors to the total cooling load. **Figure 9** highlights the percentage breakdown of the cooling loads for each orientation based on design strategy 1 to 3 above. It helps demonstrate how the individual facades contributed differently to the total cooling load and can help identify areas where different ventilation solutions may

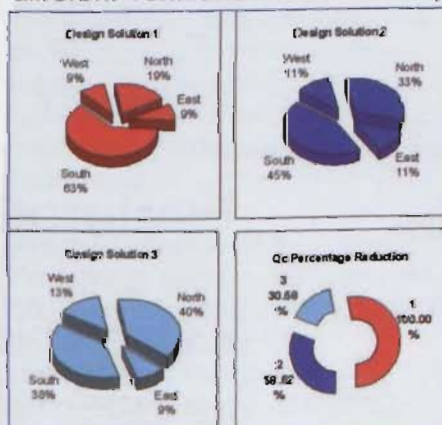


Figure 9 — Cooling load breakdown per orientation for types 1-3

apply.

Design solution 1, with glazing only on the south facing facade, results in 63% of the overall solar load being incident on that facade. The introduction of an external overhang reduced this to 45% of the total space load and, ultimately, 38% with design solution 3 having improved the glazing specification and reduced the net exposed area of glass. The total load reduction was almost 70% from design solution 1 to 3, increasing shading each time.

### How Shading and Ventilation Relate

**Figure 10** (see over) highlights the typical cooling load ranges where different solutions might apply and typical energy consumption values. From this the solar cooling percentage will help the reader to begin to see the target reductions needed to achieve their intentions. At any rate the average daily solar cooling load shouldn't be greater than 25W/m<sup>2</sup> and around 10W/m<sup>2</sup> if possible.

### Further Guidance

With the correct combination of glazing area, north-south orientation, effective glazing specification and shading device, it is very achievable to minimise solar impact and design towards a natural ventilation solution.

It is important to utilise manufacturers' data for their shading products, where available, when undertaking shading assessments. Most manufacturers of glazing and

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ENERGIZING INDOOR CLIMATE



## how improved solar shading influences the ventilation strategy

Strategy	Qc Load	Solar %	Potential Shading Solutions	Cooling/ Fans + Control Energy Use
Natural Ventilation and Daylight	30-40	25-30	External Overhang	2/6 kWh/m <sup>2</sup> /yr
			External Louvres	
			Fixed Mid Pane Louvres, Solar Control Glass (g = 0.6 - 0.4)	
Mixed Mode (Zoned)	40-100	20-30	Mid pane blinds/louvres	25/35 kWh/m <sup>2</sup> /yr
			External Overhang (South)	
			Improved Solar Glazing	
Air Conditioning (Prestige)	100-150	20-30	Internal Blinds	41/50 kWh/m <sup>2</sup> /yr
			External Overhang (South)	

Figure 10 — Characteristic benchmarks for ventilation solutions

manufacturers of glazing and external shading systems such as louvers, brise soleil, etc will have readily-available data and will assist in the process of establishing the effective g value for a particular building façade.

Introducing more complex façade solutions will always have an impact on the capital cost for the project. There will be operational benefits with reduced utility costs and a solution that maximises daylight will negate any additional artificial lighting, otherwise increasing electricity costs. For instance, the reduction in average solar cooling load between design solution 1 and 3 above was of the order of 17kW.

This can result in seasonal reductions of 6,800 kWh<sub>e</sub> and 4.4 tonnes CO<sub>2</sub> for that floor alone.

The pending new Part L will more than likely see further tightening of the solar overheating limitations and, as a result, will further increase the importance of fenestration design. Therefore, the building services engineer should be aware of the benefits of the different options available and the extent of the importance solar shading can have on the resultant solution that is appropriate.

The reader should explore the documents listed under References for a more rounded, in-depth understanding of solar

shading design on building facades.

### References

- (1) CIBSE Guide A 2006 Environmental Design;
- (2) BRE 364 Solar Shading of Buildings;
- (3) CIBSE TM37 Improved Solar Shading of Buildings;
- (4) SEI Energy Managers Resource Guide;
- (5) Building Regulations TGD Part L 2006;
- (6) CIBSE Guide F Energy Efficiency.

**Paul O'Sullivan is a Lead Engineer with PM Group based in Cork. He holds a Diploma in Building Services Engineering, an Honours Degree in Mechanical Engineering, and a Masters Degree in Building Services Engineering Management. Paul has seven years industry experience (in Ireland and France) primarily in the healthcare sector, along with the commercial and industrial sectors. He is a member of Engineers Ireland, has lectured in building services design at Cork Institute of Technology.**

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# Sanyo Eco GHP M Series Helps Reduce Carbon Footprint

**S**anyo's recently-introduced ECO G GHP M Series is a new low-carbon, gas-driven, VRF air conditioning system intended as an alternative to traditional electric VRF. It provides the perfect solution to power supply issues, in addition to improved performance and reduced carbon emissions.

More powerful than ever before, the new M Series range can connect up to 48 indoor units. Improvements include increased part-load performance, reduced gas consumption with a Miller cycle engine, and reduced electrical consumption. With the new gas-driven VRF systems now using R410A, enhanced heat exchangers and an engine management system, all contribute to a claimed 19% increase in efficiency.

Dave Colbert, Senior Technical Consultant, Sanyo Airconditioners Ireland, explains: "Sanyo has been developing GHP VRF systems for almost 30 years, showing our commitment to delivering ground-breaking technology. The GHP M Series uses R410A refrigerant and clean-burning natural gas for high-efficiency operation, offering an easy way to renew an old air conditioning system by using existing piping.

"Our range of GHP VRF systems is leading the industry in the development of efficient and flexible systems, making them the natural choice for commercial projects, especially where power restrictions apply."

The new M Series range consists of:—

- ECO G Power, an innovative gas-driven VRF with electrical power generator, the first European VRF system to supply heating, cooling hot water and generate 4.0kW of electrical power;
- ECO G 3-way heat recovery VRF system, offering improved performance and outstanding features when providing simultaneous heating and cooling. Now available with 16HP to 25HP capacities;
- ECO G W-Multi 2-way for heat pump applications, offering increased flexibility and available as multi-systems with combinations from 13HP to 50HP.

Benefits and improvements across the M Series range include:—

- High-performance air exchanger and newly-developed refrigerant heat exchanger which give high efficiency operation;
- Lowest nitrogen oxide emissions at 66% below standard and features a new

- lean-burn combustion system which utilises air fuel ratio feedback control to reduce NOx emissions;
- Excellent economy with quick and powerful cooling/heating;
- High performance with COP rating greatly improved; also advanced heat exchanger design and improved engine management system;
- Water chiller option available with temperature range from -15°C to +45°C.

The Sanyo GHP M Series VRF range provides quick and powerful cooling/heating and the efficient recovery of waste heat. Not only is the gas used as the heat source, but the waste heat from combustion is also recovered and re-used. In addition, the use of engine waste heat ensures that the system needs no defrost cycle, therefore providing 100% heat performance in severe weather conditions with an outside temperature as low as -20°C. During cooling mode the rejected heat from the engine is available for use in a DHW system and can supply up to 22kW of hot water at 65°C.

In addition, the M Series range utilises the non-ozone depleting R410A refrigerant, in line with Sanyo's "Think GAIA" brand vision of environmental responsibility. R410A refrigerant also provides increased system performance and energy efficiency, which in turn means lower operating costs.

Contact: Dave Colbert, Sanyo Airconditioners Ireland.

Tel: 01 - 403 9900;

email:

david.colbert@sanyoaircon.com



Sanyo's recently-introduced ECO G GHP M Series is a new low-carbon, gas-driven, VRF air conditioning system intended as an alternative to traditional electric VRF.

# face to face

GERARD KEATING



**H**aving served CIBSE with distinction for many many years, it is appropriate that Gerard Keating was elected Chairman, CIBSE Republic of Ireland Region, for the 2008/9 term. Gerard is widely known and respected across the entire building services industry and the industry is fortunate that a person of his experience and calibre has taken the helm as we head into uncertain and challenging times for construction as a whole.

While the official CIBSE programme for the coming term won't commence until September, Gerard has already kick-started his Chairmanship. The new Committee has met on a number of occasions and various officers have now been appointed to handle specific roles under a more structured management system.

Against this background *bs news* spoke with Gerard earlier this month for our *Face to Face* series. We asked him to briefly outline the challenges he foresees facing the industry over the coming 12 months and to identify the role building services engineers can play in meeting those challenges.

"It has been almost two months since I took on the role of Chairman of the Chartered Institution of Building Services Engineers Republic of Ireland Region" said Gerard, "and within those two months we have officially entered into a recession. The National Development Plan, which had been proposed by Government, has been reigned in while memories return of 'tighten your belts' statements from political leaders. In addition, FÁS has predicted a loss of 76,000 jobs in construction, the CIF is being challenged with pay freezes, while the growth period of the last 10 years has all but come to a standstill.

"With all that said I have great hope for our members, and for building services engineers in general. We must look forward, consolidate what we have and build on it. The CIBSE and its members are ideally placed to influence the country's goals on climate change, on infrastructural development, industrial diversification, etc. We have trained as engineers and are ideally placed to continue within these markets and in developing markets.

"As building services engineers we have implemented the updated CIBSE guides, the Irish and UK Part L standards, and the Energy Performance of Buildings Directive over the last few years. We 'adapt or die', as one of our

# face to face

GERARD KEATING

*"The Government has stated that fourth level education and research is the next step for our economy. CIBSE has a role in promoting research into areas which affect building services including carbon reduction, energy conservation and sustainable construction and design."*

past presidents stated a few years back. We engineers can, and do, adapt to our ever-changing surroundings.

"The Government has stated that fourth level education and research is the next step for our economy. CIBSE has a role in promoting research into areas which affect building services including carbon reduction, energy conservation and sustainable construction and design. CIBSE assists our members in this regard. Our region has recently supported a research programme and we review all submissions made to us, which are directly connected with building services.

"CIBSE promotes and supports the career of building services engineers by encouraging courses of study in further and higher education and continuing professional development (CPD). It is the standard setter and authority on building services engineering and sets the criteria for best practice in the profession. CIBSE is a pioneer in responding to the threat of climate change and also in sustainable design. Each group within CIBSE is focussed on best practice in the design of, and maintenance of, building services. There are many groups and societies within CIBSE and these give an indication of the scope of building services careers, and the opportunities, on offer. They include:—

- ASHRAE
- Daylight
- Electrical Services
- Facilities Management
- Heritage
- Information Technology and Controls

Margaret Dolan & Gerard Keating



- Lifts
- Energy Performance
- Project Management
- Combined Heat and Power
- Natural Ventilation
- Industry, Education and Training
- Healthcare
- Intelligent Buildings
- The Society of Light and Lighting (SLL)
- The Society of Public Health Engineers (SoPHE)
- The Society of Façade Engineering

"Keep informed and up to date through our CPD programme which runs from September through to May each year. Building Energy Ratings (BER) for Non-Domestic Dwellings is the first lecture in the series and this will be followed by all manner of presentations covering a diverse range of relevant subjects.

"Experience, qualifications and knowledge are critical if building services engineers are to deliver the sustainable and energy-efficient solutions now so urgently needed by Ireland. CIBSE provides routes to realising these objectives, along with full professional registration including Chartered Engineer, Incorporated Engineer and Engineering Technician.

"Log on to <http://www.cibse.org/> and follow the membership links to join today. If already a member check to see if you are eligible to upgrade your current grade of membership. I look forward to seeing you all over the coming year."

underfloor heating

## Uponor Invests in Infrastructure to Boost Irish Market Penetration

In market conditions that are far from ideal, the ongoing switchover from copper to plastic plumbing is still allowing plastic manufacturers the chance to grow. Now in its third year, Uponor Housing Solutions Ireland is one manufacturer still maintaining a level of growth beyond the industry's expectations. This continued growth has allowed the company add an additional two sales representatives in Ireland where two products in particular are proving extremely popular since their re-launch earlier this year.

The Uponor PEX Plumbing range extends from a product line of pipes that go all the way back to 1620 in Virsbo Sweden. The plastic PEX pipe that we know today was introduced in 1972, with a estimated 2.5 million metres

manufactured (Oct '07) by 17 factories in 11 countries around the world. The re-launch of the PEX sees no change to the polyethylene cross-linked material that has served the product well in the last 36 years, but further enhancements to the "quick-and-easy" fitting system.

Included in the re-launch is an improved fitting system that ensures the PEX ring cannot slip down the pipe; an auto-rotating expander tool; and a new range of service valves and brass fittings. In addition, the pipe range will also benefit from an additional 12mm diameter size suitable for installing within the recesses of walls. The joint is sealed by the pipe internally, using the elasticity of the pipe to obtain a secure safe joint whose integrity increases as time goes by.



Despite market conditions, Uponor Housing Solutions is still maintaining a level of growth beyond expectations

Utilising the same PEX material, Uponor's pre-insulated pipe has also undergone significant investment on the supply chain aspect of the product. Increased demand has allowed Uponor to place significant investment in a decoiling machine to reduce and simplify the process of straightening, cutting, and recoiling of the pipe. Uponor was the first to offer the "cut-to-length" service which can save money by reducing unnecessary waste and time lost on site.

In a range containing seven different pipe configurations, Uponor's flexible pre-insulated pipe is able to transport a variety of liquids, both inside and outside of buildings, with minimal temperature differentiation.

Armed with the task of introducing the new ranges to the

construction industry in Ireland will be Uponor's latest recruits, Paul Lackey and Sean Millea. Both bring a fresh enthusiasm from their previous roles from within the construction industry where they came across the Uponor brand. The two new roles will give Uponor increased coverage throughout southern Ireland and further increase its ambition to become the number one plastic system provider in Ireland.

Fitting techniques for the new PEX range can be learned, along with general UFH techniques, at the Uponor Academy in Dublin which has fully-fitted-out training facilities.

Contact: Derek Duff,  
Uponor Housing Solutions Ireland.  
Tel: 01 - 895 7430;  
email: info@uponor housingsolutions.ie



Uponor's new decoiling machine reduces and simplifies the process of straightening, cutting and recoiling pipes.



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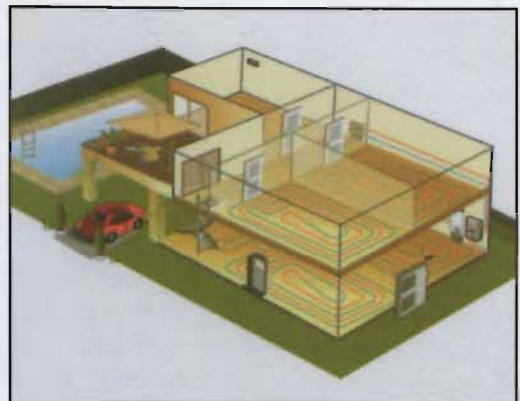
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### Residential Heat Pumps



Renewable Energy  
Solutions

underfloor heating

## Honeywell Makes Energy-Saving UFH Controls Easy

Honeywell makes energy-efficient control for underfloor heating systems easy for users and installers, with its programmable thermostats and wireless manifold controller.

Underfloor heating controls differ from those for traditional radiator circuits in that the flow temperature through the underfloor heating pipes is moderated by using some form of mixing valve or high limit control. The controls open the manifold zone valve, which in turn starts the manifold pump and switches on the boiler and main pump. It is better to use a programmable thermostat, rather than a time clock and room thermostat, so the desired room temperatures and on/off times are set in the room being controlled.

A programmable thermostat such as the slimline Honeywell CM900, with its simple operation and large "line of text" display, can reduce the delay from underfloor heating start-up before the desired temperature is reached. Its setback temperature feature maintains background heat during the "off"



The HCE80 wireless manifold controller and CM900 programmable thermostat, both from Honeywell

period, so there is faster heat-up and less energy consumed to raise the room temperature when the heating comes "on". A Honeywell programmer can be programmed to make up to six time/temperature changes automatically per day. This takes account of the fact that, in many cases, the same high temperature is not needed all the time the heating is on.

An optimisation option further increases efficiency: the user sets the desired temperature and the time it is required on the programmer, not the boiler start time. The controller calculates and adjusts the heating start time daily, using the existing room temperature and the "heat-up" time recalled from the previous day.

Honeywell makes the controls installation much easier and faster with its HCE80 wireless manifold controller, which means there are no control cables between the rooms being heated and the HCE80 which can be mounted close to the manifold. It also simplifies connections to pumps and the thermostatic actuators on manifolds, due to screwless "push-in" terminals featuring a reliable new clamp design. It is ideal for installation in existing buildings because disruption is kept to a minimum.

The basic HCE80 configuration controls up to five heating zones. This can be upgraded to eight zones with an HCS80 extension unit. Additional controllers and extension units can be added to create any

number of additional zones.

Many temperature and time control configurations are possible with the Honeywell HCE80. Automatic temperature adjustment of a zone at various times during the day is simple using a Honeywell CM900 wireless programmable thermostat, while room temperature set point control without time programming can use the Honeywell Y6630D wireless thermostat. The HCE80 is also fully compatible with a CM Zone wireless zone system.

The HCE80 controller is designed with an intelligent control algorithm and uses fuzzy logic to maintain constant room temperatures, for comfort and energy efficiency.

Help on any aspect of heating controls is available from Honeywell's Technical Support Line.

Contact: Honeywell Technical Support.  
Tel: 0044 -1344 656125;  
email: literature@honeywell.com;  
www.honeywelluk.com



# Residential & Commercial Underfloor Heating Systems



Profile panel system with 11mm or 35mm insulation



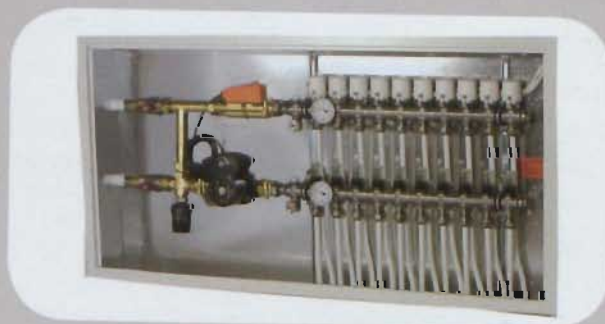
Pex Pipes 14mm 16mm & 20mm



Multilayer Pipes 16mm to 63mm



Multilayer pipe system with staples



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underfloor heating

# Altherma Low Temperature Heating Combined Advantages

Rapid progress in heating technology and improved building insulation allows water temperatures of 55°C or less to be sufficient nowadays to heat a house thoroughly, even at extremely low outside temperatures. Most modern water-based heating systems operate at low temperatures, supplying heat via radiators or underfloor heating systems, individually or in combination.

Heat pumps are inherently clean and reliable, and traditionally use "water to water" or "air to air" technology. However, the Altherma "air to water" system from Daikin represents the best of both technologies, combining:—

- The accessibility of air as the heat source;
- Low investment cost: no high-cost drilling, extensive excavation or chimney required;
- Emission-free operation;
- Easy installation and maintenance.

Heat sources for low temperature heating systems include conventional fossil fuel boilers and electricity. Altherma, as an alternative, is a far more efficient solution. More than two thirds of the energy used by Altherma over the year is freely available in the air. The system can operate down to -20°C

(Including back-up heater). As a result, Altherma can generate all the heat necessary to warm a house comfortably.

All heat pumps require electrical input in order to upgrade the low temperature. Altherma for example, can supply 3.8kW (preliminary at Eurovent design conditions i.e. 7°C ambient / 35°C leaving water temperature) of heat to a building from just 1kW of electrical input.

The Altherma system is characterised by flexible application and easy installation and features compact outdoor and indoor units. The outdoor unit can be located discreetly outside new and existing residential buildings while the indoor unit can be installed in any convenient space, removing the need for a dedicated technical room. In addition to providing heat for indoor comfort, Altherma can also supply domestic hot water all year round and can be selected with a cooling option for the hot summer months.

Altherma can be configured in three ways — Monoenergetic, Monovalent and Bivalent — to optimise the balance between investment and running costs, and to extend the types of projects for which it can be used.



The Altherma system is characterised by high efficiencies and sustainable energy use

The Monoenergetic configuration is recommended for the majority of applications because it offers the optimum balance between investment costs and running costs. This solution is recommended for ultra-low energy houses and for moderate climates without severe winters. The initial investment costs may be higher but energy consumption is the lowest of all systems.

With Monovalent the heat pump is sized to provide 100% of the heating requirement on the coldest day. Overall it is sized to provide 90-95% of the annual heating requirement, with the remaining 5-10% supplied by a small electric back-up heater. A good practice is to select the heat pump to cover 60% of the heating demand on the coldest day.

Meanwhile, the Bivalent system combines two separate heat sources — the heat pump and a

fossil fuel boiler. There are two types of bivalent system: series connected (where the configuration is the same as a Monoenergetic system but with the back-up heater replaced by the boiler); and parallel connected. When series connected the boiler is sized to cover capacity peaks only, in parallel configuration the boiler is sized to cover the full capacity on the coldest day of the year. The parallel bivalent configuration is recommended where a heating system exists as adding Altherma optimises the energy consumption of the system.

Altherma can also be combined with alternate renewable heat sources such as solar panels for domestic hot water heating

Contact: Richard Smith, Daikin Europe NV (Irish Office).  
Tel: 01 - 642 3430;  
email: info@daikin.ie

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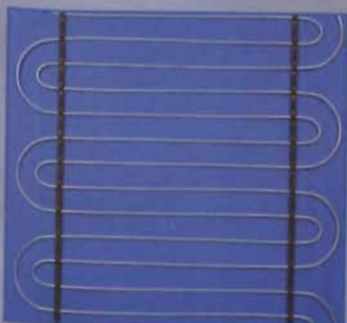
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underfloor heating

## Grundfos — Warming to Underfloor Heating

The underfloor heating market has seen many improvements since the appearance of the first systems in the 1960s. Since then their popularity has continued to grow, both for domestic and commercial building applications. Grundfos circulators have been at the heart of many of the best-known UFH systems from the outset and today they continue to be an integral part of many of the leading systems on the market. Grundfos also provides technical support and expertise to the sector as and when required.

The emphasis for the next generation of UFH systems is on increasingly more sophisticated control methods. The wide range of solutions offered by Grundfos includes incorporating 'A' rated energy-efficient Grundfos circulator pumps that deliver accurate flow and significant energy savings. Other initiatives include the inclusion of outside temperature compensation that improves both comfort levels and energy efficiency, while the introduction of centralised manifold systems reduces the installation time and cost.

Grundfos has seen this market segment increase year on year and experienced sales

growth of 21% over last 12 months alone. This is expected to increase further over the next 18 months as UFH manufacturers are currently developing controls capable of meeting the needs of even larger commercial applications.

Grundfos' newly-introduced Alpha 2 range represents the next generation of this extremely popular range and incorporates models ideally suited to new and impending developments in underfloor heating. Built on the proven platform of the innovative Grundfos circulator range, Alpha 2 takes energy efficiency, user friendliness and compact design to the Nth degree. It is the first small circulator to come equipped with Autoadapt technology which, until very recently, was only available on the larger Grundfos Magna



Grundfos Alpha

circulator range.

Basically, Alpha2 is synonymous with the transition from hardware components to software solutions which has resulted in unmatched user-friendliness, robustness, and compact design, much to the benefit of wholesalers, installers and end users alike.

The factory-set Autoadapt enables simple and fast installation by eliminating complicated specifications and individual details concerning each heating system.

Autoadapt continuously analyses the heating system it is installed in and automatically finds the optimal duty point. The result is improved comfort and the minimum possible electricity consumption.

Furthermore, Autoadapt automatically adjusts to changes in the size of the heating system. If the demand grows or drops due to any change within the heating system, Alpha 2 will immediately adapt without having to be reset by an installer.

Another advantage is size reduction. The actual size of any circulator is extremely important, as the pump is a part of a heating system with space limitations. Removing the

control box from the side of the pump and integrating it axially inside the pump housing has led to a considerable reduction in the size of Alpha 2.

In addition, several hardware components have been replaced by software solutions. The hall sensor, the cooling plate, and several security functions have been replaced by a software solution that not only saves space, but also guarantees a more durable and reliable solution, even under tough working conditions.

Finally there is the new motor construction. Combining the well-proven permanent-magnet principle with new, compact stator and rotor technology, the motor has been made even more energy-efficient. In addition to significant energy savings, fewer connections within the motor make it even more robust and reliable.

Taken together, the various features and many associated benefits of Alpha 2 make it the ideal choice for modern underfloor heating systems.

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# underfloor heating

## Myson Electric Underfloor Heating

Myson has introduced a new line in underfloor heating (UFH) — an electric version of the product in the company's already popular hot water-based system — which is ideal for installation in bathrooms, kitchens and conservatories.

including its digital clock thermostat to regulate temperature, has the added benefit of being supplied all in one box, making it even easier for the installer. It also complies with the European safety standards relating to underfloor heating.



The Myson Electric Underfloor Heating package is ideal for use in bathroom, kitchen and conservatory applications

Quick and easy to install, Myson electric underfloor heating is economical, running at 50w per sq m. It is ideal for renovation projects, or simply to help give a new look to a bathroom or similar area, with no need to adjust the existing plumbing system.

Underfloor products are the ultimate in designer warmth, giving *carte blanche* to those wanting to make the most of their rooms, without taking up wall space with radiators and other visible heating products.

Vincent Broderick, Potterton Myson (Irl) said: "Myson's electric

underfloor heating system is ideal for kitchens, bathrooms and conservatories. Not only does a warm floor give you a warm room, it also frees up more space for cupboards, cabinets or simply to create a minimalist look. Flexible and economical to use,

Myson gives an underfloor solution to heating and space saving, all in the one box."

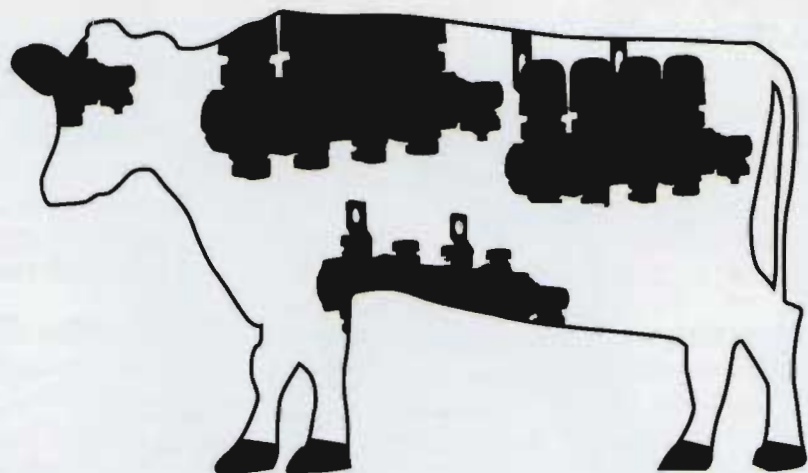
Contact: Potterton Myson (Irl).  
Tel: 01 - 459 0870;  
email: post@potterton-myson.ie

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Designed for radiators & underfloor heating, our new range of manifold's are ideal for both domestic & commercial use. Made of high quality chromed solid brass, each manifold features fill and drain points for simple filling and venting. In fact you could say, they're a whole different animal.

For further information about our new range of Manifold's, please visit our website at [www.uponorhousingolutions.ie](http://www.uponorhousingolutions.ie)



#### Uponor Housing Solutions Limited

Unit 13  
Seatown Business Campus  
Seatown Road  
Swords, County Dublin

T 01 895 7430 / 895 7432  
F 01 895 7434  
E sales@uponorhousingolutions.ie  
W www.uponorhousingolutions.ie



## underfloor heating

# Advantages of Modern Surface Heating

Surface heating systems work with very low pre-flow temperatures of between 33°C and 40°C, making them ideal for use in low-energy housing. This means that there is also significantly less heat loss in the distribution lines and heating boiler than in radiator heating systems, which operate with pre-flow temperatures of up to 70°C, writes Seamus English of Polytherm.

Surface heating systems can be ideally combined with sustainable energy sources such as heat pumps or solar energy. It is possible to operate all year around in the condensing range when using modern condensing technology, thanks to the low return temperatures which allow complete utilisation of the heat energy.

The room temperature can, in comparison to classic radiator systems, be reduced by 2°C while maintaining the same temperature feeling – a result of the constant radiation heat emitted over a large surface area. This saves up to 12 % in energy costs.

The “auto-regulating effect” of surface heating systems means that heat output is reduced when the difference between air temperature and the floor surface temperature decreases. If they are both at the same temperature level, the heat output stops “automatically”.

The installation of surface heating also includes additional construction services which enhance energy performance and reduce running costs. These include heat insulation of the floor and/or walls that would otherwise be an additional cost. Furthermore, these systems also increase the value of a building, making it easier and more profitable to sell or rent.

The average surface temperature of modern surface heating systems lies between a comfortable 23°C and 24°C. They create an ideal temperature distribution within the room, keeping feet comfortably warm while the head stays cool.

The prejudice about “swollen feet” is no

longer an issue thanks to the very low surface temperature of today’s systems. Indeed, a study by the European Organisation for Phlebology has shown that floor heating systems do not pose risks, even for people with vascular problems.

Those suffering from respiratory-related illnesses and conditions also benefit from surface temperature heating systems. The low temperature difference between radiant surface and room air prevents thermally-produced draughts. The air speeds lie in an ideal range below 0.1 m/s so significantly less dust turbulence is present with surface heating. Moisture in the flooring is also reduced, destroying the living conditions of dust mites which are the cause of many allergic reactions.

Surface heating systems are especially suited to creches and nursing homes as there are no sharp corners or very hot temperatures.

Finally, as an invisible heating system surface heating offers unlimited architectural options. With no



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Heatrack for new build, refurbishment and wall heating. Suits joisted floors.



Polycargo for industrial applications and heavy loads

radiators to contend with, the interior design possibilities are endless. An additional bonus is that the system is perfect for use with all floor types be it tiles, stone, carpets or even parquet.

Contact: Seamus English, Polytherm Heating Systems.  
Tel: 01 - 419 1990;  
email: seamusenglish@polytherm.ie



**Altherma: the heat pump system that runs on ambient heat.**



Reduction of 57% CO<sub>2</sub> emission\*

3.8kW of heating for 1kW of electricity\*\*

Reduction of your energy bill by 30%\*\*\*

Renewable energy from ambient air

High comfort level

## Altherma: Home heating solution

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EMAIL INFO@DAIKIN.IE



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by **DAIKIN**

\*Compared to fuel boiler - 28% to gas boiler - Calculations based on Eurelec Program, 2001\* for EU 27  
\*\*Meaning efficiency of Altherma is 380% (Measured by Independent Accredited Laboratory) - Gas boiler 53% and fuel boiler 89%  
\*\*\*34% compared to a fuel boiler and 18% to a gas boiler - Conditions: annual heating energy required = 20 000 kWh; energy prices provided by EURDSTAT (for reference 2007)  
Optionally - Altherma also delivers domestic hot water & cooling

underfloor heating

## Unitherm UFH With German Quality

Unitherm Heating Systems, with offices in Dublin and Galway, has been involved in designing and supplying underfloor heating systems for many years. It is now recognised as one of the leading companies offering total system solutions including heat pumps, solar panels, multi-energy tanks, condensing gas boilers and even zoned radiator systems for residential and commercial systems.

The benefits of an underfloor heating system such as control, energy saving, comfort, aesthetics, healthier living environment, etc, are now well recognised and accepted. There is little doubt a properly-designed underfloor heating system, using quality components, offers the ideal heating solution for private houses, crèches, nursing homes, hotels, churches, offices, factory floors and public buildings. Many consultants and architects who, for historical reasons, were sceptical about the concept of underfloor heating, have, in recent years, embraced the technology and advantages, particularly in conjunction with renewable energy sources.

The Unitherm underfloor heating system is based upon German technology and



Regufloor HC for heating and cooling

experiences over the last 35 years. The system and components are exported worldwide and have achieved an enviable list of over 100 approvals and accreditations in most European countries. Recently Unitherm received Irish Agrément Board approval (IAB) on it's PEX and multi-layer composite pipes. The components, making up the Unitherm underfloor heating system, are manufactured by renowned German companies such as Oventrop GmbH, Fränkische and KaMo Systemtechnik.

Unitherm heating systems offer PEX pipes with oxygen diffusion barrier in sizes 14mm, 16mm and 20mm. They also offer Turatec multi-layer pipes (PE-ALU-PE) in sizes from 16mm up to 32mm and Alpex-duo multi-layer pipes (PEX-ALU-PEX) from 16mm up to 63mm. A full range of Pressfit/crimped fittings up to 63mm are also available and compression fittings up to 32mm.

For installing underfloor heating pipes Unitherm

use Profile panel with 11mm or 35mm high-density insulation attached, or rapid rail with staples. The central point of the system is an Oventrop stainless steel manifold or distributor which is corrosion-resistant and comes complete with lead-sealable topmeters. The topmeters regulate the heating circuit flow rate and can be read off a viewing glass.

For ease of installation Unitherm offers the Oventrop Regufloor regulation station. The station regulates the flow temperature of the heating medium at a constant value by using some of the return flow of the collector and a temperature regulator with contact sensor and a three-way mixing valve. The water in the circuits of the surface heating system is circulated by an electronically-controlled pump which regulates the flow rate according to demand.

All Unitherm underfloor heating systems are individually designed and supplied with supporting mechanical and electrical layout CAD drawings. The

company's strength is in its ability to interface with the electrical contractor as well as the heating installer. A 10-year warranty is offered on systems designed, supplied and installed in accordance with BS EN 1264.

Unitherm also offers innovative, high-efficiency, heat source solutions from leading European manufacturers, such as geothermal heat pumps 6kW to 26kW; Mitsubishi Electric air-to-water heat pumps; on-roof or in-roof solar panels; Alpha condensing gas boilers up to 70kW, etc. Unitherm recently launched the Eco-combi multi-energy tank with capacities from 570lts to 2000lts, complete with 316L stainless steel coils. These tanks can combine heat pumps, solar panels and solid fuel stoves or oil/gas boilers.

Contact: Unitherm Heating Systems.  
Dublin Office:  
Tel: 01 - 610 9153;  
Fax: 01 - 621 2939;  
Galway Office:  
Tel: 091- 380 038;  
Fax: 091- 380 039.  
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et al.: BS News  
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**Honeywell**



# underfloor heating

## Carrier Nexa Underfloor Heating From Core Air Conditioning

Following its acquisition of Nexa, a designer and manufacturer of floor heating and cooling solutions in France, Carrier has developed a unique range of heat pump solutions incorporating contemporary Nexa heating technology with its own established expertise. Designed to provide optimum comfort and reduce energy consumption while caring for the environment, the new Carrier Nexa air to water heat pump has just received the ultimate endorsement in the form of approval for grant aid from Sustainable Energy Ireland (SEI).

Carrier Nexa is ideal for underfloor heating solutions and is claimed to provide annual energy savings of up to 56% in a typical domestic installation, be it a new or refurbished house, or an apartment block. It is now available throughout Ireland from Core Air Conditioning,

Carrier's appointed distributor, with full technical support, design advice and after-sales service.

The core concept of the design is simple — reduce energy usage by the addition of naturally-occurring energy sources such as air (air source) and ground (ground source). By incorporating advanced, high-tech, centralised controls, multi-zones, and all the necessary detection and programming devices, it is possible to provide the ultimate solution for virtually any application.

The system generator — in this case the heat pump — produces the heat required for the installation. To achieve this it extracts heat from the air or ground. It is quiet in operation, robust and ecological.

The heat distributor is the element that diffuses the energy throughout the

installation. The choice of heat distributor varies according to each project and is governed by the nature of the particular application and/or specific design preferences. All options are possible but Carrier Nexa system solutions are especially suitable for underfloor heating.

Controls are equally important. Designed as the electronic brain of the system, the Micronexa electronic module manages all system parameters and is in charge of the heat transfer via the water circuit to the heat distributor, which it also controls. Incorporating the latest-generation microprocessors, the interface acts intelligently according to the chosen settings and the data that it receives

on a continuous basis from the outside and inside room temperature sensors.

Designed to control installations to the highest level, Micronexa is user-friendly (simple display with four control keys) and provides reliable performance for comfort and energy savings. It also monitors the installation safety and, depending on the design, may supply supplementary energy.

CoNex II is the "high-comfort" remote controller which allows the end user control the whole installation from the lounge or any other room. Its discrete aesthetic design and small size allow it to be integrated with all types of interior.

Contact: Austin McDermott or Paul Schwegge, Core Air Conditioning.  
Tel: 01 - 409 8912;



Remote Control

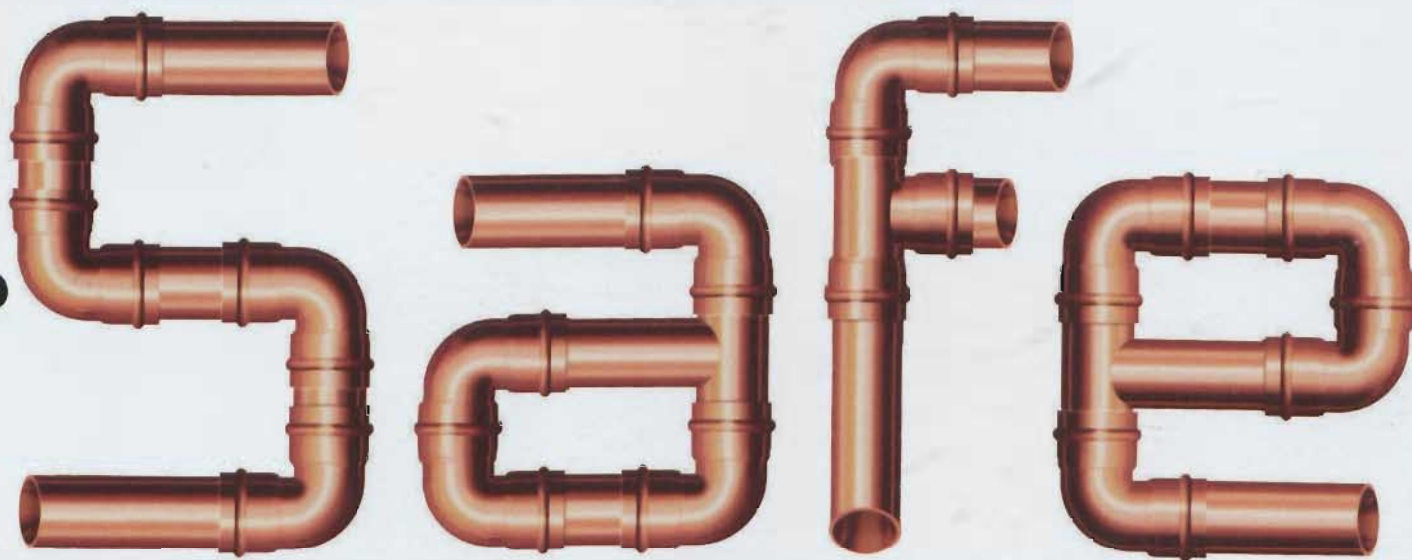
Heat Generator



System Interface Module

Underfloor heating



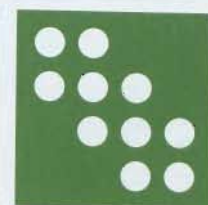


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## BTU news

### sponsor Finheat Group

# btu round-up at carton house

The Gods looked favourably on the BTU for the Carton House outing in June, even if it was Friday the 13th. The conditions were next to perfect, making for a great day's golf. Despite the large turnout and a full time sheet, the afternoon went extremely well with some great scores being returned.

At the presentation of prizes the Captain welcomed members and guests, fresh as he was from his triumphant return with the winners trophy from the BTU Nations in Wales the previous week. Tim O'Flaherty officiated at the presentation of prizes on behalf of the sponsors, Finheat Group, and the evening was rounded off with a great meal in the club house.

Unfortunately, overall winner Eamon Vickers had to leave before the presentation. He has asked us to apologise to all for his early departure and to thank Jim King of sponsors Finheat Group for the specially-engraved Tipperary Crystal (Christy O'Connor Collection) trophy.

Details of all the prize winners are as follows:—

#### Overall Winner

Eamonn Vickers (11) 41pts

#### Class 1

First — Dave Cranston (13) 39pts (Back 9);

Second — Robert Kenny (9) 39pts;

Third — Michael Kearney (11) 35pts.

#### Class 2

First — Gerry Tobin (17) 41pts;

Second — Dave Harris (16) 38pts;

Third — John Littlefield (16) 35pts.

#### Class 3

First — Steve Jones (19) 39.5pts;

Second — George Larkin (23) 34pts (Back 9);

Third — Tony Gillen (18) 34pts.

#### Visitor's Prize

Bob Daly 36pts.

#### Front Nine

Michael Morrissey 20pts.

#### Back Nine

Tony O'Reilly 21pts.



Overall Winner Eamonn Vickers



Tim O'Flaherty and Anthony Kelly, Finheat Group, with Class 2 winner Gerry Tobin



Dave Cranston, winner Class 1, with Tim O'Flaherty and Anthony Kelly, Finheat Group

Steve Jones, winner Class 3 with Tim O'Flaherty and Anthony Kelly, Finheat Group



# Innovative Car Park Ventilation From Wolter & Finheat

Increased emphasis on health and safety, coupled with ever-more-stringent Building Regulations, has catapulted underground car park ventilation to the fore as *the* most critical elements in securing planning permission, especially for mixed-use projects incorporating commercial and residential units. Quite simply, unless the fire officer has approved and certified the proposed solution, permission will not be granted.

It is against that background that Finheat has emerged as the acknowledged market-leader in car park ventilation. Wolter GmbH is an exclusive Liberty Industries product, currently marketed through Finheat Ltd. It now offers total CO ventilation and smoke extract solutions using the world-renowned Wolter jet fan system. To further reinforce this total capability, John Ennis — who is one of the industry's acknowledged smoke extract and ventilation experts — has been appointed to spearhead further development of this area of the business.

Unlike conventional ventilation concepts based on transverse ventilation and ducted systems, Wolter's jet fan technology is derived from longitudinal ventilation systems commonly found in road tunnels.

By installing an adequate number of jet fans in an enclosed car park, a constant air movement can be created. A properly-designed system means that the accumulation of exhaust fumes in dead areas can be avoided, thus ensuring that the CO concentration all over the park is maintained in line with Building Regulation requirements.

Wolter jet fans are also available in a high-temperature configuration for operation at both ambient temperature for CO ventilation and elevated temperature of 300°C for at least an hour. In addition, they contribute to the provision of a highly-efficient smoke containment system. By utilising fully-reversible impeller technology, the thrust direction of each individual fan can be controlled to contain smoke within the affected area and direct it to the nearest exhaust point.

Apart from performance capabilities, noise is another key factor in respect of underground car park ventilation. Higher densities mean a greater concentration of buildings so close neighbours have to be considered, while the proliferation of mixed-use developments also brings its own headaches.

Once again Wolter has a solution. All fan casings are manufactured as one integral sound attenuator of

2350mm in length. Size 250 has a round casing while all other sizes are oval-shaped. The fan-motor-assembly is designed as a slide-in tube which can be easily fitted and retracted through the attenuator inlet. The unique configuration of the units means they can be mounted horizontally or vertically depending on the installation, the overall footprint of the units and the exhaust point stations very often being dramatically reduced. This can



John Ennis, Finheat

release space for additional car spaces at each level.

However, technologically-advanced products with unique features are only half the story. The design expertise provided by Finheat, coupled with Wolter's computational-fluid-dynamics software (CFD), is critical to the total solutions delivered. Finheat offers everything from initial consultation at the earliest possible design stage through to design, supply, installation and commissioning. CFD is critical to this process.

With CFD Finheat creates a 3-dimensional image of the car park, determining all relevant parameters such as required air-change rates, volume and air flow direction, and the different ventilation scenarios. The number, size and positioning of the jet fans is then decided. CFD software also visualises direction vectors of airflows as well as air speed profiles and average age of air distribution in all parts of the car park. This "mean age air analysis" is very important in determining the final design solution.

Completing the total package concept is the integrated management control system. Various parameters can be set depending on the flow-through at each location. Systems can run on automatic or in timed sequences, the frequency intervals being determined in consultation with the client/building user. Ultimately, the objective is to deliver optimum performance and regulatory compliance while, at the same time, maximising energy efficiencies and reducing running costs.

The Finheat, Wolter and Liberty Industries combination claims to do just that.

Contact: John Ennis, Finheat. Tel: 01 - 456 4066; email: sales@finheat.com



# Plexus Star of Lindab Chilled Ceiling Portfolio

Lindab is a market-leading international group which develops, manufactures and markets system solutions for the ventilation industry, offering everything from ventilation components to complete indoor climate solutions. It has approximately 5,000 employees operating in 30 countries worldwide, including Ireland where it has its own, fully-owned company — Lindab (Irl) Ltd — which arose out of its acquisition of the Aervent Group late last year.

Its product portfolio is extensive, catering for virtually every ventilation and indoor comfort requirement. It is the recognised brand-leader in key market segments, one of them being chilled ceilings where it has pioneered a number of significant industry firsts.

Essentially, a chilled beam is a heat exchanger which transfers the heat from the air in a room to a cooled water circuit. This transfer takes place in two ways — radiation between the surface of the beam and the surrounding surfaces in the room; and by way of convection between the air adjacent to the surface and the surface itself. These two heat transfer values are added together to determine the total heat transfer.

Obviously, the manner in which this process is managed and maximised to deliver optimum performance is quite sophisticated but Lindab is recognised as being

at the forefront in developing technologies and system solutions which do just that.

One of the flagship ranges within the Lindab chilled ceiling portfolio is Plexus. The Plexus unit integrates both cooling and heating functions from the climate baffles, together with the supply air terminals technique. A unique feature is that the air is supplied in a 360° pattern instead of a traditional 4-way pattern, which allows for approximately 30% shorter throws.

Plexus units are available in many variants to suit most needs for effect and integration in all building types. When comfort is a priority, Plexus I60 which measures 595x595mm is suitable as a standard tile replacer, and I120 which measures 1195x595mm is suitable as a double tile replacer, both produce effects that are suitable for both small and larger installations. Where large primary air supply is required, the Plexus G/H is the solution. Plexus I and G units are suitable for ceiling-type T15/24 lay-in while Plexus X/H 60 or X120 fits the hidden T-bar or clip-in cassette.

For applications where the project requirements are for a large effect, Plexus M60 is the answer. M stands for magnum and the Magnum unit, with its large battery and lowered faceplate, delivers under the most demanding of situations. It fits ceilings of the T154/24 lay-in type but also comes as a visible unit like the Plexus F60. As standard Plexus is delivered

pre-set with a certain air flow by a certain pressure. It comes with selectable side or top connections for both water and air. The unit is ready for use, whether it is for cooling or heating. On arrival at site it only needs to be mounted and thereafter the system started up. Adjustment and commissioning time is minimised.

For service and maintenance all Plexus units are fitted as standard with an inspection and cleaning hatch, and can be fitted with an optional partial detachable battery which makes the process even easier still.

Full control of the indoor climate is via the Lindab Regula which controls both heating and cooling actuators sequentially. Regula Combi can be used to control the rooms' temperature from the unit. It can also be built in to the Plexus M/F models, or as an external regulator. Regula Secura is provided if the application calls for condensation protection while Regula Connect is used for controlling more than one Plexus unit. Plexus also comes with Drypac, which makes it possible to use very low water temperatures, without condensation.

Full details on Plexus, and the entire Lindab chilled ceiling range, are available with full technical support from Lindab (Irl).

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## Total Comfort Control Under Parasol

# P

arasol from Swegon is the generic name for

a whole family of products consisting of advanced comfort modules incorporating ventilation, heating and cooling functions. Devised and manufactured by Swegon, the world-leading Swedish air movement and air quality specialist, Parasol won the prestigious national award, the Big Indoor Climate Prize 2007, at the Nordbygg exhibition in Stockholm earlier this year. It is now available in Ireland from Marren Engineering who has just been appointed distributor for the entire Swegon range.

Parasol comfort modules operate on a principle similar to chilled beams, the main difference being that they distribute air in four directions as opposed to two with chilled beams. This maximises the area for the mixture of supply air with the room air and so enables the modules to discharge air at high capacity without taking up more ceiling space than necessary.

The 4-way air diffusion is adjustable on each side while the air volume is also individually adjustable on each side. This makes the units extremely versatile and flexible. The comfort modules are also optimised to mix the supply air with the room air quickly, thereby providing the best comfort in the room. In heating applications this technique can be used to convey heat to the room in a better, more-efficient, way. They also operate at very low sound levels.

Parasol systems are easy to size because they are available in

several functional variants, two sizes and a choice of airflows. Maintenance is minimal as the modules contain no fans, filters, drainage piping or movable parts. Being compact-sized units, they are easy to transport, handle and install.

Parasol comfort modules are designed for flush mounting in a suspended ceiling while the Parasol EX modules are intended for suspended installations from hangers or mounting directly against the ceiling. They are available either as single-module or double-module units.

Both Parasol and Parasol EX modules are available in three functional variants — cooling and supply air; cooling, heating and supply air; and supply air. Swegon's ADC (anti draught control) is included as standard on units and this enables individual control of the direction of air discharge along each side of the comfort module.

Apart from the advanced technical features and benefits, Parasol modules are ultra-modern in design with straight, clean lines that blend in with virtually any interior. The visible surfaces are painted white as standard but other colours are available to order.

Meanwhile, the face-plate of the units are available with three different perforation patterns that make them easily adaptable to suit different types of ceiling components, such as light fittings and exhaust grilles that share the surface of a suspended ceiling. Other patterns are available on request.

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Swegon Parasol unit for flush mounting



Swegon Parasol EX unit for suspended mounting

# Combating CO<sub>2</sub> Build-Up in the Classroom Environment



**E**veryone knows that oxygen is a vital element for the human body to function correctly and that an inadequate supply is likely to have negative health implications. Therefore, in any indoor environment a poor heating and ventilation system — especially one that does not supply enough oxygen — will increase the chances of occupants suffering from health-related problems. This is a particularly sensitive issue when it comes to the school classroom and one which needs to be addressed urgently, writes Andrew Treacy, Director, Versatile Heating Solutions.

A large number of people in a confined space over a long period will lead to stale air and an excessive build up of CO<sub>2</sub> which can result in headaches, dizziness, aggression, feelings of lethargy, nausea and falls in concentration levels. In a school environment these symptoms can have a devastating effect on the pupil and teacher performance and contribute to higher levels of sickness and/or absenteeism.

So, the burning question of the

moment is how do we address this problem? I suggest we emulate our UK counterparts who follow the guidelines set out in their Government's Building Bulletin 101, a regulatory framework introduced in 2005 that designers must incorporate into their plans for new school buildings. We could use this as a blueprint to devise our own, similar, guidelines for school classroom heating and ventilation installations.

In most cases, the capital and lifetime costs of air conditioning systems make them an unlikely specification for education establishments. Schools require a ventilation system that will regulate air quality and react automatically to provide more fresh air whenever a room needs it. Such a system must be able to respond quickly enough to deal with a constantly-changing indoor climate. Jaga's oXygen heating and air refreshment system can do just that.

This system was recently specified by Paul Walters from Scott Wilson Consulting on behalf of Torquay Borough Council and installed at Torquay Girls Grammar School in the UK. Commenting on the chosen solution Paul said: "Firstly, we needed a system that was fit for purpose and one that would comply with both Building Bulletins 101 and 93. The oXygen

system met this challenge with ease but there were also other far-reaching benefits for the school in the form of a healthier indoor climate for all and significant energy and cost savings.

"We are committed to achieving the highest standards in environmental sustainable design in our projects so the all round energy-efficiency benefits of this system struck a real chord. The free night time cooling feature of the system draws cool air in during the evening, helping to keep the building cool during the hot summer months. This was an attractive alternative to expensive, energy-intensive air conditioning and we have strongly recommended that the school take full advantage of this benefit."

"Paul Walters' sentiments about the Jaga oXygen system installed in the Torquay Girls Grammar School reflect the experience we have had here in Ireland with similar school projects", concludes Andrew Treacy. "The benefits are significant, not just in terms of health and safety issues but also from an energy usage and sustainability viewpoint".

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# Samurai Strength from Hitachi

The new Hitachi Samurai range is available in capacities from 106kW to 1030kW and is manufactured at HAPE, the company's advanced production facility, which is located just outside Barcelona.

The Samurai air-cooled chiller is available in both cooling only and heat pump versions — cooling only from 112kW to 1030kW and heat pump from 106kW to 585kW.

The Samurai water-cooled chiller is available from 120kW to 696kW (optional heating mode from 161kW to 824kW) and is claimed to be one of the most efficient water-cooled chillers on the market.

A key feature is the compact footprint of the units which is achieved by the use of Hitachi's own plate heat exchangers for both the condenser and evaporator. When combined with Hitachi's advanced electronic control system, the chillers provide full modulation capacity control. This allows the chillers to accurately match the required cooling load while maintaining the outlet water temperature to within +/- 0.5°.

To control water temperature Samurai uses two essential components:—

- A sliding valve in the screw compressor to change the refrigerant circuit variables, adapting them to the requested load;
- A sophisticated electronic system based on control bands in which the aim is to maintain constant outlet temperature.

The benefit of this system is that it allows for control bands with different behaviours so the unit is better able to adapt to load requirements.

Because Samurai utilises continuous capacity control it is able to match the required cooling capacity accurately, controlling on outlet water temperature rather than inlet. The variations in the input capacity are smaller than the variations in the unit's cooling capacity and this leads to increased COP at partial loads.

Sound levels and vibration are other key factors in the operation of a chiller. Samurai chillers operate at low sound and vibration levels because of a combination of technical innovations in the Hitachi semi-hermetic screw compressors, precise machining of components, and meticulous care during manufacture and assembly.

Samurai units also eliminate the need to install oversized electrical wiring to cater for peak currents that are often associated with conventional chillers. This is due mainly to two factors.

Firstly, the compressor's electrical motors have a Star-Delta starting system which is installed as standard in each compressor and allows a significant reduction in the compressor's starting power.

Secondly, the chillers employ a staged start-up process. If the system has more than one compressor, start-up begins with the unit that has worked the least hours and this is run at minimum load to minimise the power load on the installation. After a one-minute delay the second compressor is started. Both compressors continue to work at minimum load as the next compressor begins to operate, and so on, until all the compressors are working at minimum load.

Then, after a 30-second safety delay, the machine increases to normal (rated) power.

Other energy-saving and sustainable features include:—

- High power factor which eliminates the need to install a series of capacitors to compensate for the reactive energy consumer;
- Small installed water volume since the capacity control range is very wide (15% to 100%);
- Minimum amount of refrigeration because of the high-efficiency compact stainless steel plate heat exchanger.

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Hitachi Samurai air cooled cooling only unit



Hitachi Samurai water cooled cooling only unit





# Plumbing Matters

John Kealy — email:plumber@plumberonduty.ie

A quick question and answer session on various topics down at the “Plumbers’ Arms” recently produced some very curious and unsettling results.



## On Building Regulations

All of the plumbers questioned were aware that Building Regulations existed but the majority had never seen or read a copy of them. Very few had a clue as to whether or not Building Regulations seriously applied to plumbing and heating work.

When told that Part L of the Building Regulations now specifies that all boilers to be installed in a domestic setting have to be condensing boilers, some said this condition wouldn't really apply to them as they never install, maintain or replace gas boilers because they're not Registered Gas Installers. Others reckoned that it only applied to new installations and, if they were replacing an existing boiler, they wouldn't have to worry about it.

Sadness descended when it was pointed out that the Regulations applied to all boilers — not just gas boilers — in new and existing

installations. There was even more concern when those present were told that, to be compliant with the Regulations, careful choice of boiler would be required as not all condensing boilers would be suitable (minimum 86% seasonal efficiency).

The general feeling was that adherence to such Building Regulations was more likely on new-builds but, on existing installations, price sensitivity was going to remain the deciding factor. So, as long as cheaper (lower efficiency) boilers are available, they would remain the popular selection.

Either way some reckoned that it would take four to five years at least before these Regulations relating to boilers will filter down to the market coal-face. Many cited the example that it has been “illegal” to install mains-fed electric showers and garden taps in most areas of Ireland

since the beginning of time yet they are on sale in practically every plumber's merchant, electrical suppliers and DIY store in Ireland.

Regardless, all in attendance relaxed in the knowledge that the odds of them ever being caught on a transgression of the Building Regulations were so remote that they wouldn't have to worry anyway. Moreover, it was also pointed out that, Registered Gas Installer or not, the reality at present is that any Tom, Dick or Harry who considers themselves competent can work on gas without fear of prosecution.

## On The Installer Register

Most of those involved in working on gas installations said they were aware that something will happen in January 2009 in relation to gas installations. They know that it will tighten up on who will be allowed to work on gas but few understood exactly

# Plumbing Matters



John Kealy — email:plumber@plumberonduty.ie

what will be involved. The popular rumour was that, from January 2009, if you are caught doing gas work and don't have a GID certificate then you will be given a mandatory prison sentence!

Pleading lack of awareness in this case is inexcusable as the entire industry was given access to the Criteria Document outlining the "rights, duties and functions to be fulfilled by the Gas Safety Supervisory Body and Registered Gas Installers" — pretty relevant stuff for anyone earning a living from heating work. By all accounts very few installers provided feedback on the Criteria Document to the CER, with nobody in the "Plumbers' Arms" *vox pop* having bothered to do so. While that is not the fault of the CER, it is unnerving that it has no handle on how the majority of installers feel about the matter as they carry on regardless.

Of the very few who had bothered to read the Criteria Document, they pointed out that they could find no mention of the new Regulatory Body punishing unregistered installers, just comments about the infringements they would punish registered installers for.

## On The Plumbing Code of Practice

The forthcoming NSAI Plumbing and Heating Code of Practice is seen as a welcome development by our "Plumbers' Arms" *vox pop* and viewed, in the main, as something that will make life easier for those involved in plumbing and heating. It was agreed that it will assist them in their deliberations and help them choose and implement the correct course of action — complying with all regulations and standards — from the outset. It should even eliminate time-wasting call-backs.

Well, that's the theory. The question is ... how many installers are aware that such a Code will shortly be published? Moreover, if and when they do come across it, will they read and implement it? Are they shooting themselves in the foot (feet?) if they don't? While some might view such a Code as an imposition, our *vox pop* result indicates that some installers at least are astute enough to know that it could give them an edge over the competition.

## Time To Circle The Wagons

In an increasingly-competitive marketplace where price-erosion and falling margins are doing untold damage to the industry,

it's ironic that the vast majority of domestic installers still fail to see that the greatest threat is from the rotten apples in the barrel. It's time to circle the wagons to keep out the real threat ... the unprofessional, unscrupulous operators that plague the industry.

Initiatives such as the forthcoming Plumbing Code of Practice — coupled with changes to the Building Regulations and the imminent Register of Installers — are not the threat ... they are the solution. *Bona fide* installers must join together in a unifying representative body which can speak on our behalf and participate in the various initiatives and developments that affect our livelihoods. It's time we became part of the solution process rather than victims of it.



# Plumb Lines

heard it on the grapevine ...



## MARREN FLIES INDUSTRY FLAG

Congratulations to Tom Marren of CESenergy (and Marren Engineering) who is one of eight finalists in the Emerging category for this year's Ernst & Young Entrepreneur of the Year awards. Tom established CESenergy in 2002 as a provider of innovative energy solutions with the objective of focussing on the international market.



To date the company has enjoyed considerable success, especially in Australia, and is fast gaining a reputation throughout Europe as a supplier of energy-efficient engineering solutions combining carbon reduction and financial benefits.

Well done Tom for flying the building services flag in such exalted company. We'll follow your progress over the coming months, especially in October when the three-part TV series is broadcast on RTE. Maybe we'll even see you on the winners' podium on 23 October!

## Ashcoin & Elenco Crash

The recent liquidation of mechanical and electrical contractors Ashcoin and Elenco highlights the challenge now facing building services. While it will take some time for the precise details behind the demise of both companies to emerge, the fact of the matter is that sub-contractors in general are currently very exposed to developers who have severe cash-flow problems. Consequently, cut-backs and re-structuring are inevitable, as are lay-offs. However, companies rising to the challenge and taking this type of definitive action should be commended. It may be unpalatable for those adversely affected but, when looked at in the broader context, it is essential if the industry is to manage its way through the current slowdown.

## LEGIONNAIRES' DISEASE IN DUBLIN 4

Two staff members at the Dublin headquarters of insurance giant Allianz were confirmed to have contracted legionnaires' disease from the air conditioning system earlier this month. Allianz first became aware of the problem when a staff member was admitted to hospital in the last week of June and subsequently diagnosed with the disease.

The company immediately contacted the HSE and activated standard procedures which quickly identified the source as the ac system. It was immediately shut down and emergency cleaning and disinfection procedures undertaken. Staff were notified of the potential dangers and this led to a further case being identified on 7 July. As we went to press no other cases had been confirmed.

While legionnaires' disease is obviously very serious, Ireland has an excellent record on the matter. The Health Protection Surveillance Centre reports that the disease occurs in approximately 3.8 people out of every million in Ireland, compared with an average of 11.2 cases per million across Europe.

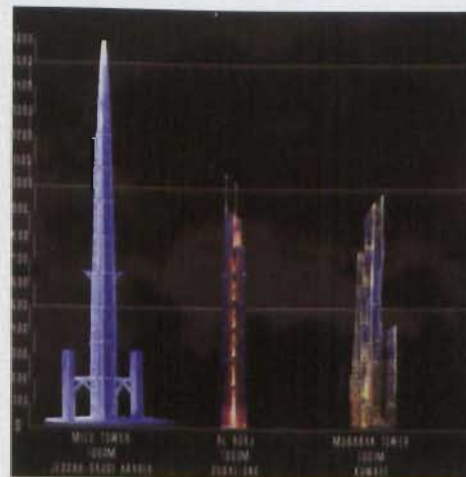
So, while the recent outbreak is unfortunate, the industry as a whole can feel very proud of its performance in respect of legionnaires' disease.

## JOIN THE MILE-HIGH CLUB ... WITHOUT THE PLANE!



This incredible photograph is taken from the upper-most girders of the world's tallest building which is currently under construction in Dubai. No matter how you measure it — 2,620 ft; 798.5metres; 0.49 miles or 0.798kms — Burj Dubai is truly amazing. Apparently, those working on the project at this level can actually see the rotation of the earth.

If you think 0.49 miles high is tall, then what about Prince Alwaleed's proposal for a mile-tall mega-skyscraper in Jeddah, Saudi Arabia. If it proceeds, the \$10 billion tower will be taller than four Empire State Buildings stacked upon each other. You'd no longer need to fly to join the mile-high club!



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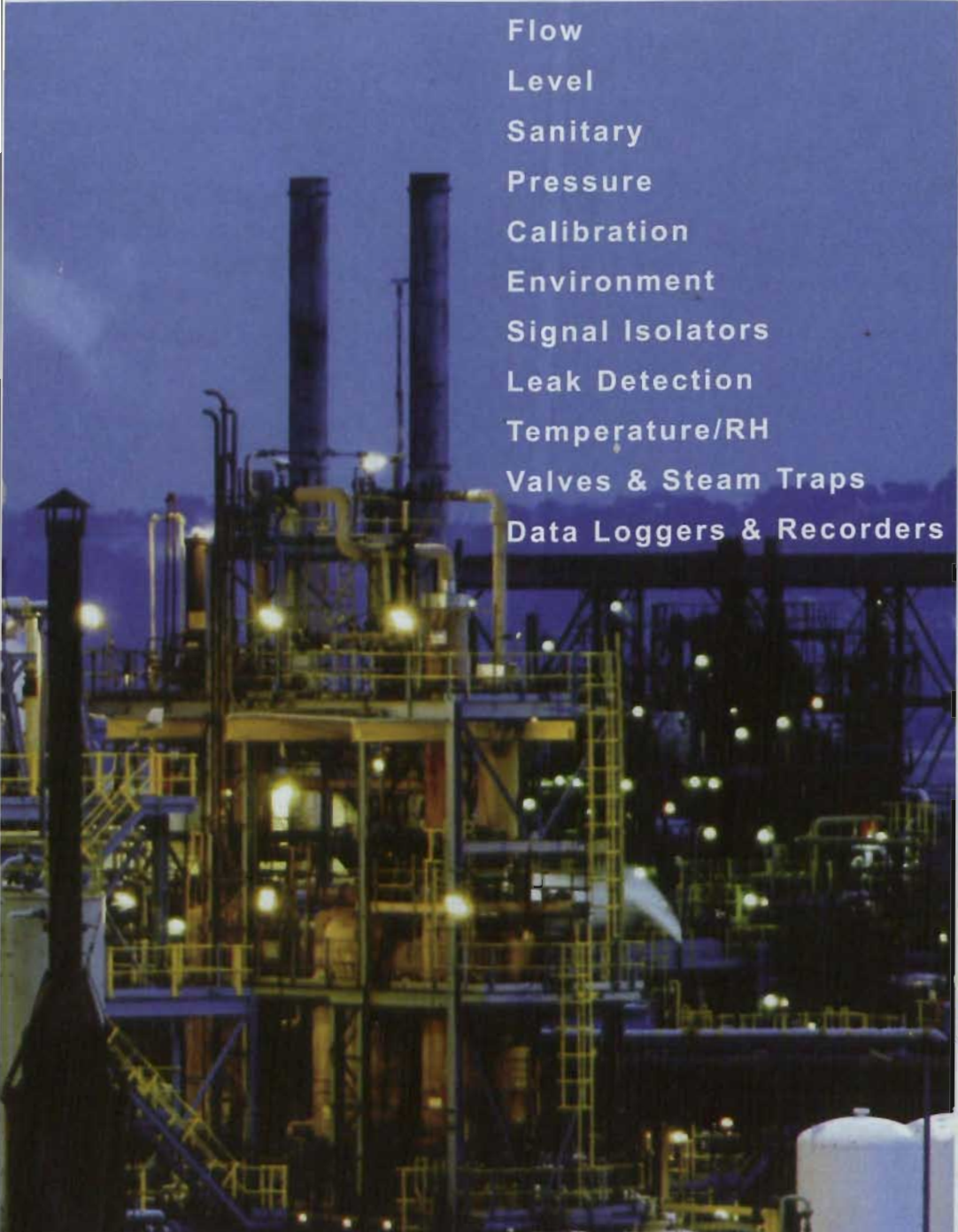
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