INCA

LEADING THE UK EWI INDUSTRY

The Benefits of External Wall Insulation

Using EWI to design warmer, healthier, more attractive buildings which are cheaper to heat and better for the environment.

About this document

Produced by INCA, the recognised trade association for the external wall insulation (EWI) industry in the UK, and aimed at architects, specifiers, main contractors and building owners alike, this document details the extensive benefits in specifying and installing EWI systems on both new build and refurbishment projects across all sectors of the construction industry.

All project images contained within this report are INCA award winning projects and taken from the extensive bank of INCA EWI Case Studies.

WEBSITE

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EWI systems explained

External Wall Insulation (EWI) is a composite system which consists of a thick layer of insulation, sandwiched between the external skin of a wall and the visible decorative finish of the building (typically render or brick effect) which can be applied directly to the insulation itself.

INSTALLATION PROCESS:

Adhesive coat bonds the insulation to the substrate

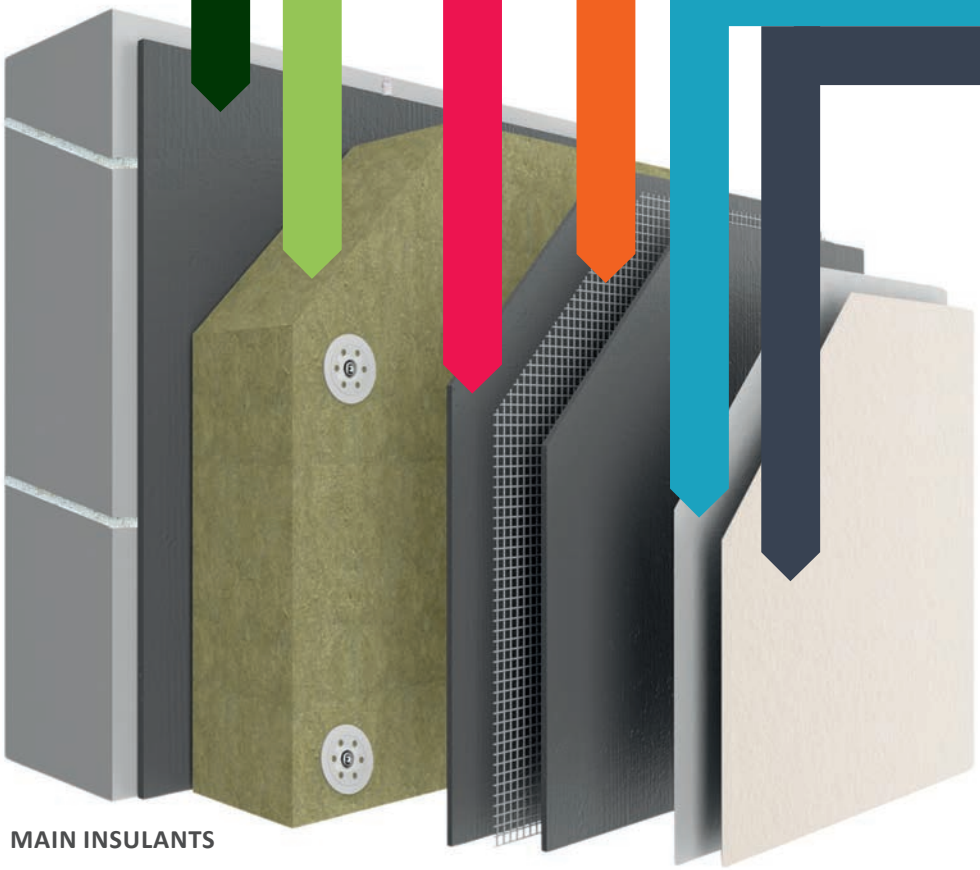
Insulation boards mechanically fixed back to the substrate

Specialist basecoat applied directly to the insulation boards

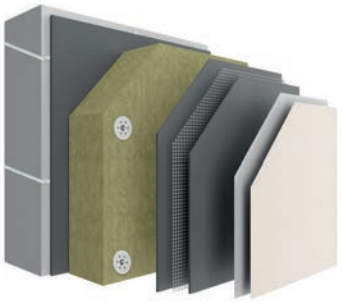
Reinforcing mesh bedded into the basecoat

Primer applied as required

Decorative finish of choice



MAIN INSULANTS



MINERAL FIBRE

EPS (LOW RISE ONLY)

EWI **finishes**

TEXTURED RENDER

SCRATCH RENDER

RENDER AND DASH

BRICK SLIP OR BRICK EFFECT

EWI systems can be finished in a wide variety of different finishes, textures and colours.

Incorporating different finishes alongside innovative design and detailing can create stunning buildings.

Where can **EWI be used**

External wall insulation can prove to be one of THE most effective ways to thermally upgrade existing buildings or to construct new buildings with energy efficiency in mind. It can be used on high rise or low rise and residential or non-residential buildings.

REFURBISHMENT

HIGH RISE

LOW RISE

NEW BUILD

For **CASE STUDIES** visit the INCA website

www.inca-ltd.org.uk

CASE STUDIES

Design benefits

MEETING ALL DESIGN NEEDS

External wall insulation systems have been marketed for over 60 years and continue to provide one of the most flexible design solutions on the market today. It provides the dual benefit of enhancing the thermal performance of the building in addition to improving the overall appearance and durability.

Whether the project is retrofit or new build the options are impressive.

Different types and thicknesses of insulation can be specified to achieve almost any U-value target from simply meeting minimum regulations right down to Passivhaus standard.

The type of insulation can also be specified to meet sustainability targets. Apart from the usual mineral fibre and expanded polystyrene options, a range of wood fibre and cork insulation is also available for those green construction projects.

EWI systems conform to all fire and building regulations, with the availability of Cavity systems to meet NHBC requirements. Heavy duty systems can be installed where impact damage is a concern and systems to withstand wind loading and structural challenges can also be specified.

When it comes to finishes the choice is almost unlimited. Light textured, heavy textured, smooth or scratch renders, dry dash with a vast choice of aggregate, clay brick slips, lightweight acrylic brick slips, tiles, brick effect render, wood effect render … the list goes on.

Design benefits

And then there's colour...

EWI finishes are through coloured and the choices are limitless. From a system manufacturers standard range to bespoke colours to match the specific project requirements – it's all possible. And, by mixing colour pigments directly into the finish, it ensures that the colour permeates the entire coating thereby providing durability, resistance to fading and a reduced need for maintenance.

Whether you want your project to stand out and make a real impact on the building landscape or if you need it to simply blend in with the existing neighbourhood, an EWI system provides unsurpassed versatility, design options and solutions.

FIRE RESISTANCE

The Building Regulations in the UK apply to the safe design and construction of new buildings and the refurbishment of existing structures and compliance to all aspects of these Regulations, including fire safety, is a legal requirement. England, Wales, Scotland, and Northern Ireland all have their own guidance documents and within these are dedicated parts relating to all aspects of building fire safety. Each has provision for achieving adequate containment of the spread of fire over the external envelope of a structure and although the underlying principles are common to all, the requirements and guidance for individual UK regions may differ.

EWI systems are fully tested and accredited to conform to all UK fire regulations with tested systems, traceable documentation and technically robust specification forming the foundation of compliant and safe external wall insulation design.

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Design benefits

EWI IS THE MOST EFFECTIVE RETROFIT INTERVENTION FOR SOLID WALL PROPERTIES

Respected authorities and government studies agree that EWI is one of the most impactful additions which can be made to any building. The Committee on Fuel Poverty says that "the best path toward sustainability for low-income households has to be a fabric first – insulation, insulation, insulation - approach."[1]

In June 2025, a study commissioned by the Department for Energy Security and Net Zero showed that "SWI (Solid Wall Insulation) was predicted to reduce [heat transfer] by between 10 and 60%, and household fuel bills by between 7 and 38%, substantially more than other retrofits… SWI is therefore the most impactful measure and saves more energy than all other measures combined."[2]

Evaluation of government-funded retrofit schemes showed that SWI accounted for the largest proportion of carbon savings of all measures installed.[3] One government-backed retrofit scheme found that although SWI made up around 19 per cent of the measures installed with modelled estimated savings, it accounted for around 53 per cent of the estimated annual energy savings.

MINIMISE THERMAL BRIDGING

Thermal bridging occurs when gaps in an insulation system exist. Heat loss is significantly higher through these gaps, causing heat to be concentrated and allowing water and condensation to collect. Thermal bridging can significantly reduce insulation effectiveness and can cause surface condensation which leads to mould growth.

There are many thermal bridges that cannot be overcome when using some other insulation systems but, in the case of EWI, the system is installed externally and completely seamless therefore reducing risk.

[1] *https://www.gov.uk/government/news/fuel-poverty-has-not-fallen-to-any-meaningful-extent-in-5-years*
https://assets.publishing.service.gov.uk/media/66cdfe604e046525fa39cf78/committee-on-fuel-poverty-annual-report-2024.pdf

[2] *https://assets.publishing.service.gov.uk/media/671f61e4ae0462c448fc4074/1._DEEP_Synthesis_Report.pdf*

[3] *https://assets.publishing.service.gov.uk/media/64230bbd3d885d000cdadd20/HEE_Stats_Detailed_Release_-_Mar_23.pdf*

Core thermal & **financial** benefits

REDUCES HEAT LOSS

A better insulated building retains more heat for longer. Up to 35% of heat is lost through the walls. EWI reduces this substantial thermal loss and therefore also decreases the amount of heat needed to be generated to keep people warm.

All construction materials are measured for how they conduct heat (a Lambda value). When constructing a wall the combined thermal capacity of the various materials used in the build-up (plasterboard, blocks, bricks insulation etc.) is calculated and presented as a U-Value. The lower the U-Value, the more thermally-efficient the wall, meaning less heat loss.

Whether new build or refurbishment, by installing EWI it's easy to incorporate different types and thicknesses of insulation to dramatically improve the U-Value and bring it down to almost any design target (subject to any project restrictions). And, as the building is wrapped in a continuous layer of insulation, cold spots and areas where heat can escape from can be avoided.

This means that heat loss can be dramatically reduced and minimised through the use of external wall insulation.

COMFORTABLE HOMES AND WORKPLACES

Regardless of whether the project is a new build construction or the retrofit of an existing building, a well specified and properly installed EWI system can ensure that the temperature inside the building is ideal for internal comfort regardless of the weather outside.

In colder conditions insulation keeps the heat generated by the heating system inside the building, whilst also keeping cold outside air from entering.

Conversely, in the summer, EWI acts as a shield to help prevent walls from absorbing heat radiated by the sun; therefore, allowing for a more comfortable indoor temperature and keeping the inside cooler.

As our weather becomes more extreme due to climate change, our buildings will need to withstand more extreme cycles of heat, cold and rainfall. EWI provides a robust, watertight exterior façade which can both reflect external heat, and retain internal heat making the solution futureproof.

Core thermal & **financial** benefits

LOWER ENERGY BILLS

With high energy prices and unacceptable numbers of British households in fuel poverty, reducing the cost of energy for householders and businesses is essential.

A better insulated building retains more heat for longer and because EWI reduces this thermal loss the resulting effect is a reduction in the amount of heat which needs to be generated to keep people warm and hence reduced energy consumption and lower bills.

In retrofit conditions EWI can have the greatest cost saving impact on fuel bills of all energy efficiency measures, as it can reduce energy use by up to 40%. Latest figures from the Energy Savings Trust suggest that installing EWI on a semi-detached house (the most common dwelling type in England), it can save £330 from an annual fuel bill and 900kg of CO_2.[4] A detached house could save £550 and 1,500kg of CO_2 per year.

For new build this means that you can design and build with energy efficiency in mind – working with different types and thicknesses of insulants to minimise energy consumption.

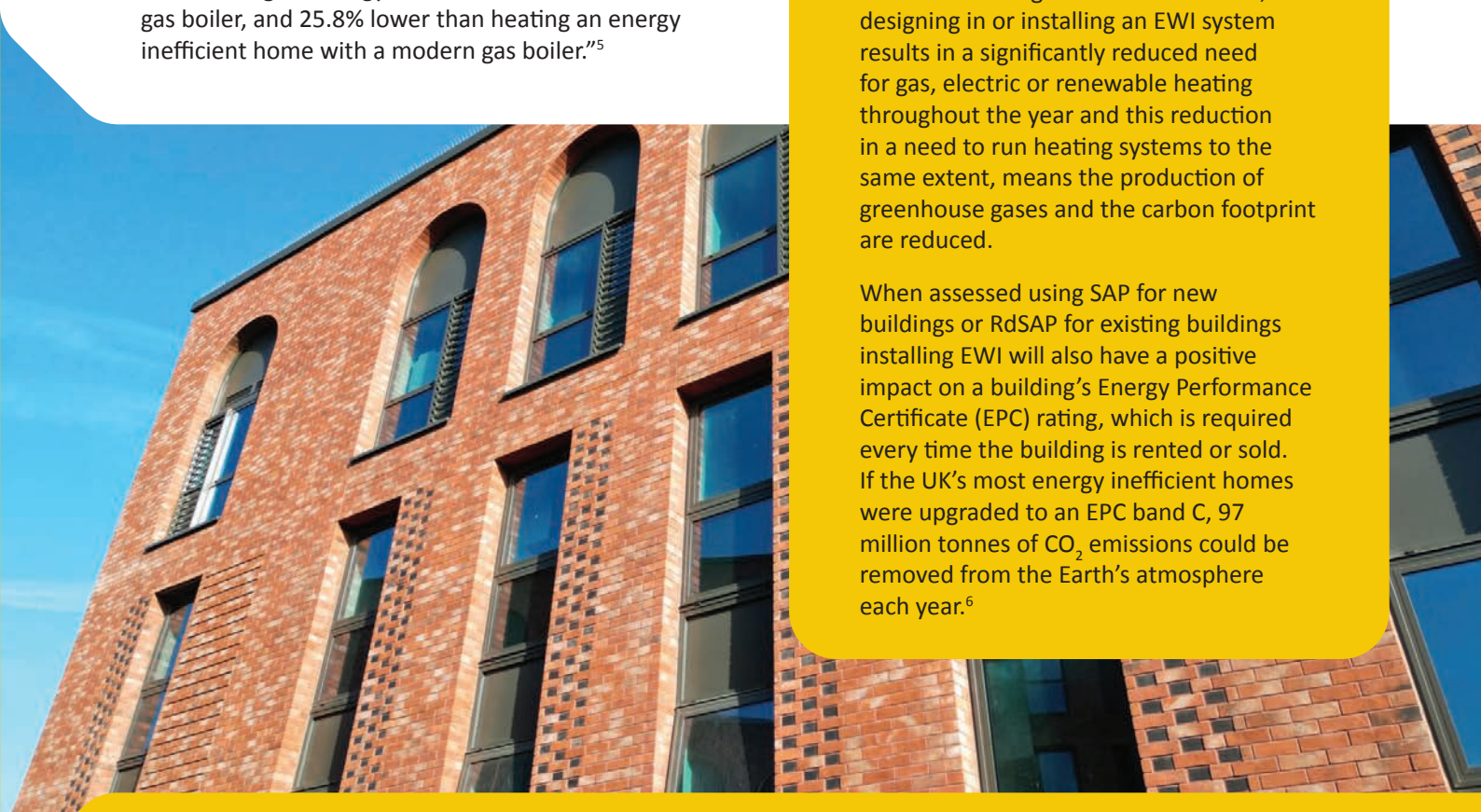
EWI also works alongside other green technologies to further reduce the energy costs of a building. Heat pumps are most effective, and most likely to reduce energy bills, when installed in well-insulated homes. Research by Scottish Power and WWF shows that "when a heat pump is installed in a well-insulated, energy efficient home, energy costs are 37.4% lower than heating an energy inefficient home with an old gas boiler, and 25.8% lower than heating an energy inefficient home with a modern gas boiler."[5]

LOWER CARBON FOOTPRINT

As well as helping to lower fuel bills, reducing the amount of heat which needs to be generated to keep a building's occupants comfortable also reduces the amount of carbon emitted by predominantly gas or electric powered heating systems.

Because of its high levels of insulation, designing in or installing an EWI system results in a significantly reduced need for gas, electric or renewable heating throughout the year and this reduction in a need to run heating systems to the same extent, means the production of greenhouse gases and the carbon footprint are reduced.

When assessed using SAP for new buildings or RdSAP for existing buildings installing EWI will also have a positive impact on a building's Energy Performance Certificate (EPC) rating, which is required every time the building is rented or sold. If the UK's most energy inefficient homes were upgraded to an EPC band C, 97 million tonnes of CO_2 emissions could be removed from the Earth's atmosphere each year.[6]



[4] *https://energysavingtrust.org.uk/advice/solid-wall-insulation/*

[5] *https://www.scottishpower.com/userfiles/file/Better%20Homes%2C%20Cooler%20Planet%20-%20Web%20Report%20-%203%20August%202022.pdf*

[6] *https://files.bregroup.com/corporate/BRE_the_Cost_of_ignoring_Poor_Housing_Report_Web.pdf*
https://bregroup.com/news/poor-housing-will-cost-over-135.5bn-over-the-next-30-years-without-urgent-action

Physical & **aesthetic** benefits

HEALTHIER BUILDINGS

Better external insulation of a building to keep it warmer makes it healthier for the occupiers. Cold homes are linked to respiratory conditions like asthma and bronchitis, cardiovascular strain which increases the risk of heart attacks along with strokes and worsening of musculoskeletal conditions like arthritis. The cold is particularly harmful to vulnerable groups like the elderly, children and pregnant women. Even our mental health is better when our bedrooms are warm enough.[7]

The cost to the NHS of treating people made ill by their homes being too cold is estimated to be well over £540mn a year, so making buildings healthier also contributes to saving public money.[8]

NOTE: It's vital that an appropriate ventilation strategy is considered and specified when installing any insulation or energy efficiency measure to ensure healthy airflow throughout the building,

A 2023 study entitled Health gains from home energy efficiency measures: The missing evidence in the UK net-zero policy debate found that "following receipt of (external) wall insulation, the inability to achieve thermal comfort in winter reduced by two-thirds. Improvements in thermal comfort were associated with gains in physical health scores. Relative standardised admissions fell in the treatment areas, remaining lower than the district-wide standardised rate for the majority of a five-year period."

https://pubmed.ncbi.nlm.nih.gov/37305854/

[7] *https://shura.shu.ac.uk/18167/1/CRESR_WF_final%2BNav%2520%282%29.pdf*

[8] *https://bregroup.com/news/tackling-cold-homes-would-save-the-nhs-540mn-per-year-new-bre-research-reveals#:~:text=According%20to%20the%20Building%20Research%20Establishment%20(BRE)%2C,that%20are%20owner%20occupied%20or%20privately%20rented*

Physical & **aesthetic** benefits

REDUCES DAMP, MOULD AND CONDENSATION

When buildings are poorly insulated and ventilated, damp and condensation can build up, making it more likely that mould will spread.

Respiratory conditions like asthma are exacerbated by damp and mould, which can also cause problems with eyes and skin, like eczema. These are particularly serious for people with underlying health conditions and weakened immune systems.

Damp and mould can also damage the fabric of a building and the possessions and furnishings inside it.

By retaining heat within the walls EWI slows the rate of heat transfer. Condensation occurs when hot air collides with cold walls. Because EWI warms the property's exterior walls, condensation is greatly reduced, helping to minimise the risk of mould, improve indoor air quality and maintain structural integrity.

New regulations came into effect in 2025 requiring landlords to take faster action to remedy damp and mould. Preventative action, such as installing EWI, can stop damp taking hold. Once damp has been treated, installing EWI will significantly reduce the likelihoods of its reoccurring.

QUIETER BUILDINGS

External wall insulation can reduce the impact of noise pollution inside a property by acting as a sound barrier. The insulation layer of an EWI system will absorb sound waves and therefore reduce the amount of noise that enters the building, thereby providing specific benefit in noisy city environments and in close proximity to main roads and transportation routes.

The exact level of noise reduction will depend on the density and type of insulation used.

As well as disturbing sleep and focus, noise pollution is linked to higher risks of cardiovascular disease, so better insulation contributes to making the building healthier to live and work in.[9]

[9] *https://committees.parliament.uk/publications/40937/documents/199438/default/*

Physical & **aesthetic** benefits

MORE APPEALING AND HIGHER VALUE PROPERTIES

When it comes to EWI design options are vast. By incorporating different textures, colours and finishes and adding in different architectural features such as quoins, profiles and ashlar grooves there's no limit to what can be achieved … stunning buildings with a wow factor that truly stand out from the crowd, fresh, new looking properties designed to blend in with the existing architectural landscape or even the transformation of entire communities with new modern looking buildings. Whether new build or renovation it's all possible with EWI.

In some cases, simply improving the appearance of flats, houses and buildings across a rundown area, EWI contributes to a transformational sense of pride and community spirit, with falls in antisocial behaviour being reported as a result.

Better insulation is one of the most common measures which renters would like their landlords (social or private) to install to make their homes more comfortable.[10] But, along with greater energy efficiency and lower bills, an improved appearance means that rental properties become a better investment for landlords by making them more economical and attractive for tenants and enhancing the resale value for the landlord.

Likewise, not only can building owners see an increase in the value of their property of up to 14% from improving or maximising their EPC rating, thereby demonstrating to potential buyers that it will be less expensive to heat, but they can often add additional value and attract more potential buyers simply as a result of how the property looks.

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[10] *https://www.neso.energy/document/364576/download*

Installation benefits

SPEED OF INSTALLATION

When specified in new build construction the installation process means that EWI can be installed more efficiently than many other exterior finishes and can therefore provide a highly cost-effective, fast-track, build programme.

EWI can also be incorporated within modern methods of off-site or modular construction for additional economies of build speed.

MAINTAIN INTERNAL FLOOR SPACE

Specifically in respect of retrofit and with the ever growing need to insulate our homes due to rising energy costs, if cavity wall insulation is not appropriate, we are faced with 1 of 2 options:

1. External Wall Insulation (EWI)
– insulating the external walls of the property

2. Internal Wall Insulation (IWI)
– insulating the internal wall of the property

When compared to IWI, the big advantage to EWI is that it doesn't result in any loss of internal living space at all.

The entire structure is encased in insulation, which is adhered to the exterior walls with adhesive and mechanical fixings. The wall becomes thicker but the increase in thickness is added to the outside of the building and not on the internal walls, meaning no loss in living space.

Installation benefits

MINIMAL DISRUPTION

All EWI works are carried out externally meaning that residents can continue to live in a property with minimal disruption during refurbishments works and internal trades can continue to work inside the building in the case of new build.

INCREASED PROTECTION & REDUCED MAINTENANCE COSTS

Adding an additional layer of insulation and an external finish coat helps shield and protect the fabric underneath from wear and tear from the elements. EWI acts as a water-resistant barrier, preventing water ingress and damage from extreme weather thereby increasing the lifespan and durability of the fabric, hence reducing repair bills and the frequency of maintenance.

EWI system designers will provide a 10+ year warranty and there's an option for insurance backed guarantees too thereby ensuring that property owners can have peace of mind for many years.

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Why choose an **INCA member**

INCA: representing the External Wall Insulation industry in the UK for over 40 years through technical excellence, education, effective collaboration, strong marketing, communications, and member benefits.

Our members include System Designers, Installation Contractors, Component Suppliers along with professional Service and Training Providers from across the EWI industry – all of who are committed to the very highest levels of quality and service.

Our Members:

- Meet a highly stringent criteria for membership
- Adhere to the strict INCA code of professional practice
- Lead the drive for industry excellence and best practice
- Represent and promote the EWI market
- Support Government, regulatory bodies and key stakeholders
- Deliver on training, apprenticeship and industry competence initiatives

together
STRONGER

Find an **INCA member**

"INCA members apply the latest skills, innovations, and techniques to deliver high quality new build and refurbishment projects in both the domestic and non-residential sectors."

- **INCA System Designers** will help you put together the right specification for your project
- **INCA Installation Contractors** will ensure that the system is installed in accordance with specification and best practice
- **INCA Associate members** are on hand to provide any specialist input as required

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MEMBER DIRECTORY

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LEADING THE UK EWI INDUSTRY

Tel: **0330 124 6585**

Email: **info@inca-ltd.org.uk**

Website: **www.inca-ltd.org.uk**

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