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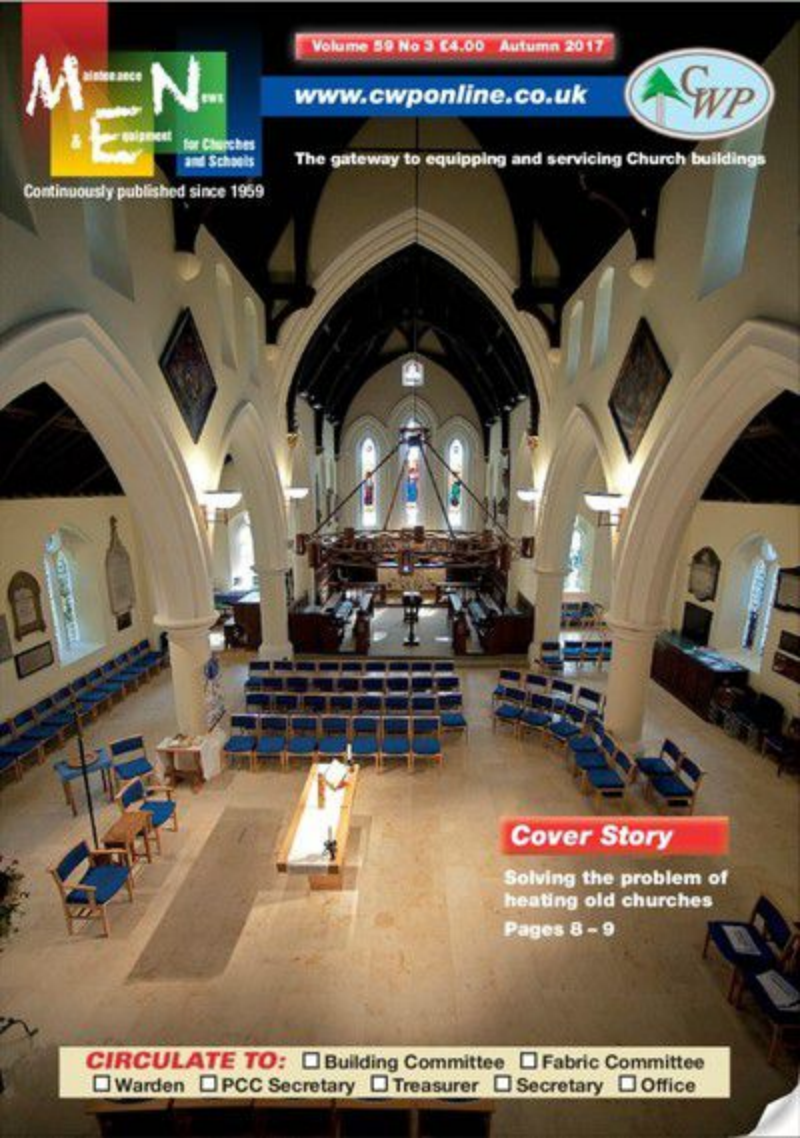

Cover Story

Solving the problem of heating old churches

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SOLVING THE PROBLEM OF HEATING OLD CHURCHES

By Chris Kollmer M.D. of **Jupiter Heating Systems Ltd**

IN the 15 years (or so) since **Jupiter Heating Systems** arrived in the UK from Germany the company has transformed the approach to underfloor heating within the historic buildings market – specifically in respect of churches. This is due to the building approach and the technologies adopted from the continent that centre around dry building techniques.

In the past, underfloor heating has been associated with wet screeds and concrete which is known for slow response times which in turn meant systems were kept on 24/7. This meant high running costs and gave the system a poor reputation. Churches are a good example where a building, infrequently used, needed to be heated shortly before a service but not at other times. This has proved difficult in the past and left parish churches dissatisfied with the resulting heating bills.

Jupiter first introduced a unique solution to church underfloor heating (back) in 2007 with an installation at St Mary's Church in Worthing. The/This same system, designed jointly by **Jupiter** and Lee Evans Architects, has been installed successfully in many churches and since then throughout the UK and Scotland.

The **Jupiter** system is recognised by architects and contractors as one the most reliable underfloor heating systems on the UK market and has been specified on a variety of very well-known projects.

Unique technology

The **Jupiter** system does not use wet materials such as concrete or screed. This fact alone provides a far more sympathetic solution for an old building that requires more consideration than usual. Despite being called a 'dry installed' system the heating system is still fed with warm water. Rather than embedding heating pipes permanently within screed, **Jupiter** use a unique tongue and groove ceramic tile system only 20mm thick. Remarkably the Screed Replacement Tile (S.R.T) system is stronger than a typical screed – it has a tested point load of 500 kg and a deflection capability of l/150 (nearly 5 times better than BS requirements).

In addition to its incredible strength it has very high thermal conductivity and being only 20mm very low in mass. This equates to high heat output and a fast response time. It shouldn't be forgotten that response time doesn't just relate to heating up time, the rate a system cools is equally important. The biggest complaint of traditional underfloor heating systems is the response time and public buildings that can hold many people can over heat very quickly. The thermostat of a traditional screed system may switch the system off promptly, but the residual heat with the huge mass of floor will take hours to dissipate.

Being only 20mm thick and ceramic the S.R.T. system can provide up to 150 W/m² of output within a church. This has led us to install systems without the need for additional radiators as the floor heating is self-sufficient.



Screed Replacement Tile system installed at Lady Of Our Victories, High Street Kensington

Architecturally speaking, the S.R.T. system has one other 'trick up its flooring sleeve' – being a floating floor the tiles are essentially decoupled from the heating system. This means that no expensive decoupling system is required under stone slabs and what's more – no movement joints are required up to areas of 450m².

The heating panels themselves are manufactured from high density expanded polystyrene and are pre-finished with 0.5 mm aluminium heat diffuser plates throughout. This ensures even, wall to wall heat output. The pipe employed is a German manufactured 16mm PE/RT multi-layer composite pipe.



Jupiter IDEAL EPS system installed at Mary Immaculate & St Gregory RC church in Barnet

Underlying substrates

All panel based underfloor heating systems require a flat and level substrate and in old medieval buildings this can be difficult. Keeping with the 'dry installation' philosophy **Jupiter** employ dry aggregates to fill and level voids left by excavated floors and removed pew platforms. Again, being dry, these materials are sympathetic to sensitive floors that may contain vaults and other archaeological artefacts that need to be preserved for future generations. Large voids are filled using a foamed glass aggregate that looks similar to pumice stone. This material has the advantage of being lightweight, extremely strong as well as insulative. In addition foamed glass aggregate allows any potential moisture in the floor to permeate through without absorbing moisture any itself. The system allows floors to breathe through specific perimeter and columns details. A final levelling of floors is achieved using dehydrated crushed slate. Unlike sand, slate mechanically binds together and does not dissipate through continual 'pumping' action from any potential floor movement above or below.



Dry levelling slate being accurately installed at Holy Trinity, Cambridge by robotic arm

The combination of the above aggregates means that **Jupiter** can be tasked with the responsibility of creating the complete floor construction – from existing substrate to underside of floor finish?

The beauty of 'dry installed' systems and the removal of wet trades is the speed of installation. Public buildings such as churches have a busy calendar and appreciate a short down time. Screeds and typical lime crete alternatives can take months to dry, causing costly delays to the overall program. With the **Jupiter** system it is possible to provide an accurate completion date after which the floor finishes can be installed 36 hours after our last tile is installed.

Final floor finishes

Stone and tile floor finishes can be installed directly onto the S.R.T. system using a good adhesive that complies with BS12004 class C2/S1. Using this adhesive type guarantees that the floor finish will never fail and allows us to provide a 5 year warranty on floor finishes even though they are not installed by us. We have not had a broken tile or stone slab in 15 years.

Timber floors

As with stone and tile floors, timber boards can be installed by adhering them suitable wood flooring glue or installed as a floating floor. Unlike tile and stone floors timber floors have a higher thermal resistance and therefore are not so suitable for underfloor heating when high outputs are required.

Vinyl, marmoleum and carpets

With all rolled or ultra-thin floor finishes it may be necessary to apply a thin levelling screed to the Screed Replacement Tile to prevent shadowing of the tile joints showing through the floor finish over time.

JUPITER

More information on the Jupiter system can be found at: www.churchunderfloorheating.com or www.jupiterunderfloorheating.com

Alternatively, Jupiter can be contacted by telephone on 01276 859066 M9