

Retro fit business opportunity Shorten pool building times and increase your profit



**Save money on heating bills
Save 3.46 - 10.74 tonnes Co2 per year**



THERMAPOOL™

Revolutionary energy-saving lining for swimming pools

THE ORIGINAL POOL INSULATION COMPANY LTD
changing the face of traditional pool construction

New build and renovations

www.thermapool.co.uk

INSULATION RESEARCH COULD

"CHANGE OUR INDUSTRY"

Swimming Pool News is supporting a bid by a specialist UK company which is calling for funding to be approved to establish that thermal induction of the soil around a swimming pool is now the most dramatic way significant energy savings can be made to pool running costs. We are supporting the search to raise cash for the project as we believe research can produce one of the best PR and marketing advantages for the pool trade in years.

The proper use of insulation in swimming pools around the world just does not happen, claims Nick Rose.

"THE SWIMMING POOL INDUSTRY BELIEVES THAT THE GROUND ITSELF HAS SUITABLE INSULATION PROPERTIES. WE HAVE PROVEN THAT THIS IS INCORRECT AND HAVE DEVELOPED A SYSTEM TO SOLVE THIS ISSUE AND MAKE POOLS CHEAPER AND LESS WASTEFUL TO OPERATE."

Nick's company, Topic UK, has been working since 2002 to develop an energy-saving pool insulation system – Thermapool – which achieves savings in energy/heat loss through thermal

Nigel Rose:

"One main point is we need to stop the trade believing that 70-90% of heat loss goes up in evaporation. Why bother about the 30%-10% that goes into the ground seems to be the answer.

"This is a big issue that needs sorting out. This is so ambiguous and out of date especially when you can heat pools with solar and gain a 7°C difference. There have been building regulations for basements which requires the use of insulation on floor and walls, if you can use a mental picture one cubic metre of air now heat that just one degree. It's not that hard to do and it only takes 1 joule or 1 watt of energy. Now picture 1 metre cube of water and heat that 1 degree it will take you 4,184 watts or joules of energy to heat.

"So even though we don't have regulations currently to insulate pools there is a very obvious recognition using the basement building regulations."



conduction into the surrounding soil to the pool.

In 2004, the company contracted the Building Research Establishment (BRE) to carry out a study on heat loss from swimming pools. The research was backed by the Swimming Pool and Allied Trades Association (SPATA) and the British Swimming Pool Federation (BSPF).

The report calculated that Thermapool retains up to 86% of heat normally lost into the ground. No other pool insulation system reduces heat loss as efficiently.

But there is now a call for more detailed research based not on computer models but real life analysis which says Nick would produce evidence which would benefit the whole pool trade by showing what reductions could be achieved in day to day running costs.

"The funding is to study the long term performance of this energy saving solution in the real world not just computer modelling. Upon completion there will be a conclusion of the rates of energy usage from swimming pools weather covered or not and the pros and cons of using insulation within the structure. Other points of interest may be discovered whilst this investigation is carried out as there are many perimeters to this project.

"Whilst the trade is interested in the result of this they do not have the funds

"THE SWIMMING POOL INDUSTRY BELIEVES THAT THE GROUND ITSELF HAS SUITABLE INSULATION PROPERTIES. WE HAVE PROVEN THAT THIS IS INCORRECT AND HAVE DEVELOPED A SYSTEM TO SOLVE THIS ISSUE AND MAKE POOLS CHEAPER AND LESS WASTEFUL TO OPERATE".

or resources to carry out this work. The industry is very cottage industry run and there is great opportunity for educated improvements.

"Once the project is concluded, this information should be made available so that action can be taken to make new best practice or legislation wherever appropriate."

The research which would cost £90,000 would be carried out over 13 months which will include computer modelling and trials of my small pools and the construction and monitoring of a 10 by 5m pool.

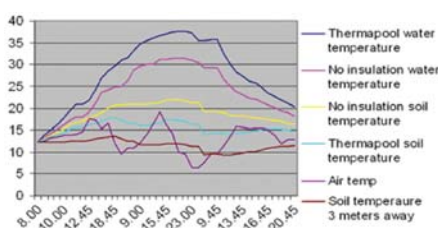
Project description

Two identical miniature swimming pools were constructed and set into the ground to compare the benefits of insulation.

Both pools were constructed from concrete, steel and then tiled.

One pool had a 14mm layer of Thermapool applied to the inside wall and floor, 500 by 300 by 250mm. Neither pool was ever covered.

After heating both pools for three days with a 1.2kW heat lamp placed 1.5 metres above both pools using 14mm of insulation, clearly shows benefits over no insulation. Significant heat gains are shown in the soil from the un-insulated pool and a 7degree water temperature difference between the two pools.



75mm of insulation will give a Thermal Resistance of 2.5 m2K/W

3.75 metres of dry clay soil will give a Thermal Resistance of 2.5 m2K/W

8.75 metres of rock soil will give a Thermal Resistance of 2.5 m2K/W

These diagrams are scaled to show the amount of conduction into the ground showing a 5 metre wide 1.5 deep pool normal domestic pool 10m by 5 by 1.5 deep.



Our system Thermapool 75 mm of internal insulation area of conduction
75mm of Thermapool will give a Thermal Resistance of 2.5 m2K/W



Dry clay soil thermal conductivity 1.5 W/m·K (dry) area of conduction
3.75 metres of dry clay soil will give a Thermal Resistance of 2.5 m2K/W



Rock soil thermal conductivity 3.5 W/m·K area of conduction
8.75 metres of rock soil will give a Thermal Resistance of 2.5 m2K/W

It is proposed to carry out this same experiment as part of the Kingston University research and monitor the pools for a longer period of time with thermal couplings to record soil, water and air temperatures firstly besides both pools and then 10 metres away and calculate the amount of energy being put into the pools from the heat lamp also to study the amount of evaporation and the wind speed around the pool and across the surface.

Experiment 1

Another experiment will be to place heating elements (cost about £1,500 per pool) into the pools and to monitor the rate of energy required to keep them at a set temperature of 30°C. This experiment would again monitor all of the above conditions and would be carried out looking at covered pools and uncovered pools and comparing the results.

Domestic pool owners are able to save between £2,500 and £35,000 a year based on the report by BRE looking into the thermal performance of swimming pools.

From this data the university would be able to scale up this data to full size pools to calculate rates of heat loss into the air and ground on both covered and uncovered pools.

This research will also determine the amount of solar energy that is gained from the sun and the greenhouse effect that happens in swimming pools which has never been researched.

Experiment 2

It is also possible to set up these experiments and data login on a full size pool which will be constructed in March, data login should be continued for at least one year.

The monitoring will show any break down of the thermal performance of the insulation. The data from both these models and the real size pool experiments will then be drawn up into conclude all energy losses on all aspects of swimming pools.

Domestic owners are able to save between £2,500-£5,000 per year based on the BRE report. Thermal performance of swimming pools and Defra's Carbon Emissions Targets document from ground heat losses. These energy savings equate to between 3.46 - 10.74 tonnes of CO₂ per year, using Defra's maximum allowance of carbon savings of a 40 years these saving accrue to between 138.4 - 429.52 tonnes of CO₂ per pool.

Kingston University base their calculations on energy impact of pools on the evidence of 200,000 swimming pools in the UK, 8% being commercial and 2% council owned. Basing all pools as domestic only, shows national carbon figures currently wasted into the ground between 692,000 - 2,148,000 tonnes of CO₂ per year. The figure will be nearer the 2 -3 million tonnes due to not accounting for the 10% commercial or council pools.

Kingston University carried out a report

on analysis of seven and a half million pools in seven countries. The carbon based on all of these pools being domestic (which they are not) would accrue to 25,950,000 - 80,550,000 tonnes of CO₂ per year.

"There is no research data of this type on the wasted energy around the world from pools, and having researched the subject for some six years and I can find nothing like this sort of substantial data." adds Nick.

"The subject of carbon in the wet leisure industry has never been addressed and there is vastly more potential for other carbon savings in relation to cheap throw away pools, which have heaters and can be purchased from most store in the summer for as little as £100. Most families with children will own at least one of these.

"Also the massively expanding hot tub market have insulated covers but very few have insulated sides. This is the same as very large hot water tanks, hot tubs operate at between 38-40°C and use a significant amount of energy but are uninsulated on the floor and walls."

Nigel Rose has six years of research and development experience on the subject of heat loss from pools and in developing a solution to this problem. He has designed and developed a swimming pool insulation system which is the subject of this project and carbon saving solution.

He is prepared to give free access to all reports including Kingston University market size report and the BRE thermal performance of swimming pools, carried out by the technical director of BRE and who is contracted to the government as chief advisor on heat losses from buildings.

He is able to show that the system he has designed is in line with the recommended method of insulation the BRE report recommends quantification of this is show from the basic studies already carried out with the miniature pools shown above.

THERMAPOOL 'VERSUS' CONVENTIONAL INSULATION

- When insulation is placed on the outside of the structure only 41% of the heat loss is stopped, due to heat escaping through the foundation into the ground and through the coping stone. Thermapool is more than 50% more efficient.
- Other insulating materials absorb water and lose their insulating efficiency. Thermapool is resistant to both liquids and vapours. It will not deteriorate through age or usage.
- The system has the strength, durability and elasticity to withstand minor ground settlement cracks.

"This project will enable real life quantification of this area of wasted energy loss."

The renovation market and new build market, if it became compulsory to insulate all of these pools in ground alone would accrue an annual reduction of between 20,760 tCO₂/yr to 64,440 tCO₂/yr in the UK.

The UK has proportionally one of the smallest number of pools in the world but this does give the added opportunity to advise the world on the best practise measures possible. Based on the Kingston market report there is opportunity to bring in regulation for renovations and new build around the world.

If adopted by the seven countries profiled this would generate an annual reduction of 2,768,000 - 8,592,000 tCO₂ every year. **spn**

TOPIC UK LTD

08701 662 532

www.poolinsulation.com