

ATCM NEWS



FOR MEMBERS OF THE ASSOCIATION OF TANK & CISTERN MANUFACTURERS

TANK & CISTERN INSULATION

INSULATION - THE WHYS AND WHEREFORES!

Tank and cistern insulation is a subject, which is prescribed as a requirement in every specification for water storage products but is a very little understood topic.

The following may explain why.

Who or what advises that insulating water tanks is beneficial? Arguably, common sense has a voice. In winter, if sufficient heat is lost, the contents will freeze. In summer, heat will be gained and the contents possibly become unpalatable and unsafe.

The Water Regulations state in Schedule 2 -16 (4c) "every storage cistern shall be fitted with thermal insulation to minimize freezing and undue warming.

THERMAL INSULATION
IS REQUIRED TO
MINIMIZE FREEZING &
UNDUE WARMING





The Consideration of WRAS Guidance

BSEN806 and the WRAS Water Regulations Guide also advise on the requirement for cistern insulation.

However little or no guidance is advised as to the degree of protection required, if, dare it be said, if protection is required at all.

Standard practice for GRP tanks is for the specification to advise 25mm, sometimes 50mm, thick pre-insulation but does not define the type of insulating material. Whereas Cladding Jackets are the norm for thermoplastic cisterns.

Almost assuredly, no indications of the thermal properties of the insulation material are advised. So who decides?

WHO DECIDES?

Trade and practice over the last 15 years or so has seen the use of PU Foam, either in slab or injected form, being sandwiched into GRP laminates. For Thermoplastic tanks, Rockwool or loose fill expanded Polystyrene being a Cladding Jackets' principle insulating material.

Low density PU Foam provides a high performance insulating quality with a Thermal Conductivity 'u' = 0.02 W/m.k and at lowest cost. Rockwool and Expanded Polystyrene on the other hand offers a 'u' value ranging from 0.35 to 0.04 W/m.k again at low cost.

The important factor when designing in or selecting any insulation material is to determine its performance in terms of the rate of heat transfer. That is, the total amount of heat transferred in a given time frame is a function of its thickness, thermal conductivity and total surface area. i.e. its Thermal Conductance, measured in W/m².k.

It would be rare indeed to have a Consultants specification for cold water tanks to advise the thermal performance required of the insulation.

With ever increasing environmental pressures, more and more specifications are requiring the PU Foam to be not only CFC free but additionally, HCFC free of these ozone depleting gases.

What is missed in this rush to keep the planet green is that HCFC free material is approximately 50% less efficient as an insulator than the CFC free standard PU Foam but still the 25mm thickness specification is trotted out as the norm. To provide the same performance of insulation the HCFC free material would require to be half as thick again and, as it happens, at 4 times the cost.

This shows the general lack of understanding of the subject matter. If 25mm thickness was required before why is 38mm not specified now?

It is fair to say monitoring the temperature of stored water in certain establishments, (hospitals prisons, etc.) has dramatically increased. However one wonders how often a tank is drained down because the temperature of the contents is approaching 20 deg. k.

Having set out the parameters related to current tank and cistern insulation practice and the apparent general lack of understanding as to how this is determined, the next issue of *News Update* will discuss whether it really is necessary to insulate in all occasions.