

QUALICheck International Workshop on summer comfort technologies in buildings: content and major outcomes



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This article provides a summary of the QUALICheck project International Workshop on summer comfort technologies in buildings which focused on voluntary and regulatory frameworks to improve quality and compliance of solar control, cool roofs and ventilative cooling. The Workshop attracted the interest of 90 experts of public and private bodies involved in the field of energy performance of buildings and of the construction sector from 10 countries.

Keywords: summer comfort, compliance of EPC data, quality of works, solar control, ventilative cooling, cool roofs

During the international workshop held in Athens, Greece on 9–10 March 2016, 90 participants from 10 countries exchanged their experience and views on proper consideration of summer comfort technologies in energy assessment procedures, with a specific focus on solar control, ventilative cooling and cool roof products and systems.

The workshop included general presentations on the overall context of energy conservation and thermal comfort in buildings. More specifically, the challenges of thermal comfort for our societies in terms of mortality and well-being, economy, and environment were discussed [1]. Furthermore, climate change combined with critical constraints set by the urban environment

both amplify those problems and compromise the extended use of renewable energy sources [2].

Although it is now recognised that solar shading, inertia, and ventilative cooling should be prioritised before considering active systems even in North European regions, this was mostly ignored in European regulations and standards until the mid-2000s as reflected by the poor consideration of summer comfort issues in EN832:2000 [3]. Fortunately, several recent initiatives aim to improve this situation.

[1] <http://qualicheck-platform.eu/wp-content/uploads/2016/03/QUALICheck-Athens-1.2-Santamouris.pdf>

[2] <http://qualicheck-platform.eu/wp-content/uploads/2016/03/QUALICheck-Athens-2.3-Fintikakis.pdf>

[3] <http://qualicheck-platform.eu/wp-content/uploads/2016/03/QUALICheck-Athens-1.3-Molina.pdf>

The European Solar Shading Organisation (ES-SO) should have, by the end of the year 2016, an on-line access database including all key characteristics – reviewed and determined in accordance with existing standards – that are necessary for dynamic energy modelling. This would be a major step to help designers and consultant engineers easily access input data for energy performance assessment methods, and thereby remove a major barrier to consider the benefits of these technologies at the design stage [4], [5], [6]. ES-SO acknowledged the existence of pre-conditioned or mandatory recognition/certification of persons and companies in France or the UK, as well as technical approvals and labels that support quality and transparency for customers [7].

It was shown that ventilative cooling can be very effective at reducing the overheating risk, both for residential and commercial buildings. Nevertheless, one specificity of ventilative cooling is that this concept cannot be based on certified components, but rather on strategies whose performance very much depends on the strategies implemented, including effective use of building inertia and consistency with solar shading controls [8], [9].

The use of the new EPBD set of standards to fairly account for summer comfort solutions in building energy performance assessment methods was discussed [10]. This new set of standards which was developed to support the implementation of the 2010 Energy Performance of Buildings Directive covers for instance thermal comfort issues and the determination of the airflow rates – which are critical for ventilative cooling assessment. Each standard clearly shows the inputs and outputs of the calculation modules and attempts to ease quality and compliance checks with specific clauses. To cover specifically ventilative cooling, many elements are already there, but some important missing parts – regarding for instance the controls, the long-term comfort criteria, or the effectiveness of heat removal from surfaces – were pointed out [11]. The participants also discussed uncertainties and limitations regarding climate data, time steps, and zoning which may severely influence the performance assessment of summer comfort technologies [6], [8], [11].

Cool roof products reduce solar heat gain on outer building surfaces and thereby have a number of advantages including: reduced buildings cooling energy needs with estimates in the region of 10–40% on air-conditioned buildings; reduced urban heat island effect; improved thermal comfort in non-A/C buildings; improved lifespan of building materials. The European Cool Roof Council (ECRC) was founded in 2011 to promote these products, in particular, with a transparent rating programme, inclusion of cool materials in EU standards and energy assessment methods [12], [13]. Early in 2016, ECRC included in its freely-accessible on-line database the first products rated under its rating programme [14]. Nevertheless, several challenges remain regarding the characterisation of these products in real conditions, i.e., accounting for ageing and soiling effects [15].

This workshop was also the occasion to give an overview of energy saving policies implemented in Greece, in particular the results of the “Energy Efficiency at Household programme”, including pre- and post-retrofit energy inspections with over 40,000 completed applications [16]. Also, a field study on 26 Greek buildings showed frequent discrepancies between EPC input data and as-built characteristics [17].

Finally, the QUALICheck draft source books on compliance of EPC input data and quality of the works were discussed. These draft books – available on the QUALICheck website – unfold 3 fundamental aspects to develop compliance frameworks: clear rules to achieve and show compliance; clear rules to handle non-compliance; elements to consider for effective implementation.

The workshop was organised by INIVE and its member NKUA (the National and Kapodistrian University of Athens) on behalf of the QUALICheck consortium, with the support of Sympraxis Team, and with session contributions from ES-SO (the European Solar Shading Organization), venticool (the international platform for ventilative cooling) and ECRC (the European Cool Roofs Council). ■

[4] <http://qualicheck-platform.eu/wp-content/uploads/2016/03/QUALICheck-Athens-3.1-Beck.pdf>
 [5] <http://qualicheck-platform.eu/wp-content/uploads/2016/03/QUALICheck-Athens-3.2-Bush.pdf>
 [6] <http://qualicheck-platform.eu/wp-content/uploads/2016/03/QUALICheck-Athens-4.1-Pollet.pdf>
 [7] <http://qualicheck-platform.eu/wp-content/uploads/2016/03/QUALICheck-Athens-3.3-Van-Eycken.pdf>
 [8] <http://qualicheck-platform.eu/wp-content/uploads/2016/03/QUALICheck-Athens-2.1-Heiselberg.pdf>
 [9] <http://qualicheck-platform.eu/wp-content/uploads/2016/03/QUALICheck-Athens-1.3-Molina.pdf>
 [10] <http://qualicheck-platform.eu/wp-content/uploads/2016/03/QUALICheck-Athens-5.1-Hogeling.pdf>
 [11] <http://qualicheck-platform.eu/wp-content/uploads/2016/03/QUALICheck-Athens-4.4-Carrie.pdf>

[12] <http://qualicheck-platform.eu/wp-content/uploads/2016/04/QUALICheck-Athens-6.1-Kolokotsa.pdf>
 [13] <http://qualicheck-platform.eu/wp-content/uploads/2016/03/QUALICheck-Athens-6.4-Evans.pdf>
 [14] <http://qualicheck-platform.eu/wp-content/uploads/2016/03/QUALICheck-Athens-6.2-Synnefa.pdf>
 [15] <http://qualicheck-platform.eu/wp-content/uploads/2016/03/QUALICheck-Athens-6.3-Meier.pdf>
 [16] <http://qualicheck-platform.eu/wp-content/uploads/2016/03/QUALICheck-Athens-2.2-Karavassili.pdf>
 [17] <http://qualicheck-platform.eu/wp-content/uploads/2016/03/QUALICheck-Athens-4.3-Karlessi.pdf>