


Event:  
Date:  
Place:

**ENERGY in BUILDINGS 2017**  
Saturday October 21, 2017  
Athens, Hellas



<b>#</b>	<p><b>Mary Tzortzi</b> Architect Engineer NTUA, Lighting Designer EAP.</p>	
Title:	<p>Architectural engineer, NTUA , Lighting Designer, School of Applied Arts, Hellenic Open University(HOU), Head of Design and co- owner in the architectural workshop FORMarchitects.</p>	
email:	<p>mtzortzi@formarchitects.gr</p>	
Presentation title:	<p><b>The impact of the color temperature of lighting in the rendering of artworks</b></p>	
<p>Museum lighting constitutes an important field in lighting design. In the context of exhibition planning, optimal lighting is a challenge as it should give prominence to the appearance of the artwork and on the same time minimize any risk of irreversible damage by respecting regulations and special specifications, [1]. Until recently the artificial lighting of artworks was dominantly performed with tungsten-halogen lamps thanks to several advantages foremost due to their excellent color rendering, with a Color Rendering Index value of CRI ~100. The minimization of any potential damage produced by the halogen-tungsten lamps was assured by the use of ultraviolet and infrared / thermal irradiation filters as well as the maintenance of low levels of illumination (53,800 lux hours -120,000 lux hours, for high sensitivity artifacts), [2]. This common practice resulted in the establishment of the 2700 K warm light, featuring in these lamps, whilst there was not any specific CIE recommendation for selecting light sources with preferable Correlated Color Temperature (CCT) for the illumination of artworks in display.</p> <p>The constantly evolving Light Emitting Diode (LED) technology has recently attracted the interest of museum lighting designers, mainly for reasons concerning energy saving, ease of placement, long lifetime of the equipment, small and flexible luminaires, while their ever-improving quality features for both appearance and preservation of the collections are recognized altogether.</p> <p>This evolutionary course has opened up a new field of research, exploring the wide range of CCT offered by LED sources technology, for the purpose of optimizing the appearance of the artwork. Within this field, the present research is aiming at the investigation and understanding of the impact of Correlated Color Temperature of the lighting in the visitor's viewing experience of the artworks in display.</p> <p>An experimental installation was setup in order to investigate the visitors' preference in the CCT of the lighting applied on artworks presenting similar technique and style but diverse color compositions in terms of balance between cool and warm colors. For the experiment we examined three LED sources with similar specifications and a range of CCT values (3000K, 4000K and 5000K) applied on three artworks' mock-ups with color compositions weighted to reflect (a) "warm colors", (b) "cool colors" and (c) a "balanced" impression. The whole experiment was carried out with a uniform illuminance value on the artworks surface set at 200 lux. We analyzed 32 visitor's preference in color temperature by comparing at a first stage the same model artwork under the two distant illuminants of 3000K and 5000K and then the preferred illuminant was compared with the 4000K illuminant. Between viewing trials, an interval for chromatic adaptation to the new lighting conditions was given to the observer. Although 4000K was chosen as preferred color temperature for the three examined paintings, this result does not lead to a straightforward conclusion for the selection of an optimal CCT for the illumination of these paintings. A quite greater number of criteria must be taken into consideration.</p>		

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CV:

Mary Tzortzi was born in Athens in 1975 and she graduated from the School of Architecture of the National Technical University of Athens (NTUA) in 2002. She has been a member of the Technical Chamber of Greece (TEE-TCG) since 2002 and also a member of the Architects Association of SADAS since 2004. From 2002-2007 she worked as an external partner with various offices among them the Anamorhosis office with which they took part in the 8th Venice Biennale International Architecture Exhibition "Next" 2002, with the project "Museum of the History of Hellenism. and the office of I. and A. Vikelas 2003-2006. Since 2004 she has established together with I.Rozos the architectural workshop FORM architects which deals with private and public projects, many of which have been published. In 2007, she participated in the 5th Greek Biennale of young architects. In 2012 she continued her postgraduate studies in Hellenic Open University (HOU) to the department of School of Applied Arts at "Lighting Design and Multimedia".

She has participated in exhibitions and architectural competitions (in Greece and abroad) with awards and distinctions. A lot of projects has been published.

**Competitions**

- 2004 - Participation and distinction with the 2nd prize in the architectural competition on the theme "Study of the redevelopment of the eastern coastal front of Hersonissos harbor" - ,
  - 2005 - Participation and praise in the architectural competition for ideas on "International Architectural Competition of Ideas Center for Architecture and Construction" Domna Brestskoy
- 2013-Praise in the Architectural Ideas Contest "General Plan for the development of the property of the Pangratio Stadiou of Heraklion, located on the west coastal front of the city of Heraklion" Study Group, Rozos Giannis, Manolis Dayiantas, Mary Tzortzi,

**Publications**

- FORMarchitects. "Feeling Spaciousness". <http://www.formarchitects.gr/interior.pdf>  
Publication of a project in Architectural Magazine, Greek Constructions, Issue 153- January 2011 in the Interiors section.
- FORMarchitects. "Linear Growth of Tumors". <http://www.formarchitects.gr/residence.pdf>  
Publication of a project in Architectural Magazine, Greek Constructions, Issue 148 - June 2010 in the Architecture section.
- FORMarchitects. "Graphic Relationships". <http://www.formarchitects.gr/health.pdf>  
Publication of a project in the architectural magazine, Greek Constructions, Issue 147- May 2010.