

Abstract Submitted
for the GEC09 Meeting of
The American Physical Society

Ultra High Luminance and Luminous Efficacy Mercury-free Flat Fluorescent Lamp¹ IN WOO SEO, BYUNG JOO OH, JAE-CHUL JUNG, KI-WOONG WHANG, Seoul National University — We proposed a new Mercury-free Flat Fluorescent Lamp (MFFL) as a flat light source which can be used as an alternative of conventional line-type Cold Cathode Fluorescent Lamp (CCFL) containing Mercury. The MFFL using dielectric barrier discharge with Ne-Xe gas mixtures has a pair of the parallel-running main electrodes covered by dielectric layer in a 40x40 mm size of the emission area as a unit cell. A new electrode structure and optimized driving methods have been adopted to make an effective glow discharge which shows a wide driving voltage margin. In order to realize the high luminance and luminous efficacy MFFLs, we optimized the phosphor profile to enlarge the surface area. The MFFL with the new phosphor profile shows a very wide luminance range from 2,600 to 17,000 nit with the corresponding luminous efficacy from 66 to 32.5 lm/W. The results were obtained with the color coordinate of the phosphor to be around (0.25, 0.23), which is required for LCD backlights. The work to realize improved luminance and luminous efficacy MFFLs with the color coordinate (0.32, 0.32) for daylight lighting is in progress.

¹This work was supported by Samsung Electronics Co., LTD. LCD Division.

In Woo Seo
Seoul National University

Date submitted: 15 Jun 2009

Electronic form version 1.4