

[Display Technology]

Fundamentals, Present Status, and Remaining Issues of Color PDPs

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World-wide sales of plasma display panels (PDPs) is expected to grow to US \$6 billion in the year 2005. Compared to CRTs and LCDs whose maximum diagonal sizes are limited to 30 inches, PDPs may accomplish up to 80 inches, pioneering a new field of a large-size, flat, and high resolution display.

PDPs utilize vacuum ultraviolet radiation of 147 and 173nm, emitted from the low pressure Xe glow discharge. The radiation excite R, G, and B phosphor deposited on the discharge cell walls. There are three fabrication processes which have to be improved. The first is a deposition of MgO thin film. A major difficulty here is that the desirable film properties are not yet known. The second is a formation of barrier ribs.

Although the ribs can be made by various processes such as screen printing or sand blasting, none of the processes are satisfactory in terms of productivity.

The third is a deposition of phosphor layer. Again, although various methods are proposed, further efforts are required.

Remaining issues for achieving higher PDP performances are to increase luminance (700cd/sq m), to improve bright-room contrast (100:1), to improve luminous efficiency (2 lm/W), and also to obtain picture quality which is comparable to that of CRTs. The top priority item to all the PDP manufacturers today is to reduce the retail cost to US \$4,000.