

# DDC NEWSLETTER

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## COMMENTS

Issues, Volume 1, Numbers 1 & 2 are available on the web. From the number of downloads observed, it was appreciated

We will now continue with our article on Mercury Arc Lamps.

## LAMP DEVELOPMENT

Some of the lamp development shown in the arc lamp time line seen in the next table.

YEAR	LAMP DEVELOPMENT
1806	Davy discovers the arc
1821	Davy demonstrates a Hg discharge
1902	Cooper Hewitt lamp introduced
1906	Kuch and Retschinsky describe a high pressure Hg lamp
1910	Bastian introduces pool electrode discharge to produce high intensity 254nm output
1931	One atmosphere discharge in Germany
1935	C. Bol develops the Hg Capillary Arc Lamp
1940's	Hg Short arc lamp developed
1950's	Advent of semiconductors
1960's	Integrated circuits produced
1970's	ARC Bent Capillary Lamp used to make ICs
1980's	DUV Arc Lamp introduced
1990's	I - line lamps and excimer laser Photolithography

Table 2. Hg Arc Lamp Time Line

Table 2 shows the development of the Hg arc lamp serving the display and microelectronics industry. We could easily write a book on this but the time line is presented to allow the reader to see some of the historic changes in lamps and how they are involved with applications and developments in semiconductors, printed circuits and microelectronics.

## ARC LAMPS USED IN MICROELECTRONICS

The earliest lamp used in microelectronics is the 200W and through the years power levels progressed to 350W, 500W, 750W, 1000W and now 2,000W and 4,000W (in printed circuits fabrication, up to 8,000W lamps are being used). Photo-fabrication was introduced into the electronics industry in the 1930s with the advent of screen printing for the fabrication of resistors. In the 1950s the direct application of a photographically developed pattern was used in the processing of printed circuit boards. The late 1950s saw the use of Hg arc lamps in the fabrication of Color Television. These air cooled BH6 and water cooled AH6 Capillary types are still used today in the TV industry.

From an economic point of view, it has been reported that in 1998, over 10% of the investment in semiconductor production was on exposure systems such as wafer steppers and Step and Scan Systems.

New optical techniques of Phase Shifting have allowed the DUV (248nm) optical lithographic technology to print features as small as 0.025 microns without going to laser methods. ([www.numeritech.com](http://www.numeritech.com) , May 31, 2000).

(In the next issue of the DDC Newsletter, we will cover some arc lamp thermal issues)

## DISPLAY NEWS

Colorado MicroDisplay has declared they are now ready to begin volume manufacturing with partner Hana MicroDisplay Technologies, Inc., who is also the foundry for Philips. See Chris Chinnock's report at [www.mdreport.com](http://www.mdreport.com) for more info.

The 7<sup>th</sup> Annual Symposium on Vehicle Displays is to be held on October 3<sup>rd</sup>, 2000 at the Ritz Carlton Hotel in Dearborn, MI. It is to be held in conjunction with the IEEE Intelligent Transportation Systems Conference (ITSC2000) & the Intelligent Vehicles Symposium (IV2000) (call for papers can be found at [www.sid.org](http://www.sid.org))

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