

Practical Resolution of Laser Photoplots for Transparency Masks

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October 2003 (printed October 14, 2003)

The following images analyze the resolution of 1/25.4th mil and 1/46.4th mil laser transparency photoplots, purchased from The Photoplot Store (<http://www.photoplotstore.com>) in September 2003. The following limiting dimensions are apparent when comparing the transparency plots to the CAD data submitted to the plotter:

Parameter	1/25.4th mil Transp.	1/46.4th mil Transp.
Edge roughness (horiz. and vert.)	3 μm	2 μm
Default feature radius	5 μm	3–4 μm
Minimum vertical line width	10 μm	8 μm
Minimum horizontal line width	8 μm	6–8 μm
Minimum feature size (diameter)	9 μm	7 μm

The 1/25.4th mil pattern was transferred to a chrome blank; representative features on the transferred chrome pattern are shown in Figure 5.

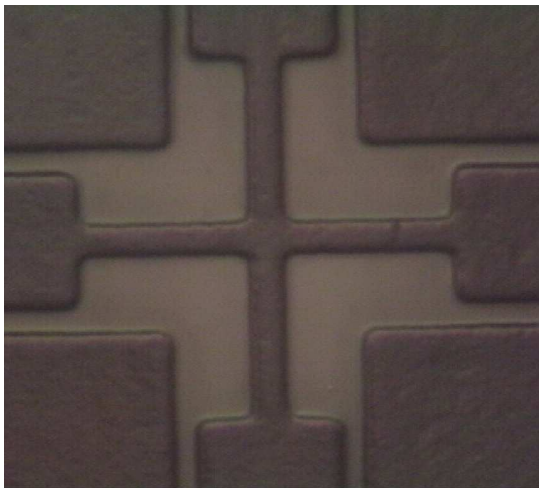
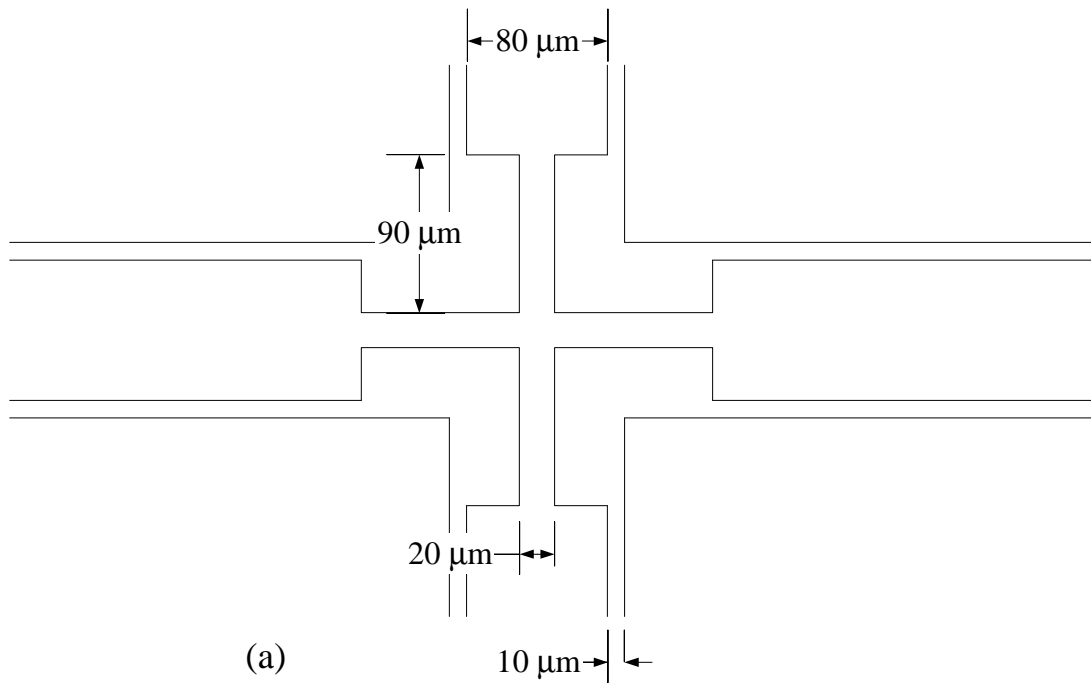


Figure 1: (a) drawing of alignment mark; (b) alignment mark on $1/25.4$ th mil plot; (c) alignment mark on $1/46.4$ th mil plot.

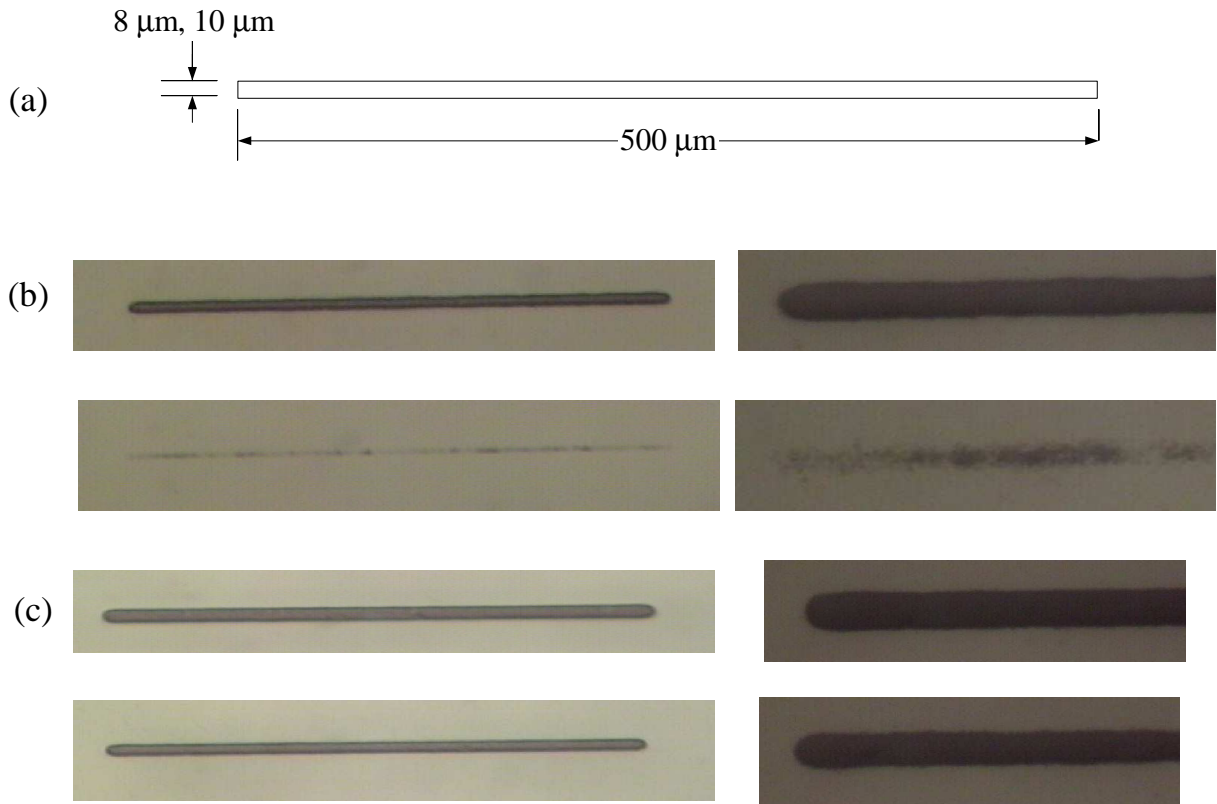


Figure 2: Comparison of narrow horizontal line features; (a) drawing; (b) nominal 10 μm (upper) and 8 μm (lower) lines on 1/25.4th mil plot, with close views at right; (c) nominal 10 μm (upper) and 8 μm (lower) lines on 1/46.4th mil plot, with close views at right.

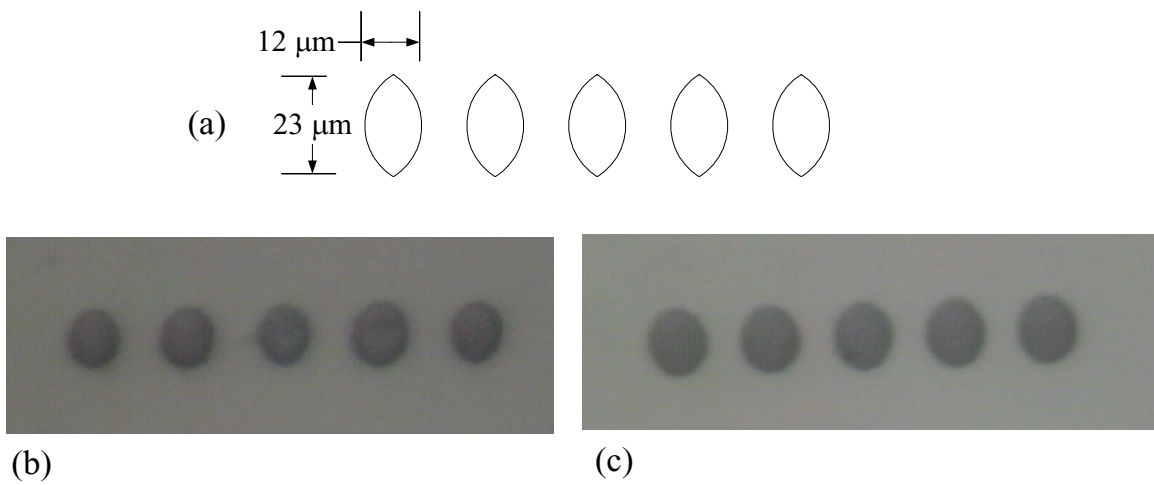


Figure 3: Comparison of rows of small football shapes; (a) drawing; (b) features on 1/25.4th mil plot; (c) features on 1/46.4th mil plot.

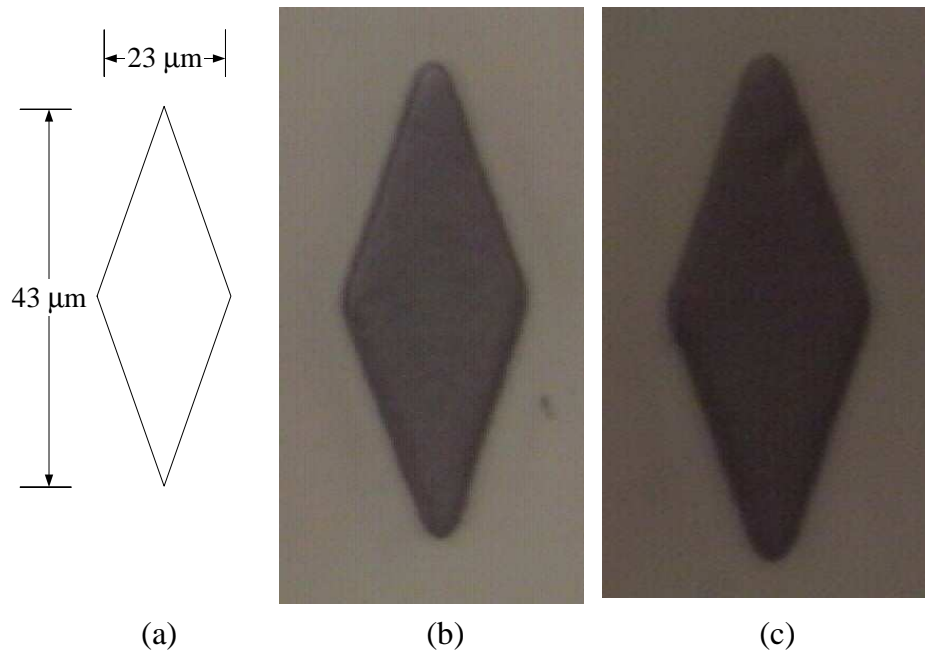
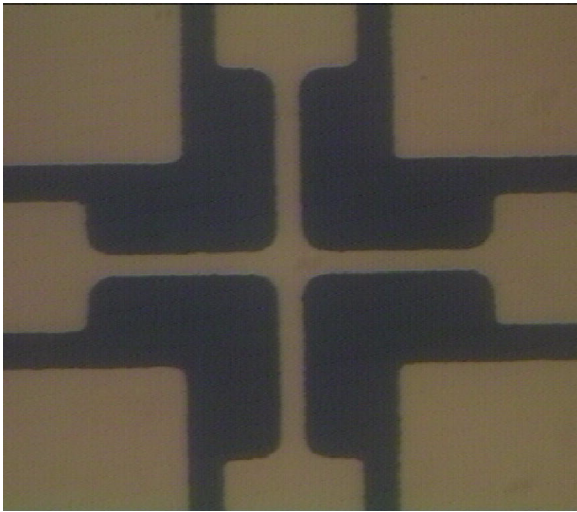
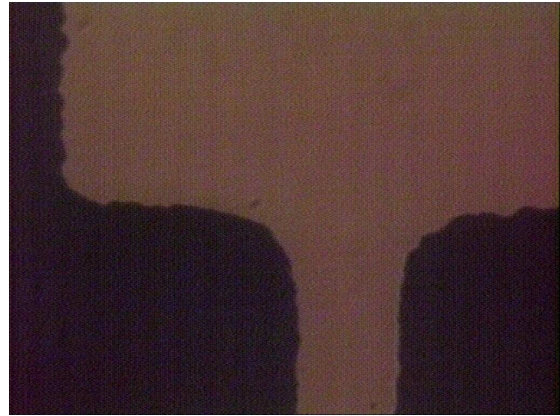


Figure 4: Comparison of large diamond shapes; (a) drawing; (b) feature on 1/25.4th mil plot; (c) feature on 1/46.4th mil plot.

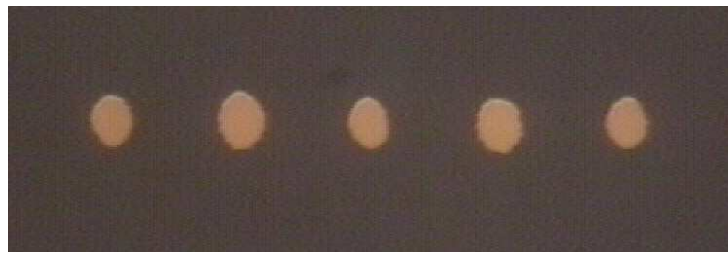


(a)



(b)

(c)



(d)



Figure 5: Features on chrome mask made from 1/25.4th mil plot on TELIC 7" soda-lime blank; (a) alignment mark at 20X magnification; (b) top area of alignment mark at 100X; (c) row of 23 μm by 12 μm football shapes; (d) 10 μm wide horizontal line.