Printing grids at the University of Southampton Print Centre - Using the ‘High Quality’ mode

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The nominal printing modes are, depending on the printing quality selectable in the software:

‘High’ : H x V =1058 x 902
‘Fine Art’ : H x V = 446 x 601
‘Quality’ : H x V = 446 x 451
‘Express production’ : H x V = 446 x 301

The former document (Oct 7) showed how to use the ‘Quality’ mode, at a real definition of 445.6825 x 451.

I run some other tests today with the highest resolution (nominal 1058 x 902).

Once again, some periodic defects appeared when using it. Using the formula indicated previously:

$$\Delta \text{DPI} = \pm \frac{d_0}{d}$$

where $d$ is the defect period and $d_0 = 25.4 \text{ mm}$, it was possible to determine the actual definition:

| 1058.33867 x 902 |

Notice that 902 is exactly twice 451, the vertical definition used with the ‘quality’ mode, where no adjustment had to be made. The ratio between the horizontal definitions of the ‘high’ and ‘quality’ modes is 2.37464713108547, not evoking anything sensible...

I had to amend once again the Postscript file, in order to be able to use a different number of points in the $x$ and $y$ directions, to achieve a grid with similar periods along the two directions. Fortunately, a 6/7 ratio works almost perfectly:

- 14 points @ 1058.33867 DPI (H) = 0.335998 mm
- 12 points @ 902 DPI (V) = 0.337916 mm

I also ask for black enhancement: the solution is simply to print the grid twice.

It was possible to print a fairly decent 0.336 mm grid. I tried to halve the period (only possibility to keep the 6/7 ratio), but the result was rather poor (too many deviations of the dots from their ideal location).
$/GrilleVerticale % (S -- )
{
    PasH 2 div setlinewidth
    Largeur PasH div ceiling cvi 1 add
    {
        currentpoint
        0 Hauteur PasH div ceiling PasH mul rlineto
        exch PasH add exch moveto
    } repeat
    stroke
} bind def

$/GrilleHorizontale % ( -- )
{
    PasV 2 div setlinewidth
    currentlinewidth -2 div 0 rmoveto
    Hauteur PasV div ceiling cvi 1 add
    {
        currentpoint
        Largeur PasV div ceiling PasV mul currentlinewidth add 0 rlineto
        PasV add moveto
    } repeat
    stroke
} bind def

/Titre
{
    /Courier findfont 9 scalefont setfont
    0 -20 rmoveto
    (p_x = ) show
    PasH 72 div 25.4 mul str cvs show
    ( mm \() show
    pts_per_periodH str cvs show
    ( pts\); p_y = ) show
    PasV 72 div 25.4 mul str cvs show
    ( mm \() show
    pts_per_periodV str cvs show
    ( pts\); DPI = ) show
    resolutionH str cvs show
    ( (x) ) show
    resolutionV str cvs show
    ( (y)) show
}
} bind def

$/GrilleVerticale % (S x y -- )
{
    /Hauteur exch def
    /Largeur exch def
    pts_per_periodV printer_pt_to_PSptV /PasV exch def
    gsave
    PrepareCouleur
    $GrilleVerticale
grestore 0 setcolor Titre
} bind def

$/GrilleHorizontale % (S x y -- )
{
    /Hauteur exch def
    /Largeur exch def
    pts_per_periodH printer_pt_to_PSptH /PasH exch def
    gsave
    PrepareCouleur
    $GrilleHorizontale
grestore 0 setcolor Titre
} bind def
The caption at the bottom of the printed grid has also been changed. With the listed file, the printed caption is:

\[ p_x = 0.335998 \text{ mm (14 pts)}; \quad p_y = 0.337916 \text{ mm (12 pts)}; \quad \text{DPI} = 1058.34 \text{ (x) 902 (y)} \]