Printhead Calculations

Pixel Pitch

$ pixel_{Pitch}= $

In [23]:

```
resolutions = [360, 600, 1200, 2400] # dpi
inch2cm     = 2.54 # cm/inch
pixel_pitch = np.empty(shape=[size(resolutions)], dtype=np.float64) # um

for i in range(size(resolutions)):
  pixel_pitch[i] = (inch2cm/resolutions[i])*10000

for i in range(size(resolutions)):
  print("Resolution: {:4} dpi   Pixel Pitch: {} um".format(resolutions[i], pixel_pitch[i]))
```

```
Resolution:  360 dpi   Pixel Pitch: 70.5555555556 um
Resolution:  600 dpi   Pixel Pitch: 42.3333333333 um
Resolution: 1200 dpi   Pixel Pitch: 21.1666666667 um
Resolution: 2400 dpi   Pixel Pitch: 10.5833333333 um
```

Error in Pixel Pitch \(\Delta x_{Pitch}\)because of substrate speed and clock frequency $ x_{Pitch}=v_{Substrate}·t $

Error is the modulus of the achieved and the ideal pixel pitch. $ e=Rest() $

In [97]:

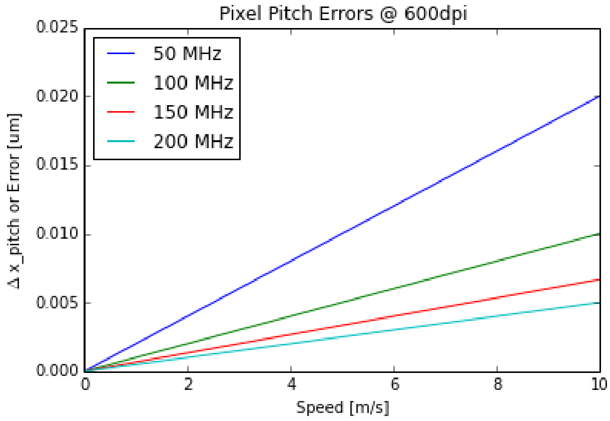
```
import numpy as np
import pylab as pl
pl.clf()
frequencies = [50e6, 100e6, 150e6, 200e6] # MHz
speed = np.linspace(0,10,50) # 50 x points from 0m/s to 10m/s

for freq in frequencies:
  delta_x_pitch = (speed*100000) * 1/freq # um/s / s
  #error = numpy.mod(pixel_pitch[1],delta_x_pitch)
  # Plot graph
  pl.plot(speed,delta_x_pitch,label=str(int(freq/1000000))+" MHz")

# Place legend, Axis and Title
pl.legend(loc='best')
pl.xlabel("Speed [m/s]")
pl.ylabel("$\Delta$ x_pitch or Error [um]")
pl.title("Pixel Pitch Errors @ {}dpi".format(resolutions[1]))
```

Out[97]:

```
<matplotlib.text.Text at 0x15df70f0>
```



Resolution

In [4]:

```
pixel_pitch = 0.1692 # mm
inch2cm = 2.54 # cm/inch
resolution = (inch2cm/pixel_pitch)*10
```

```
print("Resolution: {:4} dpi   Pixel Pitch: {} um".format(resolution, pixel_pitch))
```

```
Resolution: 150.11820331 dpi   Pixel Pitch: 0.1692 um
```

Stitching

For Steinemann machine (KonicaMinolta KM1024i)

$ pixel_{overlap}= $

In [9]:

```
ph_resolution  = 360   # dpi
inch2cm        = 2.54  # cm/inch
ph_overlapping = 0.196 # cm

pixel_overlap = ph_resolution / inch2cm * ph_overlapping

print("{} dots".format(pixel_overlap))
```

```
27.7795275591 dots
```

Pixel distance

KonicaMinolta KM1024i & KM1024

$ pixel_{pitch}= $

Sprinting Speed

$ pixel_{pitch} = = [mm] $

$ freq_{adjusted} = = [Hz] $

$ speed = pixel_{pitch} * freq_{adjusted} * = [] $

In [30]:

```
resolution_job = 720  # dpi
resolution_ph  = 360  # dpi
f_ph           = 30e3 # Hz
speed_percent  = 100  # %
#-------------------------------------
inch2mm     = 25.4 # mm/inch
#-------------------------------------
pixel_pinch = inch2mm/resolution_ph          # (inch/mm)/(dot/inch) = mm/dot
adjusted_frequency = f_ph / 100 * speed_percent # Hz

speed = pixel_pinch * adjusted_frequency * resolution_ph/resolution_job # (mm/dot) * 1/s * (dot/inch)/(dot/inch) = mm/s

print("Pixel Pinch = {} mm".format(pixel_pinch))
print("Adjusted Frequency = {}% of {} Hz = {} Hz".format(speed_percent, f_ph, adjusted_frequency))

print("Speed = {} mm/s".format(speed))
print("Speed = {} m/s".format(speed/1000))
```

```
Pixel Pinch = 0.0705555555556 mm
Adjusted Frequency = 100% of 30000.0 Hz = 30000.0 Hz
Speed = 1058.33333333 mm/s
Speed = 1.05833333333 m/s
```