



## Square vs non-square pixels

Adapted from: *Flash + After Effects* By Chris Jackson



Square vs non square pixels can cause problems when exporting flash for TV and video if you get it wrong. Here Chris Jackson explains how best to avoid these mistakes...

Before you adjust the Stage width and height, you need to be aware of the pixel aspect ratio. This refers to the width and height of each pixel that makes up an image. Computer screens display square pixels. Every pixel has an aspect ratio of 1:1. Video uses non-square rectangular pixels, actually scan lines. To make matters even more complicated, the pixel aspect ratio is not consistent between video formats. NTSC video uses a non-square pixel that is taller than it is wide. It has a pixel aspect ratio of 1:0.906. PAL is just the opposite. Its pixels are wider than they are tall with a pixel aspect ratio of 1:1.06.



**Figure 1:** The pixel aspect ratio can produce undesirable image distortion if you do not compensate for the difference between square and non-square pixels.

Flash only works in square pixels on your computer screen. As the Flash file migrates to video, the pixel aspect ratio changes from square to non-square. The end result will produce a slightly stretched image on your television screen. On NTSC, round objects will appear flattened. PAL stretches objects making them appear skinny. The solution is to adjust the dimensions of the Flash Stage. A common Flash Stage size used for NTSC video is 720 x 540 which is slightly taller than its video size of 720 x 486 (D1). For PAL, set the Stage size to 768 x 576. This is wider than its video size of 720 x 576. The published movie can be rescaled in After Effects to fit the correct dimensions. Even though the image may look distorted on the computer screen, it will appear correct on video. Table 2.1 shows the correct Stage size needed for each video format.

Video Format	Frame Ratio	Pixel Ratio	Video Size	Flash Stage
NTSC DV	4:3	non-square	720 x 480	720 x 534
NTSC D1	4:3	non-square	720 x 486	720 x 540
PAL DV/D1	4:3	non-square	720 x 576	768 x 576
NTSC DV	16:9	non-square	720 x 480	864 x 480
NTSC D1	16:9	non-square	720 x 486	864 x 486
PAL	16:9	non-square	720 x 576	1024 x 576
HDTV 720p	16:9	square	1280 x 720	1280 x 720
HDTV 1080i	16:9	square	1920 x 1080	1920 x 1080

**Figure 2:** *Flash Stage Size Settings for Different Video Formats*

There is some good news with high-definition (HD) television. HD uses square pixels. This means that depending on the HD format you choose, either 720p or 1080i, your Flash Stage dimensions are the same as the video size.