Image Resolution for Decals - Explained

By Eddie20

Resolution can be a tough to understand, but in customizing, can be the difference between good looking decals and great looking decals. The following information relates to raster images though you will be able to apply it to vector images and imaging in general.

For reference, standard computer monitor resolution is 72 dpi (dots per inch). Chances are that your monitor is running at 72 dpi and consists of 1024 pixels (dots) horizontally by 768 pixels vertically *though it may be larger or smaller depending on your settings. Keeping this in mind, we will be using several images of different resolutions and sizes. How these images display on your monitor will depend on your settings, but you should be able to adapt the information in any case. Also, while viewing this document, have your level of zoom set to 100% unless otherwise noted. (Note that 1024x786 is the recommended display size for this tutorial)

If you are getting disappointed in the quality of your decals after printing, chances are you are probably facing image problems, not printing problems. Your image quality is directly related to both your starting and ending resolution and size. Images consist of a series of pixels. The size of your picture and your resolution determine how many pixels exist in your image. For instance, the following is a 1”x1”x72dpi image. On your monitor, it should display at approximately 1”x1” as your monitor is likely set to a resolution of 72dpi:

The image consists of 5184 pixels (72 dots X 72 dots). This is a common image you may find on the internet that you would want to use on a custom, perhaps on an insert or an ice base. However, this will likely require it to be resized. The following is a 3”x3”x72dpi image that was resized from the original image. The image dimensions are now 216 pixels by 216pixels (72x3=216, which is the number of pixels per side)

Notice the loss of quality. The image has become blurry and pixilated. The image now consists of 46656 pixels, or 9 times the number of pixels as the original image. Images are similar to the law of conservation of mass, which says that mass cannot be created or destroyed. In this case, information (pixels for this example) cannot be created. So where do the extra 41472 pixels come from? The computer uses a process called interpolation to guess where it should put additional pixels needed to fill out the image. Interpolation is a form of averaging. This basically lets the computer fill in those extra pixels with what it guesses SHOULD be there. However, it is nothing more than a guess (and not that good of a guess as you can see from the image).
So the key is to match the number of pixels in your native image to the number of pixels in your final image. If we want that 3"x3" image to display the correct way on the monitor, we need to find an appropriate image. There are several approaches to this.

Approach 1

The first approach is to find a 1"x1" image with a larger resolution to act as our native image. To be resized with no distortion, we need a native image that is 1"x1"x216 dpi. The image on the left is the 1"x1"x216 dpi image. The image on the right is the first image we looked at, the 1"x1"x72dpi.

They look identical when your zoom is set to 100%. But take a second look at them with your zoom set to a higher level, for instance, 200%.

Alight, zoom back out to 100%. The image on the left was considerably clearer, right? This is the same thing that happens when you change the size of an image without adjusting the resolution. The image on the left contains more information. It has a much larger resolution (216dpi vs. 72dpi). That means that when you blow up the images (like we did when we zoomed in) the computer doesn't have to interpolate to fill in those missing pixels for the image on the left because they are already there. The computer doesn't have to guess, and you come out with a much better looking picture.

With all this extra information in that first picture, we can resize that image to fit our needs on the screen. By reducing the resolution from 216dpi to 72dpi, we can increase our image size from 1”x1” to 3”x3” and it will still look clean and crisp

However, when using jpeg and bitmap images (such as those found on jomo’s website), you will not be able to find images readily available on the internet with a variety of resolutions. The solution to this is to use a vector image, which will be discussed in a later installment. Most every image found on the internet, either on this site, google, or wherever, will be at a 72dpi resolution.

Approach 2

The second option is to find a larger image and resize it to fit our need. This is a good approach if you are using images from the net. If you get lucky, you'll find good sized images on the net. The larger, the better. You can always make a larger image go further than a smaller image. When it comes to making customs, bigger IS better (no matter what she says). In this case, our native image will be found as a 5"x5"x72dpi image, which is something you may be able to find on a logo reference website. It looks like this:

It is definitely too big for the 3”x3” image that we need. So there are 2 ways to get this image to be the size we need it. We can first try a simple resize. Just go in and resize it from 5x5 down to 3x3 and leave the resolution alone. The second way is to change the resolution and the image size. Change the size to 3”x3” and change the resolution from 72dpi to 120dpi. The second method is the preferred way to do this.

The results of the first method are shown on the left, the second shown on the right. Zoom in to 200% and see why the second method is preferred.

The image on the right has more information and thus looks better blown up.

Approach 3

The final approach is to find the perfect image all set for you. Let’s face it, that probably won’t happen, so don’t expect it to.

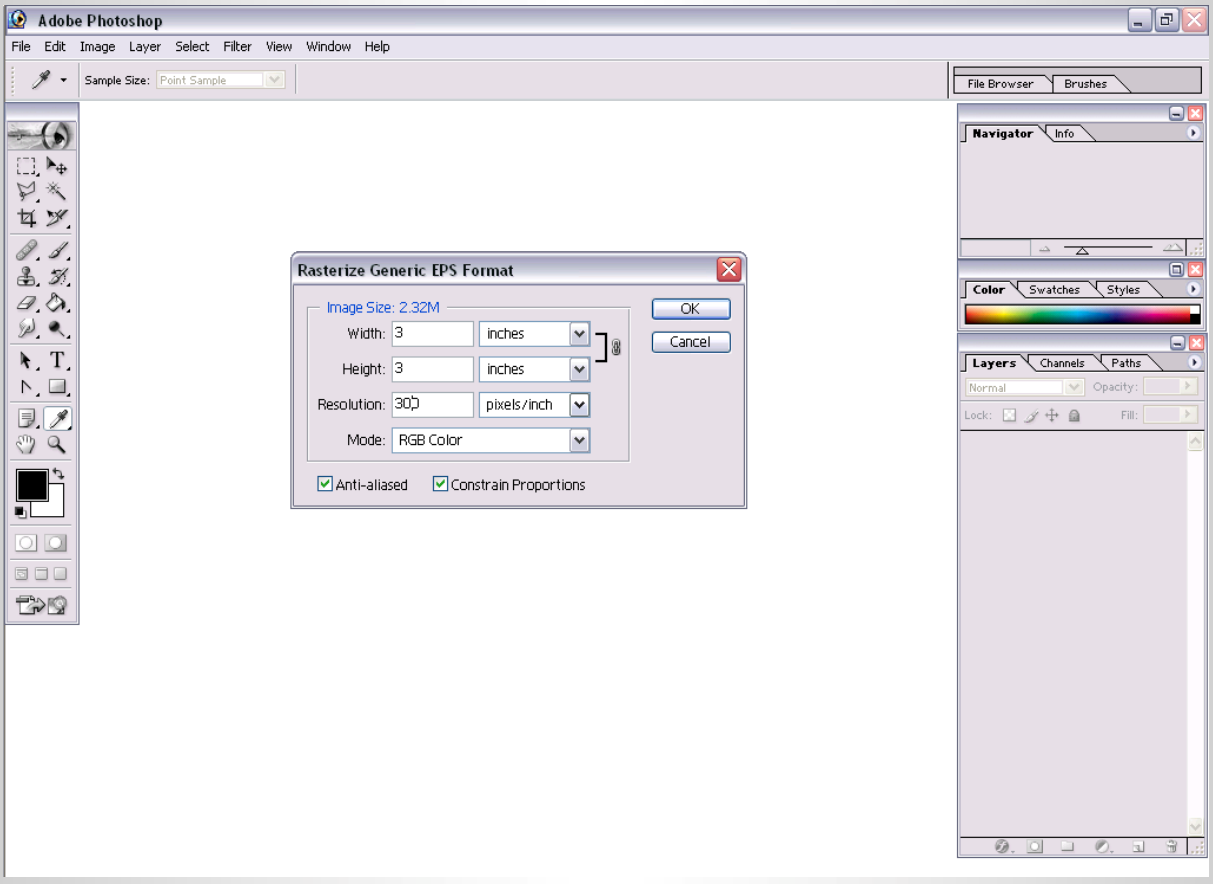
So why do we care about how these things look on the screen when zoomed in? Well, having those extra pixels means that your printer can print more pixels too. Your printer can probably print at least at 600 dpi and probably more. So why use a 72 dpi image?

Your printer is set up to print whatever resolution is required. No adjustments have to be made there. The best printer in the world can only print a picture or decal as good as the image that it is given.

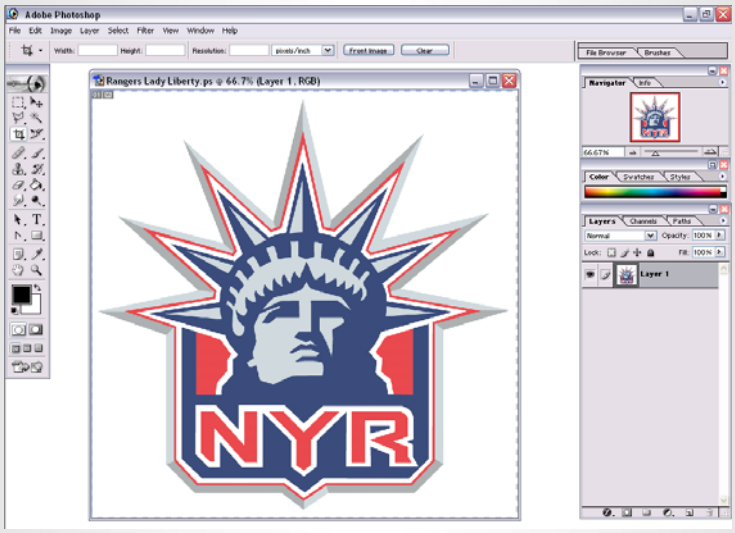
So how can you do that? The best way is to start with a vector image. What is a vector image? A vector image is made up of a series of lines and curves. The lines and curves are able to be resized to any size or resolution without any loss of quality. Big or small, no problem with a vector. Vector images typically have file extensions such as .eps .ai or .ps Any of those formats will work with Photoshop. Using Photoshop, I will show you an example how to produce a high quality image for the crest of a hockey figure.

Begin by opening your file in Photoshop. You may have an option to choose the size and resolution of your image. It is good practice to pick a size larger than what you will need. You should shoot to have decals with a resolution of 300 dpi or higher. However, in most cases, you will not notice a significant difference in decal quality with resolutions greater than 600 dpi. Shown below is an image of Photoshop showing a size choice when opening a vector image. In this case, I have chosen a 3”x3”x300dpi image.

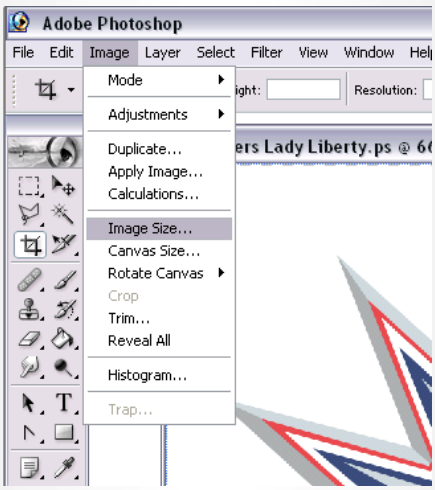
Note: when working with or printing digital photographs, you typically want to use the highest resolution possible.



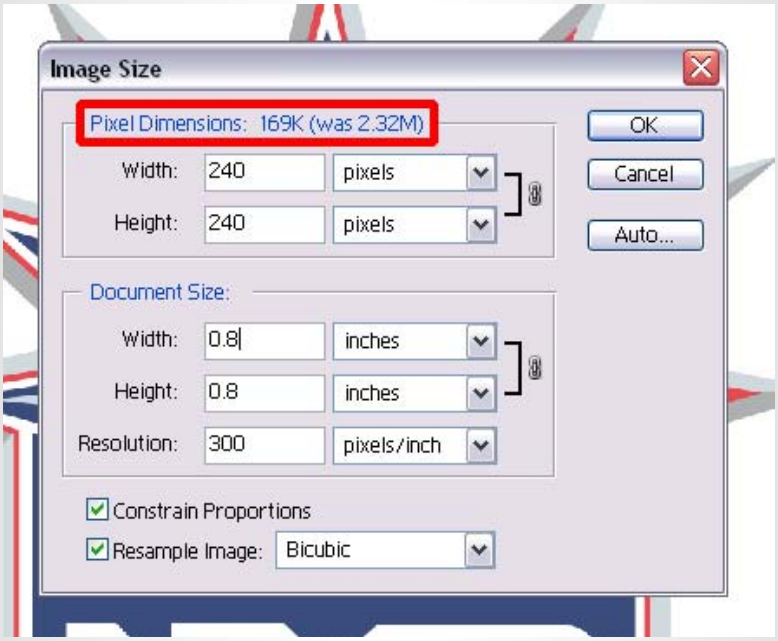
With that chosen, you should get a large image shown on the screen (see below). This is fine. Remember that your monitor has a resolution of 72dpi, and your image at 300 dpi. Because of this different, your monitor makes the image look much larger than it really is.

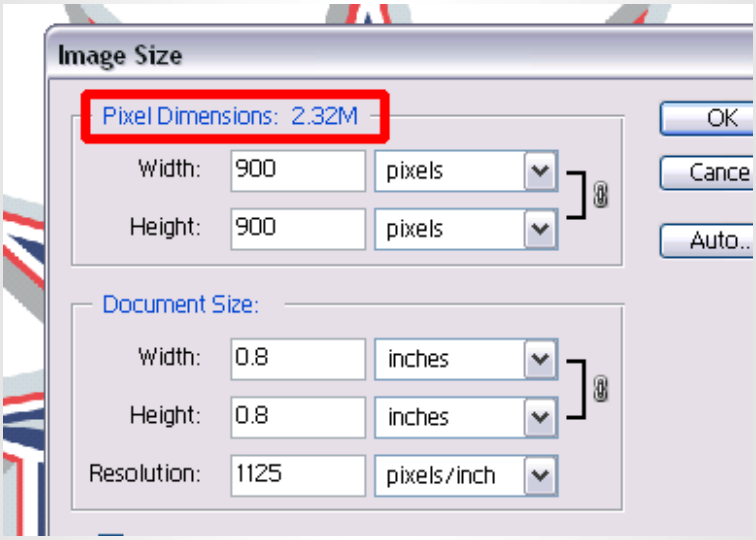


The next set is to determine the size you need for your logo. In the case of a hockey figure, most logos on the front of a jersey are about 0.8" tall. So to resize the image, click on the image menu near the top of the screen and select image size



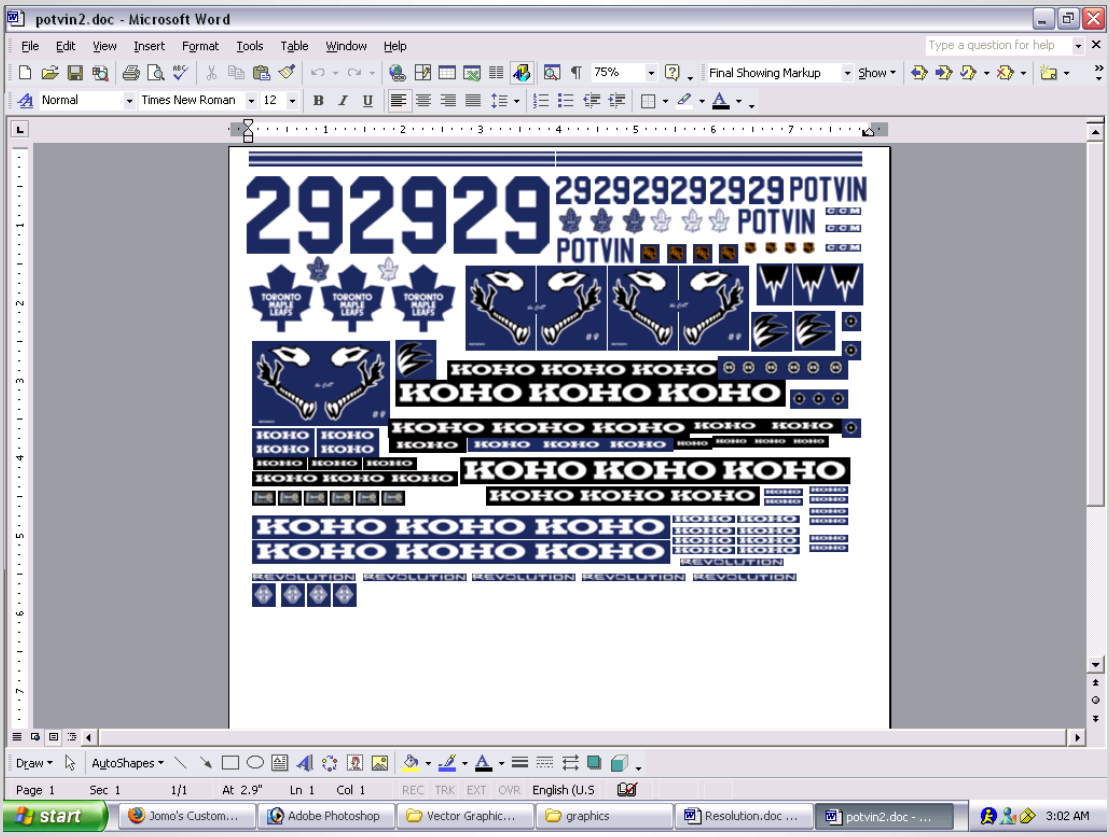
Next we adjust the image size. Change the image to your desired size of 0.8”x0.8”. If you leave the resolution unchanged, notice how number next to pixel dimensions changes (shown below in the red box). This is shown that the number of pixels used in the image have decreased, not to mention the quality of the image. This is corrected by increasing the resolution until the number in the pixel box remains unchanged (see second figure





However, keep in mind that a resolution greater than 600 dpi (pixels/inch) is unnecessary for the purposes of making decals. My suggestion is to choose a resolution of 600dpi in this case. There is no significant increase in quality at resolutions greater than 600 dpi, so save your hard drive space and stick with 600 dpi.

Next simply press okay. Your image should be ready to go. Now save the image. Every customizer uses a different method. I prefer to put my images in a bitmap (.bmp) format then import them into Microsoft word. I put all my logos onto a page and then I can arrange them to maximize the number of decals per sheet of decal paper.



Following the steps that were outlined, your graphics will likely have come a long ways. Just for comparison, let's look at the potential difference. First is a 1"x1"x72dpi native image that was resized the simple way. No change in resolution and resized to the size of our crest, 0.8"x0.8". That image is shown on the left. The second image comes from a vector file that we adjusted and is shown on the right. The native image was 3"x3"x300dpi. We resized it to 0.8"x0.8" and changed the resolution to 600dpi. Don't be afraid to zoom in to 500% to see the difference. Which image would you rather use?

Hopefully this will help you in your quest to make decals and other graphics for your custom figures. Use this as a guide to get you started, but feel free to improve upon the methods listed here or develop your own. I wish you the best of luck in your customizing endeavors.