

How to Determine the Perforation of a Stamp Using a Scanner, a PC and Photoshop™

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Correctly determining the perforation of a postage stamp is a critical element in philately. However, determining a stamp's perforation has its challenges. Not everyone measures the perforation in exactly the same way, even amongst the most experienced collectors. Moreover, subtle but significant differences exist between the common perforation gauges currently available.

This article will help illustrate how to accurately determine the perforation of a stamp without the need of a handheld gauge.

For the purposes of this article, I have used an Epson™ Perfection V600 Photo Flatbed Scanner and Adobe™ Photoshop CC Version 19.1.5. Other types of photo software can be used but require a Ruler Tool feature to enable this method of digital perforation measurement.

Calculations

The perforation (P) of a stamp is the number of perforations or teeth (T) in 2 cm.

$$P = \frac{T}{2 \text{ cm}}$$

1 inch = 2.54000508 cm

Based on the resolution of the scan in dpi (dots per inch):

$$300 \text{ dpi} = \frac{300 \text{ dots}}{1 \text{ inch}} = \frac{300 \text{ dots}}{2.54000508 \text{ cm}} = 118.11 \text{ dots per cm} = 236.22 \text{ dots per 2 cm}$$

$$600 \text{ dpi} = \frac{600 \text{ dots}}{1 \text{ inch}} = \frac{600 \text{ dots}}{2.54000508 \text{ cm}} = 236.22 \text{ dots per cm} = 472.44 \text{ dots per 2 cm}$$

$$1200 \text{ dpi} = \frac{1200 \text{ dots}}{1 \text{ inch}} = \frac{1200 \text{ dots}}{2.54000508 \text{ cm}} = 472.44 \text{ dots per cm} = 944.88 \text{ dots per 2 cm}$$

$$2400 \text{ dpi} = \frac{2400 \text{ dots}}{1 \text{ inch}} = \frac{2400 \text{ dots}}{2.54000508 \text{ cm}} = 944.88 \text{ dots per cm} = 1889.76 \text{ dots per 2 cm}$$

$$4800 \text{ dpi} = \frac{4800 \text{ dots}}{1 \text{ inch}} = \frac{4800 \text{ dots}}{2.54000508 \text{ cm}} = 1889.76 \text{ dots per cm} = 3779.52 \text{ dots per 2 cm}$$

Based on the above calculations, the following formula (Table 1) can be used to calculate the perforation of a stamp both precisely and accurately, virtually eliminating inter-user variation.

Calculated Perforation at 300 dpi = $\frac{\# T \text{ counted}}{\# \text{ dots measured}} \times 236.22 \text{ dots}$
Calculated Perforation at 600 dpi = $\frac{\# T \text{ counted}}{\# \text{ dots measured}} \times 472.44 \text{ dots}$
Calculated Perforation at 1200 dpi = $\frac{\# T \text{ counted}}{\# \text{ dots measured}} \times 944.88 \text{ dots}$
Calculated Perforation at 2400 dpi = $\frac{\# T \text{ counted}}{\# \text{ dots measured}} \times 1889.76 \text{ dots}$
Calculated Perforation at 4800 dpi = $\frac{\# T \text{ counted}}{\# \text{ dots measured}} \times 3779.52 \text{ dots}$

Table 1 – Formula Used to Calculate Digital Perforations

Here is an example of how to determine a stamp’s perforation digitally:

You scan a stamp at 1200 dpi.

You open the image in Adobe™ Photoshop CC (Fig. 1).

You use the Ruler function to measure the number of pixels between two chosen teeth using the same part of each tooth (in this case Zone 3 as illustrated in Fig. 2) to measure from.

The number of measured dots is 643.23

The number of teeth counted is 8. Please note that the first tooth is measured as “Tooth Zero”.

The Digital Perforation Measurement is:

$$\begin{aligned} \text{Perforation at 1200 dpi} &= \frac{\# T \text{ counted}}{\# \text{ dots measured}} \times 944.88 \text{ dots} \\ &= \frac{8}{643.23} \times 944.88 \text{ dots} \\ &= 11.75 \end{aligned}$$

The stamp’s top perforation is 11.75 (measured from Zone 3) and is accurate to the second decimal place. The Zone chosen will depend on the quality of the perforations. With a little practice, you will instinctively choose the Zone that best gets the job done for each side of the stamp.



Fig. 1 Screen Image of Adobe™ Photoshop CC

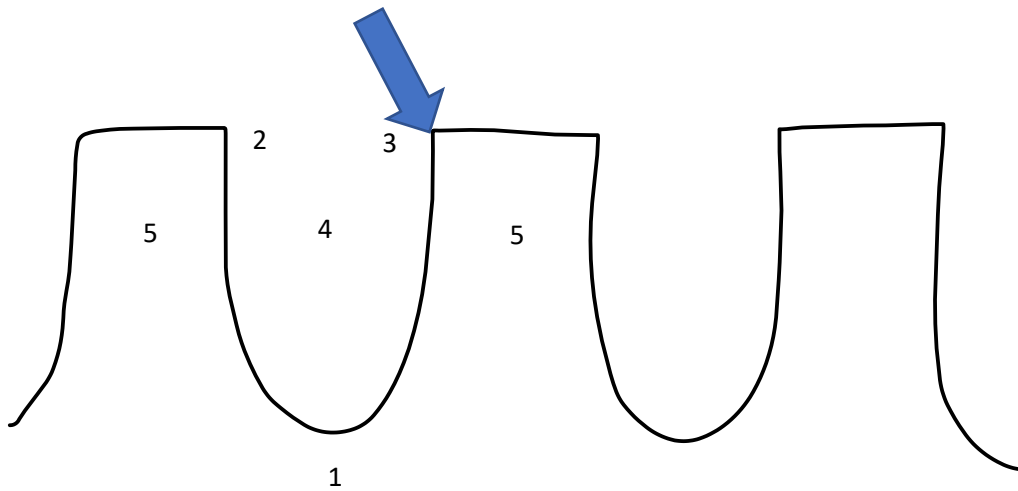


Fig. 2 - Perforation Zones (Zone 4 is at the centre of the perf hole)

With a little practice, you will be determining perforations quickly, confidently and with accuracy and precision.

Hopefully, this technique will catch on and become the gold standard in perforation measurement.

Feel free to email me at [**chickenchan@icloud.com**](mailto:chickenchan@icloud.com) with your ideas, comments and suggestions.

Happy Stamping!

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