

All-new Speckle Kit

The speckle kit provides tools to help produce an ideal speckle pattern for a variety of digital image correlation applications. An ideal speckle pattern provides good signatures throughout the area of interest so that subsets may be tracked with certainty. Therefore, the certainty of your results is often defined by the quality of the speckle pattern. In order to provide consistent speckle patterns for various sample sizes and materials, the speckle kit includes:

- Stamp Rollers (6 sizes)
- Stamp Rockers (6 sizes)
- Accessories (ink pad, extra ink, padded Pelican carrying case)



What Makes a Good Speckle Pattern?

Random & High Contrast

Irregular patterns of dark black dots on a bright white background or bright white dots on a dark black background.

Consistent Dot Size

The dots should ideally be around 5-10 pixels in size in order to optimize spatial resolution, but the most important thing is that the dots are fairly consistent in size and not too small (less than 3 pixels in size is too small and can cause aliased results). Dots larger than 10 pixels are also acceptable as long as they are reasonably consistent in size.

50% Coverage

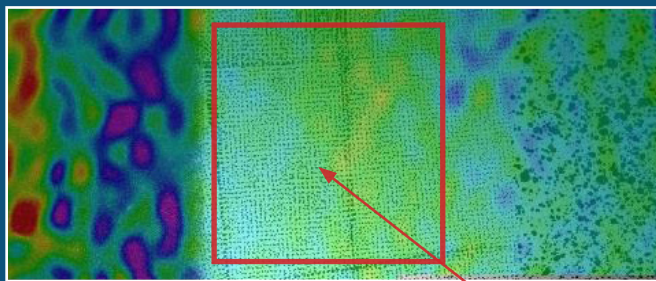
Ideally there should be equal amounts of white and black on the surface. If the speckles are 5 pixels in size, they should be approximately 5 pixels apart from one another.



Why Do We Need a Good Speckle Pattern?

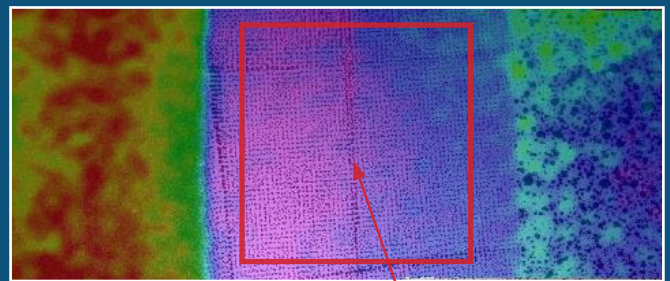
In digital image correlation, using an optimal speckle pattern is one of the most important factors in reducing measurement noise and improving overall results. A good pattern will allow the correlation to be made with high confidence and produce low noise. Below is shape and strain measurement data for a flat plate with different speckle patterns. The middle region was created with the speckle kit and illustrates an optimal pattern for this particular test, while the left and right regions are less adequate.

Strain Noise (Exx)



low noise

Correlation Confidence (Sigma)



strong correlation



The series of stamp rollers provide patterns for different fields of view (FOV), depending on the camera resolution. Below are the stamp sizes and corresponding field-of-view ranges for various camera resolutions.



	0.007" (0.18 mm) Dot Size	0.013" (0.33 mm) Dot Size	0.026" (0.66 mm) Dot Size	0.05" (1.27 mm) Dot Size	0.10" (2.54 mm) Dot Size	0.20" (5.08 mm) Dot Size
1 MP Camera 1024 px across	0.9" - 2.4" 2.3 cm - 6.1 cm	1.7" - 4.4" 4.2 cm - 11 cm	3.3" - 8.9" 8.4 cm - 23 cm	6.4" - 17.1" 16 cm - 43 cm	12.8" - 34.1" 33 cm - 87 cm	26.6" - 68.3" 65 cm - 173 cm
2.3 MP Camera 1920 px across	1.7" - 4.5" 4.3 cm - 11 cm	3.1" - 8.3" 7.9 cm - 21 cm	6.2" - 16.6" 16 cm - 42 cm	12.0" - 32.0" 31 cm - 81 cm	24.0" - 64.0" 61 cm - 163 cm	48.0" - 128.0" 122 cm - 325 cm
5 MP Camera 2448 px across	2.1" - 5.7" 5.4 cm - 15 cm	3.9" - 10.6" 10 cm - 27 cm	8.0" - 21.2" 20 cm - 54 cm	15.3" - 40.8" 39 cm - 103 cm	30.6" - 81.6" 78 cm - 207 cm	61.2" - 162.2" 155 cm - 415 cm
16 MP Camera 4872 px across	4.3" - 11.4" 11 cm - 29 cm	7.9" - 21.1" 20 cm - 54 cm	15.8" - 42.2" 40 cm - 107 cm	30.5" - 81.2" 77 cm - 206 cm	60.9" - 162.4" 155 cm - 413 cm	121.8" - 324.8" 309 cm - 825 cm