

## Moiré Patterns

### Why they happen, how to minimize the effect

Moiré is a disruptive pattern that occurs on a video image when some portion of the view contains small, repetitive details that are comparable to the resolution and scan rate of the camera.

Moiré patterns can be caused by numerous intersecting lines, or by patterns with fine details. Some examples of objects that can cause moiré include:

- Door, window, or patio screens
- Walls, floors, or other surfaces or materials with detailed, repetitive, or concentric patterns
- Natural features that create intersecting patterns, such as small leaves, or fine gravel

Moiré is most commonly seen on analog surveillance cameras with standard-definition resolutions or frame rates. High-resolution IP cameras are less likely to have moiré issues.

The moiré effect is often more noticeable on color images, because the patterns interfere heavily with color signal processing. This can create false and pulsating color in areas where the moiré effect is most pronounced.

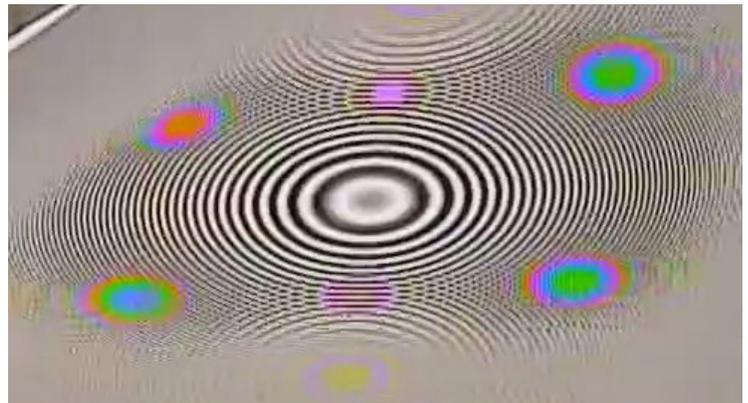
This effect is less noticeable on cameras in black-and-white or night mode; moiré patterns can still be seen, but since colors are not processed, the effect is not as easily seen.

### How to Address Camera Moiré

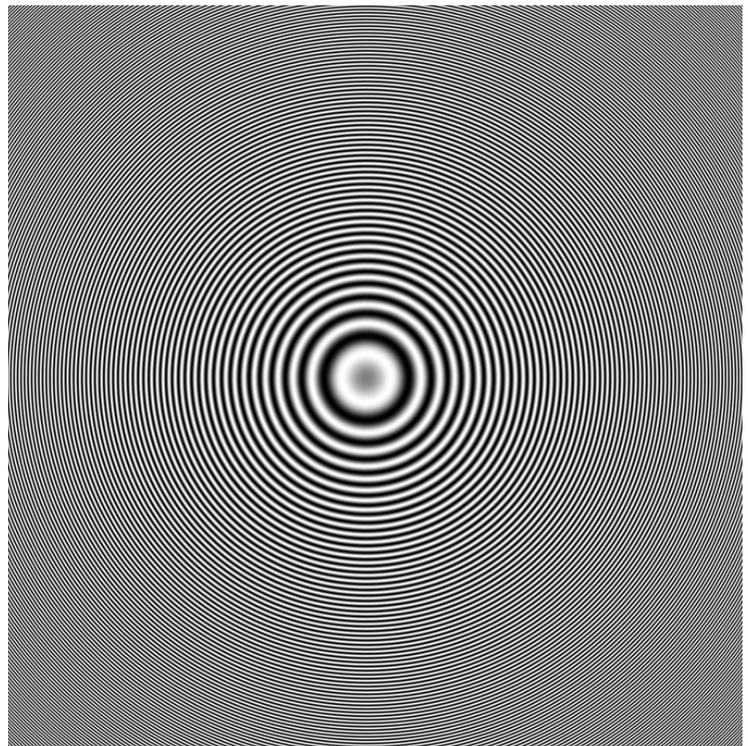
First and foremost, the surveillance needs of the customer must be taken into account. That said, the customer must also accept the technical limitations of the system and be willing to make some changes if needed.

Here are some methods to reduce the effect of moiré:

- If possible, reposition the camera to capture the scene at a different angle that is higher, lower, or to one side. Start by trying an angle of approximately 30° to the distracting element; experimenting is often required to find the best placement and angle.
- For cameras with on-screen displays (OSD) or menus, some settings can reduce (but likely, not eliminate) the effects of moiré in a scene:
  - Reducing the sharpness setting (or turning it off) can significantly reduce obvious moiré effects.
  - Reducing the color saturation and/or modifying the hue or tint can reduce pulsing or false-color effects of moiré.
- Change the camera's zoom in or out, if doing so does not compromise security.
- In a worst-case scenario where color imaging is not required, changing the camera to black-and-white mode eliminates pulsing and false-color effects altogether. Moiré patterns may still be visible, but will be much less distracting.



*This analog camera view of a test pattern produces an extreme example of a false-color moiré effect.*



*The test pattern used to create the above moiré effect*