



# TECHNICAL BULLETIN

## BEST PRACTICES FOR IR-ENABLED DOME CAMERAS



Both Static and PTZ dome cameras have a clear covering to protect the camera lens and gear. While this provides many benefits, it also creates some potential installation issues not normally associated with surveillance cameras. This guide walks you through those, how they occur, and how to avoid them.



Provided by the Staub technical services department

## CONSIDERATIONS

Most dome cameras are installed under the eaves of a roofline. The surfaces of the soffit and wall can cause infrared reflection issues. When installing under an eave, the camera should be 6" or less from the edge of the roof, whether the edge is defined by the soffit or a gutter. Similarly, because they can swivel, PTZs are often mounted at the corner of the roof, where there is often a downspout from the gutter. The PTZ should also be mounted at least 6" away from a downspout. Internal testing has shown that a camera lens tilt of 13° avoids noticeable soffit glare. Similarly, the camera should be turned 34° away from a wall or downspout to avoid IR reflection. Do not install the camera so that it faces the sun directly. This prevents potential daylight reflections. With difficult installs, use a pendant or arm mount to improve your results.

## TILT TEST: SOFFIT GLARE

With camera at 0° tilt, a halo of infrared reflection is noticeable in the live view. You can see some of its effects at the top of this snapshot; the sky and nearby roof are unnaturally light.

From 0° tilt to around 10° the IR reflection is still there, though it diminishes as the camera is tilted further down.

With the camera tilted down between 11°–13°, the reflection disappears, and image looks good.



## PAN TEST

Downspout Glare The series of photographs below show the amount of reflection based on the angle of the camera from a nearby downspout. The series starts with the downspout barely visible in the upper left-hand corner of the image. You can see the massive glare it creates. Each subsequent image is rotated further from the downspout.



## DAYLIGHT TEST

Potential daylight reflection when camera is facing direct sunlight is shown in the picture below.



## EXAMPLE: POOR PTZ INSTALL

This camera has several problems created by its install location.

It has half of its field of view blocked by a downspout

It's tucked behind a corner, so the wall blocks another large portion of its field of view

The areas where the camera can see are liable to have IR glare, especially near the house corner and the topmost part of the downspout



All these problems mean that the camera has a field of view that is free from glare for the roughly 90° toward the top of the picture; everything else is blocked or suffers infrared glare.

If your nighttime surveillance video looks foggy or soft-focus, one likely cause is that infrared reflection or bleed is affecting the image. Infrared interference can be caused by:

Loose or missing foam ring (dome camera only)

Problematic installation

Dust or grease on the dome cover

Nearby objects in the environment reflecting IR light

## FOAM RINGS

The most common error among inexperienced installers is removing the foam ring from around a dome camera. People have been conditioned to think of foam as disposable padding used to protect devices during shipping. The foam ring is an essential part of the camera and must be kept for a proper installation.



WITHOUT FOAM RING



WITH FOAM RING

Even with the foam ring in place, an improperly installed ring can still leak infrared glare. When properly installed, the dome bubble should sit snugly against the foam ring. Note that a good contact seal with the dome bubble means the foam ring is slightly squished, thus negating all other possible sources of internal and external glare.

The photos below illustrate how improperly installed foam rings can affect your camera's infrared images. Daylight glare can cause similar effects.



NORMAL FOAM RING

FOAM RING LOOSE CONTACT

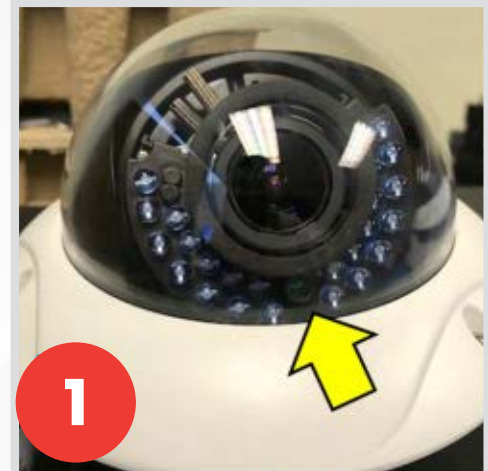
FOAM RING REMOVED

## AVOIDING INTERNAL GLARE

There are three main ways that installers may accidentally create internal IR glare.

### INTERNAL EMITTERS

A second error is to aim the camera in a manner such that the emitters are below the edge of the camera skirt (1). Their light then reflects off the camera skirt and can be picked up by the lens.



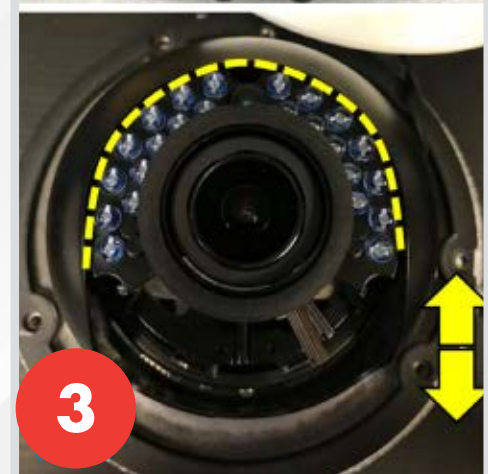
### ALIGNMENT OF COWL & EMITTERS

The cowl that surrounds the camera is designed to prevent IR leaks. Twisting the camera can result in a situation where the cowl no longer covers all the emitters (2). This can cause internal IR glare.



### PROPER INSTALL TECHNIQUE

An improper install can also cause internal glare. Start with the emitters aligned with the cowl trim line (3), then rotate and angle the camera to find the best position. Avoid positioning the camera at a flat angle where the emitter might strike the casing.



## PROBLEMATIC INSTALLATION

If the IR lamps are pointed into the camera housing (see image at left), this can cause reflective infrared issues. Note the daytime and nighttime photographs below, and how IR reflection against the housing affect the image.



Other nearby cameras (with their own infrared emitters) can also cause poor nighttime images.

Cameras can cause this even if they are not in the field of view. Cameras that shine infrared on the same area, or on an area that is at the edge of another camera's field of view, can cause glare.

The image at right shows one example of another camera's infrared causing glare.



## DIRTY DOME



DUSTY BUBBLE

GREASY DOME

DUSTY AND GREASY BUBBLE

If the glass dome is dirty, the dirt can reflect infrared into the camera lens. To keep the dome clean during installation, keep the protective film on the dome until you have completed installation. In addition, avoid touching the dome, which creates grease spots on the bubble. Such spots may not affect the daytime image but are an issue with infrared images. Over time, domes also can get covered with dust, raindrop rings, and cobwebs, which cause the image quality to degrade and appear foggy. Clean the dome periodically to maintain a clear image. When you clean the dome, always use a soft cloth. Do not use an abrasive cleaner; use distilled water if you need a liquid.