This Tech Talk provides information on an optical phenomenon called moiré and recommendations to minimize occurrences.

Introduction
When using silkscreen patterns in architectural building applications, there may be, in rare cases, a potential to see a moiré pattern develop in the glass when viewed in certain light conditions and at specific solar angles.

What is Moiré?
Moiré is an optical phenomenon that may present itself as a “wavy, rippled or circular” pattern under certain conditions. Moiré patterns can be created whenever one semi-transparent object with a repetitive pattern is placed over another. The moiré pattern is not a defect in the glass or silkscreen pattern, but rather a pattern in the image formed by the eye.

HOW THE IMAGE IS FORMED
The moiré image is a pattern formed when two regularly spaced patterns “overlap” and are not aligned. In architectural glass applications, this may occur when silkscreen patterns of lines or dots are closely spaced and a secondary pattern image is formed (as in the case of an insulating glass unit or shadowbox assembly.) The “secondary” pattern can be created by the shadow of the ceramic frit on a second surface, as in the case of a spandrel panel installed behind the silkscreened glass. Another possibility is the second pattern may be the result of light transmitted through the glass portion not covered with ceramic frit.

LIGHTER BACKDROPS INCREASE POTENTIAL FOR OCCURRENCES
The potential for moiré patterns to occur is also dependent upon the color of the backdrop whether it is another lite of glass, in the case of an insulating glass unit, or when an aluminum panel is installed directly behind the glass. Glass will reflect light from each of its surfaces. When silkscreen patterns are applied to the #2 surface of an insulating glass unit, the image will be cast as a shadow onto the #3 glass surface. It is the misalignment of the two images that causes the moiré pattern. Lighter colors such as white and light gray will show these shadow patterns more so than darker colors.

Surface Orientation

Recommendations
Although it may be impossible to identify when the potential for moiré pattern may occur, the following glass treatments are generally more prone to exhibiting moiré patterns.

1. Closely spaced line patterns or two glass surfaces having a silkscreen pattern applied (insulating glass).

2. Silkscreen patterns using closely spaced dots & holes.

3. Insulating glass units used in spandrel areas with a silkscreen pattern on the #2 surface and full coverage ceramic frit on the #3 or #4 surface.

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4. Highly transparent glass such as clear or Low-E coated.

5. Shadow box applications with large spacing (i.e. >1/2”) between the silkscreen pattern and back-up panel.

6. Light colors of full coverage spandrel glass or aluminum panels installed behind silkscreen patterns.

Special consideration must be given to the selection of colors, silkscreen patterns and application of these products since moiré patterns are not a glass defect. Viracon recommends that a full size mock-up be evaluated on all projects considering the use of silkscreen patterns. The mock-up should be installed at the building site to better evaluate lighting conditions and be viewed at different times of day and under varying temperature conditions.