Photography Filters

Presented by
Gregg Kerber

Topics Covered

- UV Haze
- Circular polarizer
- Neutral density
- Spilt/Graduated Neutral density
- Infrared

UV Haze

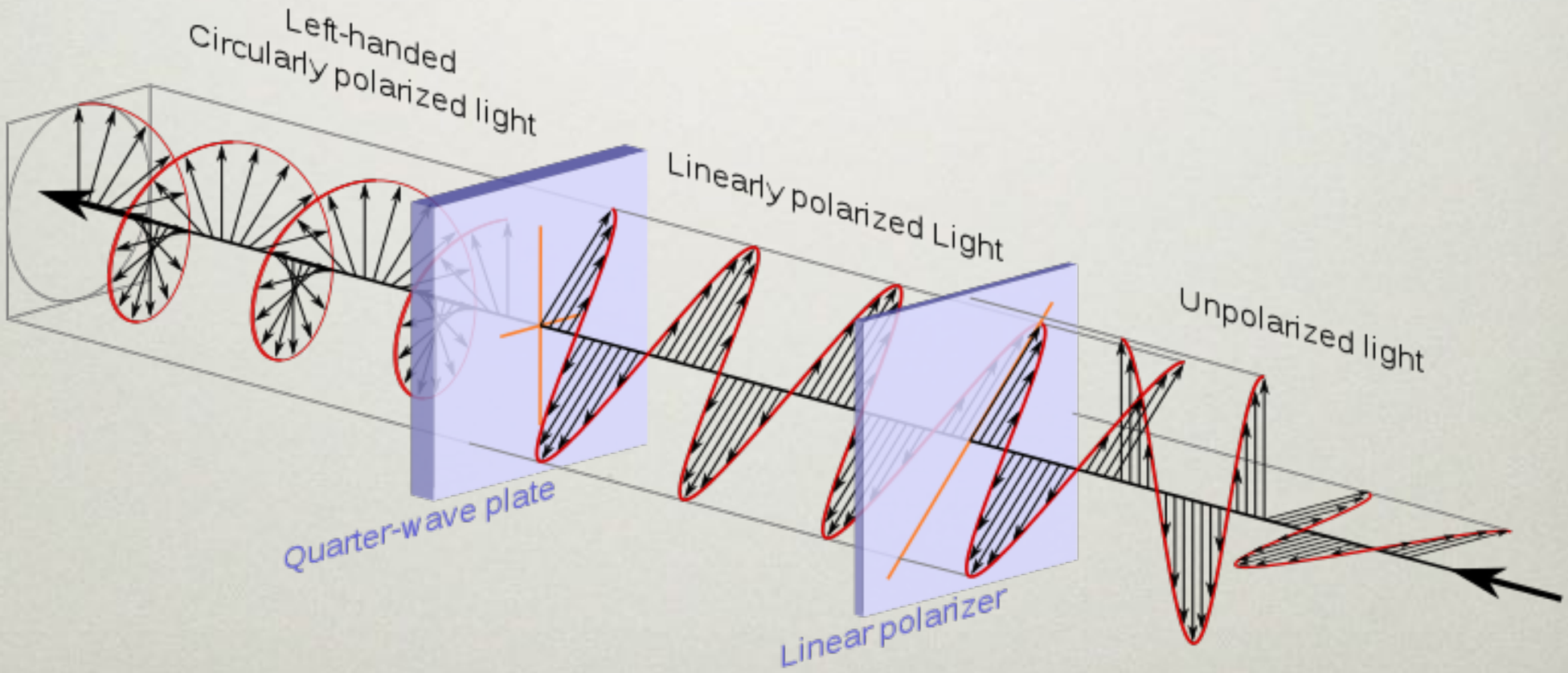
What Are They Used For?

- Prevents ultraviolet light from entering lens.
- More useful with film to prevent hazy/foggy images.
- Transparent to visible light and will not affect exposure or colors.
- Sometimes referred to as L37 or L39 filters (removes wavelengths less than 370nm or 390nm respectively).
- Mostly used for protecting the front element of a lens.

Circular Polarizer

How do they work?

- Creates circularly polarized light.
- Consists of a linear polarizer plate followed by a quarter-wave plate (filters the linear polarized light into circularly-polarized light).



DISCOVER THE LIGHT
PHOTOGRAPHY

Circular vs Linear Polarizer

- Both do the same thing.
- Linear polarizers may affect metering on some cameras and will affect auto-focus systems on nearly all cameras.

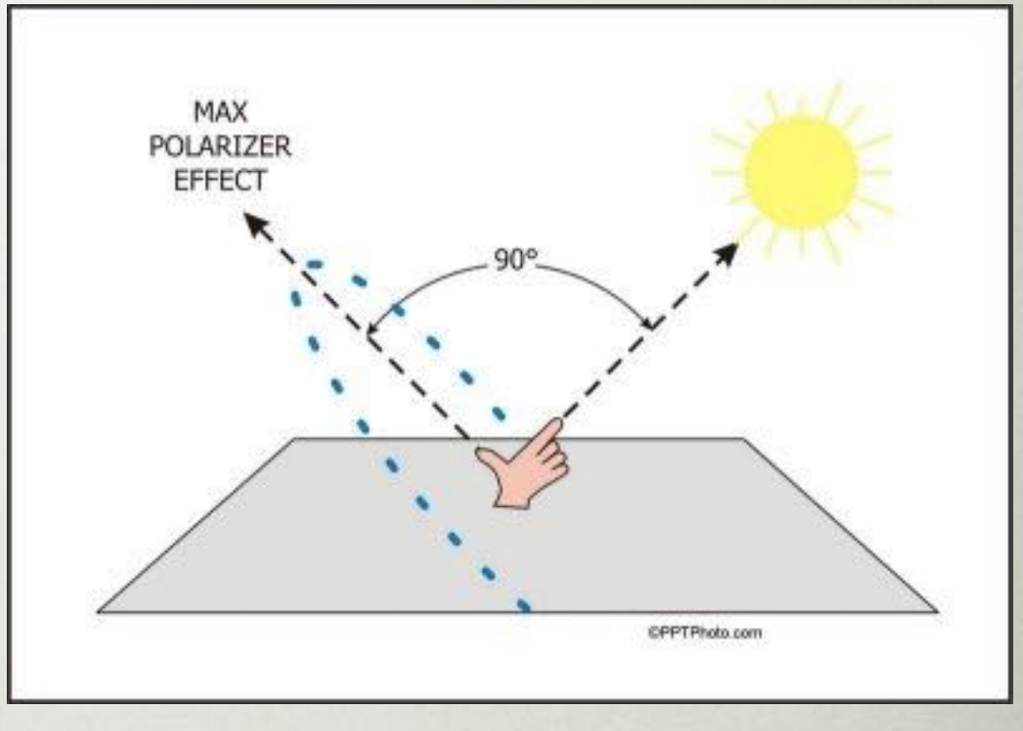
What are They Used For?

Reduce Glare

- Light reflected from nonmetallic surfaces become polarized.
- Rotating the CPL ring allows only polarized light to pass in the direction perpendicular to the reflected light… so always rotate the CPL ring to see how it affects your image.
- **NOTE**: Always rotate the CPL clockwise (as if you were tightening it).

Darken Skies/Pop Clouds

- Some light coming from the sky is polarized (bees use this to navigate).
- Light in the sky is totally polarized when looking 90 degrees to the direction of sun…maximum effect from a CPL is achieved when pointing your camera in these directions. This will darken the blue sky making clouds pop more.
- Can also reduce smog/haze.
- **NOTE**: Wide angle lenses cover a vast area of the sky and will result in a gradient in the sky (dark to light).



Colors and Exposure

- Certain colors of foliage can become more vibrant with reflections reduced.
- Most CPL filters reduce light by about 2 stops. Always take this into account when using a CPL.
- High-Rate Transparency (HRT) CPLs reduce less light (by only about 1 stop).

What to look for in a CPL

- You get what you pay for (coatings, glass quality, etc).
- Coatings on CPLs improve glare reduction between the CPL elements. Multi-coated CPLs are generally better than un-coated or single-coated.
- Coatings also reduce ghosting which can become more prevalent at wider apertures.
- Make sure the filter easily screws on (and off) your lens. It should thread easily without hanging up.
- Make sure the rotation of the CPL ring is smooth and effortless.

Neutral Density (ND)

Rectangular

Screw-In

DISCOVER THE LIGHT
PHOTOGRAPHY

10-stop ND used for 10 minute exposure (midday)

How do they work?

- Neutral gray color.
- Reduces the amount of light entering the lens.
- Does not affect colors.
- Threaded screw-in filter.
- Rectangular/square filter.
- Comes in varying degrees of darkness (1 to 10 or more stops).

When to use

- To slow shutter speed (motion blur, creamy water effect, etc) - even on bright sunny days.
- Decrease depth of field by allowing wider apertures on bright sunny days.

What do the numbers mean?

F-Stop Reduction	Density Rating	Density Rating
1 stop	0.3	ND2
2 stops	0.6	ND4
3 stops	0.9	ND8
4 stops	1.2	ND16
6 stops	1.8	ND64
8 stops	2.4	ND256
10 stops	3.0	ND1000

Screw-in vs Rectangular

	Screw-In	Rectangular
Ease of use	Very easy	Using a holder requires a lens adapted More time to set up Can be handheld without a holder
Cost	Usually more expensive	Smaller filters are less expensive Optical materials are more expensive
Stacking	Can lead to vignetting (especially with wide angles)	Easy to do (even handheld)
Other		Handholding can scratch filter

Using a Low-Stop Screw-in ND

- 1 to 6 stops.
- May need to use a tripod (depending on shutter speed).
- Screw the filter onto the lens.
- Camera should auto focus and meter normally.
- Stacking filters can lead to vignetting (especially at wide angles).

DISCOVER THE LIGHT
PHOTOGRAPHY

Using a Big-Stop Screw-in ND

- 8 or more stops.
- Tripod required.
- Compose, focus, and meter **BEFORE** installing filter.
- Switch to manual mode.
- Calculate exposure (usually shutter speed) based on metered setting and filter being used.
  NOTE: Use BULB mode for exposures over 30 seconds.
- Screw the filter onto the lens.
- Check histogram to evaluate exposure after taking shot. Adjust exposure and retake if necessary.
- Stacking filters can lead to vignetting (especially at wide angles).

Using a Rectangular ND Handheld

- Tripod required.
- Remote shutter release is recommended.
- Remove lens hood.
- Hold filter on one corner with fingers out of field of view.
- Hold filter flat against front of lens (gaps will create reflections and light leaks).
- Make sure filter covers entire lens opening (larger filters work best).

Using a Rectangular ND w/holder

- Tripod recommended.
- Remote shutter release recommended.
- Remove lens hood.
- Screw adapter ring onto lens.
- Attach holder on adapter ring.
- Slide filter into slot closest to lens.
- Slide second filter into next slot (if desired).
- Watch for holder intruding into frame with wide angles.

DISCOVER THE LIGHT
PHOTOGRAPHY

Graduated Neutral Density (GND)

Not recommended

Soft edge

Hard edge

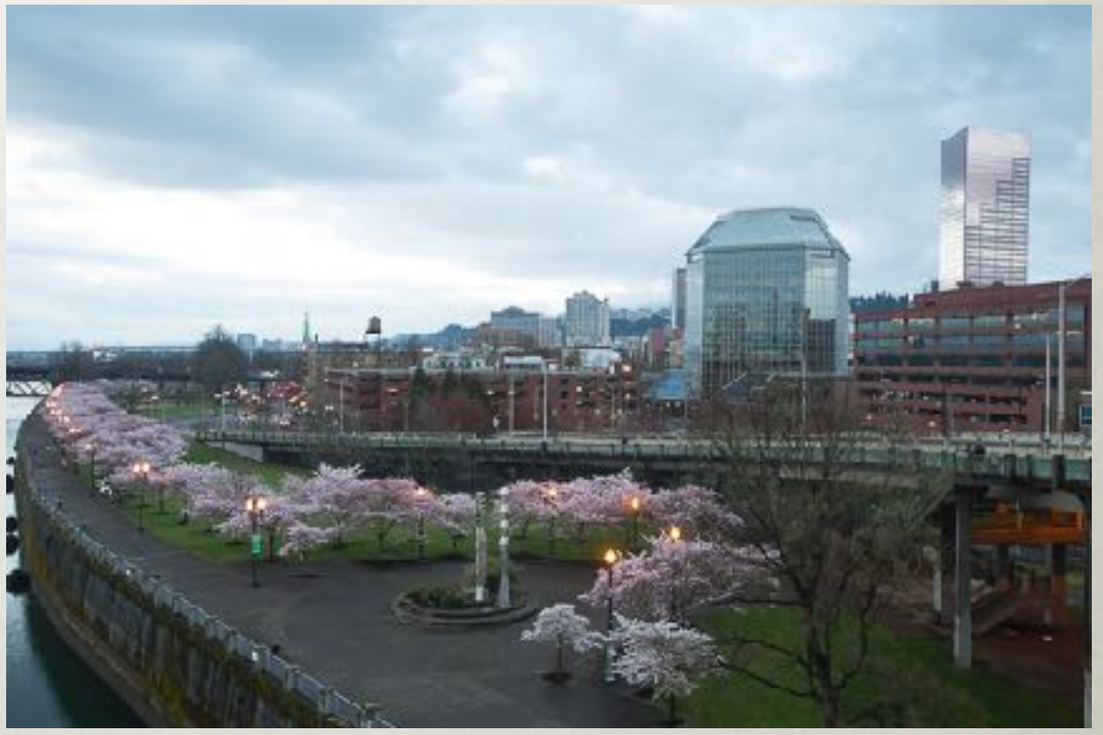
How do they work?

- Neutral gray color on one side and clear on the other.
- Reduces the amount of light entering the lens.
- Does not affect colors.
- Comes in varying degrees of light reduction (usually 1 to 4 stops). Can be stacked.

When to use

- To darken only a portion of a scene that is much brighter than the rest of the scene.
- Helps balance the exposure.

Without GND



With GND

DISCOVER THE LIGHT
PHOTOGRAPHY

Using a GND Handheld

- Tripod recommended.
- Remote shutter release recommended.
- Meter on the side of the image that will be on the clear side of the GND and note the settings.
- Use Manual mode with settings.
- Remove lens hood.
- Compose shot.
- Hold GND with fingers in one corner.
- Hold GND on front of lens flat against lens.
- Move/rotate GND to desired location.
- Can stack 2 or more filters.

Using a GND w/holder

- Tripod recommended.
- Remote shutter release recommended.
- Meter on the side of the image that will be on the clear side of the GND and note the settings.
- Use Manual mode with settings.
- Remove lens hood.
- Screw adapter ring onto lens.
- Mount slot holder onto adapter ring.
- Slide GND into slot closest to lens.
- Slide second GND into next slot (if desired).
- Compose shot.
- Slide filter(s) up or down and rotate to desired location.
- Rotate holder to desired location.

Infrared Filter (IR)

How do they work?

- Blocks visible light and transmits IR wavelengths of light.
- Turns green foliage white.
- Turns water and blue skies very dark.
- Requires a fair amount of post processing.
- Some cameras work better than others with IR filters.
- Reduces light about 14 stops = LONG exposures.
- Can convert a camera permanently to IR (replace low pass sensor filter with IR filter).

Converted Camera vs IR Filter

	Converted Camera	IR Filter
Ease of use	Very easy	More work getting exposure, focus, and composition right
Cost	$170 or more (depends on camera)	$50-$150 (depends on filter size)
Post processing	Better starting point than IR filter Using Photoshop allows many more options	Images from camera are red and washed out Use a custom camera profile (Adobe DNG Profile Editor)
Other	Metering is about the same as the unconverted camera was prior to conversion	Requires much longer exposures which can limit use

Using an IR converted camera

- Pick a scene that lends itself well to IR.
- Use the custom white balance that was installed by the conversion company (if one was installed).
- OR…Fill the frame with green foliage (grass) and take a shot to be used for a custom white balance.
- Take the shot.
- Check focus and exposure.

Using an IR Filter on a non-converted camera

- Camera on tripod.
- Compose the shot.
- Focus the shot.
- Meter the scene.
- Install IR filter on lens.
- Switch to Manual mode and adjust shutter speed and/or ISO by 10 stops or more (depending on camera and filter).
- Take the shot.
- Check focus and exposure.

Example (converted Canon G12)

Example (converted Canon G12)