

HOYA

F I L T E R S

**For the Moments to
Remember**





Photographed by Dave Zdanowicz



THE PRODUCTION PROCESS OF HOYA FILTERS

Each Hoya filter is the result of research, know-how and complete precision facilities backed by full quality control.

Before production starts, controls are first programmed into a computer. Then the finest materials are carefully mixed by an automatic V-blender for absolute uniformity. After being melted with highly sophisticated equipment, this material is then precision molded with automatic direct pressing equipment. The pressed blanks are next then slowly and continuously cooled to prevent any strain, and are then polished by high-speed, double-surface polishing machines that assure precise surface quality and perfect flatness.

Next is the coating process which improves the filter light transmission ability. The transmission characteristics are checked by Spectro-Photometer, after which an ultra-sonic cleaner removes all foreign matter from the surfaces. Only after passing all of Hoya's quality tests are the filters assembled, finished and made ready for shipment to customers throughout the world.



HOYA SEES AND RESPONDS TO THE NEEDS OF TODAY

HOYA Corporation has diversified its operations by capitalizing on the potential of optoelectronic technologies since its establishment in 1941 as Japan's first specialty manufacturer of optical glass.

Today, Hoya is active in four fields of business:

Information Technology business makes mask blanks and photomasks for semiconductor devices and liquid crystal panels, optical lenses, and glass memory disks for hard disk drives. The Eye Care provides eyeglasses and operates contact lens retail shops, as well as makes intraocular lenses for cataract surgery. The Life Care Business provides endoscopic systems. The Imaging System produces SLR/compact digital cameras and interchangeable lenses as well as digital camera lens module and microlens.

With HOYA's approval, Kenko Tokina Co., Ltd. delivers HOYA brand filters around the world.

O U T L I N E

INFORMATION TECHNOLOGY

EYE CARE

MEDICAL

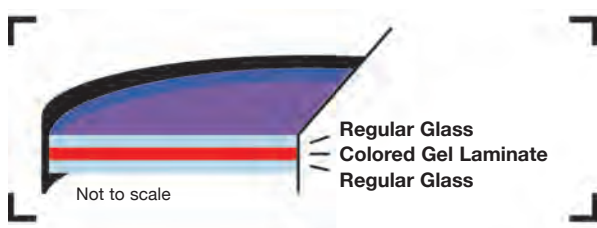
IMAGING SYSTEM

A L L F I L T E R S A R E



How another Large Manufacturer makes Filters

Imagine a sandwich made with a thin gel or even colored glue between two pieces of regular glass, similar to the glass used in windowpanes. This is how some other brands of optical filters are made. These types of filters are cheap to produce, but inferior for several reasons:



1. Over time, the expansion and contraction of the different materials can lead to delamination, which is a separation of the different materials. This will show up as bubbling, peeling, or discoloration, rendering the filter useless.
2. The color of the gel can shift or fade over a relatively short period of time and will not yield the same color rendition.
3. If all six surfaces, three layers, two surfaces each, are not perfectly flat and perfectly parallel, the filter causes a “lens effect” which degrades the optical performance, or in extreme cases, shift or limit the focus of the lens it is used with.

How Hoya Makes Filter Glass



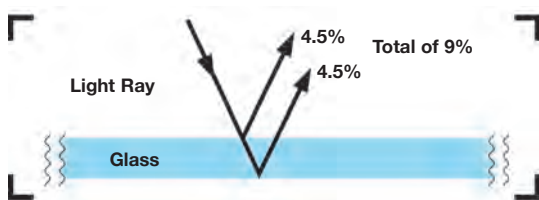
To make its filters, Hoya adds different raw elements, like gold, and chemicals compounds to its optical glass silicates while mixing in a molten state. To insure consistency in glass manufacturing, Hoya uses a furnace called an Automatic V blender to mix the different materials continuously at a highly controlled rate. This ensures that Hoya filter glass is uniformly colored all the way through. There is never any risk of uneven coloration, shifting or fading of the color, or delamination. The two surfaces are ground and polished for perfect flatness.

NOT CREATED EQUAL!



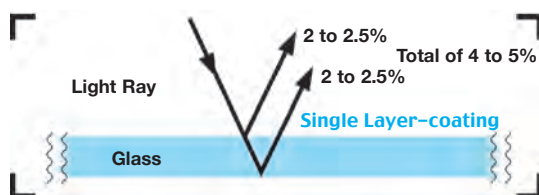
Hoya Coating and Multi-Coating, the Quality Difference.

Hoya manufactures a full line of filters in both standard and Hoya multi-coated. The difference between Hoya's standard line and that of other manufacturer is that Hoya standard filters have a layer of anti-reflective coating bonded to each surface of the glass. Many other manufacturer's standard filters are bare glass, and bare glass can reflect as much as 10% of the light hitting it. This greatly increases the risks of flare and ghosting and reflections.

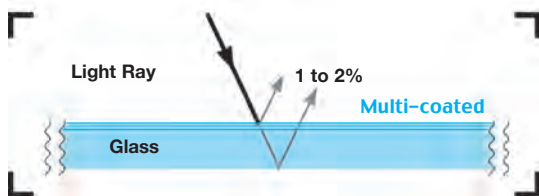


Hoya's single layer coating decreases light reflection off the surface from approx. 10% down to 4-5%.

Multi-Coating, Clearly Different



To provide photographers with a higher quality professionals require, Hoya created the Multi-coated line of filters. These filters have a 3 layer coating system that further reduces light reflections off the surfaces of the glass, the average is only 1-2%. This means that 98-99% of the light striking the filter is going through it, into the camera lens and onto the film or sensor. These layers of anti-reflective coating are bonded to the surface of the glass in a furnace at a temperature of up to 800 degrees F, so there is never any chance of the coatings coming off through normal use.



You should beware!

Some other manufacturers claim to have "coated" filters. But this coating is often only applied to the front side of the glass, not both sides like Hoya filters. Also, the coating on some filters is "painted" on or applied as a cold spray that wears off or can even flake off easily.

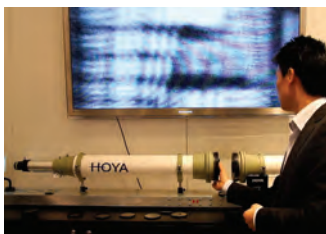
T H E D I F F E R E N C E



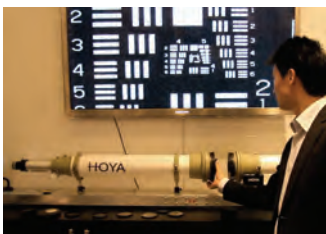
Filter Quality Comparison

The apparatus on the counter in the image below is a simple collimator used for testing the optical clarity of filters and other optics. On one side is a light source shining into an "eyepiece" that contains a test chart. The image of the test chart is projected through one telescope into the other. The other telescope has a video camera attached to its eyepiece so the test pattern can be displayed on the LCD TV mounted above.

There are so many circular polarizing filters in the world, most are made in India or China regardless of what name is on them. They all look fine and clear if you look through them but once tested by the collimator you can find that these filters degrade the image quality so that the test pattern cannot even be seen. (See the image left below) It would be impossible to get a sharp picture when photographing with these filters. The test pattern shown right below is shot with Hoya circular polarizing filter and it has almost no optical effect on it. This is how a filter should perform in this test.



Other brand circular polarizing filter



HOYA circular polarizing filter

We've Been Framed!

Hoya believes the filter frame is an extremely important part of the filter as well. Hoya created precision machined aluminum frames to hold their high quality glass. They prefer aluminum to other materials because it is strong enough to hold up to years of use. Some say that brass is the best material to use. However, Hoya doesn't hold that view and here is why; brass is a far more rigid material than either aluminum, or other materials that are being used in today's lens barrels. This means that, should the front of the lens get hit, the rigid brass filter ring will transfer almost all the force of the shock to the lens barrels and mechanics within the lens. An aluminum filter frame will absorb some of the shock by bending, and at a certain point the glass will chip or break, which is what the filter is supposed to do, protect the lens! Replacing a filter is always preferable to getting a lens repaired.



I S C L E A R !



The Value in a Hoya Multi-coated filter

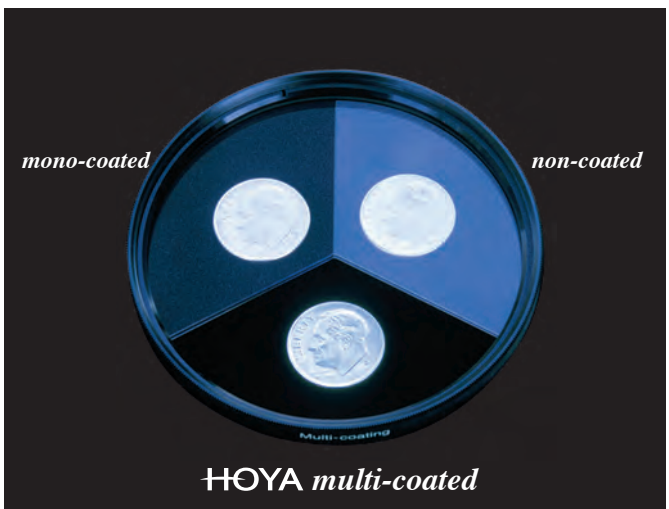
Wide aperture professional lenses are very expensive, and all photographers want to get the most speed, optical performance, and dollar performance from their investment.

There is a saying: "A \$1,200 lens with a \$20 filter will perform like a \$20 filter. If a customer pays \$1,200 for a 80-200 f/2.8 lens and puts a cheap bare glass filter in front of it that filter is going to reflect 10% of the light that strikes it. That is slowing the lens down 10%, lowering the value of the lens 10% or \$120. Does the cheap filter still look like it's a good deal? The cost savings of the less expensive filter do not off-set the light loss.

Also, this does not address the possible loss of sharpness or focus shift, which can have a detrimental impact on picture quality. For these reasons, Hoya multi-coated filters present the best value in filters available today.

Testing, 1, 2, 3...

Take a bare glass filter, hold it so that light reflection off the surface can be seen. Then take a long very thin object like a pin or the tip of a pen and hold it over the filter so that its reflection can be seen. There will actually be two reflections of the pin on the surface, one a little more pronounced than the other. The more pronounced reflection is from the front surface and the lighter one is from light reflecting off the rear surface. Now try it with a HOYA Multi-coated filter and see how much more dim the reflection is, a dimmer reflection means less light is reflected off the surface of the glass.



HOYA OFFERS A WIDE VARIETY

HOYA offers a wide variety of superior quality filters for use in all imaging applications such as 35mm SLR cameras, Medium Format, Large Format, Video, Movie and Digital. It is important to select the best filters for your needs, as choosing inferior brands can deteriorate the performance of your high quality lenses. HOYA filters guarantee you the highest standards so you can create the best images.

In order for you to fully understand the wide range which HOYA offers, the four main categories, into which our filters are grouped, are explained below:

GENERAL FILTERS

This group includes everyday filters which can be left on your lenses, such as Skylight 1B, UV and Polarising. These are the first filters that every photographer should ensure they own. Skylight and UV filters should be constantly fitted to a lens to give improved clarity and color balance as well as offering protection to your lens. Polarising filters have several uses such as eliminating unwanted reflections, increasing color saturation and enhancing contrast. As to whether you should use Circular Polarising or Linear Polarising filters with your camera, we recommend that you refer to the detailed explanation later in this catalogue.

CREATIVE FILTERS

This is a new classification, exclusive to HOYA. Although similar to general filters, they produce a subtle, but realistic result which may be used to artistic effect. They are also suitable for use as everyday protection filters and may be combined with other types such as Circular- PL and UV for enhanced effect. In this case, we recommend the use of HD2, EVO or NXT series filters which have thin rings and multiccoating to avoid vignetting and ghosting.

COLORED FILTERS

As their names suggests, these filters use HOYA colored glass. They are used for color correction of different light sources when using color film, or for controlling contrast with Black & White film. Color correction filters are important as color films do not have the flexibility of the human eye to automatically adjust to different situations. Black & White films register colors as shades of grey and the rendition of each color in a scene is important, so filters can be used to control this. The color of the glass used in all these filters is carefully controlled and to reduce the possibility of color shift over a period of time, such high quality filters are coated or multiccoated on both sides. This maintains the desired effect and gives a long service life.

SPECIAL EFFECT FILTERS

As you saw in the previous pages of this catalogue, HOYA makes it possible to add many different special effects to your pictures, such as star-bursts, close-ups, softening and multi-images. It is simple to achieve outstanding creative or unusual results and take special photographs for memorable occasions such as weddings, birthdays and holidays.

OF SUPERIOR QUALITY FILTERS

Why Coated?

There are three main reasons why filters should be coated. First, coating enhances light transmission, second, it protects the surface of the filter and third, it removes ghosting and flare, particularly between the rear of a filter and the surface of a lens. In general, light transmission increases as more layers of coating are applied.

Within these four groups, we offer a choice of grades with different coatings as follows:

STANDARD

These filters offer both amateur and professional photographers HOYA's famous quality at reasonable prices. They have coatings applied to both surfaces to suppress reflection and increase light transmission. There are a few exceptions in the special effects range which, due to the special materials used in construction, do not have coatings applied.

HMC (HOYA MULTI COATED)

These popular filters are renowned for their ability to minimise reflection at the filter surfaces which reduces flare and ghosting. The result is an average light transmission of over 97%, giving sharp contrast and well balanced color. HOYA HMC filters are recommended for enhancing the performance of today's multicoated lenses.

PRO1 DIGITAL FILTERS

Newly formulated multi-coating for digital camera CCD or CMOS sensor. These image capture devices are highly susceptible to reflections - this stray light can ruin your photographs! Don't risk your valuable photos by using bare-glass filters.

HD FILTERS

Newly developed industry leading 16 layer multi-coating yields an average light transmission rate of 99.35% between 400 and 700nm (visible spectrum). These coatings greatly reduce reflections off the surface of the glass allowing you to capture more light in your photos. As with all HOYA multi-coatings, HD HMC is applied in a furnace at high heat, bonding the coating to the surface of the glass. This process is called "hard coating" and it is far more durable than other coating techniques. The chemistry of the top layer is formulated not just to be more durable but to be resistant to oil stains. This means that finger prints and other oils are much easier to remove.

PRO ND FILTERS

PRO ND coating is the coating which had reduction of reflectance, and a neutral damping characteristic to the broadband. PRO ND coating is given to both sides of the polished glass, and the filter is assembled with structure with few optical leaks.

FUSION ANTISTATIC FILTERS

Hoya engineers have developed a new ANTISTATIC coating that acts like a force field around the filter to repel dust. Perfect for environments where dust is common, these filters require less frequent cleaning and maintenance than traditional filters.



The coating of the filter is not permanent. It gets a damage repeatedly when we clean it with wipes and gets weak as time passes by. The filter can protect the lens from physical damage, but the coating receives the strike first as scratch. When a coating of a filter is solid and scratch resistant, it will be a great advantage.

This is designed with ultra-hard nano coating to protect your camera lens. The HD nano UV filter is a filter with a UV cut curve that does not affect the visible light range. In addition this filter features a new powered coating that protects the lens from scouring, while allowing easy cleaning of water spots and fingerprints. The HD nano glass is 4X stronger chemically enhanced optical glass.

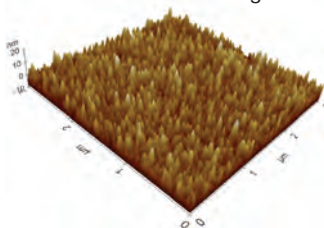
Designed to protect a camera's expensive lens system from scratches and impact, HD nano filter is essential gear for photography under extremely severe conditions.

POWERED COATING

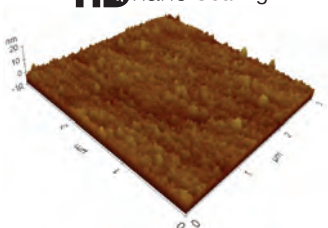
Newly developed coating is stuck to the glass surface more firmly and closely by the nano level than formerly. Due to this, the particles are layered on the glass surface with extremely high density that creates a hard and smooth coating. Besides ultra-hard and smooth features, HOYA HD nano coating has superior water and oil repellent abilities that will make filter maintenance easy and stress free.

Surface enlarged picture (UV)

Current Coating



HD nano Coating

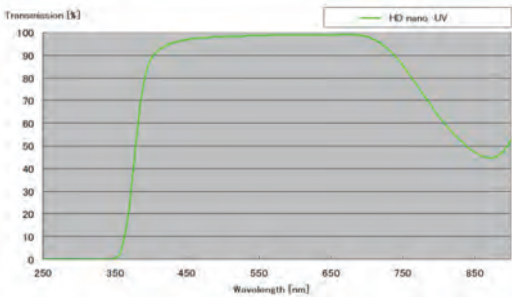


Improved Protection Performance and Durability



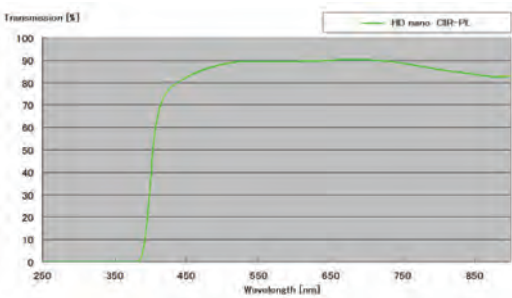
HARDENED GLASS (UV)

Hardened optical glass that has 4 times the breaking strength in ANSI standardized testing (ANSI Z80.3: 2001) where a steel of varying size and weight were dropped from a height of 50 inches onto the glass.



HIGH TRANSPARENCY POLARIZING FILM (CIR-PL)

The polarizing film is the same as that used in the latest high definition LCD TV screens. It has 25% higher light transmission than standard polarizing film used in current photographic filters. The filter has virtually no effect on the color balance, contrast, or clarity of the final image beyond its polarizing effects.





Ultra-Hard nano Coating

- New 32 layer ultra-smooth, ultra-hard nano coating
- Stain resistant, water & oil repellent coating makes everyday maintenance easier
- Ultra-hard surface coating is 800% more scratch resistant than general coating

HD Glass

- High Density Sharp Cut UV glass
- Chemically Enhanced Optical Glass is 4x Stronger

HD Frame

- Very Thin Frame, Front thread to attach lens caps and other filters
- Press mount technology holds glass securely

The HD nano filter that not only the hardened glass but also the ultra-hard nano coating protects your lens solidly under the severe conditions".

Available sizes (mm):

52

55

58

62

67

72

77

82

CIR-PL



Ultra-Hard nano Coating

- New 16 layer ultra-smooth, ultra-hard nano coating
- Stain resistant, water & oil repellent coating makes everyday maintenance easier
- Ultra-hard surface coating is 200% more scratch resistant than general coating

HD Polarizing Film

- High Transparency & High Durability UV Absorbing Film
- 25% Greater Light Transmission than Standard Polarizing Film

HD Frame

- Very Thin Frame, Front thread to attach lens caps and other filters
- Press mount technology holds glass securely

The HD nano CIR-PL filter is using the polarizing film with the high transmission factor, so a picture through a filter and the lens can be recognized clearly by a better contrast. This effect enables a fast shutter valve. This polarizing filter doesn't affect the overall color balance of the shot.

Available sizes (mm):

52

55

58

62

67

72

77

82

HD FILTERS

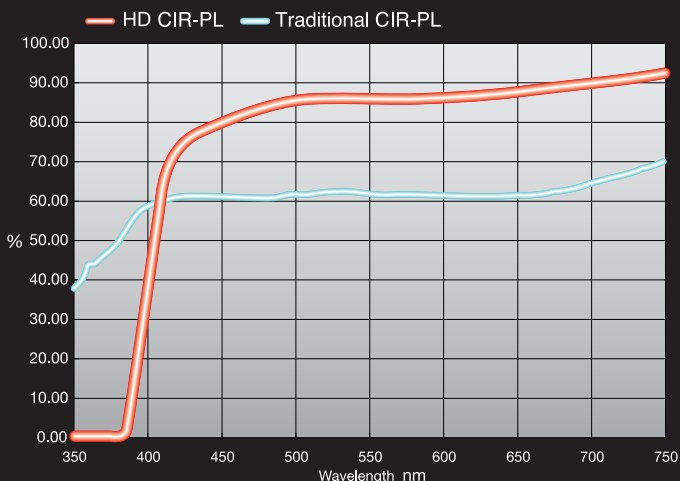
Premium Performance in Lens Protection and Image Enhancement

HARDENED GLASS (UV / PROTECTOR)

Hardened optical glass that has 4 times the breaking strength in ANSI standardized testing (ANSI Z80.3 : 2001) where a steel balls of varying size and weight were dropped from a height of 50 inches onto the glass.

HIGH TRANSPARENCY POLARIZING FILM (CIR-PL)

The polarizing film is the same as that used in the latest high definition LCD TV screens. It has 25% higher light transmission than standard polarizing film used in current photographic filters.



HARDENED 16 LAYER WATERPROOF MULTI-COATING THAT IS SCRATCH & STAIN RESISTANT

Newly developed industry leading 16 layer multi-coating yields an average light transmission rate of 99.35% between 400 and 700nm (visible spectrum). These coatings greatly reduce reflections off the surface of the glass allowing you to capture more light in your photos.

As with all HOYA multi-coatings, HD HMC is applied in a furnace at high heat, bonding the coating to the surface of the glass. This process is called "hard coating" and it is far more durable than other coating techniques. The chemistry of the top layer is formulated not just to be more durable but to be resistant to oil stains. This means that finger prints and other oils are much easier to remove.

HD FILTER

UV



Best Quality Filter in History

HD GLASS

- High Density Sharp Cut UV Glass
- Chemically Enhanced Optical Glass is 4x Stronger

HD COATING

- 16 layer Anti-Reflective Multi-Coating
- Water & Oil Repellent, Scratch & Stain Resistant

HD FRAME

- Wide-Angle Lens Compatible Ultra Thin Frame
- Glass Mounted with High Pressure Press Technology

A multi-purpose fine-weather filter

Absorbs the ultraviolet rays which often make outdoor photographs hazy and indistinct. A multi-purpose, fine-weather filter for color as well as black and white films. Also serves as a permanent lens protector.

Available sizes (mm):

37	40.5	43	46	49	52	55	58	62	67	72	77	82
----	------	----	----	----	----	----	----	----	----	----	----	----

HD FILTER

CIR-PL



Best Filter Performance in History

HD POLARIZING FILM

- High Transparency & High Durability UV Absorbing Film
- 25% Greater Light Transmission than Standard Polarizing Film

HD COATING

- 16 layer Anti-Reflective Multi-Coating
- Water & Oil Repellent, Scratch & Stain Resistant

HD FRAME

- Wide-Angle Lens Compatible Ultra Thin Frame
- Glass Mounted with High Pressure Press Technology

Color and contrast enhancement

Light rays which are reflected by any surface can become polarised so polarising filters are used to select which light rays enter your camera lens. CIR-PL filters allow you to remove unwanted reflections from non-metallic surfaces such as water, glass etc. They also enable colors to become more saturated and appear clearer with better contrast. This effect is often used to increase the contrast and saturation in blue skies and white clouds. HOYA's polarising filters will not affect the overall color balance of a shot.

Available sizes (mm):

37	40.5	43	46	49	52	55	58	62	67	72	77	82
----	------	----	----	----	----	----	----	----	----	----	----	----

HD FILTER PROTECTOR



Best Lens Protection in History

HD GLASS

- Ultra Clear High Transparency Optical Glass
- Chemically Enhanced Optical Glass is 4x Stronger

HD COATING

- 16 layer Anti-Reflective Multi-Coating
- Water & Oil Repellent, Scratch & Stain Resistant

HD FRAME

- Wide-Angle Lens Compatible Ultra Thin Frame
- Glass Mounted with High Pressure Press Technology

Protect your valued lenses

This is the ultimate in clear filters. It will not affect the color balance or performance of your lenses in the slightest. However, constant use will protect your valued lenses from expensive front element damage which could be caused by dirt, knocks or scratches. A cracked filter costs nothing in comparison to a cracked lens.

Available sizes (mm):

37	40.5	43	46	49	52	55	58	62	67	72	77	82
----	------	----	----	----	----	----	----	----	----	----	----	----

FUSION ANTISTATIC FILTERS



Designed and Engineered for Any Environment

Hoya engineers have developed a new ANTISTATIC coating that acts like a force field around the filter to repel dust. Perfect for environments where dust is common, these filters require less frequent cleaning and maintenance than traditional filters.

Additionally, the hardened, antistatic top-layer is water repellent, stain and scratch resistant, and cleans easily when smudges or fingerprints are introduced to the surface.

***Antistatic & Stain Resistant
Dust & Water Repellent
Fingerprints & Smudges Proof***



- NEW Antistatic coating repels dust
- Ultra Clear High Transmission
- Stain resistant - Protects against exposure to ink, markers etc.
- Water repellent – Water beads up and wipes away easily
- Fingerprints and smudges wipe away cleanly
- Hoya's Professional-grade optical glass (UV and Protector)
- Hoya exclusive one-piece, low-profile filter frame with front filter threads (UV and Protector)
- Two-piece, very low-profile filter frame with front filter threads (Circular Polarizer)

FUSION ANTISTATIC FILTERS

Features



NEW Antistatic coating does not allow the build-up of static electricity that attracts dust.



Water repellent – Water beads up and wipes away easily.



Stain resistant - Protects against exposure to ink, markers etc.



Fingerprints and smudges wipe away cleanly.

Antistatic & Stain Resistant
Dust & Water Repellent
Fingerprints & Smudges Proof



Hoya's Professional-grade optical glass. (UV and Protector)



Hoya exclusive mono-piece, low-profile filter frame with front filter threads, so normal lens caps can be used. (UV and Protector)



By rotating ultra-smooth filter ring on the Circular Polarizer you can select just the right amount of filtration needed to achieve the creative effect.



Two-piece, low-profile filter frame with front filter threads, so normal lens caps can be used. (Circular Polarizer)



Photo Enhancement & Lens Protection

The new FUSION Antistatic professional filters are made in Japan using hand selected silicates that are carefully smelted and blended to yield high performance optical glass. Hoya then uses extreme care and precision to apply the Improved 18-layer Super Multi-coating formula which greatly reduces or eliminates reflections on the surface of the glass and yields a ultra clear high transmission rate. This means the filter has virtually no effect on the color balance, contrast, or clarity of the final image. The filter's UV properties filter unwanted ultra-violet rays, reducing haze and increasing clarity.

The filters features a lightweight, mono-piece, low-profile aluminum frame to house the glass. This mono-piece design allows the filter to maintain perfect parallel alignment to the sensor plane for maximum sharpness, while the low-profile form eliminates vignetting when used on ultra-wide-angle lenses.

Available sizes (mm):

37	40.5	43	46	49	52	55	58	62	67	72	77	82	86	95	105
----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

FUSION ANTISTATIC

PROTECTOR



Premium Lens Protection

The new FUSION Antistatic professional filters are made in Japan using hand selected silicates that are carefully smelted and blended to yield high performance optical glass. Hoya then uses extreme care and precision to apply the Improved 18-layer Super Multi-coating formula which greatly reduces or eliminates reflections on the surface of the glass and yields a ultra clear high transmission rate. This means the filter has virtually no effect on the color balance, contrast, or clarity of the final image. The Protector filter is designed for photographers that only want their filter to protect their lenses and do not require or want any additional filtering properties in the glass.

The filters features a lightweight, mono-piece, low-profile aluminum frame to house the glass. This mono-piece design allows the filter to maintain perfect parallel alignment to the sensor plane for maximum sharpness, while the low-profile form eliminates vignetting when used on ultra-wide-angle lenses.

Available sizes (mm):

37	40.5	43	46	49	52	55	58	62	67	72	77	82	86	95	105
----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

FUSION
ANTISTATIC

CIRCULAR POLARIZER



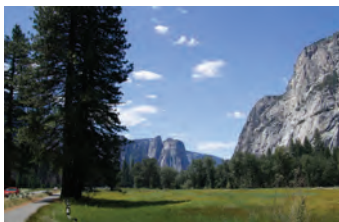


Enhance scenic and travel photos

Circular polarizing filters allow photographers to achieve creative, in-camera, effects not possible after the image is created. A polarizing filter simply filters out unwanted reflections from non-metallic surfaces such as water and glass in addition to light reflecting off moisture and pollution in the atmosphere. By rotating ultra-smooth filter you can select just the right amount of filtration needed to achieve the creative effect. This results in bluer skies, greener leaves, reduced or eliminated reflections, and greater clarity in your final image.

The new FUSION Antistatic professional filters are made in Japan using hand selected silicates that are carefully smelted and blended to yield high performance optical glass. Hoya then uses extreme care and precision to apply the Improved 18-layer Super Multi-coating formula which greatly reduces or eliminates reflections on the surface of the glass and yields very high light transmission rates. This means the filter has virtually no effect on the color balance, contrast, or clarity of the final image beyond its polarizing effects.

The filters features a lightweight, two-piece, low-profile aluminum frame to house the glass. The low-profile frame eliminates vignetting when used on ultra-wide-angle lenses.



▲ Without Filter

◀ With CIR-PL Filter

Available sizes (mm):

37	40.5	43	46	49	52	55	58	62	67	72	77	82	86	95	105
----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

PRO1 Digital

Filter Series



Designed exclusively for Digital Cameras



Digital Multi-Coated

Digital multi-coated filters greatly reduce the appearance of lens flare and ghosting caused by reflections.



Black Almite Frame

Filters feature a black matte aluminum satin finish almite frame which reduces reflections.



Black Rimmed Glass

These filters are equipped with black rimmed glass to reduce the chance of light reflecting off the edge.



Low Profile Frame

Ultra thin filter frames to help avoid vignetting on super wide angle lenses are also designed to hold a lens cap.



Knurling Edge Frame

These filters are equipped with a straight knurling edge for non-slip, easy attachment and removal.



UV Protected Case

Filter cases are UV protected to further lengthen the life of filters.

PRO1 UV (0)

A multi-purpose
fine-weather filter



▲ With UV(0) Filter



▲ Without Filter

Absorbs the ultraviolet rays which often make outdoor photographs hazy and indistinct. A multi-purpose, fine-weather filter for color as well as black and white films. Also serves as a permanent lens protector.

Features:



Available sizes (mm):

37	39	40.5	43	46	49	52	55	58	62	67	72	77	82
----	----	------	----	----	----	----	----	----	----	----	----	----	----

PRO1 PROTECTOR

Protect your valued lenses



This is the ultimate in clear filters. It will not affect the color balance or performance of your lenses in the slightest. However, constant use will protect your valued lenses from expensive front element damage which could be caused by dirt, knocks or scratches. A cracked filter costs nothing in comparison to a cracked lens.

Features:



Available sizes (mm):

37	40.5	43	46	49	52	55	58	62	67	72	77	82
----	------	----	----	----	----	----	----	----	----	----	----	----

PRO1 CIRCULAR PL

Color and contrast enhancement



▲ With UV(0) Filter



▲ Without Filter

Light rays which are reflected by any surface can become polarised so polarising filters are used to select which light rays enter your camera lens. CIRCULAR PL filters allow you to remove unwanted reflections from non-metallic surfaces such as water, glass etc. They also enable colors to become more saturated and appear clearer with better contrast. This effect is often used to increase the contrast and saturation in blue skies and white clouds. HOYA's polarising filters will not affect the overall color balance of a shot.

Features:



Available sizes (mm):

37	40.5	43	46	49	52	55	58	62	67	72	77	82
----	------	----	----	----	----	----	----	----	----	----	----	----

PRO1 SOFTON-A

Clear focus and
soft gradation



▲ With SOFTON-A Filter



▲ Without Filter

Creates a picture with a clear focus and a soft gradation. This effect is especially evident on an object with a point light source. A filter randomly arranging minute lens shaped like drops of water on the surface of an acrylic board scatters the light and results in a soft focus.

Features:



Available sizes (mm):

52	55	58	62	67	72	77
----	----	----	----	----	----	----

PRO1 Digital Filter Series

PRO1 STAR-4

Add a dramatic
four-cross flare



▲ With STAR-4 Filter



▲ Without Filter

The STAR-4 filter adds a dramatic four-cross flare to very bright areas, giving a soft-focus effect. Ideal for photographs of night scene illumination or other scenes with strong reflections.

Features:



Available sizes (mm):

52	55	58	62	67	72	77	82
----	----	----	----	----	----	----	----

PRO1 AC CLOSE-UP No.3

A world of new creativity



▲ With AC CLOSE-UP No.3 Filter



▲ Without Filter

The AC CLOSE-UP No.3 lens turns a normal lens into a macro by reducing the lens minimum focusing distance. Depth-of-field is shallow so use as small an aperture as possible. AC CLOSE-UP NO.3 offers a world of new creativity.

Features:



Available sizes (mm):

52	55	58	62	67	72	77
----	----	----	----	----	----	----

HRT CIR-PL UV FILTER

The perfect filter to capture seasons



High-Rate Transparency Film

This filter uses a newly developed High-Rate Transparency film that passes more visible light through the filter while still filtering the same amount of polarized light. The HOYA HRT circular polarizer filter transmits as much as 25% more light through the polarizing film giving the photographer about 1/3 stop more light than a standard circular polarizer. This new polarizing film is also used in the latest HD LCD TVs.

UV Absorbing

The glass of the HOYA HRT filter also has UV absorbing properties making the HRT a combination UV/circular polarizing filter.

The most common use for a circular polarizer filter is to darken bright blue skies in outdoor photography, but they also can reduce or eliminate reflections from non-metallic surfaces such as glass and water. By rotating the outer ring of the filter the change of effect can be seen by looking through the filter or through the viewfinder if it is mounted on a camera.



HRT CIR-PL UV

The perfect filter to capture seasons



▲ With CIR-PL UV Filter



▲ Without Filter



Available sizes (mm):

37	46	49	52	55	58	62	67	72	77	82
----	----	----	----	----	----	----	----	----	----	----

PROND

2 • 4 • 8 • 16 • 32 • 64 • 100 • 200 • 500 • 1000



The accurate vapor deposition technology in the Hoya PRO ND filters yields a true neutral color balance that will not add any noticeable color cast to your images.

The series provides 10 filters from 1-stop (ND2) to 10-stops (ND1000) light reduction.

The Metallic accurate ND coating on the PRO ND filters do not color shift as you move from one density to the next, a common problem with other series of neutral density filters.

Now you can set your white balance once and have the same color balance even if you need to change filters due to changes in lighting, or for creative effect.

This ND filter is keeping the same attenuation to the infrared band which causes color cast.

This makes the PRO ND filters even more neutral.

Neutral density filters are designed to reduce the amount of light entering your camera lens and should not have any other effect on the image. Reducing the amount of light allows for the use of wider apertures or slower shutter speeds for creative and dramatic effect in bright lighting conditions.

Ultimate Light Control for Professional Imaging



Photographed by Dave Zdanowicz



PRO ND Filter Ratings

PRO ND (Filter Factor)	Density	Adjust Exposure Stops (EV)	Transmission (%)
ND2	0.3	1.0	50.000
ND4	0.6	2.0	25.000
ND8	0.9	3.0	12.500
ND16	1.2	4.0	6.250
ND32	1.5	5.0	3.125
ND64	1.8	6.0	1.563
ND100	2.0	6 2/3	1.000
ND200	2.3	7 2/3	0.500
NDx400	2.6	8 2/3	0.250
ND500	2.7	9.0	0.200
ND1000	3.0	10.0	0.010

PROND

2.4.8.16.32



▲ With PRO ND2 Filter

The PRO ND2 (1-stop) - PRO ND16 (4-stops) filters are suitable for the use to make the vignette of the background using maximum aperture of a lens like portrait photography.

Available sizes (mm): 49 52 55 58 62 67 72 77 82

PROND

64·100·200



▲ With PRO ND100 Filter

Photographed by Dave Zdanowicz

The PRO ND64 (6-stops) - PRO ND200 (7 2/3-stops) filters are suitable for the use to make the expression of the movement in the daily life using a little long exposure (slow

Available sizes (mm): 49 52 55 58 62 67 72 77 82

PROND

500·1000



▲ With PRO ND500 Filter

The PRO ND500 (9-stops) and PRO ND1000 (10-stops) are suitable for the use to express the unrealistic world and solar photography using long exposure (super slow shutter).

Available sizes (mm): 49 52 55 58 62 67 72 77 82

ND(NEUTRAL DENSITY) 2X 4X 8X

For wider apertures or longer exposures



▲ Without Filter



▲ With ND 2X Filter

Available sizes (mm): 2X

40.5	46	49	52	55	58	62	67	72	77	82
------	----	----	----	----	----	----	----	----	----	----



▲ With ND 4X Filter



▲ With ND 8X Filter

Available sizes (mm): 4X, 8X

37	40.5	43	46	49	52	55	58	62	67	72	77	82
----	------	----	----	----	----	----	----	----	----	----	----	----

Neutral Density filters are often ignored by photographers, but they have several uses and offer the possibility to get otherwise unachievable results. ND filters appear grey and reduce the amount of light reaching the film and sensor. They have no effect on color balance. Their four main uses are:

- 1) To enable slow shutter speeds to be used, especially with fast film, to record movement in subjects such as waterfalls, clouds, cars, the sea, etc.
- 2) To decrease depth of field by allowing wider apertures to be used, which helps separate subjects from their background.
- 3) To decrease the effective ISO of high speed film (i.e., above ISO 400) and allow it to be used outdoors in bright situations.
- 4) To allow HDSLR, movie and video cameras (which have fixed shutter speeds) to film subjects such as snow, sand or other bright scenes which would normally cause overexposure.



▲ With ND Filter

HALF ND X4

Control bright/dark contrast



▼ Without Filter

▲ With HALF-ND X4 Filter

Without Filter ►



One half of this filter is ND X4 Neutral Density and the other half is clear, with a soft boundary between the two. It is used to control bright/dark contrast, by reducing half the shot by 2 stops. Particularly useful in landscape photography, the rotating mount allows bright skies to be easily controlled for dramatic effect.

Available sizes (mm):

49

52

55

58

ND X400

8 2/3-STOPS LIGHT LOSS

Blurring time to create beauty



▲ With ND X400 Filter



▲ Without Filter

The ND 400 can be used in many creative ways to achieve super slow shutter speeds in daylight. It can create beautiful blurred motion or render moving subjects invisible.

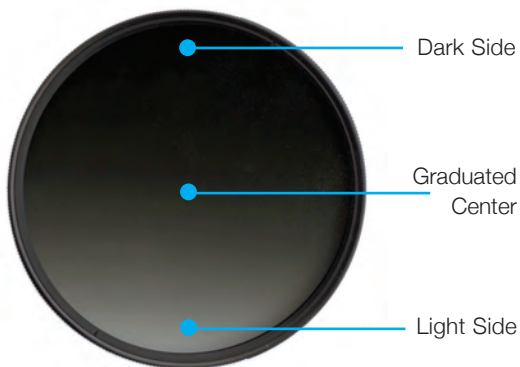
Photographing solar eclipses and ultra-bright light sources can be extremely dangerous. This filter reduces light values by 9 stops to less than 1/500th of its original intensity and allows safe photography. It can also be used to achieve super slow shutter speeds in daylight to render moving subjects invisible.

Available sizes (mm):

49	52	55	58	62	67	72	77	82
----	----	----	----	----	----	----	----	----

GRADUATED ND10

Perfect for Nature Scenes and Portraiture



This filter is great for Landscape photography because it can darken blown-out skies for a more balanced exposure. The GRADUATED ND 10 filter reduces the amount of light by 3 Stops in the darkest area and 1 stop in the lightest area. The filter also allows for wider apertures or slower shutter speeds to be used over-all.

Average
Transmission (%)

t=2.2 (52mm / 58mm)
t=3.0 (77mm / 82mm)

	Light Side	Center	Dark Side
t=2.2	53±5 (f≐1.4)	30±5 (f≐1.8)	12±5 (f≐2.8)
t=3.0	51±5 (f≐1.4)	20±5 (f≐2.2)	8±5 (f≐3.6)



▲ With GRADUATED ND10



▲ Without Filter

Available sizes (mm):

52

58

77

82

Variable Density FILTER

The creative possibilities are endless



▲ Without Filter



▲ With Variable Density - MINIMUM

Available sizes (mm):

52	55	58	62	67	72	77	82
----	----	----	----	----	----	----	----

SPECIAL EFFECTS FILTERS

The Hoya Variable Density filter uses two polarizing layers to control the amount of light that passes through the filter and into the camera lens. At its minimum effect the filter passes $\frac{1}{3}$ of the light in a scene. That is equal to 1.5 stops on the aperture or shutter speed. At its maximum effect the filter passes just $\frac{1}{400}$ of the light in a scene. That is equal to 9 stops on the aperture or shutter speed.

After the filter is mounted on the lens, turning the filter ring between “MINI” and “MAX” can greatly control the amount of light entering the lens. With the Hoya Variable Density filter it is possible to shoot with fast lenses like a 50mm f/1.4 lens wide open at f/1.4 in full sun for a very shallow depth of field. Or, to slow down the shutter speed to where the shutter can be open for several seconds in full sunlight. This is enough to create artistic blurring shots of motion on water, cars, people or almost anything that moves. The creative possibilities are endless.

The Hoya Variable Density filter uses high-quality optical glass from Hoya Corporation, the worlds largest optical glass manufacturer.



▲ With Variable Density - 50%



▲ With Variable Density - MAXIMUM

Notes: At the position that an ND level comes to have maximum, the cross pattern such as an X shadow will be appeared. In before and after of that pollution, a chromatic aberration may occur. It is caused by the dimming structure of the filter for the light incidence. We'll recommend to avoid this the use by near the maximum ND value.

UV & IR Cut FILTER

Blocks both UV rays and IR rays



▲ With UV & IR Cut Filter



HOYA has introduced the new Hoya UV & IR Cut filter in 49mm through 82mm sizes. This specialized filter has the ability to cut out both UV rays below 390nm and IR rays above 700nm leaving just the light rays in the visible spectrum passing through the filters and into the camera. This is important because CCD and CMOS sensors are extremely susceptible to UV and IR rays just outside the visible spectrum that have a very negative impact on image quality.

The Hoya UV & IR Cut filter blocks both UV rays and IR rays yielding clearer and sharper pictures outdoors. This filter can reduce the effects of atmospheric haze to an even greater degree than a standard UV filter.

The Hoya UV & IR's light transmission curve shows the sharp-cut nature of the filter glass and coatings as well as the consistent light transmission in the visible spectrum. This curve demonstrates a more even light transmission than the closest competitor. This means that sharper images with more depth and finer, richer color gradations are possible with the Hoya UV & IR Cut filter.

AN IMPORTANT NOTE REGARDING USE OF WIDE-ANGLE LENSES:

Increasing the angle of incidence, meaning light rays entering the filter from an extreme angle as is the case with super-wide and ultra-wide angle lenses, leads to an increasing color shift as the angle increases. This is based on the physics of light and the nature of the coatings. All UV-IR cut filters have the same properties in this regard. It is not recommended this filter be used with lenses having a field of view greater than 60 degrees.

Available sizes (mm):

49	52	55	58	62	67	72	77	82
----	----	----	----	----	----	----	----	----

HMC UV(C)

A multi-purpose fine-weather filter



▲ With HMC UV(C) Filter

Without Filter ►



Heat-resistant / High-Transparency glass

The HOYA UV (C) filter uses the highest quality heat-resistant tempered glass, which creates a smooth, clear image.

This filter cuts out all range of UV rays to give an astounding sharpness and clarity without the least affect on color balance. Constant use for lens protection is recommended.

These popular filters are renowned for their ability to minimize reflection on filter surfaces which reduces flare and ghosting. With an average light transmission of over 97%, the HOYA HMC filters are engineered to enhance the performance of today's multi-coated lenses.



Available sizes (mm):

37	39	40.5	43	46	49	52	55	58	62	67	72	77	82
----	----	------	----	----	----	----	----	----	----	----	----	----	----

UV(O)

A multi-purpose fine-weather filter



▲ With UV(O) Filter



▲ Without Filter

Absorbs the ultraviolet rays which often make outdoor photographs hazy and indistinct. A multi-purpose, fine-weather filter for color as well as black and white films. Also serves as a permanent lens protector.

Available sizes (mm):

37	40.5	43	46	49	52	55	58	62	67	72	77	82	86	95
----	------	----	----	----	----	----	----	----	----	----	----	----	----	----

SKYLIGHT 1B

For outdoor color photography



▲ With SKYLIGHT 1B Filter



▲ Without Filter

Reduces excessive bluishness that frequently occurs in outdoor color photography, especially in open shade under a clear, blue sky. The absorption peak is in the range which corresponds to the film's green spectrum. This means outstanding outdoor shots with superb color balance and clarity under all conditions. Also keeps skin tones free of colored reflections from nearby objects such as the shade of trees.

Available sizes (mm):

37	43	46	49	52	55	58	62	67	72	77	82
----	----	----	----	----	----	----	----	----	----	----	----

PL/CIR-PL

Color and contrast enhancement



▲ With PL Filter



▲ Without Filter

What is a polarizing filter?

Light rays which are reflected by any surface can become polarised so polarising filters are used to select which light rays enter your camera lens. CIRCULAR PL filters allow you to remove unwanted reflections from non-metallic surfaces such as water, glass etc. They also enable colors to become more saturated and appear clearer with better contrast. This effect is often used to increase the contrast and saturation in blue skies and white clouds. HOYA's polarising filters will not affect the overall color balance of a shot.

PL Filter Available sizes (mm):

39	40.5	43	46	49	52	55	58	62	67	72	77	82	86	95
----	------	----	----	----	----	----	----	----	----	----	----	----	----	----



▲ With CIR-PL Filter



▲ Without Filter

How to select the correct Polarizing Filter

Circular Polarizers can also act as a light-balancing filter. In outdoor scenes the filter can decrease the exposure in bright (high-light areas) by reducing reflections and glare while increasing the exposure in darker or shadowed areas. This has the effect of increasing the dynamic range of the scene, yielding a more evenly graded image that needs less time and work with image editing or HDR software after the photo is taken.

CIR-PL Filter Available sizes (mm):

37	40.5	43	46	49	52	55	58	62	67	72	77	82	86	95
----	------	----	----	----	----	----	----	----	----	----	----	----	----	----

RA54 RED ENHANCER

Enhance red, orange and brown



▲ With RED ENHANCER Filter



▲ Without Filter

Also known as a “didymium” filter, this is used to enhance red, orange and brown subjects to give more color saturation and contrast, while having very little effect on other colors. It can be used in many situations such as architecture where certain building features need emphasizing, or for landscapes to enhance foliage and rocky features.

Available sizes (mm):

49

52

55

58

62

67

72

77

82

RA56 GREEN ENHANCER

Improve outdoor shots



▲ With GREEN ENHANCER

Without Filter



Intensifies and enhances colors in the Green region of the spectrum without adversely affecting other colors. It is particularly useful for improving outdoor shots which include nature, flowers, landscapes and water. Combination use with PRO 1 UV (0) or PL-Circular is recommended for increased contrast and sharpness.

Available sizes (mm): 49 52 55 58 62 67 72 77 82

RA64 BLUE ENHANCER

Brighten landscapes



▲ With RA64 BLUE ENHANCER

Without Filter



Intensifies and enhances colors in the Blue region of the spectrum without adversely affecting other colors. It is particularly useful for brightening seascapes and partial or cloudy skies, but also suitable for when, due to the sun's direction, polarizing filters are ineffective in increasing the saturation of a blue sky. For increased contrast Hoya recommends using the Blue Enhancer with a circular polarizer filter.

Available sizes (mm): 49 52 55 58 62 67 72 77 82

PORTRAIT

Make skin tones more vivid and clear



▲ With PORTRAIT Filter



▲ Without Filter

Enhances pink and reduces both yellow and orange to make human skin tones more vivid and clear. Combination use with UV is ideal when shooting under fine blue skies.

Available sizes (mm): 49 52 55 58 62 67 72 77 82

FL-W

Correct greenish tones



▲ With FL-W Filter

Without Filter ►



Used to correct the greenish tone that appears when daylight type film is used under fluorescent lighting. FL-W is for use with warm white or white type fluorescent lamps. It is recommended that auxiliary light sources be used when long exposures become necessary due to insufficient light.

Available sizes (mm): 46 49 52 55 58 62 67 72 77 82

FL-DAY

Correct greenish tones



▲ With FL-DAY Filter

Without Filter ►



Used to correct the greenish tone that appears when daylight type film is used under fluorescent lighting. FL-DAY is for use with daylight type fluorescent lamps. It is recommended that auxiliary light sources be used when long exposures become necessary due to insufficient light.

Available sizes (mm): 46 49 52 55 58 62 67 72 77 82

Blue Cooling Series

C2 • C4 • C8 • C12



▲ With C8 Blue Cooling Filter



▲ Without Filter



C2 BLUE COOLING



C4 BLUE COOLING



C8 BLUE COOLING



C12 BLUE COOLING



Our blue cooling filters are used to balance out any reddish orange hues. These filters raise the overall color temperature value and are generally used to adjust the white balance when shooting in tungsten or fluorescent lighting. The -120 mired value raises in color temperature is now referred to as the C12 filter.

There are 4 incremental variations in cooling filters offered: -20, -40, -80 and -120 mired values.

※Mired:

Contracted from the term micro reciprocal degree, the mired is a unit of measurement used to express color temperature.

It is given by the formula: $M \text{ (Mired)} = 1000000/T \text{ (kelvin: Color Temperature)}$

The increase and decrease by color temperature and the mired value become the opposite direction since the formula is a reciprocal.

Hue	Mired Shift (Ability for Color Conversion)	Filter Type	New Filter (Combination)	Filter Factor	f/stops
Blue Cooling filter	-20	82A (218)	C2	1.2	1/4
	-30	82B (203)		1.4	1/2
	-40		C4	1.4	1/2
	-50	82C		1.5	3/5
	-60		(C4 + C2)	1.9	1
	-80	(202)	C8	2.0	1
	-90	80C		1.9	1
	-100		(C8 + C2)	2.4	1 1/4
	-110	80B (281)		2.0	1
	-120		C12	3.0	1 2/3
	-130	80A		2.4	1 1/4
	-140	(201)	(C12 + C2)	3.6	1 4/5
	-160		(C12 + C4)	4.8	2 1/4

Available sizes (mm): 46 49 52 55 58 62 67 72 77 82

Umber Warming Series

W2 • W4 • W10 • W12



▲ With W10 Umber Warming Filter



▲ Without Filter

The Umber Warming Filters corrects any blue cast and adds an amber warmth to photos. This filter lowers the color temperature by adding a red/orange tint to the picture. The Umber Warming filter which raises the mired value by +100 is labeled W10 in our new labeling system.

Our lineup includes filters which change the color temperature by +20, +40, +100 and +120 mired value increments



W2 UMBER WAMING



W4 UMBER WAMING



W10 UMBER WAMING



W12 UMBER WAMING

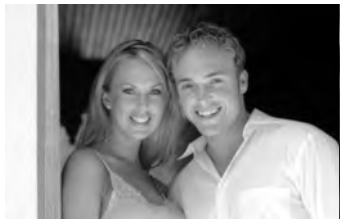


Hue	Mired Shift (Ability for Color Conversion)	Filter Type	New Filter (Combination)	Filter Factor	f/stops
Umber Warming filter	+200		(W10 + W10)	4.0	2
	+140		(W10 + W4)	2.8	1 1/2
	+130	85B		2.1	1
	+120	(285)	W12	2.0	1
	+110	85 (205)		2.0	1
	+100		W10	2.0	1
	+80	85C (442)	(W4 + W4)	1.8 - 2	4/5 - 1
	+60	(206)	(W4 + W2)	1.7	3/4
	+50	81C		1.5	3/5
	+40	(443)	W4	1.4	1/2
	+30	81B (223)		1.4	1/2
	+20	(444)	W2	1.2	1/4
	+10	81A		1.2	1/4

Available sizes (mm): 46 49 52 55 58 62 67 72 77 82

Y2 PRO (YELLOW)

For clear contrast



▲ Without Filter

◀ With Y2 PRO Filter

Especially useful for clear contrast between blue sky with clouds and foreground. Provides a natural tonal rendition. Often used for subjects at intermediate distances.

Available sizes (mm): 46 49 52 55 58 62 67 72 77 82

YA3 PRO (ORANGE)

For balancing contrast



▲ Without Filter

◀ With YA3 PRO Filter

Increases contrast between reds and yellows. Particularly useful for distant outdoor shots taken with a telephoto lens. Also useful in color photography for spectacular sunsets, seascapes, etc.

Available sizes (mm): 46 49 52 55 58 62 67 72 77 82

R1 PRO (RED)

Increases contrast



▲ Without Filter

◀ With R1 PRO Filter

Especially effective for increasing contrast. Ideal for dramatic cloud effects in landscapes. Can also be applied creatively in color and infrared photography.

Available sizes (mm): 46 49 52 55 58 62 67 72 77 82

X0 (YELLOW GREEN)

Great for outdoor portraits



▲ With X0 Filter

▲ Without Filter

Used primarily for black and white photography. X0 is highly effective for outdoor portraits because red is rendered dark while green appears lighter. Great for correcting skin tones, bringing out facial expressions in close-ups and emphasizing the feeling of liveliness.

Available sizes (mm): 46 49 52 55 58 62 67 72 77 82

X1 (GREEN)

Great for indoor portraits



▲ With X1 Filter

▲ Without Filter

Used primarily for black and white photography. X1 is highly effective for indoor portraits under tungsten lighting.

Available sizes (mm): 46 49 52 55 58 62 67 72 77 82

SPECTRAL CROSS

Produce soft-focus and cross effects



▲ Without Filter



◀ With **SPECTRAL CROSS**

A filter made by sandwiching black gauze-like fiber between two pieces of colorless, transparent optical glass in a rotating frame, producing both soft focus and cross effects.

Available sizes (mm): 49 52 55 58 62 67 72 77

FOG FILTER A • B

Produce the effect of dense fog



▲ Without Filter



◀ With **FOG Filter**

Lightly veils the entire picture in white. Available in a set of two: FOG (A) and FOG (B). FOG (B) has a stronger effect than FOG (A). Both can be used together to produce an effect similar to dense fog. The effect can be varied by changing the aperture of the lens, but stopping down too far will reduce the effect.

Available sizes (mm): 49 52 55 58 62 67 72 77 82

DIFFUSER • DUTO

The beauty of a Soft-focus effect



▲ With DIFFUSER Filter



▲ With DUTO Filter

Both are diffusion type filters, but DIFFUSER gives a soft-focus effect due to its irregularly uneven surface while DUTO has fine concentric lines etched on its surface. The center of the picture is usually sharp with DUTO, but DIFFUSER gives an overall soft-focus effect. Both are particularly effective in portraiture and commercial.

Available sizes (mm): 39 46 49 52 55 58 62 67 72 77 82

SOFTENER A • B

Scatters light for a soft-focus



▲ With SOFTENER A Filter



▲ With SOFTENER B Filter

A filter with randomly arranged minute lenses shaped like drops of water on an acrylic surface which scatters the light and results in a soft focus. Creates a picture with a clear focus and a soft gradation. This effect is especially evident with an object with a point light source. Color reproduction is easy and there is no need for exposure adjustment.

Available sizes (mm): 49 52 55 58 62 67 72 77

INFRARED (R72)

Used for photography with infrared film



▲▼ Both Photos taken with a digital cameras and R72 filter



The Hoya R72 Infrared filter is specifically designed for infrared photography with digital cameras or infrared film.

Infrared light starts in the high-red area of the visible spectrum at around 750nm and goes up beyond 1000nm. This light is not visible to the naked eye. Looking through the R72 filter it looks almost opaque because the filter is only passing light from the very high red edge of the visible spectrum and infrared light. Infrared photography yields very interesting, sometimes stunning, and creative result as object in a scene reflect infrared light differently than normal light.

Due to the nature of infrared light, filter factor and exposure compensation vary widely from visible light and depends largely on lighting conditions.

SPECIAL EFFECTS FILTERS



▲ With R72 Filter



▲ Without Filter



Available sizes (mm):

46	49	52	55	58	62	67	72	77	82	86	95
----	----	----	----	----	----	----	----	----	----	----	----

STAR-4 • STAR-6 • STAR-8

Add a dramatic cross flare



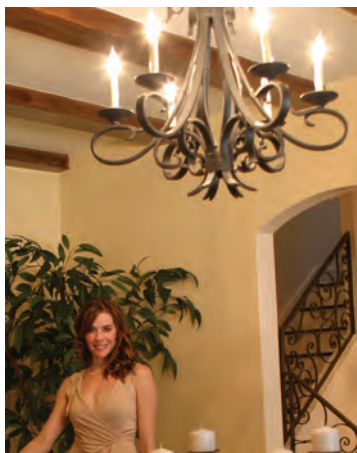
▲ With STAR-4 Filter



▲ With STAR-6 Filter



▲ With STAR-8 Filter



▲ Without Filter

STAR-4 adds a dramatic four-cross flare to very bright areas, giving a soft-focus effect. Ideal for photographs of ladies wearing jewelry or other objects with strong reflections. STAR-6 (six-pointed light flares) and STAR-8 (eight-pointed star flares) can also be used for a variety of effects.

Available sizes (mm): 46 49 52 55 58 62 67 72 77 82

CLOSE-UP II

A world of new creativity



▲ With +4



▲ With +3



▲ With +2



▲ With +1



▲ Without Filter

Available in +1, +2, +3 and +4 diopters for close-up photography. Depth-of-field is shallow so use as small an aperture as possible. CLOSE-UPS offer a world of new creativity.

Available sizes (mm):

+1, +2		40.5	46	49	52	55	58	62	67	72	77	82
+3, +4	37	40.5	46	49	52	55	58	62	67	72	77	82

MACRO CLOSE-UP

Discover the art of nature



▲ With MACRO CLOSE-UP

Without Filter ►

A lens of 2-element, 2-group construction and a +10 diopter rating. Resolution is outstanding and focusing is possible at 10cm for super close-ups of insects, flowers and other small objects. The magnification is about 1:2 with a 50mm standard lens (35mm camera), roughly equates to a 100mm telephoto lens. The lens should be stopped down as much as possible to get maximum depth-of-field.

Available sizes (mm): 49 52 55

DIGITAL FILTER KIT II

3 main filters in one package



HOYA Digital Filter Kit II brings 3 main filters in one package which frequent use at the time of photography and is a kit for economic guides. Three kinds of next filters are packed in a filter porch.

UV(C) Filter

A UV(C) filter is used to intercept UV light and is done a general protection of the lens. Made of high quality UV cut and anti-reflective coat is given both sides. It will not affect the quality of your image.

Circular Polarizer Filter

A circular polarizer filter is a basic filter with polarization effect to eliminate unwanted reflections or to enhance contrast of the sky and nature objects. Its frame thickness is slim than a previous Filter Kit One.

NDx8 Filter

A ND(Neutral Density)8 filter reduces the light quantity for 3-stops and is equivalent to 8 times longer shutter speed. It is to wider aperture during shiny day or to imitate blur motion of the water and moving objects. This filter is effective to avoid the diffraction phenomenon which occurs by slow iris.

Filter factor 8, Transmissivity 12.5%, Density 0.9 f/stop 3

Available sizes (mm):

40.5	46	49	52	55	58	62	67	72	77	82
------	----	----	----	----	----	----	----	----	----	----

Filter Factors

Since photographic filters absorb light, exposure must be increased to compensate for the effective light absorbed. The number by which the exposure must be increased for a particular filter used with a particular film is called the filter factor.

While these factors for basic applications are given below, as well as on the filter instruction sheet, the factor will vary according to shooting conditions. The precise filter factor is determined by considering the film type and specific light source. Therefore, filter factors indicated are for your reference only. The filter factor and exposure compensation required is as follows:

	Filter factor	f-stop
UV (O)	1	0
1B	1	0
PL	2~3	1~1 2/3
CIR-PL	1.2~2	1/4~1
FL-W	2	1
FL-DAY	2	1
C2	1.2	1/4
C4	1.4	1/2
C8	2	1
C12	3	1 2/3
W2	1.2	1/4
W4	1.4	1/2
W10	2	1
W12	2	1

	Filter factor	f-stop
Y2 (Y)	2	1
YA3 (O)	4	2
R1 (R)	8	3
X0 (YG)	2.5	1 1/3
X1 (G)	4	2
NDx2	2	1
NDx4	4	2
NDx8	8	3
RA54 (R)	1.5	1/2
RA56 (G)	2.5	1 1/3
RA64 (B)	2	1
Portrait	1.15	1/5

The Production Process Of Hoya Filters

Automatic V-blender



Direct pressing machine



Continuous annealing furnace



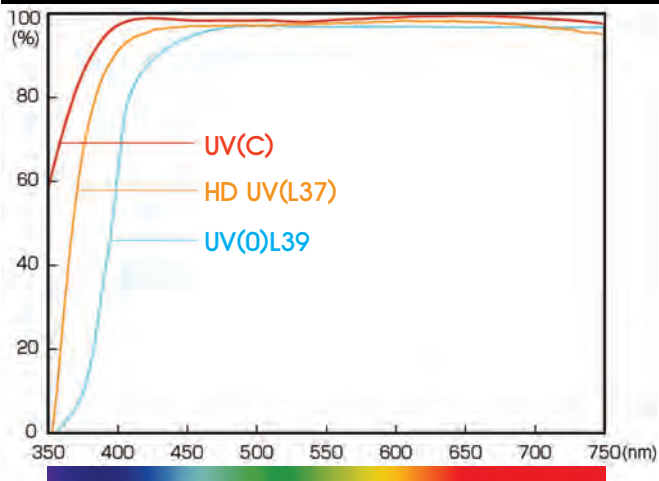
High speed polishing machine

Vacuum evaporator

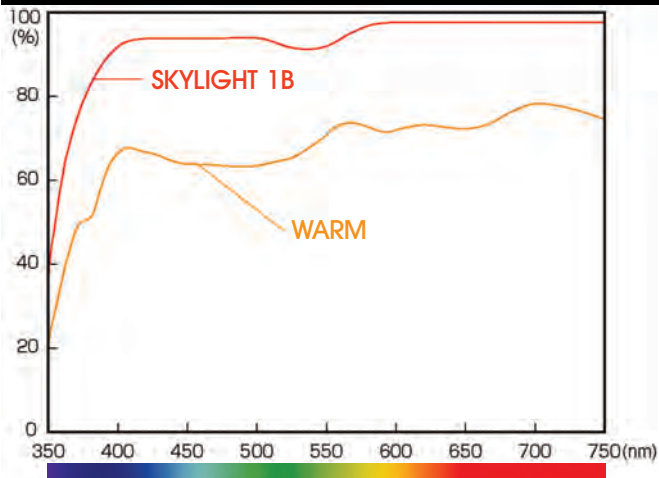


TRANSMISSION CURVES

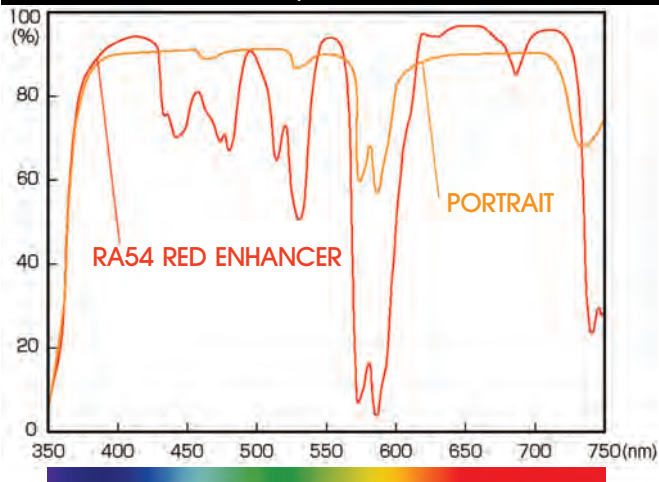
UV(C) / HD UV(L37) / UV(O)L39



SKYLIGHT 1B / WARM

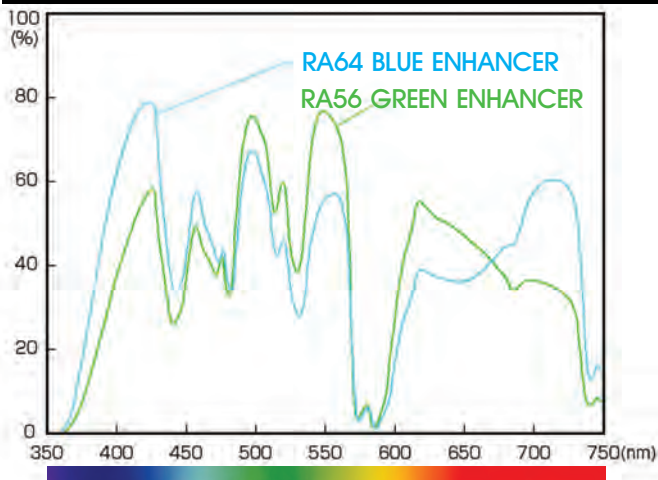


RA54 RED ENHANCER / PORTRAIT

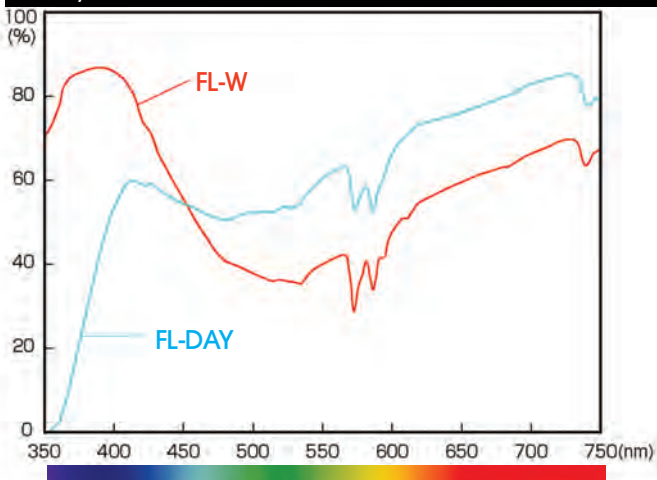


TRANSMISSION CURVES

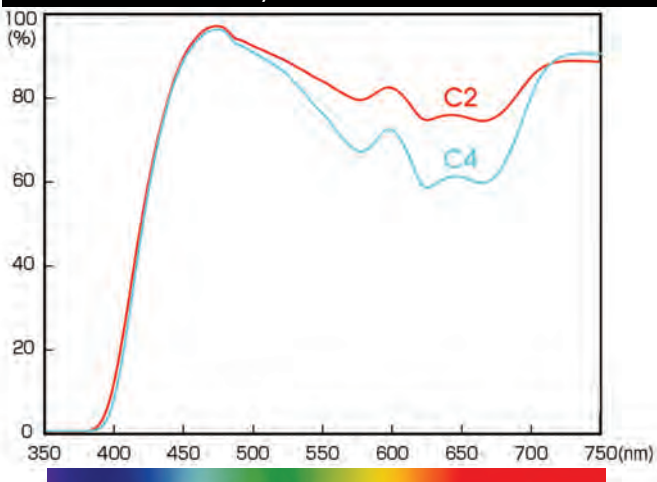
RA56 GREEN ENHANCER / RA64 BLUE ENHANCER



FL-W / FL-DAY

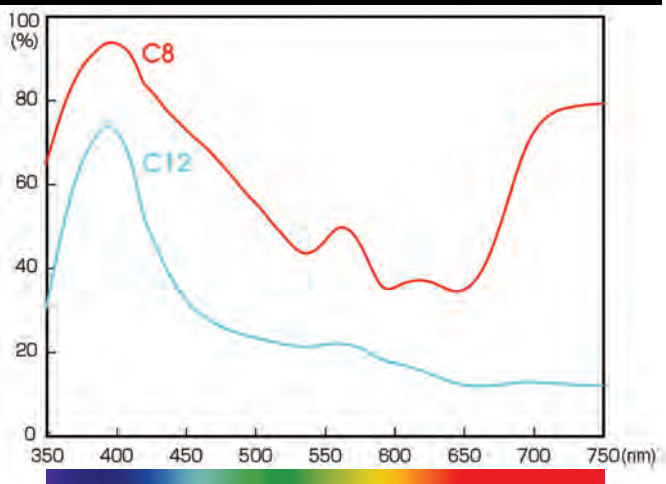


C2 BLUE COOLING / C4 BLUE COOLING

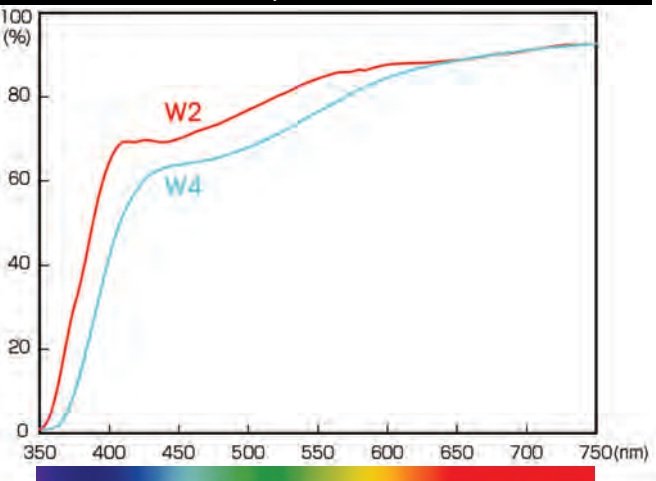


TRANSMISSION CURVES

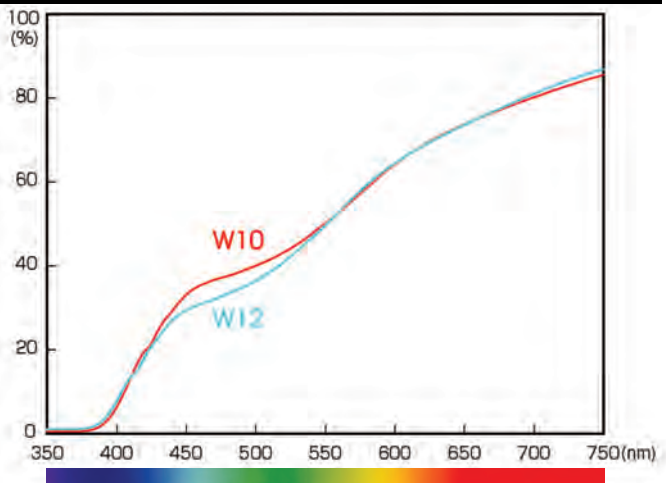
C8 BLUE COOLING / C12 BLUE COOLING



W2 UMBER WAMING / W4 UMBER WAMING

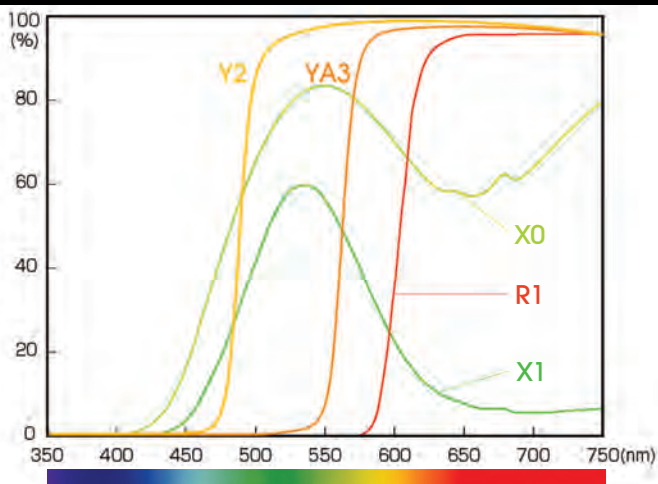


W10 UMBER WAMING / W12 UMBER WAMING

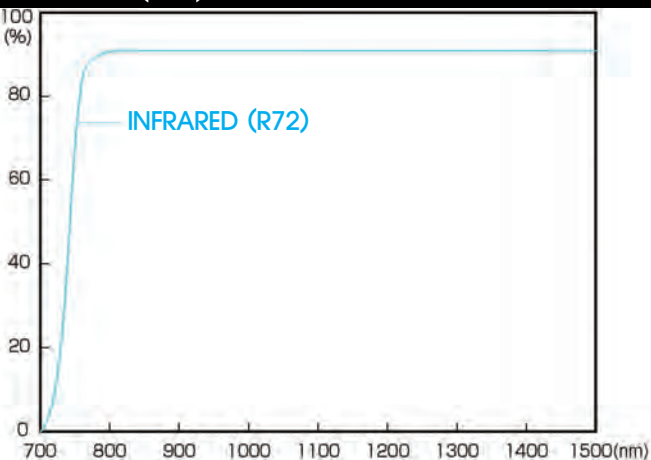


TRANSMISSION CURVES

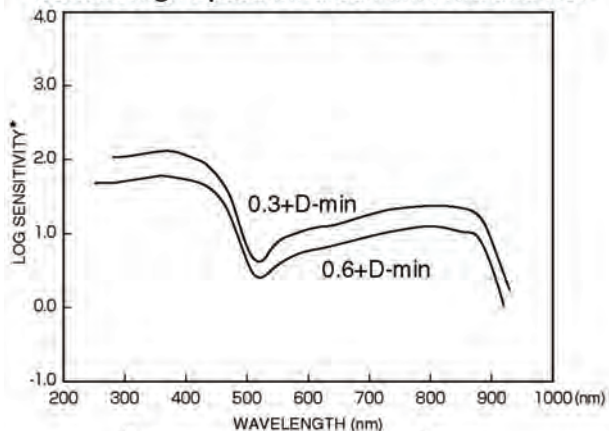
X0 / X1 / YA3 / Y2 / R1



INFRARED (R72)



Spectral-Sensitivity Curves for KODAK High Speed Infrared Film / HIE and HSI



*Sensitivity = reciprocal of exposure (args/cm²) required to produce specified density

Kodak is the registered trade mark of EASTMAN KODAK COMPANY in USA.

Filter Size List

	COAT	37.0	39.0	40.5	43.0	46.0
HD nano Series						
HD nano UV	HDN					
HD nano CIR-PL	HDN					
HD Series						
HD UV(O)	HDC	●		●	●	●
HD PROTECTOR	HDC	●		●	●	●
HD CIR-PL	HDC	●		●	●	●
FUSION Antistatic Series						
FUSION UV	FAC	●		●	●	●
FUSION PROTECTOR	FAC	●		●	●	●
FUSION CIR-PL	FAC	●		●	●	●
PRO1D DIGITAL Series						
PRO1D UV(O)	DMC	●	●	●	●	●
PRO1D PROTECTOR	DMC	●		●	●	●
PRO1D CIRCULAR PL	DMC	●		●	●	●
PRO1D PRO SOFTON A	MC*					
PRO1D STAR-4	SMC					
PRO1D CLOSE-UP No.3 (Achromat Lens)	HMC					
HRT FILTERS						
CIR-PL UV	HRT	●				●
GENERAL FILTERS						
UV(O) SUPER Pro1	SMC					
UV(O)	HMC	●		●	●	●
SKYLIGHT 1B SUP Pro1	SUP					
SKYLIGHT 1B	HMC	●			●	●
UV (C)	HMC	●	●	●	●	●
PL-CIR		●		●	●	●
PL			●	●	●	●
RA54 Red Enhancer (Intensifire)						
RA56 Green Enhancer (GREEN FIELD)						
RA64 Blue Enhancer						
PORTRAIT						
FL-W	HMC					●
FL-DAY	HMC					●
W2, W4, W10, W12 Umber Warming	HMC					●
C2, C4, C8, C12 Blue Cooling	HMC					●
Y2 Yellow, YA3 Orange, R1 Red	HMC					●
X0, X1	HMC					●
DIGITAL FILTER KIT2 (UV (C), CIR-PL, NDx8)	HMC	●		●	●	●
PRO ND Series						
PRO ND2, ND4, ND8, ND16, ND32	PNC					
PRO ND64, ND100, ND200	PNC					
PRO ND500	PNC					
PRO ND1000	PNC					
GRADATED ND10						
SPECIAL EFFECT FILTERS						
CROSS SCREEN (STAR-4)						●
STAR-6, STAR-8						●
NDx2	HMC			●		●
NDx4, NDx8	HMC	●		●	●	●
NDx400	HMC					
HALF NDx4						
VARIABLE DENSITY						
UV & IR CUT	HMC					
FOG FILTER A, B						●
FOG FILTER A+B SET						●
DIFFUSER			●	●	●	●
DUTO			●			●
SOFTNER A, B						
SPECTRAL CROSS						
R72 INFRARED						●
CLOSE-UP II +1, +2, +3, +4	HMC	+3, +4		●		●
CLOSE-UP SET II(+1,+2,+4)	HMC			●		●
MACRO CLOSE UP (+10)						
	COAT	37.0	39.0	40.5	43.0	46.0

FILTER SIZE LIST

[illegible]

Catalog Issue Date: November 1, 2016

HOYA

F I L T E R S



Kenko Tokina

Kenko Tokina Co., Ltd.

5-68-10 Nakano, Nakano-ku, Tokyo 164-8616, Japan

www.hoyafilter.com

“HOYA” is the registered trademark of HOYA CORPORATION in Japan.

Cover Photo by Dave Zdanowicz