Canon

EF LENSES

For EOS Cameras

EF LENSES

Images From Your Imagination, Delivered by Canon EF Lenses

Ever notice that “imagination” contains the word “image”? That’s because creating an image starts with your imagination. When you have an image in mind, you must choose a lens which can capture that image. And whatever that image may be, you can be sure that Canon has the lens you need. Whether it is a 15mm fisheye or a 1200mm super telephoto, all Canon EF lenses feature the finest materials (especially the L-series lenses) and technologies. They include Fluorite, UD (Ultra-low Dispersion) glass, Aspherical lenses, lens-based Ultrasonic Motors, inner and rear focusing, Image Stabilizer, Diffractive Optics, and a fully-electronic interface. Only the variety and versatility of EF lenses can match your wondrous imagination.

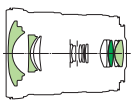
Specialists for the Digital Age

EF-S lenses specifically target the EOS 20D and Digital Rebel cameras, with optics designed to efficiently cover their compact imaging sensors. Technologies EOS users have come to expect in lenses, including Ultrasonic focusing motors, Aspherical elements, and even Image Stabilization are available throughout this new lens series. EF-S lenses are yet another option for EOS digital shooters.

EF-S 10-22mm f/3.5-4.5
•f/9.5 •1/180 sec.

EF-S 10-22mm f/3.5-4.5 USM

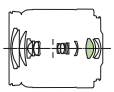
This lens brings ultra-wide angle zoom capability to users of the Digital Rebel and EOS 20D cameras. Equivalent to a 16-35mm lens (on a full-frame camera), this superb lens combines three Aspherical lens elements with a Super UD element for excellent image quality. Like all EF-S lenses, it projects a smaller image circle to the imaging sensor, and has shorter back-focus to further enhance its performance. A powerful ring-type USM is used for AF, and permits full-time manual focus. Smooth and solid, it's the ideal lens for a broad range of digital shooters.



AL 3 | S-UD 1 | I/R | FT-M | CA

EF-S 17-85mm f/4-5.6 IS USM

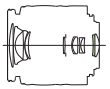
Perhaps the perfect standard lens for the EOS 20D user, or advanced users of the Digital Rebel. It's equivalent to a 27-136mm lens on a 35mm film camera, but optimized for the APS-C size digital imaging sensor on compatible cameras. Image Stabilization provides up to three stops of slow-speed hand-holding correction, further enhancing this lens's practicality. The powerful and silent Ultrasonic motor focuses the lens as close as 13.8 inches (0.35m), and provides full-time manual focus capability. Its 17-element design includes a double-sided Aspheric lens element, and delivers excellent image quality.



AL 1 | I/R | FT-M | IS | CA

EF-S 18-55mm f/3.5-5.6 USM

A great lightweight standard lens exclusively for the EOS Digital Rebel XT, EOS Digital Rebel or EOS 20D is available in an Ultrasonic version. A tiny second-generation Micro USM focuses the lens quietly and rapidly from infinity down to 11 inches (0.28m), enabling magnifications greater than 1/4 life-size. Optically, it's identical to the standard EF-S 18-55 lens, and likewise is optimized for compatible EOS digital SLRs. True wide-angle to portrait-length telephoto coverage with excellent sharpness in a compact design are the hallmarks of this EF-S lens.

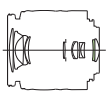


AL 1 | CA

EF-S 18-55mm f/3.5-5.6

Available only with EOS 20D, Digital Rebel XT & Digital Rebel lens Kit

Available in kit form along with the EOS Digital Rebel XT, Digital Rebel or EOS 20D only, this remarkable lightweight lens was the first in the EF-S series – a lens optimized for the APS-C size sensor in affordable Canon digital SLRs. It projects a smaller image circle to the camera's sensor, and its quality is enhanced by the rear lens elements projecting deeper into the camera body. An Aspherical lens element helps insure great image quality, even at wide-open apertures; AF is powered by a conventional compact DC motor. Equivalent to a 29-88mm lens (on a 35mm camera), it makes a great first lens for digital SLR users.

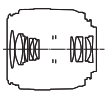


AL 1 | CA

EF-S 60mm f/2.8 Macro USM

NEW

A thoroughly modern design that's optimized for select Canon EOS digital SLRs. It's equivalent to a 96mm f/2.8 lens, with a floating optical system that can focus down to full life-size (1:1) magnification. Inner focusing, driven by a silent and powerful ring-type USM, means the lens' overall length never changes during focus. This lens is a wonderful multi-purpose lens that's equally at home shooting macro shots, portraits, or available-light photos. Like all Canon EF-S lenses, its use is restricted to the EOS 20D, EOS Digital Rebel and Digital Rebel XT cameras (as of February, 2005).



I/R | FT-M | Float | CA

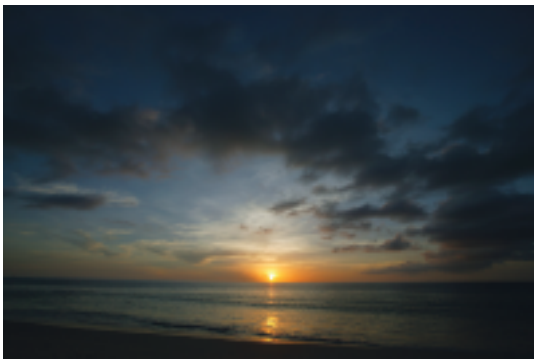
* The icons are described on page 34-38 "EF Lens Technologies."

Aspherical lens Super UD lens

Getting Everything In

Ultra-wide zooms are the ideal way to change the look of your photography. The stunning perspectives they deliver, combined with the versatility of zooming, make them perfect for enthusiasts and professionals alike. Two L-series lenses highlight the available choices for EOS users.

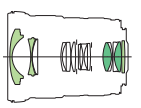
EF 16-35mm f/2.8L USM
•f/2.8 •2 sec.



EF 17-40mmf/4L USM
•f/8 •1/250 sec.

EF 16-35mm f/2.8L USM

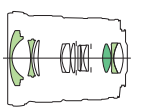
A superb lens that covers nearly every professional wide-angle task. Outstanding optical performance comes from three Aspherical lens elements, and (for the first time ever in an EF wide-angle zoom lens) two Ultra-low Dispersion UD elements. Weather-resistant construction, a rear gel filter holder, close-focusing to 11 inches (0.28m), and a circular diaphragm are among its many highlights.



AL 3 · UD 2 · I/R · FT-M · DW-R

EF 17-40mm f/4L USM

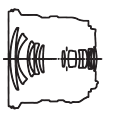
About half the price of the 16-35 f/2.8 lens, this L-series lens has an entirely new optical design with three Aspherical elements and a Super UD-glass element. The combination provides superb contrast and sharpness, even at the widest settings. It's ideal for both film and digital SLRs, and features the same weather-resistant design, rear gel filter holder, and high-speed Ultrasonic Motor as the EF 16-35mm lens.



AL 3 · S-UD 1 · I/R · FT-M · DW-R

EF 20-35mm f/3.5-4.5 USM

A superior performance ultra-wide-angle zoom lens, covering the entire range of popular wide-angle focal lengths. A ring-type USM and an inner focus design provide fast and silent AF, along with full-time manual focus override. Priced within the range of serious photo enthusiasts, it's a great all-around choice.



I/R · FT-M

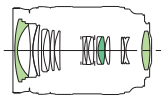
Aspherical lens · UD lens

The Best of Both Worlds

These lenses cover the most popular range of focal lengths for most photographers, from wide-angle through telephoto. This versatility makes them not only great standard lenses, but ideal for situations ranging from travel to professional wedding photography. Like every EF lens series, there are choices—in maximum apertures, size and weight, telephoto range, and price.

EF 24-70mm f/2.8L USM

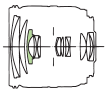
A superb professional lens that offers an even wider zoom range than its predecessor—ideal for digital cameras. It now features two types of Aspherical elements, and an entirely new UD-glass element for superb optical performance even wide-open. It focuses closer than before, and even faster with revised electronics and a new processor. And, it's now sealed against dust and moisture at the lens mount, the zoom and focus rings, and the switch plate. The ultimate professional standard zoom lens just got better.



AL 2 · UD 1 · I/R · FT-M · CA · DW-R

EF 24-85mm f/3.5-4.5 USM

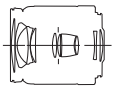
An excellent all-around zoom lens that covers the range from ultra-wide-angle to true portrait-length telephoto. Its solid construction, fast USM autofocus and smooth operation are matched by its excellent optical quality. This compact lens is an ideal choice for shooters who want wider coverage than provided by most standard zooms. The extra-wide coverage also makes it a great standard zoom for digital SLRs.



AL 1 · I/R

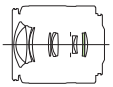
EF 28-80mm f/3.5-5.6 II

For many EOS users, this is their first EF lens. Light, compact and affordable, it covers a practical range of focal lengths—ideal for almost everything from family snapshots and travel to event photography. A lightweight DC-focusing motor provides brisk autofocus—as close as 1.3 feet (0.38m)—enough to fill the frame with a subject about the size of a postcard.



EF 28-90mm f/4-5.6 II USM

Super-light and compact like its predecessor, but now with even faster AF due to new internal electronics and a faster lens CPU. It's optically unchanged, which is a good thing—images are sharp and crisp throughout the zoom range, and the Micro USM provides quick and ultra-quiet AF. It's an ideal standard lens, and one of the most popular in the entire EOS system.



AL 1

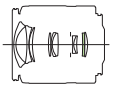
EF 24-70mm f/2.8L USM
•f/11 •1/60 sec.

EF 28-90mm f/4-5.6 II USM
•f/5.0 •1/200 sec.

Aspherical lens · UD lens

EF 28-90mm f/4-5.6 III

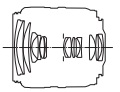
Lightweight and affordable, this lens is one of the most popular in the entire EOS system and often the first lens purchased with an EOS SLR. Now in its third generation, it's optically identical to its predecessor, but now provides distance information to compatible EOS bodies for E-TTL II flash operation. Fast autofocus down to 1.3 feet (0.38m) highlights its abilities.



AL 1

EF 28-105mm f/3.5-4.5 II USM

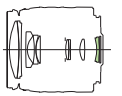
This lens is an outstanding choice as a standard zoom for advanced photographers looking for durability and performance. It has the same optical formula (and quality) as the previous highly-regarded EF 28-105mm USM lens, but with a refined exterior appearance. Its ring-type USM gives the silent and fast autofocus that EOS users expect, along with full-time manual focusing capability—even when in the AF mode.



I/R FT-M

EF 28-105mm f/4-5.6 USM

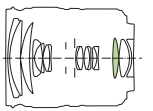
This incredible lens is the smallest and lightest in its class. It's totally new optically, with an Aspherical element to keep the quality up and the size down. Even more noteworthy is an entirely new Micro USM, that's about half the length of previous designs—with the same focusing power and performance. Features like circular diaphragm blades (for natural backgrounds) and internal focusing (the front element never rotates) round out this great new lens.



AL 1 I/R CA

EF 28-135mmf/3.5-5.6 IS USM

An unbeatable combination of zoom range, silent and fast USM autofocus, excellent optics and Canon's Image Stabilization technology. IS allows steady hand-held operation at shutter speeds up to two full stops slower than would normally be possible—and makes this a practical lens even in low-light situations. It's one of the most versatile lens choices in the entire EF line-up for the advanced EOS photographer.

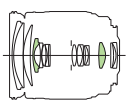


AL 1 I/R FT-M IS

EF 28-105mm f/3.5-4.5 II USM
•f/8 •1/180 sec.

EF 28-200mm f/3.5-5.6 USM

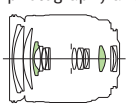
The ultimate all-in-one zoom lens, and one of the world's closest-focusing 28-200mm zooms with internal focusing down to 17.7 inches (0.45m) at all focal lengths. Canon's Micro USM provides the quick and quiet AF, and sixteen optical elements (with two Aspheric elements) provide the highest optical quality in its class. A brilliant choice when you need one zoom lens to perform many different tasks.



AL 2 I/R

EF 35-80mm f/4-5.6 III

The most affordable zoom lens in the entire EF lens system. Light and ultra-compact, this lens isn't lacking for optical performance. It has an Aspherical lens element for better optical quality, and its close-focusing allows filling the frame with a subject the size of a postcard at its 80mm focal length. It's a great entry into SLR photography and the EOS system.



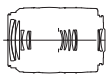
AL 1

Isolate the Interesting Part

Telephoto lenses are ideal for riveting your viewer's attention on the subject, and any of these zoom lenses is a great tool to get the job done. They make it easy to throw backgrounds out of focus, grab details, or approach subjects you'd rather not get too close to. Again, Canon provides many options at a broad range of price points.

EF 55-200mm f/4.5-5.6 II USM

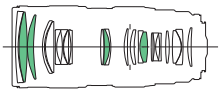
Super-compact and light, this lens is ideal for digital SLRs. Used on the EOS Digital Rebel, it's equivalent to an approx. 90-320mm lens. The 13-element design's new optical coatings are optimized for digital cameras; it's a lightweight telephoto that's perfect for any EOS SLR. It focuses down to under 4 feet (1.2m), and its Micro USM-powered AF is faster than ever, due to new electronics within the lens.



CA

EF 70-200mm f/2.8L IS USM

A spectacular professional lens that combines the virtues of the legendary EF 70-200 f/2.8L with Canon's newest Image Stabilization technology. The IS system now offers up to a three-stop improvement in hand-held ability, responds faster than ever before, and functions on a solid tripod. Additional improvements include faster AF response and tracking speed and weather-resistant construction. The entirely new optical system focuses even closer (to 4.6 feet/1.4m) than the non-IS version.

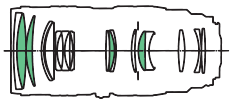


UD 4 · I/R · FT-M · IS · CA · DW-R

EF 70-200mm f/2.8L USM
•f/4 •1/1500 sec.

EF 70-200mm f/2.8L USM

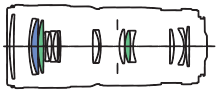
For years, the most popular professional lens in the entire Canon line-up. Superbly sharp and versatile, its constant f/2.8 maximum aperture makes it a favorite of photojournalists and low-light shooters. Four UD-glass elements contribute to its excellent performance. Full compatibility with the EF Extenders 1.4x II and 2x II extends its usefulness, and it's also compatible with the EF Extension Tubes 12 and 25, and the 77mm Close-up Lens 500D.



UD 4 · I/R · FT-M

EF 70-200mm f/4L USM

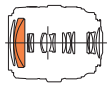
A truly professional L-series telephoto zoom lens, with reduced size and weight for applications where portability is important. Superb optically, it combines a Fluorite element with two UD-glass elements for outstanding contrast and performance. Its ring-type USM is fast, silent, and permits full-time manual focus—as well as the closest minimum focus of any of the L-series 70-200 designs. It's also compatible with EF Extenders 1.4x II and 2x II, and accepts an optional accessory tripod collar.



CaF2 1 · UD 2 · I/R · FT-M

EF 70-300mm f/4.5-5.6 DO IS USM

Aimed at the professional market, this ultra-compact zoom lens uses Canon's exclusive Diffractive Optics technology, now with three diffractive surfaces. It reduces overall lens size significantly and at the same time improves optical quality. Image Stabilization allows shooting at speeds up to three stops slower than otherwise possible, and works even on a solid tripod. Aluminum alloy construction of major barrel components insures a smooth, solid lens, and the zoom ring can be locked at the 70mm setting when the lens is stored.



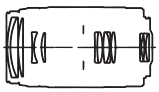
DO · I/R · FT-M · IS

Fluorite lens · UD lens · Diffractive Optical lens

EF 100-400mm f/4.5-5.6L IS USM
•f/14 •1/80 sec.

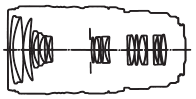
EF 75-300mm f/4-5.6 III

The most affordable of Canon's long telephoto zooms, this lens is excellent for subjects from portraits to wildlife and nature. It shares the same 13-element optical system as the 75-300mm USM lens, but uses a DC motor for autofocus. Close-focusing down to 4.9 feet (1.5m) allows filling the frame (at 300mm) with a subject the size of a dollar bill, and it's compatible with the Canon 58mm Close-up Lens 500D for even more spectacular shots of small objects.



EF 75-300mm f/4-5.6 IS USM

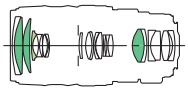
A significant lens in the history of Canon optics, this was the first SLR lens in the world to offer Image Stabilization—providing up to two stops of improvement in hand-held capability at slow shutter speeds. Its 15-element optical formula is unique, but it offers capabilities similar to Canon's 75-300 versions without IS. Image Stabilization gives this lens amazing real-world sharpness in many situations, and is especially advantageous when combined with lightweight camera bodies.



IS

EF 28-300mm f/3.5-5.6L IS USM

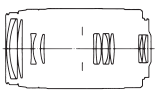
Over 10x zoom coverage and totally professional optical quality in one amazing lens. This lens is perfect for travel and any other application where having one versatile lens is desirable. Three UD-glass and three Aspherical elements combine for superb quality across the entire zoom range. Canon's Image Stabilization adds up to three stops of shake correction, making this lens useful even in low-light conditions. A powerful ring-type USM provides faster AF than ever before, and it close-focuses down to 2.3 feet (0.7m) at any zoom setting.



AL 2 UD 3 I/R FT-M IS CA

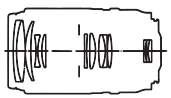
EF 75-300mm f/4-5.6 III USM

With the addition of a Micro USM for faster and even quieter autofocus, this version of the EF 75-300mm is well-suited for sports and other applications requiring fast AF. The USM version shares the compact size, close focusing range, and accessory compatibility of the non-USM lens. For many advanced amateurs, the 75-300 range is ideal as a versatile entry into telephoto photography.



EF 100-300mm f/4.5-5.6 USM

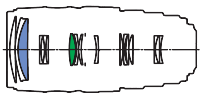
This affordable and lightweight zoom differs from the 75-300mm models with its higher-performance ring-type Ultrasonic focusing motor and superior AF speed. It also uses rear group focusing—so the front elements never rotate during focusing—and adds full-time manual focusing capability. It's excellent not just for outdoor sports, but any subjects requiring the versatility of a telephoto zoom.



I/R FT-M

EF 100-400mm f/4.5-5.6L IS USM

A truly professional L-series telephoto zoom lens with Image Stabilization, making hand-holding practical even at its 400mm focal length. Both a Fluorite and a Super UD-glass element ensure outstanding contrast and sharpness, and it accepts the EF Extenders 1.4x II and 2x II. A ring-type USM makes AF fast and silent down to 5.9 feet (1.8m); of course it offers full-time manual focus override. This durable L-series lens is regarded by many pros as one of the world's finest telephoto zooms for hand-held outdoor use.



CaF2 1 S-UD 1 I/R FT-M Float IS

Fluorite lens Aspherical lens
UD lens Super UD lens

Wide and Fast

Why a fixed-focal length wide-angle lens instead of a zoom? Lens speed, for starters—every lens in this series is f/2.8 or faster, so they're great in low light. Except for the EF 15mm f/2.8 Fisheye lens, their optics are characterized by excellent correction of linear distortion, so they're ideal for subjects like buildings and architecture. They make a great addition to zooms you may already own.

EF 15mm f/2.8 Fisheye
•f/16 •1/640 sec.

EF 24mm f/1.4L USM
•f/8 •5 sec.

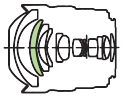
EF 15mm f/2.8 Fisheye

A full-frame fisheye lens that's ideal for special effects with any EOS camera, film or digital. It focuses as close as 8 inches (0.2m), and is tack-sharp throughout its focus range. Up to three gel filters can be inserted into its built-in rear filter holder.

I/R

EF 14mm f/2.8L USM

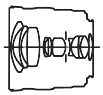
This is a true rectilinear ultra-wide-angle lens that's absolutely corrected for linear distortion—straight lines remain straight. It's outstanding for shooting in confined areas and interiors, and is often used by professionals because of the unique "look" its extreme wide-angle perspective provides. The optics are superb, highlighted by a ground and polished Aspherical element. It has a gel filter holder in the rear that allows up to three gel filters to be used for color correction.



AL I/R FT-M Float

EF 20mm f/2.8 USM

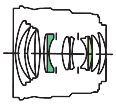
Optical performance, fast f/2.8 speed and ultra-wide-angle coverage make this a great choice for many applications—like interiors, scenics, travel and photojournalism. This lens uses a "floating" optical system for excellent sharpness even at its minimum focusing distance of under 10 inches (0.25m). With a ring-type USM and full-time manual focusing capability, it offers the speed and handling pros expect.



I/R FT-M Float

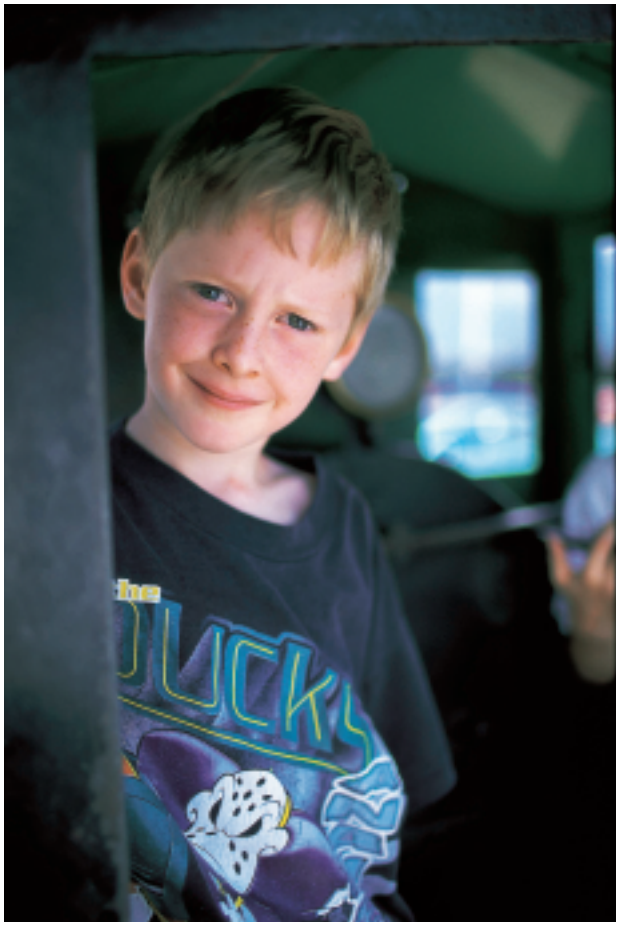
EF 24mm f/1.4L USM

That f/1.4 is not a typo; this is the fastest ultra-wide-angle lens in the world. The first EF lens to combine Aspherical and UD Ultra-low Dispersion glass L-series optical technologies, the 24mm f/1.4L provides outstanding sharpness and contrast even wide open. It focuses down to 10 inches (0.25m), and the AF is what you'd expect from a professional Canon lens with USM—fast and silent, with smooth full-time manual focus available at any time.



AL UD I/R FT-M Float

Aspherical lens UD lens



EF 35mm f/1.4L USM
•f/1.4 •1/500 sec.

EF 24mm f/2.8

Another superb ultra-wide-angle choice, with floating optics for superior performance throughout its focus range. It has a fast f/2.8 aperture that makes it a great alternative to a zoom lens for low-light shooting. Its rear-group focusing system reaches down to less than 10 inches (0.25m).

I/R Float

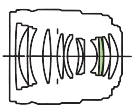
EF 28mm f/1.8 USM

Combine a fast f/1.8 aperture with 28mm wide-angle focal length, and add Canon's Ultrasonic Motor AF. The result is this surprisingly affordable fixed focal length alternative to wide-angle zooms that's ideal for low-light shooting. Internal, rear-group focusing means the front element never moves, so it's easy to use with filters and accessories. The autofocus is virtually silent, and full-time manual focus is always available.

AL I/R FT-M

EF 35mm f/1.4L USM

Long requested by professionals, it's the standard lens for many photo-journalists and others who value its low-light capability and performance. With the help of an Aspherical lens element, its contrast and sharpness are stunning, even wide-open at f/1.4. Solid construction, a powerful ring-type USM for smooth and fast AF, and full-time manual focusing make this a great lens for film or digital shooters.



AL I/R FT-M Float

EF 28mm f/2.8

The most affordable fixed focal length wide-angle lens in the Canon EF line-up continues to give benefits difficult or impossible to find with zooms. The fast f/2.8 aperture makes it easy to use in low light, and provides a bright viewfinder image in the camera. It focuses as close as 10 inches (0.25m) without accessories. And optically, it provides excellent edge-to-edge contrast and sharpness along with superior correction of linear distortion, so straight lines in a subject (such as architecture) remain straight.

AL

EF 35mm f/2

An affordable lens that's ideal for tasks like group photos and other applications calling for excellent optical performance and moderately wide focal length. It's compact and lightweight, and with f/2.0 speed, it's a compelling alternative to a wide-angle zoom lens for low-light shooting.

Aspherical lens

Standard and Medium Tele

Fast lenses are the rule here, with wide apertures that are great for low-light shooting as well as for throwing backgrounds out of focus. The 50mm lenses are the classic standard focal length on full-frame cameras, and prized by some shooters for the natural perspective they provide. The 85mm and 100mm designs are portrait-length telephotos, but they're great for all types of available light shooting.

EF 50mm f/1.4 USM

The ultimate "normal" lens in the EF system. This superb lens is sharp even wide-open, and of course its f/1.4 speed makes it perfect for available-light shooting. For many, it's an ideal lens to accompany a zoom when shooting in low-light conditions. Compact and affordable, it's the only lens in the EF system to combine the extra-small Micro USM and still provide full-time manual focusing when the lens is in the AF mode.

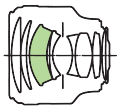
FT-M

EF 50mm f/1.8 II

Lightweight and affordable, this sharp lens with a fast f/1.8 aperture is an excellent first lens for those who prefer a fixed focal length; It makes an excellent addition to any photographer's system for available-light shooting. A traditional Gauss-type optical design ensures sharp performance even wide-open, and it focuses as close as 18 inches (0.45m).

EF 85mm f/1.2L USM

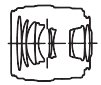
The fastest telephoto lens in the entire Canon EF line-up—and the world's fastest 85mm autofocus lens. This exquisite professional lens is obviously popular for its available-light capabilities, but its proven performance makes it ideal for portraits, fashion and even sports. A ground and polished large-aperture aspherical element provides thorough correction of spherical aberration. A ring-type USM means silent AF from 3 feet (0.9m) to infinity, and full-time electronic manual focusing is also available.



AL FT-M Float

EF 85mm f/1.8 USM

Sharp. Lightweight. Responsive. These are just a few adjectives that describe this terrific portrait-length telephoto lens. With a powerful ring-type USM and fast f/1.8 aperture, subjects zip into focus in the viewfinder. It's great for all types of work calling for moderate telephoto power, but comes into its own in low-light situations, and offers a 1/3-stop speed advantage over the 100mm f/2 USM lens.

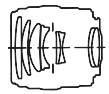


I/R FT-M

EF 85mm f/1.2L USM
•f/1.2 •1/750 sec.

EF 100mm f/2 USM

Another option in high-speed moderate telephotos, this compact lens is ideal for portraits and low-light work. Compared to the 85mm f/1.8 USM lens, it provides that little bit extra of telephoto power sometimes necessary outdoors or for candid shooting. Like the 85mm, it's super-sharp (even wide-open), and has fast USM autofocus along with full-time manual focusing.



I/R FT-M

Aspherical lens

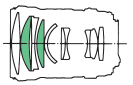
Long and Fast

These lenses combine great picture quality, telephoto "reach" and fast maximum apertures. They're brilliant for low-light shooting, and can be easily hand-held by most users. Outdoors, they make it easy to blur backgrounds and isolate the primary subject, and all L-series fixed focal length lenses 135mm and higher can be used with both the EF 1.4x II and EF 2x II tele converters for even more versatility.

EF 135mm f/2L USM
•f/2 •1/200 sec.

EF 135mm f/2L USM

One of the finest lenses of its type in the world today. This magnificent telephoto lens uses two UD-glass elements to provide incredible sharpness and contrast, even wide-open. It's perfect for outdoor portraits, but comes into its own in low-light situations. It focuses down to 3 feet (0.9m), and is fully compatible with both the EF 1.4x II and 2x II Tele-extenders.



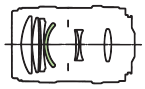
UD 2 I/R FT-M

EF 135mm f/2.8 with Softfocus
•Soft level: 2

EF 135mm f/2.8 with Softfocus
•Soft level: 0

EF 135mm f/2.8 with Softfocus

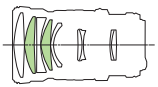
A unique, compact telephoto lens that gives the choice of razor-sharp images, or with the twist of a ring, two degrees of soft focus. It works by applying "softness over sharpness," using deliberate spherical aberration on top of a sharp "core" image at apertures from f/2.8 through 5.6; images taken at apertures smaller than f/5.6 are always sharp. Autofocus continues to function, with or without the soft focus in use. This lens is an ideal addition to a portrait or scenic photographer's arsenal. A perfect combination with a digital EOS SLR, with the camera enabling review of soft-focus effect on the LCD monitor.



AL 1 I/R

EF 200mm f/2.8L II USM

Lighter by more than 1.2 pounds (545g) than the 70-200 f/2.8L zoom lens, this fast telephoto lens is a perfect alternative for low-light shooting or just reducing weight in the gadget bag. Two UD-glass elements and internal rear-group focusing are among its optical highlights; and it's fully compatible with Canon's EF 1.4x II and 2x II Tele-extenders. A detachable hood is included, and Tripod Ring A (B) is available as an accessory.



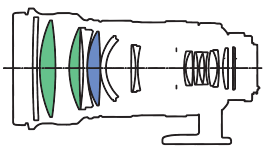
UD 2 I/R FT-M

Aspherical lens UD lens

EF 300mm f/2.8L IS USM
•f/3.5 •1/180 sec.

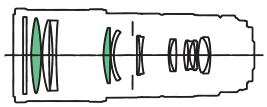
EF 300mm f/2.8L IS USM

Image Stabilization adds to what's already a legendary professional lens. The 300mm f/2.8L IS lens focuses closer (down to 8.2 feet/2.5m), offers the world's fastest autofocus when used with EOS bodies having 45-point AF, is gasketed and sealed against dust and moisture, and has a lightweight magnesium alloy barrel and tripod collar. Its image quality, aided by both Fluorite and UD-glass, is stellar, and its advanced IS even works on a rock-steady tripod—as well as on a monopod or when hand-held.



EF 300mm f/4L IS USM

Excellent optics and superb handling in a compact package with Image Stabilization. The IS allows safe hand-holding at shutter speeds up to two stops slower than otherwise possible—making it even more useful in low-light levels. It's less than half the weight of the 300mm f/2.8L IS, and it focuses to an incredibly close 4.9 feet (1.5m), filling the frame with a subject the size of a postcard. Like all of Canon's fixed focal length L-series lenses above 135mm, it's compatible with Canon's EF Extenders 1.4x II and 2x II.



EF 300mm f/4L IS USM
•f/13 •1/60 sec.

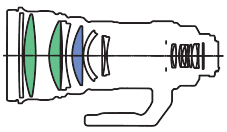
Fluorite lens UD lens

The Big Guns

The powerful Canon EF super-telephotos are world famous for their performance and ability to deliver sharp images of distant subjects, and they can be seen on the sidelines at sporting events around the world. But they're more than just great sports lenses – they're superb for wildlife, nature, scenics, and even outdoor fashion. Focusing performance is unmatched with Canon's ring-type USM being used in every super tele lens, and most offer Image Stabilization for sharp images even at slower shutter speeds. Canon super telephoto lenses are the ultimate testament to Canon's dedication to the serious photographer.

EF 400mm f/2.8L IS USM

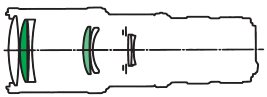
Virtually the standard lens for many professional sports shooters, this optical powerhouse is ideal for any film or digital application where you need telephoto power and low-light capability. With one Fluorite element and two UD-glass elements, it's one lens you won't need to stop down to get a good image. The Image Stabilization only adds to its all-around abilities. Details include a network of weather-resistant seals and gaskets, and a focus preset that enables instant return to a memorized focusing distance.



CaF2 1 · UD 2 · I/R · FT-M · FP · IS · AF-S · DW-R

EF 400mm f/5.6L USM

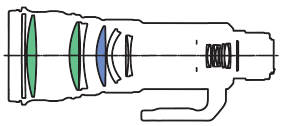
Light. Portable. Excellent handling. Sharp. And amazingly fast autofocus. The 400mm f/5.6L is all of these things, and a premier choice for wildlife and nature photographers; it's one of the finest telephoto lenses in the world for fast-moving subjects such as birds in flight or motor sports. It uses UD-glass elements to provide outstanding optical quality, even wide-open, and image quality is preserved when used with either the EF 1.4x II or EF 2x II Tele-extenders. It accepts 77mm filters, and has a built-in removable tripod collar.



UD 1 · S-UD 1 · I/R · FT-M

EF 500mm f/4L IS USM

Always a favorite of motor sports, wildlife and nature shooters, this relatively lightweight 500mm lens now adds Image Stabilization for an unbeatable package of handling and sharpness. Fluorite and UD-glass—a combination available from no other lens manufacturer—provide great performance, even with the EF 1.4x II or 2x II Tele-extender attached. It focuses down to less than 15 feet (4.5m), and offers the same weather-resistant design and incredible AF speed as its 300mm, 400mm and 600mm siblings.



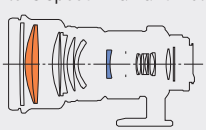
CaF2 1 · UD 2 · I/R · FT-M · FP · IS · AF-S · DW-R

EF 400mm f/4 IS DO USM
•f/4 •1/1250 sec.

World's First Diffractive Optics Lens for Photography

EF 400mm f/4 DO IS USM

An entirely new optical technology for SLR camera lenses—Multi-Layer Diffractive Optics—makes possible a 400mm super-telephoto lens that's about 1/3rd shorter and significantly lighter. Diffractive Optics don't end there; combined with a small Fluorite element, they permit almost total elimination of chromatic aberrations, and at the same time are able to combat spherical aberrations. Combining portability and easy handling, Image Stabilization, weather-resistant construction, superb optics and incredible AF performance, the 400mm f/4 DO IS lens is ideal for photographers who want super telephoto power along with good lens speed in a hand-holdable package.



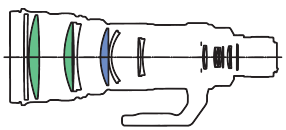
DO · CaF2 1 · I/R · FT-M · FP · IS · AF-S · DW-R

Fluorite lens · UD lens · Super UD lens · Diffractive Optical lens

EF 600mm f/4L IS USM
•f/10 •1/500 sec.

EF 600mm f/4L IS USM

An outstanding professional lens for bridging distances in sports, wildlife and many other applications—including commercial and fashion for the distinct "compressed" telephoto character and totally out-of-focus backgrounds its images can possess. Fluorite and UD- glass are combined for incredible image quality, even wide-open. Image Stabilization adds a new dimension to this long lens' usefulness, even in marginal lighting. It works beautifully with both 1.4x II and 2x II extenders, and now focuses as close as 17.5 feet (5.4m). It has the same weather-resistant gaskets and sealed focusing and focus pre-set rings as Canon's other Image Stabilized super-telephoto lenses.



Fluorite lens UD lens

Focal Length Comparison


15mm Fisheye


14mm


17mm


20mm


24mm


28mm

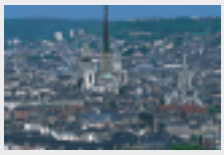

35mm


50mm


70mm


85mm


100mm

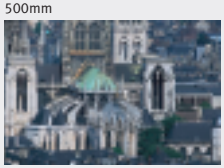

135mm

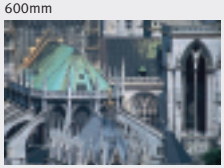

200mm


300mm


400mm


500mm


600mm


1200mm

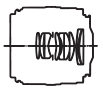
Discovering a Small World

It's a whole new world when you get in close, and Canon makes four EF macro lenses to do just that. The 50mm, 100mm and spectacular 180mm macro lenses are also great all-around lenses that can focus to infinity, while the MP-E 65mm macro lens is a special-purpose design strictly for high-quality and high-magnification shooting. To expand the possibilities with other EF lenses, Canon also offers the EF Extension Tubes, and high-quality screw-in Close-up Lenses.

MP-E 65mm f/2.8 1-5x Macro Photo
•f/11 •1/125 sec. (3.0x)

EF 50mm f/2.5 Compact Macro

A versatile macro lens with focusing from infinity down to half life-size (0.5x), and floating optics to ensure sharpness and contrast at any focusing distance. With f/2.5 speed, it's actually an ideal general-purpose normal lens that adds true macro capability, and it's great for photographing flat artwork or subjects because of its outstanding center-to-corner flat field performance. A dedicated optional accessory Life Size Converter, available separately, allows focusing down to full life-size (1x magnification) and its optics actually increase working distance from the front of the lens to the subject.



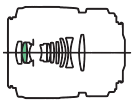
Float

Life-Size Converter EF

A unique accessory, dedicated exclusively to the EF 50mm f/2.5 Compact Macro lens. Unlike a conventional extension tube, the Life Size Converter EF has a 4-element optical design that acts like a Tele-extender, allowing magnifications from 0.26x to 1x (full life-size) while increasing the working distance from the front of the lens to the subject. Optical quality is outstanding with the Life Size Converter EF in place.

MP-E 65mm f/2.8 1-5x Macro Photo

This special-purpose lens is strictly for high-magnification shooting between 1x (life-size) and 5x. At its closest focus distance, you can fill the frame with a grain of rice. Its optics, dedicated for macro work, are superb. Focus is manual only, and there's a detailed magnification scale engraved on the barrel. It includes a tripod collar, and is fully compatible with Macro Ring Lite MR-14EX and Macro Twin Lite MT-24EX.

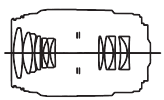


Float UD

EF 100mm f/2.8 Macro USM
•f/5.6 •1/6 sec.

EF 100mm f/2.8 Macro USM

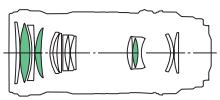
Many EOS shooters consider this to be two professional lenses in one: a superior-performance portrait-length tele with a fast f/2.8 aperture and lightning-quick USM AF; and a superb macro lens that focuses to life-size (1x) without accessories. It has a unique internal focusing design and floating optics for sharpness throughout its vast focus range, and allows a working distance of 5.9 inches (149mm) at life-size. Full-time manual focusing and an available Tripod Mount B with adapter round out this terrific macro lens.



I/R FT-M Float

EF 180mm f/3.5L Macro USM

One of the sharpest lenses in the entire EOS system, and a brilliant all-around telephoto lens that can focus to true life-size (1x)—with a working distance of almost 10 inches (0.25m) from the subject! Three UD-glass elements, a floating optical system, and internal focusing assure superb performance at any distance. It's even compatible with the EF 1.4x II and 2x II Tele-extenders. A powerful ring-type USM means fast and silent AF, along with full-time manual focus. It includes a tripod collar and detachable lens hood.



UD I/R FT-M Float

Close-up Lens 250D
Close-up Lens 500D
Close-up Lens 500

An effective close-up method with telephoto lenses—and the only close-up accessory that doesn't lose light. The 250D is optimized for lenses between 50 and 135mm, while the 500D works best with lenses from 75mm through 300mm. Both have a double-element design, so their optical quality is excellent. The Close-up Lens 500, a single-element design, offers an even more affordable alternative.

About Macro Magnification

A life-size macro lens—that is, a 1x magnification—records an image on film at its actual size. If you're photographing a flower, for example, and it has a diameter of 1 in., it will occupy 1 in. on your film. With a digital SLR, at 1x magnification, the image projected onto your camera's sensor will likewise be the same size at the sensor plane as the actual subject itself. Other macro lenses have lower or higher magnifications. A lens with 0.5x magnification will produce an image on film that is half the size of the actual subject. Your 1 in. flower, then, would only occupy 0.5 in. on film.

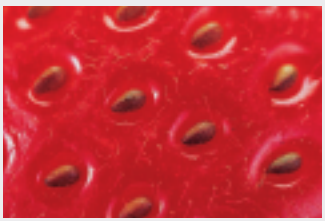
In the other direction, a 5x magnification lens will convert the 1 in. flower to a 5 in. diameter image. Since the entire image won't fit in the frame of your film, you will have an enlarged image of a detail of the flower.

Magnification is not the same thing as focal length. A 50mm lens and a 135mm might both be macro lenses with, for example, 1x magnification. The advantage of the longer lens is that it allows greater distance from a subject. You would choose the 135mm macro lens to photograph a butterfly or a bird. The 50mm lens would be more suitable for a subject that won't move away when you approach it.

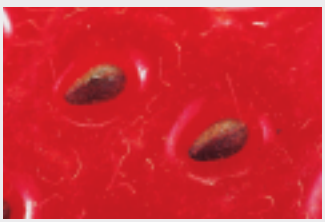
0.25x

0.5x

1.0x



3.0x



5.0x

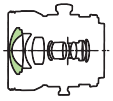
UD lens

Not a Tilt/Shift Lens. A Tilt/Shift System.

Canon's manual focus TS-E (Tilt/Shift) lenses have been solving advanced photographic problems for years. With their shift capability, the perspectives of straight lines, such as buildings, can be preserved. But it's their tilt capability that makes them so exciting to pros—the plane of focus can be altered to enhance apparent depth-of-field without stopping the lens to its smallest aperture. Most significant, Canon offers a series of TS-E lenses, so there's an answer for situations from architecture to studio portraits.

TS-E 24mm f/3.5L

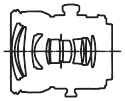
The widest tilt-shift lens in the Canon system, and a marvelous problem-solver for architecture, scenics and many other applications calling for a wide-angle perspective. With floating optics, it's sharp from infinity down to 1 feet (0.3m), and it uses a ground and polished Aspherical front element to assure excellent quality. Like all the TS-E lenses, it has a fully automatic diaphragm, so there's never a risk of forgetting to stop the lens down.



AL Float

TS-E 45mm f/2.8

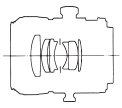
The normal lens in the TS-E system, and an excellent choice for product shooting and other applications calling for a natural perspective. It allows up to 11mm of shift off-center, and even more impressively, tilting of the front standard up to 8° to modify the plane of focus. Among the TS-E 45mm f/2.8's optical highlights are a floating optical system (focusing down to 1.3 ft./0.4m), and a precise rear-group focusing system.



Float I/R

TS-E 90mm f/2.8

Telephoto perspective, f/2.8 speed, and full tilt and shift movements in a compact, professional package. Impressively sharp, its ability to alter the plane of focus can provide a "look" that previously required a view camera to achieve. Pros have found it a great option for portraits, products and even fashion work. At its closest focus distance (1.6 ft./0.5m), it gives magnifications of about 1/3 life-size.



TS-E 45mm f/2.8
•f/4 •1/30 sec.

Aspherical lens

TS-E Lens Movements

TS-E lenses are capable of tilt and shift movements that greatly expand picture-taking possibilities. Tilt movements alter the angle of the plane of focus between the lens and focal plane, and shift movements move the lens' optical axis in parallel.

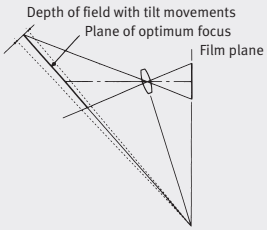
Tilt Movements

If you want to bring the entire field of flowers into focus, you could use a wide-angle lens and a small aperture to obtain a wide depth of field (Photo 1-a). With tilt movements, you can achieve this wide depth of field even at the maximum aperture. By tilting the center of the TS-E lens barrel, you can tilt the lens so that the plane of focus is uniform on the focal plane (Photo 1-b).

Photo 1-a
Uncorrected

Photo 1-b
Corrected with tilt

Using Tilt Movement to Focus an Oblique Subject Plane



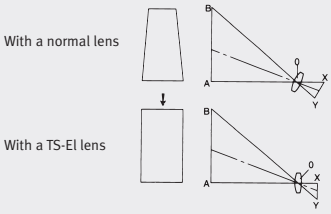
Shift Movements

Normally, when you point your camera up at a tall building, the building will look slimmer toward the top. It becomes trapezoidal (Photo 2-a). This perspective effect is more pronounced with shorter lens focal lengths, distorting the building even more. By keeping the camera level, and using the shift function to raise the lens instead, this perspective effect can be corrected. With the camera's focal plane set parallel to the building, shifting the lens upward will obtain a more rectangular-looking building (Photo 2-b).

Photo 2-a
Uncorrected

Photo 2-b
Corrected with shift

Using Shift Movements to Focus Tall Building



The Possibilities are Endless

Even with the world's most versatile lens system, there's more you can do. Select Canon telephoto lenses are compatible with our tele extenders, increasing their telephoto power and making them even more useful in specific situations. And for moving in close—from getting tighter portraits with a tele lens to extreme close-ups with a short focal length lens—the EF Extension Tubes are a perfect addition. Perhaps most appealing is the affordability and easy portability of these accessories.

Extender EF 1.4x II

A powerful addition to any serious photographer's arsenal, this compact extender is compatible with every fixed focal length L-series lens 135mm and over—as well as the 70-200/2.8L, 70-200/2.8L IS, 70-200/4L, and 100-400/4.5-5.6L IS lenses. It multiplies the lens' marked focal length 1.4 times, with a light loss of only one stop. Most impressively, its superior optics preserve the lens' inherent image quality. New with the version II extender are improved internal anti-reflective blackening, and enhanced weather resistance.

DW-R

Extender EF 2x II

A totally new 7-element optical design for this version II extender means superior image quality combined with a doubling of the lens' marked focal length (with a two-stop reduction in effective aperture). Compatible with the same lenses as the 1.4x II extender, the EF 2x II still allows autofocus with any EOS body when used with a lens f/2.8 or faster. It features an improved anti-reflection internal design and weather-resistant exterior, including seals at its front and rear lens mounts, that match those on Canon's newest professional lenses and camera bodies.

DW-R

Extension Tube EF 12 II
Extension Tube EF 25 II

Extension tubes are one method of getting closer with EF lenses. A powerful tool when attached to standard and wide-angle lenses, they're also used with telephotos to get just a bit closer. With any lens, the longer the extension tube, the greater the close-up effect. The 12mm EF 12 II is often used with wide-angle lenses, while the longer EF 25 II is a better choice for normal or telephoto lenses. Auto exposure continues to work reliably, but manual focus is recommended in most instances. The version II extension tubes are also compatible with EF-S lenses.

Without Extension Tube

With Extension Tube

EF 200mm f/2.8L II USM plus Extender 2x II

Autofocus with EF Tele Extenders:

AF is possible when the effective maximum aperture of the EF lens/EF extender combination is f/5.6 or faster. AF is automatically disabled when the combined maximum aperture of the lens plus extender is slower than f/5.6.

With EOS bodies using the 45-point AF system (EOS-1D Mark II, EOS-3, etc.), AF is possible at the center AF point only at effective apertures f/8 and faster; the remaining 44 AF points require f/5.6 or faster effective maximum apertures for AF operation.

Autofocus with EF Extension Tubes:

AF is possible in some circumstances, but generally it is recommended to focus manually. This is especially true at close distances when using short focal-length lenses with an Extension Tube.

Technology Where It Counts

Canon's innovations put your images on film quickly, quietly, and easily with outstanding results.

Ultrasonic Motors (USM)

The Ultrasonic Motor (USM) in Canon EF lenses is the world's first lens-based motor of its type. Based on a totally new technology, the motor spins by ultrasonic oscillation energy. The USM is quiet and quick. It has made EF lenses almost noiseless and autofocusing fast, precise and practical. The direct-drive construction is very simple, with no gear train. This makes it durable and efficient. It also consumes little power. Two types of USM are used: Ring-type USM and Micro USM. The former type is found in large-aperture and super telephoto lenses, while the latter is used in more compact lenses. Using the optimum type of USM in the lens results in maximum efficiency and effectiveness.

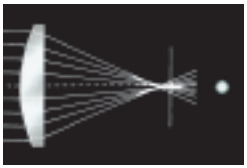
Ring-type USM

Micro USM

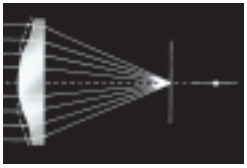
Aspherical Lenses

Ordinary spherical elements have an inherent flaw in that the point of focus for the lens center does not match that of the lens periphery. Spherical aberrations of large-aperture lenses and distortion by ultra-wide-angle lenses cannot be resolved with spherical elements alone. The Aspherical lens element was therefore developed. The curvature of the lens element is calculated and shaped to achieve the ideal single point of focus. The result is high contrast with minimal flare, even with a large-aperture lens. Distortion can also be effectively corrected in ultra-wide-angle lenses. Canon started to develop manufacturing technology for Aspherical elements early on. We eventually succeeded in establishing a mass-production grinding and polishing process with a polishing precision of 5/10,000 mm. In 1971, Canon marketed the FD 55mm f/1.2AL lens, the world's first large-aperture Aspherical lens for SLRs. This was followed by many other Canon lenses incorporating Aspherical elements and they were well received.

Also, Canon developed mass-production technology for glass-molded Aspherical elements and replicated Aspherical lenses. The former was produced by an ultra-high-precision Aspherical lens-molding machine which shaped the glass directly. For the latter, the Aspherical surface was formed by ultraviolet-hardened resin film applied on a spherical element. Canon has developed numerous compact-size lenses, taking full advantage of Aspherical elements to attain high image quality.



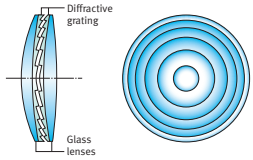
Spherical aberration of spherical lens.



Convergence of parallel light rays by an Aspherical lens.

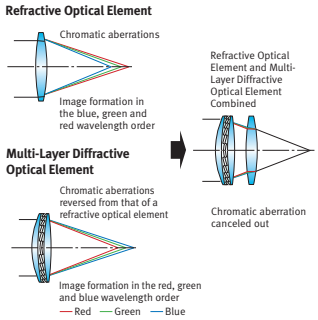
Diffractive Optics

Another world's first in camera lens optical design, Canon introduced new technology in order to build a super telephoto that complements its latest compact film and digital SLR cameras. This cutting-edge technology employs diffractive optical elements that use the principle of diffraction to change the direction of a lightwave's path. This revolutionary element has Aspherical characteristics, which help define superior maximum aperture image quality, as well as optical qualities superior to UD-glass to totally correct color fringing. The Multi-Layer Diffractive Optical Elements exhibit outstanding ability to correct chromatic aberrations (color defects), and are especially effective in super telephoto lens design, where these specific types of optical defects are most likely to happen. You can see how well the technology works in your own pictures by examining the straight edges of a subject. You will see a crisp, clear edge without the telltale, prismatic color fringing that is visible with images shot using inferior optics.



Multi-Layer Diffractive Optical Element Construction

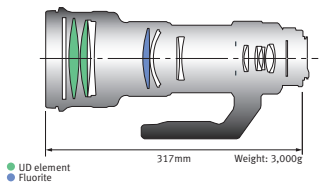
Glass lens elements refract, or bend lightwaves, as they pass through to form an image. That's simply the naturally occurring physics of light. We use multiple elements and special glass to help keep the waves focused like a pinpoint instead of spreading them into the rainbow of color seen when light passes through a glass prism. To diffract a lightwave means that the ray goes through a change in direction before passing through the lens. The change in direction is caused by a diffraction grating—very fine parallel grooves or slits on the surface. Canon found that using a concentric diffraction grating that gets smaller toward the edges—some as fine as tenths of a micrometer—solved many of the inherent physical limitations of camera optics. The design also makes it possible to obtain the same effect as an Aspherical lens. And taking the technology a step beyond, we actually use two single-layer diffractive optical elements whose diffraction gratings are bonded together face-to-face. Since longer wavelengths form an image closer to the lens due to the large diffractive angle, and shorter wavelengths form an image farther from the lens due to the smaller diffractive angle, putting the DO elements with conventional glass optics actually cancels out each other's chromatic aberrations and is exceptionally effective in correcting this optical defect. The diffraction that occurs with Canon's Multi-Layer Diffractive optical elements actually corrects the optical system's chromatic aberrations and improves the image formation performance.



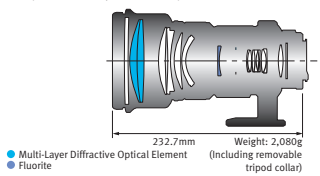
Correction of Chromatic Aberration by the Multi-Layer Diffractive Optical Element

The net result of Canon's DO technology is a lens design with reduced size and weight while offering higher image quality than a comparable focal length lens that incorporates conventional glass optical elements. It means a new generation of high-performance lenses that complement the more compact designs of our latest SLR film and digital cameras.

400mm f/4 Lens Designed with Refractive Optical Elements Only



400mm f/4 DO IS USM
(Incorporates Multi-Layer Diffractive Optical Element)



Lens Downsizing with the Multi-Layer Diffractive Optical Element

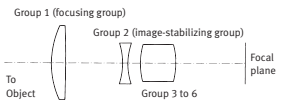
Note: If a very bright spotlight like a mercury lamp is photographed with a DO lens, a ring of light may occasionally appear around the light source, due to the imaging characteristics of the Multi-Layer Diffractive Optical Element.

IS

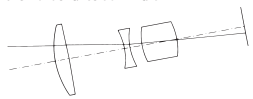
Image Stabilizer

No matter how great the lens is, camera shake can spoil the shot. Blurred photos due to camera shake usually occur when the shutter speed is slower than the reciprocal of the lens focal length. For example, a shutter speed slower than 1/200 sec. at the 200mm focal length can invite a blurred photo caused by camera shake. In such cases, a tripod is necessary. However, a tripod can be a heavy and troublesome burden when you go hiking or traveling. There are even places where using tripods is prohibited. Using a slow shutter speed then becomes difficult. To resolve this problem, Canon became the first manufacturer to incorporate an Image Stabilizer in an SLR camera lens. Optical shake is detected by gyro sensors which provide the data necessary to shift the image-stabilizing lens group in parallel to neutralize the shake. This increases the usable shutter speed range by up to 3 full steps for hand-held shooting. All L-series, IS lenses have two IS modes. One is for normal image stabilization and the other is for panned shots. With a monopod, the Image Stabilizer on all IS lenses operates normally as during hand-held shooting. Also, all IS super telephoto lenses as well as the EF 28-300mm f/3.5-5.6L IS USM and the EF 70-200mm f/2.8L IS USM have a mechanism that shuts off the Image Stabilizer while the lens is mounted on a tripod.

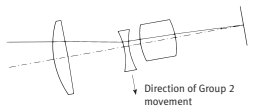
1: No camera shake



2: Lens front shakes downward



3: Image-stabilizing group counteracting downward camera shake



How the Image Stabilizer Works in the EF 75-300mm f/4-5.6 IS USM

With Image Stabilizer on

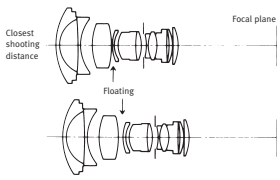
With Image Stabilizer off

Float

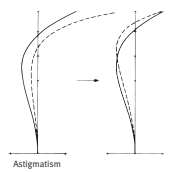
Floating System

Ordinary lenses are designed to give the best results when the correction of aberrations is most effective. This is usually at the most commonly-used focusing distances. At other focusing distances, especially at the closest focusing distance, aberrations tend to appear. Canon's floating system suppresses aberrations at close focusing distances. This system adjusts the gap between certain lens elements in correspondence to the focusing distance. The aberration is effectively corrected. The result is high image quality with aberrations suppressed at all focusing distances.

TS-E 24mm f/3.5L Floating System



Floating Effect (TS-E 24mm f/3.5L)



Floating System

CA

Circular Aperture

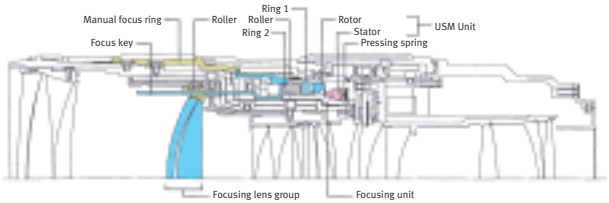
Certain Canon lenses feature a new Circular Aperture diaphragm unit, which uses curved aperture blades to provide for a more rounded opening as the lens is stopped down. It's especially effective at rendering out-of-focus background highlights as natural rounded shapes. In lenses such as the EF 70-200mm f/2.8L IS lens, the lens opening is virtually circular from f/2.8 to f/5.6. These lenses retain all the benefits previously available with Canon's Electromagnetic Diaphragm — smooth and consistent stop-down operation (even at up to 10 fps with the EOS-1v), near-silent aperture control, and total absence of mechanical levers or switches in the lens mount.

FT-M

Full-Time Manual Focusing

Canon EF lenses and EOS cameras have very high AF precision. Optimum focus can be achieved quickly for almost any shooting situation. Recent EOS cameras have been equipped with multiple focusing points for higher flexibility in composing a photo while using AF. Picture-taking is even more flexible with Canon's full-time manual focusing which overrides the autofocusing mode. Lenses with this feature allow you to switch to manual focusing even in the AF mode. You can keep looking through the viewfinder and touch up the focus manually without switching the focus mode switch. Since the focusing ring does not rotate during autofocusing, we could make it wider for better holding comfort and easier manual focusing. Another ergonomic design which lets you convey your intentions quickly.

Input pulse board for electronic manual focusing



Full-time mechanical manual focus mechanism

Full-time manual focusing comes in two types. One is electronic manual focusing where the rotation amount of the focusing ring is detected and the focusing motor is driven electronically. The other type is mechanical manual focusing where the rotation of the focusing ring adjusts the focus mechanically.

DW-R

AF Stop Feature

AF stop is featured on the EF 300mm f/2.8L IS USM, EF 400mm f/2.8L IS USM, EF 400mm f/4 DO IS USM, EF 500mm f/4L IS USM, and EF 600mm f/4L IS USM lenses. If something passes between the camera and subject during autofocusing, pressing the AF stop buttons momentarily locks the AF to prevent the focus from shifting to the obstruction passing by. After the obstruction is gone, the focus is still maintained on the subject and you can quickly resume shooting. The AF stop buttons are positioned at four locations around the lens grip at the front of the lens for easy access during both horizontal and vertical shooting.

FP

Focus Preset

With the focus preset feature, you can set the desired focusing distance in memory and later instantly focus the lens at that distance. Normal picture-taking and focusing are possible even while focus preset has been set. At a soccer game, for example, you can preset the focus for the goal. You can focus normally while the player approaches the goal, then when the ball is shot into the goal, you can obtain instant focus.

DW-R

Dust- and Water-Resistant Construction

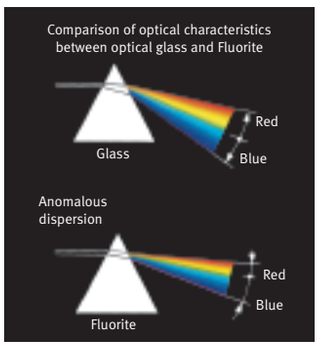
The EF 300mm f/2.8L IS USM, EF 400mm f/2.8L IS USM, EF 500mm f/4L IS USM, EF 600mm f/4L IS USM lenses and all subsequent L-series lenses are highly dust- and water-resistant. The switch panel, exterior seams, and drop-in filter compartment have rubber linings. Moving parts such as the focusing ring and switches are also designed to prevent water and dust from entering. These lenses can therefore be used in harsh conditions without dust and water getting inside.

The lens is equipped with a rubber ring on the mount to improve its dustproofing and waterproofing characteristics. As the lens is repeatedly mounted and detached, the rubber ring will leave fine abrasion marks on the outside of the camera mount. This will not affect operation.

CaF2 UD S-UD

Fluorite (CaF2) and UD-Glass

The refraction of light differs depending on the wavelength. The point of focus therefore differs depending on the different wavelengths or colors. When the different wavelengths are focused at different points, the colors look smeared. This is called chromatic aberration. The longer the focal length, the more pronounced chromatic aberration becomes. Usually, an achromatic element is used in a lens to correct chromatic aberration. However, normal optical glass can only be corrected for two primary spectral colors. An exception to this limitation is Fluorite, an ideal material. Fluorite, which is crystalline, has abnormally low refraction and dispersion characteristics, which optical glass cannot achieve. It also has anomalous dispersion from the green to blue wavelengths. Canon developed production technologies to manufacture Fluorite. By incorporating Fluorite in lenses, the points of focus of the three primary spectral colors of red, green, and blue all meet at one point for ideal correction of chromatic aberration. There is also UD-glass, which is a special type of optical glass whose properties nearly match those of Fluorite. The effect of two UD-glass elements is equivalent to having one Fluorite element. And one super-UD-glass element gives almost the same effect as one Fluorite element.



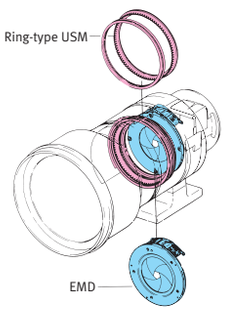
Fluorite and UD glass

Large, Fully Electronic Mount System

The conventional interface between the lens and camera body is mechanical, with the use of engaging levers and gears. This method causes physical problems such as wear and rattle. This system is limited and more diverse information cannot be exchanged. Canon EF lenses do not use such mechanical links at all. About 50 items of information are exchanged as digital signals between the lens and camera in real time. This enables high-speed and high-precision control. And since the lens mount diameter is an ample 54mm, special lenses such as large-aperture lenses and TS-E lenses can be used. The EF mount is an advanced interfacing system with infinite possibilities.

Built-In Motor and EMD

Canon EF lenses (except TS-E and MP-E lenses) have a built-in AF motor. Compared to camera body-based AF motors, lens-based motors have driving energy with lower transmission loss. The optimum AF motor for a particular lens can also be selected and installed. The AF operation is therefore quick, quiet and highly precise. The lenses also have an EMD (Electromagnetic Diaphragm) to control the aperture electronically. The aperture can be set either with an electronic dial or with the electronic pulse signal sent according to the exposure reading. Aperture control precision is therefore unmatched.



Built-in motor and EMD

I/R

Inner Focusing and Rear Focusing

An inner focusing lens has the focusing lens group(s) in front of the diaphragm, while a rear focusing lens has the focusing lens group(s) behind the diaphragm. Both focusing systems allow the focusing lens group to be small. This minimizes the load on the actuator which drives the autofocus. In turn, the AF speed is faster. The whole optical system can also be made more compact. Also, since the lens does not rotate during focusing, the effects of a circular polarizing filter or gelatin filter remain intact.

EF-S

EF-S Lenses

Some digital SLR imaging sensors are smaller than 35mm film, and this means that any lens used has its field of view cropped compared to a full-frame camera. This can be a problem with wide-angle lenses, which now "act" more like a standard lens. Canon's EF-S lenses are exclusively designed for digital SLRs with the APS-C 22x15mm sensor size. Optimized for digital, these lenses not only cover a smaller imaging circle, but equally important they have a shorter "back focus" distance–that is, the rear of the lens is closer to the imaging sensor than standard EF lenses. Because of this, EF-S lenses can only be used on EOS camera bodies specifically designed to accept them. Four EF-S lenses have been announced as of early 2005: the EF-S 18-55mm standard zoom lens (field of view equivalent to a 28-90mm lens on a full-frame camera), the EF-S 17-85mm IS zoom lens (28-135mm equivalent), the ultra-wide EF-S 10-22mm zoom (16-35mm equivalent), and the EF-S 60mm Macro lens.

Description of Lens Designation

The lens designations follow a standard format to identify the lens.

EF 75-300mm f/4-5.6 IS USM

- **EF 75-300mm** — Focal Length: Indicates the focal length range from the shortest to longest length. (See below for details.)
- **f/4-5.6** — Maximum Aperture: Indicates the lens' maximum aperture. (See below for details.)
- **IS** — Special Function: Any special feature such as an image stabilizer, macro feature, etc., is indicated.
- **USM** — USM: Indicates that the lens uses an Ultrasonic Motor for autofocusing. (See page 34 for details.)

Focal Length

In the 35mm format, a focal length of 50mm is closest to what the eye sees. This focal length is used as a reference point for lens categories. For example, lenses with a shorter focal length are called wide-angle lenses, while those with a longer focal length are called telephoto lenses. Single focal length lenses have only one focal length, while zoom lenses have a range of focal lengths.

Angle-of-View

This indicates how much coverage of a scene you can see through the lens. Telephoto lenses have a narrower angle of view than wide-angle lenses.

Angle-of-View and Perspective

Perspective refers to the size relationship between the near and far objects that you can see at the same time. When distance is short and the angle-of-view is wide (with a shorter focal length), the perspective becomes more apparent. And at greater distances with a narrow angle of view (with a longer focal length), the perspective becomes less apparent. The image also becomes more compressed, with the far objects looking like they are right behind the near objects.

Maximum Aperture

This indicates the speed of the lens. A fast lens has a large maximum aperture, allowing more light to enter. The smaller the maximum aperture's f-number, the larger the aperture opening is. A larger maximum aperture makes the image look brighter and easier to see through the viewfinder. You can also use a faster shutter speed or obtain better background blur. On the other hand, a smaller maximum aperture (the f-number is larger) allows the lens to be more compact and light. Single focal length lenses have only one maximum aperture, while zoom lenses may have two, one for each end of the focal length range. For example, a EF 28-80mm f/3.5-5.6 lens has a maximum aperture of f/3.5 at 28mm and f/5.6 at 80mm.

Aperture and Shutter Speed

Under the same light level, if the aperture opening is made larger by one step, the shutter speed can be increased by one step. For example, if an aperture of f/5.6 and shutter speed of 1/60 sec. are set, adjusting the aperture to f/4 will enable a shutter speed of 1/125 sec. to be used. An aperture of f/2.8 will allow a faster shutter speed of 1/250 sec. while the same exposure level is maintained.

Depth-of-Field

Normally, there is only one point of optimum focus. However, we often see objects in front of or behind this point also in focus. This is made possible by a wide depth-of-field.

Depth-of-Field with the Aperture and Focal Length

The depth-of-field is mainly determined by the lens focal length, aperture and subject distance. For example, if a wide-angle lens is used at the minimum aperture, almost everything in the picture will be in focus. However, if a telephoto lens is used at maximum aperture and focused on a relatively close subject, the background will be really blurred, making the subject in focus stand out.

Canon EF Lens Accessories

General Purpose Filters for Black and White or Color Film

Sky (1A), Haze (UV-1)
• 52mm • 58mm • 72mm

Softmat Filters

Softmat filters mildly soften the focus for flattering portraits and dreamy landscapes. These filters utilize the effect of diffraction which occurs between light passing through the transparent part and light passing through the coated part. Use Softmat No. 1 filter for a gentle softfocus effect, and Softmat No. 2 for a stronger effect.
No.1, No.2
• 52mm • 58mm

Circular Polarizing Filters PL-C

Polarizing filters enhance picture quality by blocking harmful reflected light. Use them to reduce polarized light reflections from glass and water surfaces or to improve color saturation. Simple to use, circular polarizing filters (such as Canon's PL-C) polarize light circularly, rather than linearly, so it does not interfere with autofocus or TTL light metering.
• 52mm • 58mm • 67mm • 72mm • 77mm (Type II)

Loupe 8x & 4x

The Canon Loupe 4x is a high-performance magnifier for viewing the entire picture area (24 x 36mm) of a 35mm-format slide or negative. With three lens elements in three groups, chromatic aberration and distortion are effectively corrected to give crystal-clear images. Eye fatigue is not a problem even after prolonged use. Loupe 8x is another magnifier for viewing the entire picture area, but with special emphasis on a 24mm-diameter area at the center. The four lens elements in four groups attain high performance and a high magnification. All elements have Super Spectra Coating to make image viewing clear enough for you to effectively check the quality of photos taken with EF lenses. These two loupes can make your evaluation of photos more accurate.

Drop-in Filters

Drop-in Filters PL-C

Drop-in Filters PL-C can be rotated from the outside without removing them from the lens for precise control. The 48mm PL-C filter can be used with the following lenses: EF 200mm f/1.8L USM and EF 1200mm f/5.6L USM. The 52mm PL-C filter is designed for use with the EF 300mm f/2.8L IS USM, EF 400mm f/2.8L IS USM, EF 400mm f/4 DO IS USM, EF 500mm f/4L IS USM and EF 600mm f/4L IS USM.

Drop-in Gelatin Filter Holders

These glass-backed holders accept up to three commercially available cut-to-size gelatin filters for rear-insertion lenses. A 48mm holder is provided standard with EF 200mm f/1.8L USM and EF 1200mm f/5.6L USM; and a 52mm holder, with EF 300mm f/2.8L IS USM, EF 400mm f/2.8L IS USM, EF 400mm f/4 DO IS USM, EF 500mm f/4L IS USM and EF 600mm f/4L IS USM.

Drop-in Screw Filter Holders With Protect Filters

The enclosed regular filter can be exchanged with other commercially available screw-type filters. Note that only filters with correct filter frame thickness can be mounted on the lens.
• 48mm • 52mm

Only Canon filters are guaranteed for use with EF lenses.

Gelatin filter Holders III & IV

Gelatin Filter Holder III

Gelatin Filter Holder IV

Gelatin Filter Holder III uses 3 x 3-inch gelatin filters and Gelatin Filter Holder IV uses 4 x 4-inch gelatin filters. Holders III and IV both provide extension hoods and 52mm, 58mm, 67mm, 72mm and 77mm adapters. Refer to the EF Lens Accessory Table for information on lens combinations.
• 52mm • 58mm • 67mm • 72mm • 77mm
• Adapter III for EF 50mm 1: 1.4

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