MACRO MAKING SMALL THINGS BIG

- EXPOSURE
- LENSES
- ACCESSORIES

Canon Academy

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At the Canon Academy you will find inspiration and expertise for your photography and videography. Whether in a workshop with our trainers or in our online programme (available live or 24/7):

We share our experience with enthusiasm and passion.

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CLOSER INSTEAD OF COVERING IT ALL

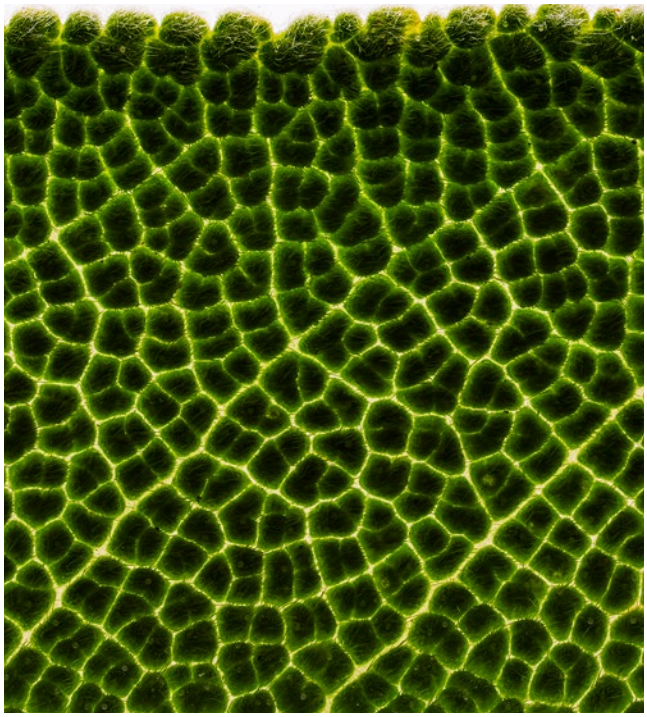
Intro

With many subjects, the aim is to get as much of "everything" in the picture as possible. In macro photography, the opposite is true: when taking close-ups, it is important to make the subject as lifelike and detailed as possible. This is because close-ups or macro shots draw the eye to details that remain hidden at normal viewing distances. To capture small objects, fine structures or details as spectacular macro compositions, you need to get close to the subject. This guide explains what to look out for when taking close-ups and what equipment you need to take impressive macro photos and videos.

EXPOSURE: APERTURE, SHUTTER SPEED AND ISO SENSITIVITY

The aperture of the lens determines the distribution of sharpness in the image. The smaller the aperture opening (i.e. large aperture, e.g. F16), the greater the depth of field. The larger the aperture opening (i.e. the smaller the aperture value, e.g. F2.8), the smaller the depth of field in front of and behind the point of focus.

At the large image scales used in macro photography, the depth of field is much smaller than when shooting at normal distances, due to the laws of optical imaging. This means that to achieve a large depth of field at close range, for example to get a flower in focus from front to back, you need to stop down much more than usual.



Tip: For more information and practical tips on exposure, see the Canon Academy Guide on the subject.

However, this means that less light reaches the sensor due to the smaller aperture. A longer shutter speed is therefore required to get the correct exposure. This increases the risk of camera shake and therefore the risk of blurred images of moving objects, such as flowers in the wind or insects.

It is important to be aware of this: Any movement of the subject and camera shake when shooting handheld will have an effect proportional to the larger image scale: At a reproduction scale of 1:1, one millimetre of movement in the subject corresponds exactly to one millimetre on the camera sensor.

When taking macro shots, it is therefore always advisable to fix the camera on a tripod if possible.

Short exposure times counteract motion blur in the image. The larger the image scale and the stronger or faster the movement, the shorter the exposure time must be to keep the subject in focus. For static subjects, such as macro still life, the shutter speed is irrelevant. When the camera is mounted on a tripod, you can also use long exposure times.

The sensitivity setting plays an important role here: using a higher ISO sensitivity level, e.g. ISO 1600, allows you to use an exposure time eight times shorter than ISO 200: 1/500 second can be used instead of 1/60 second. Unfortunately, there are limits to how far you can turn the sensitivity dial: At very high ISO values, noise becomes an unwanted side effect.

Conclusion: When taking macro shots, it is important to think carefully about what exposure factors affect the image and how - and what is important in the scene.

WHAT TO DO ...

... when taking macro shots of still life subjects?

Stop down –> more depth of field, but longer exposure times –> camera shake

Recommendation: Use a tripod and/or macro lenses with IS and/or higher ISO settings.

... when taking macro shots of moving subjects?

Large aperture, select fast shutter speed –> 'freeze' movement –> shallow depth of field

Recommendation: Choose a higher ISO value or use a macro flash light.

MACRO LIGHTING

Like any photo, macro photography "lives" from light that brings out the colours and contours of the subject.

When the camera is very close to the subject, there is little space between subject and camera, e.g. for flash. The built-in flash cannot be used for close-up photography. Special macro flashes or "unleashed" Speedlite flash units give you more room to manoeuvre when lighting.

Problems can also arise when photographing in natural light, for example when shadows from the camera and photographer are cast on the subject.

The distance between subject and lens can be increased by using a macro lens with a longer focal length, such as the Canon RF 100mm F2.8 L Macro IS USM.

Macro RingLite
MR-14EX II

Macro Twin Lite
MT-26EX-RT

The EOS system offers a range of solutions for illuminating close-up subjects or supplementing existing light. The Canon Ringlite MR-14EX II is a ring flash that attaches to the front of the lens. It provides even, shadow-free lighting at close range.

The Macro TwinLite MT-26EX-RT, on the other hand, uses two independently adjustable flash tubes to provide accent lighting for objects at close range like in a mini photo studio and to enable light and shadow gradients.

Both Macro Flashes are compatible with the EOS E-TTL system, which means that both flash and ambient light are metered through the lens. This allows precise control of lighting at close range.

The macro flash units can also be used in conjunction with other Speedlite flash units. These can be used, for example, to create accent lighting in the background. The E-TTL control helps to achieve the perfect flash exposure.

RF 100mm F2.8 L
IS Macro USM

Macro Twin Lite
MT-26EX-RT

EOS R5 Mark II

EOS R6 Mark II

EQUIPMENT

If you want to make small things big, pay attention to the details when buying a camera and lenses.

Most cameras come with a "basic kit" for close-up photography. There is often a special scene mode for close-ups, usually marked with a flower symbol. Many lenses also allow you to get relatively close to your subject without additional accessories. But: "relatively close" does not mean "very close".

This is where the "specialists" come in. The macro range starts at a reproduction scale of 1:2. A reproduction scale of 1:2 means that the subject is reproduced on the sensor at half its original size. A reproduction scale of 1:1 reproduces the object as large as it is in reality.

So, if you take a picture of a small coin at 1:1, the image on the sensor will be the same size as if you had placed the coin directly on the sensor.

Similarly, the resolution of detail in a macro shot is much higher than in a picture taken at a smaller reproduction scale from which you are only taking a section.

Tip: Focus stacking involves combining several shots with different distance settings. This allows you to artificially 'stretch' the very shallow depth of field for close-ups. Of course, this only works with still subjects. With the EOS RP, the focus stacking function is integrated into the camera.

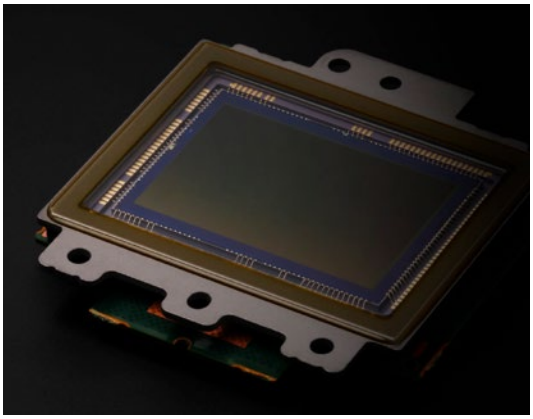
Fascinating macro shots can be taken right from the start with any EOS R system camera. Thanks to the interchangeability of lenses, the macro capabilities of the camera can be extended step by step with special lenses. As well as the lens, there are a number of other camera features that make EOS R camera suitable for macro photography.

The size of the sensor

The size of the image sensor is an important factor in macro photography, as it is directly related to the depth of field. For the same aperture, cameras with a smaller sensor will produce a greater depth of field. This means that it is not necessary to stop down as much.

This increases the exposure latitude. APS-C like the EOS R7 cameras and lenses are also more compact and lighter than full-frame cameras.

Canon cameras with an APS-C sensor (EOS R7, EOS R10, EOS R50, EOS R100) are ideal for beginners in macro photography.



Full frame cameras offer the highest level of detail when used with a macro lens.

Variable Display

An adjustable display is particularly useful for macro shots. Especially when the camera is placed close to the ground to get plants or animals in front of the lens.

EOS R camera displays can be rotated and swivelled for advanced control of image and composition. Touch screen functions simplify camera settings.

Camera Connect App

Canon EOS cameras with built-in WiFi can be operated wirelessly using the Canon Camera Connect app. This free app allows you to control the field of view, aperture and exposure time.

You can also trigger the camera without touching it, like a remote shutter release, to avoid blur caused by vibrations when the shutter button is pressed.

Ready for a new connection?

Connect your Apple or Android mobile device to your camera and you can easily transfer and share your images.

Download on the App Store

ANDROID APP ON Google play

RF 24mm F1.8
Macro IS STM

RF 35mm F1.8 IS
Macro STM

MP-E 65mm F2.8 1-5x
Macro Photo

RF 85mm F2
MACRO IS STM

RF 100mm F2.8 L
IS Macro USM

LENSES FOR THE CLOSE-UP

Unlike conventional lenses, which are designed for distant subjects and normal magnification, macro lenses offer the highest imaging performance for close-up subjects and an image scale of 1:2 to 1:1. Magnifying lenses, such as the Canon MP-E 65mm F2.8 1-5x Macro Photo, even achieve magnifications of up to 5:1, allowing subjects to be magnified five times. This special EF lens needs a mount adapter to be adapted to the RF mount. **Tip:** With a tripod, you can "only" prevent blur caused by unintentional camera movement ("camera shake"). If, on the other hand, you want to prevent blur caused by movement of the subject, e.g. flowers moving in the breeze, short exposure times or flash are the means of choice to "freeze" the subject.

In addition to the image scale, the closest focusing distance of the lens and the focal length are the most important criteria when making a purchase decision. Lenses with a short (wide-angle) focal length (24mm, 35mm) capture more of the background due to the wider angle of view than macro lenses with a long (telephoto) focal length (100mm), which frame the main subject more closely.

Checklist

With macro lenses, this is what matters

- **High level of magnification** (from 1:2) and close focusing distance
- **Precise autofocus** and manual focusing
- **For video recordings:** Quiet autofocus, e.g. with STM step motors

MACRO LENSES AT A GLANCE

					
Lens	**MP-E 65mm F2.8** 1-5x Macro Photo	**EF 100mm** F2.8L Macro IS USM	**TS-E 50mm** F2.8L Macro	**TS-E 90mm** F2.8L Macro	**TS-E 135mm** F4L Macro
Camera mount	EF	EF	EF	EF	EF
Focal length (mm)	65	100	50	90	135
35mm Film Equivalent Focal Length (mm)	65	100	-	-	-
Angle of View (diag.)	18°40´	24°	46°	27°	18°
Lens Construction	10/8	15/12	12/9	11/9	11/7
Maximum Aperture	2.8	2.8	2.8	2.8	4
Minimum Aperture	16	32	32	45	45
Aperture blades	6	9	9	9	9
AF Actuator	-	Ring-USM	-	-	-
Image Stabiliser	no	4 stops (2 stops at 1.0x magnification)	no	no	no
Distance Information	n.a.	yes	yes	yes	yes
Closest focusing distance (m)	0.24	0.3	0.27	0.39	0.48
Maximum magnification	5	1	0.5	0.5	0.5
Magnification - Extension Tube EF12 II	-	1.17–0.12	0.74-0.23	0.64-0.15	0.62-0.09
Magnification - Extension Tube EF25 II	-	1.37–0.27	1.00-0.48	0.82-0.32	0.77-0.20
Filter Diameter (mm)	58	67	77	77	82
Macro Light	no	no	no	no	no
Diameter x Length (mm)	81 x 98	77.7 x 123	86.9 x 114.9	86.9 x 116.5	88.5 x 139.1
Weight (ca. g)	710	625	94	915	1.110

MACRO LENSES AT A GLANCE




Lens	**RF 24mm** F1.8 Macro IS STM	**RF 35mm** F1.8 IS Macro STM	**RF 85mm** F2 Macro IS STM	**RF 100mm** F2.8 L Macro IS USM
Camera mount	RF	RF	RF	RF
Focal length (mm)	24	35	85	100
Angle of View (diag.)	84°	63°	28°30´	24°
Lens Construction	11/9	11/9	12/11	17/13
Maximum aperture	1.8	1.8	2	2.8
Minimum aperture	22	22	29	32
Number of Aperture blades	9	9	9	9
AF Actuator	STM	STM	STM	Dual Nano USM
Image Stabiliser	OIS: 5 stops IBIS x OIS: 6.5 stops	OIS: 5 stops IBIS x OIS: 7 stops	OIS: 5 stops IBIS x OIS: 8 stop	OIS: 5 stops IBIS x OIS: 8 stop
Distance Information	yes	yes	yes	yes
Closest Focusing Distance (m)	0.14	0.17	0.35	0.26
Maximum Magnification	0.5	0.5	0.5	1.4
Filter Diameter (mm)	52	58	67	67
Diameter x Length (mm)	74.4 x 63.1	74.4 x 62.8	78 x 90.5	81.5 x 148
Weight (ca. g)	270	305	500	730

ACCESSORIES

Tripod

A camera on a tripod prevents blur caused by camera shake. A ball head is ideal for connecting the tripod to the camera, allowing the camera to be flexibly aligned at close range. Some tripods also allow the centre column to tilt or rotate 180 degrees so that the camera is directly above the ground. When shooting outdoors, clamp tripods or custom camera mounts can also be a solution for securing the camera. A wide range of custom solutions are available from specialist retailers and, for the more creative, from DIY stores.

Timer Remote Control TC-80N3

Remote shutter release

A useful accessory for close-up photography on a tripod is a remote shutter release, which allows the EOS camera to be triggered electronically without vibration. The Canon remote switch models RS-60E3 and RS-80N3 have a lockable release button for the "B" setting (bulb mode for long exposures). For even more functionality, the Canon TC-80N3 timer remote control (pictured) has a self-timer and interval timer.

Tip: For compatible EOS cameras with Wi-Fi capability, use your smartphone as a remote shutter release with the **Canon Camera Connect App**.

Light shaper

Standard reflectors and light shapers are usually too large for macro photography. Macro photographers can easily make their own light shapers out of styrofoam, aluminium foil and black cardboard or fabric, which can be used to direct the available light or flash to brighten shadows, reduce reflections or emphasise subject areas. The sky is the limit. Using flexible holders ("3rd hand"), the light shapers can be positioned for optimum effect without being visible in the subject.

Macro Twin Lite
MT-26EX-RT

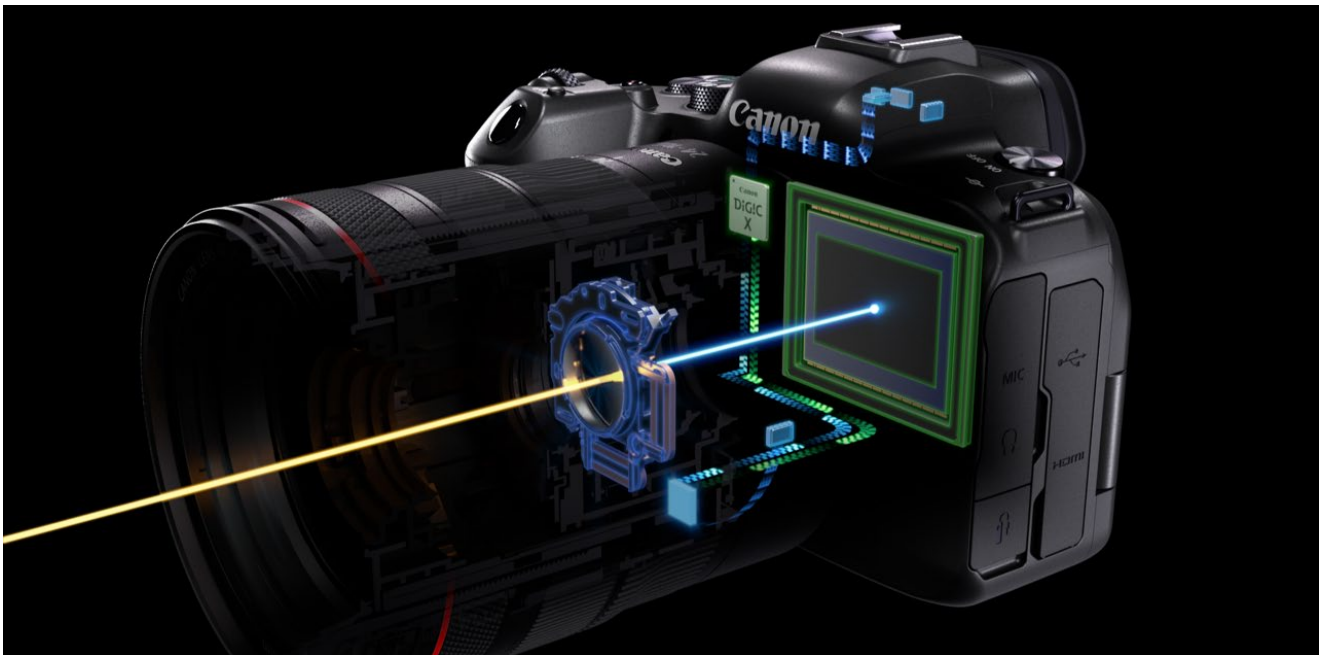


IMAGE STABILISATION: STEADY SHOTS FROM THE HAND

The risk of camera shake increases with longer exposure times. The risk of camera shake is also increased by the larger image scale of macro photography.

The EOS R1, R3, R5, R5 Mark II, R6, R6 Mark II and R7 feature 5-axis image stabilisation of the sensor in the body ("IBIS"), which works in conjunction with the optical image stabilisation of Canon lenses (Coordinated Control IS).

IN-BODY IMAGE STABILIZER × OPTICAL IMAGE STABILIZER

I.e. the RF 100mm F2.8 L Macro USM has a 5-stop IS and achieves up to 8 stops with the internal stabilisation of the cameras

The RF 35mm F1.8 Macro IS STM achives a total of 7 stops.

The in-body IS compensates for vertical (up/down) and horizontal (left/right) shifts, as well as rolling movements.

When using a lens with Hybrid IS (e.g. RF 100mm F2.8 L IS Macro or RF 35 F1.8 IS Macro), the in-body IS only stabilises the roll movement, all other movements are stabilised by the lens IS.

If there is no option for image stabilisation in the camera's settings, the in- IS and lens IS work together. Using EF lenses with mount adapter on an EOS R camera, the stabilisation methods of the lens and body are added together.

	Without Optical Image Stabiliser (OIS):	**With Optical Image Stabiliser (OIS):**
RF lenses	The camera‘s In-body Image Stabiliser stabilises all five axes.	The in-body IS supports two axes at long shooting distances (pan/tilt) and extends stabilisation to all five axes.
EF and EF-S lenses	The camera's In-body Image Stabiliser stabilises all five axes.	Optical IS stabilises as before, while In-body IS extends stabilisation to all five axes.
Manually adjusted lenses:	The in-body IS stabilises all five axes. The focal length of the lens is set manually in the camera menu.	

Macro shot with the RF 24mm F2.8 IS STM and EOS R5 (ISO 100, shutter speed 1/250 sec., aperture F3.5)

With RF lenses, the stabilisation methods are also synchronised so that the in-body IS adds an extra two stops to the performance of the RF lens.

The focal length of the lens used also plays a role. Lens IS provides better stabilisation at long focal lengths, while in-body IS provides optimal support at medium and wide focal lengths.

Thanks to the intelligent combination of In-Body IS and Optical IS, the new EOS R cameras offer new possibilities not only in macro photography. The high ISO sensitivity and AF system also open up new possibilities in lowlight macro photography.

Non Hybrid-IS
An angular speed sensor detects pivoting and pulling movements..

Hybrid IS
Hybrid IS was first used in the EF 100mm f/2.8L Macro IS USM. An additional acceleration sensor stabilises horizontal and vertical camera movements, reducing blur caused by camera shake. Hybrid IS is particularly effective in macro shooting.

SHOOTING TIPS: CLOSE UPS

There are classic subjects for close-up and macro photography: plants such as flowers, mosses and lichens, mushrooms or the bark structure of a tree are particularly effective.

These subjects are also suitable for beginners as they do not move or change. On the other hand, insects and other small animals make interesting subjects. However, as they move, sometimes very quickly or erratically, it takes a lot of experience and even more patience.

Even snails whiz through the small field of view surprisingly quickly if you want to compose your subject in peace.

The fascination of close-ups is not only evident in nature, but also in - seemingly - everyday subjects. There are no limits to the imagination when it comes to inanimate objects.

With extreme magnification and interesting lighting, even unassuming objects such as a pebble can be transformed into fascinating subjects. Everyday objects take on new aspects in macro mode: The teeth on a bicycle sprocket, the glittering facets of jewellery or children‘s playthings staged at life-size.

To get started, hold coins, shells, minerals or pens in front of the lens and see what you can see in close-up - and how distance, light and focus affect the image.

PHOTOGRAPHY IN THE OUTDOORS

Spring is finally here: buds appear, leaves unfurl, bees buzz around flowers. Get outdoors again, enjoy the light of the spring sunshine and capture the fascinating and surprising details of nature with your camera: In the woods, in the park, in the garden or on the balcony.

Flowers should not be photographed in direct sunlight. In addition to the strong contrast, flowers and leaves reflect too much in direct sunlight. The colours will appear paler. The best light for colourful flowers is an overcast sky. Early morning and evening hours are also ideal for taking photographs.

Important: Make sure there is no wind when photographing plants. Even a slight breeze can move the flower on the stem, making the close-up blurry and the picture out of focus. To be on the safe side, increase the ISO sensitivity to achieve faster shutter speeds.

Be patient when photographing insects. Very rarely will the live animal be where you want it to be. The best thing to do is to set up the camera, preferably with the focus already set, and lure the insect there.

MORE OF THIS?

Want to learn more about exposure? At the Canon Academy workshops, our trainers will teach you step-by-step how to get the perfect exposure for any subject, but the Canon Academy has much more in store for you.

Check the Canon Academy website for the latest workshop offers and dates.

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