



Illuminated magnifiers for electronics, cosmetology and other industrial applications



# Magnification is essential to a large number of industrial applications

Modern manufacturing includes all intermediate processes required for the production and integration of a product's components. Many of these processes including assembly, inspection and rework, rely on the use of illuminated magnifiers.

A number of industries are particularly sensitive to electrostatic discharges (ESD), and need to establish measures for eliminating static. ESD-Safe magnifiers are a valuable tool in these industries as they help guard against uncontrolled static dissipation.

## The history of Luxo illuminated magnifiers

Luxo's history of lighting for the individual began with the development of the L-1 task light in 1937. The freedom of movement and the ability to place light exactly where it was needed, forever changed the way task lights are used.

L-1 was designed by Luxo's founder, the Norwegian industrialist Jac Jacobsen, and is still in production today. The lamp arm is balanced by springs that work on the action and reaction principle of human arm muscles. Jac Jacobsen soon realized that his spring-balanced arm could carry a variety of different luminaires, including illuminated magnifiers, for numerous purposes.

The decades following saw Luxo's development of a range of illuminated magnifiers for industrial applications, electronics, therapy and cosmetology, low vision and the healthcare sector.

## Modern range of arm-based magnifiers

Naturally, Luxo's range of products has been vastly expanded since those early days. However, the philosophy and knowledge from the development of the L-1 is still maintained in all of Luxo's modern products. Today, Luxo's range of illuminated magnifiers comprises a wide variety of arm technologies, with internal or external springs. They all have perfect balance and careful ergonomics built into them.

Luxo pioneered the development of illuminated magnifiers for industrial use. This L-1 L magnifier was manufactured in 1955 and is still in use today.





# Perfect balance, maximum flexibility

Luxo's magnifiers are specially designed to maximize horizontal and vertical movement. They provide significant horizontal reach, and will always stay in the right position without drifting. The arms are balanced by spring systems which ensure smooth and easy positioning – no knobs to tighten, nothing to adjust.

The ability to position the lens and direct the light exactly where it is needed is the hallmark of Luxo's illuminated magnifiers. The flexibility of the lamp head means that it is easy to adjust the magnifier for your personal needs.

## Friction-free lamp head movements

It is the combination of arm and head movements that determines the degree of flexibility in a magnifier. Luxo's magnifiers are highly flexible, offering a combination of the three all-important head movements:

- Horizontal side-to-side movement (yaw)
- Up and down movement (tilt)
- Rotation around a horizontal axis (roll)

The flexibility of the self-balancing arm and friction-free joint between the lamp head and arm makes exact positioning easy.



Friction-free joint between the lamp head and arm.



Friction-free joint between the lamp head and arm.





## The importance of light quality

At Luxo we know how important light is for the working environment and for the health and well-being of an individual in a workplace. Good lighting reduces the risk of health problems, increases safety, and enhances productivity.

For this reason Luxo places great importance on the light quality of our illuminated magnifiers. They are not just magnifiers with light, but powerful luminaires with excellent light output. The quality and exact positioning of the light sources in relation to the lens allows for virtually shadow-free magnification and excellent color rendering capabilities

### **LED: Lightsource of the future**

Over the past few years, Luxo has designed and manufactured a new generation of luminaires, all featuring LED instead of traditional light sources. Light Emitting Diodes (LEDs) are semiconductors that emit light when an electric current passes through them. LEDs can be used on their own, or assembled into modules for added power.

### **Ergonomic. Energy-efficient. Economic.**

Luxo's modern LED magnifiers are designed to provide the best possible ergonomics, while saving energy. They use only a fraction of the energy required by luminaires with traditional light sources.

LEDs have an incredibly long life span. The diodes in Luxo LED magnifiers have a life expectancy of more than 50,000 hours. That equates to 25 years or more with normal use.

# Product guide

## Wave<sup>®</sup> LED

### Rectangular lens LED magnifier

WAVE LED is a magnifier for industrial applications. No knobs to tighten, nothing to adjust – a flexible, self-balancing shade and hands-free neck assembly allows the lamp head to be secured in any position. The fully-enclosed neck design is ideal for environments where foreign object debris (FOD) is a concern. An automatic shut-off feature further ensures energy savings. WAVE LED offers shadow-free magnification with light coming from both sides, as well as three-dimensional magnification lighting from the left or right. The 3D-feature is especially welcome when working with circuit boards and similar delicate objects.

### Technical details

**Lightsources:** Two 6W dimmable LED modules. 13W total energy consumed. 4600 lux at 11" focal length. CCT: 4000°K. CRI: 80.

**Body material and color:** Steel arm and die-cast aluminum shade. Fully-enclosed neck design. Color: light gray.

**Optics:** 3.5- (1.88X) or 5-diopter (2.25X), 6.75" x 4.5" rectangular white crown optical-quality glass lens.

**Secondary lenses:** For additional magnification a secondary 4-, 6- or 10-diopter STAYS lens can be attached to the primary lens.

**Power supply:** Supplied with cable and plug.

**Arm technology and movement:** Heavy-duty internal-spring 45" or 30" parallel, three-pivot K-arm.

**Timer and dimming:** Step dimming 0-50-100%. 9/4 hour auto shut-off.

**Mounting:** Edge clamp or weighted base.

UL/cUL listed



Part numbers	
18845LG	WAVE LED, 3.5-diopter, 45", edge clamp, light gray
18846LG	WAVE LED, 3.5-diopter, 30", edge clamp, light gray
18847LG	WAVE LED, 3.5-diopter, 30", weighted base, light gray
18945LG	WAVE LED, 5-diopter, 45", edge clamp, light gray
18946LG	WAVE LED, 5-diopter, 30", edge clamp, light gray
18947LG	WAVE LED, 5-diopter, 30", weighted base, light gray

# Wave® LED ESD

## ESD-Safe rectangular lens LED magnifier

ESD-Safe WAVE LED is especially designed for use in static sensitive environments where electrostatic discharges can prove fatal for electronic components. The shade and arm are powder-coated with a metal-laced paint that measures  $10^4 \Omega/\text{sq.}$  (conductive). The remaining components are molded in a material that measures  $10^5\text{-}10^6 \Omega/\text{sq.}$  (static dissipative). Since the surfaces are no longer insulative, triboelectric charging results in drastically lower voltages, especially since any charge (under 50 volts) is uniformly distributed throughout the entire surface of the head assembly.

## Technical details

**Lightsources:** Two 6W dimmable LED modules. 13W total energy consumed. 4600 lux at 11" focal length. CCT: 4000°K. CRI: 80.

**Body material and color:** ESD-Safe steel arm and die-cast aluminium shade. Fully-enclosed neck design. Color: black.

**Optics:** 3.5- (1.88X) or 5-diopter (2.25X), 6.75" x 4.5" rectangular white crown optical-quality glass lens.

**Secondary lenses:** For additional magnification a secondary 4-, 6- or 10-diopter STAYS lens can be attached to the primary lens.

**Power supply:** Supplied with cable and plug.

**Arm technology and movement:** Heavy-duty internal-spring 45" or 30" parallel, three-pivot K-arm.

**Timer and dimming:** Step dimming 0-50-100%. 9/4 hour auto shut-off.

**Mounting:** Edge clamp or weighted base.

UL/cUL listed



Part numbers	
18900BK	ESD-Safe, WAVE LED, 3.5-diopter, 45", edge clamp, black
18902BK	ESD-Safe, WAVE LED, 3.5-diopter, 30", edge clamp, black
18904BK	ESD-Safe, WAVE LED, 3.5-diopter, 30", weighted base, black
18910BK	ESD-Safe, WAVE LED, 5-diopter, 45", edge clamp, black

# KFM™ LED

## Heavy-duty round lens LED magnifier

KFM LED produces nearly 75% greater light output than traditional KFM models. A heavy-duty, all-metal construction with sleek design, adjustable arm and excellent light output makes the KFM suitable for a variety of industrial applications. No knobs to tighten, nothing to adjust. A flexible, self-balancing shade and full-enclosed, hands-free neck design are ideal for environments where foreign object debris (FOD) is a concern and allows the lamp head to be secured in any position. The quality and positioning of the LEDs across two semi-circular modules allows for virtually shadow-free magnification and excellent color rendering.

## Technical details

**Lightsources:** 9W dimmable LED modules. 11W total energy consumed. 2800 lux at 13" focal length. CCT: 4000°K. CRI: 80.

**Body material and color:** Steel arm and die-cast aluminum shade. Fully-enclosed neck design. Colors: black, light gray and white.

**Optics:** 3- (1.75X) or 5-diopter (2.25X), 5" diameter optical-quality glass lens.

**Secondary lenses:** For additional magnification a secondary 4-, 6- or 10-diopter STAYS lens can be attached to the primary lens.

**Power supply:** Supplied with cable and plug.

**Arm technology and movement:** Heavy-duty internal-spring 45" or 30" parallel, three-pivot K-arm.

**Timer and dimming:** Infinity dimming 1–100%. 9/4 hour auto shut-off.

**Mounting:** Edge clamp or weighted base.

UL/cUL listed



Part numbers	
18113BK	KFM LED, 3-diopter, 45", edge clamp, black
18113LG	KFM LED, 3-diopter, 45", edge clamp, light gray
18115BK	KFM LED, 5-diopter, 45", edge clamp, black
18115LG	KFM LED, 5-diopter, 45", edge clamp, light gray
18115WT	KFM LED, 5-diopter, 45", edge clamp, white
18213LG	KFM LED, 3-diopter, 30", edge clamp, light gray
18215LG	KFM LED, 5-diopter, 30", edge clamp, light gray
18253LG	KFM LED, 3-diopter, 30", weighted base, light gray
18255BK	KFM LED, 5-diopter, 30", weighted base, black

# KFM™ LED ESD

## ESD-Safe heavy-duty round lens LED magnifier

KFM LED ESD is especially designed for use in static sensitive environments where electrostatic discharges can prove fatal for electronic components. An ESD-Safe lens is protected with a special coating that alters the electrical characteristics at the surface of the material and guards against uncontrolled static dissipation. The shade and arm are powder-coated with a metal-laced paint that measures  $10^4 \Omega/\text{sq.}$  (conductive). The remaining components are molded in a material that measures  $10^{10} \Omega/\text{sq.}$  (static dissipative). Since the surfaces are no longer insulative, triboelectric charging results in drastically lower voltages, especially since any charge (under 50 volts) is uniformly distributed throughout the entire surface of the head assembly.

## Technical details

**Lightsources:** 9W dimmable LED modules. 11W total energy consumed. 2800 lux at 13" focal length. CCT: 4000°K. CRI: 80.

**Body material and color:** ESD-Safe steel arm and die-cast aluminum shade. Fully-enclosed neck design. Color: black.

**Optics:** 5-diopter (2.25X), 5" diameter optical-quality glass lens.

**Secondary lenses:** For additional magnification a secondary 4-, 6- or 10-diopter STAYS lens can be attached to the primary lens.

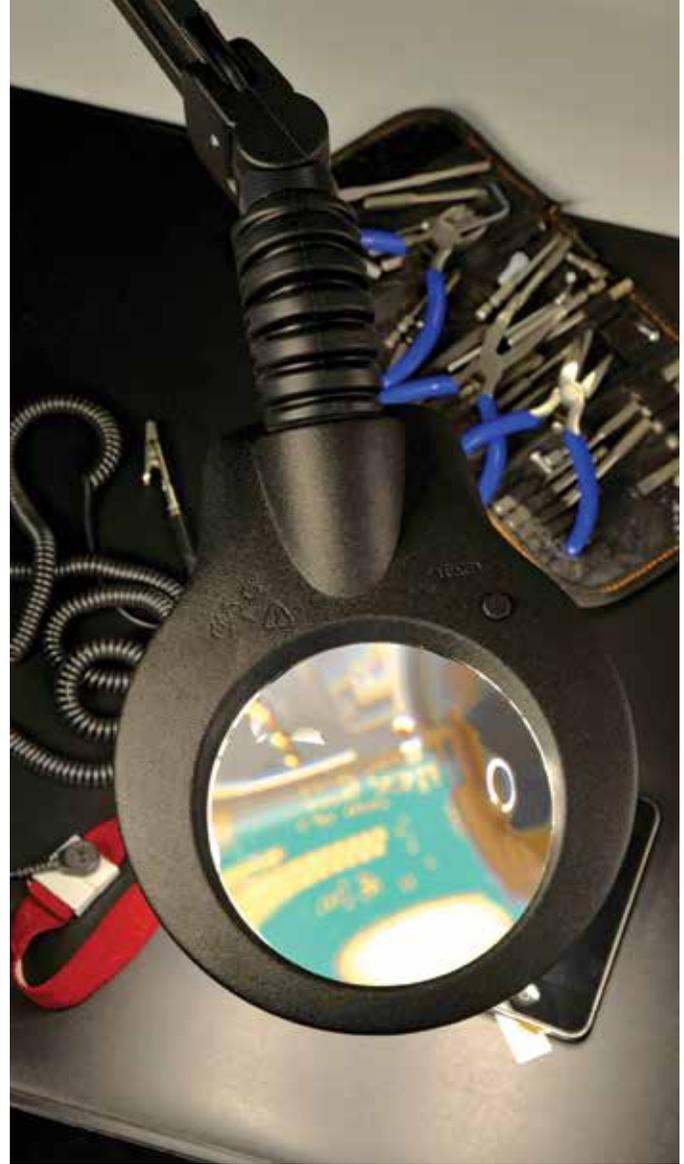
**Power supply:** Supplied with cable and plug.

**Arm technology and movement:** Heavy-duty internal-spring 45" parallel, three-pivot K-arm.

**Timer and dimming:** Infinity dimming 1–100%. 9/4 hour auto shut-off.

**Mounting:** Edge clamp.

UL/cUL listed



Part numbers	
18313BK	ESD-Safe, KFM LED, 5-diopter, 45", edge clamp, black

# Circus

## Heavy-duty round lens magnifier with hinged lens cover

Circus is specially designed to withstand the rigors of everyday use in industrial and manufacturing environments as well as cosmetology, health spas, beauty salons and clean room applications where foreign object debris (FOD) is a concern. No knobs to tighten, nothing to adjust. The highly flexible, self-balancing shade allows the lamp head to be positioned horizontally, vertically and laterally and a removable tinted hinged lens cover protects the lens from unwanted dust, debris and contamination and allows for safe operation in direct sunlight. A 22W T-5C fluorescent lightsource provides 40% greater light output than a traditional 22W T9 illuminated magnifier.

## Technical details

**Lightsource:** 22W T-5C fluorescent. 3500 lux at 11" focal length. CCT: 4100°K.

**Body material and color:** Heavy-duty die-cast aluminium housing. Fully-enclosed neck design with protective rubber cover. Color: white.

**Optics:** 3.5-diopter (1.88X) or 5-diopter (2.25X), 6.5" diameter white crown optical-quality glass lens.

**Secondary lenses:** For additional magnification a secondary 4-, 6- or 10-diopter STAYS lens can be attached to the primary lens.

**Power supply and ballast:** Supplied with cable and plug. High frequency ballast.

**Arm technology and movement:** Heavy-duty internal-spring 45" parallel, three-pivot K-arm with .75" steel tubing.

**Shade:** Built-in handles for positioning of lamp head. Removable tinted hinged lens cover.

**Mounting:** Edge clamp.

UL/cUL listed



Part numbers	
17980WT	Circus, 3.5-diopter, 45", edge clamp, white
17981WT	Circus, 5-diopter, 45", edge clamp, white

# LFM LED

## Lighter-duty round lens LED magnifier

LFM LED is Luxo's most cost-effective LED Magnifier. A die-cast aluminium housing and flexible, spring-balanced L-arm ensure the magnifier can be placed in any position. Auto shut-off and dimming features further ensure energy savings. LFM is suitable for a variety of Industrial applications.

## Technical details

**Lightsources:** 7W dimmable LED modules. 9.5W total energy consumed. 1500 lux at 13" focal length. CCT: 4000°K. CRI: 80.

**Body material and color:** Die-cast aluminum housing. Color: light gray.

**Optics:** 3- (1.75X) or 5-diopter (2.25X), 5" diameter lens.

**Secondary lenses:** For additional magnification a secondary 4-, 6- or 10-diopter STAYS lens can be attached to the primary lens.

**Power supply:** Supplied with cable and external power supply with plug.

**Arm technology and movement:** Lighter-duty external-spring 45" or 30" L-arm.

**Timer and dimming:** Step dimming 0-25-50-100%.

**Mounting:** Edge clamp or weighted base.

UL/cUL listed



Part numbers	
18345LG	LFM, 3-diopter, 45", edge clamp, light gray
18346LG	LFM, 5-diopter, 45", edge clamp, light gray
18350LG	LFM, 3-diopter, 30", edge clamp, light gray
18351LG	LFM, 3-diopter, 30", weighted base, light gray
18352LG	LFM, 5-diopter, 30", edge clamp, light gray
18353LG	LFM, 5-diopter, 30", weighted base, light gray

# More Luxo magnifiers...

## KFM™ Magnifier

Heavy-duty round lens multi-purpose fluorescent magnifier

KFM has a sturdy all-metal construction with a sleek design, flexible arm and excellent light output suitable for a variety of industrial, laboratory, cosmetology and low vision applications. The flexibility of the neck assembly and patented internal spring K-arm makes exact positioning easy. An ESD-Safe model, which is designed for use in static-sensitive environments and guards against uncontrolled static dissipation, is also available.



**Lightsource:** 22-Watt fluorescent. Instant-on switch ignites the fluorescent tube with just a touch.

**Body material and color:** Die-cast aluminium housing. ESD-Safe shade and arm are powdered metal-laced paint that measures  $10^{10}\Omega/\text{sq}$ . (static dissipative). Colors: black, white and light gray. ESD-Safe models are black.

**Optics:** 3- (1.75X) or 5-diopter (2.25X), 5" diameter optical-quality glass lens.

**Secondary lenses:** For additional magnification a secondary 4-, 6- or 10-diopter STAYS lens or 10-diopter swing away lens (model #50206) can be used.

**Power supply and ballast:** Supplied with cable and plug. Electronic ballast.

**Arm technology:** Heavy-duty internal-spring 45" or 30" internal spring K-arm.

**Mounting:** Edge clamp or weighted base.

UL/cUL listed

Part numbers	
17113BK	KFM, 3-diopter, 45", edge clamp, black
17113LG	KFM, 3-diopter, 45", edge clamp, light gray
17115BK	KFM, 5-diopter, 45", edge clamp, black
17115LG	KFM, 5-diopter, 45", edge clamp, light gray
17115WT	KFM, 5-diopter, 45", edge clamp, white
17213LG	KFM, 3-diopter, 30", edge clamp, light gray
17215LG	KFM, 5-diopter, 30", edge clamp, light gray
17253LG	KFM, 3-diopter, 30", weighted base, light gray
17255BK	KFM, 5-diopter, 30", weighted base, black
17255LG	KFM, 5-diopter, 30", weighted base, light gray
16913BK	ESD-Safe KFM, 5-diopter, 45", edge clamp, black
50206	10-diopter swing-away lens

## IFM Magnifier

Lighter-duty round lens fluorescent magnifier

IFM is an ideal lighter-duty magnifier for low-power inspection. A 22W circline fluorescent lamp provides 360° shadow-free illumination and a lamp diffuser cover protects the bulb from damage. The IFM is a smart, economical choice for tight budgets.



**Lightsource:** 22W circline fluorescent. Built-in starter switch.

**Body material and color:** Stamped steel shade. Colors: light gray and white.

**Optics:** 3- (1.75X) or 5-diopter (2.25X), 5" diameter lens.

**Power supply and ballast:** Supplied with cable and plug. Electromagnetic ballast. 3-wire single outlet receptacle at the base of the arm for models 16345WT and 16346WT.

**Arm technology:** External-spring 45" or 30" L-arm.

**Mounting:** Edge clamp or weighted base.

UL/cUL listed

Part numbers	
16345LG	IFM, 3-diopter, 45", edge clamp, light gray
16345WT	IFM, 3-diopter, 45", edge clamp, white
16346LG	IFM, 5-diopter, 45", edge clamp, light gray
16346WT	IFM, 5-diopter, 45", edge clamp, white
16350LG	IFM, 3-diopter, 30", edge clamp, light gray
16351LG	IFM, 3-diopter, 30", weighted base, light gray
16352LG	IFM, 5-diopter, 30", edge clamp, light gray
16353LG	IFM, 5-diopter, 30", weighted base, light gray

# Accessories

Luxo illuminated magnifiers are suitable for use in a multitude of applications. Luxo offers a choice of accessories including mounting options and secondary lenses for increased levels of magnification.

Mounting options	
	<b>34" Rolling Floor Stand</b>  Painted steel pole and cast iron base includes both casters and glides.
	50036BK      Rolling Floor Stand, black
	50036LG      Rolling Floor Stand, light gray
	50036WT      Rolling Floor Stand, white
	<b>A-Edge Mount Bracket</b>  For mounting products to horizontal surfaces. Maximum 2.25" opening.
	60001BK      A Edge Mount Bracket, black
	60001LG      A Edge Mount Bracket, light gray
	<b>B-Wall Mount</b>  For permanent mounting to walls or other vertical surfaces.
	50003LG      B Wall Mount, light gray
	<b>C-Surface Mount Bracket</b>  For permanent mounting on horizontal surfaces.
	50005BK      C Surface Mount Bracket, black
	50005LG      C Surface Mount Bracket, light gray
	<b>Flush/Surface Mount Bushing</b>  For flush mount surface installation. 19.3mm outer diameter.
	31639      Flush/surface mount bushing, aluminum

Secondary Lenses	
	<b>STAYS Lenses</b>  SelfTraction Accessory Yield System for use with KFM™ LED, KFM, WAVE® LED, WAVE+Plus, LFM LED, JFM and Circus Magnifiers. 2" lens diameter (2.5" diameter including the silicon gasket frame).
	50404      4-diopter STAYS Lens
	50406      6-diopter STAYS Lens
	50410      10-diopter STAYS Lens

# About magnification

Luxo offers a range of illuminated magnifiers for different applications. Luxo's line of magnifiers includes a selection of lenses (shape and size), materials and glass. Please refer to the product guide to determine which model is best suited for your needs.

## Using a Luxo magnifier

Luxo's illuminated magnifiers are working tools. They are designed for precision and comfort. We recommend using both eyes to view an object whenever possible.

In order to achieve maximum magnification without distortion, the user should position the lens a proper distance from the object, and fairly close to the eyes. Do not lean back and away from the lens in order to increase magnification.

Seating and worksurface height should be adjusted for good posture.

## Definitions

### Diopter

Diopter is an optical term referring to the refractive (light bending) capacity of a lens. Each diopter increases magnification by 25%.

### Magnification

The degree to which a viewed object is enlarged. Expressed in percentage or by the symbol X. 100% magnification = 1X magnification, i.e. the object appears to be twice its actual size. To determine the level of magnification based on diopters used, divide the total diopters by 4 and add 1. eg.  $5D/4+1=2.25X$ .

### Field-of-view

Field-of-view is the area which is visible as seen through a lens.

### Focal length

Focal length is the distance from the center of the lens to the viewed object when in focus. As magnification increases, the focal length decreases.

### Working distance

Working distance is the area between the underside of the magnifier and the top of the object being viewed when the object appears in focus.



### Choice of magnification

The degree of magnification needed varies with the task at hand. With low level magnification an object can be studied while the edge of the object remains in focus. With increased magnification, small details are clearly visible but the blurring at the edge of the object increases.

# Magnification table

This table provides a complete overview of the total magnification options available by adding secondary lenses to Luxo's illuminated magnifiers.

Primary lens diopter	Secondary lens diopter	Total magnification	Total Diopter	Magnification (%)	Focal length (in.)
<b>Wave® LED, WAVE+Plus, Circus (includes ESD-Safe Models)</b>					
3.5		1.88X	3.5	188%	11
3.5	4.0	2.88X	7.5	288%	5
3.5	6.0	3.38X	9.5	338%	4
3.5	10.0	4.38X	13.5	438%	3
5.0		2.25X	5	225%	8
5.0	4.0	3.25X	9	325%	4.3
5.0	6.0	3.75X	11	375%	3.5
5.0	10.0	4.75X	15	475%	2
<b>KFM™ LED, LFM LED, KFM, JFM, IFM (includes ESD-Safe Models)</b>					
3.0		1.75X	3	175%	13
3.0	4.0	2.75X	7	275%	5.5
3.0	6.0	3.25X	9	325%	4.3
3.0	10.0	4.25X	13	425%	2.8
5.0		2.25X	5	225%	8
5.0	4.0	3.25X	9	325%	4.2
5.0	6.0	3.75X	11	375%	3.5
5.0	10.0	4.75X	15	475%	2



## Added magnification with a secondary lens

For additional magnification, a secondary STAYS Lens can be attached to the primary lens. To apply the STAYS Lens, simply moisten the silicon ring around the lens and stick it onto the primary lens. STAYS Lenses are available in 4-, 6- and 10-diopter strengths, increasing magnification by 100%, 150% and 250% respectively. Luxo also offers swing-away lenses for use with other magnifiers.



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## Luxo

For more than 75 years Luxo has designed arm-based innovative, ergonomic lighting and magnification products. Luxo products improve work efficiency, taking particular care of individual needs.

Luxo products and solutions are developed and tested by our engineers at our own research and testing facilities, and manufactured and certified in accordance with all relevant quality and environmental standards. They are based on the latest technology and expertise – and generations of experience.

### Luxo

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Please refer to our website for information about our 5-year warranty.