

AvaLight-HAL-S-MINI

Tungsten-Halogen Light Source

AvaLight-HAL-S-MINI



From visible light to near infrared, that's where the AvaLight-HAL-S-Mini works best. It's a compact, stabilized halogen light source, with adjustable focusing of the fiber connection, maximizing output power at the desired wavelength. The light source also has adjustable output power to provide extra power or longer bulb life.

A filter-slot mounted on the front of the AvaLight-HAL-S-Mini accepts 1" round or 2" x 2" square filters, to block specific ranges of wavelengths or instantly lower the intensity.

The adjustable focus on the AvaLight-HAL-S-Mini helps you get the most out of your light source: it makes sure all possible power is transmitted through your optical fiber. Bulb replacement is easy and can be done in a matter of minutes.

Optionally a combined direct-attach cuvette holder and attenuator is available (CUV-ATT-DA-HAL). for attenuation you can use the Inline Filterholder, FH-INL, or the Inline attenuator, ATT-INL.

The optical output can be controlled through a dongle at the backside or from your spectrometer. At low setting the

lamp has a color temperature of 2700K but provides over 13000 hours of lifetime. The standard or medium setting changes the color temperature to 2850K and provides 50% more power with a bulb lifetime of 4000 hours. The high power setting gives a color temperature of 3000K, double power compared to the long-life setting and gives you up to 1000 hours of lifetime.

The AvaLight-HAL-S-Mini features an internal TTL-shutter, controllable from your AvaSpec spectrometer. This gives you the ability to use the auto-save dark option in AvaSoft spectroscopy software.

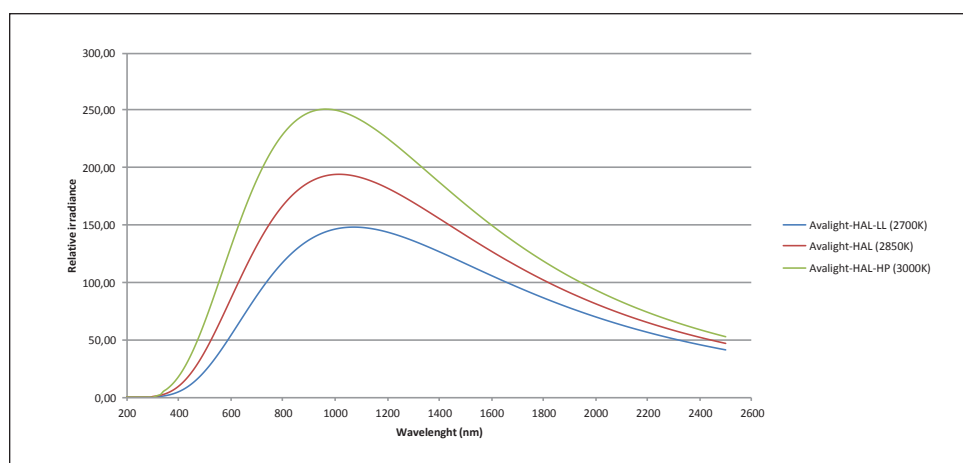


Figure 9 Spectral output of AvaLight-HAL-Mini

Technical Data

	AvaLight-HAL-S-Mini (standard)	AvaLight-HAL-S-Mini (long life)	AvaLight-HAL-S-Mini (high power)
Wavelength Range	360-2500 nm		
Stability	± 0.1%/ °C		
Time to stabilize	Ca. 10 min.		
Output to bulb	12.0 VDC/ 0.83A	11.3 VDC/ 0.8A	14.1 VDC/ 1.0A
Bulb Life	4000 hrs	> 13000 hrs	< 1000 hrs
Min. Optical power* 200 µm fiber	0.5 mWatt	0.35 mWatt	0.7 mWatt
Min. Optical power* 600 µm fiber	4.5 mWatt	3.2 mWatt	6 mWatt
Min. Optical power* 1000 µm fiber	10 mWatt	7 mWatt	14 mWatt
Bulb Color Temperature	2,850 K	2,730 K	3,000 K
Power requirement	12 VDC / 2.08A		
Temperature range	0-55 °C		
Dimensions, weight	150 x 78 x 37 mm, 510 grams		
Lifetime shutter	1,000,000 cycles (typical)		

* Optical power measured from 350-1100nm

Separate 50x50 mm filters to install in AvaLight-HAL-(S)-Mini

GL-WG305-3	Separate 50 x 50 x 3 mm long-pass filter > 305 nm
GL-KG3-3	Separate 50 x 50 x 3 mm band-pass filter, transparent > 325 nm and < 700 nm
GL-BG28-3	Separate 50 x 50 x 3 mm band-pass filter, transparent > 360 nm and < 500 nm
GL-GG385-3	Separate 50 x 50 x 3 mm long-pass filter > 385 nm
GL-GG475-3	Separate 50 x 50 x 3 mm long-pass filter > 475 nm
GL-OG515-3	Separate 50 x 50 x 3 mm long-pass filter > 515 nm
GL-OG550-3	Separate 50 x 50 x 3 mm long-pass filter > 550 nm
GL-NG9-1	Separate 50 x 50 x 1 mm Neutral Density filter (transmission 10%, 400-1100 nm)
GL-NG9-2	Separate 50 x 50 x 2 mm Neutral Density filter (transmission 1%, 400-1100 nm)
GL-NG9-3	Separate 50 x 50 x 3 mm Neutral Density filter (transmission 0.1%, 400-1100 nm)

More filter types available, please contact us for ordering information

Ordering Information

AvaLight-HAL-S-Mini	• 10W Tungsten Halogen lamp, fan cooled, incl. TTL shutter, needs extra PS-12V/2.08A power supply
AvaLight-HAL-S-RM	• Rack-mounted version of AvaLight-HAL-S-Mini
IC-DB26-2	• Interface cable AvaSpec-USB2/EVO platform to AvaLight-HAL-(S)-Mini for shutter and power setting
AvaLight-HAL-B-Mini	• 10W Tungsten Halogen Replacement bulb for AvaLight-HAL-(S)-Mini
PS-12V/2.08A	• Power supply 100-240VAC/12VDC, 2.08A, necessary for AvaLight-HAL-Mini
DONGLE-Mini-H	• Dongle for high power setting
DONGLE-Mini-L	• Dongle for long life setting



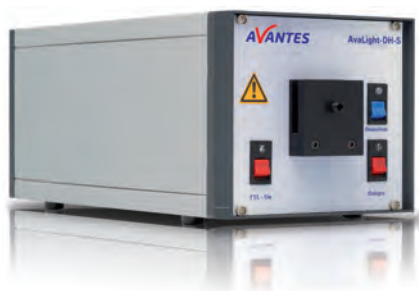
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AvaLight-DH-S Deuterium-Halogen Light Source

AvaLight-DH-S



In need of more power than the AvaLight-DHc? The AvaLight-DH-S is Avantes' most powerful deuterium halogen source. Like the DHc it is also a combined deuterium and halogen light source, capable of transmitting light in the UV/VIS/NIR-range, but has 35 times more halogen output and up to 300 times more deuterium power. The source has a prominent 656 nm deuterium peak which can limit dynamic range (see AvaLight-DH-S-BAL as an alternative). It includes a focusing lens assembly, to fully utilize the possibilities and size of your fiber.

The AvaLight-D-S is a deuterium light source only, making it a great option for measurements in the UV range, 190-400 nm. The AvaLight-D-S-DUV version starts even lower at 175 nm, for your deep-UV experiments. This version also offers twice the intensity at 200nm.

The output of the AvaLight-DH-S is optimized for fibers or bundles up to 600 micrometers. For larger fibers the focal point is manually adjustable to optimize the light coupling into your fiber.

The AvaLight-D(H)-S features an integrated TTL-shutter and filter holder for filters of up to 50x50x5.0 mm.

- Combined Deuterium-Halogen
- UV-VIS-NIR
- Deep-UV optional
- Powerful

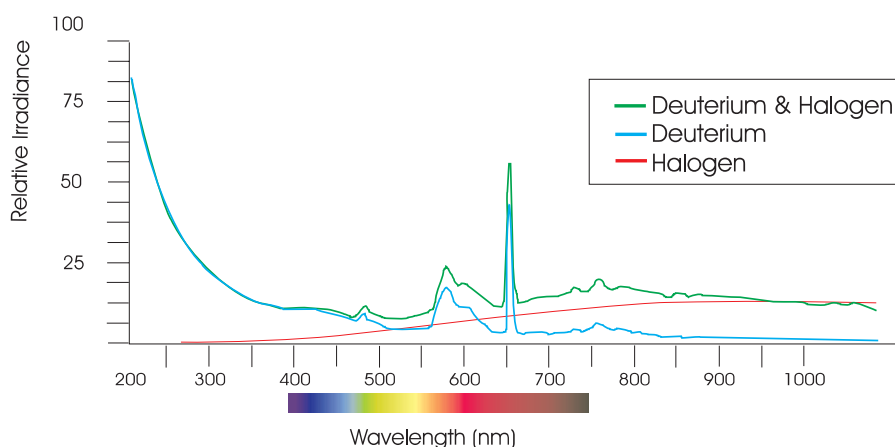


Figure 10 Spectral output AvaLight-DH-S

Technical Data

	Deuterium (Deep-UV) Long life	Deuterium (Standard) Long life	Halogen
Wavelength Range	175-400 nm	190-400 nm	360-2500 nm
Warm-up Time	30 min.		20 min.
Lamp Power	78W / 0.75A		5W /0.5A
Lamp Lifetime	2000 h		1000 h
Noise (AU)	2×10^{-5}		10^{-4}
Max. drift	$\pm 0.5\%/h$		$\pm 0.1\%/h$
Color Temperature	-	-	3000 K
Optical Power* in 200µm fiber	11 µW	11 µW	43 µW
Optical Power* in 600µm fiber	72 µW	72 µW	239 µW
Optical Power* in 1000µm fiber	206 µW	206 µW	354 µW
Power consumption	90 Watt (190Watt for heating D-Lamp 4-5 sec.)		
Power Requirements	100-240VAC 50/60 Hz		
Dimensions / Weight	315 x 165 x 140 mm / ca 5 kg.		
Lifetime shutter	1,000,000 cycles (typical)		

* total power for the specified wavelength range

For a table of separate 50x50 mm filters to install in AvaLight-D(H)-S see AvaLight-HAL.

Ordering Information

AvaLight-D-S	• Deuterium light source, 190-400 nm, incl. TTL shutter, -SR fibers needed
AvaLight-DH-S	• Deuterium-Halogen light source, 190-2500 nm, incl. TTL shutter, -SR fibers needed
AvaLight-D-S-DUV	• Deep-UV deuterium light source, 175-400 nm , TTL shutter, -SR fibers needed, 2000h
AvaLight-DH-S-DUV	• Deep-UV deuterium-halogen light source, 175-2500 nm , TTL shutter, -SR fibers needed
IC-DB26-2	• Interface cable AvaSpec-USB2/EVO platform to AvaLight-D(H)S-BAL
AvaLight-D-B	• Replacement deuterium bulb for AvaLight-D/AvaLight DH-BAL light source
AvaLight-D-B-DUV	• Replacement deep-UV deuterium bulb for AvaLight-D/AvaLight DH-BAL light source
AvaLight-DH-B	• Replacement halogen bulb for AvaLight-DH-BAL light source
CUV-DA-DHS	• Direct-attach cuvette holder for AvaLight-D(H)S-BAL



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AvaLight-DHc

Full-range Compact Light Source

AvaLight-DHc



Get the best out of two worlds with the AvaLight-DHc. It has both a deuterium light source and a halogen light source, providing you with adequate light between 200 and 2500 nm for nearly all absorbance chemistry applications. Deuterium emits light between 200 and 550 nm, where the halogen takes over up to 2500 nm. Coupling this lightsource to the rest of your spectroscopy system is easy with the SMA connector.

This light source is recommended in settings with large fiber cables or direct-attachment to a cuvette holder such as the CUV-DA, due to its relatively low output energy. The integrated TTL-shutter makes saving a dark measurement very simple in combination with AvaSoft (extra IC-DB26-2 needed).

Optionally the AvaLight-DHc is available in a rack-mountable version, to be used in the 19" rack or the 9.5" desktop system.

- Combined Deuterium-Halogen
- Integrated TTL-shutter

A direct-attach cuvette holder CUV-DA (see section accessories) is available for fluorescence or absorbance measurements.

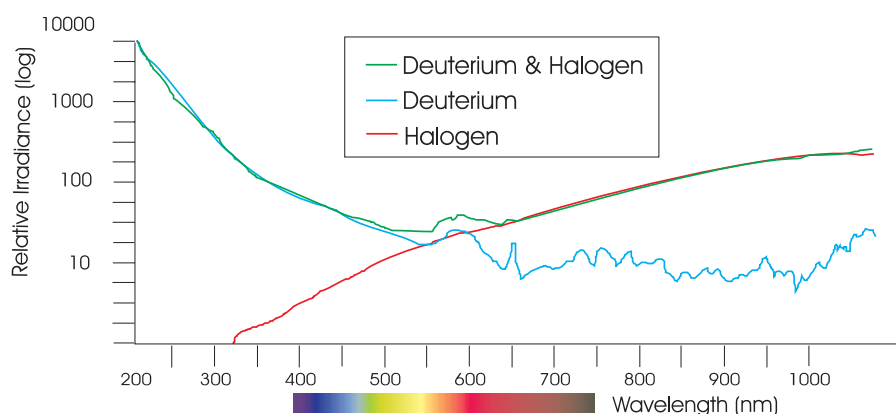


Figure 8 Spectral output of AvaLight-DHc

Technical Data

	Deuterium Light Source	Halogen Light Source
Wavelength Range	200 - 400 nm	400 - 2500 nm
Stability	< 1 mAU	< 1 mAU
Warm-up time	8 min	1 min
Drift	< 0.25% / h	< 0.25% / h
Optical Power in 600 μm fiber	0.2 μ Watt	7 μ Watt
Lamp Lifetime	1000 hours	2000 hours
Temp. Range	5°C - 35°C	
Power Supply	12VDC / 450 mA	
Dimensions, weight	175 x 110 x 44 mm, 570 grams	
Lifetime shutter	1.000.000 cycles (typical)	

Ordering information

AvaLight-DHc	• Compact Deuterium Halogen Light Source with TTL Shutter
IC-DB26-2	• Interface cable AvaSpec-USB2/EVO platform to AvaLight-DHc-TTL-shutter
AvaLight-DHc-RM	• Rackmount Compact Deuterium Halogen Light Source with TTL Shutter
AvaLight-DHc-B	• Compact Deuterium Halogen Replacement Bulb
CUV-DA	• Direct-attach cuvette holder for AvaLight-DHc/XE/LED
PS-12V/1.0A	• Power supply 100-240VAC/12VDC, 1.0A for AvaLight-DHc



Three years
limited warranty on all
Avantes spectrometers,
light sources and accessories

AvaLight-HPLED High-power Light Sources for Fluorescence Applications

The AvaLight-HPLED is a compact, affordable LED light source meant for fluorescence applications. This high-power version was made for more demanding applications compared to our regular LED light source.

The AvaLight-HPLED light sources produce continuous or pulsed spectral output at different wavelengths. All sources have an SMA-905 connector to connect fiber optics and come with a 5V/1.6A power supply.

This high-power LED light source can be used as a DC source or pulsed with a programmable Pulse Width Modulation (PWM), supplied by an AvaSpec-USB2 or EVO spectrometer (IC-DB26-2 cable needed).

Benefits of the AvaLight-HPLED:

- Compact
- High power levels
- Fluorescence excitation
- Several excitation wavelengths

AvaLight-HPLED



Technical Data for AvaLight-HPLED

	AvaLight-HPLED-385	AvaLight-HPLED-405	AvaLight-HPLED-470	AvaLight-HPLED-530	AvaLight-HPLED-625	AvaLight-HPLED-White
Peak wavelength	385 nm	405 nm	470 nm	530 nm	625 nm	N.A.
FWHM (nm)	15 nm	15 nm	25 nm	35 nm	25 nm	N.A.
Optical power 600 µm fiber	3.4 mWatt	3.4 mWatt	3.4 mWatt	3.4 mWatt	3.4 mWatt	3.4 mWatt
Connector	SMA-905					
Power supply	5V, 500 mA					
Dimensions, weight	150 x 78 x 37 mm, 420 grams					

Ordering Information

AvaLight-HPLED-XXX

- High-power light-emitting diode light source, specify wavelength XXX = 385, 405, 470, 530, 625, White. Includes 5V/1.6A power supply

IC-DB26-2

- Interface cable AvaSpec-USB2/EVO platform to AvaLight-HPLED for PWM



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AvaLight-XE Pulsed Xenon

AvaLight-XE



Perfect for ultraviolet applications like fluorescence, the AvaLight-XE is a pulsed xenon light source. When connected to your AvaSpec spectrometer through the IC-DB26-2 cable (sold separately), the flashes are synchronized with the data collected by the spectrometer. In AvaSoft the number of flashes per scan can be selected.

With a special DUV bulb the AvaLight-XE can be used for deep ultraviolet application (below 200 nm). A special direct-attach cuvette holder is available for your fluorescence applications. For transmission measurements, the AvaLight-XE can be used in conjunction with the CUV-ATT-DA which has an iris attenuator to limit the light output and to avoid saturation.

- Pulsed light source
- Perfect for fluorescence
- Cuvette holder available
- Long lifetime

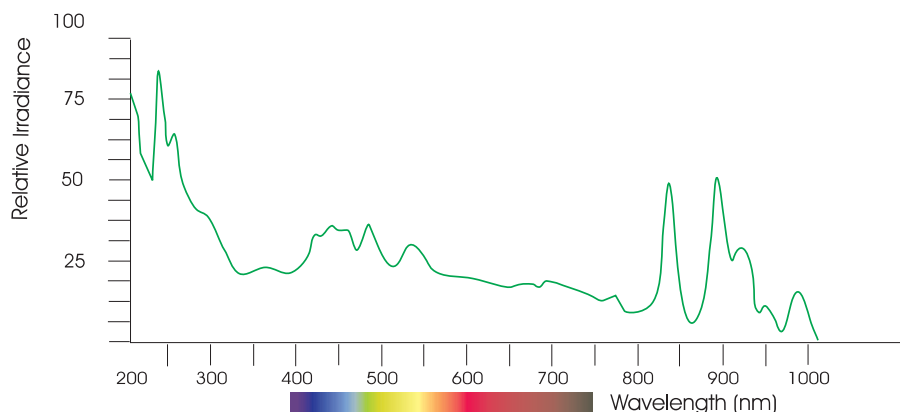


Figure 12 Spectral output of the AvaLight-XE

Technical Data

Spectral Output	200 nm to 1000 nm
Total Optical Power output	39 μ J per pulse (average 66 mW)
Optical Power in 200 μm fiber	0.66 μ J per pulse (average 20 μ W)
Optical Power in 600 μm fiber	3.2 μ J per pulse (average 320 μ W)
Optical Power in 1000 μm fiber	7.4 μ J per pulse (average 744 μ W)
Synchronization Input	15 pin sub-D connector, TTL level
Pulse Duration	5 μ s (at 1/3 height)
Pulse delay	6 μ s
Pulse rate (max.)	100 Hz
Bulb Life	min. 10^9 pulses
Connector	SMA-905 connector
Power requirement	12 VDC/550 mA
Dimensions, weight	175 x 110 x 44 mm, 540 grams

Ordering Information

AvaLight-XE	• Xenon Light Source (200-1000 nm), needs interface cable and power supply
AvaLight-XE-DUV	• DUV (160-1000 nm) version of the AvaLight-XE, needs interface cable and power supply
AvaLight-XE-B	• Spare bulb for the AvaLight-XE (200-1000 nm)
AvaLight-XE-B-DUV	• Spare bulb for the AvaLight-XE-DUV (160-1000 nm)
IC-DB26-2	• Interface cable AvaSpec-USB2/EVO platform to AvaLight-XE
CUV-DA	• Direct-attach cuvette holder for AvaLight-DHc/XE/LED
ATT-DA	• Direct-attach attenuator for AvaLight-DHc/XE/LED
CUV-ATT-DA	• Direct-attach cuvette holder and attenuator for AvaLight-DHc/XE/LED
PS-12V/1.0A	• Power supply 100-240VAC/12VDC, 1.0A for AvaLight-XE

AvaLight-XE High Power Pulsed Xenon

AvaLight-XE-HP

Perfect for ultraviolet applications like fluorescence, the AvaLight-XE-HP is a pulsed xenon light source. When connected to your AvaSpec spectrometer through the Y-cable, the flashes are synchronized with the data collected by the spectrometer. In AvaSoft the number of flashes per scan can be selected.

Compared to the AvaLight-XE (2W), the XE-HP can provide significant more power. The AvaLight-XE-HP comes in a compact housing and is ideal for OEM integration.



Technical Data

Spectral Output	200 nm to 1000 nm
Total Optical Power output	max 6W / 39mJ per flash
Synchronization Input	9 pin sub-D connector, TTL level
Pulse rate (max.)	150 Hz
Long Life	1,0 x 10 ⁹ flashes
Connector	SMA-905 connector
Power requirement	11 -28 VDC/2.08A
Dimensions, weight	98 x 44 x 35 mm, 192 grams

Ordering Information

AvaLight-XE-HP	• 6W Xenon Light Source (200-1000 nm), with Y-cable for power and trigger connection. Needs extra PS-12V/2.08A power supply
PS-12V/2.08A	• Power supply 100-240VAC/12VDC, 2.08A for AvaLight-XE-HP

AvaLight-CAL Spectral Calibration Source

The AvaLight-CAL-xxx is a spectral calibration lamp. It's available in Mercury-Argon (253.6-922.5 nm), Neon (337-1084.5 nm), Argon (696.5-1704 nm) Zinc (202.5-636.2 nm) and Cadmium (214.4-643.8 nm) versions. The major lines including their relative intensity and structures are shown below.

The standard SMA-905 connector supplies an easy connection between the lamp and optical fibers, making the AvaLight-CAL-xxx a low cost wavelength calibration system for any fiber-optic spectrometer. AvaSoft-Full spectroscopy software includes an automatic recalibration procedure.

The AvaLight-CAL-Mini, AvaLight-CAL-AR-Mini, AvaLight-CAL-Neon-Mini all come in the Mini-housing. They are equipped with a connector at the rear enabling to switch the unit on/off remotely with a TTL signal.

The AvaLight-CAL can also be delivered in rack-mountable version, to be integrated in Avantes 19" Rack-mount or the 9.5" desktop housing. The PS-12V/1.0A power supply should be ordered separately.

AvaLight-CAL-Mini



- Calibration light source
- Available in a variety of wavelength ranges (UV to NIR)

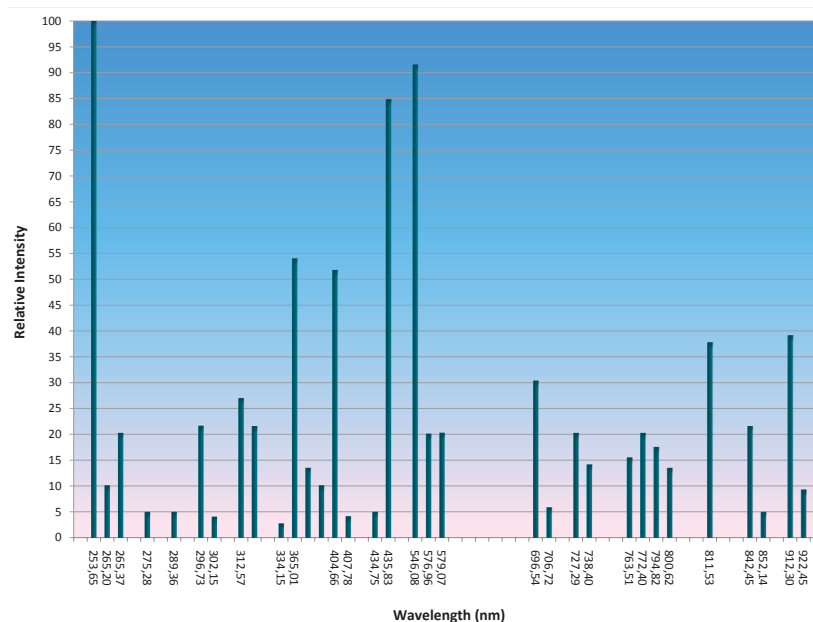


Figure 14 Spectral lines AvaLight-CAL-Mini

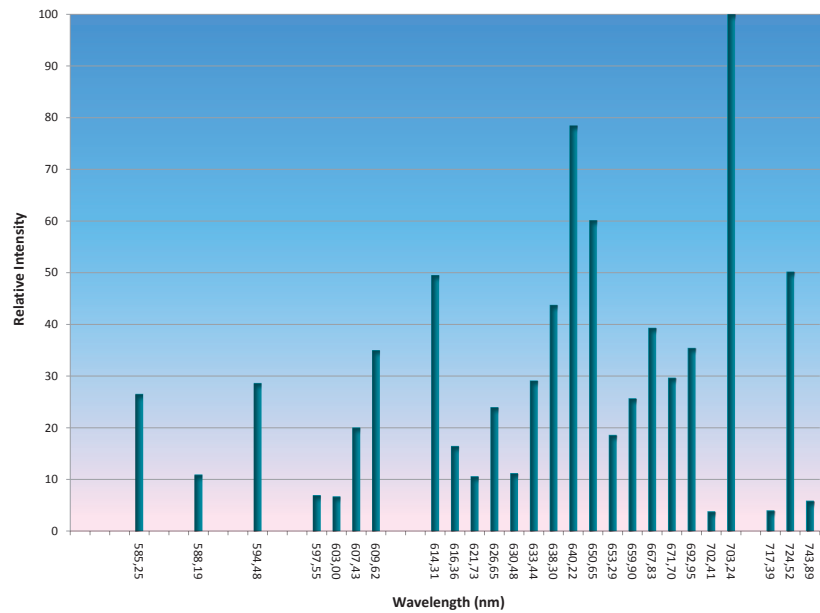


Figure 15 Spectral lines AvaLight-CAL-Neon-Mini

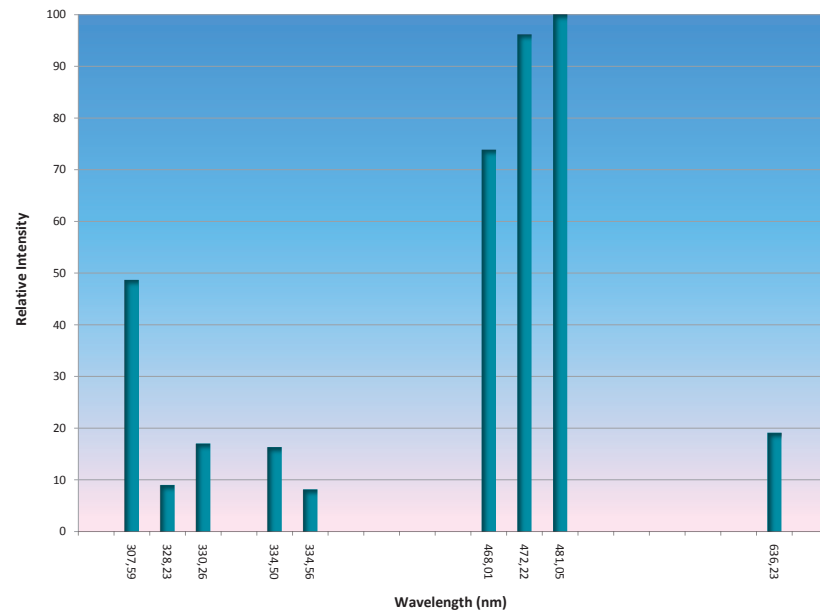


Figure 16 Spectral lines AvaLight-CAL-Zinc

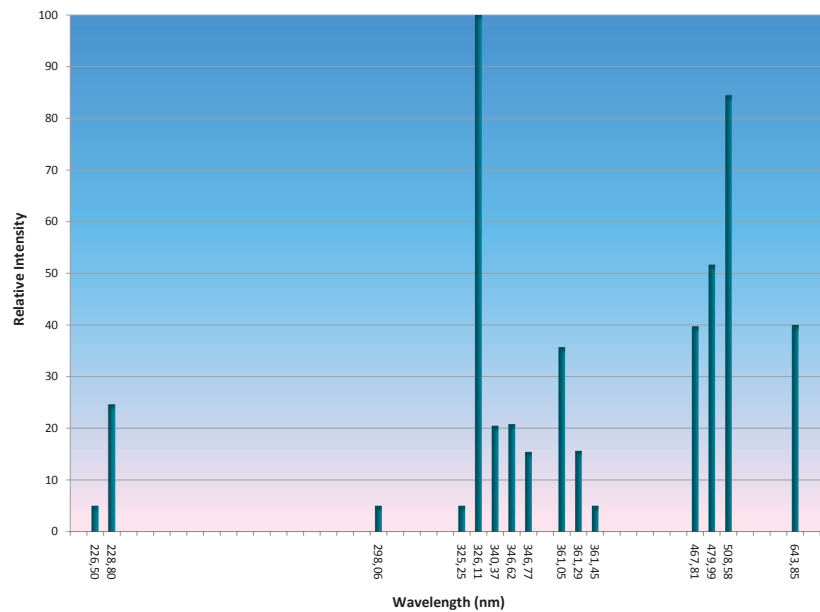


Figure 17 Spectral lines AvaLight-CAL-CAD

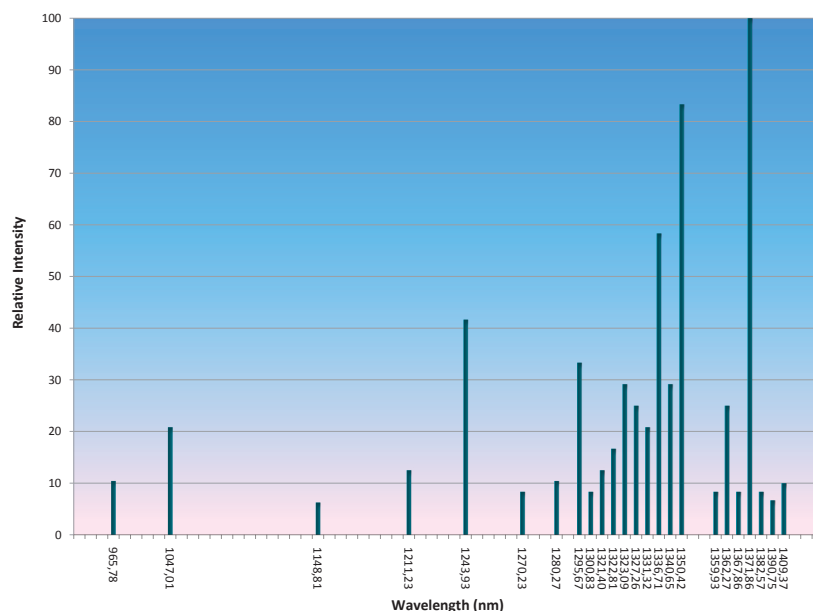


Figure 18 Spectral lines AvaLight-CAL-AR-Mini

Technical Data

Lamp	HgAr	Neon	Ar	Zinc	Cadmium
Output	253.6–922.5 nm	337–966 nm	950–1704 nm	202.5–636.2 nm	214.4–643.8 nm
Optical power in 600 µm fiber	1.6 µW				
Connector	SMA-905 connector				
Internal Voltage	1200 Volts AC at 30 kHz, 10 mA			1500 Volts AC at 27 kHz, 47.5 mA	
Warm up	1 minute for vapor stabilization			< 10 min.	
Lamp lifetime	5000 hrs.			1000 hrs.	
Power requirement	12VDC supply, 240 mA			85–240 VAC, 1.0A	
Dimensions, weight	150 x 78 x 37 mm, 480 grams			Lamp unit :	
				175 x 110 x 44 mm, 480 grams	
				Power supply unit :	
					102 x 167 x 58 mm, 450 grams

Ordering Information

AvaLight-CAL-Mini	• Mercury Argon Calibration source needs extra PS-12V/1.0A power supply, SMA
AvaLight-CAL-NEON-Mini	• Neon Calibration source needs extra PS-12V/1.0A power supply, SMA
AvaLight-CAL-AR-Mini	• Argon Calibration source needs extra PS-12V/1.0A power supply, SMA
AvaLight-CAL-RM	• Rack-mounted version of AvaLight-CAL
AvaLight-CAL-B-Mini	• Replacement bulb, Mercury-Argon
AvaLight-CAL-NEON-B-Mini	• Replacement bulb, Neon
AvaLight-CAL-AR-B-Mini	• Replacement bulb, Argon
AvaLight-CAL-ZINC	• Zinc Calibration Light source, including power supply
AvaLight-CAL-CAD	• Cadmium Calibration Light source, including power supply
AvaLight-CAL-ZINC-B	• Zinc replacement bulb
AvaLight-CAL-CAD-B	• Cadmium replacement bulb
PS-12V/1.0A	• Power supply 100–240 VAC/12 VDC, 1.0 A for AvaLight-CAL-Mini series