QUV Operator Training

Kobe Qu - Senior Technical and Marketing Manager

Tommy Hu – Repair Adviser

Q-Lab Corporation

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Topics

- Safety
- Functions of the Tester
- Running a Test
- Calibration
- Maintenance

Electrical Shock 触电风险

- The QUV uses 400V to operate the lamps

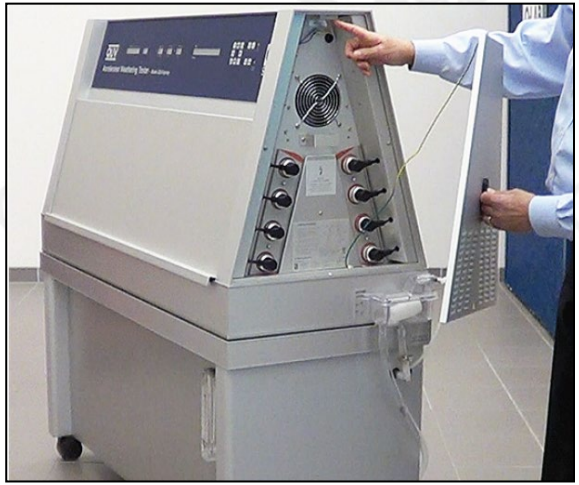
QUV使用高压触发灯管

- Due to this high voltage, the QUV uses interlock switches to remove power to the lamps when the end covers are removed.

联锁开关切断电源当移除端盖时候

- Always use caution around high voltage, and do not bypass the safety interlock switches!

一定不要绕过安全联锁开关



UV Exposure 紫外曝露

- One sample holder removed

当一个样品架移开时候

- Hand 5 cm (2 in) from lamps (same distance as specimens)
  - Allowable Daily Exposure: 1 minute

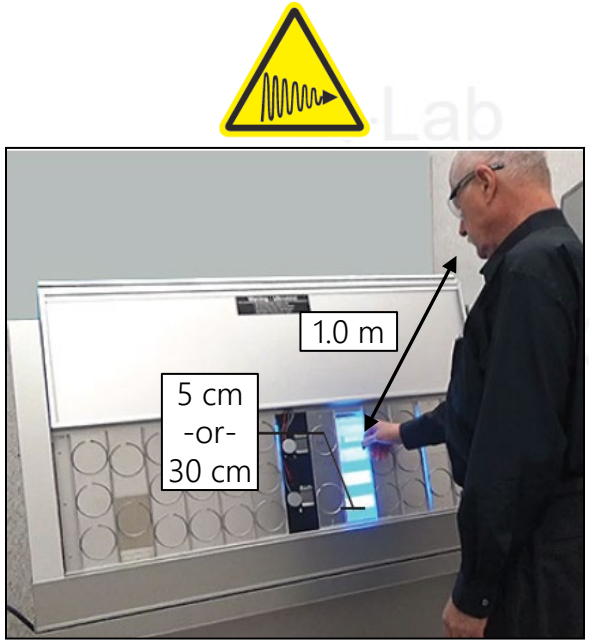
手距离灯管5cm，每天允许曝露1分钟

- Hand 30 cm from lamps
  - Allowable Daily Exposure: 6 minutes

手距离灯管30cm，每天允许曝露6分钟

- Face 1.0 m from lamps
  - Allowable Daily Exposure: 18 minutes

距离灯管1米，每天允许曝露18分钟



UV Exposure 紫外曝露

- All sample holders removed

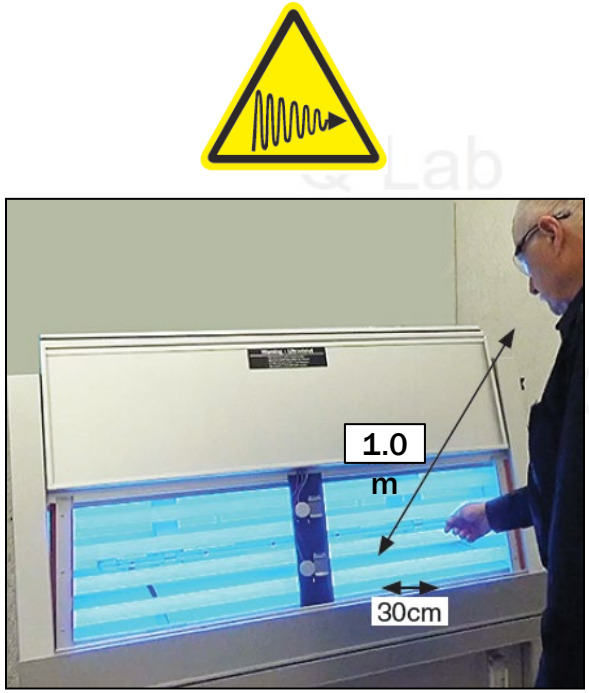
当所有样品架移除时

- Hand 30 cm from lamps
  - Allowable Daily Exposure: 2 minutes

距离灯管30cm，每天允许曝露2分钟

- Face 1.0 m from lamps
  - Allowable Daily Exposure: 6 minutes

距离灯管1米，每天允许曝露6分钟



QUV Door Interlocks 门联锁开关

- The UV dosage someone will see from periodic irradiance calibration and specimen handling is equivalent to being outside on a clear day

平常做辐照度校准和安装样品时接受的紫外辐射，就和大晴天走在外面一样

- Nevertheless, QUV testers have interlocks on the front and rear swing doors that will shut off the lamps after 30 seconds.

QUV在30秒之后会自动切断电源，当箱门打开时候

Topics

- Safety
- Functions of the Tester
- Running a Test
- Calibration
- Maintenance

QUV Functions

- UV Light System

紫外光照系统

- Controlled Temperature

温度控制

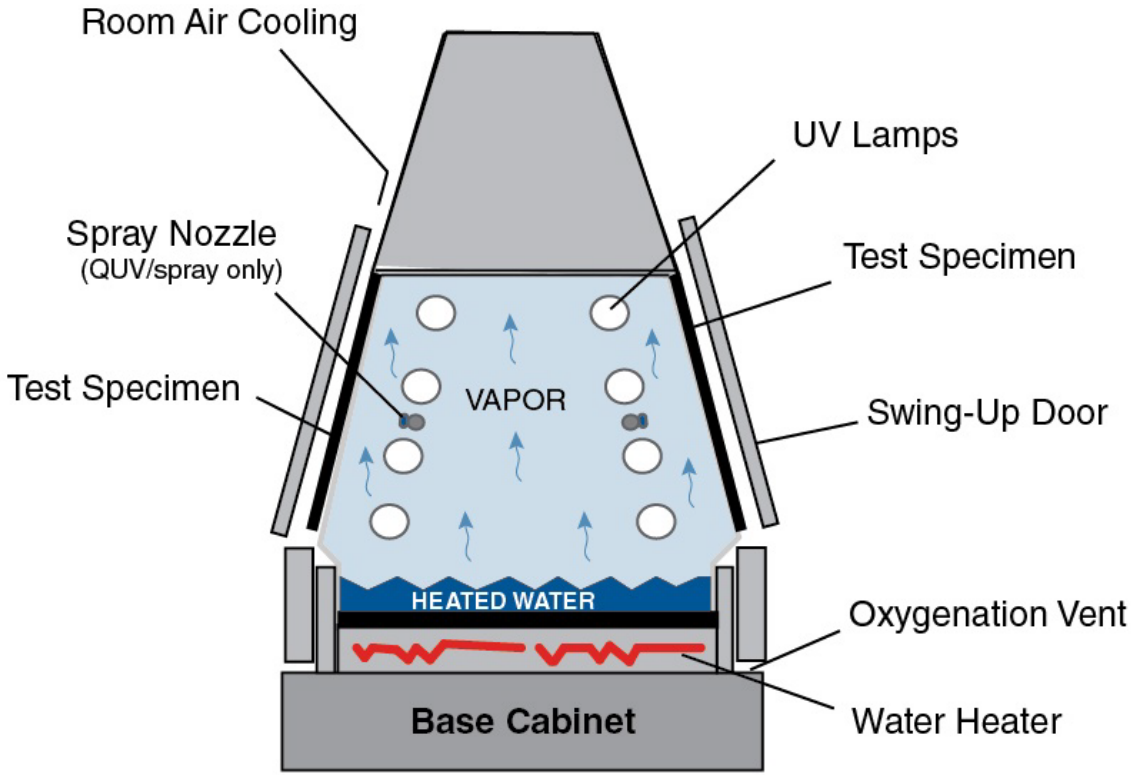
- Condensation

冷凝

- Water Spray (optional)

水喷淋

QUV Overview



UV Light System 光照系统

- QUV/basic
  - No control of irradiance

  无辐照度控制
  - 4 separate ballasts

  4组独立整流器

- QUV/se, QUV/spray, QUV/cw, QUV/uvc
  - Solar Eye Irradiance Control maintains the same irradiance at all times

  SE太阳眼辐照控制系统实时控制辐照度水平
  - Single ballast controls 4 banks of lamps

  一个整流器控制4组灯管

Solar Eye Irradiance Control

- One specialized ballast powers four channels of eight total lamps

整流器点亮4组灯管（8支灯管）

- Power to lamps controlled to maintain constant UV irradiance

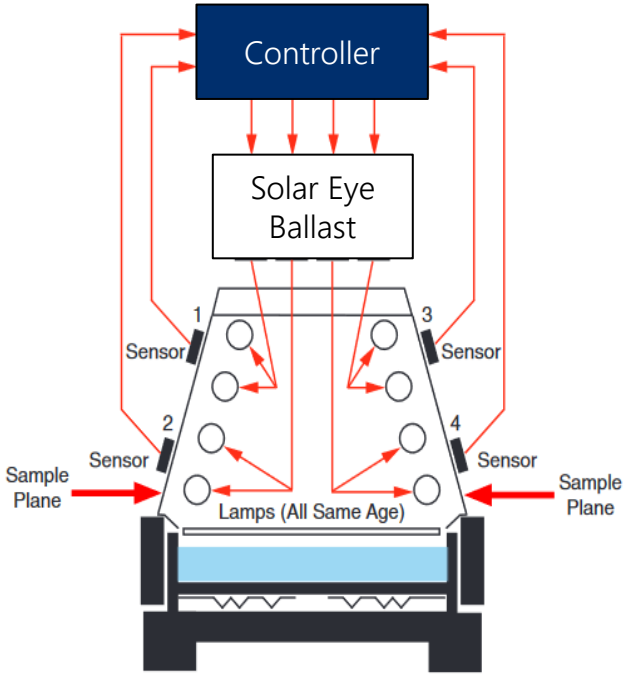
控制灯管的功率以保持恒定的紫外线辐照度

- Benefits are numerous –
  - Calibrated light source for better repeatability

    经过校准的光源可获得更好的实验可重复性
  - Controlled Higher & Lower Intensity

    控制较高和较低辐照强度
  - Replace lamps only when needed

    仅在需要时才更换灯管

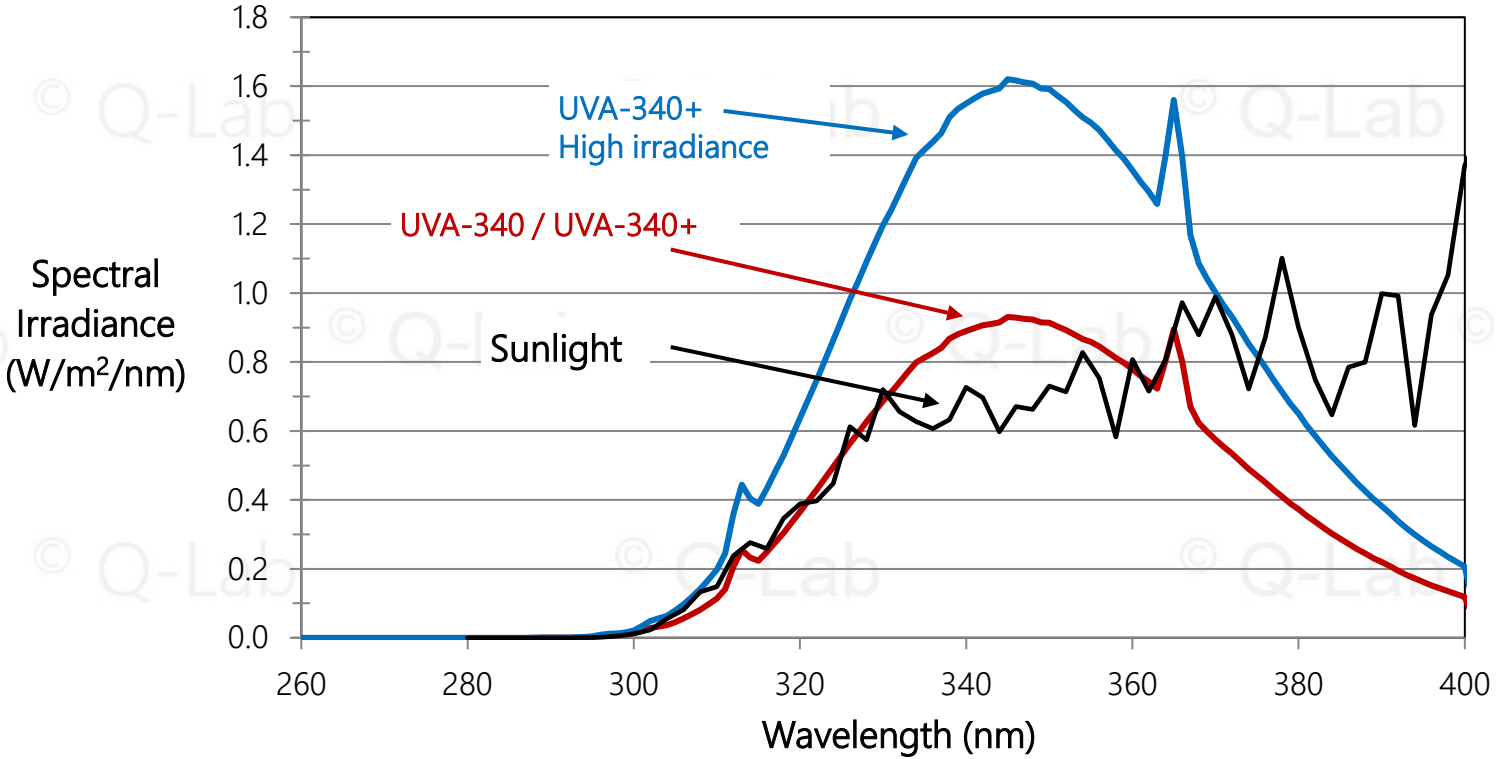


Irradiance Levels

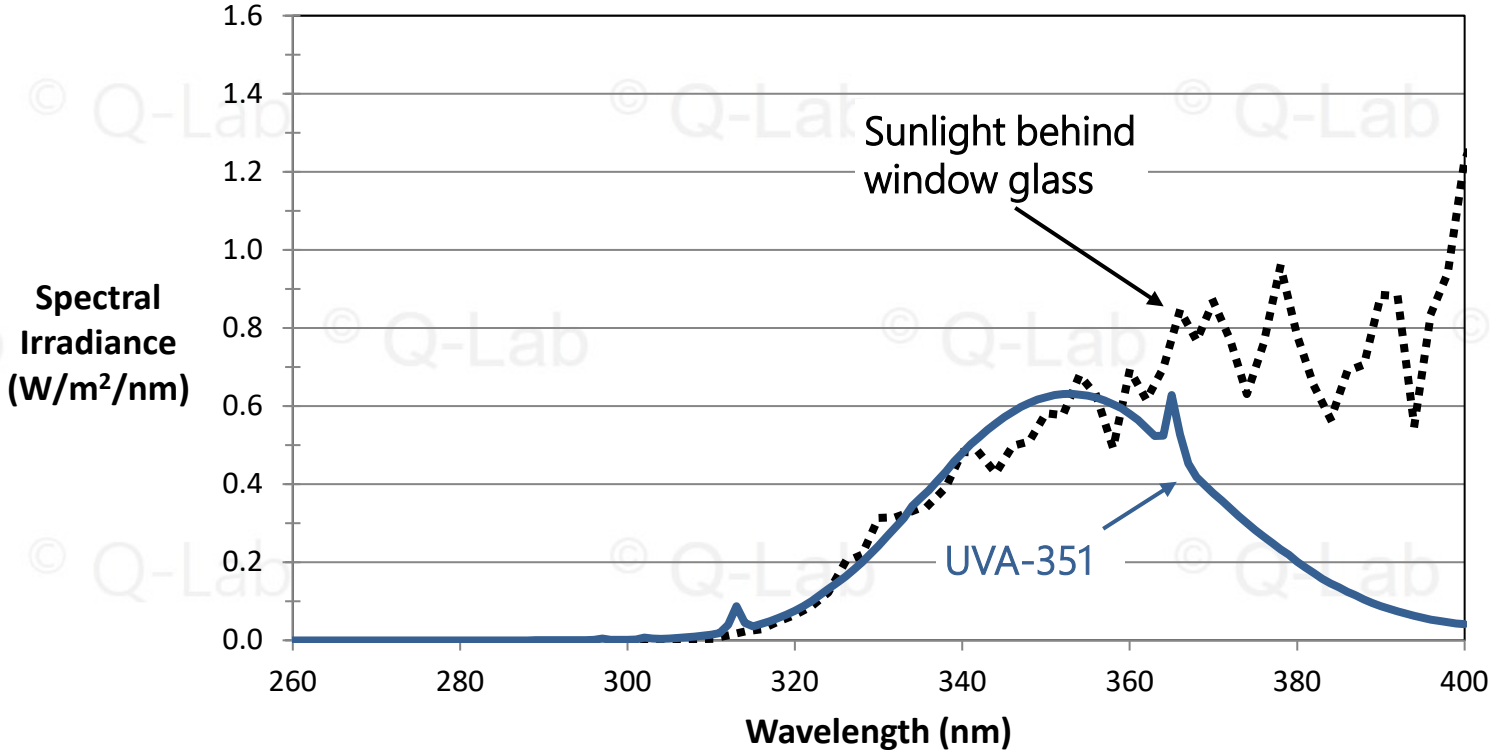
Irradiance	Warranty[1]	UVA-340	UVA-340+[2]	UVA-351	UVB-313EL	UVB-313EL+[3]	UVC-254[4]
Minimum	*Reference*	0.20	0.35	0.20	0.20	0.35	1.0
Low	1,000 hours	0.40-0.59	0.60-0.74	0.35-0.59	0.40-0.47	0.40-0.47	1.1-1.9
Typical	8,000 hours	0.60-0.90	0.75-0.95	0.60-0.80	0.48-0.62	0.48-0.95	2.0-6.0
High	1,000 hours	0.91-1.25	0.96-1.85	0.81-1.25	0.63-0.95	0.96-1.85	6.1-10.0
Maximum	*Reference*	1.54	2.04	1.54	1.23	2.04	13.0

Note: Irradiance value ($W/m^2/nm$) at 340 nm for UVA lamps, 310 nm for UVB lamps
Irradiance in mW/cm^2 @254 nm for UVC lamps ($10 \times W/m^2$)

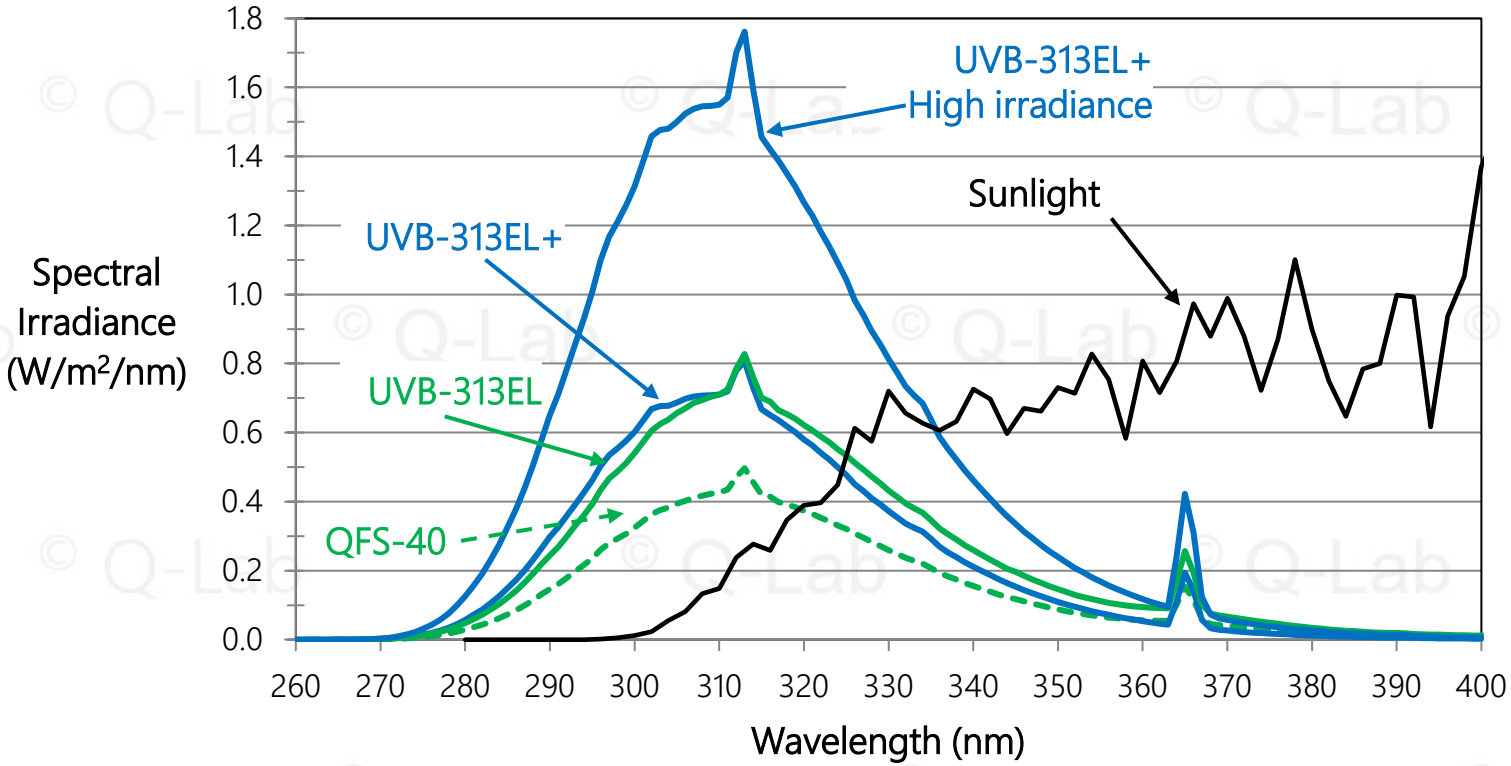
UVA-340 / UVA-340+ Lamps SPD



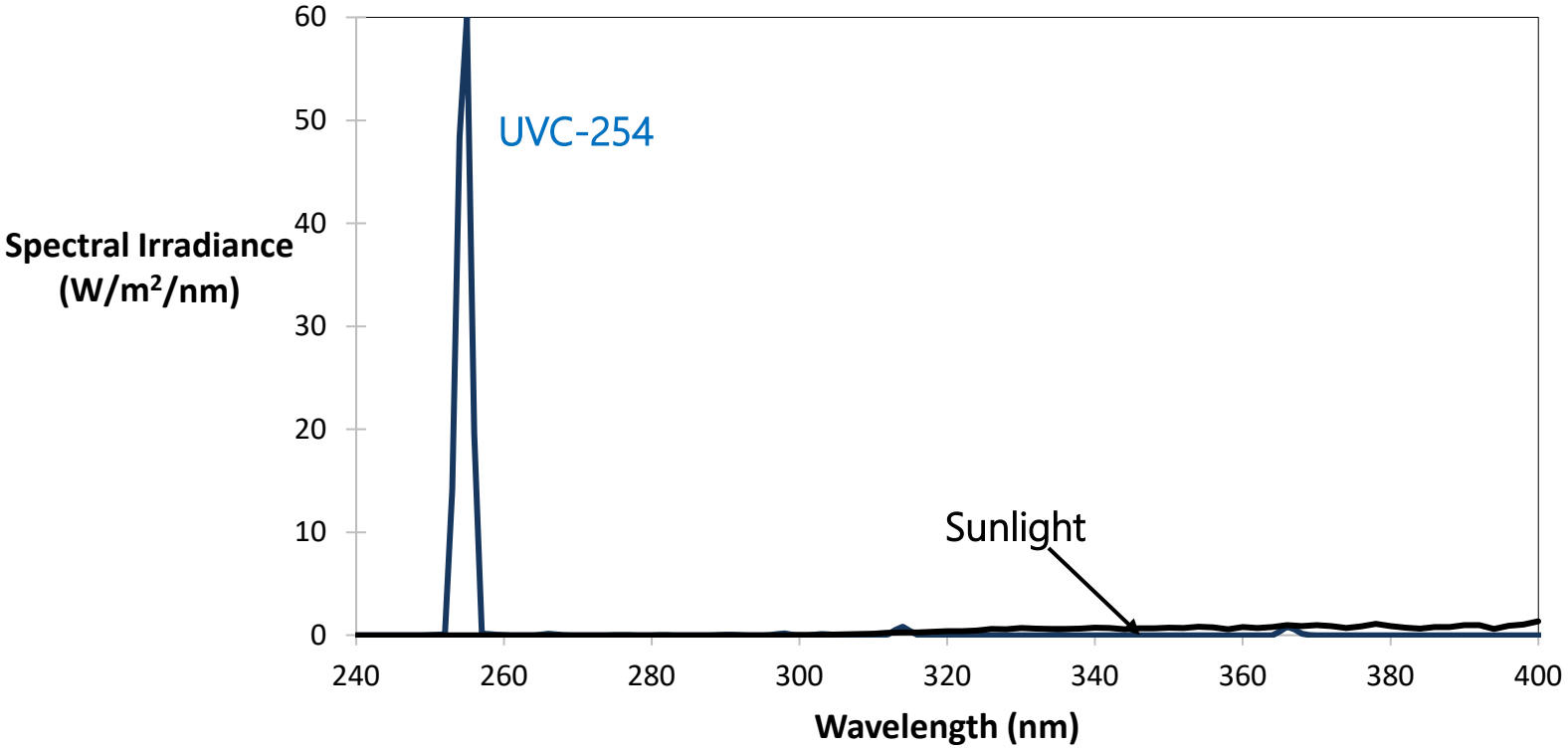
UVA-351 Lamps SPD



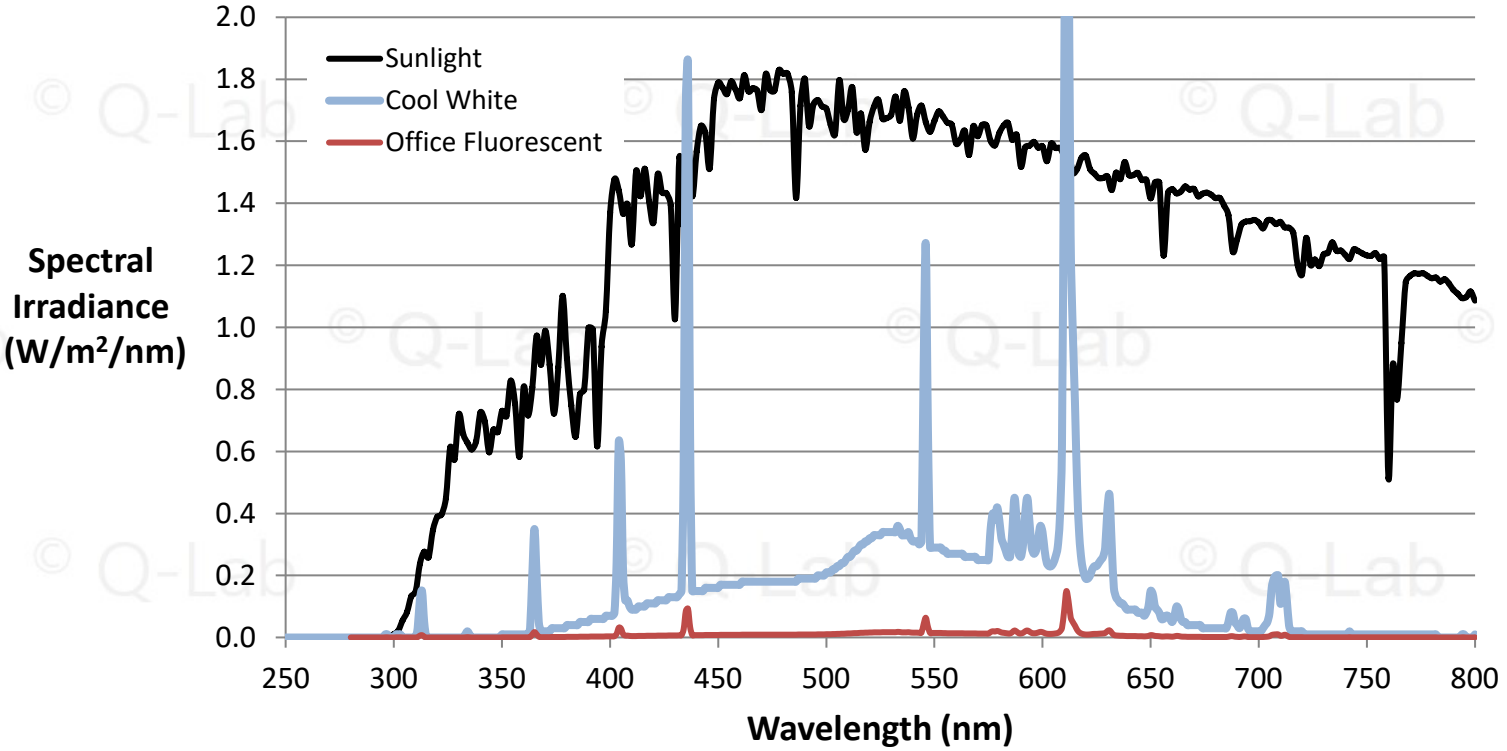
UVB Lamps SPD



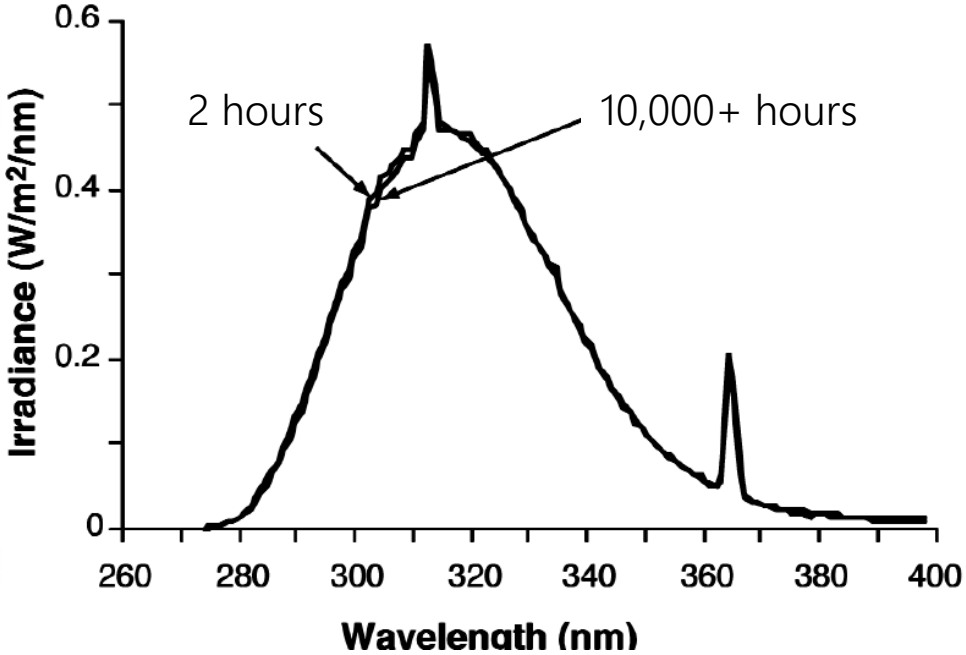
UVC Lamps



Cool White SPD



SOLAR EYE Lamps - No Aging



Minimal to no spectral change after 10,000 hours in SOLAR EYE models.

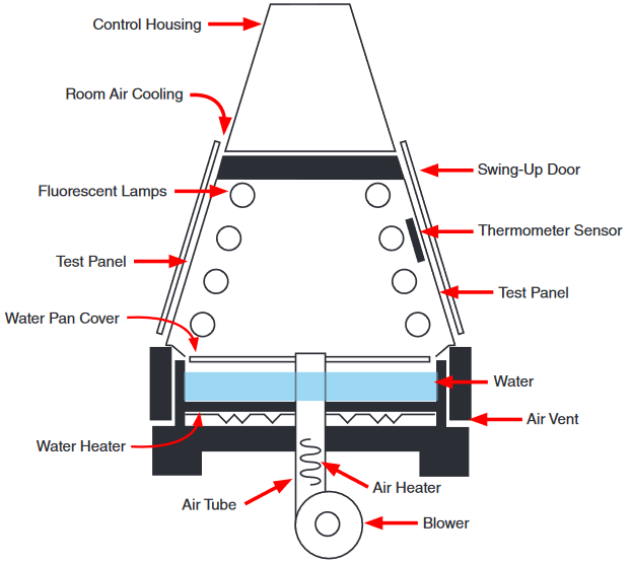
Temperature Control in UV Function

- Controlled by panel temperature sensor

控制（黑）板温度

  - Uninsulated 非绝缘
  - Insulated 绝缘
- Blower 风机
- Air Heater 空气加热器
- Both Blower and Air Heater are on during UV Cycle

在紫外光照时候风机和空气加热器都工作



QUV Moisture

- Condensing Humidity 冷凝
  - Hot condensation 热冷凝
  - Maximum water uptake 最大水吸收
- Water Spray 水喷淋
  - Thermal Shock 热冲击
  - Erosion 侵蚀

QUV Condensation

- Standard in most QUV's

QUV标配冷凝功能

- Requires tap water connection, but distilled water reduces maintenance, do not soften water.

需要自来水连接，但去离子水减少维护，不要用软化水

- Uses approximately 8 liters/day

8升每天的用水量

- Water Heater is on, warming the water and filling the chamber with warm water vapor

水盘加热器加热水，使得箱内充满热蒸汽

- Water Temperature Sensor ensures safety and that the water pan is full

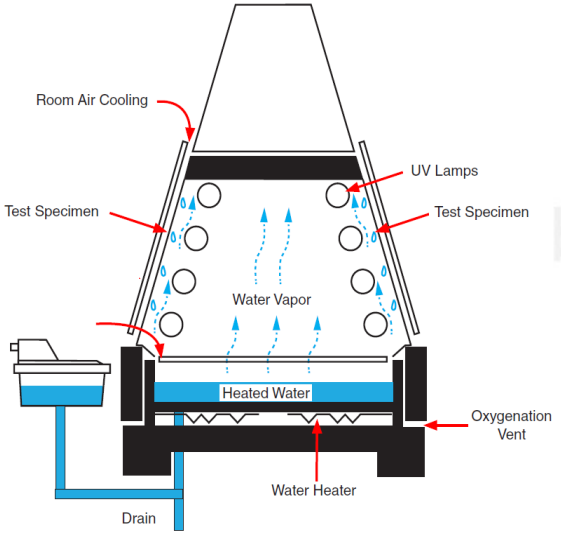
水温传感器确保安全，水盘满水状态

- Blower is on until the panel temperature is met

风机运行直到黑板温度达到设定值

- Lamps and Air Heater are off

灯管和空气加热器不工作



QUV/spray and QUV/spray-RP

- Purified water required (> 200 kΩ resistivity)

水质要求(> 200 kΩ 电阻率)

- 12× nozzles total, 6× on each side

12个喷头，每边6个

- 7 liters/minute

流量7升/分钟

- Panel temperature is displayed but not controlled

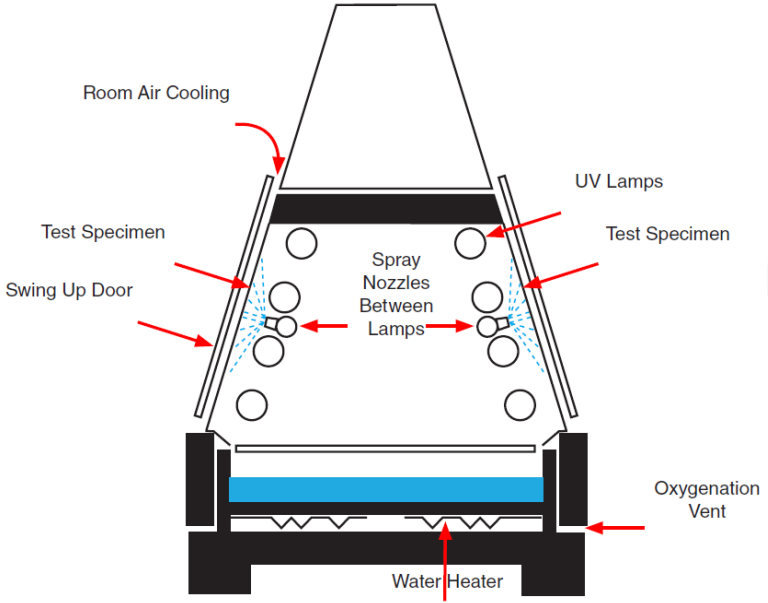
温度有显示但不控制

- Lamps, Water Heater, Air Heater, and Blower are off

灯管、水热水器、空气加热器和风机关闭

- QUV/spray-RP is an optional system that re-circulates and re-purifies water (purified water connection still required)

QUV/spray-RP可以实现水回收再净化 （仍然使用去离子水）



Field Calibration 现场设备计量

- Q-Lab Repair team offers tester audits and field calibrations, in addition to their on-site repair visits and troubleshooting services.

Q-Lab维修团队除了提供现场维修和故障排除服务外，还提供**现场设备校准服务**

- Contact Repair.cn@q-lab.com for more info

计量内容	Q-Lab计量
校准/计量证书	√
校准	√
设备全面功能检查	√
保养	√
维修（若有）	√
培训	√

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