



# Q-SUN Xenon Test Chambers

## Overview

Q-SUN® xenon arc chambers reproduce the damage caused by full-spectrum sunlight and rain. In a few days or weeks, Q-SUN testers can reproduce the damage that occurs over months or years outdoors.

## Features

Q-SUN xenon arc chambers are available in four different models. The tabletop Xe-1, and full-sized Xe-2 and Xe-3 are covered in this document. The large capacity rotating rack Q-SUN Xe-8 is covered in the [Q-SUN Xe-8 Specifications](#). Each tester is 100% air-cooled, for extreme reliability and simple, low-cost maintenance. All testers have standard datalogging via ethernet, a variety of standard specimen holders, and a remarkably simple dual touchscreen user interface available in 17 languages.

|  | Xe-1       | Xe-2          | Xe-3       |
|--|------------|---------------|------------|
| <b>Chamber Type</b>  | Flat Array | Rotating Rack | Flat Array |
| <b>Specimen Capacity</b>                                     | 17         | 31            | 55         |
| <b>Specimen Orientation (measured from horizontal)</b>       | 10°        | 90°           | 10°        |
| <b>Full Spectrum, Ozone-Free Xenon Arc Lamps - 1800 W</b>    | 1          | 1             | 3          |
| <b>SOLAR EYE® Irradiance Control (340 nm, 420 nm or TUV)</b> | ●          | ●             | ●          |
| <b>Relative Humidity Control</b>                             | —          | ●             | ●          |
| <b>Water Spray</b>   | ◐          | ◐             | ◐          |
| <b>Heated Water Immersion</b>                                | ◐          | —             | —          |

● Standard ◐ Optional — Not Available

## Optical Filters and Radiometers

Q-SUN optical filters are very durable and all filters maintain the required spectrum indefinitely, lasting for years under normal use with proper maintenance (except Window-IR). The application or test standard dictates which filter to use. Xe-1 and Xe-3 filters are flat, while the Xe-2 filter lantern consists of an outer borosilicate or quartz cylinder and 14 inner filters.

|   | Xe-1 & Xe-3 Irradiance Values<br>Typical (& Maximum) <sup>1,2,3</sup> |                                 |                                       | Xe-2 Irradiance Values<br>Typical (& Maximum) <sup>1,2,3</sup> |                                 |                                       |
|---|---|---------------------------------|---------------------------------------|--|---------------------------------|---------------------------------------|
|   | W/m <sup>2</sup> /nm<br>@340 nm                                       | W/m <sup>2</sup> /nm<br>@420 nm | W/m <sup>2</sup> @TUV<br>(300-400 nm) | W/m <sup>2</sup> /nm<br>@340 nm                                | W/m <sup>2</sup> /nm<br>@420 nm | W/m <sup>2</sup> @TUV<br>(300-400 nm) |
| <b>Daylight-F<sup>4</sup></b>                 | 0.80 (1.30)   | 1.50 (2.40)                     | 75 (125)                              | 0.80 (0.95)  | 1.50 (1.70)                     | 75 (85)                               |
| <b>Daylight Q<sup>4</sup></b>                 | 0.68 (1.10)   |                                 |                                       | 0.68 (0.80)  |                                 |                                       |
| <b>Extended UV (-Q/B,-Quartz<sup>5</sup>)</b> |   |                                 |                                       | 0.51 (0.61) <sup>6</sup>                                       |                                 |                                       |
| <b>Daylight-B/B<sup>4</sup></b>               |   |                                 |                                       | 0.55 (0.65)  |                                 |                                       |
| <b>Window (-Q, -B/SL)</b>                     | 0.55 (0.85)   |                                 |                                       | 70 (108)   |                                 |                                       |
| <b>Window (-SF5, -IR, -B04<sup>7</sup>)</b>   | -   | 42 (68)                         | 42 (62)                               |  |                                 |                                       |

### Notes:

- 1) Minimum irradiance 0.25 @340 nm, 0.45 @420 nm, and 20 @TUV.
- 2) Typical irradiance that can be obtained by using the X-1800+ or X-1850+ lamp with a lamp life of 3000 hours. For important warranty information, visit [Q-Lab.com/Warranty](http://Q-Lab.com/Warranty).
- 3) Maximum irradiance that can be obtained by using the X-1800+ or X-1850+ lamp with a lamp life of 1000 hours.
- 4) Daylight-F and Daylight-Q filters meet the requirements of Type I Daylight filters defined in ISO 4892-2 and ASTM G155. Daylight-B/B filters meet the requirements of Type II Daylight filters.
- 5) Xe-1 and Xe-3 only.
- 6) In addition to the standard 1,000 and 3,000 hour warranties for Maximum and Typical irradiance values shown, Q-Lab will also guarantee 2000 hours at 0.55 W/m<sup>2</sup>/nm.
- 7) Xe-2 only.

## Calibration, Temperature and Humidity Control

Q-SUN Xe-2 and Xe-3 testers simultaneously control chamber air temperature (CAT) and black panel (uninsulated/BP) or black standard (insulated/IBP/BST) temperature; the Xe-1 controls either, but not both. A disposable electronic relative humidity and CAT sensor provides precise control of relative humidity of the Xe-2 and Xe-3 and should be replaced annually. All Q-SUN testers can be calibrated quickly and easily using Q-Lab's Universal Calibrator system, featuring the patented AUTOCAL® system.

|  | Xe-1 | Xe-2 | Xe-3 |
|--|------|------|------|
| <b>AUTOCAL UC20 Irradiance Control</b> | ●    | ●    | ●    |
| <b>UC202 Black Panel Thermometer</b>   | ●    | ●    | ●    |
| <b>Chamber Air Temp (CAT) Sensor</b>   | ◐    | ●    | ●    |
| <b>Relative Humidity (RH) Sensor</b>   | —    | ●    | ●    |

● Standard ◐ Optional — Not Available



## Operating Specifications

| Models   | Xe-1   |                   |  |                                       |                                      |   | Xe-2  |  | Xe-3   |                                     |   |                       |            |     |
|--|--|-------------------|--|---------------------------------------|--------------------------------------|---|---|--|--|-------------------------------------|---|-----------------------|------------|-----|
| Configurations <sup>1</sup>                              | Xe-1-BE<br>Xe-1-SE   |                   | Xe-1-BCE<br>Xe-1-SCE   |                                       | Xe-1-WE                              |   | Xe-2-HE<br>Xe-2-HSE<br>Xe-2-HBSE              |  | Xe-3-HE<br>Xe-3-HSE                            | Xe-3-HDSE <sup>2</sup><br>Xe-3-HBSE |   | Xe-3-HCE<br>Xe-3-HSCE |            |     |
|  | BP   | IBP               | BP   | IBP                                   | BP                                   | IBP                                     | BP  | IBP                                    | BP   | IBP                                 | BP  | IBP                   | BP         | IBP |
| <b>Black Panel Temp<sup>3</sup> (°C)</b>                 |  |                   |  |                                       |                                      |   |   |  |  |                                     |   |                       |            |     |
| Light  | 45-90  | 50-100            | 25-90  | 25-100                                | 45-90                                | 50-100                                  | 50-100  | 55-105                                 | 45-110   | 50-120                              | 35-110  | 36-120                |            |     |
| Light w/IR Filter  | 40-70  | 45-80             | 20-70  | 20-80                                 | 40-70                                | 45-80                                   | 35-85   | 40-90                                  | 40-90  | 45-100                              | 30-90   | 31-100                |            |     |
| Dark   | 25-50  | 25-50             | 10-50  | 10-50                                 | 25-50                                | 25-50                                   | 25-45   | 25-45                                  | 25-50  | 25-50                               | 15-50   | 15-50                 |            |     |
| Light+Immersion  | —  | —                 | —  | —                                     | 35-55                                | 35-55                                   | —   | —                                      | —  | —                                   | —   | —                     |            |     |
| Dark+Immersion   | —  | —                 | —  | —                                     | 30-50                                | 30-50                                   | —   | —                                      | —  | —                                   | —   | —                     |            |     |
| <b>Chamber Air Temp<sup>3,4</sup> (°C)</b>               | <b>CAT</b>   |                   | <b>CAT</b>   |                                       | <b>CAT</b>                           |   | <b>CAT</b>                                    |  | <b>CAT</b>                                     |                                     | <b>CAT</b>  |                       | <b>CAT</b> |     |
| Light (any filter)                                       | 35-55  |                   | 15-55  |                                       | —                                    |   | 35-65   |  | 35-65  |                                     | 25-65   |                       | —          |     |
| Dark   | 30-45  |                   | 10-40  |                                       | —                                    |   | 25-45   |  | 25-50  |                                     | 15-50   |                       | —          |     |
| <b>Relative Humidity<sup>3</sup></b>                     | N/A  |                   |  |                                       |                                      |   | 20-95%  |  |  |                                     |   |                       |            |     |
| <b>Specimen Area</b>                                     | 25 × 46 cm (d × w)<br>(9.9 × 18.0 in)  |                   |  | 22 × 42 cm (d × w)<br>(8.8 × 16.5 in) |                                      | 30 × 25 cm (h × dia)<br>(11.9 × 9.8 in) |   | 45 × 72 cm (d × w)<br>(17.8 × 28.3 in) |  |                                     |   |                       |            |     |
| <b>Specimen Capacity<sup>5</sup><br/>(qty @ size)</b>    | 17 @ 51 × 102 mm<br>(2 × 4 in)   |                   |  | 15 @ 51 × 102 mm<br>(2 × 4 in)        |                                      | 31 @ 45 × 132 mm<br>(1.8 × 5.2 in)      |   | 55 @ 51 × 102 mm<br>(2 × 4 in)         |  |                                     |   |                       |            |     |
| <b>Max Specimen Weight<br/>(distributed evenly)</b>      | 14 kg (30 lbs)   |                   |  |                                       |                                      | 4.5 kg (10 lbs)                         |   | 23 kg (50 lbs) <sup>6</sup>            |  |                                     |   |                       |            |     |
| <b>Inlet Water Pressure<br/>and Purity<sup>7</sup></b>   | All non-"S", non-"W" models <sup>1</sup> : 0.7-6.2 bar (10-90 psi); > 200 kΩ-cm; < 5 μS/cm; < 2.5 ppm TDS<br>All "S" or "W" models: 2.1-6.2 bar (30-90 psi); > 5 MΩ-cm; < 0.2 μS/cm; < 0.1 ppm TDS; < 0.1 ppm colloidal silica |                   |  |                                       |                                      |   |   |  |  |                                     |   |                       |            |     |
| <b>Water Consumed with<br/>Spray On<sup>8</sup></b>      | 0.12 L/min   |                   | 0.12 L/min   |                                       | 0.001 L/min                          |   | 0.5 L/min (front)<br>1.0 L/min (front & back) |  | 0.16 L/min (front)<br>0.4 L/min (front & back) |                                     | 0.16 L/min  |                       |            |     |
| <b>Water Consumed with<br/>Humidifier On<sup>8</sup></b> | —  |                   | —  |                                       | —                                    |   | 8 L/day                                       |  | 44 L/day                                       |                                     | 44 L/day  |                       |            |     |
| <b>External Dimensions<sup>9</sup><br/>(w × h × d)</b>   | 78 × 52 × 65 cm<br>(31 × 21 × 26 in)   |                   | 78 × 138 × 79 cm<br>(31 × 55 × 31 in)<br><i>Xe-1 &amp; Chiller</i> |                                       | 99 × 72 × 65 cm<br>(39 × 28 × 26 in) |   | 91 × 166 × 69 cm<br>(36 × 66 × 27 in)         |  | 91 × 178 × 99 cm<br>(36 × 70 × 39 in)          |                                     | 78 × 94 × 94 cm<br>(31 × 37 × 37 in)<br><i>Chiller Only</i> |                       |            |     |
| <b>Weight<sup>10</sup></b>                               | 50 kg<br>(110 lbs)   |                   | 124 kg<br>(272 lbs)  |                                       | 88 kg<br>(195 lbs)                   |   | 172 kg<br>(379 lbs)                           |  | 190-233 kg<br>(420-512 lbs)                    |                                     | 85 kg (186 lbs)<br><i>Chiller Only</i>                      |                       |            |     |
| <b>Electrical<sup>11</sup><br/>Requirements</b>          | 208 V (230 V)  | 1-Φ @ 12 A (11 A) |  | 1-Φ @ 19 A (16 A)                     |                                      | 1-Φ @ 13 A (12 A)                       |   | 1-Φ @ 24 A (23 A)                      |  | 3-Φ @ 39 A (39 A)                   |   | 3-Φ @ 44 A (44 A)     |            |     |
|  | 400 V  | —                 |  | —                                     |                                      | —                                       |   | —                                      |  | 3-Φ @ 26 A                          |   | 3-Φ @ 26 A            |            |     |
| <b>Lab Recommendations<sup>12</sup></b>                  | Temperature (°C)   |                   |  |                                       |                                      |   | 23 ± 5 °C                                     |  |  |                                     |   |                       |            |     |
|  | Relative Humidity (%)  |                   |  |                                       |                                      |   | 50 ± 25%                                      |  |  |                                     |   |                       |            |     |

### Notes:

- 1) Nomenclature designations: basic (B), spray (S), humidity (H), dual spray (DS), chiller (C), back spray (BS), water immersion (W). Model (E) Q-SUN testers feature dual touchscreen displays and improved irradiance/lamp efficiency.
- 2) Model Xe-3-HDSE has a separate water reservoir that requires additional floor space (not shown in picture).
- 3) Achievable test conditions, including maximum and minimum setpoints and transitions between steps, are influenced by laboratory ambient conditions and interdependencies between test parameters.
- 4) CAT control is optional on Xe-1-BE and S models; BP/CAT can only be controlled simultaneously on Xe-2 and Xe-3 models.
- 5) The Xe-1 and Xe-3 specimen capacity shown is without specimen holders. Xe-2 specimen capacity is shown with specimen holders. Add one additional specimen to Xe-1 specimen capacity if CAT is used in place of BP/IBP.
- 6) Maximum specimen weight listed is for when the specimen tray is used. If the specimen tray is removed from the Xe-3, the chamber floor can hold evenly distributed specimens with a weight of 90 kg (200 lbs) max.
- 7) Maintain pH 6-8. For best performance, use a reverse osmosis/deionization (RO/DI) system for all S models.
- 8) Spray consumption applies to all S models; humidifier consumption applies to all H models. Water consumption values are greatly dependent upon test and lab conditions, and software settings. Values shown are typical for many common standards.
- 9) Rear Xe-3 vent duct is easily removed to reduce the depth from 99 cm (39 in) to 88 cm (34.5 in) to fit through small doors.
- 10) Actual shipping weights will be higher, depending upon model and whether the shipment is domestic, ocean or air.
- 11) Voltages shown are ± 10% and 50/60 Hz.
- 12) Operating outside these conditions can result in temperature, humidity, or other faults. Never operate in laboratory ambient conditions >36 °C or >80% RH.

## Warranty

For important warranty information, visit [Q-Lab.com/Warranty](https://www.q-lab.com/Warranty).



For sales, technical, or repair support, please visit:

**Q-Lab.com/support**

Westlake, Ohio USA • Homestead, Florida USA • Wittmann, Arizona USA  
Bolton, England • Saarbrücken, Germany • Shanghai, China

