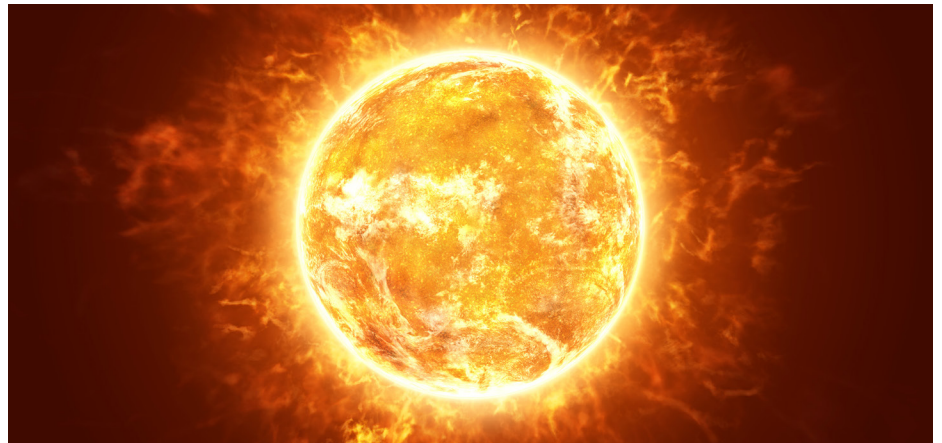


FACT SHEET

SUNLOAD/SOLAR IRRADIATION (IR) FAQs

Answers to some of your most frequently asked questions

This test simulation is run to help eliminate risk of discoloration, deformation, out gassing, coating failures and fire with prolonged exposure from the sun while the product is in use. This FAQ sheet offers helpful information to know before your products undergo a IR testing program.



1. What is Solar Irradiation (IR) testing?

IR testing uses heat lamps (infrared) in environmental test chamber to simulate the heating effects of prolonged exposure to the sun. Intertek uses a combination of precision temperature controls, humidity systems, wind speed adjustments and numerous proprietary radiant heat sources capable of achieving various incident angles to perform testing as required. A radiant heat solar array is positioned a specific angle over a test sample, while the radiation (among other things) is controlled. Radiation levels can be controlled to a black panel temperature, sample's surface temperature, or a set irradiance measured with a pyrometer (typically ~1000-1200 W/m²).

2. What is the value or purpose for conducting IR testing?

The purpose of testing is to investigate to what extent the equipment or components are affected by simulated solar radiation and the associated heating elements. Effects from exposure to the sun is important for understanding design robustness and risk mitigation. The heating effect from a radiant heat source such as the sun differ from those of high air temperature alone. Heat absorption is affected by color, reflectivity, and surface irregularities (e.g., smoothness/

roughness, etc.). How heat is absorbed by two dissimilar materials can exacerbate mechanical deterioration or damage. Heat absorption also stresses a product of uniform composition by producing a thermal gradient across areas under irradiation to those only exposed to ambient environment.

3. What are the common types of IR test?

The two most common types of IR testing are steady state exposures and cyclical exposers. For a steady state exposure, the chamber air temperature is stabilized at the agreed upon ambient temperature prior to the irradiation, while the cyclical exposure may ramp temperature and radiation up or down as prescribed.

4. What data is produced by a IR test, and how does one interpret it?

The reported results from an IR test are frequently post exposure evaluations or functional tests. Common posttest inspections look for fading, warping, blistering, and/or peeling. Functional checks often include rigidity measurements, dimensional measurements, photometric checks, and/or simple operational checks.

Monitoring of internal component temperatures is also common during the exposure.

5. Can multiple samples be tested at one time?

The number of samples that should be tested at the same is a factor of sample size, sample uniformity, and radiant heat array control method. Intertek Grand Rapids, MI has two 4'x4' radiant heat solar arrays that can irradiate multiple samples at once, but it is advised that all samples fit fully within the radiation area. Samples with different colors, shapes, or finishes will not have a uniform exposure if controlling the radiant light array to one representative sample's surface temperature. If controlling to a black panel temperature or set irradiance, then the irradiation experienced by the samples would be the same irrespective of if they were exposed in a separate run or exposed under a separate solar array as each array can be controlled independently, operate simultaneously, or be used one at a time.

SUNLOAD/SOLAR IRRADIATION (IR) FAQ



6. What information is needed to request a IR test quotation?

It is important to know the test specification, required radiation control method along with sample size and number of samples to be tested. Samples' orientation and need for fixture should be discussed to ensure the orientation of the test item within the solar chamber replicates the in-use conditions with respect to both the direct radiant light energy and the airflow direction. This will affect both the temperature gradients and any cooling effects provided by the airflow. The need for power application or sample cycling and the need for any pre/post is also critical for quotation purposes. Client is expected to provide any specialized or proprietary equipment required to power or cycling the samples.

7. What samples shall be submitted for IR testing?

This testing is important for any sample that may be exposed to intense sunlight while in use. Testing can be performed on full assemblies, components, and/or plaques or swatches.

8. What are the commonly referenced IR test standards?

Intertek operates state-of-the-art solar irradiation testing facilities, capable of testing to solar standards for various product types:

- MIL-STD-810
- SAE J575
- IEC 60068-2-5 Sa
- GMW14906
- Ford 17.00-E-476
- NES M0131G
- TSC3000G

9. How long do IR test take to perform?

Test durations vary with most lasting from a few hours to a few days per run.



FOR MORE INFORMATION



+1-800-WORLD-LAB



iCenter@intertek.com



[intertek.com/automotive/](https://www.intertek.com/automotive/)