Analytik Service Obernburg
Part of viridiusLAB AG

SOLAR SIMULATION

Recreate environmental simulations in a short time under realistic conditions

TASK

In numerous applications, materials of all kinds are exposed to natural environmental conditions. Examples of this include plastic parts in the automotive sector and textile (also coated) fabrics for awnings or roofing. In addition to directly visible effects (e.g. color change or yellowing), exposure to sunlight can also change the structure and thus the mechanical properties of the material. In order to assess and influence such changes, it is necessary to simulate exposure to natural UV light in a time-lapse and then examine the exposed samples with regard to optical, mechanical or structural properties in comparison to non-exposed material.

SOLUTION

Due to growing demand, the Automotive Testing Center at Analytik Service Obernburg has expanded its testing options for environmental simulation. A sun simulation and weathering device has been available since the beginning of March 2014. Among other things, this device allows tests in accordance with DIN 75220, as well as material and component tests in accordance with many common automotive standards (example: VW regulation TL 226 point 3.12.2)

Industries
Automotive supplier
Plastics manufacturer
Fabric processor

Analysis goals
Failure analysis
Process optimization

Materials
Prefabricated plastic parts Painted components Fabric

Analysis method
Optical tests (color, gloss)
Environmental simulation

Supplementary methods
Visual evaluation
Gray scale
Cross-cut Scratch resistance

Similar questions
Basic investigations
Damage assessment
Quality control

SOLUTION

In addition, all exposure conditions dependent on UV light and weather can be simulated. At Analytik Service Obernburg, for example, it is possible to simulate temperatures from -15 to +95°C under solar radiation on the component. Humidity can also be controlled from 10-85%. The irradiance can be increased up to 1200 W/m². As standard, the tester offers the option of exposing specimens measuring up to 600 x 600 mm with a volume of up to 3000 liters.

Exposure takes place using a metal halide lamp which, in conjunction with additional filters, is able to generate a spectrum similar to natural sunlight.

Following storage in the chamber, the component can be visually assessed in order to classify the degradation phenomena of the samples caused by weathering, such as possible warping or fading. As well as classification on the gray scale and the cross-cut and scratch resistance.

EVALUATION ACCORDING TO GRAY SCALE

Evaluation according to the gray scale is carried out in accordance with DIN EN 20105-A02. A sample of the original component is placed next to the tested part and compared. The gray scale is placed next to it in the same plane. The overall contrast between the original sample and the tested component is then visually evaluated. It is also possible to determine the change in color in several characteristics, such as hue and color depth.

ADVANTAGE

The solar simulation of a component is particularly suitable for preliminary investigations to decide on the use of new materials, as well as for routine monitoring during production. All types of samples can be tested, especially large parts and assembled components such as airbags, dashboards and side panels. Furthermore, various test parameters such as global irradiance, temperature and relative humidity in the test chamber can be varied to create a modifiable climate.

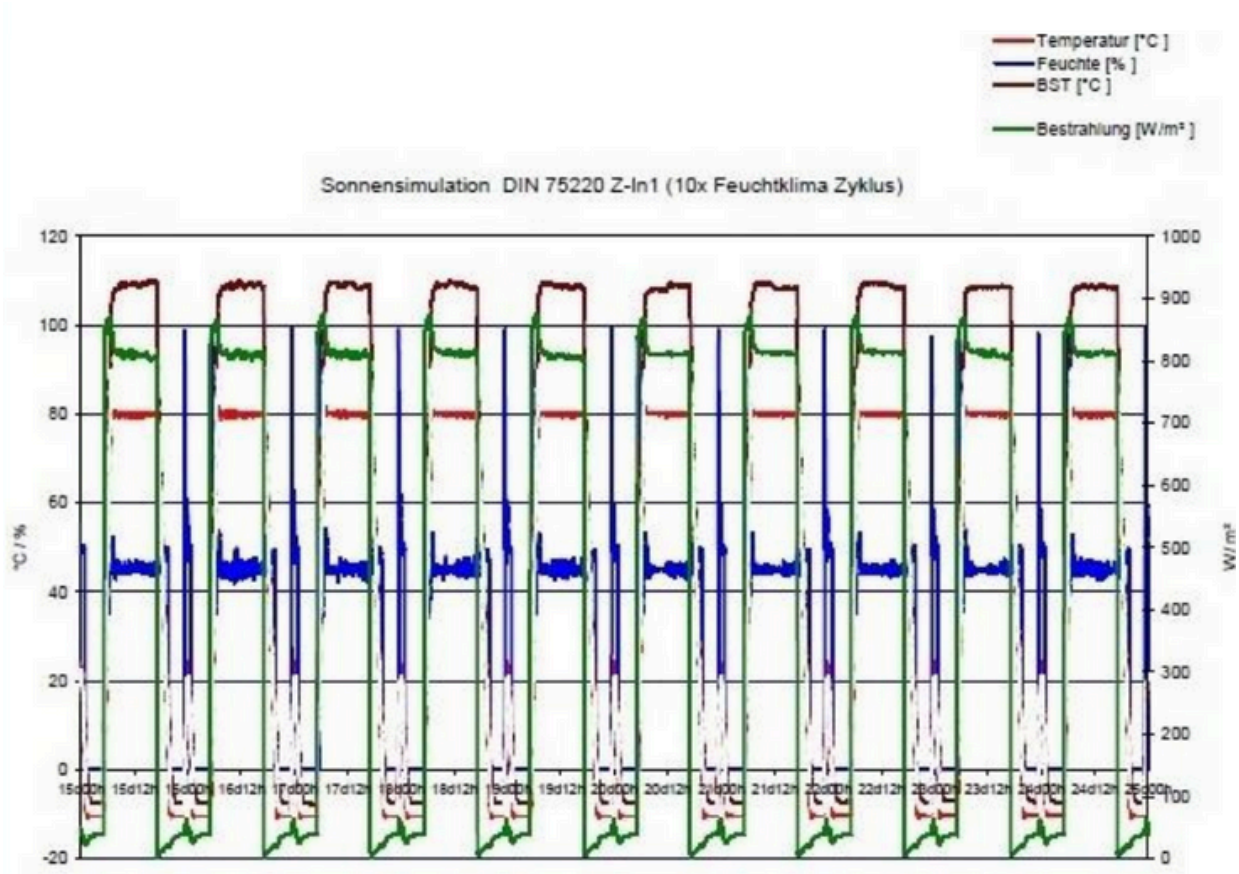

Fig. 1: Schematic sequence of a solar simulation with humid climate cycles