

Apparatus for accelerated weathering typically includes three carbon arc radiation sources. Commercially available instruments are not suited for radiation dosimetry. The emission of a selectively operating carbon arc radiation source cannot be measured with sufficient accuracy by a single, fixed light guide; at least three such light guides, frosted on both sides, are necessary for radiation dosimetry. However, such a device did not meet the customarily required accuracy of ± 5 percent. This requirement was met only by a device which was carried movably alongside with a sample and equipped with two-sided frosting of light guides for vertical averaging of radiation incident on a sample.

EXAMPLE 5

Use of the radiation measuring device under natural conditions of light and weather.

Upon adjustment of sensitivity by approximately an order of magnitude, a radiation measuring device in accordance with the invention can be used for dosimetry under naturally occurring conditions of light and weather. To compensate for the cosine distribution of light incident on a flat sample surface, a set of frosted light guides is used which are arranged at different angles to such surface.

We claim:

1. Apparatus for determining resistance to light and weather influences of sample surfaces, said apparatus including, in combination, with at least one source of light disposed for irradiation of said sample surfaces: fastening means (34) for fastening at least one sample for a period of time during which radiation from said source is incident on at least a portion of the surface of said sample,

radiation measuring means (15) comprising radiation detection means (14) and radiation indicating means (24; 27,28), and light guiding means (1, 2, 3; 29; 8; 9), having a plurality of input terminals, each in the vicinity of one of said fastening means (34), for guiding a portion of the radiation of said at least one light source from said input terminals to said radiation measuring means (15), said input terminals being disposed for receiving radiation from said at least one light source comparable with the radiation incident on portions of said at least one sample respectively adjacent to said input terminals,

wherein, in accordance with the invention, said radiation measuring means (15) comprises, means (12) for producing a spectral dispersion of radiation received from said light guiding means and thereby making spectrally dispersed radiation incident on said radiation detection means (14), and means (16) for adjusting said radiation detection means so as to selectively detect radiation in at least one of a plurality of spectral regions.

2. Apparatus of claim 1 in which said radiation detection means is an array of photodiodes.

3. Apparatus of claim 1 in which said light-guiding means comprises a plurality of light guides and means for combining radiation propagating in said light guides.

4. Apparatus of claim 1 comprising a plurality of said light radiation sources, said light guides having input terminals which are disposed so that radiation from each radiation source reaches at least one light-guide terminal.

5. Apparatus of claim 1 comprising rotation means for rotating said fastening means around said light source, said input terminals being fixedly attached to said rotation means so as to take part in the rotation of said fastening means.

* * * * *

40

45

50

55

60

65