

Avoid Complaints

Light Fastness of Footwear Materials

The undesired changes occurring in footwear materials on exposure to light may be so drastic that they lead to complaints. There is nothing new about this and yet PFI is repeatedly confronted with cases of inadequate light fastness of shoe upper materials. In particular vegetable tanned and natural leathers, but also aniline leathers as well as textiles, synthetic materials, and even sole materials should be tested prior to use for their response to light.

Light is a form of electromagnetic radiation in the wavelength range of about 400–700 nm which is visible to the human eye. However, other components of daylight (sunlight), such as ultraviolet and infrared radiation of wavelengths adjacent to the visible range of the spectrum, also act upon the surface of footwear materials. The action of daylight is of primary relevance for any practical assessment of the light fastness of materials.

The changes which a footwear material undergoes on exposure to light energy depend largely upon the nature and quantity of the incident light.

Since the testing of light fastness in daylight or sunlight can be extremely time consuming and highly dependent upon temperature, humidity, and geographical location, testing is now carried out with artificial light sources. DIN EN ISO 105-B02 is the relevant standard.

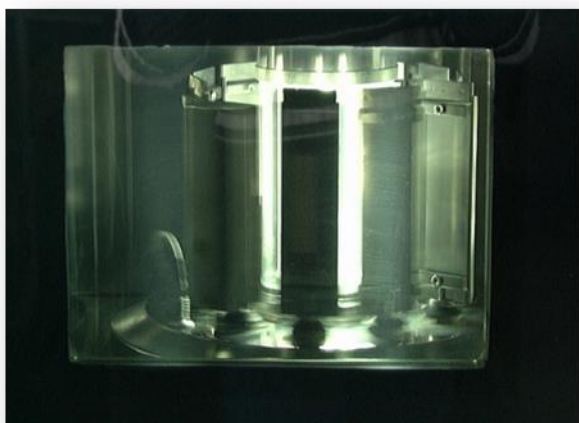
Use of xenon-arc light has proved to be particularly effective because it very closely approaches natural daylight in the visible and adjacent spectral regions. Filters serve to lower the levels of ultraviolet and infrared radiation.

The amount of light acting upon a given footwear material is assessed with the aid of the fading of a set of dyes of differing light fastness on a special kind of textile, known as “blue wool references”. The results are given as classes on the blue scale, with Class 1 corresponding to the greatest degree of change (= very low light fastness) and Class 8 to the lowest (e.g. showing no change after irradiation = excellent light fastness).

The demands to be met by a footwear material clearly depend upon its intended use. As a matter of principle, all materials used for the exterior of shoe uppers or which are exposed to light in the interior of footwear by virtue of design (as in the case of sandals) should attain Class 3 light fastness. Apart from any fading of the colour, no change of hue – such as yellowing – should occur.

True to the adage “prevention is better than cure” we can only recommend that all footwear manufacturers have the light fastness of all kinds of upper materials (whether vegetable tanned or natural leathers, aniline leathers, as well as textiles and synthetic materials) tested prior to their use in production to avoid any nasty surprises at a later date.

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Test area illuminated with xenon-arc light



Leather samples after exposure: The right side of each sample was exposed to light. The left side was covered during irradiation.