

Thermography and facades

Infra-red thermography has many uses in the inspection of facades and diagnosis of facade defects. This Technical Note describes infrared thermography and the ways in which it can be used to survey facade systems. Example thermal images are shown.

Introduction

Infra-red thermography has become increasingly common as an inspection process applied to facades. It is a technique for making images of facades that show the surface temperatures. It may be applied to both internal and external surfaces.

Thermography is best used for observing temperature differences over a surface and identifying hot or cold spots resulting from cold-bridging or construction irregularities.

Thermal imaging may be undertaken:

- During construction,
- On completion,
- As part of a condition survey,
- To assist an investigation, for instance a study of condensation formation.

Thermal images may be used to:

- Check continuity of insulation,
- Identify cold-bridges (designed and unintended),
- Identify air leakage,
- Identify component failures such as the absence of gas filling in glazing units.

BS EN 13187:1995 sets out the procedures to be followed when carrying out a thermographic survey.

Infra-red images

An infrared camera detects and measures the infrared energy that is given off by a surface. If the relevant properties of the surface and the body of air between the surface and the detector are known then it is possible to derive the surface temperature from the measured energy values.



Figure 1 Typical rainbow colour spectrum

Radiant energy is represented on a thermal image, normally as a continuous spectrum of colours. The greatest intensity of radiant energy is represented by white and the least by black (Figure 1).

Calibration making a generalised allowance for surface conditions allows the spectrum to represent surface temperatures. Note however that different surface properties may mean that the temperature scale does not apply precisely to all components of the wall.

Thermal images used for anything but illustrative purposes should be reproduced with a calibrated temperature spectrum attached.

The calibration of the colour spectrum will differ from image to image, normally ranging from the lowest surface temperature to the highest in a particular image. This means that two images cannot be compared simply by comparing colours in the image.