HOCHIKI

World Class Leaders in Fire Detection Since 1918

ESPintelligent

TECHNOLOGYGUIDE

ACC-EN Multi Sensor

ACC-EN Multi Sensor

Multi-sensor detection is becoming increasingly popular with consultants and specifiers particularly for systems where a change of detection method and/or sensitivity is required at different times of the day.

Multi-sensors are particularly valuable in situations where one detection method alone is not suitable for the environment. The ACC-EN Multi-Sensor has Flat Response Capability in single Photoelectric Smoke Detection Mode as well as in Multi-Sensor Mode (incorporating photoelectric smoke and heat detection) negating the need for the ionisation smoke detection method.

COMPANY OVERVIEW

Established in Japan in 1918, Hochiki is a wholly independent, multinational, publicly listed group of companies with over 2000 employees working across six manufacturing plants, 38 sales offices and 14 subsidiaries.

One of the world's leading manufacturers of commercial and industrial fire detection and emergency lighting solutions, Hochiki has acquired global acceptance as the benchmark for high-integrity and long-term reliability.

Hochiki's facilities in Japan, the United States of America and Europe design and manufacture products and provide technical support suited to local standards and customer requirements.

Total commitment to meeting the needs of individual national markets has reinforced the company's global reputation, resulting in Hochiki products being installed in many prestigious sites and in over 80 countries worldwide.

STATISTICS TAKEN FROM THE HOCHIKI CUSTOMER SERVICE SURVEY DECEMBER 2016

91%

Respondents rated product quality as either 'very good' or 'excellent'

92%

Customers stated our market reputation is 'very good' or 'excellent'

88%

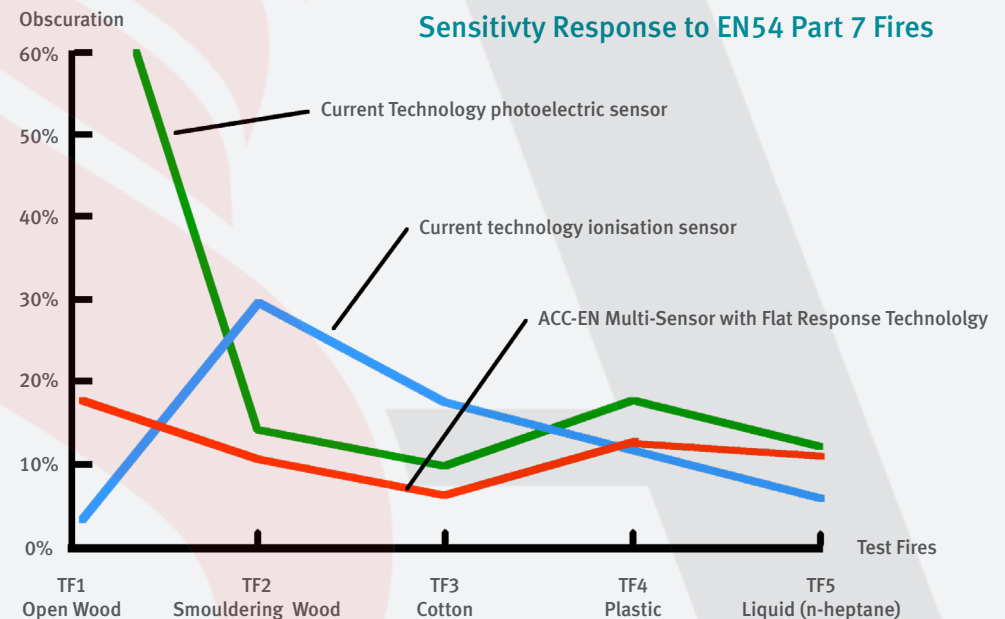Customers are most likely to recommend our products

ACC-EN

A **Multi Sensor** incorporating a thermal element and a High Performance photoelectric smoke chamber. Has three modes controlled from the Control Panel, allowing either the optical or thermal element or both to be active in making the fire decision.

▸ **User selectable modes**

▸ **Incorporates Optical & Heat elements**

▸ **Removable, High Performance Chamber**

▸ **Twin fire LEDs allow 360° viewing**

▸ **Pulsing/non-pulsing controlled from panel***

▸ **Variable sensitivity**

▸ **Electronically addressed**

▸ **Addressed via TCH-B200 Hand Held Programmer**

▸ **Approved by LPCB & VdS.**

Flat Response Technology

The 'Flat Response' performance within the Hochiki ALN-EN Photoelectric Smoke Sensor and the ACC-EN is achieved with the Photoelectric chamber only. This dramatic improvement to the chamber performance has been achieved using Hochiki's patented chamber design. The graph below shows that the 'Flat Response' characteristics prevent the sensors from being sensitive to particular particle types of smoke and insensitive to others hence extending the detection range and minimising unwanted alarms.

Sensitivty Response to EN54 Part 7 Fires

Obscuration

- Current Technology photoelectric sensor
- Current technology ionisation sensor
- ACC-EN Multi-Sensor with Flat Response Technolgy

60%
50%
40%
30%
20%
10%
0%

Test Fires

| TF1 | TF2 | TF3 | TF4 | TF5 |
| Open Wood | Smouldering Wood | Cotton | Plastic | Liquid (n-heptane) |

NOTE: It should be borne in mind that the sensor spacing defined in installation standards is different for smoke and heat sensors.

Therefore this must be taken into consideration when designing systems that may involve a mode change, in other words, smoke to heat.

Modes of Operation

The 'Flat Response' performance within the Hochiki ALN-EN Photoelectric Smoke Sensor and the ACC-EN is achieve The ACC-EN has 3 possible modes of operation which are selected directly from the control panel.

These are -

▸ Photoelectric Smoke Detection Mode,

▸ Heat Detection Mode

▸ Multi-Sensor Mode.

The ACC-EN will always default to the Multi-Sensor Mode on power-up. However, during initialisation, if the user has previously programmed the ACC-EN to employ a different Mode then the control panel will immediately send the appropriate command to the Multi-Sensor and recalibrate the sensor for the mode selected with the Photoelectric chamber only.

This dramatic improvement to the chamber performance has been achieved using Hochiki's patented chamber design. The graph below shows that the 'Flat Response' characteristics prevent the sensors from being sensitive to particular particle types of smoke and insensitive to others hence extending the detection range and minimising unwanted alarms.

Photoelectric Smoke Detection

In this mode, the photoelectric chamber is the primary detection method and performs similarly to the ALN-EN.

The sensor continuously monitors the response back from the photodiode even in no-smoke conditions to ensure that the infra-red emitter and receiver are functioning correctly.

The sensitivity is also fully adjustable which allows it to be varied from 1% through to 5%/m.

Heat Detection

In this mode the thermistor is the primary detection method and performs similarly to the ATJ-EN.

The internal processor linearises the output of the thermistor and the analogue output can be directly related to °C by the following formula: OUTPUT = (ANALOGUE VALUE/2) - 20.

The sensor has adjustable sensitivity that allows the sensitivity to varied from 0°C through to 88°C.

Multi-Sensor

In this mode both the photoelectric element and the heat element are active in the fire decision process.

Essentially, the device is operating as a photoelectric smoke sensor but the photoelectric sensitivity is enhanced when a temperature rise above 40°C is detected by the heat-sensing element.

The ACC-EN achieves this utilising a microprocessor with an algorithm. This algorithm linearises the heat detection element and calculates the enhancement to the sensitivity of the photoelectric element.

This additional sensitivity of the photoelectric element provides an earlier response to fire whilst still maintaining low false-alarm characteristics.
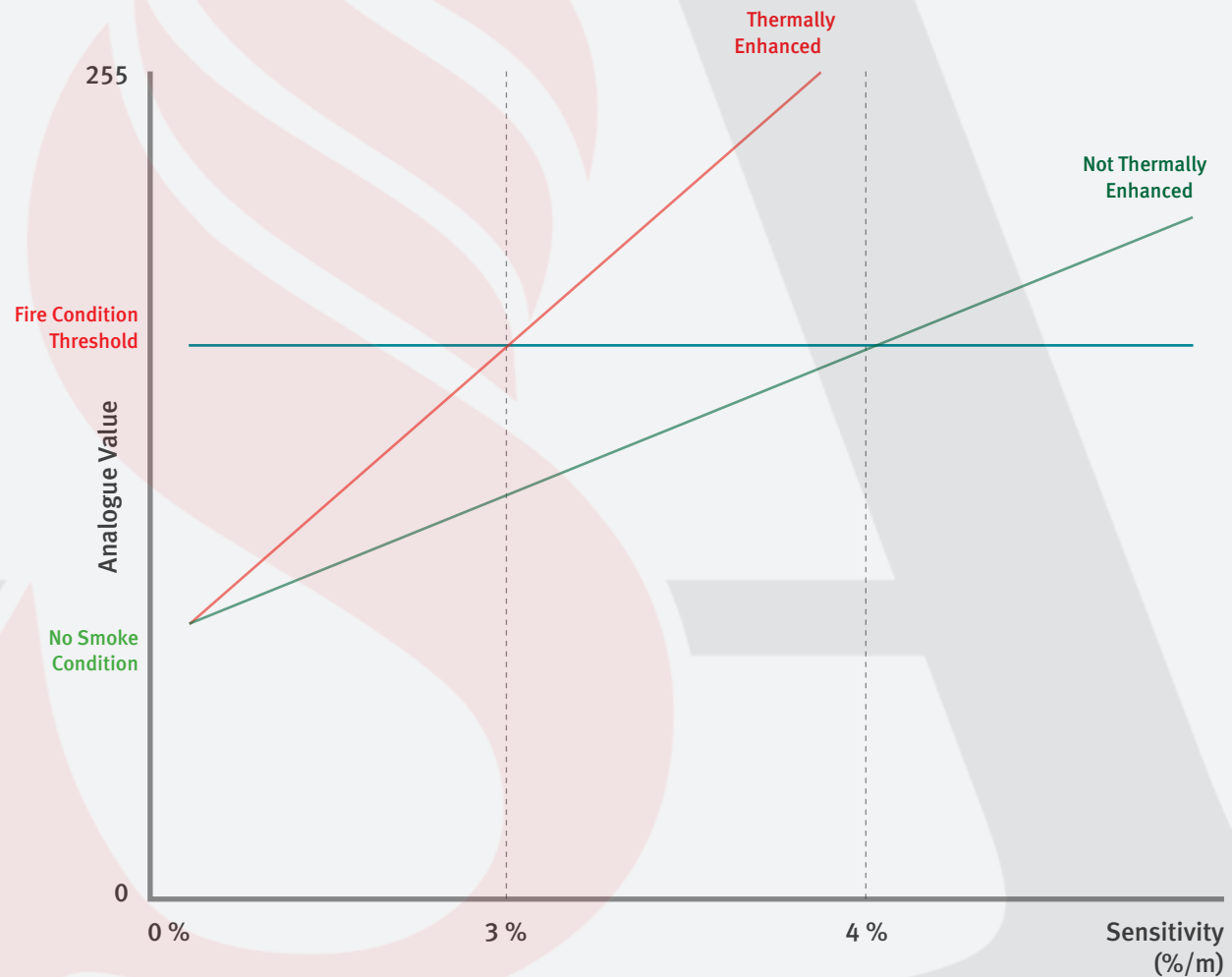
ACC-EN
Sensitivity Example

This graph shows how the ACC-EN Multi-Sensor's photoelectric smoke sensitivity is enhanced when the temperature exceeds 40ºC in Multi-Sensor Mode .

The green line represents the analogue value output of the ACC-EN increasing as the photoelectric element detects smoke without any thermal enhancement. The sensitivity in this instance is shown as 4%/m, indicated where the green line intersects the Fire Condition Threshold.

When the temperature exceeds 40ºC the photoelectric smoke sensitivity is increased as shown by the red line so that the Fire Condition Threshold is reached earlier, at a sensitivity of only 3%/m.

NOTE: In Multi-Sensor Mode, the ACC-EN cannot initiate a fire condition by the detection of heat alone, smoke must also be present. The device can however initiate a fire condition by the detection of smoke only in Multi-Sensor Mode, and this response is similar to that of the ALN-EN sensor.

Thermally Enhanced

Not Thermally Enhanced

255

Fire Condition Threshold

Analogue Value

No Smoke Condition

0

0 %   3 %   4 %   Sensitivity (%/m)

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Your Safety, Our Technology