Special Fire Detection Technology
Application report: ADW 511A

Difficult fire protection conditions
Fire detection in paint shops

Extremely difficult fire protection conditions predominate in paint shops. This is partly due to pervasive and explosive paint mist and high ambient temperatures. Production line paint shops (e.g. in the automobile industry) require a high level of availability, since downtime can have consequences for the entire upstream and downstream production stages.

For difficult applications such as this, the SecuriSens ADW 511A linear rate-of-rise heat detector has proven to be an excellent solution.

High ambient temperatures
In automated production line paint shops, the work pieces are transported on conveyor belts automatically through the various processing stages: cleaning, undercoat, filler, topcoat, etc. Located between each stage is a drying tunnel in which the coats are dried at temperatures ranging from 50°C to 200°C.

Experience shows that an automatic extinguishing system is necessary (today usually CO₂). Actuation is usually via a fire alarm system that can be triggered automatically and manually. Because of the paint mist, the use of point type or linear smoke detectors is not possible for two reasons: the paint mist causes false alarms and paint precipitation eventually disables the detectors. Point type heat detectors are not suitable for ambient temperatures of up to 200°C.

In contrast, the Transafe rate-of-rise heat detector can be used at ambient temperatures of 200°C thanks to its configurable rate-of-rise behaviour because it does not evaluate the absolute temperature but rather the increase within a defined time period. Extensive tests have shown that even a one millimetre thick layer of paint on the copper sensor tubing only marginally influences detection properties.

Explosive areas
Paints whose vapours are explosive are still being used, making Ex installations necessary. No problem for Transafe: the SecuriSens ADW 511A sensor tubing made of copper can be used throughout Ex zones 1 and 2. The standard design of the cable terminal processor must be installed outside the Ex zones, which is possible in most cases.

There are applications, however, in which it is necessary to mount the cable terminal processor within an Ex zone. This can be done with
the specially designed ADW 511Ex II Atex or ADW 511Ex I.

A note about planning
The ADW 511A is planned similarly to point type heat detectors. Thus, a maximum width of 7 metres can be monitored with one sensor tube. For large spaces, the sensor tubing is looped in a meandering fashion across the ceiling. This permits one system to monitor a maximum area of 560 m² using 80 metres of sensor tubing.

About SecuriSens ADW 511A
The system was originally developed for the harsh conditions of traffic tunnels and today is deployed wherever critical environmental conditions predominate. The ADW 511A is a linear heat detector based on the pneumatic principle. An air-filled sensor tube made of copper converts temperature changes into pressure changes. These are measured by an electronic pressure sensor and checked for maximum temperature and rate-of-rise behaviour.

Advantages of the ADW 511A
• The fully automatic self-testing system is a decisive plus factor for the special maintenance conditions in paint shops: it is not necessary to carry out manual function checks.
• Adjustable alarm threshold and rate-of-rise behaviour ensure optimal response characteristics.
• Resistant against environmental influences such as moisture, aggressive steams and paint mist, high temperatures and temperature changes, dirt, etc.
• The sensor tubing can be installed alternately through Ex zones 1 and 2 as well as through non-hazardous areas.

There are large-scale paint shops also in the railway sector

All specifications subject to correction. For planning, Securiton planning guidelines are binding.