An allowance for transport time

Taken out of context, the introduction above is alarming! It is possible that ASD technology, which for years has been associated with Early Warning smoke detection, can, under EN54-20, actually respond later than a conventional point detector? Of course, this is not normally the case and needs to be understood in context. Firstly, such delayed detection is only possible if:

- the ASD detection unit has been configured to be just sensitive enough to meet EN54-20 Class C,
- the fire to be detected has a fast growth rate,
- the smoke from that fire only enters a single sampling hole far distant from the detector.

It has been very rare for these three factors to occur simultaneously, particularly given the evidence presented in the November 2008 article, which concluded that “the majority of ASD installations currently installed achieve Class B capability or better.”

At this point, it is worth noting that under the previous European product standard, CEA4022, an ASD system was permitted to respond up to 120 seconds after the End-of-Test (EOT) in the four standard test fires (specifically TF2, TF5 – identical to those for EN 54-7 and EN 54-20 Class C). This was in compensation for the transport time, which was limited to 120 seconds. A more restrictive allowance of up to 60 seconds after EOT is included in EN 54-20 (ref EN 54-20:2006 clause 6.15.4) and there is no specific limitation on the maximum transport time.

As a follow on to the article published in November 2008 entitled “Understanding the normal capability of Aspirating Smoke Detection”, this short piece re-iterates the November article’s main points while illustrating how the Xtralis range of ASD products comfortably satisfy the requirements of EN 54-20.

Of note in the original article was the statement “The result of a Class C approval to EN54-20 is confidence that a particular aspirating system is at least as reactive to fire as any EN 54-7 approved smoke detector.” While this is generally true given the cumulative advantage of ASD systems, it is potentially misleading. In layman’s terms, clause 16.5.4 of EN54-20:2006 means that in test conditions, according to EN54-20, a Class C ASD system can respond up to 60 seconds after a standard point detector when smoke from a fire only enters the furthest hole.

Is this what you want? If not, then you should clearly specify that a Class A or B ASD system is required.

For more information please contact:
Tel: +44 1442 242 330
Email: marketing-emea@xtralis.com

By Peter Massingberd-Mundy
Technology and Expert Practices Manager, Xtralis – manufacturer of VESDA
VESDA approvals
Some time ago, as the market leader of ASD systems, Xtralis (formally Vision Systems) ensured that the VESDA systems approved to CE4022 detected the four test fires before EOT with no allowance for transport time, thus demonstrating that a single VESDA sampling hole is more than capable of matching the performance requirements of point detectors – without any correction or allowance for transport time. To be specific, smoke from all four test fires was detected before the EOT when entering a single (“worst case”) hole out of 100 sampling holes on a full length (200m) VESDA system with an alarm threshold of 0.06% obscuration/m. (ref: LPCB report TE94690)

Moreover, in the field, the installed capability of VESDA systems has always comfortably exceeded the minimum requirements of the standard. Invariably fewer than 100 holes are installed and, as discussed in the November 2008 article, the majority of systems are actually Class B or better.

ASPIRE2
Fortunately, Xtralis also provides a comprehensive tool (called ASPIRE2) to establish the performance and the EN 54-20 Class of any particular VESDA system – no matter the pipe and hole configuration.

A convenient interface enables users to enter details of the pipe runs (including bends, tees, capillary off-takes and hole positions) for a particular project and then cross check the results in a three-dimensional rotatable viewer. At the click of a button, the software will optimise the design and provide recommended hole sizes to achieve a “good” system. For any given design, the software calculates the flow entering each hole, thus calculating the time to transport smoke from each hole to the detector and the effective sensitivity of each single hole (i.e. the concentration of smoke needed at a single hole to trigger an alarm).

This tool has been developed over many years and, in addition to providing clear prediction of the Class of any particular VESDA system (including VLP, VLS, VLC and VLF), now supports the ICAM range of ASD detectors from Xtralis as well. For details, visit www.xtralis.com

A new sensitivity tab in the software (see figure 1) compares the predicted performance of each hole with agreed limits for each EN54-20 Class (e.g. a Class B system must have 4.5% obscuration/m or better at each sampling hole and transport time of < 90 seconds). Thus, ASPIRE2 clearly indicates the Class achieved by each alarm threshold of any particular VESDA system.

ASPIRE2 provides predictions for transporting smoke from the sampling point to the detector. As discussed in a previous article, “CFD – Colour for Directors?,” published in IFP in February 2008, the latest CFD software used to model fires can provide predictions for how smoke travels from the fire to the sampling holes. The converter linking ASPIRE2 data to FDS5 introduced in this article is continually being improved and serves to demonstrate Xtralis’ commitment to understanding and accurately predicting the performance of its systems in pursuit of Performance Based Design.

Conclusion
From the information presented above and in November’s article, it is clear that, while a Class C aspirating smoke detector may be considered to be code compliant, most applications will benefit from a Class B (or better) solution. The evidence presented demonstrates that Class A & B systems provide earlier warning without risk of false alarms so specifiers of ASD systems can confidently require a Class B or, where relevant, Class A system to achieve the best possible protection against fire.

In further support of providing detection that is “better than code compliant”, the latest version of ASPIRE2 not only clearly indicates the Class of any system, but it can be integrated with the most popular CFD Fire Simulator to support validated Performance-Based Designs.

Excepting any direct references to EN54-20, the performance figures and experience given in this piece and the previous article published in November 2008 pertain to VESDA technology only.

Figure 1 – ASPIRE2 clearly indicates the Class of each alarm threshold
Are you ready?

Be prepared with Xtralis VESDA

By June of 2009, aspiring smoke detection solutions deployed across Europe need to comply with the new EN 54-20 European product standard. Are you ready to meet this challenge? Xtralis is.

Xtralis VESDA, the world’s leading brand of ASD solutions, was first in the fire industry to meet the demanding requirements of EN 54-20. So you can rest assured that with Xtralis VESDA you will have a powerful, compliant solution to protect safety, critical infrastructure and business continuity today and well into the future.

To learn how VESDA can help you be EN 54-20 ready, go to www.xtralis.com/en54-20 or contact us at +44 1442 242 330.