

Three replicate specimens are tested in each of 3 test conditions:

1. irradiance of 25kW/m² in the presence of pilot flame.
2. irradiance of 25kW/m² in the absence of pilot flame.
3. irradiance of 50kW/m² in the absence of pilot flame.

The attenuation of a light beam passing through the evolved smoke is measured and the results are reported in terms of the maximum Specific Optical Density attained during the test, given by the equation:

$$D_s = (V/(A*L)) * \log_{10} (100/T)$$

where:

V	=	total volume of the chamber (m ³)
A	=	exposed area of the specimen (m ²)
L	=	optical length (m) of smoke measurement
T	=	% light transmitted.

Test duration is a minimum of 10 minutes. This period is extended by a further 10 minutes if the maximum Specific Optical Density has not been reached.

The sampling of the fire effluent created in the chamber during the test for the analysis of the concentration of the 7 different gases for which criteria are given is conducted using a variety of methods.

In all cases, the sample is taken from the geometric centre of the chamber and sample lines with the exception of those for the Carbon Monoxide and Oxides of Nitrogen are kept as short as possible between the top of the smoke chamber and the sampling media.

For the analysis of oxides of nitrogen and carbon monoxide, continuous measurements are made throughout the duration of the test. For the other gases, single point analysis is conducted. The gases are absorbed into aqueous media and analysed remotely. Two types of media are used; 0.1M sodium hydroxide solution and 0.3% Hydrogen Peroxide solution.

The gases are sampled over the three minute period of maximum smoke density by bubbling the gases through the media using a fritted funnel Dreschel bottle arrangement. Analysis of the gases is conducted using the methods given in ISO TR 9122-3.

Carbon monoxide (CO) is determined continuously using a pre-calibrated non-dispersive infra-red analyser with a range of 0 to 0.5% CO. The values reported are those averaged over a 3 minute period of maximum smoke obscuration.

Oxides of Nitrogen (NO_x) are determined continuously using a chemiluminescence analyser with a range of 0 to 500ppm. Again, the values reported are those averaged over a 3 minute period of maximum smoke obscuration.

Hydrogen Cyanide (HCN) is determined from gases absorbed into a solution of sodium hydroxide and analysed using ion chromatography via an ion exchange column and eluent as specified in ISO TR 9122-3. Hydrogen Fluoride (HF), Hydrogen Chloride (HCl) and Hydrogen Bromide (HBr) are absorbed into a solution of 0.3% hydrogen peroxide and are also analysed by ion chromatography.

Sulphur Dioxide (SO₂) is analysed by absorbing into an aqueous solution and using ion chromatography to determine concentrations.

