



SOUTHWEST RESEARCH INSTITUTE



## Smoke Density and Toxicity Testing

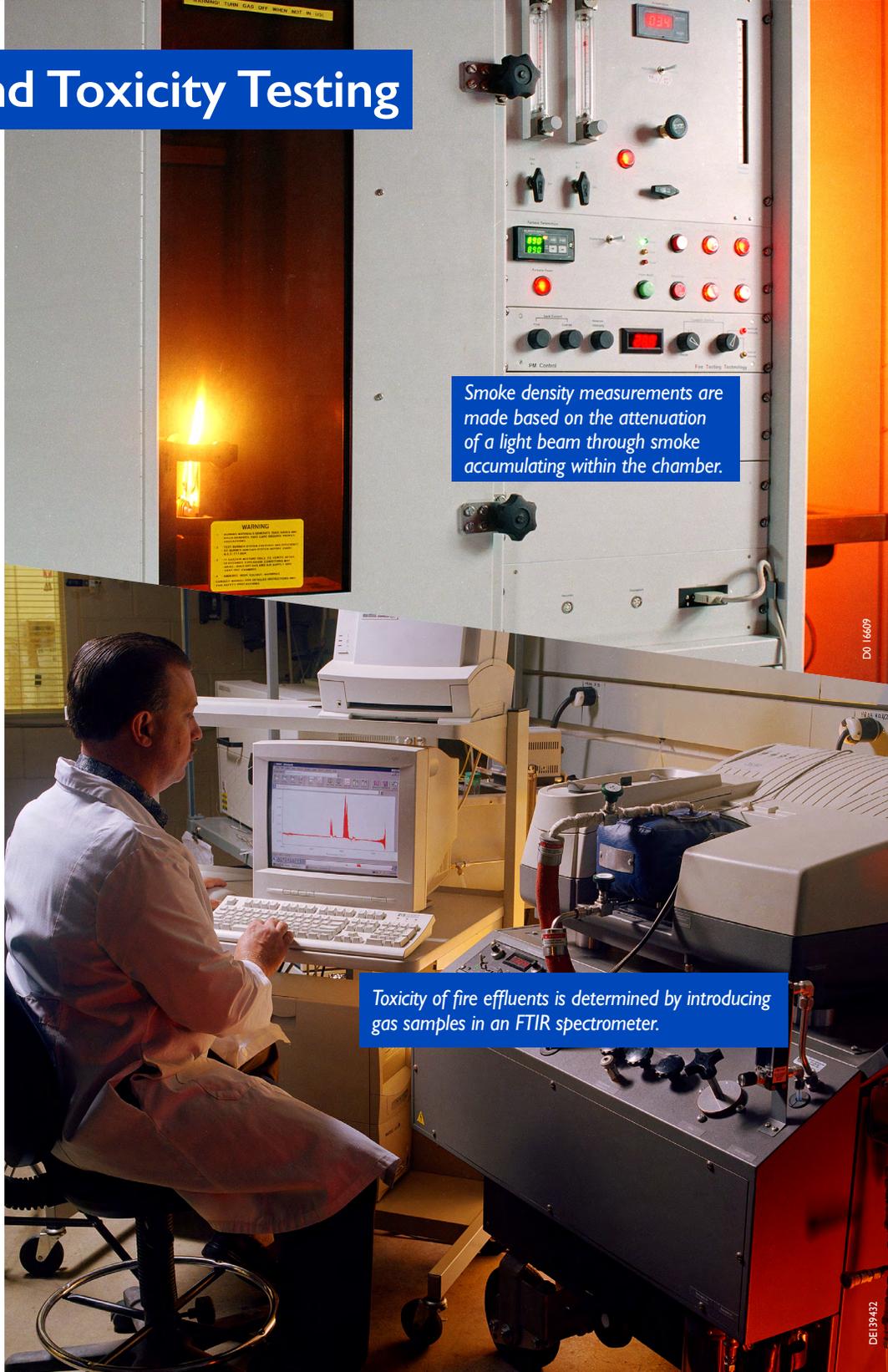
Southwest Research Institute® (SwRI®) performs smoke density and toxicity tests to a variety of standard procedures. Standard tests are supplemented for customized procedures to meet client-specific needs. Qualification and verification testing can be provided in support of third-party quality assurance programs.

### Capabilities

- Smoke density (specific optical density,  $D_s$ ) and mass loss measurements
- Time evolution toxic gas production
- Gas yield determinations (amount of gas produced per gram of sample consumed)
- $LC_{50}$  and  $LA_{50}$  determination
- Collection of gas samples for a variety of chemical analyses

### Related Services

- Fourier transform infrared (FTIR) quantitative and qualitative gas analysis
- FTIR custom calibration and quantification
- Listing, labeling and follow-up inspection services



Smoke density measurements are made based on the attenuation of a light beam through smoke accumulating within the chamber.

Toxicity of fire effluents is determined by introducing gas samples in an FTIR spectrometer.

**SOUTHWEST RESEARCH INSTITUTE  
ASTM E 662 SMOKE DENSITY TEST REPORT**

<b>Client:</b> SwRI	<b>Heat Flux:</b> 25 kW/m <sup>2</sup>
<b>Operator:</b> E. Vergara	<b>Exposure Mode:</b> Piloted (Flaming)
<b>Test Date(s):</b> August 21, 2001	<b>Orientation:</b> Vertical
<b>Material ID*:</b> Standard Reference	<b>Color:</b> White
<b>Description*:</b> Polycarbonate	<b>Thickness:</b> 0.2 in. (6.0 mm)
	<b>Receipt Date:</b> August 15, 2001
	<b>Date Prepared by SwRI:</b> August 16, 2001

\* Information/instructions provided by the Client

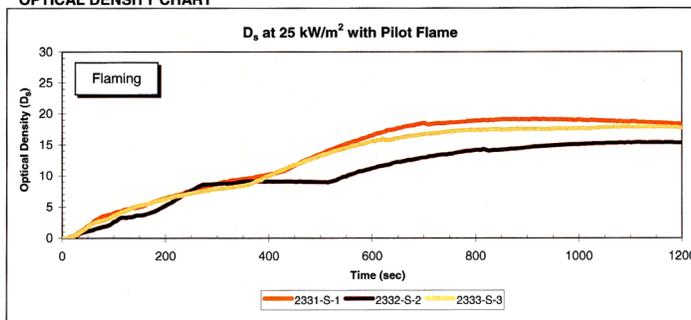
**RESULTS**

Test ID	Initial Mass (g)	Final Mass (g)	Mass Loss (g)	1.5 min D <sub>s</sub>	4.0 min D <sub>s</sub>	Maximum D <sub>s</sub>	Time to Max. D <sub>s</sub> (sec)	Correction Factor	Corrected Max. D <sub>s</sub>
2331-S-1	39.70	39.58	0.12	5	8	19	1200	-	19
2332-S-2	39.56	39.45	0.11	7	7	15	1192	-	15
2333-S-3	39.83	39.72	0.11	6	9	18	1195	-	18
<b>Average</b>	<b>39.70</b>	<b>39.58</b>	<b>0.11</b>	<b>6</b>	<b>8</b>	<b>17</b>	<b>1196</b>	<b>-</b>	<b>17</b>

**OBSERVATIONS**

Test ID	Observed Smoke (sec)	Observed Discoloration (sec)	Observed Blistering (sec)	Time to Ignition (sec)	Flames to Top (sec)	Initial Flame Out (sec)	Second Ignition (sec)	Final Flame Out (sec)
2331-S-1	464	275	74	None	-	-	-	-
2332-S-2	450	300	82	None	-	-	-	-
2333-S-3	425	345	65	None	-	-	-	-
<b>Average</b>	<b>446</b>	<b>307</b>	<b>74</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

**OPTICAL DENSITY CHART**



Smoke density data sheet.

We welcome your inquiries.  
For more information,  
please contact:

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