

## 1. Test method

- **ASTM D5116-97**

Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products.

- **Test sample**

Sample selected for testing is representative of the product manufactured and produced under typical operating conditions.

- **Test procedure**

The principle of the test is to determine the specific emission rate of VOCs emitted from prepared specimens of building products. The test is conducted in a small-scale environmental chamber at specified constant conditions of temperature, relative humidity, ventilation rate, and product loading factor.

- **Chamber conditions for test period**

PARAMETER	SYMBOL	UNITS	VALUE
Product exposed area	Ac	m <sup>2</sup>	0.0316
Chamber volume	Vc	m <sup>3</sup>	0.067
Loading ratio	Lc	m <sup>2</sup> m <sup>-3</sup>	0.47
Inlet air flow rate	Q	m <sup>3</sup> m <sup>-1</sup>	0.067
Ventilation rate	ac	h <sup>-1</sup>	1
Temperature		°C	23.3
Relative humidity		%	48.6

- **Analytical methods**

TVOC (Total Volatile Organic Compounds): quantified by GC/MS TIC method using toluene as calibration reference.

Formaldehyde and acetaldehyde: volatile aldehydes were quantified by HPLC following ASTM Method D 5197-97.

Individual VOCs, other than formaldehyde and acetaldehyde, were quantified by thermal desorption GC/MS following EPA Methods TO-1 and TO-17. Compounds are quantified using multipoint calibrations prepared with pure substances.

## 2. Test result

- **Emission Test results for individual VOCs**

SUBSTANCE	CAS	CHAMBER CONCENTRATION(µg m <sup>-3</sup> )	EMISSION FACTOR(µg m <sup>-2</sup> h <sup>-1</sup> )
24 hour Test Period			
Methyl Methacrylate	80-62-6	6.6	14.0

- **TOVC Chamber concentrations and emission factors**

TEST DURATION	CHAMBER CONCENTRATION (µg m <sup>-3</sup> )	EMISSION FACTOR (µg m <sup>-2</sup> h <sup>-1</sup> )
24 hours	LQ	Not applicable

"LQ" indicates calculated value is below quantitation base on concentration LOQ (Lower Limit of quantitation).

LOQ for TVOC is 20 µg m<sup>-3</sup>. Most standards and guidelines (Ex: EPA, OSHA, etc.) consider 200-500 µg m<sup>-3</sup> TVOC an acceptable level in buildings. Levels higher than this may result in irritation to some occupants.

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