

R E P O R T

Table Component Volatile Organic Compound Emissions Tests

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1. INTRODUCTION

At the request of Prismatic Designs Ltd., Canadian ORTECH Environmental Inc. (ORTECH) conducted volatile organic compound emissions tests on four (4) table components according to ASTM Standard Guide for Small-Scale Environmental Chamber Determinations of Organics from Indoor Materials/Products, D5116.

2. TESTING METHODOLOGY

2.1 Materials

The four (4) table components were supplied appropriately packaged to ORTECH for VOC emissions tests by Prismatic Designs. The table components were selected as those representative of components and materials used in the Prismatic Designs line of products. The table components were identified as:

- Standard Laminate on 1" Particle Board, with vinyl edging
- Wood Veneer on 1" Particle Board, with Clear Coat on Maple
- Colora applied to ¾" Medium Density Fibre Board
- Colora applied to 16 Gauge Steel

2.2 Sample Preparation

The furniture element samples were unwrapped, conditioned for 6 days and then placed into the chambers. As directed, the table component samples were fabricated according to the following dimensions:

Standard Laminate on 1" Particle Board

- length..... 38 cm
- width..... 15 cm

Wood Veneer on 1" Particle Board

- length..... 38 cm
- width..... 15 cm

Colora on 3/4" Particle Board

- length..... 38 cm
- width..... 15 cm

Colora on 16 Gauge Steel (Tube)

- Diameter 5.1 cm
- Length 30.1 cm

2.3 Chamber Emission Tests

The table component samples were placed in materials emission dynamic test chambers under the following conditions:

- Chamber Volume: 52.5 litres
- Temperature: 20°C
- Humidity:..... 50% RH
- Ventilation:..... 0.5 air changes per hour

The emission rate of volatile organic compounds was tested 7 days after the samples were fabricated. The main VOCs were sampled onto a Carbotrap 300 adsorbent tube with subsequent thermal desorption and GC/MS analysis. The VOC analysis was performed using an indoor air quality material target list of 23 volatile organic compounds. The GC/MS VOC detection limits for this emissions test method were 0.001 mg/m².h. Aldehydes, including formaldehyde, were sampled by collection of the chamber air on a DNPH treated silica gel tube (Sep-Pak) with analysis by the gas chromatography/flame ionization detection. The aldehyde detection limits for this emissions test method were 0.001 mg/m².h.

3. EMISSIONS TESTING RESULTS

The emission tests results of the 4 table components are presented in Table 1.

In order to determine compliance with indoor air quality furniture criteria, indoor concentrations of total volatile organic compounds (TVOCs) were calculated based on representative arrangements of the furniture in indoor environments.

Information was provided by Prismatic Designs on table furniture in 19 rooms. The total component area of the table furniture together with the component emission rates and anticipated room volumes and ventilation rates was used to calculate indoor TVOC levels.

Predicted indoor levels of TVOCs at 7 days ranged from 0.02 to 0.26 mg/m³ for the 19 room arrangements. The calculated 7-day concentrations meet the State of Washington Indoor Air Quality “Office Furniture” TVOC compliance requirement of 0.50 mg/m³. The formaldehyde compliance criteria of 0.05 ppm was also met.

Table 1

Table Component Volatile Organic Compound
Emission Rates

Volatile Organic Compounds	Veneer on Particle Board	Colora on Steel	Colora on MDF	Laminate on Particle Board
TVOCs				
n-Butanol	0.446	0.008	0.180	0.688
Ethanol	0.340	0.004	0.003	0.003
Nonane	0.028			
Xylene	0.005		0.041	
Isopropanol	0.006		0.012	0.004
Methanol	0.011			
MEK	0.024			
n-Butyl acetate	0.006		0.004	0.003
Acetone	0.014		0.105	0.009
Formaldehyde	0.004		0.002	0.094
di-isobutyl ketone	0.072			
Ethyl Benzene		0.004		
Trimethyl benzene			0.002	0.003
Toluene			0.002	0.004
Ethyl acetate			0.011	0.553
Decane			0.002	
Styrene				0.006
Isobutyl acetate				0.004
				0.005

TVOC – total volatile organic compounds, not including formaldehyde