

VOC Emissions Results

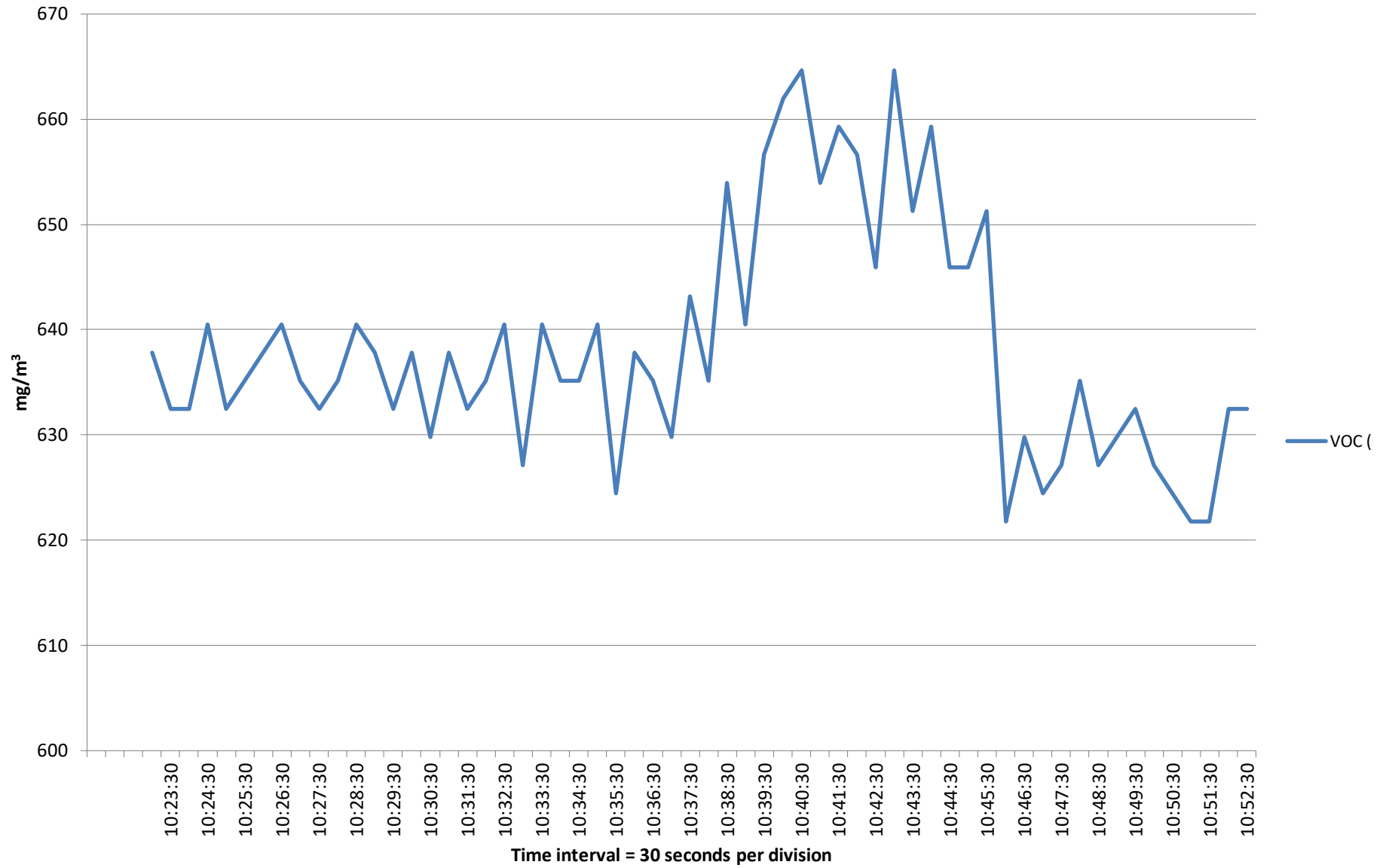
**Client** WZ Packaging **Job No 183798**  
**Location** Telford  
**Date** 29 November 2018  
**Emission Point Reference** Kroenert 339  
**Press/Coating Line** Machine 339  
**Analyser make and model** Signal 3030PM 3904  
**Engineer** M Dudek / J Pagett  
**Test run** One  
**No. of readings** 60  
**Start time** 10:23:00  
**Test period duration** 01:00:00  
**Time Interval** 30  
**Calibration Gas ppm** 500 Methane  
**Methane test ppm** N/A  
**Conversion Factor** 0.536

	Peak	Average
VOC mg/m <sup>3</sup>	664.64	638.33

Sample Time	FID Reading (ppm)	Methane Content (ppm)	VOC Less Methane (ppm)	Mean Stack Temp. (°C)	VOC (mg/m <sup>3</sup> )	Exhaust Rate Nm <sup>3</sup> /Hr	Comments	30 minute mean
10:23:00	1190.00		1190.00	42.00	637.84	8,629.63		
10:23:30	1180.00		1180.00		632.48			
10:24:00	1180.00		1180.00		632.48			
10:24:30	1195.00		1195.00		640.52			
10:25:00	1180.00		1180.00		632.48			
10:25:30	1185.00		1185.00		635.16			
10:26:00	1190.00		1190.00		637.84			
10:26:30	1195.00		1195.00		640.52			
10:27:00	1185.00		1185.00		635.16			
10:27:30	1180.00		1180.00		632.48			
10:28:00	1185.00		1185.00		635.16			
10:28:30	1195.00		1195.00		640.52			
10:29:00	1190.00		1190.00		637.84			
10:29:30	1180.00		1180.00		632.48			
10:30:00	1190.00		1190.00		637.84			
10:30:30	1175.00		1175.00		629.80			
10:31:00	1190.00		1190.00		637.84			
10:31:30	1180.00		1180.00		632.48			
10:32:00	1185.00		1185.00		635.16			
10:32:30	1195.00		1195.00		640.52			
10:33:00	1170.00		1170.00		627.12			
10:33:30	1195.00		1195.00		640.52			
10:34:00	1185.00		1185.00		635.16			
10:34:30	1185.00		1185.00		635.16			
10:35:00	1195.00		1195.00		640.52			
10:35:30	1165.00		1165.00		624.44			
10:36:00	1190.00		1190.00		637.84			
10:36:30	1185.00		1185.00		635.16			
10:37:00	1175.00		1175.00		629.80			
10:37:30	1200.00		1200.00		643.20			
10:38:00	1185.00		1185.00		635.16			
10:38:30	1220.00		1220.00		653.92			
10:39:00	1195.00		1195.00		640.52			
10:39:30	1225.00		1225.00		656.60			
10:40:00	1235.00		1235.00		661.96			

Sample Time	FID Reading (ppm)	Methane Content (ppm)	VOC Less Methane (ppm)	Mean Stack Temp. (°C)	VOC (mg/m³)	Exhaust Rate Nm³/Hr	Comments	30 minute mean
10:40:30	1240.00		1240.00		664.64			
10:41:00	1220.00		1220.00		653.92			
10:41:30	1230.00		1230.00		659.28			
10:42:00	1225.00		1225.00		656.60			
10:42:30	1205.00		1205.00		645.88			
10:43:00	1240.00		1240.00		664.64			
10:43:30	1215.00		1215.00		651.24			
10:44:00	1230.00		1230.00		659.28			
10:44:30	1205.00		1205.00		645.88			
10:45:00	1205.00		1205.00		645.88			
10:45:30	1215.00		1215.00		651.24			
10:46:00	1160.00		1160.00		621.76			
10:46:30	1175.00		1175.00		629.80			
10:47:00	1165.00		1165.00		624.44			
10:47:30	1170.00		1170.00		627.12			
10:48:00	1185.00		1185.00		635.16			
10:48:30	1170.00		1170.00		627.12			
10:49:00	1175.00		1175.00		629.80			
10:49:30	1180.00		1180.00		632.48			
10:50:00	1170.00		1170.00		627.12			
10:50:30	1165.00		1165.00		624.44			
10:51:00	1160.00		1160.00		621.76			
10:51:30	1160.00		1160.00		621.76			
10:52:00	1180.00		1180.00		632.48			
10:52:30	1180.00		1180.00		632.48			638.33
			0.00		0.00			
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			0.00		0.00			
			0.00		0.00			

# Total VOC as mg/m<sup>3</sup>



WZ

**Calculation of Duct Gas Velocity**

**339 Customer: Packaging**

**Date: 29 November 2018**

Sample Number	Distance	Sample (A) VP + Temp		Sample (B) VP + Temp		Hh (A)	Hh (B)
		Pitot Reading	Gas Temp°C	Pitot reading	Gas Temp°C		
1	0.032D	148.00	42.00	174.00	42.00	12.17	13.19
2	0.135D	194.00	42.00	195.00	42.00	13.93	13.96
3	0.321D	178.00	42.00	144.00	42.00	13.34	12.00
4	0.679D	132.00	42.00	143.00	42.00	11.49	11.96
5	0.865D	115.00	42.00	164.00	42.00	10.72	12.81
6	0.968D	138.00	42.00	190.00	42.00	11.75	13.78

Enter Stack readings in blue data areas, VP in Pa, Temp in Degrees C

Average Hh: 12.59  
 Average Temp T: 42.00  
 Enter Duct Dia (mm): 500.00  
 Q (duct area):  $(P \cdot D^2) / 4000000$   
 0.196 m<sup>2</sup>  
 Gas Velocity:  $0.075 \cdot H(h/K) \cdot H(273 + \text{Duct Temp})$   
 14.08 m/s  
 Total gas Flow:  $Q \cdot V$   
 2.77 m<sup>3</sup>/s  
 9957.27 m<sup>3</sup>/hr  
 Gas Flow correction to reference conditions  
 Nm<sup>3</sup>/hr:  $\text{Gas Flow} \cdot (273 / (273 + \text{Average duct Temp}))$   
 8629.63 Nm<sup>3</sup>/hr

\*Enter duct side A in mm:   
 \*Enter duct side B in mm:   
 Q (duct area):  $A \cdot B / 1000000$   
 0.000 m<sup>2</sup>

Enter pitot tube Constant K : 1.190

For S type K = 1.190  
 For L type K = 1

\* NOTE! The program will only use the two sided duct area, if no round duct diameter measurement is entered.

Summary of Test Results

Job No 183798

WZ Packaging

43433

**Kroenert 339**

Engineer: M Dudek / J Pagett

Species	Units		Permitted	Result
Volatile Organic Compounds	mg/m <sup>3</sup>	Peak	N/A	664.64
		Mean	N/A	<b>638.33</b>

Parameters			
	Unit	Result	Comments
Mean stack temperature	°C	42.00	
Mean volume flow rate	Nm <sup>3</sup> /hr	8,629.63	
Stack Diameter	mm	500.00	
Stack Velocity	m/sec	14.08	
Oxidiser Combustion Chamber Temperature	°C		
Fuel	N/A	Natural gas	
Plume appearance	N/A	None visible	

