

# **Guide to calculations for ChemTRAC reporting:**

## **Wood window and door manufacturing**

**Version 1.1**

**February 2013**



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## How do I use this guide?

Part 1 of this guide will help you understand the ChemTRAC program, collect information about your facility, use the ChemTRAC calculator for Wood Window and Door manufacturing, and report to ChemTRAC, if needed.

Part 2 of this guide will help you reduce your facility's environmental impact.

The Appendices provide additional information about emissions calculations.

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## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

*City of Toronto, 2012*

*For more information about ChemTRAC, call 3-1-1 or visit [www.toronto.ca/chemtrac](http://www.toronto.ca/chemtrac)*

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DISCLAIMER: This guide is for educational and informational purposes only. The City of Toronto assumes no liability for the accuracy or completeness of these materials. Readers are responsible for ensuring compliance with Toronto's Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423). These materials should not be relied upon as a substitute for legal or professional advice. Readers should seek their own legal or professional advice in regard to their use of the information contained in the guide.

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### Introduction to the ChemTRAC program

There are chemicals in Toronto's environment that can harm our health. These substances come from vehicle exhaust, homes, businesses and other sources.

Toronto Public Health identifies 25 of these chemicals as "priority substances" because they are found in our local environment at levels that are of concern for health. Evidence links these substances to short-term health effects like respiratory problems, and longer-term impacts such as cancer. In a business setting, these substances can come from process heating, cleaning with solvents, welding and other processes.

The list of 25 substances and the reporting thresholds are included in Table 5 on page 37.

ChemTRAC is a City of Toronto program that:

- tracks where businesses use and release these priority substances
- helps businesses reduce or replace these substances with safer alternatives, and
- provides the public with information on priority substances in their community.

As part of ChemTRAC, Toronto's Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423) requires many businesses to report to the City each year if they use or release a certain amount of priority substances to the environment. Wood window and door manufacturers are covered by this bylaw.

This guide is designed to help you and other wood window and door manufacturer facility owners:

- understand if your facility uses and releases any ChemTRAC priority substances
- use ChemTRAC calculators to determine if you are required to report to the City of Toronto
- use the ChemTRAC online reporting system to submit data to the City, and
- consider ways to reduce your environmental impact.

Additional information on the ChemTRAC program and the Environmental Reporting and Disclosure Bylaw is available by calling 3-1-1 or online at:  
**<http://www.toronto.ca/chemtrac/>**

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## The Wood Window and Door Manufacturing sector

The North American Industrial Classification System (NAICS) code 321911 includes all establishments that manufacture wood doors and frames, and wood window units and frames, including those covered with metal or plastic. It includes facilities that manufacture wood garage doors and window shutters.

It excludes facilities that install prefabricated windows and doors, and that manufacture plastic or metal windows and doors.

Wood window and door manufacturers are required to report their data every year if they use or release any of the 25 substances above the reporting threshold. The report is due by June 30 each year. Annual data that is reported each June should cover the period from January 1 to December 31 of the previous year.

## Identifying ChemTRAC substances in wood window and door manufacturers

Table 1 lists the typical substances and processes used in a wood window and door manufacturing facility. Most facilities will use one or more fillers, sealers, basecoats and/or topcoats as part of their manufacturing process. Most facilities will also use sawing and sanding as part of manufacturing.

Table 1 also shows the two ChemTRAC priority substances that are released in a typical wood window and door manufacturing facility. These are:

- Volatile Organic Compounds (VOCs)
- Particulate Matter 2.5 (PM<sub>2.5</sub>).

The ChemTRAC calculator can help you estimate the levels of these substances in your business.

**Table 1. ChemTRAC substances released from products and processes used in a typical wood window and door manufacturer**

ChemTRAC priority substances	Products used in manufacturing				Processes used in manufacturing	
	Fillers	Sealers	Base coats	Topcoats	Sawing	Sanding
Volatile Organic Compounds (VOCs)	X	X	X	X		
Particulate matter (PM <sub>2.5</sub> )					X	X

**Particulate Matter 2.5 (PM<sub>2.5</sub>).** The term “particulate matter” describes solid and liquid particles found in the air we breathe. Particulate matter that is smaller than 0.0025 millimetres in diameter is called PM<sub>2.5</sub> and may not be visible to the naked eye. In a wood window and door manufacturer, PM<sub>2.5</sub> is released into the air during the sawing and sanding of wood and other materials.

**Volatile Organic Substances (VOCs).** VOCs are a group of organic chemicals that easily evaporate into the air. You can often smell them. In a wood window and door manufacturing facility, VOCs are released from manufacturing products including fillers, sealers, basecoats and topcoats.

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### The health effects of VOCs and PM<sub>2.5</sub>

**VOCs.** Short-term health effects of exposure to VOCs may include eye, nose, and throat irritation, headaches, loss of coordination, and nausea. Over longer periods, VOCs can damage the liver, kidneys, and central nervous system.

**PM<sub>2.5</sub>.** Because of their small size, PM<sub>2.5</sub> can lodge deeply into the lungs. Numerous studies have linked PM to aggravated cardiac and respiratory diseases such as asthma, bronchitis and emphysema, and to heart disease.

For more information on the health effects of these substances, as well as other ChemTRAC priority substances, visit

<http://www.toronto.ca/health/chemtrac/substances.htm>.



## Calculating emissions

To help Toronto businesses calculate their emissions and comply with the Environmental Reporting and Disclosure Bylaw, Toronto Public Health developed calculators that are specific to industrial sectors and processes. Access these calculators from the ChemTRAC website at **<http://www.toronto.ca/health/chemtrac/tools.htm>**.

These calculators help businesses do three things:

- Identify which ChemTRAC priority substances are used or released in their facility
- Calculate the amounts of ChemTRAC priority substances used or released
- Determine what they are required to report to the ChemTRAC program.

Appendix B describes how the calculators calculate estimates of the quantities of ChemTRAC priority substances that are released from your facility.

The release of ChemTRAC priority substances can be calculated using methods other than the ChemTRAC calculators. For a list of alternative methods, see **<http://www.toronto.ca/health/chemtrac/tools.htm>**.

In the next section, we will work through worksheets to prepare you to use the ChemTRAC calculator for Wood Window and Door Manufacturing.

## Worksheets for collecting information

The worksheets found on the next three pages are intended to help you collect all the information needed to use the ChemTRAC calculator for Wood Window and Door Manufacturing. Two worksheets are provided:

- Fillers, sealers, basecoats and topcoats, and
- Sawing and sanding.

A printer-friendly version the worksheets can be found as Appendix A. They can be printed and completed by hand so that you have all information available on-hand for entry into the ChemTRAC calculator.

Note: if your facility has more processes than are included in the ChemTRAC calculator for Wood Window and Door Manufacturing, you may need to use additional calculators to identify other emissions. You would then add these amounts to the numbers generated by the ChemTRAC calculator for Wood Window and Door Manufacturing. You can use ChemTRAC's "Calculation of Totals" calculator to combine the findings of multiple calculators and determine if you exceed ChemTRAC thresholds. See Appendix C for more details.

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

### Worksheet 1 – Fillers, sealers, basecoats and topcoats

This worksheet will help you collect information on the fillers, sealers, basecoats and topcoats in your facility. By filling in the three [Worksheet 1 Tables](#), you will have all the information on fillers, sealers, basecoats and topcoats that you will need to use the calculator. You should collect data on your facility for the period from January 1 to December 31 of a calendar year.

#### 1. What types of fillers, sealers, basecoats and topcoats do you use?

- **Solvent-based products** include oil-based, enamel, and alkyd products.
- **Water-based products** include acrylic and latex products.
- **UV-curable coatings** require exposure to ultraviolet radiation. Coatings can be 100% UV, water-reduced UV or solvent-reduced UV.

You can find this information on the container of each product and use an 'X' to fill in the table below. You can add up to two fillers, sealers, basecoats and topcoats into the ChemTRAC calculator. Enter this data into [Worksheet 1 Table 1](#).

Worksheet 1 Table 1 – Types of fillers, sealers, basecoats, and topcoats

Type	Product name	Is it solvent-based, water-based or UV-curable?		
		Solvent-based	Water-based	UV-curable
<i>example: Filler</i>	<i>Alkyd filler A</i>	<u>X</u>		
Filler				
Filler				
Sealer				
Sealer				
Basecoat				
Basecoat				
Topcoat				
Topcoat				

#### 2. How much of each product do you use?

You can estimate how much of each product you used last year by multiplying the number of containers you use each year by the volume of each container in litres. Enter this data into [Worksheet 1 Table 2](#). If it is easier, you can start by estimating the number of containers you purchase each week or month.

*Example: 5 containers per month \* 12 months per year = 60 containers per year*

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$$60 \text{ containers per year} * 20 \text{ L per container} = 1200 \text{ L per year}$$

Worksheet 1 Table 2 – Quantity of products used

Type	Material name	Containers per year	Size of containers	Quantity used
<i>example:</i> Filler	<u>Alkyd filler A</u>	<u>60</u>	<u>20 litres</u>	<u>60 * 20 = 1200 Litres</u>
Filler				
Filler				
Sealer				
Sealer				
Basecoat				
Basecoat				
Topcoat				
Topcoat				

### 3. What is the “specific gravity” of each product?

The **specific gravity** indicates the density of a compound relative to the density of water. There are no units associated with the specific gravity because it is a ratio (density of the product / density of water).

You can find a product’s specific gravity on its **MSDS** (Material Safety Data Sheets) in the section entitled “Physical and Chemical Properties” or “Physical and Chemical Characteristics”. **Most coating and paint manufacturers publish the MSDS for all of their products online.** You can also contact the manufacturer directly to ask for your product’s MSDS. **If you do not have information on specific gravity, Question 3 can be skipped.** The ChemTRAC calculator will use default values. Enter any specific gravities that you would like to specify in [Worksheet 1 Table 3](#) found on the next page.

### 4. What is the VOC content of each product?

This question can be answered using EITHER Option 4A or Option 4B. **If you do not have information on VOC content, Question 4 can be skipped.** The ChemTRAC calculator will use default values. Enter any VOC contents that you would like to specify in [Worksheet 1 Table 3](#) found on the next page.

#### Option 4A. What VOC content is listed on the MSDS?

Sometimes you can find a product’s **VOC content** directly on its MSDS (Material Safety Data Sheets) in the Physical and Chemical Characteristics section. The VOC content will be expressed in pounds per gallon (**lb/gal**) or in grams or kilograms per litre (**g/L** or **kg/L**).

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### Option 4B. What percent weight of volatiles is listed on the MSDS?

More often, you will calculate the VOC content using the product's **percent weight** (also called **weight percent**) of volatiles in combination with the specific gravity. It may be called "Percent volatile", "VOC" or "solvent" and will be expressed as **Wt. %** or **% Wt.** It will also be located in the Physical and Chemical Characteristics section of a product's MSDS.

Worksheet 1 Table 3 – Specific gravity (optional) and VOC content (optional)

Type	Material name	Specific gravity (optional)	VOC content (optional) Enter either Option 4A OR 4B		
			Option 4A – VOC content	OR	Option 4B – percent weight of volatiles
<i>example:</i> Filler	<u>Alkyd filler A</u>	<u>1.66</u>	<input type="checkbox"/> g/L <input type="checkbox"/> kg/L <input type="checkbox"/> lb/gal	<b>OR</b>	<u>10 %</u>
Filler	_____	_____	_____	<b>OR</b>	_____ %
Filler	_____	_____	_____	<b>OR</b>	_____ %
Sealer	_____	_____	_____	<b>OR</b>	_____ %
Sealer	_____	_____	_____	<b>OR</b>	_____ %
Basecoat	_____	_____	_____	<b>OR</b>	_____ %
Basecoat	_____	_____	_____	<b>OR</b>	_____ %
Topcoat	_____	_____	_____	<b>OR</b>	_____ %
Topcoat	_____	_____	_____	<b>OR</b>	_____ %

Note: The ChemTRAC calculator will automatically use default values for each specific gravity and VOC content that you do not specify.

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### Worksheet 2 – Dust collectors (for sawing and sanding)

**Skip this worksheet if no dust collectors, baghouses, fabric filters or cyclones are in operation at your facility.**

This worksheet will help you collect information on any dust collectors at your facility that help control the sawdust from sawing and sanding. The term “dust collectors” also refers to baghouses, fabric filters and cyclones associated with sanding and sawing. You should collect data on your facility for the period from January 1 to December 31 of a calendar year.

#### 5. If dust collectors are in operation at your facility, what are the details of their use?

Information is needed on the airflow rate of the dust collector. Airflow is the speed at which the dust collector takes in air. You can find the airflow rate in the dust collector’s operating manual. You can collect this information in:

- Cubic feet per minute (cfm)
- Cubic metres per second ( $\text{m}^3/\text{s}$ )
- Cubic metres per hour ( $\text{m}^3/\text{h}$ )
- Litres per minute (L/m) OR
- Litres per second (L/s).

You can then use the conversion tool in the ChemTRAC calculator to enter the airflow rate in cubic feet per minute (cfm).

You will specify the process associated with the dust collector.

You will also need to estimate the amount of time that the dust collectors are removing dust from the air. This information can be put into [Worksheet 2 Table 1](#) below.

Information on a typical dust collector has been filled out as an example. If multiple dust collectors are found in the facility, you should enter them separately (in different rows of the table).

Worksheet 2 Table 1 – Dust collectors

Air flow rate	Airflow rate units	Process	How often are dust collectors operating?		
			Hours per day	Days per week	Weeks per year
<i>example:</i> <u>2,000</u>	<i>x cfm</i> <input type="checkbox"/> $\text{m}^3/\text{s}$ <input type="checkbox"/> L/m <input type="checkbox"/> L/s <input type="checkbox"/> $\text{m}^3/\text{h}$	<u>Sanding</u>	<u>8</u>	<u>5</u>	<u>50</u>

### Using the calculator

This section of the guide provides a step-by-step walkthrough of the main two screens of the calculator. The calculator can be used properly by entering the information from the worksheets found in the previous section of this guide into the appropriate sections of the calculator. The ChemTRAC calculator will then automatically calculate the quantities of ChemTRAC substances released from processes found in your wood window and door manufacturing facility.

#### *Getting started*

The ChemTRAC calculator for wood window and door manufacturers can be read with software such as Microsoft Excel or Open Office. To find a copy of the calculator, go to <http://www.toronto.ca/health/chemtrac/tools.htm> and click on the *Wood Window and Door Manufacturers* link found under the *Manufacturing (NAICS 32 and 33)* heading.

The calculator consists of four different screens:

- Instructions
- Input-Output
- Calculations
- References

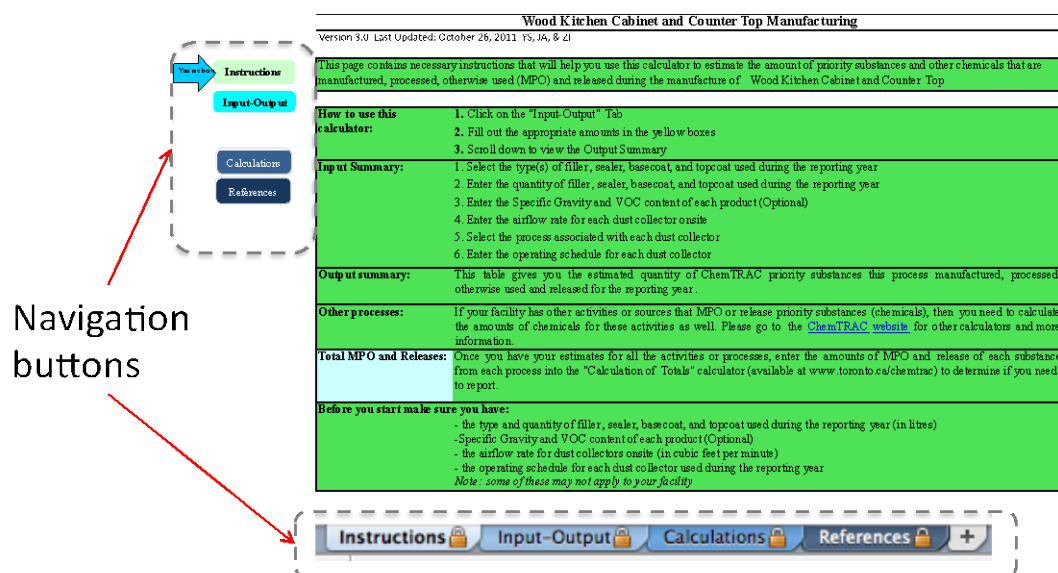
**You only have to enter information into the Input-Output screen.** The Instructions screen illustrated below can help you use the calculator. The other two screens (Calculations, References) are provided mainly for reference and are discussed in Appendix B. You do not need to enter information in these screens.<sup>1</sup>

You can navigate between screens by clicking the buttons on the left side of each screen or by clicking on the tabs at the bottom of each screen:

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<sup>1</sup> If you have site-specific emission factors for any ChemTRAC substance, they can be entered manually in the Calculator screen. See 0 for details.

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### The Instructions screen

The calculator should open on the Instructions screen. This screen contains instructions on how to use the calculator to estimate the amount of ChemTRAC substances and other substances that are used and released by your wood window and door manufacturer. It also provides a brief overview of the contents of the calculator. **You do not need to enter any information on this screen.**

### The Input-Output screen

The Input-Output screen is the screen where you will enter all of the information applicable to your facility. Information is typed in **yellow and orange boxes** only. Any cells that do not apply to your facility can be left blank. **Dropdown menus** are also used to input some information.

The Input-Output screen can be filled out using the responses to the **five questions** found within **Worksheets 1 and 2** of this guide. The input-output screen includes examples that do not enter into your facility's calculation.

Once you input your facility's information into the appropriate yellow boxes and dropdown menus, the calculator automatically calculates the quantities of ChemTRAC substances that are manufactured, processed, otherwise used and released to air from your facility.<sup>2</sup> The values are displayed in the **Output table** found at the bottom of the Input-Output screen. The next pages will walk you through the Input-Output screen and Output table. The image on the next page illustrates the different areas of the input-output screen.

<sup>2</sup> The definitions for 'Manufactured', 'Processed', 'Otherwise Used', and 'Released to Air' can be found on the References screen of the ChemTRAC calculator.



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**INPUT**

If your facility uses the following products, please indicate the type of product used, the quantity used during the reporting year, and if available, the specific gravity and VOC content from MSDS. Please leave the drop-down menu choice as "Select" if you do not use that product.

Product	Type	Quantity Used (L/yr)	Specific Gravity* (from MSDS)	VOC content* (from MSDS, kg/L)
Example	Water-based	100	1.01	0.18
Filler	Select			
Filler	Select			
Sealer	Select			
Sealer	Select			
Basecoat	Select			
Basecoat	Select			
Topcoat	Select			
Topcoat	Select			

\*Leave the cell blank if you do not know this number. The calculator will use a default value.

For dust collectors, baghouses, fabric filters, or cyclones onsite associated with sanding and sawing, please indicate the following

Flow rate (cfm)	Process	Operating Schedule		
		Hours/Day	Days/Week	Weeks/Year
Example 2000	Sanding	8	5	50
	Select			
	Select			
	Select			
	Select			
	Select			
	Select			
	Select			
	Select			

**OUTPUT (ChemTRAC Priority Substances only)**

ChemTRAC Priority Substances	Quantity (kg/yr)			
	Manufactured <sup>1</sup>	Processed <sup>1</sup>	Otherwise Used <sup>1</sup>	Released to Air <sup>1</sup>
Volatile Organic Compounds (VOCs)	0	0	0	0
Particulate Matter (PM2.5)	0	0	0	0

<sup>1</sup> Definitions available in References tab

Enter data from  
Worksheet 1 here

**Imperial-Metric Unit Conversion**

Enter number in "INPUT" column

INPUT			OUTPUT	
Imperial			Metric	
1	gallons (US)	=	3.785	L
1	gallons (Imp)	=	4.546	L
1	cubic metres (m <sup>3</sup> )	=	1000.00	L
1	lb/gal	=	119.828	g/L
1	g	=	0.001	kg
1	lb	=	0.454	kg

**Properties calculation**

INPUT			OUTPUT	
Concentration in % w/w to g/L			VOC Content	
% Weight <sup>2</sup>	Specific Gravity	=	50.000	g/L
10	0.5	=		
Mass to volume using density			Volume	
Mass (kg)	Density (g/ml)	=	1.000	L
1	1	=		

<sup>2</sup> If the percentage is based on volume or if it is not specified on the MSDS, please contact supplier for concentration in g/L

1	cubic metres per second	=	2118.88	cfm
1	litres per minute	=	0.0353147	cfm
1	litres per second	=	2.11888	cfm
1	cubic metres per hour	=	0.5885778	cfm

Use this table to  
calculate VOC  
content

Use this box to  
convert flow rate  
to cfm

Enter data from  
Worksheet 2 here

The output values  
are calculated here

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### Entering information from Worksheet 1: Fillers, sealers, basecoats & topcoats

The image below displays the area of the Input-Output screen where you enter information from Worksheet 1 on fillers, sealers, basecoats and topcoats. As an example, the sample information from Worksheet 1 will be entered into the appropriate areas of the screen.

Worksheet 1, Question 1: **“Solvent-based”** is selected from the dropdown menu for Filler 1 in the column entitled “Type”.

Worksheet 1, Question 2: **“1200”** is entered into the yellow box in the column “Quantity Used”. The column heading specifies that units are litres per year (L/yr).

Worksheet 1, Question 3: **“1.66”** is entered into the orange box in the column “Specific Gravity”. The orange cell colour indicates that this data is **optional**.

Worksheet 1, Question 4: The VOC content of **“0.166” kg / L** is calculated using the specific gravity and the percent weight of volatiles using the **Properties calculation** table. The **Properties calculation** table is described on the next page and located to the right of the input table. Again, the orange cell colour indicates that this data is **optional**.

INPUT				
If your facility uses the following products, please indicate the type of product used, the quantity used during the reporting year, and if available, the specific gravity, VOC content from MSDS. Please leave the drop-down menu choice as "Select" if you do not use that product.				
Product	Type	Quantity Used (L/yr)	Specific Gravity* (from MSDS)	VOC content* (from MSDS, kg/L)
Example	Water-based	100	1.01	0.18
Filler	Solvent-based	1200	1.66	0.166
Filler	Select			
Sealer	Select			
Sealer	Select			
Basecoat	Select			
Basecoat	Select			
Topcoat	Select			
Topcoat	Select			

\*Leave the cell blank if you do not know this number. The calculator will use a default value.

### Entering information from Worksheet 1 – Question 4 Option 4B

You only need to use the **Properties calculation** table if you answered **Option 4B** for Question 4 of Worksheet 1 (% Weight of VOCs).

The Properties calculation table asks you to enter the percent weight of volatiles (% Weight) and the Specific Gravity in the yellow boxes. It then calculates the VOC content in grams per litre (g/L) in the purple box. In the example below, the 10% Weight and Specific Gravity of 1.66 yields a VOC content of 166 g/L.

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Properties calculation				
INPUT			OUTPUT	
Concentration in %w/w to g/L				
%Weight <sup>2</sup>	Specific Gravity		VOC Content	
10	1.66	=	166.000	g/L
Mass to volume using density				
Mass (kg)	Density (g/ml)		Volume	
1	1	=	1.000	L

Note that you will need to divide by 1,000 before entering the value into the main input screen. In the example below, the VOC content of 166 g/L is entered into the main input screen for Filler 1 as **0.166 kg / L**.

### Entering information from Worksheet 2: Dust collectors

The image on the next page displays the area of the Input-Output screen where you enter information from Worksheet 2 on dust collectors. As an example, the sample information from Worksheet 2 is entered into the appropriate areas of the screen.

Worksheet 2, Question 5: The **flow rate** of “**2,000**” **cfm** is entered into the yellow box. Then, the **process** of “**sanding**” is selected from the dropdown menu. Finally, an operating schedule of **8** hours per day, **5** days per week, **50** weeks per year is entered in the appropriate boxes:

For dust collectors, baghouses, fabric filters, or cyclones onsite associated with sanding and sawing, please indicate the following				
Flow rate (cfm)	Process	Operating Schedule		
		Hours/Day	Days/Week	Weeks/Year
<i>Example</i> 2000	Sanding	8	5	50
2,000	Sanding	8	5	50
	Select			

If your flow rate is in units **other than cfm**, you will need to use the cfm conversion box at the bottom right hand side of the input-output screen:

1	cubic metres per second	=	2118.88 cfm
1	litres per minute	=	0.0353147 cfm
1	litres per second	=	2.11888 cfm
1	cubic metres per hour	=	0.5885778 cfm

This cfm conversion box allows you to convert flow rates into cfm (cubic feet per metre). Enter the flow rate in cubic metres per second (cms), litres per minute, litres per second or litres per hour in the appropriate yellow box. The tool will

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automatically calculate the flow rate in cfm in the blue column at the right of the table. Enter the flow rate in cfm into the main input table.

### *Reading the Output table*

The Output table displays the quantities of ChemTRAC substances that are manufactured, processed, released, or otherwise used in your facility. These values are the results of all of the calculations based on the information you entered about your facility.

You should compare the values that are manufactured, processed or otherwise used to the ChemTRAC reporting thresholds to see if you are required to report ChemTRAC substances. See Interpreting Results on page 17 for more details.

OUTPUT (ChemTRAC Priority Substances only)				
ChemTRAC Priority Substances	Quantity (kg/yr)			
	Manufactured <sup>1</sup>	Processed <sup>1</sup>	Otherwise Used <sup>1</sup>	Released to Air <sup>1</sup>
Volatile Organic Compounds (VOCs)	0	199	0	199
Particulate Matter (PM2.5)	120	0	0	120

<sup>1</sup> Definitions available in References tab

### Interpreting results

**Compare results to thresholds.** Once the amounts of ChemTRAC substances manufactured, processed, otherwise used have been calculated, you must compare these amounts to the ChemTRAC reporting thresholds listed in the Environmental Reporting and Disclosure Bylaw.<sup>3</sup> These thresholds are also listed in Appendix C of this guide.

**If results exceed thresholds you must report.** If a ChemTRAC priority substance is manufactured, processed, or otherwise used in an amount equal to or greater than its ChemTRAC reporting threshold, then you would need to report that substance and the quantity released to air.

**Combining multiple calculation methods.** Some facilities may need to add results of the ChemTRAC calculator for Wood Window and Door Manufacturing with emissions from other processes that happen in the facility. This is discussed in Appendix C.

**If there are no other processes and, the ChemTRAC calculator is the only tool used to estimate emissions,** the values in the Output Summary table of the calculator can be compared directly to the ChemTRAC reporting thresholds. See an example in Table 2.

Table 2 compares the Output table from the section above to ChemTRAC thresholds. This example uses the values from Worksheets 1 and 2.

Table 2. Comparison of results from the ChemTRAC calculator and reporting thresholds

Output Summary table from the ChemTRAC calculator					Comparison to thresholds	
ChemTRAC Priority Substances	Manufactured (kg/yr)	Processed (kg/yr)	Otherwise used (kg/yr)	Released to Air (kg/yr)	ChemTRAC reporting threshold (kg/yr)	Is reporting required?
VOCs	0	199	0	199	100	YES
Particulate Matter (PM <sub>2.5</sub> )	120	0.0	0.0	120	30	YES

In the Table 2 example, both PM<sub>2.5</sub> and VOCs are manufactured, processed, or otherwise used in quantities above the reporting thresholds.

Therefore, in this example, the processing and release to air of VOCs would need to be reported to the ChemTRAC program. The manufacturing and release to air of PM<sub>2.5</sub> would also need to be reported to ChemTRAC.

<sup>3</sup> The full by-law can be found at <http://www.toronto.ca/health/chemtrac/report.htm>.

## Reporting to ChemTRAC

**You are only required to report to ChemTRAC if you meet or exceed reporting thresholds for one or more priority substances.**

Facilities that meet or exceed reporting thresholds for one or more substances must use the Online Reporting System to report to the ChemTRAC program. You can access the system from any computer with an internet connection. If your facility is exempt or below reporting thresholds, you can use the system to notify the City and volunteer environmental information.

You can find the online reporting system on the ChemTRAC webpage:  
**<http://www.toronto.ca/health/chemtrac/report.htm>.**

### *You will need the following information to report to ChemTRAC*


- Your First Time Access Code **OR** Registration ID
- Your facility name, address, number of employees and contact information
- Your NAICS code
- The names of substances you are reporting
- Quantities of priority substances (in kilograms).

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

[Frequently asked questions](#)  
[Contact us](#)  
[Terms of use](#)  
[User Guide](#)

### ChemTRAC

You are in a secure site.



## Welcome to the ChemTRAC data reporting system

This application will allow you to:

- Report the use and release of priority substances under Toronto's Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423)
- Indicate if your facility is below reporting thresholds
- Indicate that the reporting requirements do not apply to your facility
- Provide information on your facility's environmental activities

To report online, you will need the **First Time Access Code** or your **Registration ID**.

To protect your privacy and security it is recommended that you close the browser after submitting your information.

To protect the secured exchange of information between you and this secure site, this transaction requires that your browser supports 128-bit data encryption. To continue, you may be asked to download and install the latest version of your browser.

As a security precaution, page sessions will end automatically as indicated at the top of each page.

To proceed with reporting information on chemical use and release you must read and consent to the [Terms of Use](#) and click the **I Agree** button below.

**Note:** Use of the browser Back button is not supported. Please use the reporting system's back/next button(if applicable) to navigate when necessary.

### *First Time Access Code for new users*

If you are a first time user, you will need a "First Time Access Code" to use the system. The City sends most businesses their First Time Access Code by mail. If you did not receive or have lost your First Time Access Code, please call 3-1-1.

### *Registration ID for facilities already in the system*

If you have already reported in the online system, you have been issued a Registration ID. This ID number is to be used for future visits to the ChemTRAC reporting system. If you have lost your Registration ID, please call 416-338-7600.

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

First Time Signing In?

Register with First Time Access Code

Already Registered?

Registration ID:

If you have lost or forgotten your Registration ID, please contact us at (416) 338-7600

Sign In

### *Once you have entered the online reporting system*

The online system has seven steps. You will see your progress at the top of the screen. In the screenshot below, Step 1 is complete and Step 2 is in progress.

**Toronto**

**ChemTRAC**  
You are in a secure site.

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**Step 1**  
Facility Registration

**Step 2**  
Reporting Period

**Step 3**  
Chemical Selection

**Step 4**  
Use & Release (0 of 0)

**Step 5**  
Environmental Statement

**Step 6**  
Summary Notification

**Step 7**  
Confirmation & Print

**15min** Note: This registration session will automatically end fifteen minutes after this Web page has finished loading.

To move to the next step, you must enter all the required information on the screen and click the “Next” button at the bottom of the screen. You can use the “Back” button to change the information you provided in previous steps.

Please remember to have all your information ready before you enter the system. **You will only have fifteen minutes to complete each screen before the system logs you out.** If your session expires before you hit the "submit" button, you will need to re-enter all your information. If you are running out of time, you can reset the countdown without losing information by switching to a different page then returning to the page you were working on.

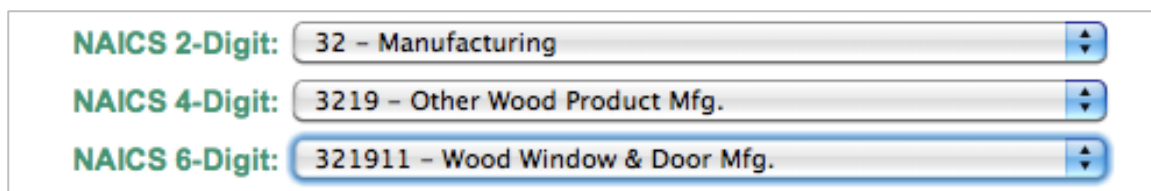
### *Step 1. Facility registration*

In Step 1, you will enter your facility name, address, number of employees and company contact information. You will also enter your **NAICS code** in the section entitled “Type of facility”. You must begin by selecting the 2-digit NAICS code from the dropdown menu. For wood window and door manufacturers, this



## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

will be “32 – Manufacturing”. Then, you can select the appropriate 4-digit code (3219), and finally, the 6 digit code (321911).

A screenshot of a web interface for selecting NAICS codes. It features three stacked dropdown menus. The first menu is labeled 'NAICS 2-Digit:' and shows '32 - Manufacturing'. The second menu is labeled 'NAICS 4-Digit:' and shows '3219 - Other Wood Product Mfg.'. The third menu is labeled 'NAICS 6-Digit:' and shows '321911 - Wood Window & Door Mfg.'. Each menu has a blue arrow on the right side indicating it can be expanded.

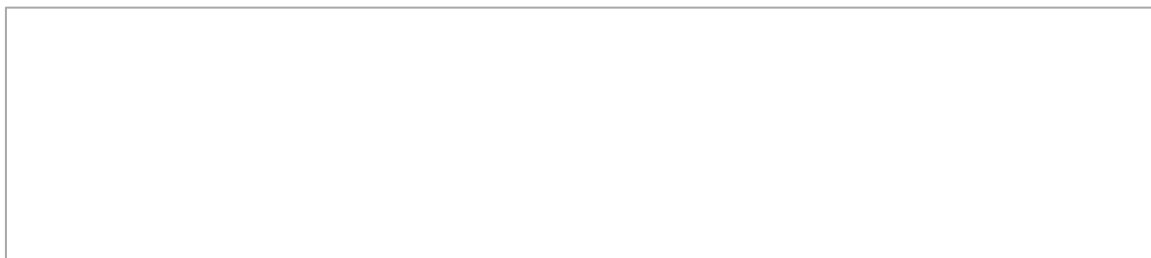
### Step 2. Reporting period

In Step 2, you will choose the calendar year from the dropdown menu and select “Yes” in response to the statement “I am ready to report for the year above”.

If your calculations showed you to be below the reporting threshold, you can enter “No” in response to the statement “I am ready to report for the year above” and then enter “I do not meet the threshold.”

### Step 3. Chemical selection

In Step 3, you will identify the substances that your facility used or released at or above reporting thresholds. The example below builds off of Table 2 in this guide. Recall that Particulate Matter 2.5 and VOCs were the only substances that exceeded thresholds.

A large, empty rectangular box with a thin black border, intended for listing substances that exceed reporting thresholds.

### Step 4. Use and release

In Step 4, you will enter information for each substance that you identified in Step 3. You will begin by determining whether a substance was used or released, and from where / to where.

***For commercial wood window and door manufacturers, PM<sub>2.5</sub> are “manufactured” and “released to air”. VOCs are “processed” and “released to air”.***

Next, you will need to **enter the total quantity of the substances that your facility manufactured and released, in kilograms and without decimals**. For example, 17.2 kg would be rounded to 17 kg and 17.6 kg rounded to 18 kg.

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

Finally, you will select an estimation method from the dropdown menu.

**Select “ChemTRAC calculator” if you have used the ChemTRAC calculator.**

The example below illustrates how to complete Step 4 for Particulate Matter 2.5 using information from Table 2 of this guide.

Particulate Matter 2.5 (PM 2.5) (Reporting Threshold = 30.0 kg)	
Quantity (kg)	Estimation Method
If you used more than one method to estimate data, please choose the main one	
Manufactured: ⓘ 120	ChemTRAC calculator
Processed: ⓘ	- Select Estimation Method From List -
Otherwise Used: ⓘ	- Select Estimation Method From List -
<b>Total Use:</b> 120	
Release to Air: ⓘ 120	ChemTRAC calculator
Release to Land: ⓘ	- Select Estimation Method From List -
Release to Surface Water: ⓘ	- Select Estimation Method From List -
<b>Total Release:</b> 120	

### Step 5. Environmental statement

In Step 5, you have the option of entering information about your environmental activities including: if you have completed environmental training courses, created a Pollution Prevention Plan, or adopted an Environmental Management System. Pollution Prevention Plans are discussed briefly in the Pollution prevention strategies section on page 24 of this guide. You will also specify if you report to the National Pollutant Release Inventory or to the Toronto Sewer Use Bylaw.

### Steps 6 and 7. Summary notification, confirmation and printing

In Steps 6 and 7, you will not enter any new information. You will review the information you provided, submit your report, and receive a printable record.

### Optional reporting for facilities below threshold levels of priority chemicals

For those businesses or facilities that do not meet or exceed ChemTRAC thresholds, the online reporting system allows you to identify yourself as a “non-reporter”. This will allow you to stay informed on ChemTRAC program initiatives. It will also help Toronto Public Health assess trends over time and gauge the effectiveness of the ChemTRAC program.

### Part 2: Reducing the environmental impact of your facility

*This section of the guide provides information about reducing the environmental impact of your facility.*

- *It provides an overview of pollution prevention strategies*
- *It identifies relevant control technologies for reducing emissions*
- *It provides guidance on getting started with pollution prevention.*

### Pollution prevention strategies

The ChemTRAC program requires facilities to report on substances that are manufactured, processes or otherwise used in quantities that are equal to or greater than ChemTRAC reporting thresholds. Although it is not required as part of the ChemTRAC program, it is good business practice for facilities to also take action to reduce the creation, use and release of ChemTRAC priority substances.

Minimizing the use and release of harmful substances at the source is called pollution prevention (or P2) and is widely recognized as good business practice. Collecting data for ChemTRAC gives you the information you need to consider P2 options in your facility.

#### How can a business benefit from pollution prevention (P2)?

- P2 can reduce operating costs from the use of chemicals and energy
- P2 can reduce the costs of waste management and the risk of liability
- P2 can improve worker health and safety
- P2 can improve community relations and build a business' reputation as socially and environmentally responsible
- P2 can improve a business' ability to respond to consumer demands for "greener" products

#### Pollution prevention strategies

Businesses have many options for reducing the use of harmful substances in their facilities. Not all of the options will be relevant to all businesses. Three types of strategies and examples specific to wood window and door manufacturers are presented below.

1. **Use low-cost, good operating practices.** Simple changes to normal practices can reduce the use and release of harmful chemicals at no cost to business owners.  
*For example: Determine the most efficient air and fluid pressure for spray guns to minimize overspray and blowback. Only mix the amount of coating that you need, and use it all. Keep containers closed when not in use.*
2. **Install control technologies or equipment.** New control technologies and equipment can reduce the release of harmful chemicals and save money by improving operating efficiency.  
*For example: Install wet scrubbers, mechanical collectors or fabric filters that capture more particulate matter from sawing and sanding.*
3. **Modify products or inputs.** Traditional products and processes can be replaced with alternatives that use and release less harmful chemicals.  
*For example: Switch to water-based sealers, fillers and paints, or choose solvent-based products with lower VOC content.*

### Control technologies for reducing emissions

Control technologies can reduce the quantity of ChemTRAC substances that are released from commercial wood window and door manufacturers. Control technologies can limit emissions from fillers, sealers, and paints, as well as from sawing and sanding.

#### *Technology for reducing VOCs from coatings and paint*

Recall that volatile organic compounds (VOCs) are released from fillers, sealers, basecoats and topcoats.

**Low VOC paints and coatings.** Manufacturers can dramatically reduce their VOC emissions by using different products and paints. Many of these environmentally-friendly products are no more expensive than traditional products.

- **Water-based paints and coatings** generally have lower VOC contents than solvent-based coatings.
- **UV curable coatings** and **“high solids” coatings** also result in lower VOC emissions.
- **Low VOC** and **VOC-free solvent-based products** are also available. Low VOC paint contains less than 50 grams of VOCs per litre. Zero VOC paints contains less than 5 grams of VOCs per litre. They are typically priced as premium paints.

**HVLP spray guns.** Manufacturers can also reduce VOC emissions by increasing the efficiency of coating and painting. High volume low pressure spray guns increase transfer efficiency by up to 40-70%<sup>4</sup>. They are effective for both solvent- and water-based products.

#### **The ChemTRAC calculator can be used to estimate a control technology's emission reduction potential.**

Without changing any of the other values entered in the Input-Output screen, enter a new VOC content of 0.01 kilograms per litre (10 grams per litre). A “low-VOC” paint would have this VOC content.

Check the Output summary table to see how this would affect your facility's annual VOC emissions – unless you already use low/zero-VOC paints, your VOC emissions should be much lower!

---

<sup>4</sup> [http://www.smallbiz-enviroweb.org/Industry/bmpfiles/BMP\\_FurnitureFinishing-3.pdf](http://www.smallbiz-enviroweb.org/Industry/bmpfiles/BMP_FurnitureFinishing-3.pdf)

## Part 2: Reducing your facility's environmental impact

### *Technology for reducing PM<sub>2.5</sub> from sawing and sanding*

Recall that particulate matter (PM<sub>2.5</sub>) in the form of sawdust is released into the air during sawing and sanding.

**Dust collection systems.** Effective dust collection systems can reduce the amount of PM<sub>2.5</sub> that is released from sawing and sanding. Fabric filters, bag houses and cyclones are examples of dust collection systems. These systems take in air with a high abundance of PM<sub>2.5</sub>, collect much of the PM<sub>2.5</sub> within filters or bags, and release the air with a reduced amount of PM<sub>2.5</sub>. When purchasing a dust collection system, consider what capacity you need. The unit should have

An effective dust collection system can have other economic benefits:

- Sanding belts and other equipment may also last longer as dust will not become embedded in them.
- There may be a market for clean sawdust captured by dust collectors (e.g. for animal bedding or as raw material for particle board manufacturing).

Table 3 summarizes the common control technologies in commercial wood window and door manufacturers.

**Table 3. Control technologies found in commercial wood window and door manufacturers**

Process or product	Control technology	ChemTRAC substance being controlled
Sawing and sanding	Dust Collection systems: fabric filters, bag houses, cyclones, etc.	Particulate matter (PM <sub>2.5</sub> )
Fillers, sealers, basecoats and topcoats	Water-based coatings, UV coatings, High-solids coatings, Low-VOC coatings, no-VOC coatings	Volatile Organic Compounds (VOCs)
	High volume low pressure spray guns	Volatile Organic Compounds (VOCs)

### More ways to reduce costs and improve performance

Minimizing the use and release of harmful substances is one aspect of improving environmental performance. Wood window and door manufacturers can also take other steps to improve their economic and environmental sustainability.

1. **Reduce energy use.** By reducing energy use, wood window and door manufacturers can save money on energy bills and reduce their environmental impact. Many energy-efficiency technologies have very short payback periods. Utilities also offer incentives for energy efficiency measures.

To reduce energy use, low-cost, good operating procedures can be adopted, and new technology or equipment can be installed. This includes:

- Undergoing an energy audit to identify opportunities for savings
- Encouraging employees to turn off lights and equipment when not in use
- Replacing old equipment with more efficient equipment
- Installing a programmable thermostat to control heating and cooling
- Assigning one person to review and track energy usage and to investigate opportunities for energy savings.

2. **Reduce water use.** Working to reduce water use can save money and provide environmental benefits.

To reduce water use, low-cost, good operating procedures can be adopted, and new technology or equipment can be installed. This includes:

- Minimizing water use in cleaning procedures
- Posting signs near sinks and hoses to encourage employees to use less water
- Purchasing high pressure, low volume cleaning equipment
- Purchasing water-saving plumbing fixtures
- Regularly checking water-supply equipment for leaks.

### Getting started with pollution prevention

The good news is that you've already started by calculating emissions of ChemTRAC priority substances.

Next steps can include:

1. Evaluating actions to reduce the use and release of energy, water and ChemTRAC substances.
2. Identifying funding for upgrades to facilities and equipment.
3. Implementing all cost-effective upgrades.
4. Tracking changes in the use and release of energy, water and substances.

To help in these steps, ChemTRAC is offering **free technical assistance visits** and **training workshops** to assist businesses in creating an inventory of chemicals used at their facility, comply with the ChemTRAC program, and identify opportunities to improve their facilities' environmental performance.

For more information, visit:

[http://www.toronto.ca/health/chemtrac/assistance\\_program.htm](http://www.toronto.ca/health/chemtrac/assistance_program.htm) and  
<http://www.toronto.ca/health/chemtrac/gogreen.htm>.

Additional resources on reducing the environmental impact of commercial wood window and door manufacturers include:

- New Hampshire Department of Environmental Services. 2008. Pollution Prevention in the Wood Finishing Industry.  
<http://des.nh.gov/organization/commissioner/p2au/pps/ppwfip/categories/overview.htm>
- Missouri Department of Natural Resources. June 2005. Preventing Pollution in Wood Furniture Manufacturing.  
<http://dnr.mo.gov/pubs/pub1183.pdf>
- Oklahoma Department of Environmental Quality. Pollution Prevention & Waste Reduction for Wood Furniture Manufactures.  
<http://www.deq.state.ok.us/factsheets/customer/woodmanf.pdf>
- Small Business Environmental Homepage. October 2004. Environmental Best Management Practices – Furniture Finishing. [http://www.smallbiz-enviroweb.org/Industry/bmpfiles/BMP\\_FurnitureFinishing-3.pdf](http://www.smallbiz-enviroweb.org/Industry/bmpfiles/BMP_FurnitureFinishing-3.pdf)
- Toronto Public Health, ChemTRAC. December 2010. Resource for Greening Upholstered Household Furniture Manufacturing: Pollution Prevention Information.  
<http://www.toronto.ca/health/chemtrac/pdf/GreenUpholsteredFurniture.pdf>
- US EPA. 2003. Profile of the Wood Furniture and Fixtures Industry, Chapter V – Pollution Prevention Opportunities.  
<http://www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/wood.html>



### Appendices

*The remaining pages of this guide offer additional material for your reference:*

**Appendix A. Printer-friendly versions of the worksheets.**

**Appendix B. Additional material related to the ChemTRAC calculator.**

- *Descriptions of the remaining calculator screen*
- *How the calculator uses emission factors to calculate quantities of ChemTRAC substances*
- *How emission factors can be changed to site-specific values.*

**Appendix C. Combining the ChemTRAC calculator with other sources:**

*How to combine the ChemTRAC calculator for Commercial Wood window and door manufacturers with emissions data from other sources.*

## Appendix A. Printer-friendly worksheets

These worksheets can be printed and completed by hand so that all information can be readily available for entry into the ChemTRAC calculator.

### Worksheet 1 – Fillers, sealers, basecoats and topcoats

#### 1. What types of fillers, sealers, basecoats and topcoats do you use?

Worksheet 1 Table 1 – Types of fillers, sealers, basecoats, and topcoats

Type	Product name	Is it solvent-based, water-based or UV-curable?		
		Solvent-based	Water-based	UV-curable
<i>example: Filler</i>	<i>Alkyd filler A</i>	<u>X</u>		
Filler				
Filler				
Sealer				
Sealer				
Basecoat				
Basecoat				
Topcoat				
Topcoat				

#### 2. How much of each product do you use?

Worksheet 1 Table 2 – Quantity of products used

Type	Material name	Containers per year	Size of containers	Quantity used
<i>example: Filler</i>	<i>Alkyd filler A</i>	<u>60</u>	<u>20 litres</u>	<u>60 * 20 = 1200 Litres</u>
Filler				
Filler				
Sealer				
Sealer				
Basecoat				
Basecoat				
Topcoat				
Topcoat				

### Additional Material

- What is the “specific gravity” of each product (optional)? and
- What is the VOC content of each product (optional)?

Worksheet 1 Table 3 – Specific gravity (optional) and VOC content (optional)

Type	Material name	Specific gravity (optional)	VOC content (optional) Enter either Option 4A OR 4B		
			Option 4A – VOC content	OR	Option 4B – percent weight of volatiles
<i>example:</i> Filler	<u>Alkyd filler A</u>	<u>1.66</u>	<input type="checkbox"/> g/L <input type="checkbox"/> kg/L <input type="checkbox"/> lb/gal	<b>OR</b>	<u>10 %</u>
Filler	_____	_____	_____	<b>OR</b>	_____ %
Filler	_____	_____	_____	<b>OR</b>	_____ %
Sealer	_____	_____	_____	<b>OR</b>	_____ %
Sealer	_____	_____	_____	<b>OR</b>	_____ %
Basecoat	_____	_____	_____	<b>OR</b>	_____ %
Basecoat	_____	_____	_____	<b>OR</b>	_____ %
Topcoat	_____	_____	_____	<b>OR</b>	_____ %
Topcoat	_____	_____	_____	<b>OR</b>	_____ %

Note: The ChemTRAC calculator will automatically use default values for each specific gravity and VOC content that you do not specify.

### Worksheet 2 – Dust collectors (for sawing and sanding)

Skip this worksheet if no dust collectors, baghouses, fabric filters or cyclones are in operation at your facility.

- If dust collectors are in operation at your facility, what are the details of their use?

Air flow rate	Airflow rate units	Process	How often are dust collectors operating?		
			Hours per day	Days per week	Weeks per year
<i>example:</i> <u>2,000</u>	<u>x cfm</u> <input type="checkbox"/> m <sup>3</sup> /s <input type="checkbox"/> L/m <input type="checkbox"/> L/s <input type="checkbox"/> m <sup>3</sup> /h	<u>Sanding</u>	<u>8</u>	<u>5</u>	<u>50</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

## Appendix B. Additional material related to the ChemTRAC calculator

This appendix describes the remaining screens of the ChemTRAC calculator. You do not need to enter any information into these screens.


This appendix also describes emission factors and how the ChemTRAC calculator makes use of them.

### The ChemTRAC calculator Calculations screen

The Calculations screen lists your facility's emissions of substances other than ChemTRAC priority substances. Under "Other Substances", commercial wood window and door manufacturers can see their emissions of all particulate matter (PM) and of larger particulate matter (PM10).

The Calculations screen also includes the formulas and assumptions to calculate emissions based on the information provided in the Input-Output screen. You do not need to enter any information on this screen.

While you do not need to enter any information on this screen, some variables can be modified if site-specific information is available. For example, if you have site-specific data on the emissions factors of PM and PM<sub>2.5</sub> from sanding and sawing in your facility, you can enter them in the table entitled "Dust Collectors". Only emission factors should be modified. All other data, sample calculations and information presented in the Calculations screen are for reference only. They should not be modified in any way.



**Summary of Calculations**

Version 3.0 Last Updated: October 26, 2011 YS, JA, & ZI

Instructions

• This page provides detailed calculations based on the information provided in the Input table. It also provides sample calculations and an assessment of emission factor data quality.

Input-Output

• If you have site specific emission factors you may use them in the table below. If you choose to insert your own emission factor ensure that the units have been converted accordingly.

10 min

→

Calculations

References

ChemTRAC Priority Substances	CAS #	Quantity (kg/yr)			
		Manufactured	Processed	Otherwise Used	Released to Air
Volatile Organic Compounds (VOCs)	n/a	0	199	0	199
Particulate Matter (PM2.5)	n/a	120	0	0	120
Other Substances					
PM	n/a	136	0	0	136
PM10	n/a	125	0	0	125

Note (1) - For all PM emissions (PM, PM10, PM2.5), it was assumed that the quantity used was equal to the quantity released, and the mass reporting threshold (where appropriate) was compared against this number )

Coating								
Product	Type Used	Quantity Processed (L/yr)	Average Specific Gravity (kg/L) <sup>(2)</sup>	Quantity Processed (kg/yr)	Average VOC Content (kg/L) <sup>(2)</sup>	VOCs Processed (kg/yr)	VOC Emission Rate (kg/yr)	Data Quality
Filler	3	1,200	1.660	1,992	0.166	199.20	199.20	B
Filler	1	0	0.000	0	0.000	0.00	0.00	B
Sealer	1	0	0.000	0	0.000	0.00	0.00	B
Sealer	1	0	0.000	0	0.000	0.00	0.00	B
Basecoat	1	0	0.000	0	0.000	0.00	0.00	B
Basecoat	1	0	0.000	0	0.000	0.00	0.00	B
Topcoat	1	0	0.000	0	0.000	0.00	0.00	B
Topcoat	1	0	0.000	0	0.000	0.00	0.00	B
<b>Total</b>				1,992		199	199	


Note (2) - Specific gravity and VOC content calculated as the average of specific gravities from product MSDSs (see references tab)

## Additional Material

### *The ChemTRAC calculator References screen*

The Reference screen describes the sourced of the assumptions used on the Calculations screen. Source documents can be viewed by clicking on the links. The Reference screen also provides the definitions for 'Manufactured', 'Processed', 'Otherwise Used', and 'Released to Air'. No information needs to be entered on this screen.

Note that this tool is provided solely as an aid, and the City of Toronto makes no representation or warranty as to its applicability to your facility or to your obligation to comply with the Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423). It is the responsibility of each facility owner or operator to take the necessary steps to ensure compliance with the bylaw.




### References

Version 3.0 Last Updated: October 26, 2011 YS, JA, & ZI

Instructions

Input-Output

Calculations

References

This page provides all the reference information for the emission factors and assumptions used in the Calculations spreadsheet. Click on the links below to view the source documents.

Dust Collector emission factors are provided in the Ontario Ministry of the Environment publication "Procedure for Preparing and ESDM Report" PIBS #3614e03, March 2009  
<http://www.ene.gov.on.ca/envision/gp/3614e03.pdf>

Particulate matter size fractions are estimated using South Coast Air Quality Management District "Final –Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds", 2006  
[http://www.aqmd.gov/ceqa/handbook/PM2\\_5/finalAppA.doc](http://www.aqmd.gov/ceqa/handbook/PM2_5/finalAppA.doc)

Coating MSDSs downloaded from:  
The Simpsons Coatings Group  
<http://www.simpsoncoatings.com/index.html>  
Davis Paint Company  
<http://www.davispaint.com/index.htm>  
Wood Kote Products Inc.  
<http://www.woodkote.com/>  
Aubuchon Hardware  
<http://www.hardwarestore.com/>  
General Finishes  
<http://www.generalfinishes.com/index.htm>  
Bone Timber Industries  
<http://www.bonetimber.com.au/>  
Timbermate USA  
<http://www.timbermate.com/>  
Sherwin-Williams  
<http://www.sherwin-williams.com/index.jsp>  
Benjamin Moore  
[http://www.benjaminmoore.com/?lang=en\\_US](http://www.benjaminmoore.com/?lang=en_US)  
AFM Safecoat  
<http://www.afmsafecoat.com/>

## Additional Material

### *Emission factors for commercial wood window and door manufacturers*

The ChemTRAC calculators are based on published estimates of the emissions associated with different industrial processes. These estimates are called “emission factors”. Emission factors indicate the amount of a specific substance (e.g. particulate matter 2.5) emitted by a specific activity (e.g. collecting a cubic metre of air from sanding).

Table 4 presents the emission factor estimates used in the wood window and door manufacturing calculator. Note that sawing and sanding emit the same total quantity of particulate matter per cubic metre of air, but that they emit different quantities of PM<sub>2.5</sub>. For sanding, an estimated 88.5% of PM emissions are PM<sub>2.5</sub>. For sawing, most of the PM emissions are larger, so only 28.3% of PM emissions are PM<sub>2.5</sub>.

If site-specific emission factors are available for the facility or processes, they can be entered in the Calculations sheet of the calculator.

**Table 4. Emission factors for PM<sub>2.5</sub> and VOCs**

Source	Substance	Emission Factor
Dust collectors – sanding	All particulate matter (PM)	20 mg/m <sup>3</sup>
	% PM <sub>2.5</sub>	88.5%
	Particulate matter 2.5 (PM <sub>2.5</sub> )	<b>17.7 mg/m<sup>3</sup></b>
Dust collectors – sawing	All particulate matter (PM)	20 mg/m <sup>3</sup>
	% PM <sub>2.5</sub>	28.3%
	Particulate matter 2.5 (PM <sub>2.5</sub> )	<b>5.66 mg/m<sup>3</sup></b>
Fillers, sealers and paints	Volatile Organic Compounds (VOCs)	Product-specific (VOC content)

#### Example: Using emission factors to estimate VOC emissions from Filler 1

In Part 1, we used a sample filler (Filler 1) with a VOC content of 0.166 kg / L.

The sample facility used 1,200 L of filler in 2011.

#### **Total emissions of VOCs for 2011 from Filler 1**

$$= 0.166 \text{ kg / L} * \text{Volume of Filler 1 used in 2011}$$

$$= 0.166 \text{ kg / L} * 1,200 \text{ L}$$

$$= \mathbf{199.2 \text{ kg of VOCs}}$$

## Appendix C. Combining the wood window and door manufacturing calculator with other sources

Depending on your business, you may need to use more than one calculator to calculate the use and release from all processes at your facility. The "Calculation of Totals" calculator can be used to compile your data.<sup>5</sup> In this calculator, you can enter the values for each process at your facility. The calculator returns the total manufactured, processed or otherwise used amounts for the facility, by substance, and then compares it to the corresponding reporting threshold.

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<sup>5</sup> The Calculation of Totals calculator can be found under the Totals bullet at <http://www.toronto.ca/health/chemtrac/tools.htm>.

## Additional Material



### Calculation of Totals

Last Update: October 21, 2011 by YS, JA, & ZI

• This page gathers information to help you determine your facility-wide substance manufacture, process, otherwise use (MPO) and release estimates.

• For each source of priority substances, enter the process name and then provide the quantity of each substance manufactured, processed, otherwise used and released.

• In the "MPO" columns, identify whether the priority substance was Manufactured, Processed or Otherwise used. To do this you may consult the "Guide to Reporting" available at [www.toronto.ca/chemtrac](http://www.toronto.ca/chemtrac). The definitions are provided in the Examples tab.

• At the end of each row, you will find the facility-wide totals that need to be compared with the Mass Reporting Thresholds.

• The last 4 columns indicate the amount of each substance that you must report to the City of Toronto.

Instructions

Calculation

Example

The total quantities of ChemTRAC substances that would have to be reported are listed here

Group	Substance	City of Toronto				City of Toronto				Mass Reporting Threshold (kg/yr)	Reportable?	To be reported			
		Manufactured	Processed	Otherwise Used	Released to Air	Manufactured	Processed	Otherwise Used	Released to Air			Total Manufactured (kg/yr)	Total Processed (kg/yr)	Total Otherwise Used (kg/yr)	Total Released to Air (kg/yr)
		Process#1:				Process#2:									
A	Acetaldehyde*									0	100	No	---	---	---
	Acrolein*									0	100	No	---	---	---
	Benzene*									0	100	No	---	---	---
	1,3-Butadiene*									0	100	No	---	---	---
	Carbon tetrachloride*									0	100	No	---	---	---
	Chloroform (Trichloromethane)*									0	100	No	---	---	---
	Chromium (non-hexavalent) <sup>1</sup>									0	100	No	---	---	---
	1,2-Dibromoethane (Ethylene dibromide)									0	100	No	---	---	---
	1,4-Dichlorobenzene*									0	100	No	---	---	---
	1,2-Dichloroethane (Ethylene dichloride)*									0	100	No	---	---	---
	Dichloromethane (Methylene chloride)									0	100	No	---	---	---
	Formaldehyde*									0	100	No	---	---	---
	Manganese <sup>1</sup>									0	10	No	---	---	---
	Nickel <sup>1</sup>									0	100	No	---	---	---
	Trichloroethylene (Perchloroethylene)									0	100	No	---	---	---
	Trichloroethylene*									0	100	No	---	---	---
	Vinyl chloride									0	100	No	---	---	---
B	Cadmium <sup>1</sup>									0	1	No	---	---	---
	Chromium (hexavalent) <sup>1</sup>									0	10	No	---	---	---
C	Lead <sup>1</sup>									0	10	No	---	---	---
	Mercury <sup>1</sup>									0	1	No	---	---	---
	Total polycyclic aromatic hydrocarbons (PAHs)*									0	10	No	---	---	---
	Nitrogen oxides (NOx)									0	200	No	---	---	---
	Particulate matter 2.5 (PM2.5)									0	30	No	---	---	---
	Total Volatile organic compounds (VOCs) <sup>2</sup>									0	100	No	---	---	---

Enter values from the Output Summary table of your first calculator here

Enter values from the Output Summary table of your second calculator here

Etc...



## Additional Material

The total combined release of substances (whether from the ChemTRAC Wood Window and Door Manufacturing calculator only, or from other substance quantification methods as well) should be compared to the mass reporting thresholds listed in Schedule A of the Environmental Reporting and Disclosure Bylaw and provided in Table 5 below.

**Table 5. ChemTRAC priority substances and their reporting thresholds (adapted from Schedule A of the Environmental Reporting and Disclosure bylaw)**

ChemTRAC substance	ChemTRAC Mass reporting threshold (kg/yr)	Concentration threshold <sup>c</sup> % w/w
Acetaldehyde	100	1
Acrolein	100	1
Benzene	100	1
1,3-Butadiene	100	1
Cadmium and its compounds	1	0.1
Carbon tetrachloride	100	1
Chloroform (Trichloromethane)	100	1
Chromium, Hexavalent and its compounds	10	0.1
Chromium, Non-hexavalent and its compounds	100	1
1,2-Dibromo ethane (Ethylene dibromide)	100	1
1,4-Dichlorobenzene	100	1
1,2-Dichloroethane (Ethylene dichloride)	100	1
Dichloromethane (Methylene chloride)	100	1
Formaldehyde	100	1
Lead and its compounds	10	0.1
Manganese and its compounds	10	1
Mercury and its compounds	1	0
Nickel and its compounds	100	1
Nitrogen Oxides (NO <sub>x</sub> )	200	N/A
Particulate Matter 2.5 (PM <sub>2.5</sub> )	30	N/A
Polycyclic Aromatic Hydrocarbons (PAHs)	10	N/A <sup>b</sup>
Tetrachloroethylene (Perchloroethylene)	100	1
Trichloroethylene	100	1
Vinyl chloride	100	1
Volatile Organic Compounds (VOCs) total	100	N/A

**Notes:**

- N/A = not applicable
- The concentration threshold % w/w is not relevant to the emissions quantified using the ChemTRAC calculator for Commercial Wood window and door manufacturers

## Appendix D. Reporting Checklist

### Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423)

#### Checklist for Facilities in Toronto

Make sure the data you submit in your reports are accurate. Here is a checklist to help you.

- Enter complete facility and contact information. If you are a consultant, identify yourself as the technical contact.
- Submit a **separate** report for **each** facility in Toronto.
- Complete the statement of certification.
- Report **all** of the priority substances (chemicals) that meet or exceed (equal to or greater than) the reporting thresholds.
- Report **both use and release** amounts of all priority substances that meet or exceed the reporting thresholds.
- Estimate use and release for **all** sources and processes in your facility.
  - This includes process such as heating by natural gas combustion, welding, equipment cleaning, drilling, grinding, crushing, sanding, and blending.
- Review the exemptions in the bylaw, such as building heating, and do not include these in your calculations.
- Compare current year estimates with that of previous years (if available) and explain any differences if present.
- If you report to NPRI and there is a difference between the amount of a substance reported to ChemTRAC and NPRI, explain the reason for the difference.
- You may need to make your records available for audit purposes. Securely store the records you based your report on and document:
  - Assumptions and parameters used for calculation and estimation of emissions
  - Procedures and methods used to measure emissions
  - Calibration records of any equipment used to measure emissions

## Additional Material

### Use and Release Calculations

- There are many sources of information that can help you identify the priority substances in your facility. Be sure to check all of them, including:

purchase records	year-end inventory	Material Safety Data Sheets (MSDS)
raw materials	Certificate of Approval or Environmental Compliance Approval	correspondence with supplier

- Use the best available method for use and release estimation. Use (if any) the most appropriate and most recent ChemTRAC calculator (available at [toronto.ca/health/chemtrac/tools.htm](http://toronto.ca/health/chemtrac/tools.htm)).
- Enter all the reportable data in kilograms (kg).
- Calculate the **total** amount of a substance used and released in **all** processes.
  - For example, process 1 used 90 kg VOC and released 75 kg. Process 2 used 60 kg VOC and released 56 kg. The total amount of use would be  $90+60=150$  kg and release  $75+56=131$  kg.
  - To help with these calculations you can use the free online ChemTRAC totals calculator.
- Double check that **decimal places** are entered in the correct place (e.g. 3.47 vs. 347)
- Check that the **total release** amount (release to land+water+air) is equal to or less than **total use** amount (manufactured+processed+otherwise used).
- Use the **average value** for use and release estimation if the substance content is listed in a range (e.g. 10-12% VOCs) on Material Data Safety Sheets or on other sources of substance data.
- The following priority substances are VOCs. Be sure to report them separately **and also include** them in your VOC estimation:

Acetaldehyde	Acrolein	Benzene
1,3-butadiene	Carbon Tetrachloride	Chloroform
1,4-Dichlorobenzene	1,2-Dichloroethane	Formaldehyde
Trichloroethylene	Vinyl chloride	Polycyclic Aromatic Hydrocarbons (PAHs)

## Additional Material

- Consider the effects of pollution control devices (e.g. filter) in the emission calculations.
- Consider the amount of waste transferred off-site (if any) in emission calculations.

**Disclaimer:** *This checklist is for information only. The City of Toronto assumes no liability for accuracy or completeness. Readers are responsible for ensuring compliance with Toronto's Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423). This information should not be relied upon as a substitute for legal or professional advice. Readers should seek their own legal or professional advice in regard to their use of the information contained in it.*