

Sustainable Materials Assistant for Inventor

TECHNOLOGY PREVIEW

The Sustainable Materials Assistant for Autodesk® Inventor® enables you to make better design decisions by including sustainability issues in your design considerations. This Inventor add-in helps you make more responsible material choices that can reduce your products' environmental impact while still meeting critical performance requirements.

The Sustainability Materials Assistant includes two key tools:

- Autodesk Inventor software users can now add their own sustainability data into the Inventor materials library through a new Sustainable Materials Editor tool. Four new properties have been added:
 - Toxicity
 - Carbon Footprint
 - Recycling
 - Regulatory Information
- Autodesk Inventor users can now examine the sustainability information of individual components or entire designs and easily create a Sustainability Report to communicate and compare their design decisions.

Getting Started

Follow this helpful information to get started with the Sustainable Materials Assistant:

System Prerequisites

Autodesk Inventor 2010 (as part of Autodesk Inventor Suite, Routed Systems, Simulation, Professional or Tooling systems)

Note: the Sustainable Materials Assistant will not work with Inventor LT™ software.

Installation Instructions

1. Download the Sustainable Materials Assistant from Autodesk Labs.
2. Locate the downloaded application for your operating system and run the Setup.msi. Please note there is a separate setup for 64-bit (x64) and 32-bit (x86) operating systems.
3. You should see a confirmation dialog that confirms that the Sustainable Materials Assistant has successfully installed. If you do not install successfully, please contact labs.iv.sustainable@autodesk.com.
4. To confirm that the add-in will be available when using Autodesk Inventor, go to the Windows start menu and select **Programs, Autodesk Inventor 2010, Tools**, and select

to launch the **Add-in Manager**. Review the list and confirm that the Sustainable Materials Assistant add-in is listed and see to be **loaded**.

Important! The Sustainable Materials Assistant currently does not use the style library location as defined in your project file. It uses the default application style library. If you use a style library “design data” location that is different from the default installation directory, the Sustainable Materials Assistant will still function correctly - it will simply ignore the project location.

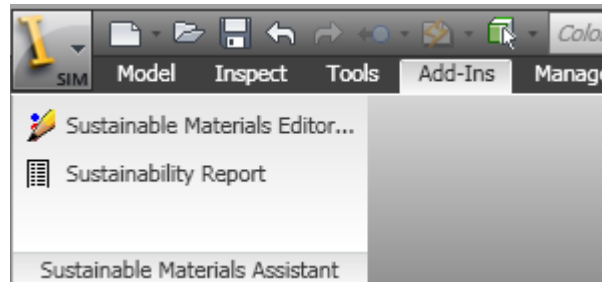
- In Windows® XP, the materials .xml file is here:
C:\Program Files\Autodesk\Inventor 2010\Design Data
- In Windows Vista®, the materials .xml file is here:
C:\Users\Public\Documents\Inventor\Design Data

User Interface

Once you start Inventor, you will notice several new tools in the user interface.

On the ribbon of **Add-Ins** tab, there is a new panel called **Sustainable Materials Assistant** with two new commands: **Sustainable Materials Editor** and **Sustainability Report**.

Sustainable Materials Editor allows you to add your sustainability information to the Autodesk Inventor’s material database and **Sustainability Report** allows you to launch the reporting tools to review the sustainability information of parts or entire assemblies.



Note: for Autodesk Inventor classic UI, **Sustainable Materials Editor** is located under **Format** menu and **Sustainability Report** is located at Part or Assembly **Panel bar**.

Adding Sustainability Properties

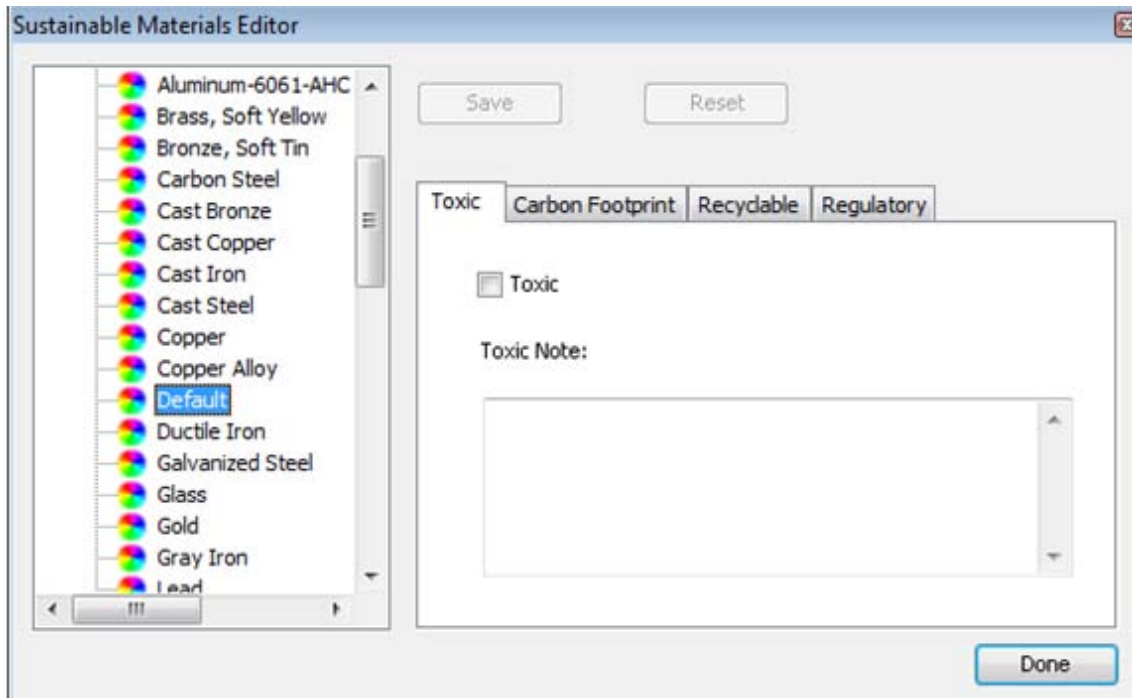
The first step is to add your company’s unique information into the Materials library. If your company does not already have this information, sustainability properties for various materials are available from a number of independent sources.

Environmental impact determinations are based solely on information provided by the user. Before uploading data into Autodesk Inventor, consult with relevant professionals and confirm toxicity, recyclability, regulatory and carbon footprint information.

On the ribbon, click the Add-Ins tab >**Sustainable Materials Editor**. The Sustainable Materials Assistant dialog appears. This dialog is similar to the existing Autodesk Inventor materials editor, but this tool is specialized to focus on the four new sustainable properties.

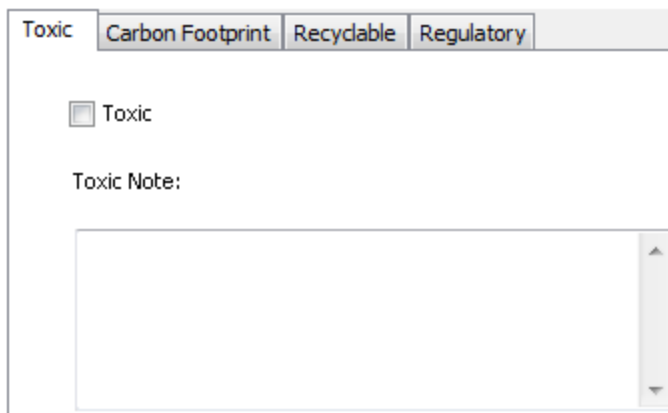
SUSTAINABLE MATERIALS ASSISTANT USER GUIDE

In the left panel you see a list of all Materials currently available in the style library. As you select a material in the left pane you can add data in the tabs to the right. A part's active material is shown bold. You can double click a material to make it active.



There are four tabs. Each tab is for one of the new categories of sustainability information you can add to the materials library.

Toxic: The Toxic tab allows you to record whether the material is toxic. If it is, you can add specific information. This might be medical information, handling information or any other data your company considers important to track and communicate on this material's toxicity.



Carbon Footprint: This tab allows you to add the Carbon Footprint in kilograms per kilogram value. This value is used in reports to calculate a total carbon footprint based on the mass of the part. Your company may track a similar index that represents embodied carbon or carbon emissions. Using this index depends on the specific material information that your company has chosen to help evaluate one material against another.

The screenshot shows the 'Carbon Footprint' tab selected. It contains a text input field labeled 'Carbon Footprint (kg/kg):' with the value '0' entered. Below this is a text area labeled 'Carbon Footprint Note:'.

Recycling: This tab allows you to record whether the material is recyclable. If it is, you can add specific information. This might be material handling information, disassembly or any other data your company considers important to track and communicate on this material's recyclability.

The screenshot shows the 'Recycling' tab selected. It features a checked checkbox labeled 'Recyclable' and a text area labeled 'Recyclable Note:' below it.

Regulatory: This tab allows you to record regulatory concerns for a given material. If you are aware that your material has any regulatory issues, you can add specific information. This might be a list of regulations, links to more information on compliance requirements, or any other data your company considers important to track and communicate on this material's regulatory compliance.

The screenshot shows the 'Regulatory' tab selected. It features an unchecked checkbox labeled 'Regulatory Issues' and a text area labeled 'Regulatory Note:' below it.

When you are finished entering the information for one material, you can press the **Save** button to save your changes. While editing, if you make changes and then decide you don't want to them, press the **Reset** button to return the fields to the last saved data.

To complete the process, select each material from the left pane and enter your company's information. Once you have completed this setup operation, you should not need to use the material editor often. Everyday use is through the reporting tools.

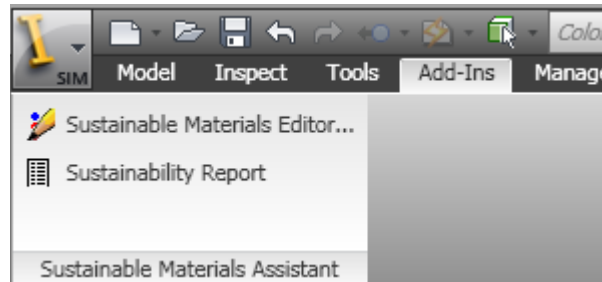
For information on how to share this new data with others in your organization, please see the section called “Sharing your Materials Library” later in this User Guide.

Using the Sustainable Materials Assistant

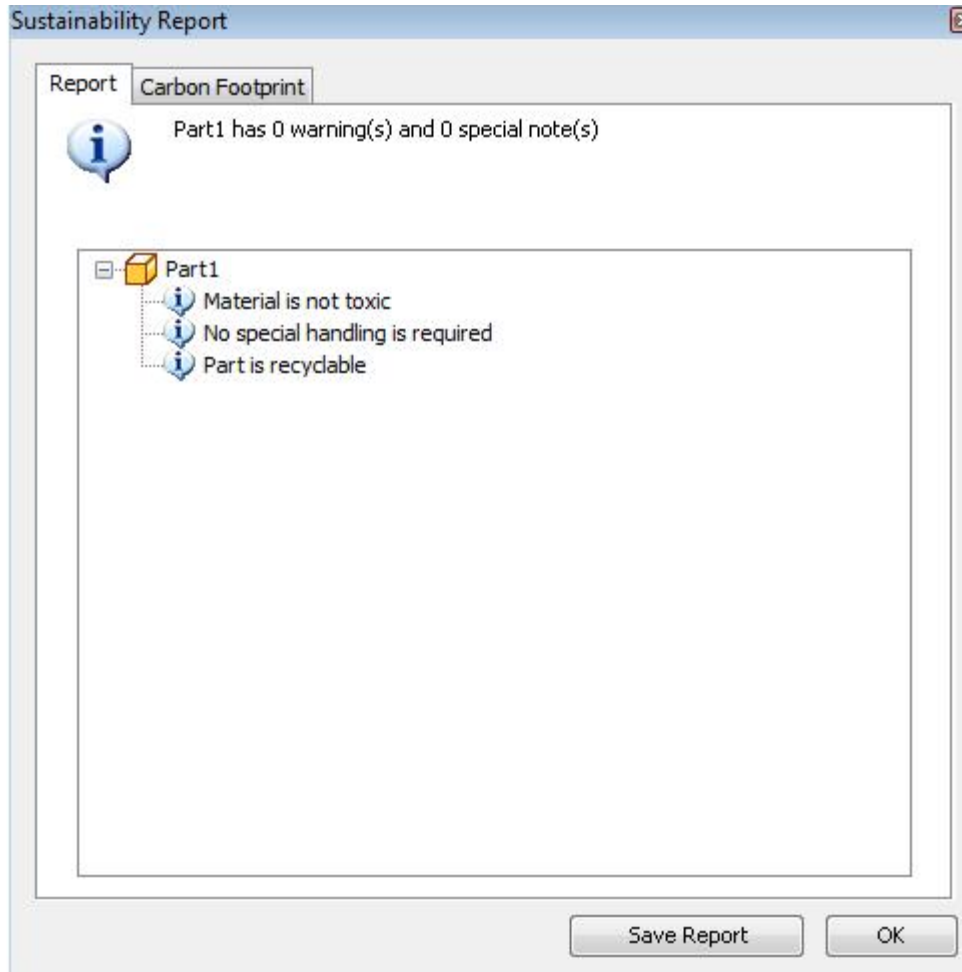
Working with Parts

Now that your materials have been updated to include sustainable properties, it is time to use those properties to generate reports on your designs.

Open a part, and select the **Sustainability Report** button from **Sustainable Materials Assistant** panel under **Add-Ins** tab.



The report dialog is divided into two tabs:



Report: The Report Tab shows a summary of the current part and tree view of the material information.

If the material is toxic, it is called-out with a warning. The summary will display a yellow exclamation icon to highlight that there is toxicity information. The yellow icon is designed to draw your attention.



Recyclability and regulatory information notes are displayed with a white bubble icon.



Carbon Footprint: The Carbon Footprint Tab shows the physical properties for the active material, the Carbon Footprint per unit, and the calculated Total Footprint for the active part. The calculated Total Footprint value is the part's mass times the Carbon Footprint per unit. This gives you an easy number to compare one material to another or one geometry to another.

The screenshot shows a dialog box titled "Sustainability Report" with a "Carbon Footprint" tab selected. The dialog contains the following fields and sections:

- Report** (selected) | **Carbon Footprint**
- Information icon: Part1 has 0 warning(s) and 0 special note(s)
- Material**: Default (dropdown)
- Density**: 1.000 g/cm³ (text field)
- Requested Accuracy**: Low (dropdown)
- General Properties** section:

Mass	0.000 lbmass	X	N/A
Area	0.000 in ²	Y	N/A
Volume	0.000 in ³	Z	N/A
- Carbon Footprint Properties** section:

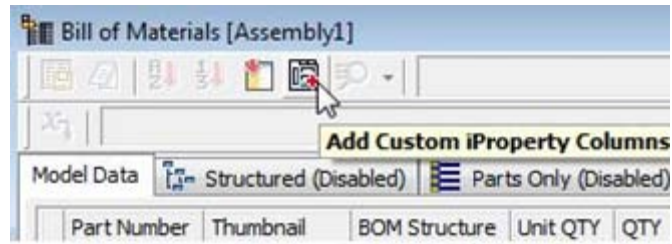
Carbon Footprint (kg/kg)	0	Total Footprint	0.000 Kg
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- Buttons: Save Report, OK

Once you close the report dialog, the Total Carbon Footprint value will be copied to the part's iProperties. This value is not associative and must be updated if the part changes size or materials. To update the value, simply open the **Sustainability Report** and select **OK**.

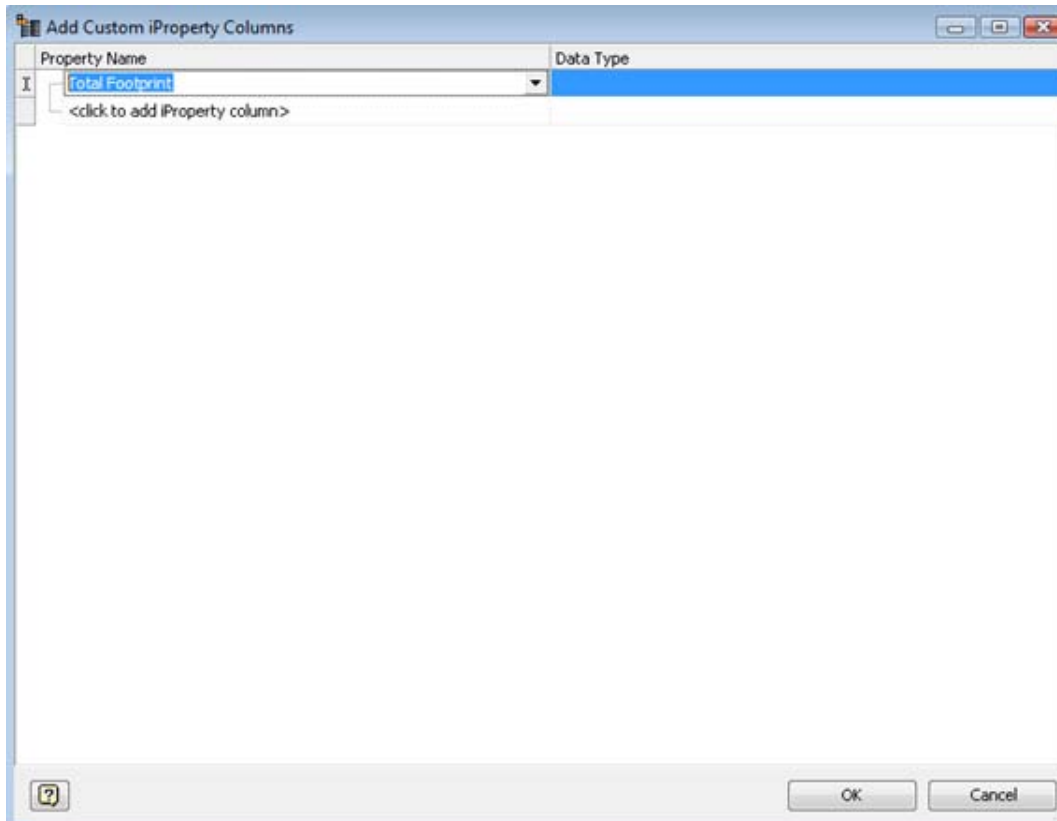
Working with Assemblies

Open an assembly, and select the **Sustainability Report** button from **Sustainable Materials Assistant** panel under **Add-Ins** tab. The **Report Tab** shows the assembly structure. For each part with a warning or important information, the part is expanded to show you the notes. Simply scan down the tree for any parts that are expanded. These are the parts with interesting information. Remember any parts with Toxic data will be displayed with the yellow exclamation icon. This makes it easy to find warnings.

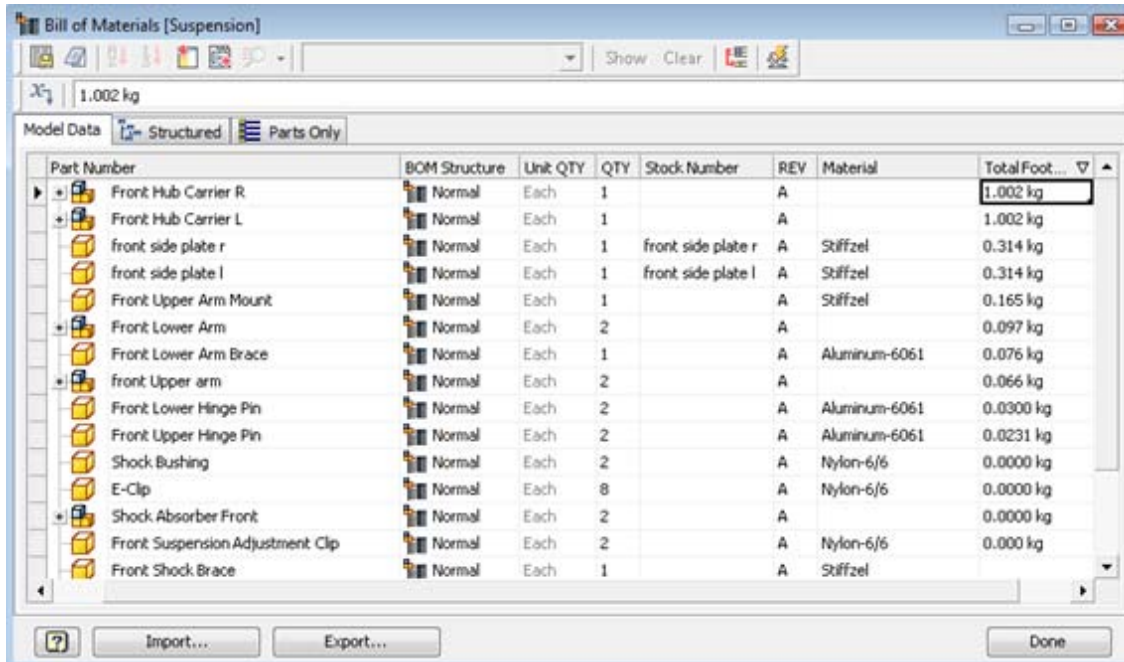
The **Carbon Footprint** tab is the rolled up value for the Total calculated Carbon Footprint for parts in the assembly. To make it easy to know which components have a Total Footprint calculated, use the assembly BOM editor. On the BOM editor, use the Add Custom Property Column. Add a custom iProperty column for **Total Footprint** and each part with a calculated value will display.



Enter **Total Footprint** as the custom Property name.



Press **OK** and the new column is now visible in you BOM. This value is for only one part, it is not the sum of carbon footprint based on the number of parts in an assembly.



Creating an HTML Report

To create a report for sharing, printing or archiving, press the **Save Report** button on the Sustainability Report dialog.

Sustainable Materials Assistant Report for Suspension.iam

Tuesday, May 12, 2009(3:37 PM)

Sustainable Properties of Suspension.iam

Toxic:	No	Toxic Note:	Assembly has no toxic material(s)
Regulatory:	No	Regulatory Note:	Assembly needs no special handling
Recyclable:	Yes	Recyclable Note:	Assembly is recyclable
Carbon Footprint (kg/kg):	N/A	Carbon Footprint Note:	N/A
Total Footprint (kg):	3.344		

Components

The following table lists the components in Suspension.iam:

Name	Path	Toxic	Toxic Note	Recyclable	Recyclable Note	Regulatory	Regulatory Note	Carbon Footprint (kg/kg)	Carbon Footprint Note	Total Footprint (kg)
front side plate r	Suspension.iam	No	N/A	Yes	N/A	No	N/A	20	N/A	0.314
front side plate l	Suspension.iam	No	N/A	Yes	N/A	No	N/A	20	N/A	0.314
Front Upper Arm Mount	Suspension.iam	No	N/A	Yes	N/A	No	N/A	20	N/A	0.165
Front Shock Brace	Suspension.iam	No	N/A	Yes	N/A	No	N/A	20	N/A	0.037
Front Lower Arm Brace	Suspension.iam	No	N/A	Yes	N/A	No	N/A	30	N/A	0.076
Front Lower Hinge Pin	Suspension.iam	No	N/A	Yes	N/A	No	N/A	30	N/A	0.0300
Front Upper Hinge Pin	Suspension.iam	No	N/A	Yes	N/A	No	N/A	30	N/A	0.0231
Front Upper Arm	Suspension.iam/front Upper arm.iam	No	N/A	Yes	N/A	No	N/A	20	N/A	0.066
Pillow Ball	Suspension.iam/front Upper arm.iam	No	N/A	Yes	N/A	No	N/A	0	N/A	0.0000

Sharing your Materials Library

To share your new sustainable materials, first have the user(s) with whom you wish to share install the Sustainable Materials Assistant. After they have installed the add-in, locate the sustainable materials.xml file in the Design Data directory of your Inventor install directory. Send them this file, and have them place this file in their Design Data folder.

Uninstall

From Add or Remove Programs in your Windows Control Panel, simply locate the Sustainable Materials Assistant entry and select **Uninstall**.

Contacting Autodesk

Thank you for your interest in Sustainable Materials Assistant. Please direct any support issues, questions or feedback to labs.iv.sustainable@autodesk.com.

Your feedback helps us make better products and technology. Based your feedback on this Technology Preview and our continued efforts in the area of sustainable design, Autodesk Currently intends to evolve this tool and continue to make sustainability a more attainable design consideration for manufacturers. All feedback is subject to the Autodesk agreement(s) applicable to your use of Autodesk Labs.

Making a Difference

Autodesk is committed to encouraging sustainable design practices. To learn more, please visit www.autodesk.com/green.



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