

# **Point Cloud for AutoCAD Help**

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# Point Cloud for AutoCAD Help

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Welcome to *Point Cloud for AutoCAD* Help!

This help file provides all the information you need to understand and use *Point Cloud for AutoCAD*. Click the links below or use the Contents tab on the left to browse help topics. You can also scroll the topics on the above right hand pane.

The *Point Cloud for AutoCAD* help file is divided into the following sections:

- [Introduction](#) - Introduction to *Point Cloud for AutoCAD*.
- [Command Reference](#) - Quick reference of all the commands added by *Point Cloud for AutoCAD*.
- [Tutorials](#) - Tutorials to get you started in the shortest possible time.

If you need any additional information please [contact](#) SYCODE.

**Note:**

- If you are having trouble loading the *Point Cloud for AutoCAD* plug-in file into the AutoCAD environment please refer to the [ReadMe](#) file.
- Please read the [License Agreement](#) before using the software.

# Introduction

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*Point Cloud for AutoCAD* is a reverse engineering plug-in for AutoCAD. This plug-in gives AutoCAD the ability to reconstruct the geometry of an object from a point cloud which describes it.

*Point Cloud for AutoCAD* can drape a surface over a point cloud or wrap a mesh around a point cloud. Draping a surface is similar to laying a piece of cloth over an object. The surface is deformed to take the shape of the object along the drape direction. A surface can be draped along one of the six orthogonal directions (top, bottom, front, back, right and left) or a custom user specified direction. Wrapping a mesh is similar to wrapping cloth all around an object to close it completely. *Point Cloud for AutoCAD* has the ability to wrap a mesh around a concave or a convex point cloud.

*Point Cloud for AutoCAD* is designed to work with the following versions of AutoCAD:

- AutoCAD 2011 (32 & 64 Bit)
- AutoCAD 2010 (32 & 64 Bit)
- AutoCAD 2009 (32 & 64 Bit)
- AutoCAD 2008 (32 & 64 Bit)
- AutoCAD 2007
- AutoCAD 2006
- AutoCAD 2005
- AutoCAD 2004
- AutoCAD 2002
- AutoCAD 2000i
- AutoCAD 2000

*Point Cloud for AutoCAD* is very easy to use. Once installed, it must be loaded into the AutoCAD environment. There are simple instructions for this in the [ReadMe](#) file. Once loaded it adds new commands to AutoCAD's existing commands and a new submenu called "PointCloud" to the AutoCAD menu containing these newly added commands.

*Point Cloud for AutoCAD* comes with detailed documentation for each command as well as a set of [tutorials](#) to get you started in the shortest possible time.

If you need any additional information please [contact](#) SYCODE.

# ReadMe

---

This is the *Point Cloud for AutoCAD* ReadMe file.

Thank you for installing Point Cloud for AutoCAD.

Please read this ReadMe document carefully and completely. It contains important information which is vital to the proper working of Point Cloud for AutoCAD.

Since Point Cloud for AutoCAD is a plug-in for AutoCAD, it has to be loaded into the AutoCAD environment before it can be used. Loading is a one time process. Point Cloud for AutoCAD will automatically load itself into AutoCAD the next time you run AutoCAD.

The Point Cloud for AutoCAD plug-in files are installed into the Point Cloud for AutoCAD installation folder (typically "C:\Program Files\SYCODE\Point Cloud for AutoCAD\"). The plug-in files have an extension of ".arx".

The list of plug-in files along with the version of AutoCAD is shown below. Please be sure to use the plug-in file that corresponds to your version of AutoCAD.

```

PointCloud_VC60.arx    -> AutoCAD 2000, 2000i, 2002
PointCloud_VC70.arx    -> AutoCAD 2004, 2005, 2006
PointCloud_VC80.arx    -> AutoCAD 2007, 2008 (32 Bit), 2009 (32 Bit)
PointCloud_VC80x64.arx -> AutoCAD 2008 (64 Bit), 2009 (64 Bit)
PointCloud_VC90.arx    -> AutoCAD 2010 (32 Bit)
PointCloud_VC90x64.arx -> AutoCAD 2010 (64 Bit)
PointCloud_VC90.arx    -> AutoCAD 2011 (32 Bit)
PointCloud_VC90x64.arx -> AutoCAD 2011 (64 Bit)

```

To load Point Cloud for AutoCAD into AutoCAD please follow the steps listed below:

- (1) Select "Load Application..." from "Tools" menu or enter the "\_APPLOAD" command.
- (2) Click the "Contents" button in "Startup Suite"
- (3) Click the "Add" button.
- (4) Browse for the plug-in file for your version of AutoCAD (see list above).
- (5) Click the "Add" button on the Add File to Startup Suite dialog box.
- (6) Click the "Close" button to close the Startup Suite dialog box.
- (7) Click the "Close" button to close the Load/Unload Applications dialog box.

Now Point Cloud for AutoCAD is completely installed and ready for use.

Usage:

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Point Cloud for AutoCAD adds new commands to AutoCAD. The commands added are:

## Point Cloud for AutoCAD Help

- 1) PCImportPoints - Imports points from a text file.
- 2) PCDrapeSurface - Drape a surface over a point cloud.
- 3) PCWrapMesh - Wrap a mesh around a point cloud.
- 4) PCHelp - Displays the Point Cloud for AutoCAD help file.
- 5) PCRegister - Register your copy of Point Cloud for AutoCAD about box.
- 6) PCAbout - Displays the Point Cloud for AutoCAD about box.

### Sample Files:

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Sample points files are copied into the Samples folder which is located in the Point Cloud for AutoCAD installation folder (typically "C:\Program Files\SYCODE\Point Cloud for AutoCAD\"). You can try Point Cloud for AutoCAD using these sample files.

### Support:

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For support, please E-Mail [support@sycode.com](mailto:support@sycode.com)

## Contact

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Mailing address	S1/116, Nova Cidade Complex, NH 17, Alto Porvorim, Goa - 403521 India
Phone	+91 9822689298
Fax	+91 832 2416615
E-Mail	<a href="mailto:info@sycode.com">info@sycode.com</a>
Web Site	<a href="http://www.sycode.com">http://www.sycode.com</a>

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# Command Reference

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*Point Cloud for AutoCAD* adds a new submenu to the AutoCAD menu called 'PointCloud'. The PointCloud submenu consists of the following commands:

<a href="#">PCImportPoints</a>	Imports a point cloud from a text file
<a href="#">PCDrapeSurface</a>	Drapes a surface over a set of a point cloud
<a href="#">PCWrapMesh</a>	Wraps a mesh around a point cloud
<a href="#">PCHelp</a>	Displays the <i>Point Cloud for AutoCAD</i> help file
<a href="#">PCRegister</a>	Registers your copy of <i>Point Cloud for AutoCAD</i>
<a href="#">PCAbout</a>	Displays the <i>Point Cloud for AutoCAD</i> about box

## PCImportPoints

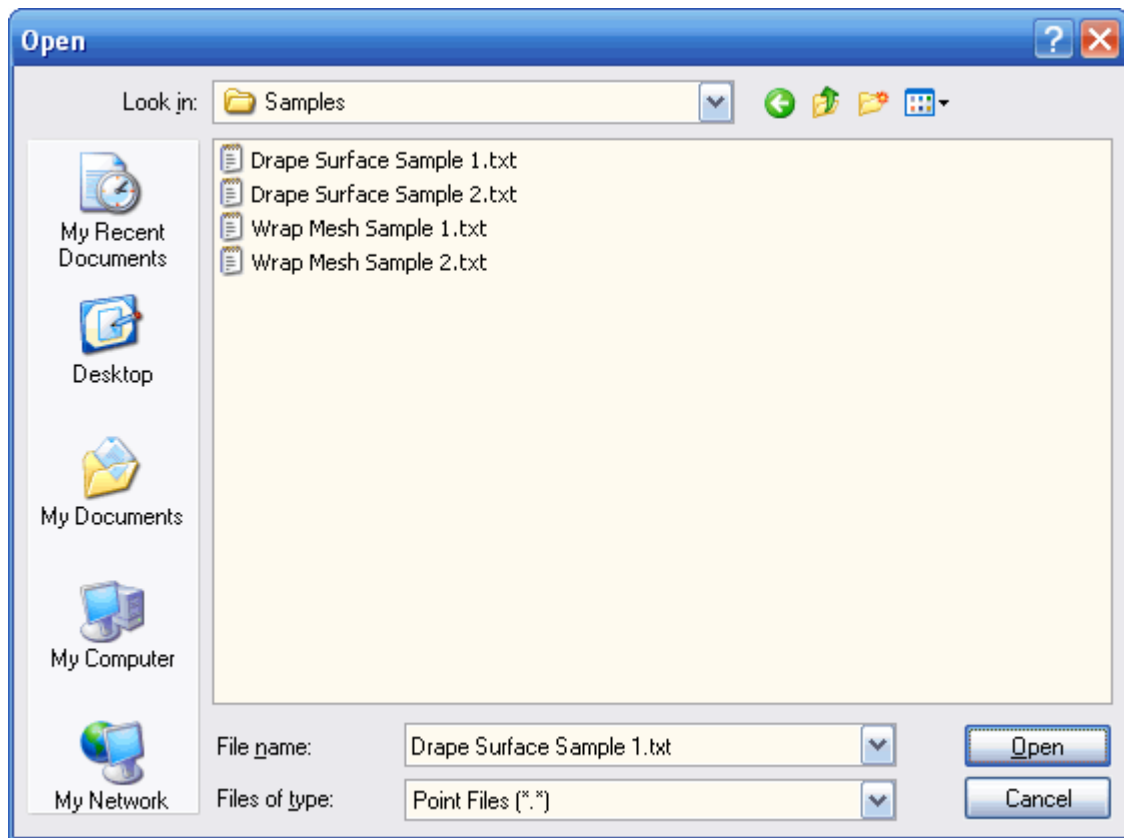
**Menu Button** PointCloud > Import Points

**Command** PCImportPoints

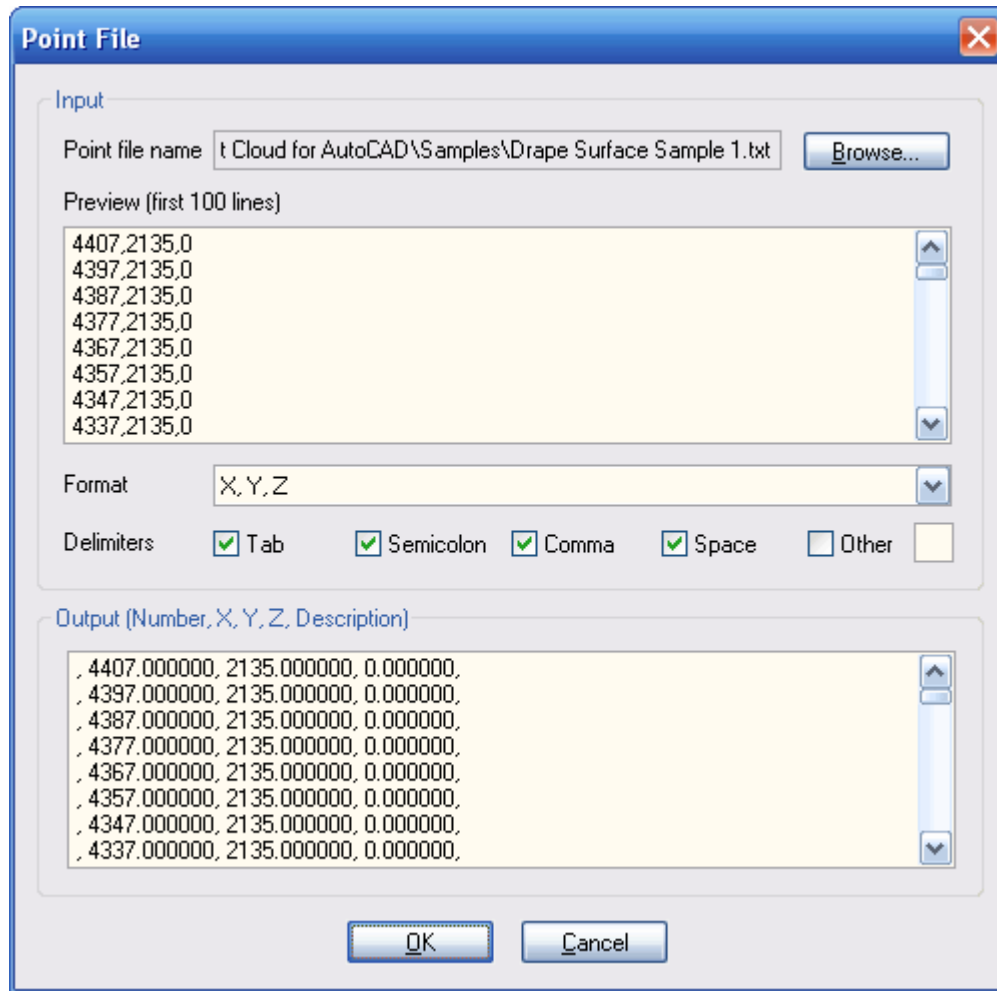
This command imports points from a text file. This command invokes the Point File dialog (shown below) which allows you to select the point file to import and set the file format and delimiters.

### To import Points

1. Click *Import Points* from the "PointCloud" menu or type *PCImportPoints* at the AutoCAD command prompt.
2. The "Point File" dialog box is displayed. Browse for the Point file you wish to import. At the "Open" dialog box select the file and click *Open*.



3. Select the format and delimiters in the "Point File" dialog box and click *Ok*.



### **Explanation**

-

#### **Format**

Each line of the text file is assumed to contain data related to a single point. The point data must contain the X, Y and Z coordinates of the point and may contain a point number and point description. The point number (if it exists) must be present before and coordinate data and the point description (if it exists) must be present after the coordinate data. The point coordinates can be in the X, Y, Z format or the Northing, Easting, Elevation (Y, X, Z) format. The general format can be described as:

[Point Number] [Point Coordinates] [Point Description]

#### **Delimiters**

The most commonly used delimiters are Tab, Semicolon, Comma and Space. You can specify a custom delimiter as well.

### **How it works**

Browse for the text file by clicking the "Browse" button. After selecting the text file the Preview list box will show you the first 100 lines of the text file. Then proceed to select the format of the text file by selecting the appropriate value from the Format drop list. Also select/unselect the delimiters. The output list box will show you the points read from the text file based on the current values of format and delimiters. When you are satisfied with the contents of the output list box click the OK button and the points will be imported into AutoCAD.

### **Note:**

- Point numbers and descriptions are not imported.

# PCDrapeSurface

---

**Menu Button** PointCloud > Drape Surface

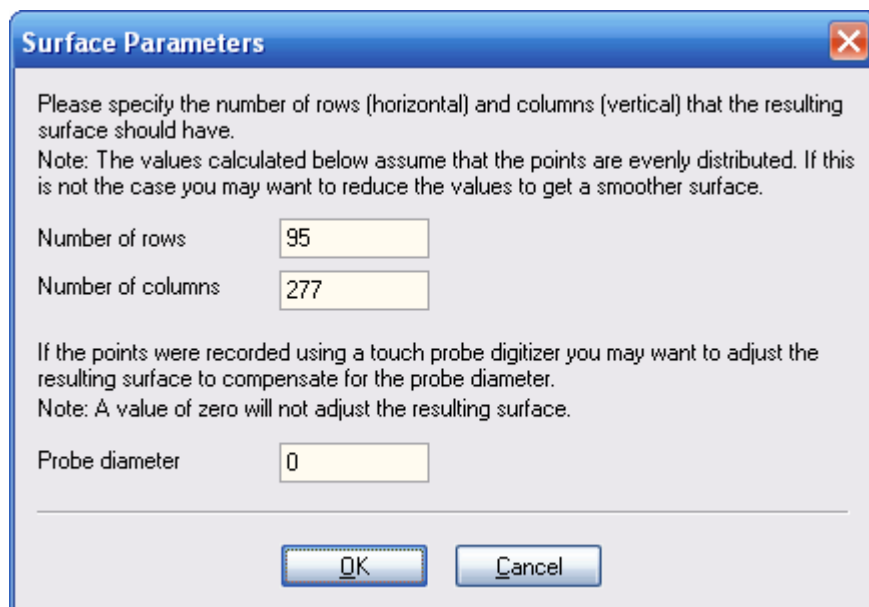
**Command Name** PCDrapeSurface

---

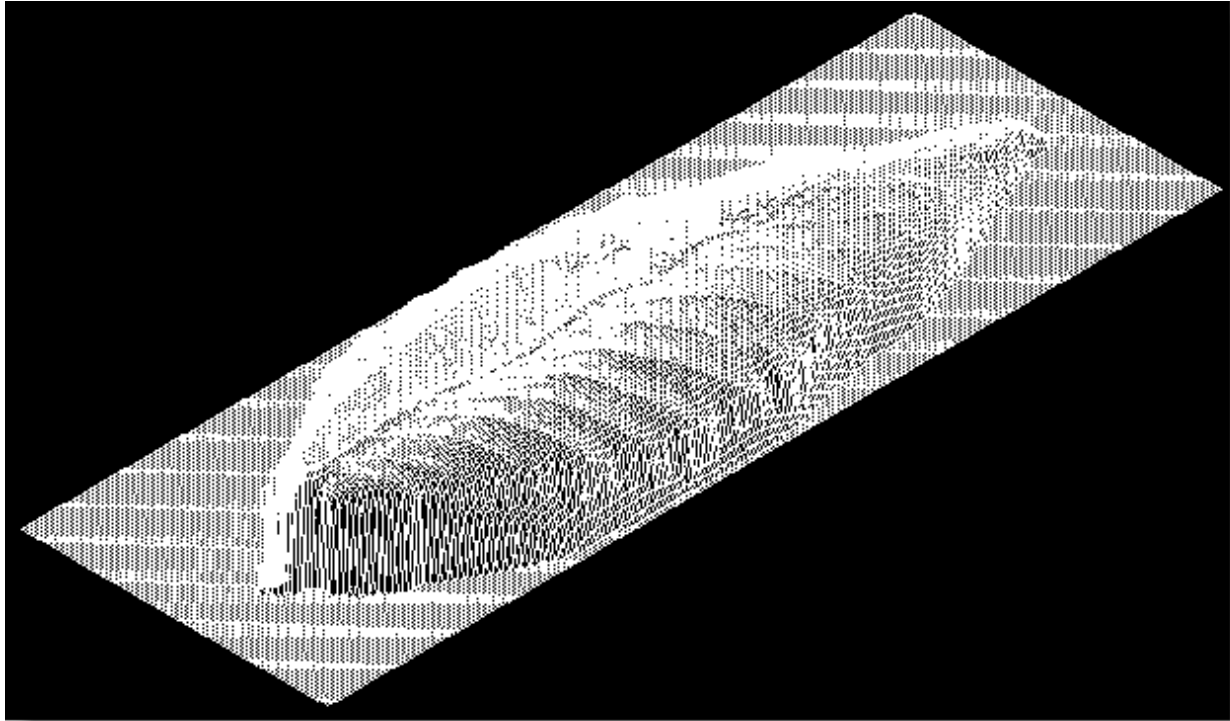
This command drapes a surface over a point cloud.

## To drape a surface over a point cloud

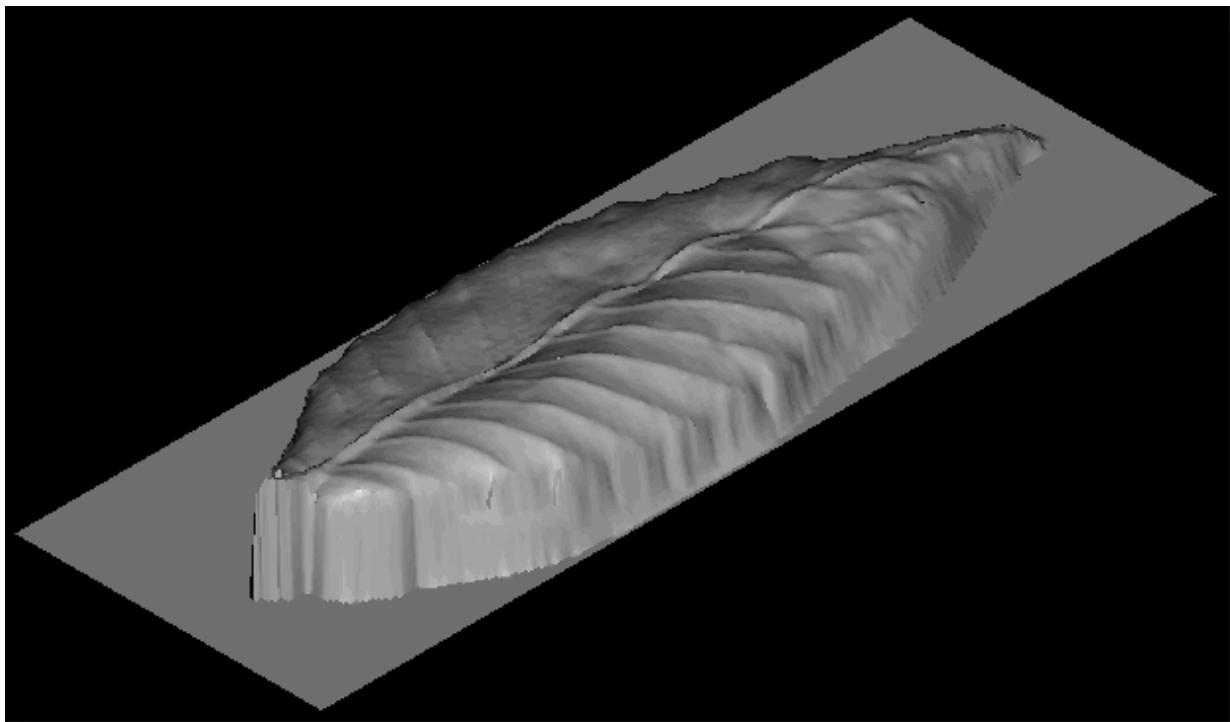
1. Click *Drape Surface* from the "PointCloud" menu or type *PCDrapeSurface* at the AutoCAD command prompt.
2. At the AutoCAD "Select Points" command prompt, select the points and press Enter.
3. At the (Drape direction) and (Surface type) command prompt set the command options and press *Enter*.
4. The "Surface Parameters" dialog box is displayed. Specify the parameters as required and click *OK*.



*The above fig is set as the default*



*Input point cloud*



*A shaded view of the Mesh surface draped over a point cloud*

# PCWrapMesh

---

**Menu Button** PointCloud > Wrap Mesh

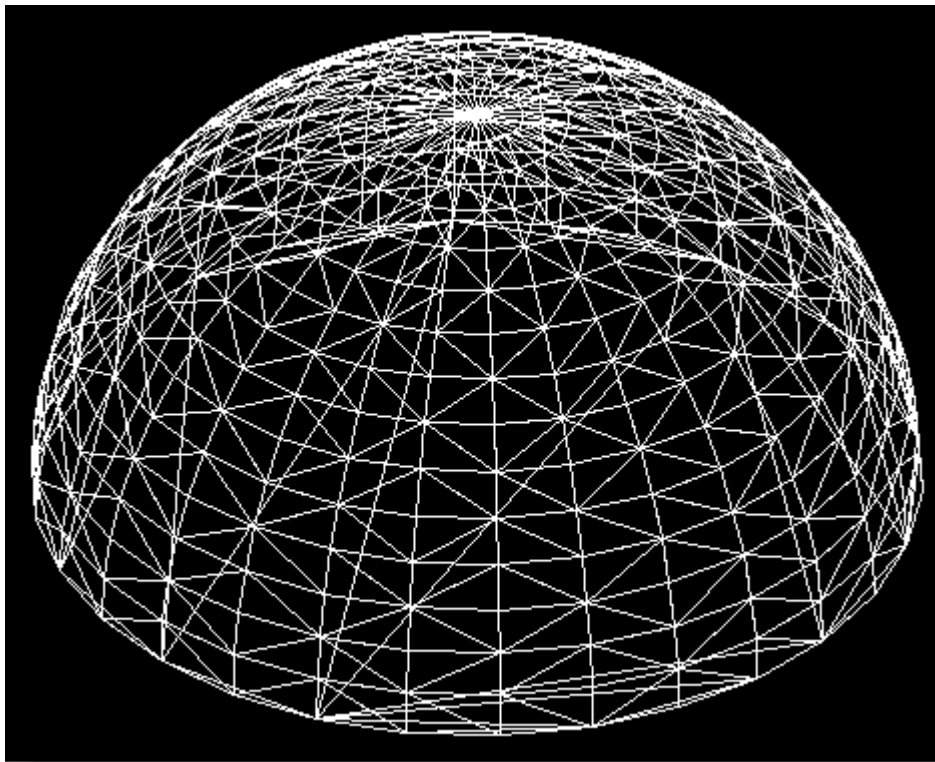
**Command** PCWrapMesh

---

This command wraps the mesh of the Point Cloud file.

## To wrap a mesh over a point cloud

1. Click *Wrap Mesh* from the "PointCloud" menu or type *PCWrapMesh* at the AutoCAD command prompt.
2. At the "Select Points" prompt, select the points and press *Enter*.
3. At the (Point cloud type) command prompt set the command options and press *Enter*.



## PCHelp

---

<b>Menu Button</b>	PointCloud > Help
<b>Command</b>	PCHelp

---

This command displays the help file. The [Welcome](#) page is a good place to start.

# PCRegister

---

<b>Menu Button</b>	PointCloud > Register
<b>Command</b>	PCRegister

---

This command is used to register your copy of *Point Cloud for AutoCAD*

You need a license key to start using the software. A license key can be of two types: Trial or Permanent. A trial key is issued to you instantly and completely free of cost so that you may try the software before you purchase a license. A permanent key is issued after you have purchased a license.

## How do I get a Trial Key?

Simply click the 'Request Key' button and select 'TRIAL KEY' as the type of key being requested. Fill the form and submit it. A trial key will be immediately sent to you by email.

## How do I get a Permanent Key?

To get a permanent key you need to have already purchased a license. If you have not yet purchased a license you can do so by clicking the 'Buy Online' button. After you place your order click the 'Request Key' button and select 'PERMANENT KEY' as the type of key being requested. Fill the form and submit it. Your order will be verified and a permanent key will be sent to you by email within one business day.

## IMPORTANT:

(1) Please ensure that your computer is connected to the internet before you request for a key.

## Point Cloud for AutoCAD Help

- (2) Please be sure to enter a valid email address as the key will be sent to you by email.
- (3) To avoid disruption in your work-flow we urge you to place your order before the trial period ends.

If you need anything else please send an email to [register@sycode.com](mailto:register@sycode.com)

## PCAbout

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**Menu Button** PointCloud > About  
**Command** PCAbout

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This command is used to display the *Point Cloud for AutoCAD* about box. The about box lists the software and its version.



# Tutorials

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The purpose of these tutorials is to provide the necessary information and hands-on experience to enable you to use *Point Cloud for AutoCAD*

The tutorials are designed to get you started with *Point Cloud for AutoCAD* in the shortest possible time.

- [Tutorial 1](#): Drape a surface over a point cloud
- [Tutorial 2](#): Wrap a mesh around a concave point cloud
- [Tutorial 3](#): Wrap a mesh around a convex point cloud

**Note:**

- The files used in these tutorials can be found in the Samples folder. (Typically C:\Program Files\SYCODE\Point Cloud for AutoCAD\Samples\)

## Tutorial 1 - Drape a surface over a point cloud

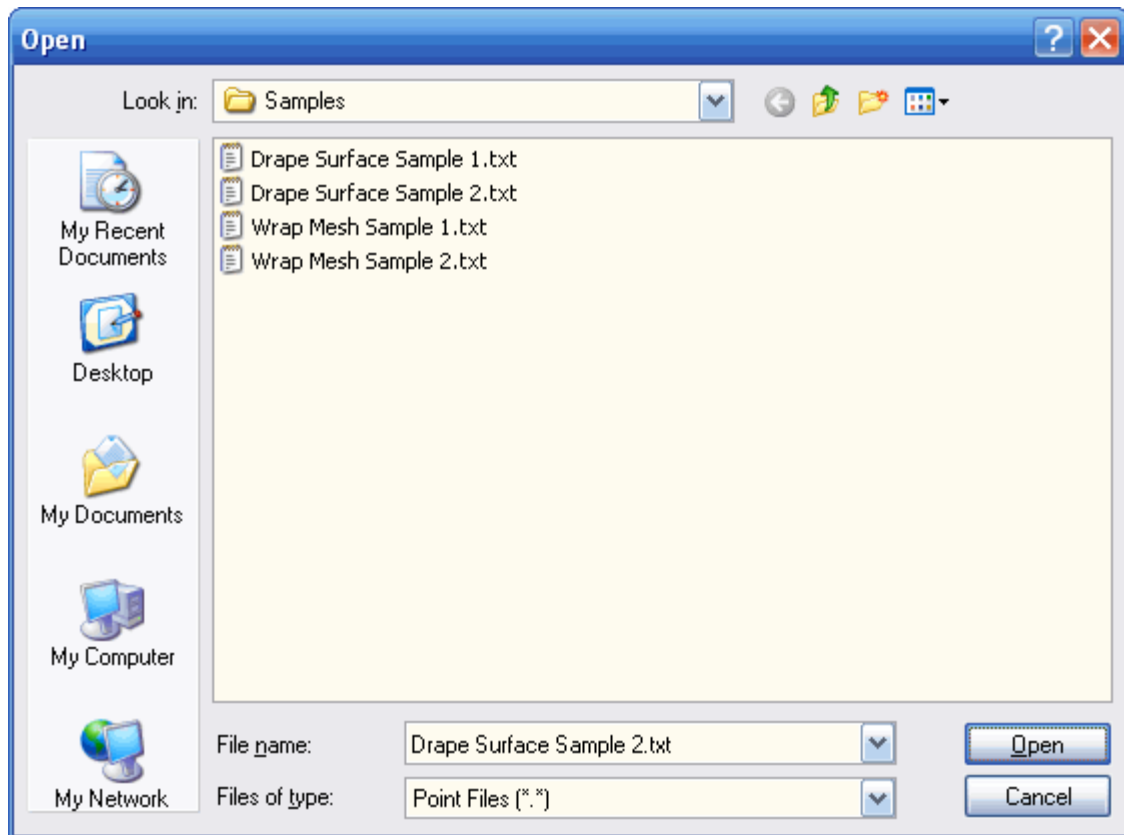
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In this tutorial we will drape a surface over a point cloud.

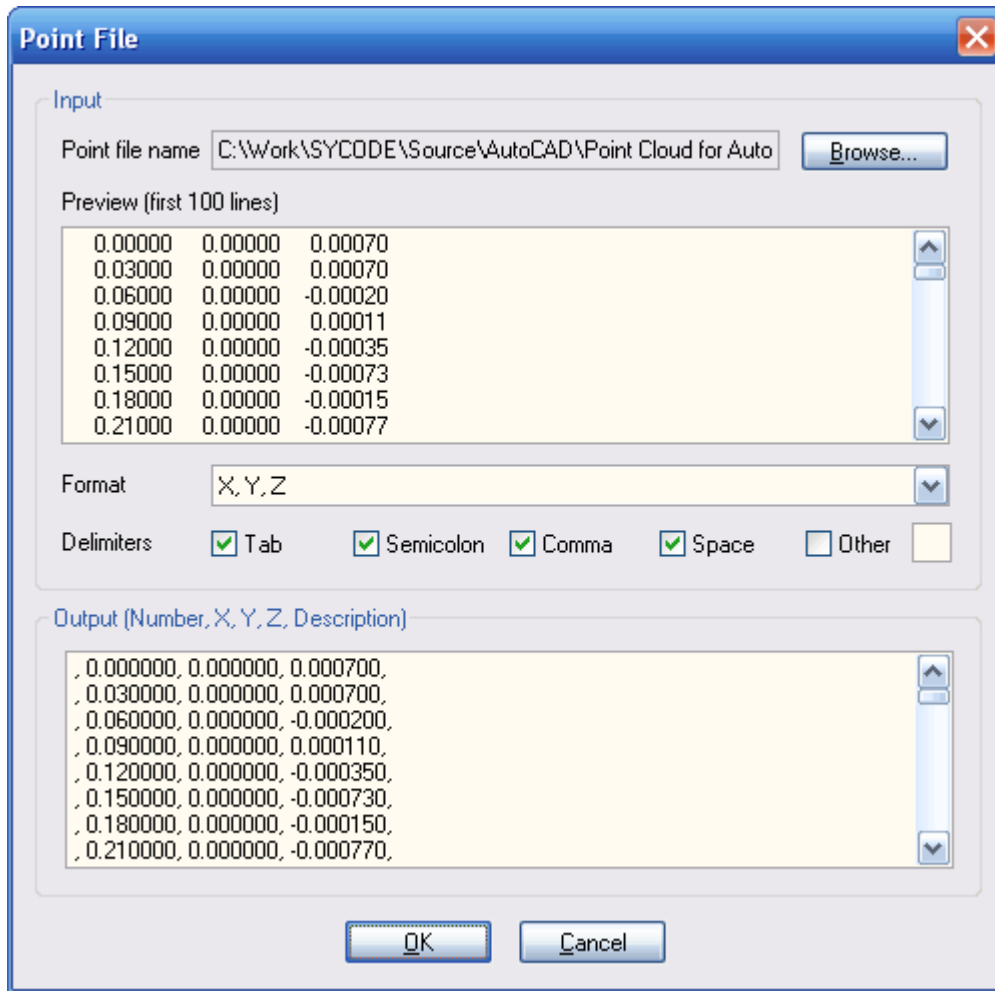
**Step 1:** Start AutoCAD.

**Step 2:** Click *Import Points* from the "PointCloud" menu or type *PCImportPoints* at the AutoCAD command prompt.

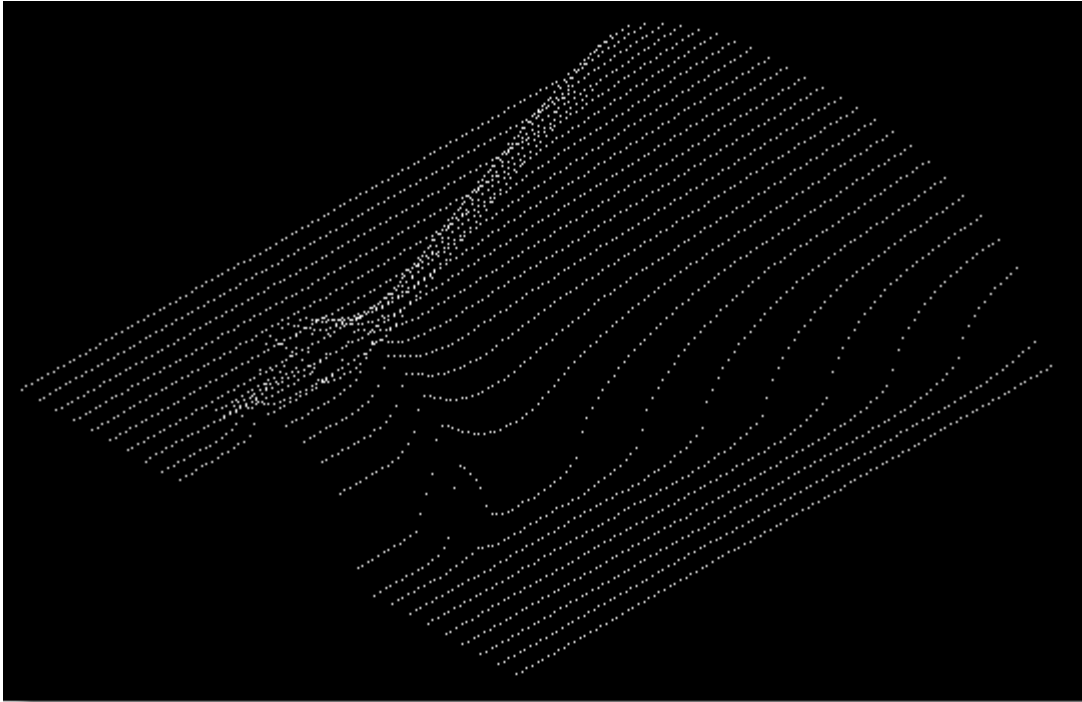
**Step 3:** The "Point File" dialog box is displayed. Browse for the file *Drape Surface Sample 2.txt* (typically located in *C:\Program Files\SYCODE\Point Cloud for AutoCAD\Samples\*) and click *Open*.



**Step 4:** Select the format and delimiters in the *Point File* dialog box and click *OK*.

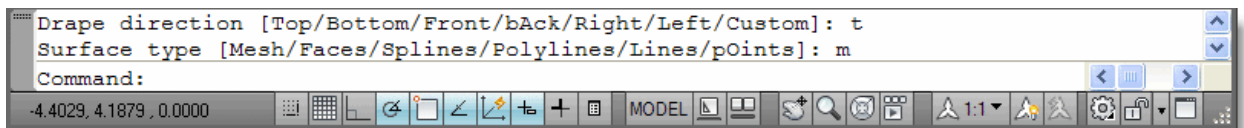


**Step 5:** Zoom to the extents of the drawing (View->Zoom->Extents). You will find the points from *Drape Surface Sample 2.txt* imported into the current model.

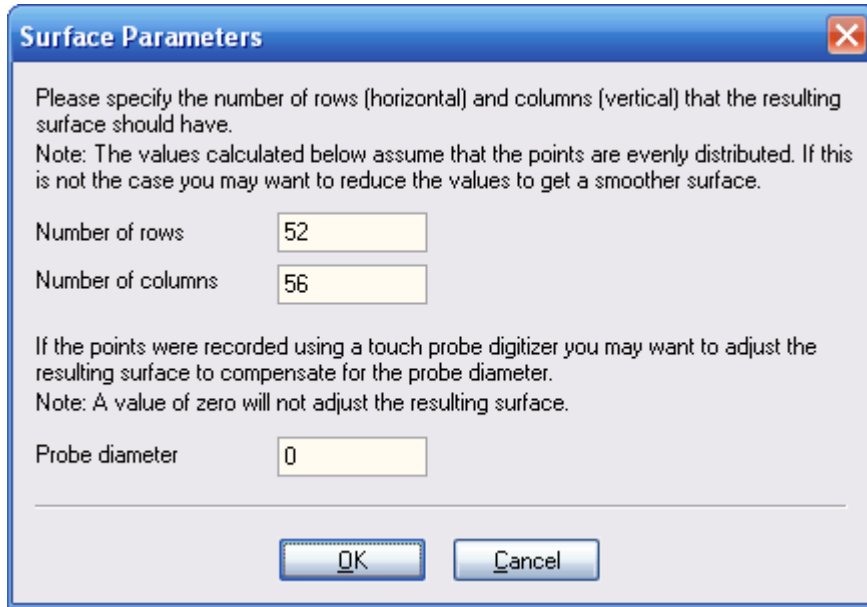


**Step 6:** Click *Drape Surface* from the "PointCloud" menu or type *PCDrapeSurface* at the AutoCAD command prompt.

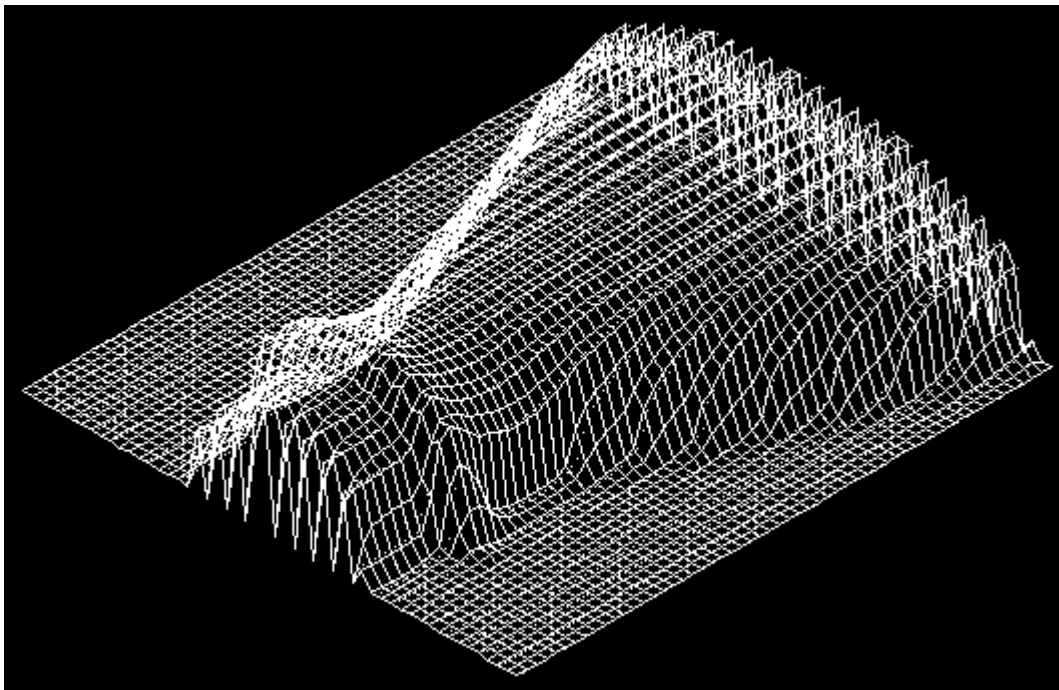
**Step 7:** Select all the points and press *Enter*. At the "Point Cloud for AutoCAD Options" set the command options as required and press *Enter*.



**Step 8:** The "Surface Parameters" dialog box is displayed. Do not modify the parameters. Click *OK* to accept the default values.



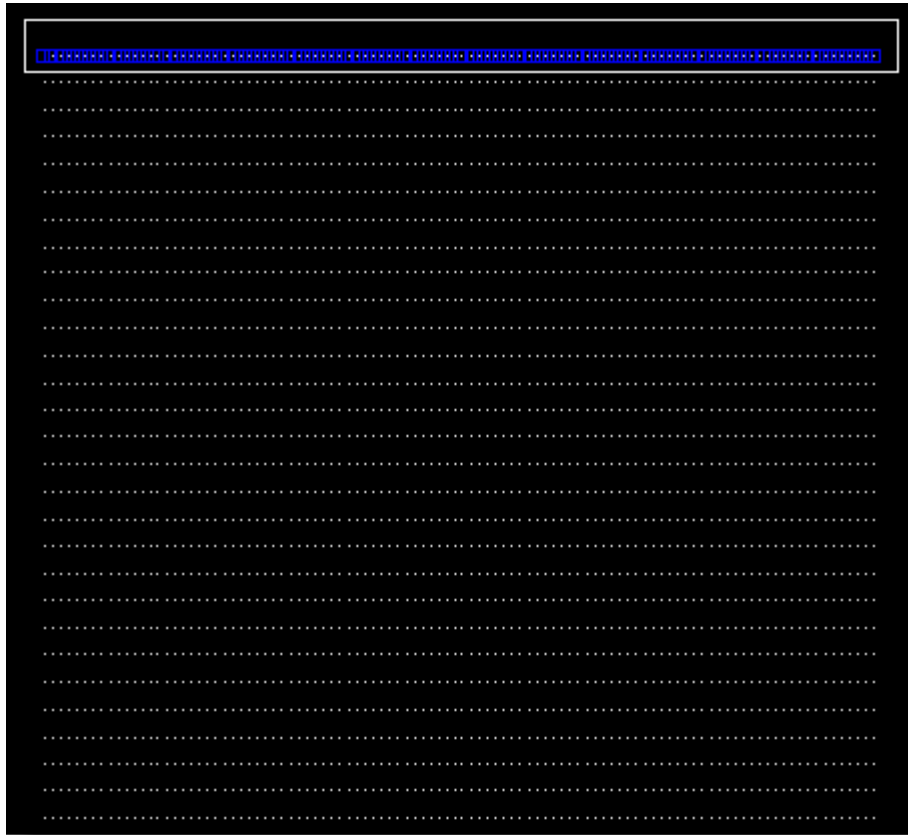
A Mesh surface is draped over the point cloud. As you can see the surface is highly uneven.



This is because the points are not evenly spaced although the points seem to be in the form of a regular matrix. The calculated values for rows and columns are 52 and 56 respectively. Let us now find out how many rows and columns of points are actually present.

**Step 9:** Delete the surface, switch to the top view (View->3D Views->Top) of the model.

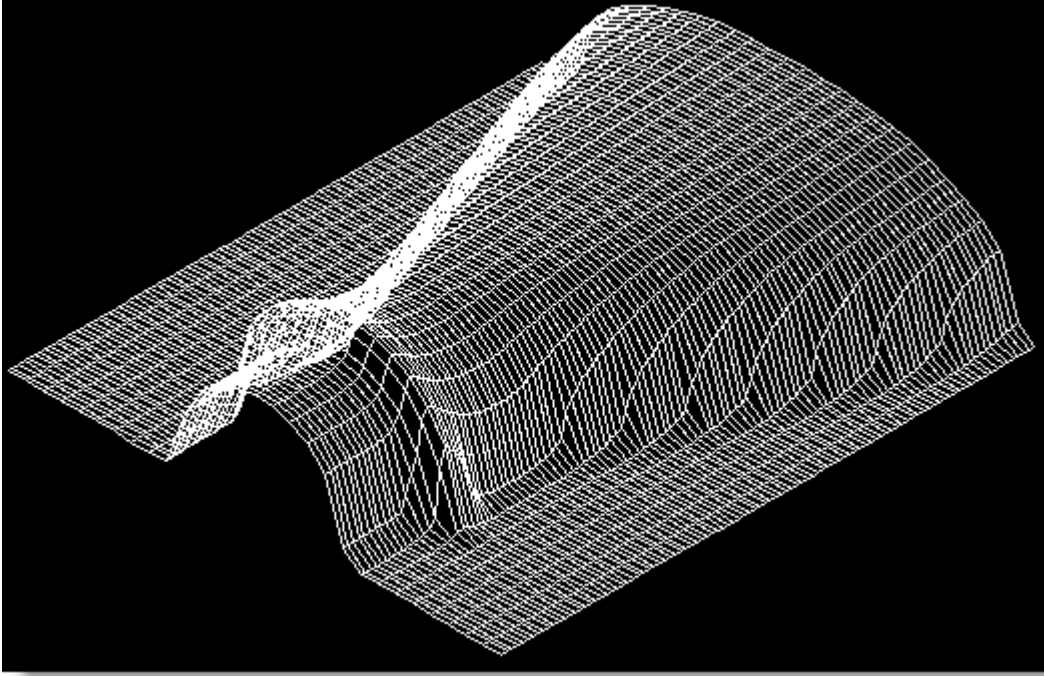
**Step 10:** Drag select the top most row of points as shown below and type *Scale* and press *Enter* when done. At the AutoCAD command prompt notice that the command prompt reports "*102 found*". So we now know that there are 102 columns of points.



**Step 11:** Drag select the right most column of points as shown below and type *Scale* and press *Enter* when done. At the AutoCAD command prompt notice that the command prompt reports "*29 found*". So we now know that there are 29 rows of points.



**Step 12:** Repeat Step 6 and this time enter 102 and 29 for the number of columns and rows respectively. This time we get the required even surface.



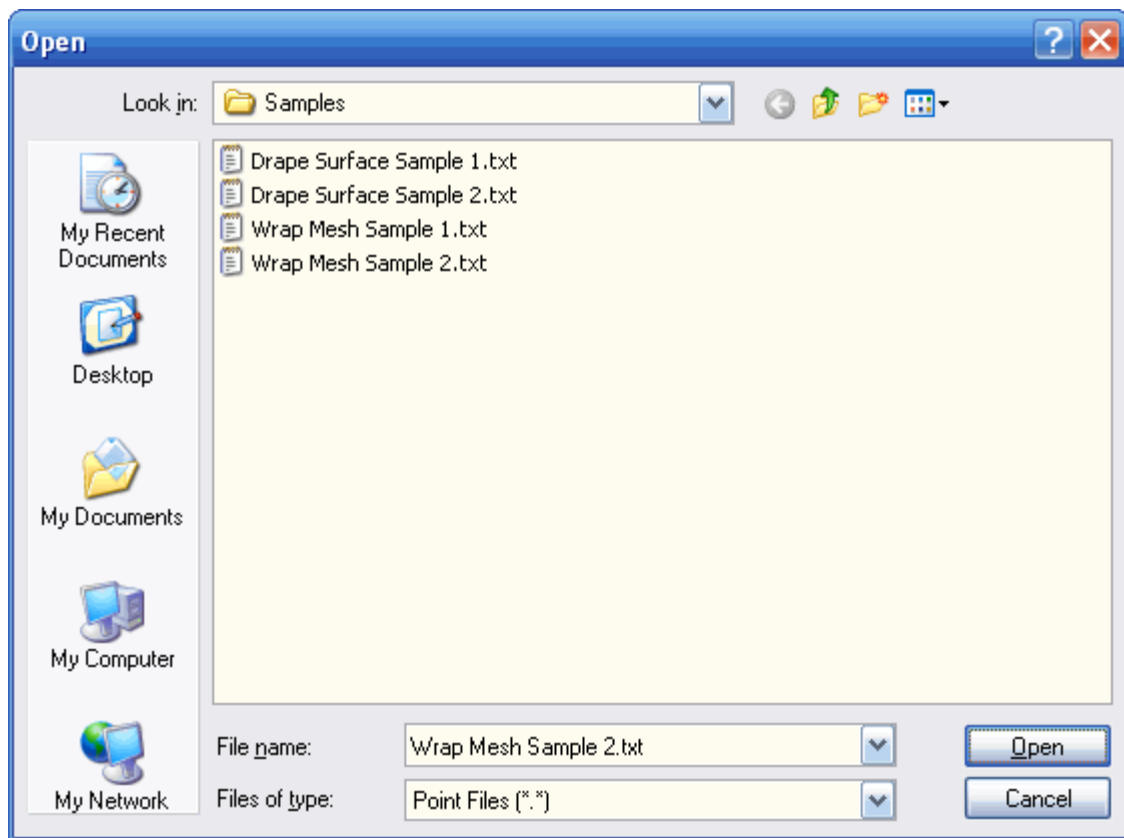
## Tutorial 2 - Wrap a mesh around a concave point cloud

In this tutorial we will learn how a mesh is wrapped around a point cloud.

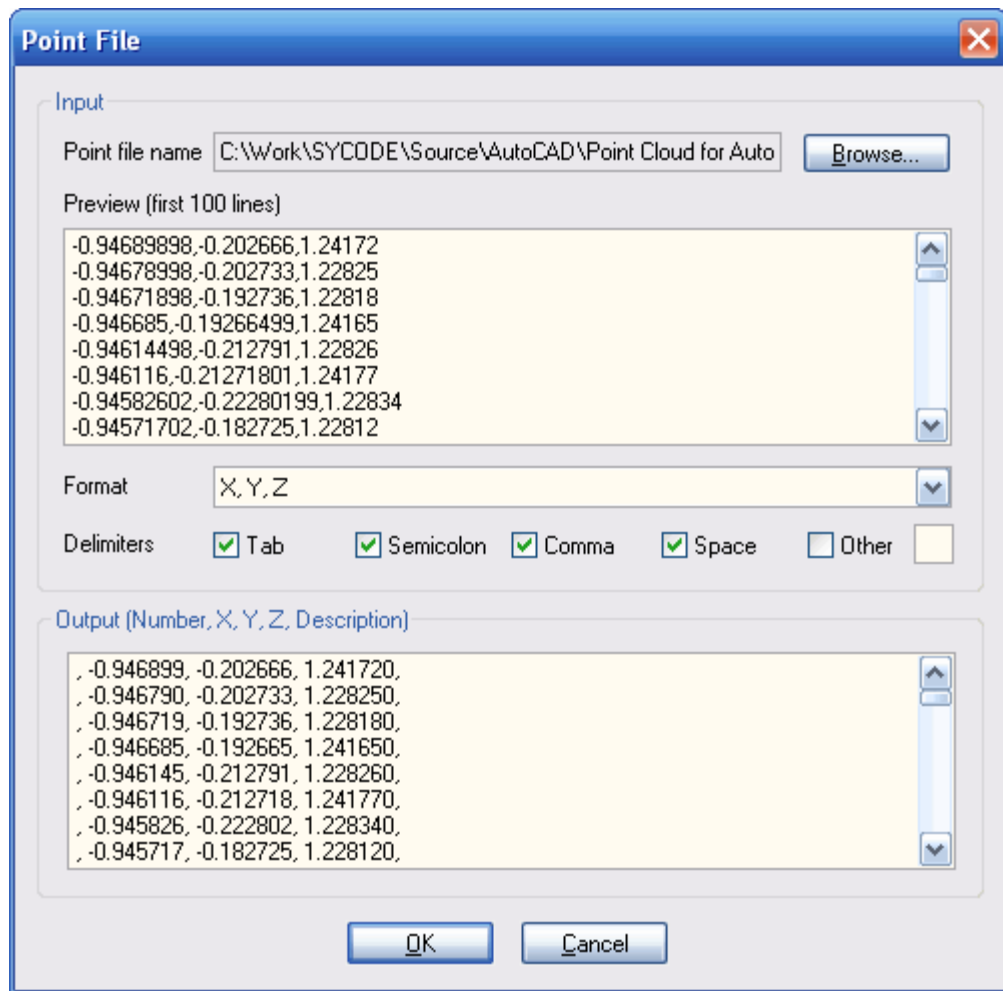
**Step 1:** Start AutoCAD.

**Step 2:** Select *Import Points* from the "PointCloud" menu or type *PCImportPoints* at the AutoCAD command prompt and press *Enter*.

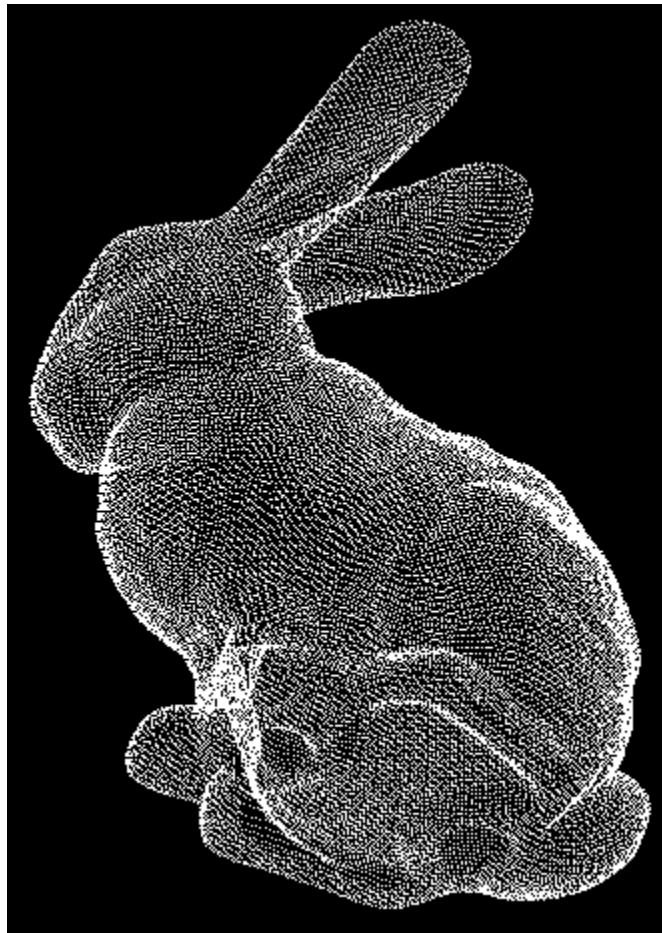
**Step 3:** The "Point File" dialog box is displayed. Browse for the file *Wrap Mesh Sample 2.txt* (typically located in *C:\Program Files\SYCODE\Point Cloud for AutoCAD\Samples\*) and click *Open*.



**Step 4:** Select the format and delimiters in the Point File dialog box and click *OK*.



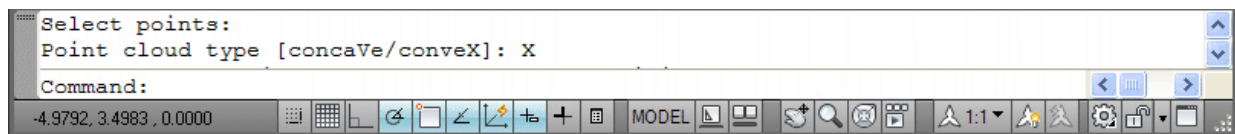
**Step 5:** Zoom to the extents of the drawing (View->Zoom->Extents). You will find the points from *Wrap Mesh Sample 2.txt* imported into the current model.



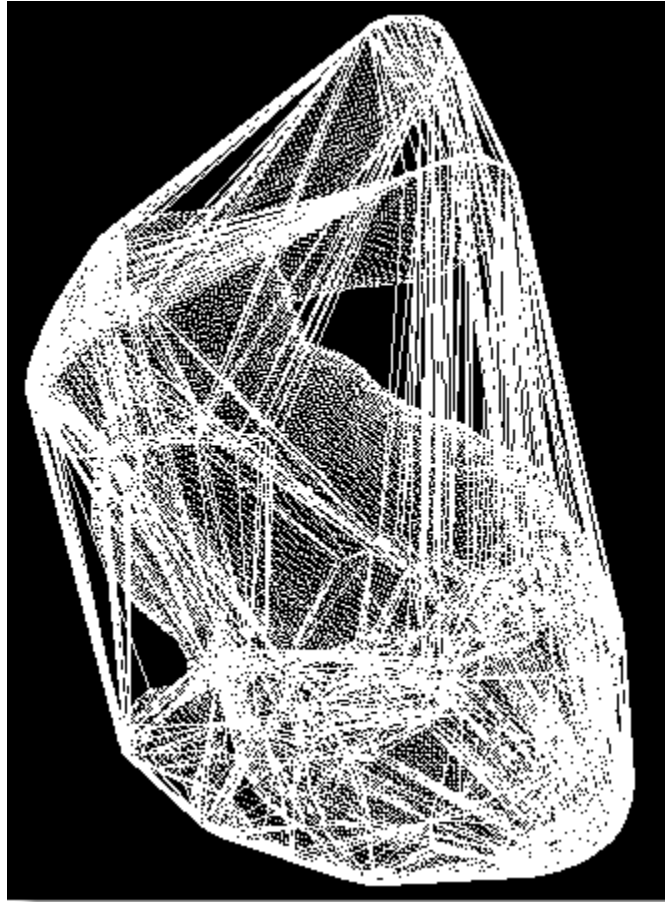
**Step 6:** Select *Wrap Mesh* from the *PointCloud* menu or type *PCWrapMesh* at the AutoCAD command prompt and press *Enter*.

**Step 7:** At the AutoCAD "Select points" command prompt, select the points and press *Enter*.

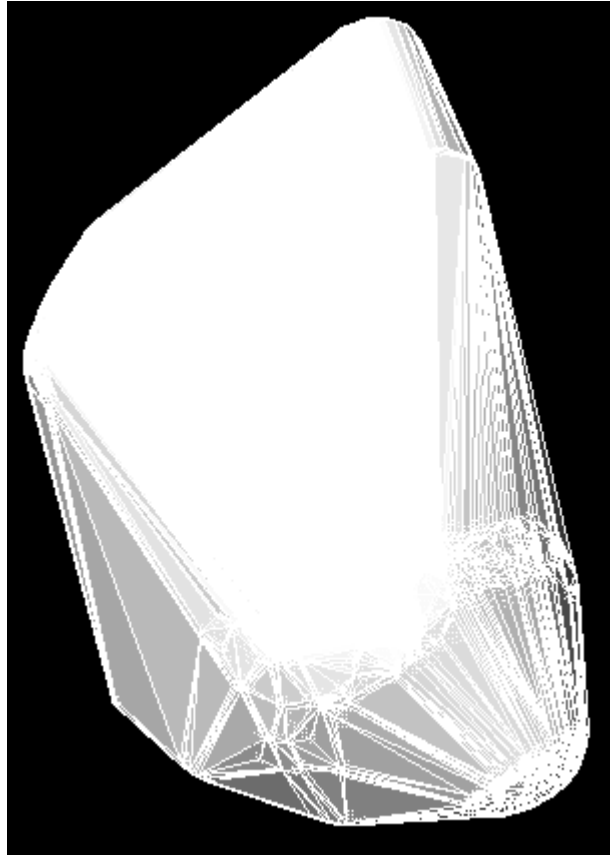
**Step 8:** At the AutoCAD "Select points" command prompt, set the *Point cloud type* to *Convex* by pressing "X". Press *Enter* when done.



A convex mesh is created as shown below. As you can see the inner points which make the point cloud concave are ignored. This is not what we want.



*A convex mesh created ignoring the inner points*

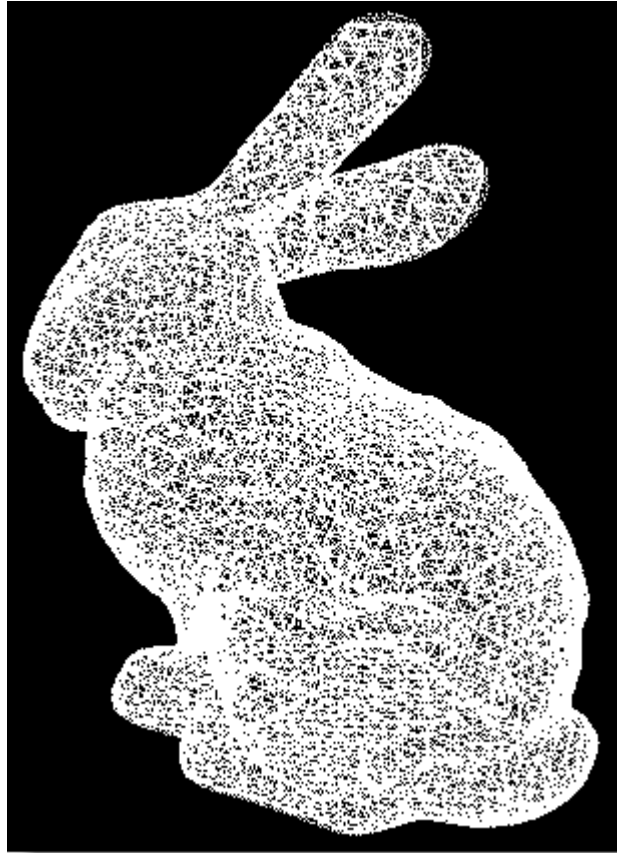


*A shaded view of the mesh*

**Step 9:** Delete the mesh and run the *PCWrapMesh* command again.

**Step 10:** At the **Select points** command prompt, select the points and press *Enter*.

**Step 11:** At the **Select points** command prompt, set *Point cloud type* to *Concave* by pressing "V", Press *Enter* when done. A concave mesh is created.



*A concave mesh*



## Point Cloud for AutoCAD Help

*A shaded view of the mesh*

[Tutorial 3 - Wrap a mesh around a convex point cloud](#)

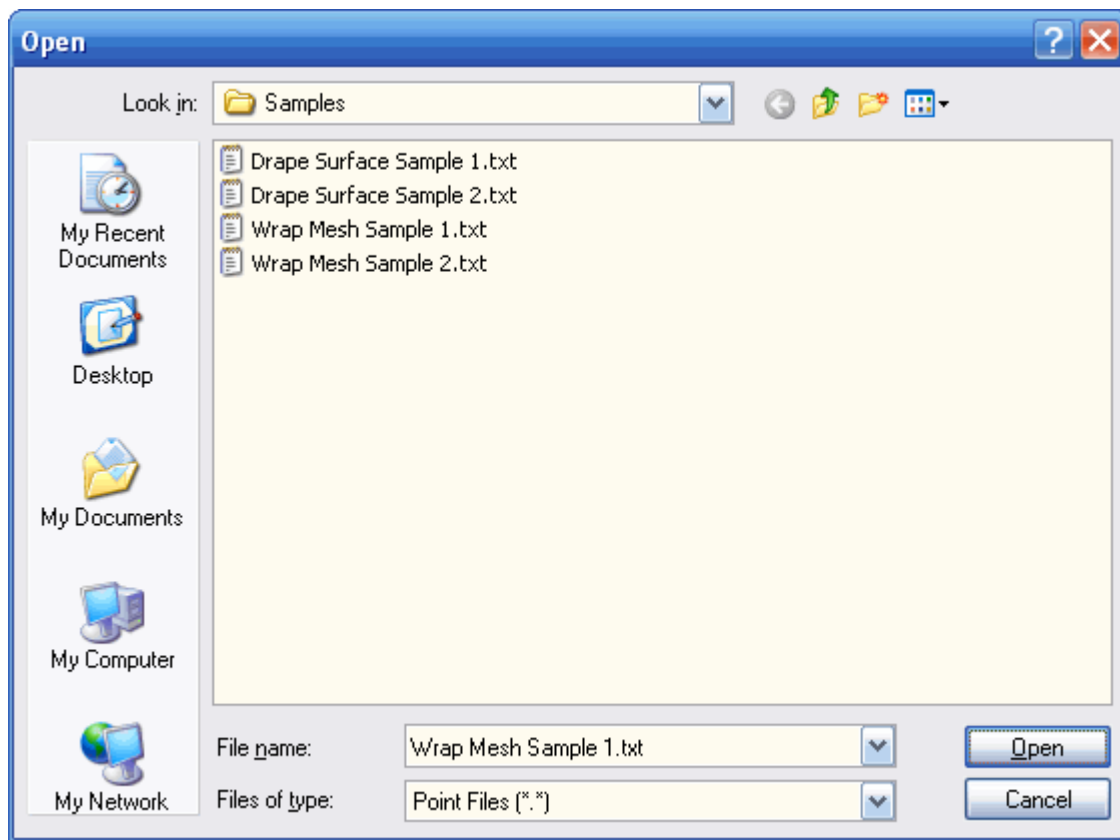
## Tutorial 3 - Wrap a mesh around a convex point cloud

In this tutorial we will learn how a mesh is wrapped around a point cloud by typing a different options.

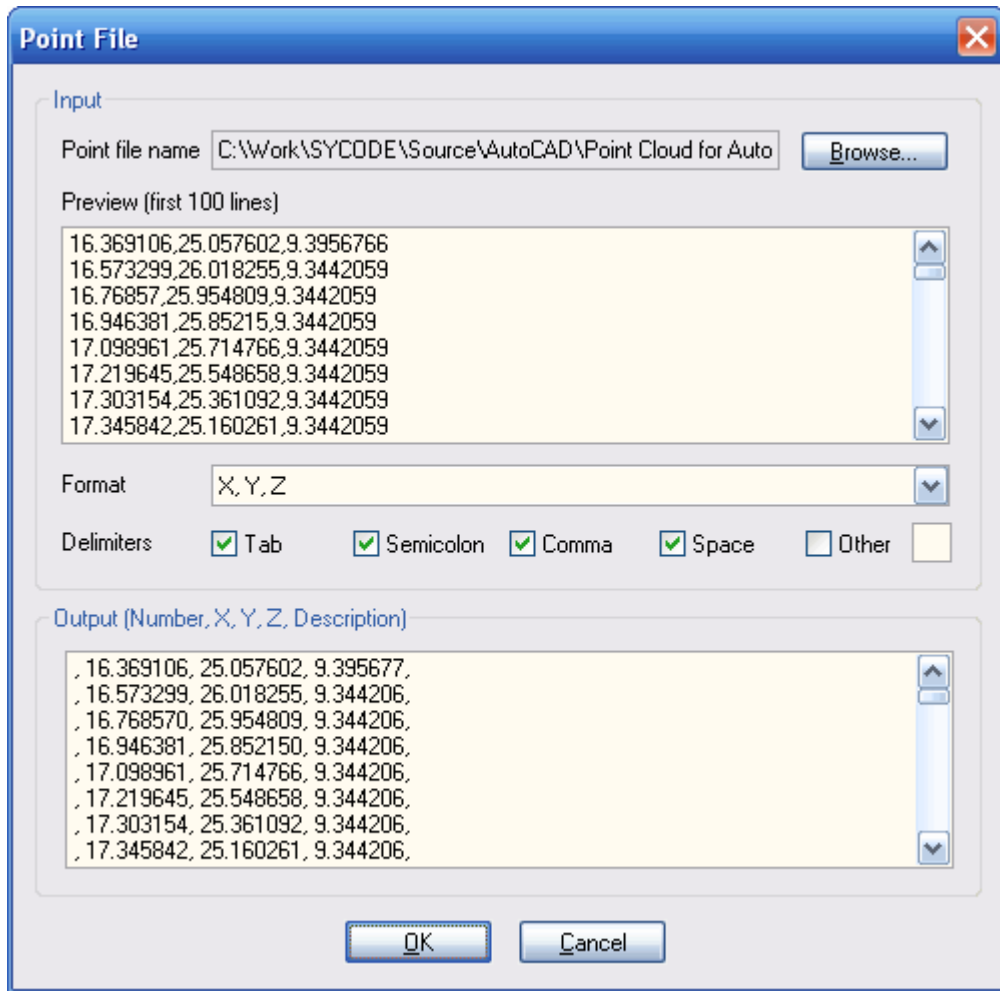
**Step 1:** Start AutoCAD.

**Step 2:** Select *Import Points* from the "PointCloud" menu or type *PCImportPoints* at the AutoCAD command prompt and press *Enter*.

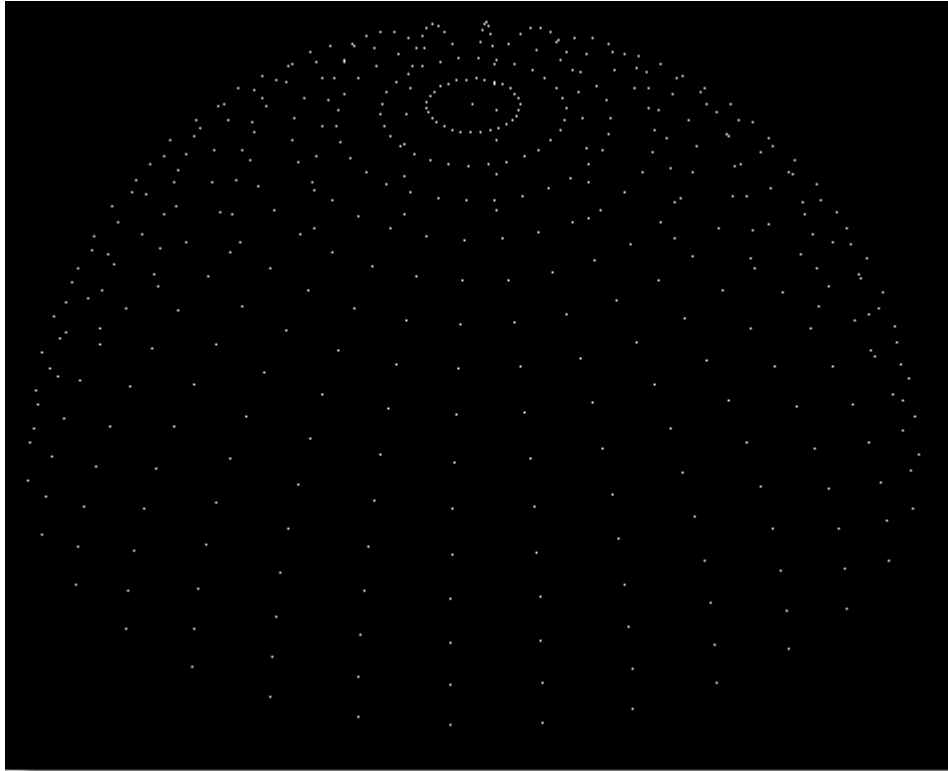
**Step 3:** The "Point File" dialog box is displayed. Browse for the file *Wrap Mesh Sample 1.txt* (typically located in C:\Program Files\SYCODE\Point Cloud for AutoCAD\Samples\) and click *Open*.



**Step 4:** Select the format and delimiters in the "Point File" dialog box and click *OK*.



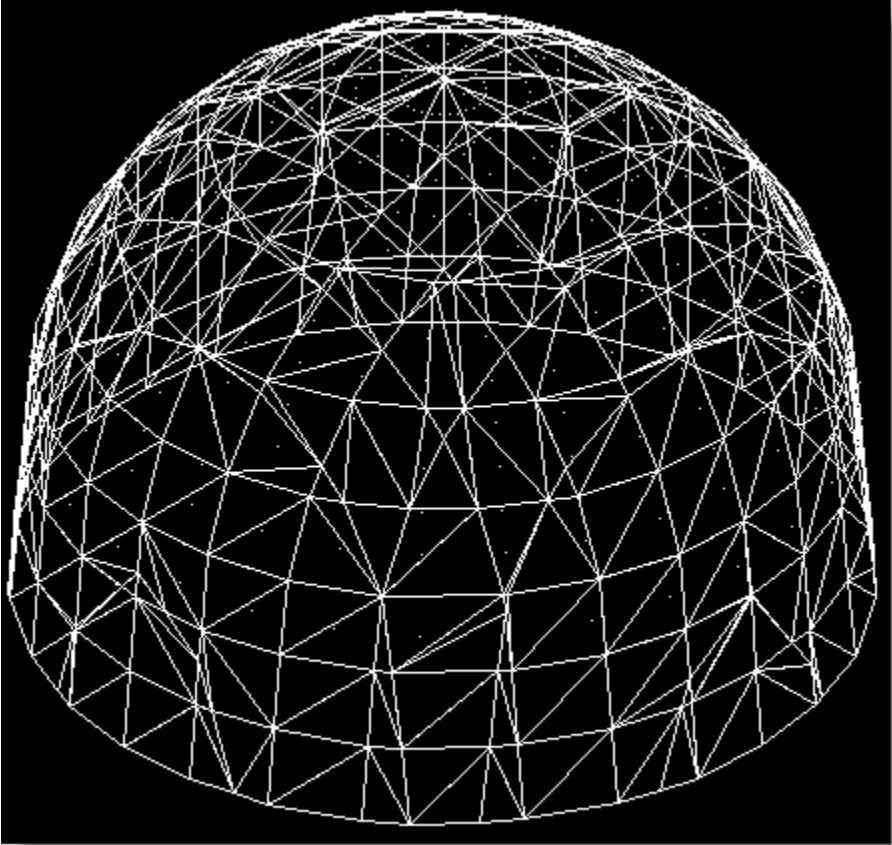
**Step 5:** Zoom to the extents of the drawing (View->Zoom->Extents). You will find the points from *Wrap Mesh Sample 2.txt* imported into the current model.



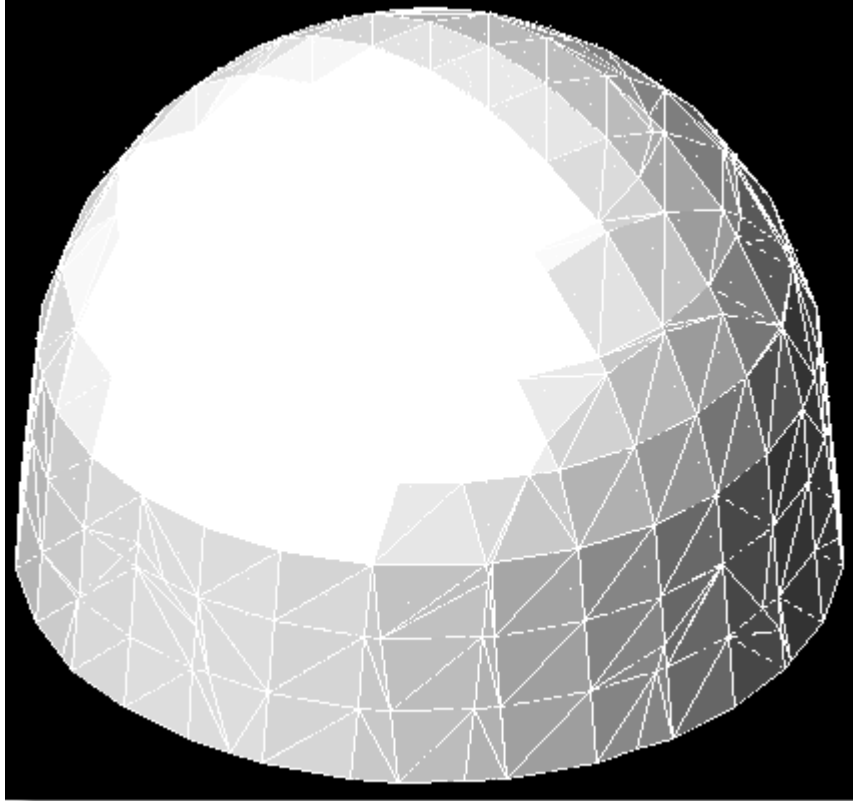
**Step 6:** Select *Wrap Mesh* from the "PointCloud" menu or type *PCWrapMesh* at the AutoCAD command prompt and press *Enter*.

**Step 7:** At the AutoCAD "Select points" command prompt, select the points and press *Enter*.

**Step 8:** At the AutoCAD "Select points" command prompt, set the *Point cloud type* to *Concave* by pressing "V". Press *Enter* when done. A concave mesh is created as shown below. As you can see the mesh spills below the point cloud. This is not what we want.



*A concave mesh*

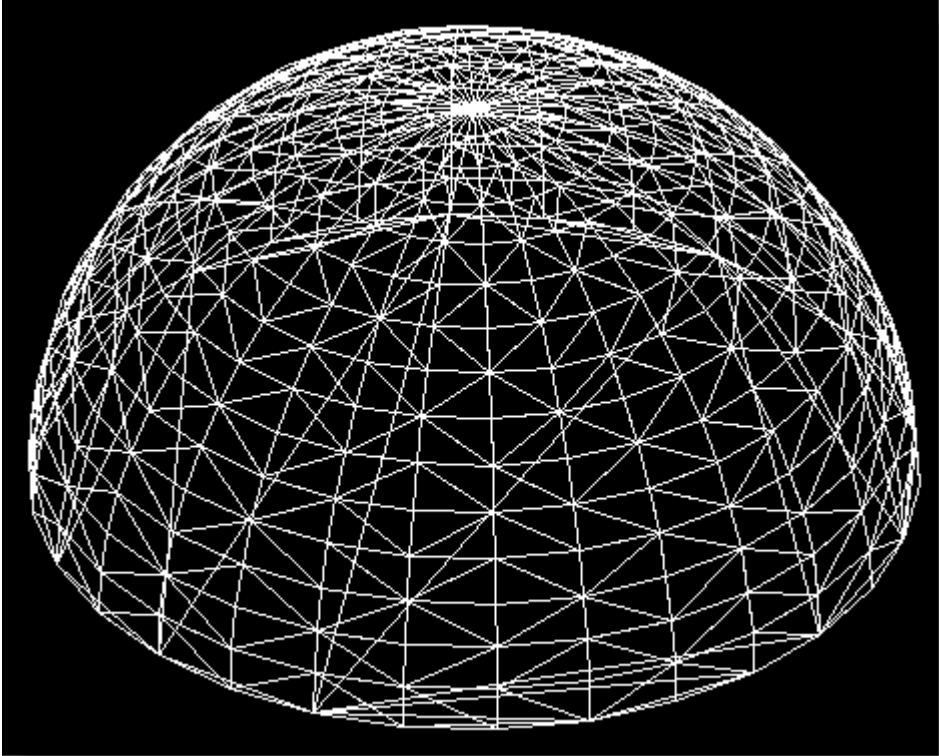


*A shaded view of the mesh*

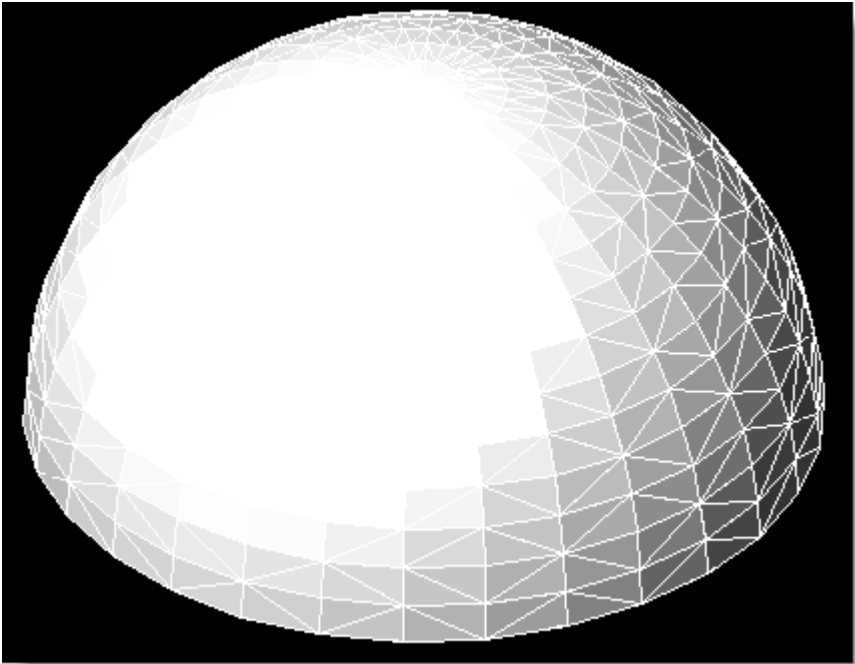
**Step 9:** Delete the mesh and run the *PCWrapMesh* command again.

**Step 10:** At the AutoCAD "Select Points" command prompt, select the points and press *Enter*.

**Step 11:** At the AutoCAD "Select Points" command prompt, set *Point cloud type* to *Convex* by pressing "X", Press *Enter* when done. A convex mesh is created as shown below



*A convex mesh*



*A shaded view of the mesh*