HATCH

The **HATCH** command is used to create hatch lines for section views or filling areas with specific patterns.

To draw **hatch** you must start with a closed boundary. A closed boundary is an area completely enclosed by objects. A rectangle would be a closed boundary. You simply place the cursor inside the closed boundary or select objects.

Note:
A Hatch set is one object.
It is good drawing management to always place Hatch on it's own layer.
Use Layer Hatch. You may also make Hatch appear or disappear with the **FILL** command (pg. 5-6)

HOW TO PLACE HATCH

1. Draw a Rectangle

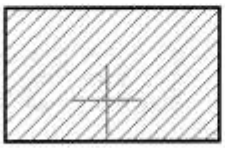
2. Select the Hatch command using one of the following:

Ribbon = Home tab / Draw panel / 
or
Keyboard = BH <enter>

The "Hatch Creation" ribbon tab appears automatically.

3. Place the cursor inside the Rectangle (a closed boundary).

A hatch pattern <u>preview</u> will appear.



4. Press the left mouse button to accept the Hatch.

5. Select **Close Hatch Creation** or press <enter>

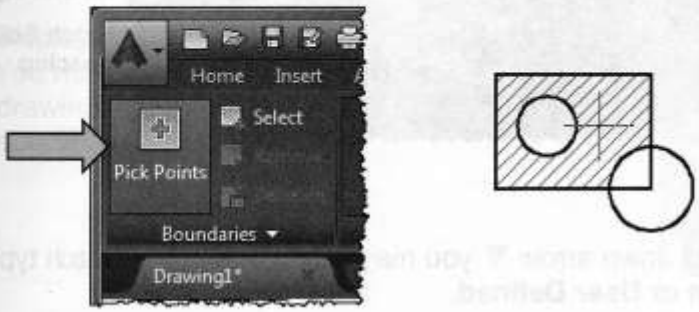
HATCH PROPERTIES

When you select the Hatch command the **Hatch Creation** ribbon tab appears automatically. The panels on this tab help set the properties of the Hatch. You should set the properties desired previous to placing the hatch set although you can easily edit an existing hatch set.

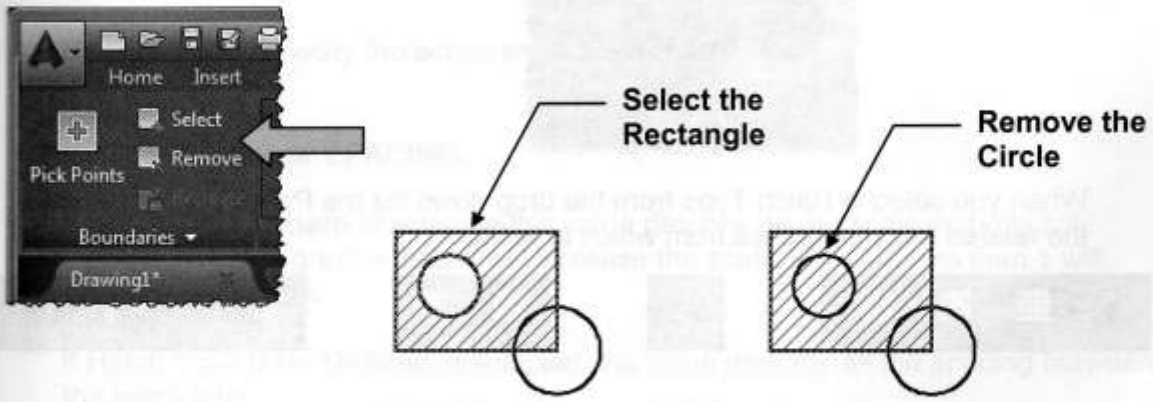
BOUNDARIES Panel

The Boundaries panel allows you to choose what method you will use to select the hatch boundary.

Pick Point:
Pick Point is the default selection. When you select the Hatch command AutoCAD assumes that you want to use the Pick Points method. You merely place the cursor in the closed area to select the boundary. The Hatch set preview will appear. Press the left mouse button to accept.



Select and Remove:
You may select or remove objects to a boundary.
Note: **Remove** will not be available unless you click on **Select**.



HATCH PROPERTIES....continued

PATTERN Panel

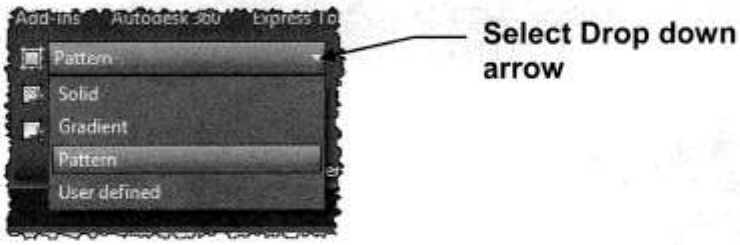
The **PATTERN panel** displays the Hatch swatches that relate to the Hatch Type that has been selected in the Properties panel. Refer to Properties Panel below.

PROPERTIES Panel

HATCH TYPE

When you select the drop down arrow ▼ you may select one of the Hatch types: **Solid, Gradient, Pattern or User Defined.**

Note: Hatch Types will be explained in more detail on pages 15-8 through 15-11.



When you select a Hatch Type from the drop down list the Pattern panel displays the related hatch swatches from which to select

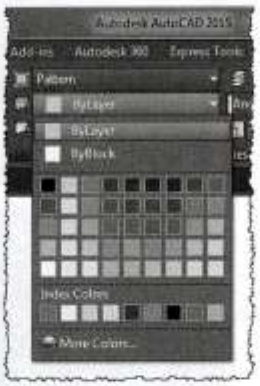
Pattern **Solid** **User Defined** **Gradient**

HATCH PROPERTIES....continued

PROPERTIES Panel... continued

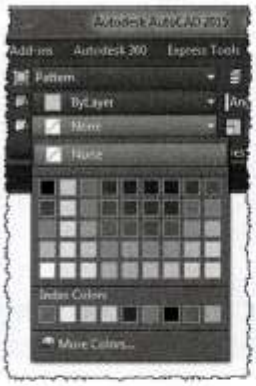
HATCH COLOR

This color selection is specific to the Hatch and will not affect any other objects.



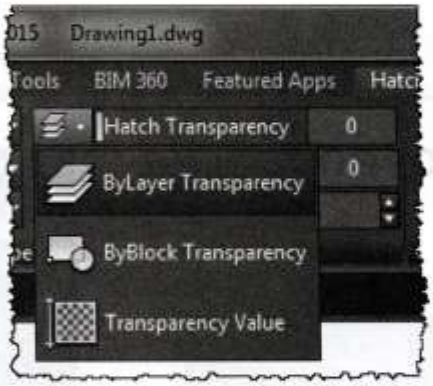
BACKGROUND COLOR

You may select a background color for the hatch area.



HATCH TRANSPARENCY

Displays the selected transparency setting. You may select to use the current setting for the drawing, the current layer setting or select a specific value.



HATCH ANGLE

Pattern: The default angle of a pattern is 0. If you change this angle the pattern will rotate relative to its original design.

User defined: Specify the actual angle of the hatch lines.

HATCH SCALE or SPACING

If Hatch Type **Pattern** is selected this value determines the scale of the Hatch Pattern. A value greater than 1 will increase the scale. A value less than 1 will decrease the scale.

If Hatch Type **User Defined** is selected this value determines the spacing between the hatch lines.

HATCH PROPERTIES....continued

ORIGIN Panel

You may specify where the Hatch will originate. Lower left, lower right, upper left, upper right, center or even the at the UCS Origin.

The Origin locations shown on the right are displayed when Hatch type, Pattern, Solid or User Defined are selected.

The Origin location Centered is displayed only when Hatch type Gradient is selected.

OPTIONS Panel

Opens the Hatch and Gradient Dialog Box. You may choose to use it instead of the Ribbon.

Associative: If the Associative option is selected, the hatch set is associated to the boundary. This means if the boundary size is changed the hatch will automatically change to fit the new boundary shape. (Refer to page 15-12 for an example)

Annotative: AutoCAD will automatically adjust the scale to match the current Annotative scale. This option will be discussed in Lesson 27.

HATCH PROPERTIES....continued

OPTIONS Panel....continued

MATCH PROPERTIES

Match Properties allows you to set the properties of the new hatch set by selecting an existing Hatch set. You may choose to "use the current origin" or "use the source hatch origin".

Use current origin: sets all properties except the hatch origin.

Use source hatch origin: sets all properties including the hatch origin.

GAP TOLERANCE

If the area you selected to hatch is not completely closed (gaps) AutoCAD will bridge the gap depending on the Gap tolerance. The Gap tolerance can be set to a value from 0 to 5000. Any gaps equal to or smaller than the value you specify are ignored and the boundary is treated as closed.

CREATE SEPARATE HATCHES

Controls whether HATCH creates a single hatch object or separate hatch objects when selecting several closed boundaries.

OUTER ISLAND DETECTION

These selections determine how Hatch recognizes internal objects.

SEND BEHIND BOUNDARIES

These selections determine the draw order of the Hatch set.

HATCH TYPES

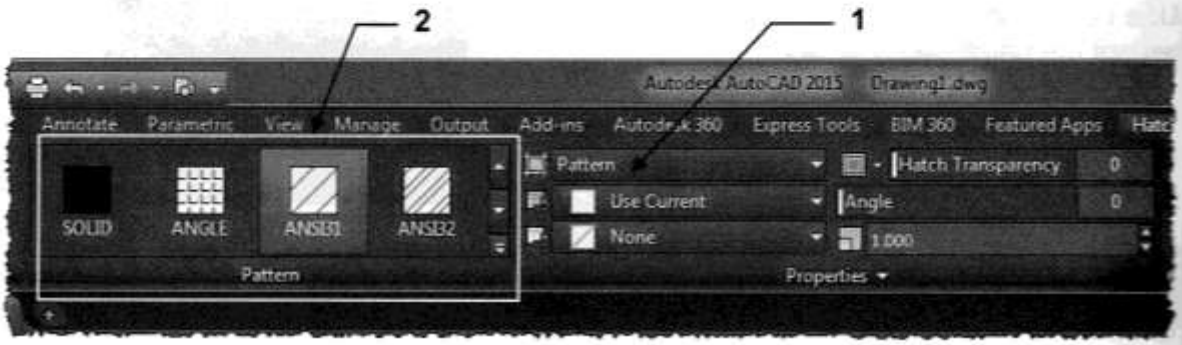
PATTERNS

PATTERNS

AutoCAD includes many previously designed Hatch Patterns. **Note:** Using Hatch Patterns will greatly increase the size of the drawing file. So use them conservatively. You may also purchase patterns from other software companies.

1. Select the Hatch Type **PATTERN**.

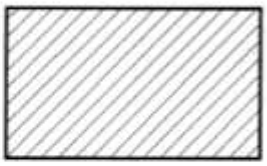
2. Select a Pattern from the list of hatch patterns displayed in the Pattern panel.



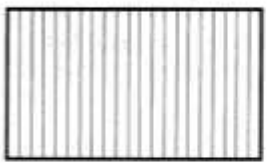
3. Select the Hatch Color, Boundary Background Color, Hatch Transparency.

4. **Angle:** A previously designed pattern has a default angle of 0. If you change this Angle the pattern will rotate the pattern relative to its original design. It is important that you understand how to control the angle.

   For example: if **ANSI31** hatch pattern is used and the angle is set to 45 degrees the pattern will rotate relative to its original design and the pattern will appear to be 90 degrees.



Original Pattern Design
Angle = 0



Pattern Design Rotated
Angle = 45

5. **Scale:** A value greater than 1 will increase the scale. A value less than 1 will decrease the scale. If the Hatch set is Annotative the scale will automatically adjust to the Annotative scale. But you might have to tweak the scale additionally to make it display exactly as you desire.
   (This will be discussed more in Lesson 27. Don't be too concerned about it right now)

HATCH TYPES

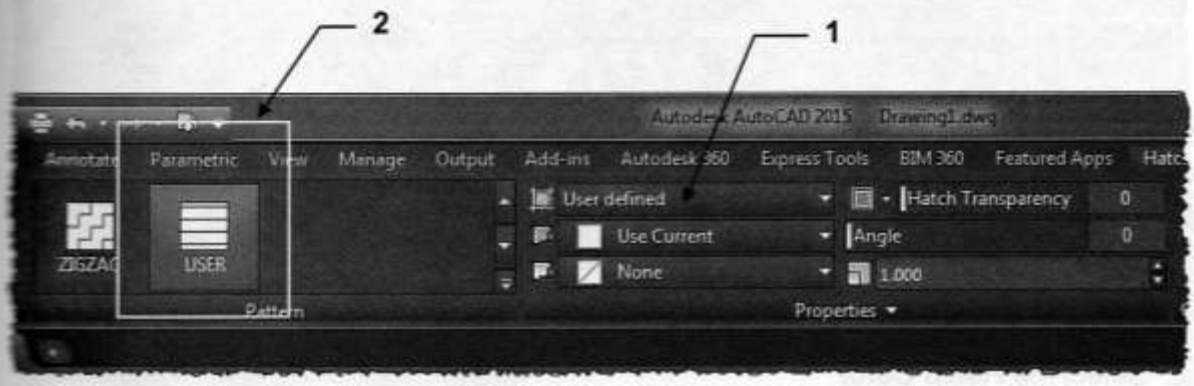
USER DEFINED

USER DEFINED

This Hatch Type allows you to simply draw continuous lines. No special pattern. You specify the **Angle** of the lines and the **Spacing** between the lines.
Note: This Hatch type does not significantly increase the size of the drawing file.

1. Select the Hatch Type **USER DEFINED**.

2. Note the Pattern swatches are not displayed in the Pattern panel. (The Zigzag is only there because alphabetically it was in the same row as User Defined)

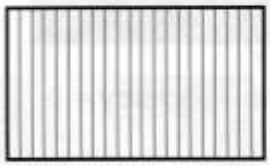


3. Select the Hatch Color, Boundary Background Color, Hatch Transparency.

4. **Angle:** Specify the actual angle that you desire from 0 to 180.

   For example: If you want the lines to be on an angle of 45 degrees you would enter 45. If you want the lines to be on an angle of 90 degrees you would enter 90. (This is different from the angle for Patterns)

Angle = 45



Angle = 90

5. **Spacing:** Specify the actual distance between each of the hatch lines.

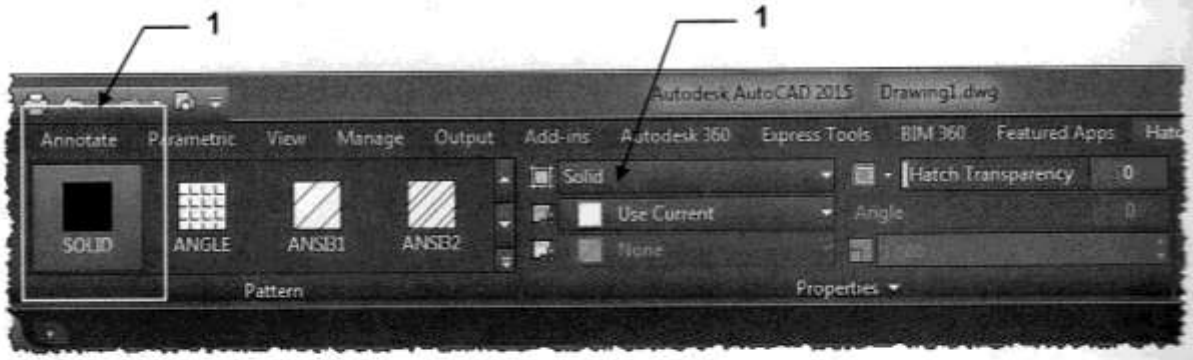
HATCH TYPES

SOLID

SOLID

If you would like to fill an area with a solid fill you should use Hatch type **Solid**.

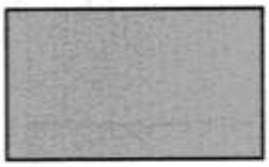
1. Select **Solid** by selecting the Hatch Type **Solid** on the Properties Panel
   or
   select the Solid swatch on the Pattern Panel.



2. Select the Hatch **Color**.
   Note: The Boundary Background Color is not available when using Hatch Type Solid.

3. Select **Transparency**

Transparency = 0



Transparency = 75

4. **Angle:** Not available when using Hatch Type Solid.

5. **Scale:** Not available when using Hatch Type Solid

HATCH TYPES

GRADIENT

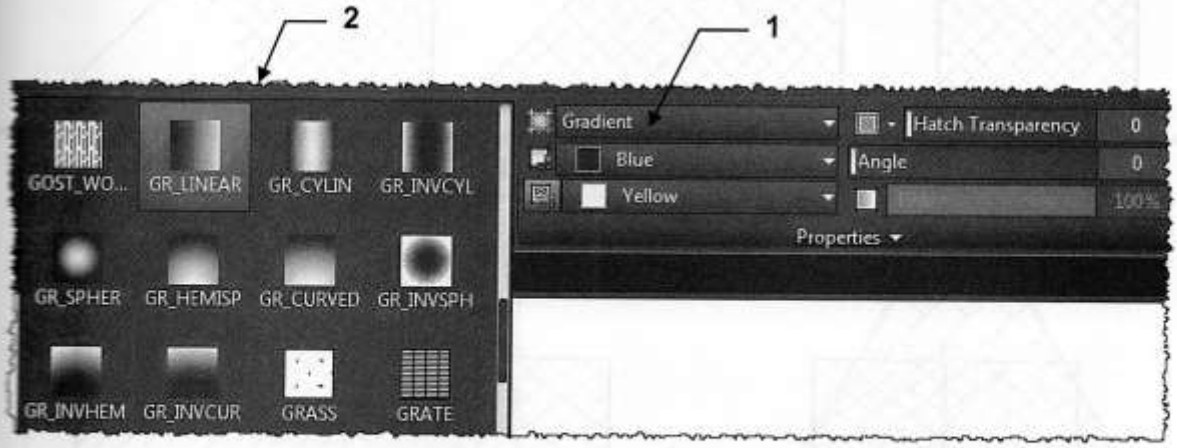
GRADIENT

Gradients are fills that gradually change from dark to light or from one color to another. Gradient fills can be used to enhance presentation drawings, giving the appearance of light reflecting on an object, or creating interesting backgrounds for illustrations.

Gradients are definitely fun to experiment with but you will have to practice to achieve complete control. They will also greatly increase the size of the drawing file.

1. Select the Hatch Type **GRADIENT**.

2. Select a Gradient Pattern from the 9 GR_ patterns displayed in the Pattern panel.



3. Select the Hatch **Color**. The Gradient can be one color or two color. If one color you can select the Tint and Shade of that color. (See step 6 below)

4. Select the Hatch **Transparency**.

5. **Angle:** Specify the actual angle that you desire from 0 to 180. The pattern will rotate the pattern relative to its original design.

Angle = 0 **Angle = 45**

6. **Tint and Shade:** Tint and Shade is used when you are using only one-color gradient fill. Specify the tint or shade of the color selected in step 3 above.

EDITING HATCH

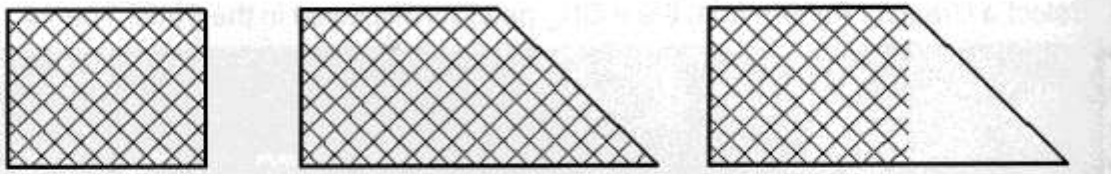
EDITING THE HATCH SET PROPERTIES

Editing a Hatch set properties is easy.

1. Simply select the Hatch set to edit.
2. The Hatch Editor Ribbon tab will appear.
3. Make new selections. Any changes are applied immediately.

CHANGING THE BOUNDARY

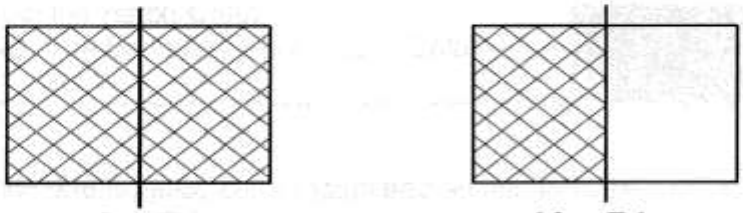
If the Hatch set is **Associative** (see 15-6) you may change the shape of the boundary and the Hatch set will conform to the new shape.
If the Hatch set is **Non-Associative** the Hatch set will not change.



Original Boundary | **New Boundary with Associative hatch** | **New Boundary with non-Associative hatch**

TRIMMING HATCH

You may trim a hatch set just like any other object.



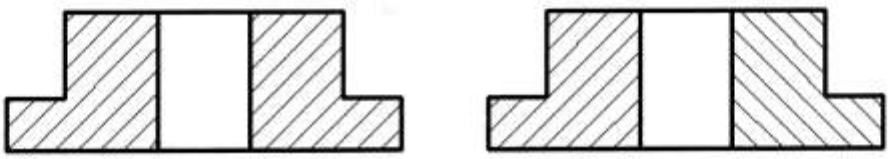
Before Trim | **After Trim**

MIRROR HATCH

An existing Hatch set can be mirrored. The boundary shape will automatically mirror. But you may control whether the Hatch pattern is mirrored or not.

To control the Hatch pattern mirror: (Note: Set prior to using the Mirror command)

1. Type **mirrhatch <enter>**
2. Enter 0 or 1 <enter> 0 = Hatch not Mirrored 1 = Hatch Mirrored



Mirrhatch = 0 | **Mirrhatch = 1**