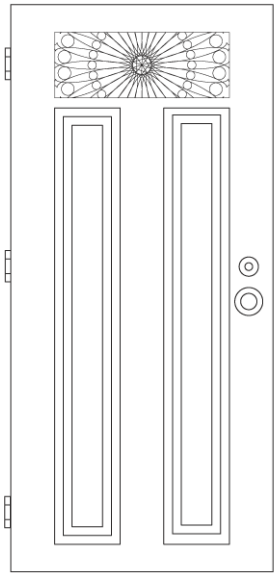
Drawing with precision

Welcome to Corel DESIGNER®, a comprehensive vector-based drawing application for creating technical graphics.

Precision is essential in creating technical graphics. This tutorial introduces you to the two groups of precision tools in Corel DESIGNER. The first group consists of on-screen tools that provide visual aids in the drawing window — such as gravity snapping, dynamic guides, and guidelines. The second group includes items such as the **Object coordinates** docker, the **Transformations** docker, and the **Transform** toolbar, which let you draw or transform objects by specifying values.

In this tutorial, you will use these precision tools to complete the drawing of a door. The following illustration shows what your completed project will look like.



If you are just starting to use the precision tools in Corel DESIGNER, it is recommended that you work your way through the tutorial from this point. If you have used some of these tools already, you can start with the second part of the tutorial, beginning with "Opening the drawing" on page 10.

What you will learn

In this tutorial, you will learn to do the following:

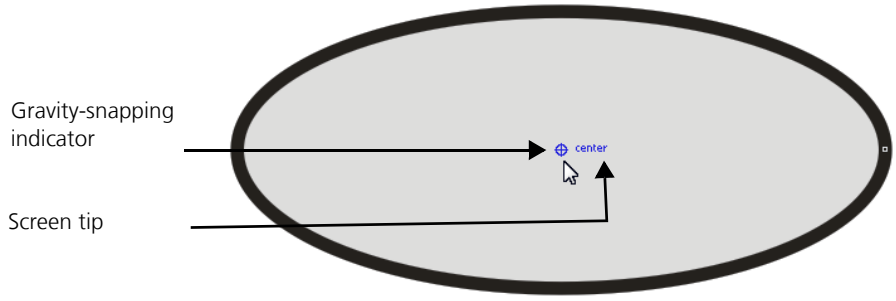
- use gravity snapping to draw objects

- use dynamic guides
- access the **Object coordinates** docker, **Transformations** docker, and **Transform** toolbar
- use the **Object coordinates** docker
- use the **3-point rectangle** tool
- use the **Transformations** docker to create complex designs
- apply PowerClip™ effects

Using gravity snapping

Gravity snapping is the attraction of the pointer to a snap point. Snap points are precise mathematical drawing coordinates. When the pointer is close to a snap point, the gravity source of the snap point is highlighted. The highlighting identifies the snap point as the snapping target for the pointer.

If you want to snap to a specific snap point, you can use a gravity key to activate only that point's gravity source and temporarily disable all other gravity sources. For example, if you want to snap the pointer to the center of an ellipse, you can hold down **C**, which is the gravity key for center snap points.



The following table provides descriptions, visual indicators, and gravity keys for all possible gravity-snapping candidates.

Gravity-snapping candidate	Description	Indicator	Gravity key
Pixel	Point on the pixel grid	✦	S
Node	Node located in an object	□	N

Gravity-snapping candidate	Description	Indicator	Gravity key
Intersection	Geometric intersection of line segments, arcs, or guidelines	◇	I
Midpoint	Midpoint of line segment	△	M
Quadrant	Points that are at 0, 90, 180, and 270 degrees on a circle, ellipse, or arc	⌖	Q
Tangent	Point on the outside edge of an arc, circle, or ellipse where a line would touch, but not intersect, the object	○	T
Perpendicular	Point on the outside edge of a segment where a line would be perpendicular to the object	⊾	P
Edge	Point at the nearest perpendicular edge (the shortest perpendicular distance from the pointer to the edge)	⌖	E
Center	Center of the closest object (arc, regular polygon, or curve centroid)	⌖	C
Grid	A visible or invisible grid point	#	G
Text baseline	Point on the baseline of artistic or paragraph text	◆	B
Absolute	Pointer location (temporarily suspends all gravity snaps)	+	A

For simplicity in this tutorial, all gravity-snapping candidates are referred to as snap points.

In the following procedure, you'll use gravity snapping to draw a circle in relation to another circle. Then, you'll draw the radius of both circles. You'll use gravity keys to activate only the snap points you need.

To draw objects by using gravity snapping

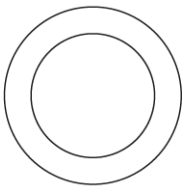
1. Click **File ▸ New** to display a blank document.
2. Turn on gravity snapping by clicking **Tools ▸ Gravity** and enabling the **Gravity on** check box.
3. Turn off the dynamic guides to make it easier to focus on the task at hand. Click **Tools ▸ Alignment and dynamic guides**, and disable the check box in the top-right corner of the **Dynamic guides** section of the docker.

4 In the toolbox, click the **Circle tools** button, and click the **Center-point circle** tool .

5 Draw a circle by dragging in the drawing window.

6 Using the **Pick** tool , click a blank spot in the drawing window to deselect the circle.

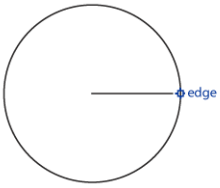
7 Draw a larger concentric circle by clicking the **Center-point circle** tool and pointing to the center of the circle. When the gravity source becomes highlighted, drag to draw a larger circle. The center point is the same for the two circles.



You can also press **C** to deactivate all snap points except the center snap point.

When you are finished, click a blank spot in the drawing window to deselect the larger circle.

8 Draw the radius of the smaller circle by using the snap points at the center and edge. Click the **Curves tools** button, and click the **2-point line** tool . Holding down **C**, point to the center of the circles, click when the center snap point appears, and drag to the edge of the circle. Activate only the edge snap point by holding down **E** while dragging. When the edge snap point appears, release the mouse button.



9 Repeat the previous step to draw the radius of the larger circle.

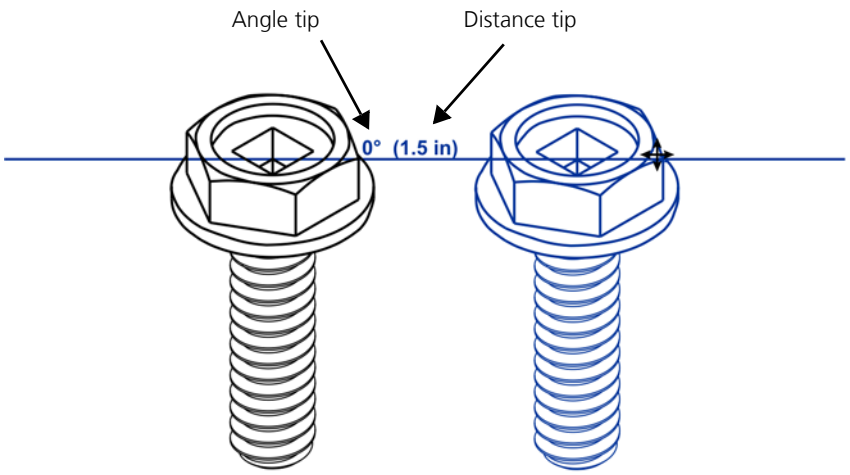
To toggle gravity snapping off and on

- Press **Alt + Z**.

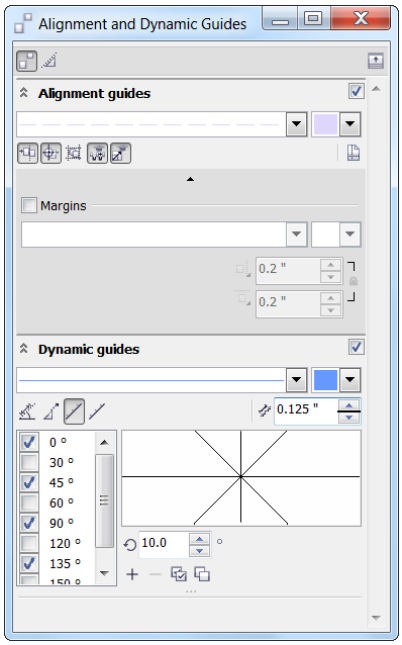
Using dynamic guides

Dynamic guides are temporary guidelines that you can display from the following snap points in objects — center, node, quadrant, and text-baseline end nodes. You can use dynamic guides to ensure precision when you draw and position objects in relation to other objects.

By default, dynamic guides are displayed with distance tips and angle tips. The distance tip shows you the distance between the pointer and the active snap point. The angle tips show you the angle at which the dynamic guide is displayed.



Dynamic guides contain invisible divisions, called ticks, to which the pointer is attracted. Ticks let you move objects with precision along a dynamic guide. You can adjust tick spacing to suit your needs.



Because dynamic guides are displayed from snap points, they can be used only in conjunction with gravity snapping. You can toggle dynamic guides off and on so that they are available only when you need them.

In the following procedure, you will use dynamic guides to draw and resize rectangles in relation to other objects.

To use dynamic guides

1 Turn on dynamic guides by clicking **Tools ▸ Alignment and dynamic guides**, and enable the check box in the top-right corner of the **Dynamic guides** section of the docker.

In the next two steps, you'll reduce the number of dynamic guides that can be displayed. Avoiding the display of too many dynamic guides can make your work easier.

2 Disable the following check boxes:

- **45** degrees
- **135** degrees

Disabling these check boxes prevents the generation of dynamic guides at these angles.

3 Click **Tools ▸ Gravity** and, disable all check boxes in the **Modes** box except for **Node** and **Edge**. Click **OK** to close the **Options** dialog box.

You can now display dynamic guides only from node and edge snap points.

4 Click the **Rectangle tools** button, and click the **2-point rectangle** tool .

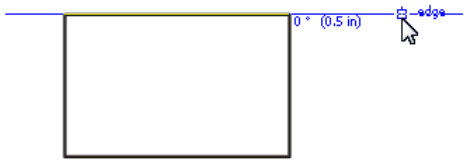
5 Drag to draw a rectangle.

6 Click the **Display screen tips** button in the **Dynamic guides** section of the **Alignment and dynamic guides** docker.

7 Click the **2-point rectangle** tool.

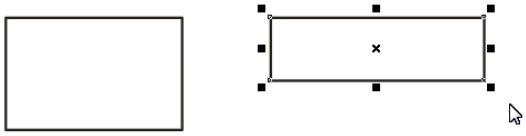
In the next few steps, you'll draw another rectangle, which will be positioned 0.5 inch from the first rectangle.

8 Point to the upper-right corner of the rectangle. When the snap point of the node is highlighted, move the pointer to the right to display a dynamic guide.

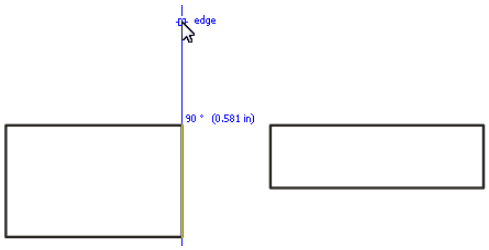


9 When **0.5"** appears in the distance screen tip, draw another rectangle by dragging.

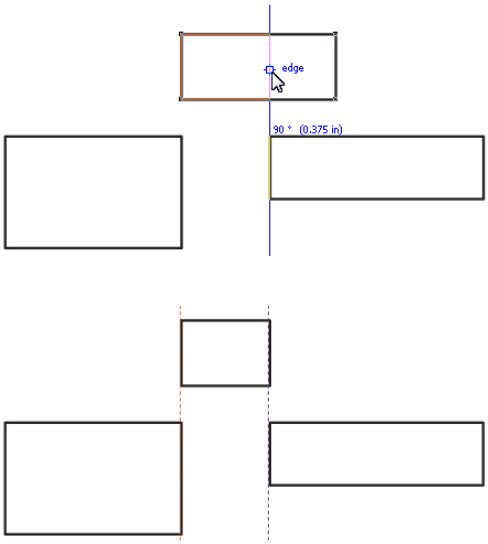
The top sides of the two rectangles are aligned horizontally because the dynamic guide was pulled at a 0-degree angle from the edge of the first rectangle.



10 Now you'll draw a rectangle that is aligned with the right side of the first rectangle. To do this, deselect all objects, and click the **2-point rectangle** tool . Point to the upper-right corner of the first rectangle, and when the node gravity source is displayed, move the pointer upward to pull a dynamic guide from the node. When the dynamic guide appears, note the angle tip that reads 90 degrees. This screen tip means that the dynamic guide was pulled at a 90-degree angle from the right side of the rectangle. Drag diagonally to draw the rectangle.



11 While the third rectangle is still selected, you'll resize it so that its right side is aligned with the left side of the second rectangle. Click the middle handle along the right side of the rectangle, and drag to resize the rectangle. When the right side of the third rectangle is on top of the left side of the second rectangle, drag toward the upper-left corner of the second rectangle, and then drag upward to display a dynamic guide at a 90-degree angle. Release the mouse button.



12 Continue to experiment until you are comfortable with dynamic guides and gravity snapping. You can then activate other snap points from which dynamic guides can be pulled. To activate additional snap points, click **Tools ▸ Gravity**, and in the **Modes** box, enable the check boxes you want. To generate dynamic guides at multiple angles enable the check boxes that correspond to the angles you want in the in the **Dynamic guides** section of the **Alignment and dynamic guides** docker.

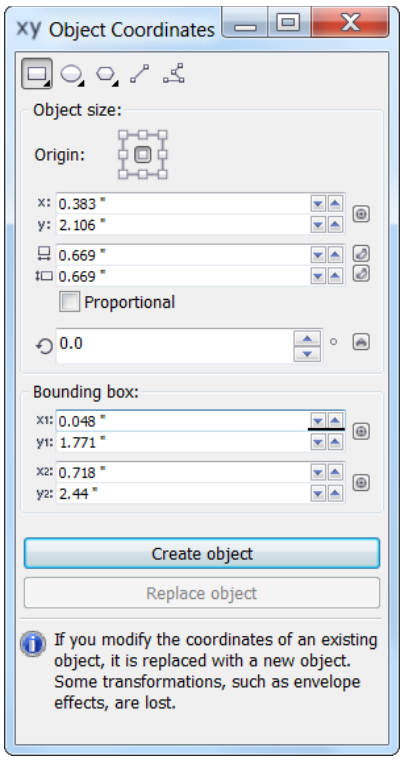
To toggle dynamic guides off and on

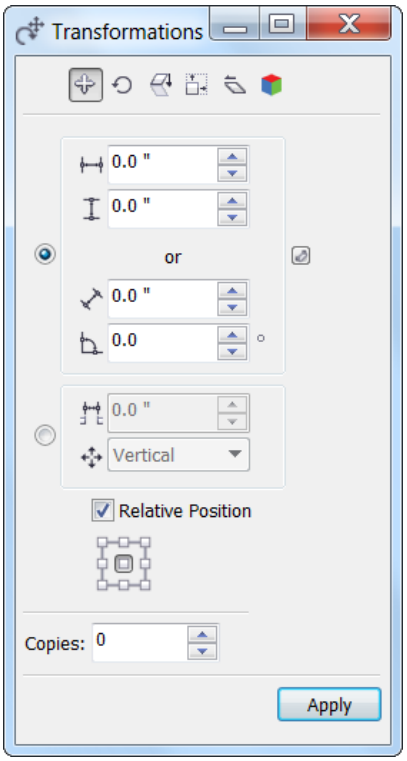
- Press **Shift + Alt + D**.

Dockers and toolbars

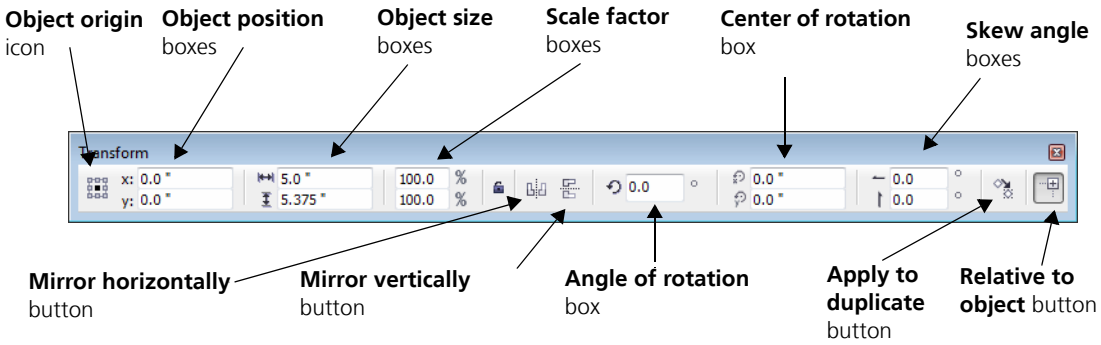
The **Object coordinates** docker lets you draw, position, size, and rotate shapes and lines by using object coordinates. The live preview in the drawing window lets you see the effect of your adjustments.

The **Transformations** docker lets you move, rotate, skew, scale, flip, and project objects with precision. For all transformations except moving, you can change the anchor point of the object. In addition, you can apply any transformation to a copy, or to multiple copies, of the original object. This feature lets you create complex designs quickly.





The **Transform** toolbar lets you apply all the transformations that you can apply with the **Transformations** docker except for projecting objects. The **Transform** toolbar offers fewer controls, however, and you cannot use it to apply a transformation to multiple copies of the original object. The following illustration identifies the controls on the **Transform** toolbar.



To access the Object coordinates docker

- Click **Window** ▸ **Object coordinates**.

  If you want to modify an existing object, select the object.

To access the Transformations docker

1 Select the object that you want to transform.

2 Click **Arrange** ▸ **Transformations**, and click one of the following commands:

- **Position** — lets you position an object with precision by specifying distances along the x-axis and y-axis, typing a distance and an angle for moving the object, or specifying the distance and direction
- **Rotate** — lets you rotate an object by specifying an angle of rotation and a point around which to rotate the object
- **Scale and mirror** — lets you scale an object by specifying a percentage and an anchor point and mirror an object by flipping it from left to right or top to bottom
- **Size** — lets you size an object by specifying values
- **Skew** — lets you slant an object at a specified angle
- **Project** — lets you project objects on the top, front, or right drawing planes

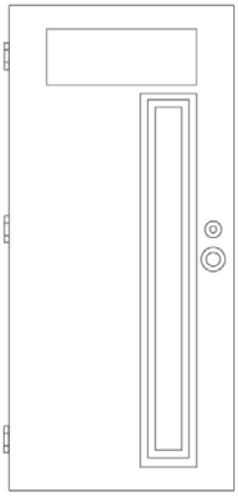
To access the Transform toolbar

1 Select the object that you want to transform.

2 Click **View** ▸ **Toolbars** ▸ **Transform**.

Opening the drawing

As you work on each section of the drawing, you'll use the precision tools that were introduced in the preceding sections of this tutorial.



To open the drawing

1 Click **File** ▸ **Open**.

2 Open the file **door.des**, which you downloaded earlier.

Drawing the left panel

You will draw three rectangles for the left panel by using dynamic guides, gravity snapping, and the **Object coordinates** docker. To draw the outside rectangle, you'll reset the tick spacing, so that you can snap the pointer along a dynamic guide every 0.5 inch.

To draw the outside rectangle

1 Click **Tools** ▸ **Alignment and dynamic guides**, and make sure that the check box in the top-right corner of the **Dynamic guides** section of the docker is enabled.

2 Click the **Snap to tick spacing** button, and type **0.5** in the **Tick spacing** box.

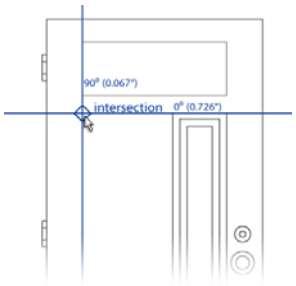
3 Click **Tools** ▸ **Gravity**, and make sure that the **Node**, **Intersection**, **Perpendicular**, and **Center** check boxes in the **Modes** box are enabled. Click **OK** to close the **Options** dialog box.

4 Click the **Rectangle tools** button, and click the **3-point rectangle** tool.

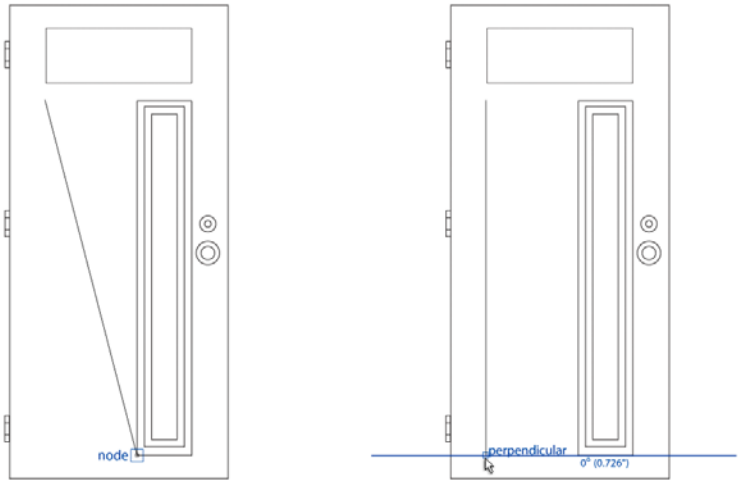
5 Point to the upper-left node of the right panel, and move the pointer to the left to display a horizontal dynamic guide.

6 Point to the lower-left corner of the top window, and move the pointer downward to display a vertical dynamic guide.

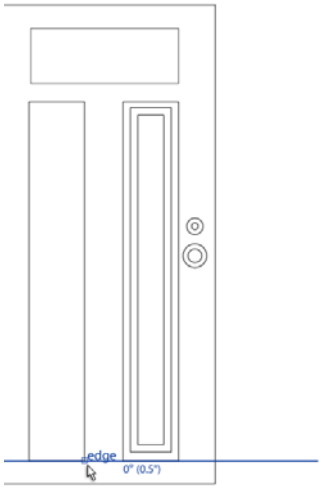
7 Continue to move the pointer until the horizontal and vertical dynamic guides intersect, and then click to place the first point of the rectangle at the intersection point. Do not release the mouse button.



8 Drag downward to the lower-left node of the right panel, and then move the pointer to the left to display a horizontal dynamic guide. Continue to move the pointer along the dynamic guide until the perpendicular snap point is displayed and the line becomes straight. Release the mouse button to place the second point of the rectangle.



9 To place the last point of the rectangle, point again to the lower-left node of the right panel to pull out a horizontal dynamic guide. Move the pointer slowly along the dynamic guide until **0.5"** appears in the distance tip and then click. The 0.5-inch distance refers to the distance between the pointer and the node from which the dynamic guide was displayed.



To draw the middle and inside rectangles

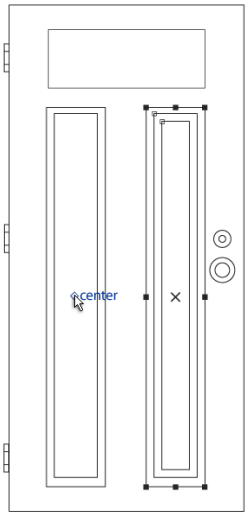
1 Click **Window ▸ Object coordinates**.

2 Select the middle rectangle of the right panel.

3 In the **Object coordinates** docker, click the **Rectangle** button .

4 In the **Origin** area, click the center point.

5 To specify the exact position of the origin point in the drawing window, click the **Set origin point interactively** button . Point to the center of the left panel. When the center snap point appears, click to snap to it. A preview of the rectangle appears.



6 To add the new rectangle at the specified position, click **Create object** in the **Object coordinates** docker.

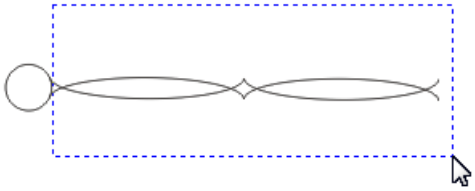
7 To add the inside rectangle, repeat steps 2 through 5.

Creating the decorative glass panel

You'll create the design based on elements already contained in the drawing. You'll use the **Transformations** docker to rotate copies of these elements and then use the PowerClip feature to insert the design in the top panel.

To create the decorative glass design

1 Using the **Pick** tool, drag a marquee around the curves in the lower-left corner of the drawing without including the circle on the left.



2 Click **Arrange** ▸ **Transformations** ▸ **Rotate**.

The **Transformations** docker appears.

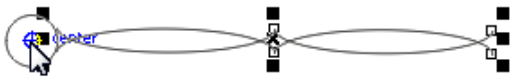
3 The selected element needs to be repeated 30 times around the circle. In the **Copies** box, type **29**. (We already have one element created.)

4 To specify the rotation angle, type **360/30** in the **Angle of rotation** box.

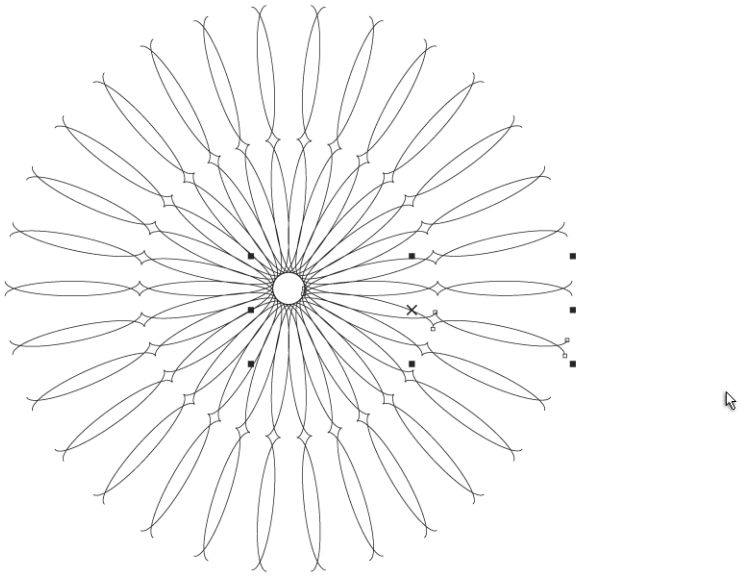
When you click another control in the docker, the rotation angle (12 degrees) is automatically calculated and displayed.

5 Click the selected element to display its rotation handles.

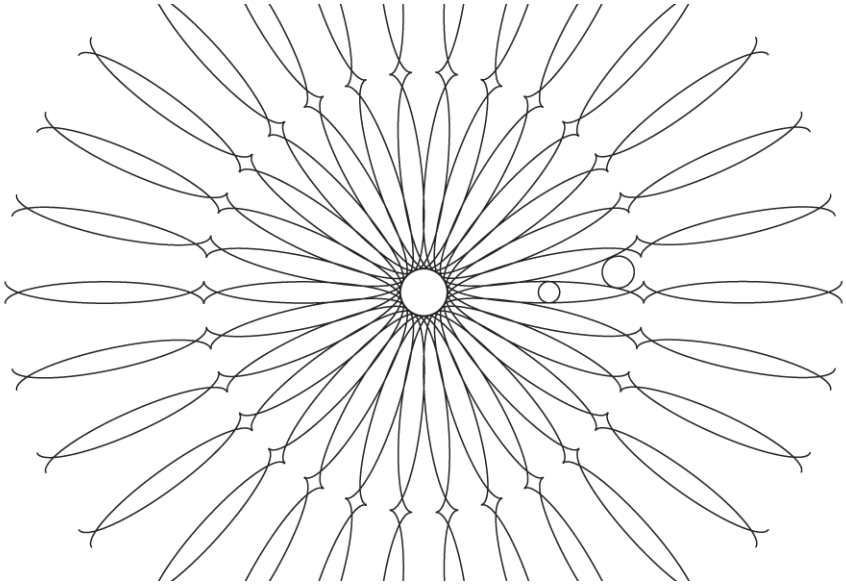
6 Click the **Specify point** button, point to the circle in the element, and click when the center snap point becomes highlighted.



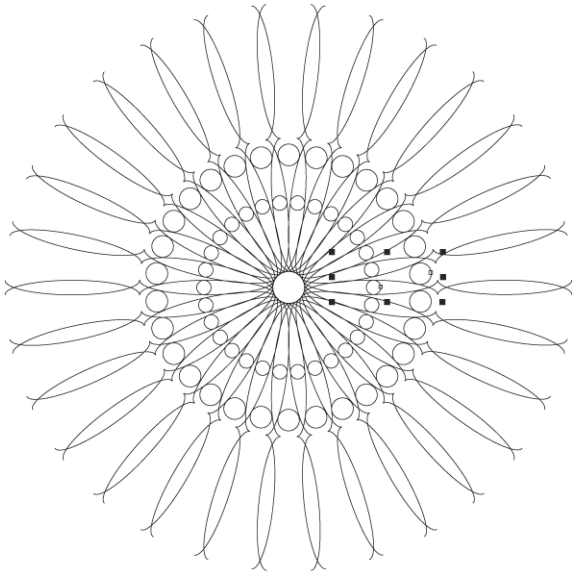
7 In the **Transformations** docker, click **Apply**.



8 To complete the design, draw two circles, and position them as shown in the following illustration. Use the **3-point circle** tool to draw the circles.



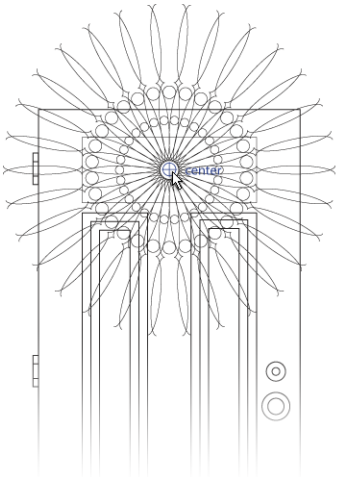
9 Select the circles, and repeat steps 3 through 7 to rotate copies of the circles in the decorative design.



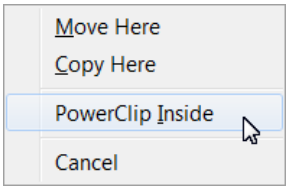
To insert the decorative design inside the top panel

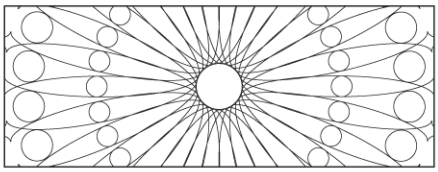
1 Marquee select all designer elements, and press **Ctrl + G** to group them.

2 Right-click the group, and drag over the window.



3 Release the mouse button, and click **PowerClip inside** on the menu that appears.





Note that to insert the design in the center of the window, you need to snap to the center of the design and move the element over the center of the window. When the center snap point becomes activated, snap the pointer to it.

If you want to edit the glass design, right-click the design, and click **Edit PowerClip**. When you are finished with your edits, right-click the design again, and click **Finish editing this level**.

The drawing is now complete.

From here...

You can explore Corel DESIGNER on your own, or you can learn more by completing other tutorials.

For more information about the topics and tools discussed in this tutorial, refer to the Help. To access Corel DESIGNER Help, click **Help ▸ Help topics**.

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