

Curve diffusers require certain parameters to be defined before ordering. The parameters required to select curve diffusers are the:

- Model
- Curve Orientation
- Radius
- Arc Length
- Radius measurement type (for FLAT curves only).

This document provides guidance to obtaining, selecting and/or calculating these parameters.

PRICE CURVE GRILLES AND DIFFUSERS

Price Industries currently offers three products available for curving. These products are the model SDSC (Curved Linear Slot Diffuser), CFC (Curved Custom Flow) and LBM (Curved Linear Bar Grille). Manufacturing limitations and plenum compatibility will vary for each product. It is important to review the submittals for the limitations of these products.

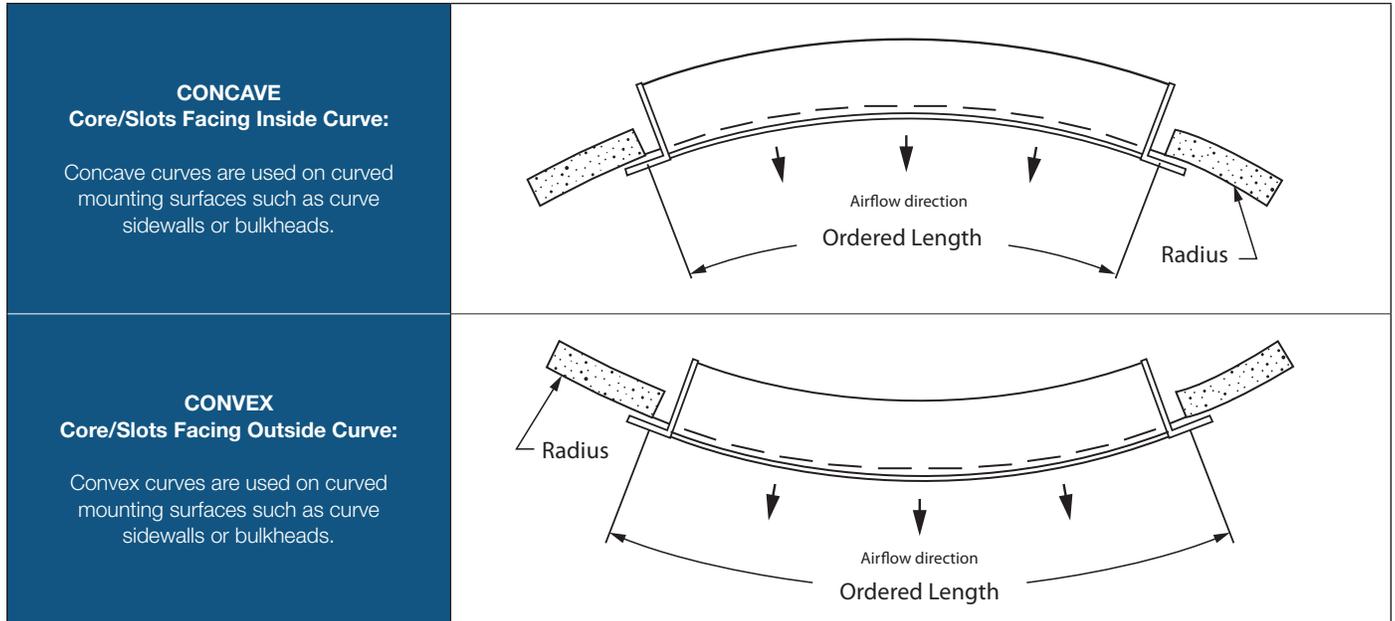
	SDSC	CFC	LBM
Curve Orientation	FLAT	FLAT, CONVEX and CONCAVE	FLAT, CONVEX and CONCAVE
Plenum	SDBC - CURVED SDB PLENUM	CFPC - CURVED CUSTOM FLOW PLENUM	UP* - UNIVERSAL PLENUM
Submittal Link	SDSC - Curved Linear Slot Submittal	CFC - Curved Custom Flow Submittal	LBM - Curved Linear Bar Grille Submittal

* **NOTE:** Special/custom UP required to match LBM.

CURVE ORIENTATION

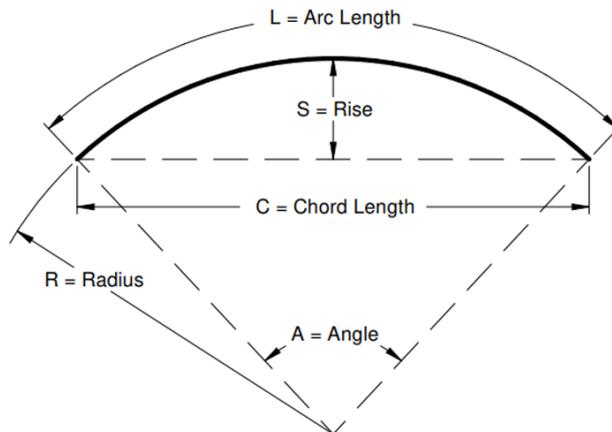
Selecting the correct curve orientation is essential to ensure the diffuser will follow the curvature of the mounting surface. There are 3 curve orientations available: Flat Face Curve, Concave Curve and Convex. Concave and convex curves are used on curved mounting surfaces such as curve sidewalls or bulkheads. Flat face curves are used on flat mounting surfaces such as a flat ceiling.

Curve Orientation	Schematic
<p>FLAT Flat Face Curve:</p> <p>Flat face curves are used on flat mounting surfaces such as a flat ceiling.</p>	



CURVE GEOMETRY

Curves have 5 dimensions that can be used to define them. These dimensions are Radius, Arc Length, Chord Length, Rise, and Radius.



For ordering curves with Price Industries, **Radius** and **Arc Length** are required. For accurate representation of the curved diffuser, we recommend obtaining these measurements either using the following methods:

1. Field measurements of the curved surface
2. Dimensions obtained from CAD models/drawings

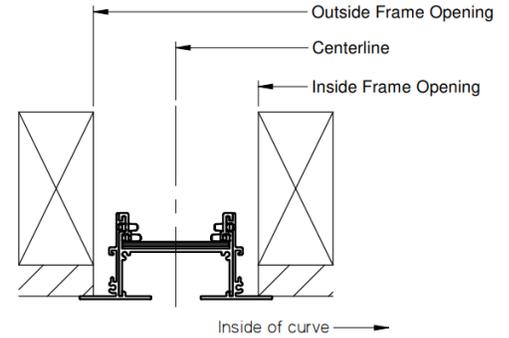
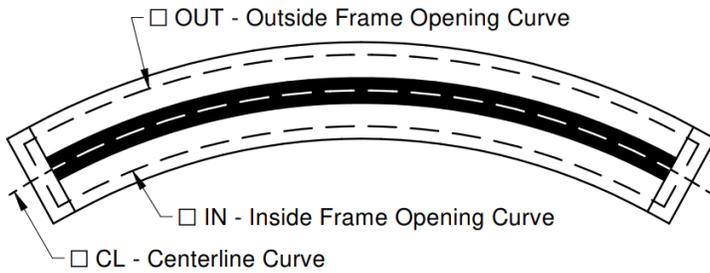
NOTE: When possible, Price recommends field verifying curved dimensions.

NOTE: Curved templates are available for the CFC to confirm field dimensions. See section CURVE TEMPLATES of this document for further information.

RADIUS MEASUREMENT (FLAT CURVES ONLY)

For FLAT – Flat Face Orientation, an additional parameter called the Radius Measurement is required for ordering. Measurements for a FLAT curve can be specified at either CL – Centerline, OUT – Outside Frame Opening, or IN – Inside Frame Opening. Depending on the Radius Measurement type, the Arc Length specified must also be measured from the same Radius Measurement Type. Both curve dimensions must be measured from the **same reference point**.

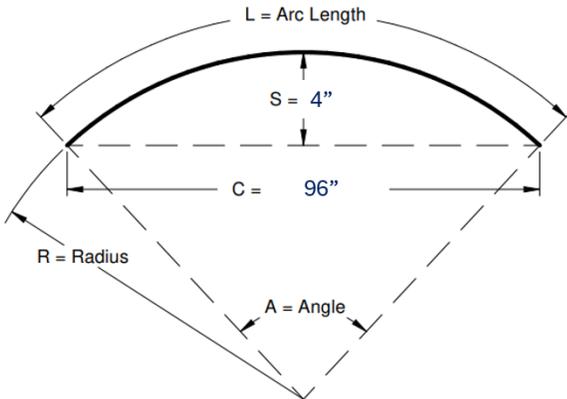
FLAT - Flat Faced Curve



NOTE: Curve linear models SDSC and LBM are automatically measured from IN - Inside Frame Opening when ordered as FLAT faced curve.

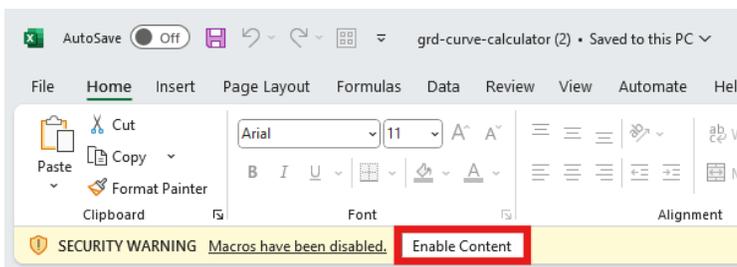
CURVE CALCULATOR

When radius and/or arc length are not available, Price’s [GRD Curve Calculator](#) can be used to obtain these dimensions **as long as 2 out of the 5 dimensions of a curve are defined**. For example, in the curve below, Chord Length, C and Rise, S are defined. We can then use the curve calculator to find the other 3 dimensions as seen below.



Known Dimensions	Chord Length (C) & Rise (S)	
Inputs		Inputs
Angle		degrees
Arc Length		inches
Chord Length	96	inches
Radius		inches
Rise	4	inches
Outputs		Inputs
Angle	19	degrees
Arc Length	96.444	inches
Chord Length	96.000	inches
Radius	290.000	inches
Rise	4.000	inches

NOTE: Ensure to enable excel macros when using the GRD Curve Calculator.

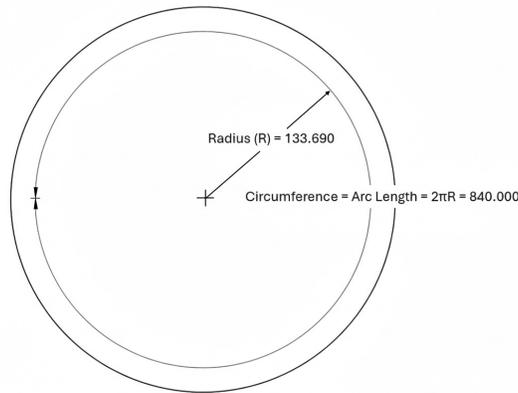


COMPLEX CURVES

Complexity of the curves can vary from application to application. Many can consist of long continuous curves with multiple radius and arc lengths. Careful consideration is required for these complex curves.

Circle

A circle, or a fully enclosed curves with a single radius, will have the **Arc Length that is equal to its Circumference**. It is recommended to submit a special quote request for any fully enclosed curve for the factory to ensure that sections will line up to form a circle.



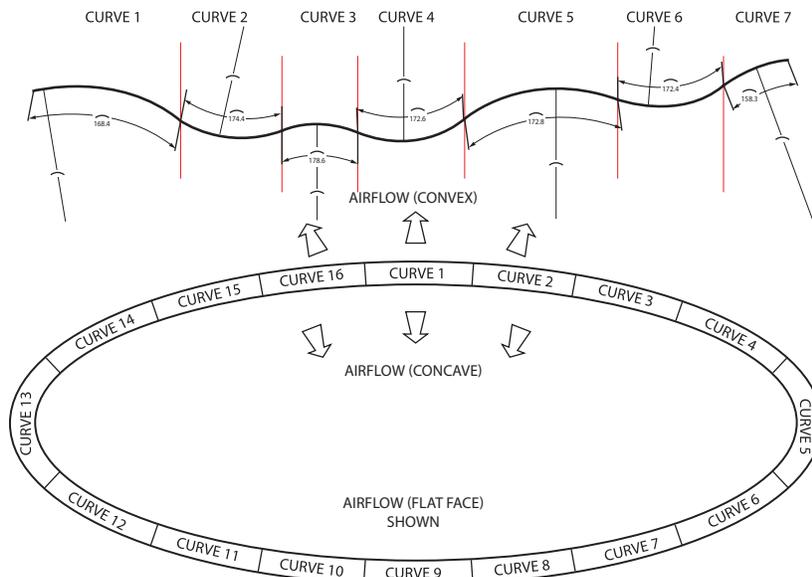
Snake and Oval/Ellipse

The Snake and Oval/Elliptical curves will have multiple varying radius. For these types of curves, each radius and its associated arc length need to be identified to ensure accurate pricing and compatibility in the field. This is important as every new radius is treated as an additional line item/curve.



In the “Snake” curve example below, there would be a total of 7 curve sections. It is **highly recommended to obtain measurements from CAD drawings or field measurements when dealing with these types of curves**. Like the circle, it is recommended to also submit a special quote request for the factory to ensure that sections will line up to form the oval/ellipse.

NOTE: For any continuous curve, the joining sections must be ordered with **Y open ends**.



FIELD MEASUREMENTS

For measuring curvature in the field, a recommended method is to measure the Rise and Chord Length of the curvature and converting these dimensions to Radius and Arc Length. The following steps will outline the details for this method.

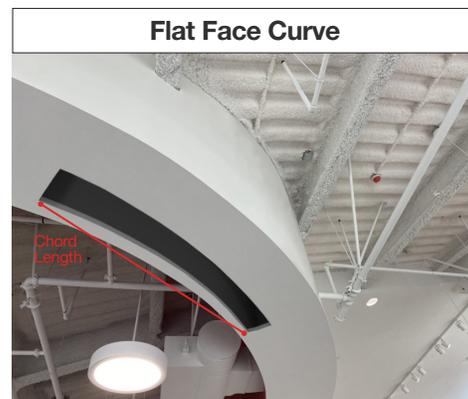
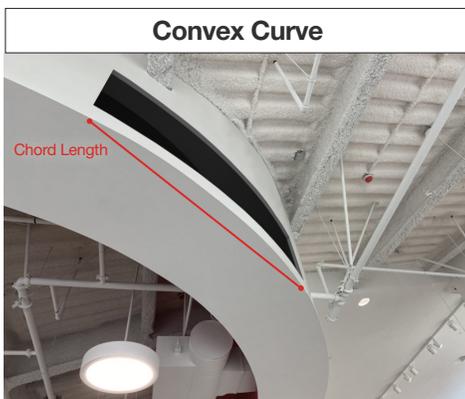
1. Assess the mounting surface for the curve diffuser and determine whether the **Curve Orientation** is FLAT (like a ceiling or an underside of a bulkhead) or CONCAVE/CONVEX (curve surface such sidewall). Field Measurements for both Curve Orientations will be detailed in this section.



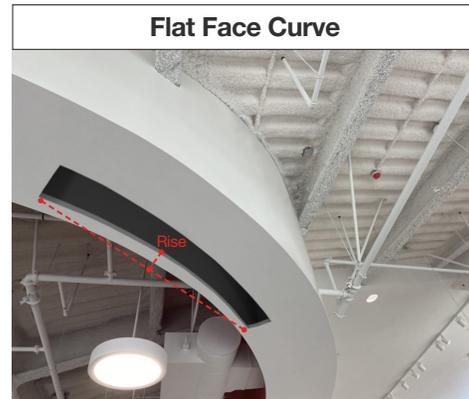
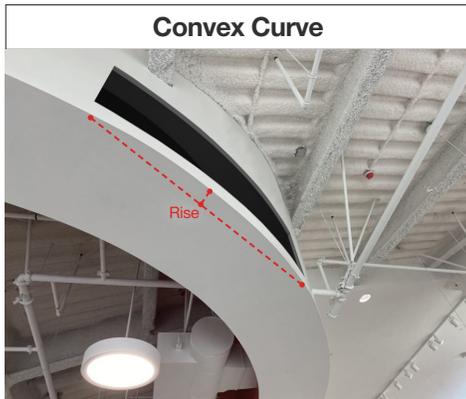
2. Locate where the opening/mounting location for the curve diffuser. The picture on the left shows a location for a CONVEX curve diffuser and the picture on the right shows a location for a FLAT curve diffuser.



3. Find the end points of the curve. Using a string or another material, make a reference line between the two end points. Measure this line and this will be your **Chord Length**.



- Locate the midpoint of this string and take a straight-line measurement between the string at the apex (highest point) of the curve. This will be your Rise.



- Once you have the chord length and rise, the GRD Curve Calculator can be used to find the other curve dimensions. In the GRD Curve Calculator, set the Known Dimensions to Chord Length (C) & Rise (S). Enter the measured Chord Length and Rise under Inputs to obtain Arc Length and Radius in the Outputs.

Known Dimensions	Chord Length (C) & Rise (S)	
Inputs		Inputs
Angle		degrees
Arc Length		inches
Chord Length	96	inches
Radius		inches
Rise	4	inches
Outputs		Inputs
Angle	19.055	degrees
Arc Length	96.444	inches
Chord Length	96.000	inches
Radius	290.000	inches
Rise	4.000	inches

NOTE: FLAT Curves Only – Note the Chord Length, Rise, Radius and Arc Length from the above examples would have a Radius Measurement of IN – Inside Curve.

NOTE: Check that the two entered Inputs match the same value in the Outputs.

- For continuous curves, where there are multiple radius OR the curve is too long, breaking down the curve into multiple sections may be required. Measuring these curves follow a similar procedure laid out in Steps 1-5 but the main difference will be measuring the curves in smaller increments or measuring at each radius change.



DIMENSIONAL TAKE-OFF AND EXAMPLE

If field measurements and CAD dimensions are unavailable, then scaling drawings is another method for obtaining dimensions. Applications or programs with measurement and scaling tools can be used with this method.

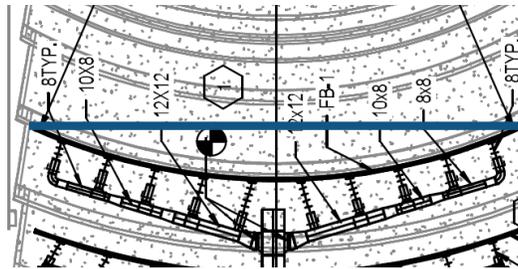
NOTE: This method may not provide accurate results as it relies on precision of the user.

1. Set the program's measurement tool to the correct scale based on the drawing. For this example, the scale will be set to 1" = 20'

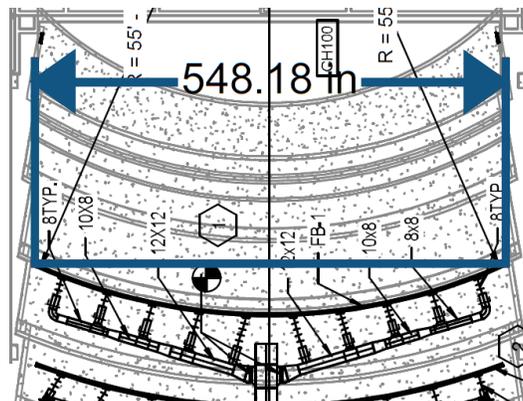
SCALE: 1" = 20'



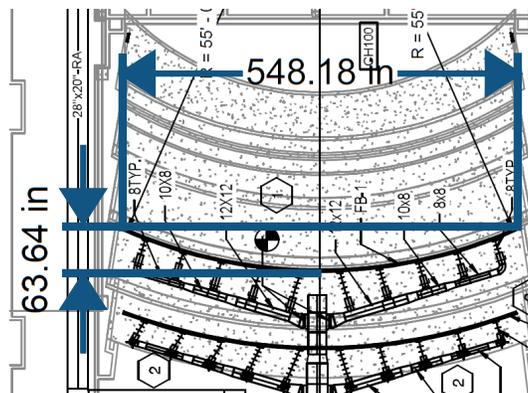
2. Find the two end points of the curve and draw a straight line connecting these two end points. This will be used as a reference line for taking measurements.



3. Use the measurement tool to take the end-to-end measurement of the previously drawn line. This will be the Chord Length. This is 548.18" in the example below.



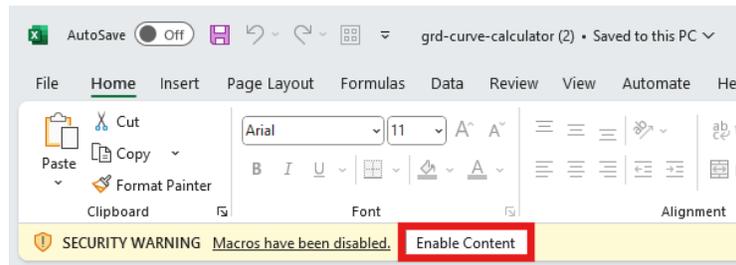
4. Use the measurement tool to take a measurement from the previously drawn line to the apex (highest point) of the curve. This will be the Rise. This is 63.64" in the example below.



Open the [GRD Curve Calculator](#) (enable the excel macros) and select Chord Length (C) & Rise (S) under the Known Dimensions Dropdown:

Known Dimensions	Angle (A) & Chord Length (C)	
Inputs	Angle (A) & Arc Length (L)	Inputs
	Angle (A) & Radius (R)	
Angle	Angle (A) & Chord Length (C)	degrees
Arc Length	Angle (A) & Rise (S)	inches
Chord Length	Arc Length (L) & Radius (R)	inches
Radius	Radius (R) & Chord Length (C)	inches
Rise	Radius (R) & Rise (S)	inches
Outputs	Chord Length (C) & Rise (S)	Inputs
Angle	#DIV/0!	degrees
Arc Length	#DIV/0!	inches
Chord Length	#DIV/0!	inches
Radius	#DIV/0!	inches
Rise	#DIV/0!	inches

NOTE: Ensure to enable excel macros when using the GRD Curve Calculator.



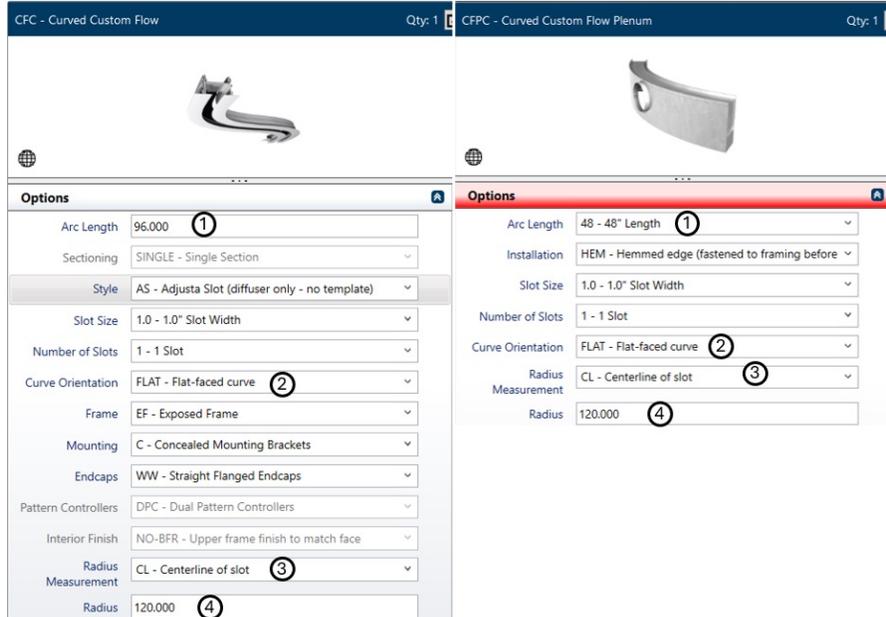
- Enter the measured Chord Length and Rise of the curve in the Inputs section. Radius and Arc Length should now be available under the Outputs section.

Known Dimensions	Chord Length (C) & Rise (S)	
Inputs		Inputs
Angle		degrees
Arc Length		inches
Chord Length	548.18	inches
Radius		inches
Rise	63.64	inches
Outputs		Inputs
Angle	52	degrees
Arc Length	567.674	inches
Chord Length	548.180	inches
Radius	622.057	inches
Rise	63.640	inches

NOTE: Check that the two entered Inputs match the same value in the Outputs.

CURVE PLENUMS

Ordering curve plenums also require the radius, arc length and curve orientation. Careful selection of these parameters are needed in order to be compatible with its curve diffuser counterpart.



- 1. Plenum Arc Length** – Comes in 24”, 36”, 48”, and 60” sizes. Quantity and length will typically be specified on the plans. Note that the total sum of the active plenum length should not exceed the total arc length of the curve diffuser. For example, a 96” CFC cannot accommodate 3 x 48” CFPC.
- 2. Plenum Curve Orientation** – The plenum Curve Orientation should match the diffuser Curve Orientation. For example, a CFC with a FLAT Curve Orientation should also have a matching CFPC plenum with FLAT Curve Orientation.
- 3. Radius Measurement (FLAT curves only)** – The plenum Radius Measurement should match the Radius Measurement of the curve diffuser. For example, a CFC with a Radius Measurement from the CL – Centerline should also have a matching CFPC plenum with a Radius Measurement from the CL – Centerline.
- 4. Radius** – The plenum Radius should match the Radius of the curve diffuser. For example, a CFC with a Radius of 120” should also have a matching CFPC plenum with a Radius Measurement of 120”.

CURVE TEMPLATES

Templates are curved pieces of sheet metal that can be ordered for the CFC to assist with verification of the opening size and curvature of the surface. Therefore, it is ideal to order templates before the opening is constructed.

