

# KRUEGER DesignFlo DFL Linear Diffusers Ceiling System Installation Guide

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## DesignFlo® (DFL) INSTALLATION GUIDE



### DesignFlo® Installation Guide

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For more information or technical support, contact your local krueger representative or visit us on the web.

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#### INSTALLATION METHOD #1: DFL INSTALLED BEFORE HARD CEILING (CLIP INSTALL)

Krueger's DesignFlo® (DFL) linear diffusers are designed to integrate with the ceiling system. The integration process takes place by installing the diffuser concurrently with the ceiling. Figure 1 (below) summarizes the steps required to install a DFL diffuser as part of a hard ceiling installation.

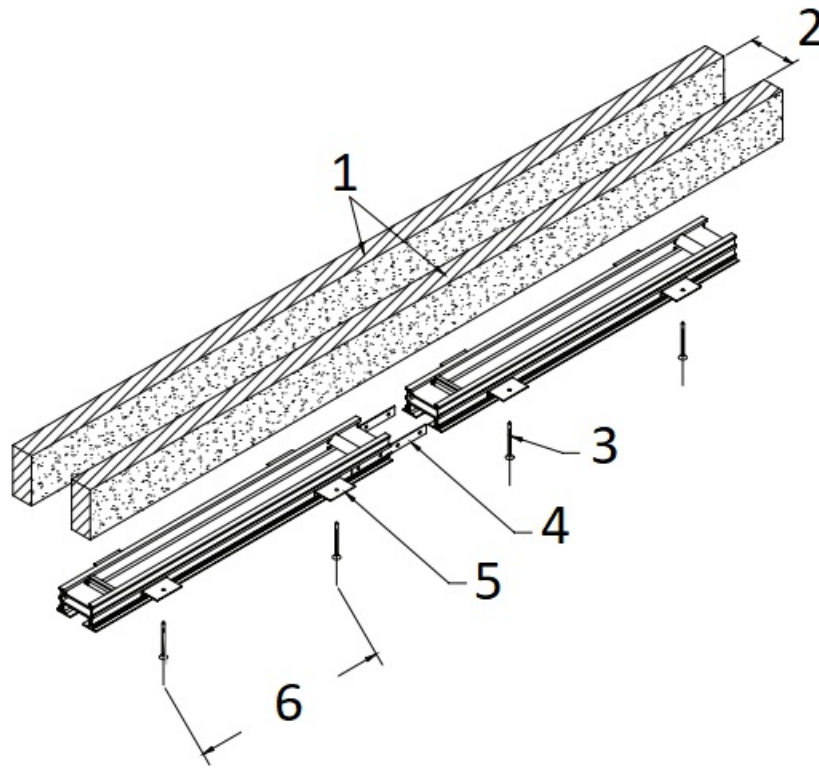


Figure 1 – Installation of DFL with a Hard Ceiling

1. SUBFRAMING (BY OTHERS)
2. FRAME OPENING WIDTH (W) SHOWN IN TABLE 1
3. MOUNTING SCREWS
4. SPLINE SUPPORT CLIP SS
5. HARD CEILING CLIP H1, H2, H3 OR H4
6. 10" MAXIMUM CENTERS

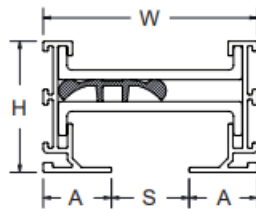
#### Summary of Steps to Install DFL in Hard Ceiling with CF Mounting

1. Identify the Diffuser Frame Style
2. Construct Ceiling Frame Work
3. Attach Mounting Clips to Diffuser
4. Attach Diffuser to Ceiling Frame Work
5. Attach Plenum to Diffuser
6. Attach Inlet Damper (if required)
7. Install Drywall
8. Review Installation – (Frame BB & EE Only)
9. Finish the Surface – (Frame BB & EE Only)

#### Skip to Installation Method #2: DFL Installed AFTER Hard Ceiling (Concealed Fastening), PG 10

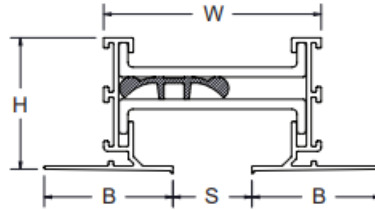
##### STEP #1. IDENTIFY THE DIFFUSER FRAME STYLE.

There are six different extrusion styles (identified as “Frame Styles” in this manual) which are combined to form six different Diffusers. **Diffusers are identified by combining the two frame styles used** (eg: DFL AC has one frame A and one frame C). See figure 2 for different Diffusers.



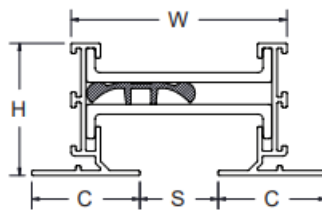
**FRAME AA**

No Overlapping Flange



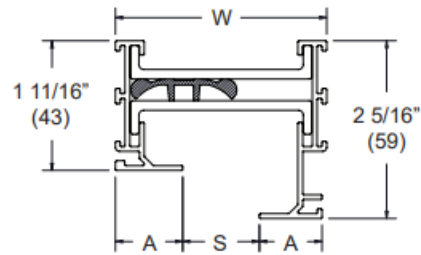
**FRAME BB**

Mud-in Flange



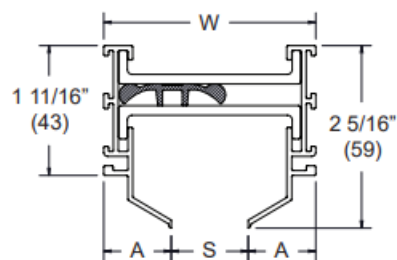
**FRAME CC**

3/16" Overlapping Flange



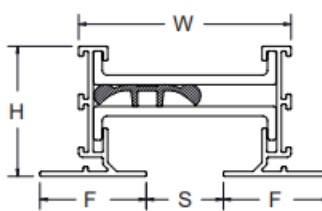
**FRAME AD**

Concealed Beveled Frame



**FRAME EE**

Concealed Beveled Frame



**FRAME FF**

1/2" Overlapping Flange

Figure 2. DFL Frame Styles

- **Frame A.** The outer edge of the face flange is even with the stack head for flush mounting. Frame A is used with diffusers AA, AC, and AD.
- **Frame B** is designed for use with hard ceiling applications where the finishing flange is taped and spackled into the ceiling to leave only the air slot exposed to the room. Frame B is used with diffuser BB. \*\*
- **Frame C.** The outer edge of the face flange is extended 3/16" out to provide a surface for sheetrock or acoustic ceiling tile to lay on. Frame C is used with diffusers AC or CC.
- **Frame D** has an extended height for use with uneven ceiling heights or where the ceiling meets the wall. Frame D is used with frame A to form diffuser AD.
- **Frame E.** Frame E is designed for use with hard ceiling applications where the drywall is angled to match the Frame E face and is meant to be taped and spackled into the ceiling to leave only the air slot exposed to the room. Frame E is used with diffuser EE.
- **Frame F.** The outer edge of the face flange is extended 1/2" out to provide an extended surface for sheetrock or acoustic ceiling tile to lay on. Frame F is used with diffuser FF. \*\*

\*\* Frame can be used with concealed fastening mounting. If concealed fastening is selected, the DFL is installed AFTER the ceiling is in place. See page 9 for installation.

#### **STEP #2. CONSTRUCT CEILING FRAMEWORK. (BY OTHERS)**

- Before installing drywall, a framed opening must be constructed to support the DFL diffuser.
- It is recommended that the framework be continuous to accommodate the hard ceiling clip spacing requirements.
- The framing material must be suitable to hold the diffuser in place when attached with screws through the DFL mounting clips.
- The width of the framed opening required depends on the model of DFL being installed. The frame opening width dimension, 'W', is listed in Table 1.

NOTE: If it appears that it will be difficult to install plenums after the opening is framed and DFL is installed, then use wires to support the plenums above the framework first.

TABLE 1: FRAME OPENING WIDTH “W”			
DFL MODEL	1-SLOT	2-SLOT – 2NV	2-SLOT – 2AB
DFL10	3 1/4" (83)	5 11/16" (144)	6 9/16" (167)
DFL15	4 1/4" (108)	7 11/16" (195)	8 9/16" (217)
DFL20	5 1/4" (133)	9 11/16" (246)	10 9/16" (268)
DFL25	6 1/4" (159)	11 11/16" (297)	12 9/16" (319)
DFL30	7 1/4" (184)	13 11/16" (348)	14 9/16" (370)

The width provided in Table 1 is NOT the actual width of the DFL Diffuser. Any differences will need to be covered with the sheet rock (See Step 7). For width of the diffuser, refer to the DFL submittal. \*\*

\*\* Frame opening is different for concealed fastening. See Page 9 for concealed fastening installation.

**STEP #3. ATTACH MOUNTING CLIPS TO DFL FRAME**

- Hard Ceiling Clips are shipped loose for field attachment to the DFL diffuser.
- Slide the Hard Ceiling Clips into the lower track on the outside of the frame of each diffuser frame rail as shown in Figure 3.
- Position the clips at a maximum of 10" intervals along the diffuser frame rail.

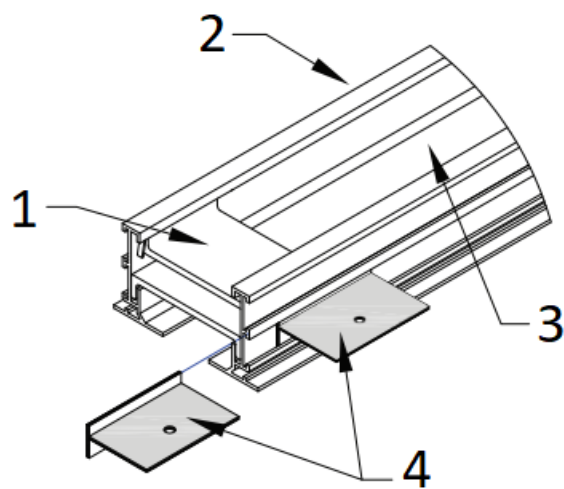


Figure 3. Installing Hard Ceiling Clips

1. SPREADER
2. DIFFUSER FRAME

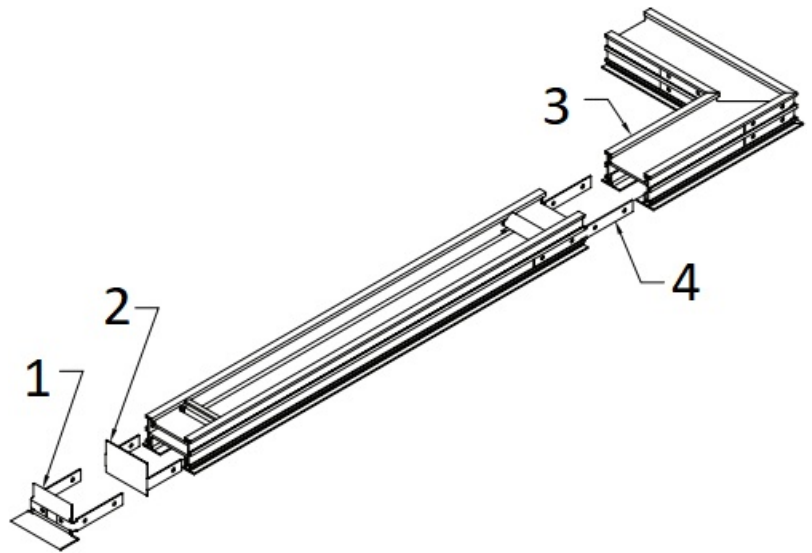
### 3. PATTERN CONTROLLER

### 4. HARD CEILING CLIPS

#### STEP #4. ATTACH DIFFUSER TO CEILING FRAME

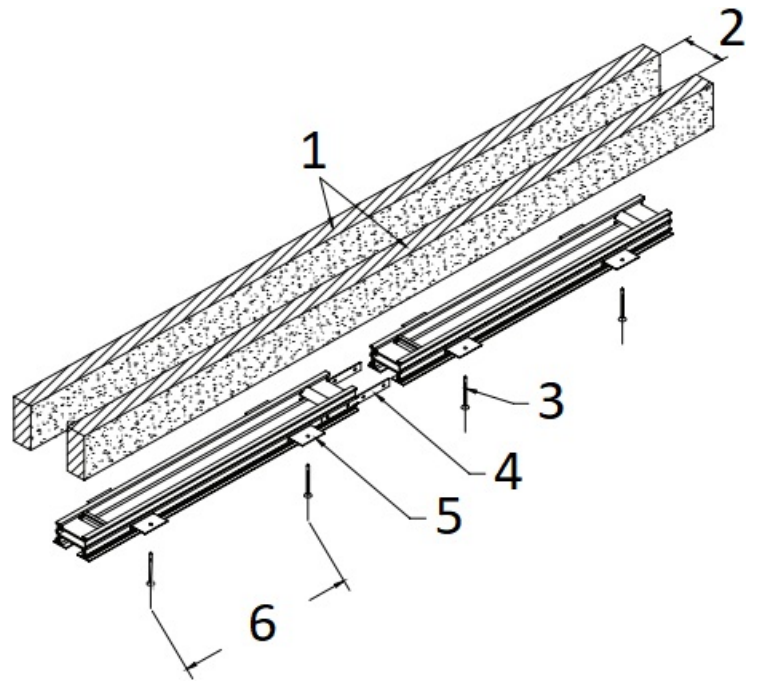
- Install and secure end caps and mitered corners to the straight sections of linear prior to lifting the DFL diffuser into the framed opening as shown in Figure 4.
- Lift the DFL diffuser into the framed opening and secure the mounting clips to the subframing at maximum 10" intervals with flat head screws as shown in Figure 5.
- If multiple sections of DFL are required, repeat previous step by lifting additional sections into the framed opening. Be sure to insert Spline Support Clips-SS into the DFL ends to insure a tight and aligned connection as shown in Figure 5.

Figure 4. Installation of End Caps, End Plates & Mitered Corners



1. END CAP
2. END PLATE
3. MITERED CORNER
4. SPLINE SUPPORT CLIP

Figure 5. Installation of Diffuser in Ceiling



1. SUBFRAMING (BY OTHERS)
2. FRAME OPENING WIDTH (W) SHOWN IN TABLE 1
3. MOUNTING SCREWS
4. SPLINE SUPPORT CLIP SS
5. HARD CEILING CLIP
6. 10" MAXIMUM CENTERS

#### STEP #5. ATTACH PLENUM TO DIFFUSER

- If plenums were secured above ceiling using hanger wire earlier, pull it towards and attach it to the DFL by snapping it onto the neck of the diffuser using the provided plenum clips as shown in Figure 6.
- If plenums were not mounted earlier, lift the plenums into place and attach them to the DFL using the same process as previous described.
- Plenums may need support with ceiling wire to the building structure per code requirements.

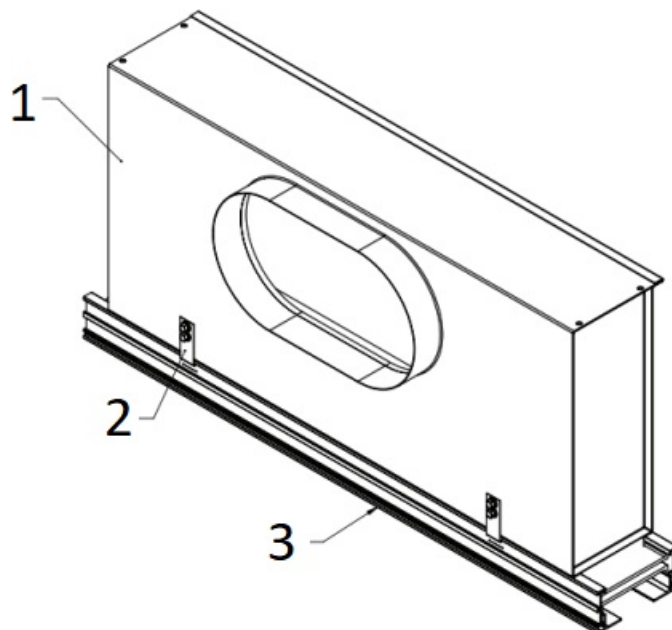


Figure 6. Attachment Plenum to Diffuser

1. PLENUM
2. PLENUM CLIPS
3. DIFFUSER

**STEP #6. ATTACH INLET DAMPER (IF REQUIRED)**

- Attach optional inlet damper assembly (if supplied) to the inlet collar. Position the lever inside the plenum on the bottom of the inlet collar.
- Install the inlet duct on the plenum inlet collar using the methods prescribed by the sheet metal specification.
- Note that inlet damper adds 6" to inlet depth.

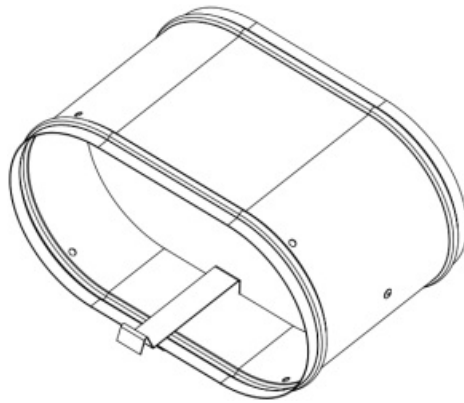


Figure 7. View of Inlet Quadrant Damper

**STEP #7. INSTALL DRYWALL**

- Slide the drywall tightly between the mounting clips and the DFL flange as shown in Figure 8. For ease of installation, insert the tapered edge of the drywall into this opening. For the best fit, slide the edge of the drywall all the way to the vertical leg of the frame.
- Fasten drywall to subframing per job requirements. For ease of taping and finishing the wall, a 1" gap (minimum) is recommended between the diffuser flange and drywall screws.
- For border EE only, the leading edge of sheet rock or wood ceiling must be trimmed at a 30° angle to match the diffuser as shown in Figure 9.

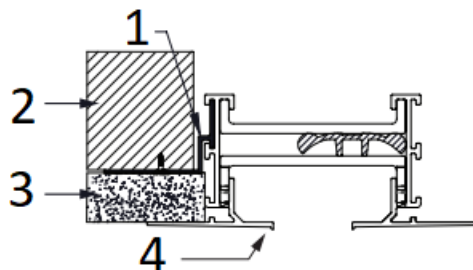


Figure 8. Drywall Installation  
(Frame BB Shown)

1. HARD CEILING CLIP

2. SUBFRAMING (BY OTHERS)
3. DRYWALL
4. DIFFUSER FLANGE

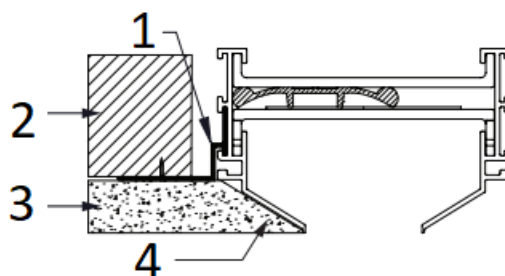


Figure 9. Drywall Installation  
(Frame EE Shown)

1. HARD CEILING CLIP
2. SUBFRAMING (BY OTHERS)
3. DRYWALL
4. DRYWALL CUT AT 30° ANGLE TO MATCH DIFFUSER FLANGE

**STEP #8. REVIEW INSTALLATION – (FRAME BB & EE ONLY)**

**Before continuing it is recommended that the installer confirm that:**

- The DFL diffuser is secure and straight.
- For units longer than twelve feet, a 1/8" gap between sections is recommended to allow for thermal expansion.
- Do not run the HVAC system during the finishing procedures. This could cause premature drying of the compounds, making them more prone to cracking.

**STEP #9. FINISH THE SURFACE – (FRAME BB & EE ONLY)**

- Thoroughly wipe the entire finishing flange with solvent/degreaser such as Rust-Oleum Ready-To-Use Cleaner/Degreaser to remove any oils or residue.
- Install one coat of bonding agent, such as Plaster Weld made by Larsen Products Corp., onto the entire surface of the finishing flange. Follow the manufacturer's instructions. (These products are readily available from plaster supply houses.) The bonding agent makes an extremely strong bond so the compound will not delaminate from the flange.
- Embed a 4" wide mesh tape into the first coat. The mesh should cover all of the aluminum and extend at least 2" onto the sheetrock surface. If 4" wide mesh tape is not available, overlap multiple pieces of narrower tape to cover the 4" width. Apply the first coat of finishing compound. Use a "durabond" setting type compound.
- After the first coat dries, apply two coats of standard finishing compound and let dry.
- Sand smooth, prime, and paint as scheduled.

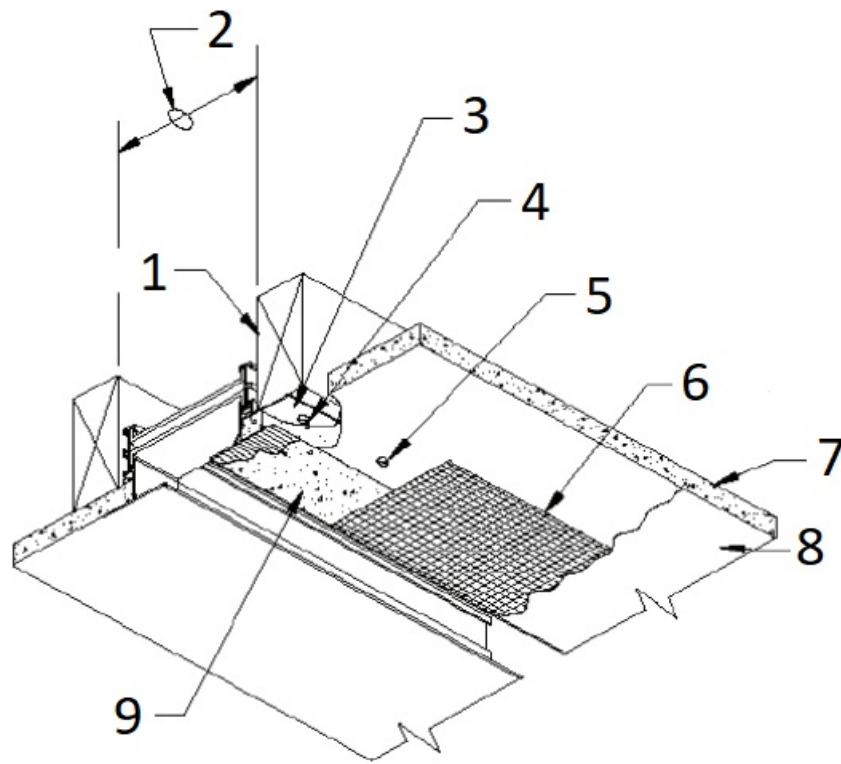


Figure 10. DFL Diffuser, BB Installation Shown

1. FRAMING MEMBER
2. CEILING FRAME OPENING WIDTH (W) SHOWN IN SUBMITTALS
3. HARD CEILING CLIPS TO BE LOCATED EVERY 10"
4. SCREW HARD CEILING CLIPS TO CEILING FRAME
5. SCREW THROUGH DRYWALL INTO CEILING FRAME EVERY 12"
6. 4" WIDE MESH TAPE
7. DRYWALL
8. JOINT COMPOUND
9. BONDING AGENT

#### **INSTALLATION METHOD #2: DFL INSTALLED AFTER HARD CEILING (CONCEALED FASTENING)**

Krueger's DFL linear diffusers are designed to integrate with the ceiling system. With Concealed Fastening, the integration process takes place by installing the diffuser AFTER the ceiling is installed. Figure 10 below summarizes the steps required to install a DFL diffuser system as part of the concealed fastening, hard ceiling installation. Concealed Fastening can only be used with Frame FF or Frame BB.

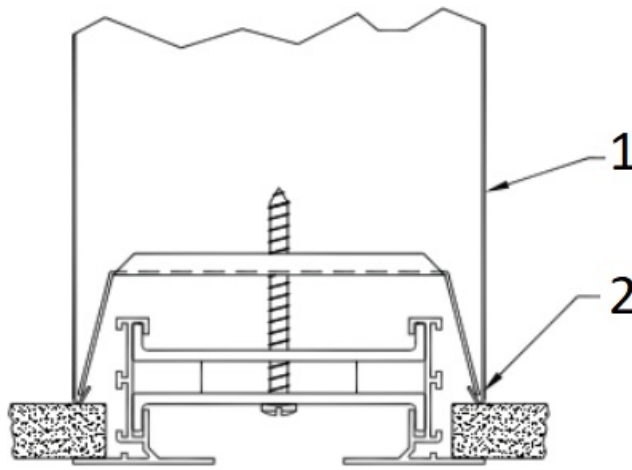


Figure 11. Installed DFL in Hard Ceiling Application with Concealed Fastening

1. PLENUM
2. MOUNTING BRACKET LAYS IN HEMMED EDGE OF PLENUM

#### Summary of Steps to Install DFL in Hard Ceiling with CF Mounting

1. Plenum Installation
2. Damper Installation (if required)
3. Hard Ceiling Installation
4. Concealed Mounting Bracket Installation
5. Diffuser Installation

**See the video animation of this installation method on Krueger's YouTube channel!**

<https://youtu.be/bSQJ2HYjyJ8?si=q1FdkBGcOfv0rNUE>

**Skip to Installation Method #1: DFL Installed BEFORE Hard Ceiling (Clip Install), PG 3**

#### STEP #1. PLENUM INSTALLATION

**If there is no access above the ceiling, the plenum will need to be mounted before the ceiling is installed.**

- Install Krueger DFL Plenum (DFP) by securing with hanger wire to the ceiling above.
  - Alternate Method: Attach plenum to a framed out opening using provided dimensions in Table 2.
- If a non-factory plenum is being provided, a hemmed edge is required at the bottom edges to properly attach the concealed mounting bracket(s).
- If using an inlet damper proceed to Step 2, otherwise attach ductwork to the plenum and proceed to Step 3.

TABLE 2: FRAME OPENING WIDTH			
DFL MODEL	1-SLOT	2-SLOT – 2NV	2-SLOT – 2AB
DFL10	3 3/4" (95)	6 3/16" (157)	7 1/16" (180)
DFL15	4 3/4" (121)	8 3/16" (208)	9 1/16" (230)
DFL20	5 3/4" (146)	10 3/16" (258)	11 1/16" (281)
DFL25	6 3/4" (171)	12 3/16" (310)	13 1/16" (332)
DFL30	7 3/4" (197)	14 3/16" (360)	15 1/16" (383)

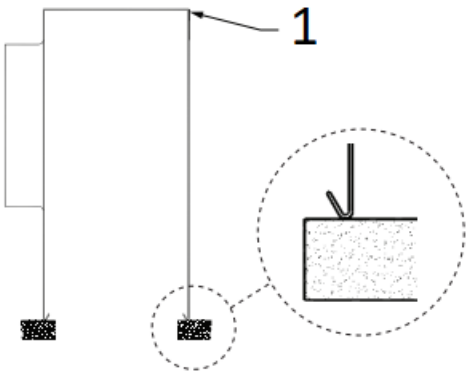


Figure 12a. Installation of DFL Plenum & Hemmed Edge Detail

1. HANG PLENUM WITH WIRE

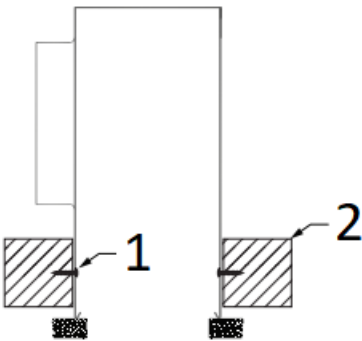


Figure 12b. Installation of DFL Plenum with Framing

- 1. SCREW
- 2. FRAMING

#### STEP #2. DAMPER INSTALLATION (IF REQUIRED)

- Attach the inlet damper assembly to the inlet collar. Position the lever inside the plenum on the bottom of the inlet collar.
- Install the inlet duct on the plenum inlet collar using the methods prescribed by the sheet metal specification.
- Note: inlet damper adds 6" to inlet depth.

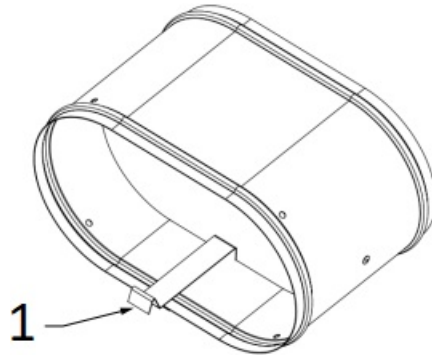


Figure 13. View of Inlet Damper

#### 1. LEVEL POSITION

#### STEP #3. HARD CEILING INSTALLATION

- The ceiling contractor can now install the hard ceiling and finish the ceiling surface.
- The width of the ceiling opening depends on the DFL being installed. The ceiling opening widths, dimension 'O', are listed in Table 3.

The width provided in Table 1 is not the actual width of the DFL diffuser. For the width of the diffuser, refer to the DFL submittal below:

<https://www.krueger-hvac.com/file/6308/GC0110.PDF>

TABLE 3: CEILING OPENING WIDTH “0”		
DFL MODEL	1-SLOT	2-SLOT – 2NV & 2WV
DFL10	3”(76)	5 1/2” (140)
DFL15	4” (102)	7 1/2” (191)
DFL20	5” (127)	9 1/2” (241)
DFL25	6” (152)	11 1/2” (292)
DFL30	7” (178)	13 1/2” (343)

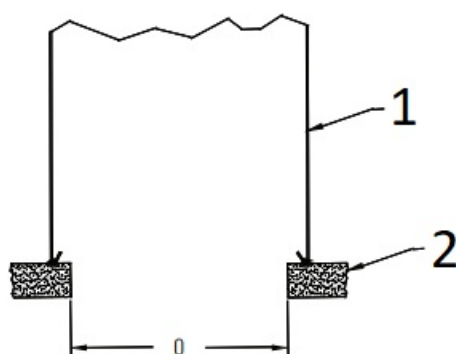


Figure 14. Ceiling Opening Widths

1. PLENUM
2. CEILING

#### STEP #4. CONCEALED MOUNTING BRACKET INSTALLATION

- Concealed Mounting Brackets are shipped loose for field attachment to the DFL diffuser.
- Position the brackets at a maximum of 24” intervals along the diffuser.
- Insert the #10 x 2 1/2” screw (provided by Krueger) into the spacer of the diffuser through the face. The spacer has a hole drilled in the center.
- Loosely fasten the screw to the concealed mounting bracket.

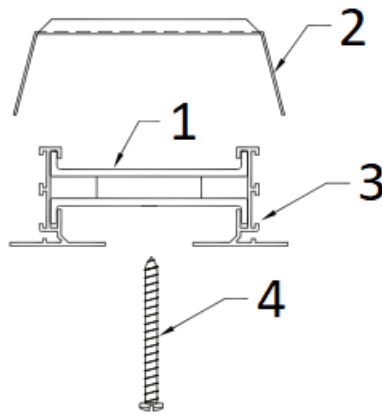


Figure 15. Concealed Mounting Components

1. SPACER
2. CONCEALED MOUNTING BRACKET
3. DESIGNFLO DIFFUSER
4. #10 x 2 1/2" SCREW

#### STEP #5. DIFFUSER INSTALLATION

- Lift the DFL diffuser into the ceiling opening. The concealed mounting bracket will snap into the hemmed edges of the plenum. (You have to push on the screw head to get the concealed mounting bracket to snap in).
- Tighten the screw until the DFL is tight against the ceiling; make sure that the ceiling opening is covered by the flanges of the diffuser.
- If multiple sections of DFL are required, repeat previous step by lifting additional sections into the ceiling opening. Be sure to insert Spline Support Clips (SS clips) into the DFL butt-cut ends to ensure a tight and aligned connection as shown in Figure 16.
- Figure 17 depicts the finished installation of the diffuser and plenum in the hard ceiling.

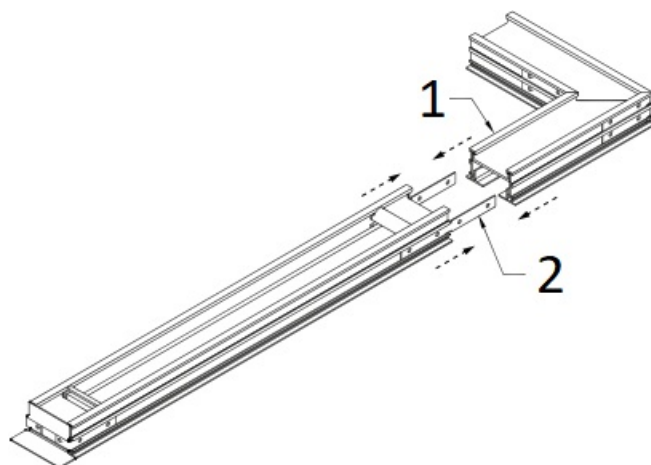


Figure 16. Connecting Segments

1. MITERED CORNER
2. SPLINE SUPPORT CLIP

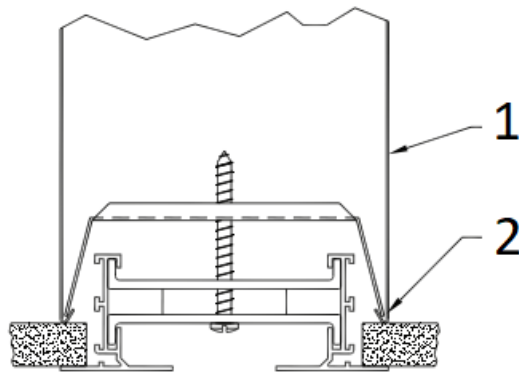


Figure 17. Finished Installation of Diffuser in Ceiling

1. PLENUM
2. MOUNTING BRACKET LAYS IN HEMMED EDGE OF PLENUM

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## Documents / Resources

	<p><a href="#">KRUEGER DesignFlo DFL Linear Diffusers Ceiling System</a> [pdf] Installation Guide DesignFlo DFL Linear Diffusers Ceiling System, DFL Linear Diffusers Ceiling System, Diffusers Ceiling System, Ceiling System, System</p>
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## References

- [User Manual](#)

[Manuals+](#), [Privacy Policy](#)

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