

DUCT BOARD FABRICATION INSTRUCTIONS

For heating and cooling air duct systems operating at velocities up to 5000 fpm, 250°F, 2" w.g. static pressure

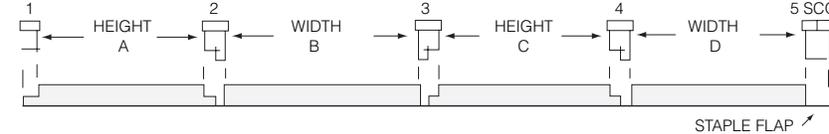
Straight Duct

Straight duct sections are fabricated using hand tools or a grooving machine. Boards are grooved at fold lines with either shi lap or V-groove tools. Both methods remove the same amount of fiber glass. Method shown here is used to make one piece duct by shi lap method using hand tools. Two piece "L", two piece "U", and four piece ducts can also be made using either method. Finished duct effective length is approximately

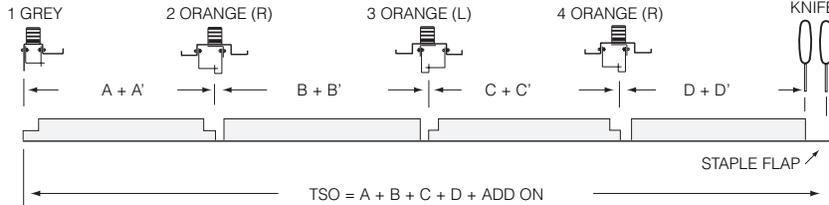
46" to 47" depending on board thickness, due to male and female shi lap ends.

First, determine length of board required to make a duct of the desired size. This is twice inside duct height plus twice inside duct width plus stretch-out. See table below. Stretch-out provides for fiber glass grooves, side joint lap, and staple flap.

Machine Tool Set-up



Hand Tool Set-up

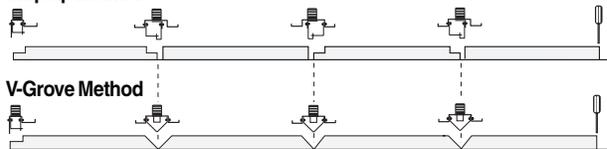


Duct board thickness	A'	Panel add-on dimensions		D'	Staple flap	Stretch-out add-on
		B'	C'			
1"	1 ³ / ₄ "	1 ³ / ₄ "	1 ³ / ₄ "	1 ³ / ₈ "	1 ³ / ₈ "	8"
1 ¹ / ₂ "	2 ³ / ₄ "	2 ³ / ₄ "	2 ³ / ₄ "	2 ¹ / ₈ "	2 ¹ / ₈ "	12 ¹ / ₂ "
2"	3 ³ / ₄ "	3 ³ / ₄ "	3 ³ / ₄ "	2 ¹ / ₈ "	2 ¹ / ₂ "	16 ⁵ / ₈ "

Hand Fabrication

Tools required: Yardstick or tape measure, straightedge, orange (shi lap) or red (v-groove) tool, grey (female shi lap) tool, duct board knife, marking pen.

Shi lap Method



V-Groove Method



1. Determine board length as described above. Measure and draw groove centerlines starting at left side of board using straightedge, adding stretch-out allowances. Draw two lines for staple flap at right side of board.



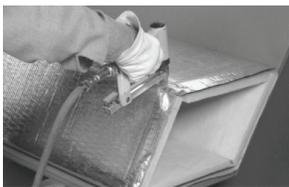
3. Use orange tool to cut right and left hand shi laps for folding duct. Start with right hand groove, turn tool around for second (left hand) groove, turn back to cut third (right hand) groove. (Use red tool for all 3 V-grooves.)



5. Fold up duct and square ends. A folding table makes this job easier. Push out of square and staple flap on about 2" to 3" centers with outward-clinching staples. Start in middle, work toward ends. Release pressure and duct will snap square.



2. Use grey tool to cut female side joint shi lap on left edge of board.



4. Use straightedge and knife to cut off board and facing at second (far right) line. Cut down to facing (not through it) at next to last staple flap line. Remove groove and staple flap scrap. Clean glass fibers from staple flap.



6. Apply approved closure to staple flap

For complete information and installation instruction procedures, refer to NAIMA *Fibrous Glass Duct Construction Standard*, Pub. No. AH 116.

Closure Systems

Only closure systems listed and labeled under UL 181A, Part I, II, or III are acceptable for use to meet requirements of UL 181 for Class 1 rigid ducts.

- UL 181A part I (P) is for pressure-sensitive tape closures.
- UL 181A part II (H) is for heat-activated tape closures.
- UL 181A part III (M) is for glass fabric and mastic closures.

To comply with requirements of UL 181A, part I and part II, tapes must be imprinted with the manufacturer's name, product designation, manufacturing date code, and UL 181A-P (for part I) or UL 181A-H (for part II).

To comply with requirements of UL 181A, part III, mastic container must be labeled with the manufacturer's name, product designation, manufacturing date code, and UL 181A-M, along with application instructions. Glass fabric designation is "fiber glass scrim, 3" wide, 5 mil thick, 20 x 10 plain weave, 1³/₄ oz. per sq. yd."

Use of non-listed closures voids the UL 181 Class 1 Air Duct rating.

Joint Preparation

Prepare longitudinal joints as described. Prepare transverse joints by joining two duct sections, pulling staple flap over adjoining section, and stapling on 2" centers.

Surface Preparation

To obtain satisfactory adhesion and bonding, closure surface must be clean and dry. Dust, dirt, oil, grease, fingerprints, moisture, and similar substances may result in adhesion and bonding failure. In most cases, wiping the closure surface clean with an oil and lint free rag or paper towel is sufficient. For best results on contaminated surfaces, follow tape manufacturer's cleaning recommendations.

Pressure-sensitive Tape (normal conditions)

Use 2¹/₂" (min.) wide tape with 1" and 1¹/₂" duct board; use 3" (min.) wide tape with 2" duct board. Position tape along edge of flap with 1" (min.) overlap on adjacent surfaces. While holding tape taut, press in place avoiding wrinkles and folds. Rub tape firmly with plastic squeegee until scrim reinforcement shows through tape.

Pressure-sensitive Tape (low temperature conditions)

If tape has been stored at temperatures below 50°F, recondition before use by placing in a warm environment (about 70°F) for at least 12 hours. Using suitable heating iron with plate temperature set at 400°F (±25°F), pass iron once over bond area to achieve initial working tack. Quickly position tape on pre-heated area and press in place. Pass iron two or three times over taped area using rapid ironing motion. Complete bond by rubbing tape firmly with plastic squeegee.

Heat-activated Tape

Use 3" (min.) wide tape. Position tape along edge of flap to allow 1" (min.) overlap on adjacent surfaces. Using a suitable heating iron with a plate temperature between 550°F and 600°F, pass iron along tape seam with sufficient pressure and dwell time to activate adhesive and bond to facings. Complete bond with a second pass of the iron, applying pressure to front edge of iron in a smearing action until heat indicator dots on tape become dark and scrim reinforcement shows through tape.

Glass Fabric and Mastic

Using brush or trowel, apply thin coat of mastic about 3¹/₂" wide over center of joint seam. Firmly press glass fabric into mastic. Apply second coat of mastic over fabric, completely filling scrim pattern. Follow mastic manufacturer's recommendations on set-up time and application rates.

FABRICATION AND INSTALLATION INSTRUCTIONS AND FIRE RATED ASSEMBLIES

Figure 1. Design Nos. P-214, P-225, P-259, P-263, G-243

The sheet metal duct drop is positioned at the center of a 24" long, minimum 0.029" thick (#22 MSG) sheet steel duct liner, insulated with 1" thick, min. 5 pcf density rigid fiber glass material. Ducts are supported by 0.053" (min.) thick (#16 MSG) 1 1/2" cold rolled steel channels suspended from joists with #12 SWG galvanized steel hanger wire. Channels are located directly below the sheet metal duct liner, one on each side of the drop, spaced between drops 72" on centers for ducts up to 36" wide and 48" on centers for ducts between 36" and 60" wide. Refer to Underwriters Laboratories Fire Resistance Directory for complete assembly descriptions.

Figure 2. Hangers and Supports

In almost all cases the designer of the system should detail hanger specifications. These requirements should follow those shown in NAIMA Fibrous Glass Duct Construction Standard or SMACNA Fibrous Glass Duct Construction Standards. Local building code requirements must also be considered.

Ducts shall be supported uniformly with 3" wide sheet metal channels constructed and spaced as shown in Figure 2. Channels are suspended trapeze style using 12 gauge (min.) hanger wire or 1" wide, 22 gauge hanger strap.

Fittings such as tees, elbows, offsets, and transitions may need additional support to avoid undue stress on joints. Equipment such as humidifiers must be separately supported.

For duct sizes not exceeding 24" high by 48" wide, 2" wide by 1 1/2" deep hangers of 22 gauge sheet metal on 4 foot (max.) intervals can be substituted for 3" channels if total hanger extension does not exceed 6'.

In residential applications where internal duct pressure does not exceed $\pm 1/2$ " w.g. and duct width does not exceed 36", channels 1 1/2" wide by 1" deep of 22 gauge sheet metal can be used on intervals not exceeding 8 feet.

If total extension is not greater than:	Minimum channel gauge	Minimum channel gauge
6"	24	3" x 1 1/2"
18"	22	3" x 2"
30"	18	3" x 2"

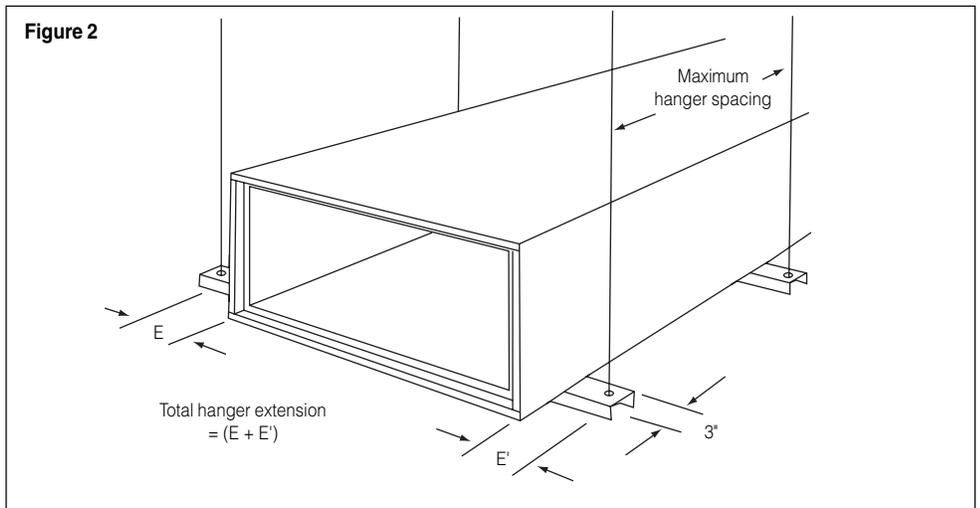
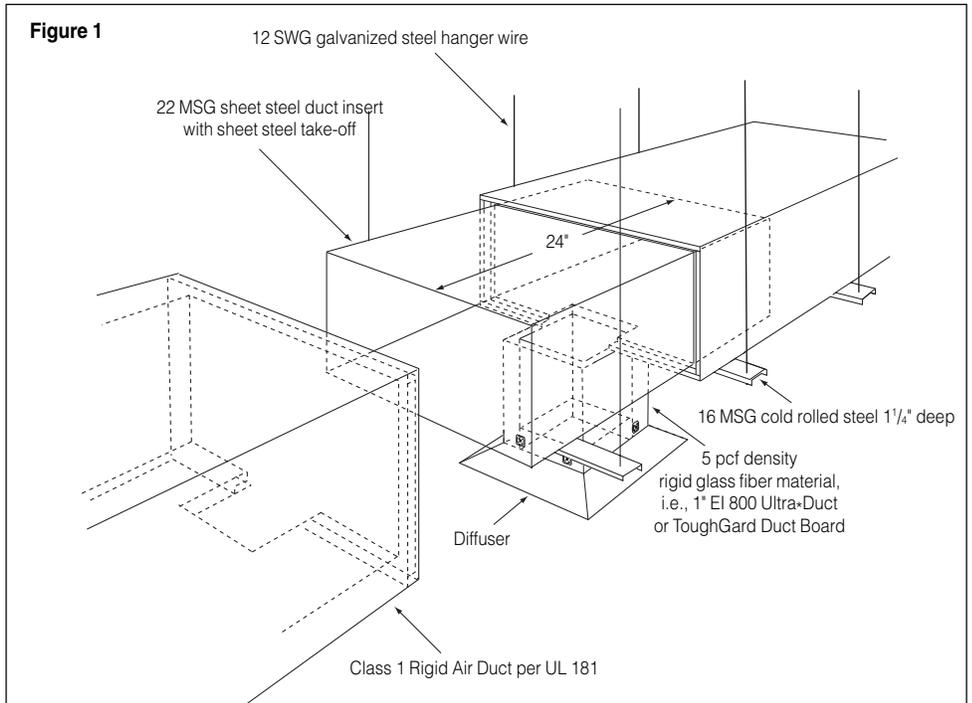
Duct size, inches	Maximum hanger spacing
48" wide or greater	4 ft.
Less than 48" wide and less than 12" high	6 ft.
Width between 24" and 36", height greater than 24"	6 ft.
Width less than 48", height between 12" and 24"	8 ft.
Width less than 24", height greater than 12"	8 ft.

Precautions

1. Fiber glass ducts should not be placed in or under concrete slabs.
2. Fiber glass ducts should not be used out-of-doors without additional reinforcement and weatherproofing.
3. Fiber glass ducts should not be used above recommended air velocities, static pressures, or temperatures.
4. Any constriction occurring during installation should be eliminated to allow duct to return to its original form.
5. If a fiber glass duct system is to be used for air-conditioning only, positive-closing type diffusers and return air grilles should be used. They must be closed during off-season periods to minimize entrance of heat and moisture to avoid condensation.
6. Fiber glass ducts should not be used as vertical risers serving more than two stories in an air duct system.
7. Fiber glass ducts should not be used immediately adjacent to high temperature heating coils.
8. If the facing is accidentally punctured, repair the puncture by sealing with the recommended joint closure.
9. Fiber glass ducts should not be used where air conveyed through the duct system will be contaminated with solid wastes or fumes.

System Commissioning

Purge the system after fabrication and before occupancy to remove any loose matter. If the system is installed after occupancy, install filters over each outlet until system is clear.



Inasmuch as CertainTeed has no control over installation design, workmanship, accessory materials, or conditions of application, CertainTeed does not warrant the performance or results of any installation containing Ultra*DUCT Gold or Toughgard Duct Board. This warranty disclaimer includes all implied warranties, including the warranties of merchantability and fitness for a particular purpose.

For complete information and installation instruction procedures, refer to NAIMA *Fibrous Glass Duct Construction Standard*, Pub. No. AH 116.