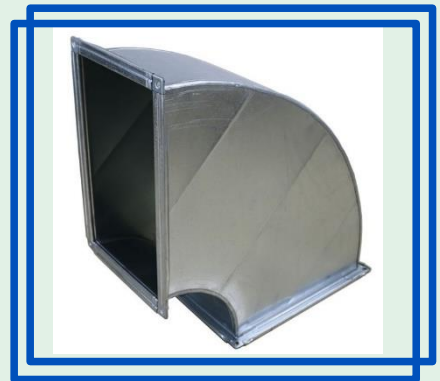


Rectangular Ducts Catalogue



As per SMACNA & DW/144

Materials: Galvanized, Stainless Steel 316 or 304



GREEN CARE SOLUTION ENGINEERING

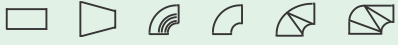
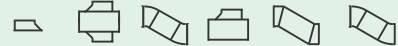

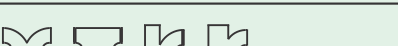
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Website: www.gcse.vn - **Email:** me-workshop@gcse.vn

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Rectangular Ducts

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INTRODUCTION

Air Ducts are associated with Heating, Ventilation and Air Conditioning System (HVAC); they are the pathway for Heated/Cooled air to travel throughout a house/building/tower.

The needed air flows include Supply air, Return air and Exhaust air. Ducts commonly deliver Ventilation Air as part of the supply air. As such, Air Ducts are one method of ensuring acceptable indoor air quality as well as thermal comfort.

Duct system is also called Ductwork. Planning (layout), sizing, optimizing, detailing and finding the pressure loss through a duct system is called duct design.

Green Care are having different shapes, such as Circular, Spiral & Rectangular, made of sheet metal.

In Air Conditioning systems they are designed to carry the air from the home to the Air Conditioning system or furnace and back to the home.

Ducts are usually located within the walls, floors or ceilings. Usually we only see the outlet which is register covered with a grille.

The purpose of a duct system is to transmit air from the central air source to the air diffusers located in the building control zones.



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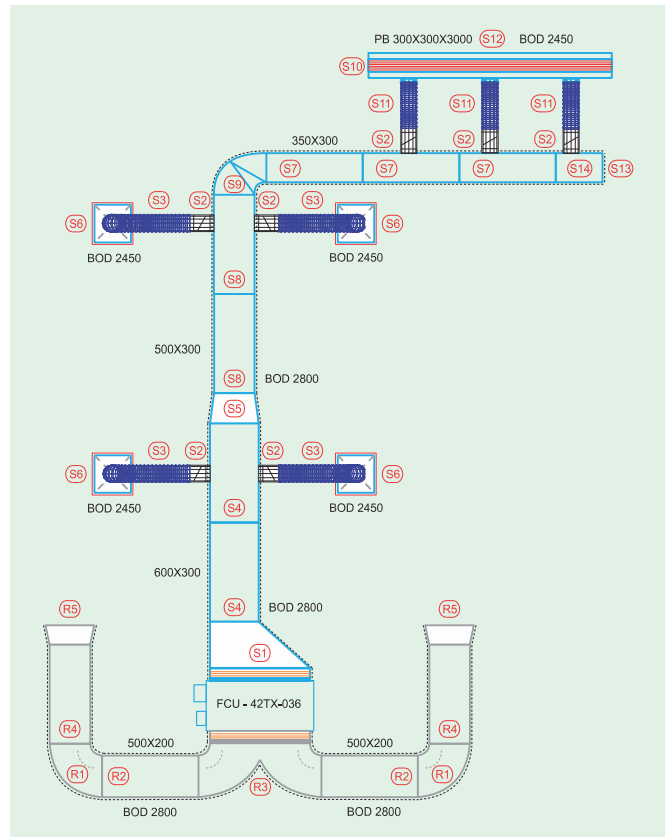
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FABRICATION PROCEDURES

Fabrication of Galvanized Rectangular Ducts shall be based on Drawing/Take-Off provided by the client, by following consequently below procedures:

- a) The Shop Drawings shall be encoded into our CAD-Mep Software, to be converted into individual plans. All items shall be Tagged on the drawings. Individual duct pieces shall be nested on sheet to maximize the sheet usage on CNC Machines avoiding material loss.
- b) An accurate BOQ shall be issued including connectors.
- c) The Fabrication Data shall be saved as NC Program and shall be printed out into different Job Orders. (Straight & Fittings).
- d) The Job orders shall be sent to the CNC Plasma and Coil Line machines for cutting and items identification, as follows:
 - 1- For Straight Rectangular ducts, the Coil shall be cut into sheets and folded through the Coil Line Machine. (Straight Duct standard size shall be 1110mm).
 - 2- For Fittings (Elbow, Tee, Reducer, etc..) the sheets shall be cut through the Plasma Cutting Machine into individual marked pieces; then shall be taken to the assembly area.
 - 3- Connectors shall be fixed to the ducts/fittings as per project specification; stiffener shall be applied in the outer middle of the duct if required.
- e) All Connectors/Joints that shall be fixed to the Ducts and Fittings, shall comply with the project specification. (Flanges/S&C Cleats/Angle Flanges).
- f) For the insulation (if requested), Clean Liner shall be applied inside the duct as per density & thickness required; Adhesive & Welding Pins shall be used for the fixation of the insulation.
- g) Upon completion of fabrication, all items shall be holding Green Mark label with code indicating the followings:
 - 1- Tag No.,
 - 2- PO Reference,
 - 3- Date,
 - 4- Customer Name,
 - 5- Project Name,
 - 6- Job Order No.,
 - 7- Type of Materials (GI, SS.)
 - 8- Weight, Length, Area,
 - 9- Insulation Thickness & Density (if any)
 - 10- Connector Dimensions
 - 11- Item Type (Straight, Elbow, Tee Reducer, etc.)



- h) Each Item shall be holding a colored sticker that defines the exact service provided.



- i) Quantity of items ready for delivery shall be bar coded by our software, same as mentioned in the Delivery Reports.
- j) QA/QC shall be conducted before each delivery in order to indicate the "Passed" Tag or "Rejected"

N.B.: All Ducts fabrication shall be complying with SMACNA Or DW144 Standards

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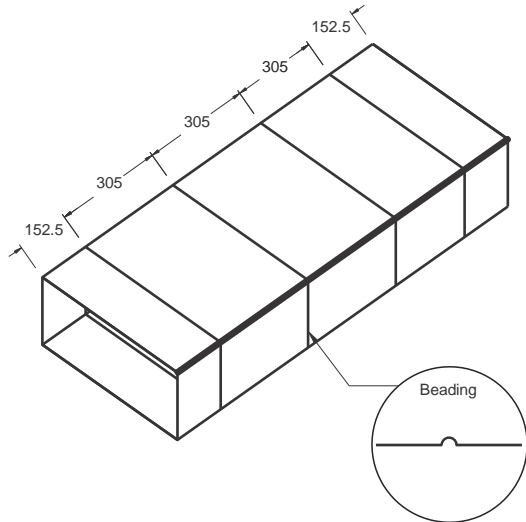
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Website: www.gcse.vn - **Email:** me-workshop@gcse.vn

LONGITUDINAL SEAMS

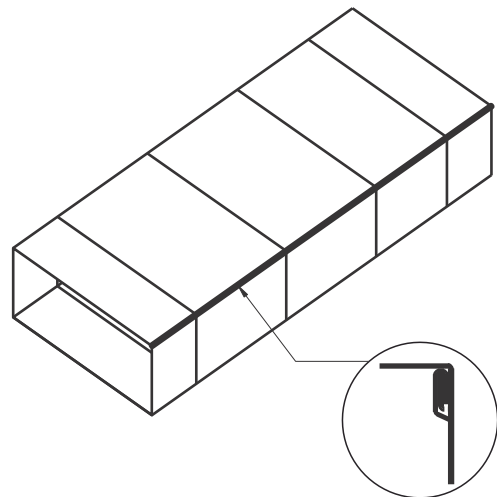
Straight Ducts are Beaded or Crossbroken

Duct sides that are 305mm and over, shall be Crossbroken or Beaded



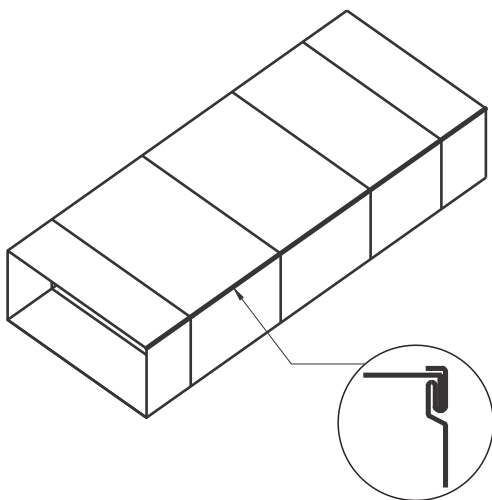
Grooved Corner Seam

- Galvanized Up to 1.5mm
- Stainless Steel Up to 1.2mm



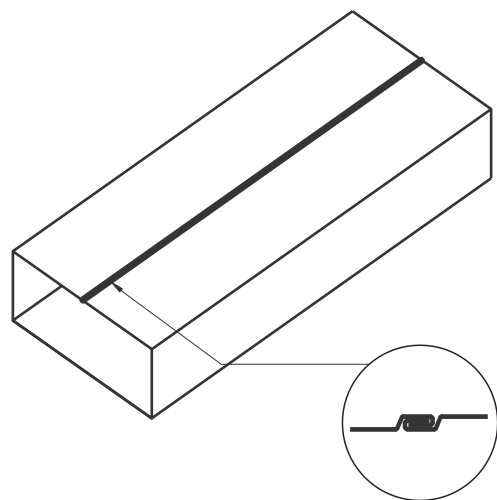
Pittsburgh Lock Seam

- Galvanized 1.5mm maximum
- Stainless Steel 1.2mm maximum



Grooved Seam

- Galvanized 1.5mm maximum
- Stainless Steel 1.2mm maximum



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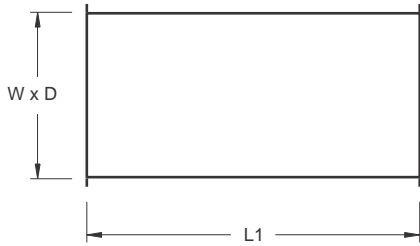
Factory: 117 Vo Van Bich, Hamlet 11, Tan Thanh Dong Commune, Cu Chi District, HCM City

Website: www.gcse.vn - **Email:** me-workshop@gcse.vn

STRAIGHT & FITTINGS

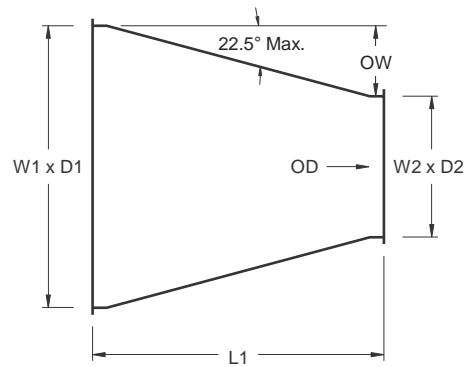
Straight

Standard Length 1110mm
While using Slip & Drive Length will be 1180mm



A

Taper

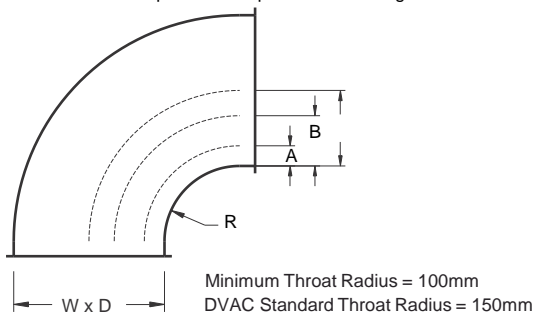


B

Radius Bend

Width - mm	Splitters	Splitter Position		
		A	B	C
400 - 800	1	W/3	-	-
801 - 1600	2	W/4	W/2	-
1601 - 2000	3	W/8	W/3	W/2

Splitter not required in Bend Angles less than 45°



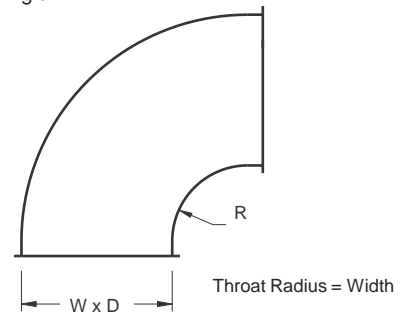
C

Medium Radius Bend (as illustrated)

Can be applied to any Angle

Long Radius Bend

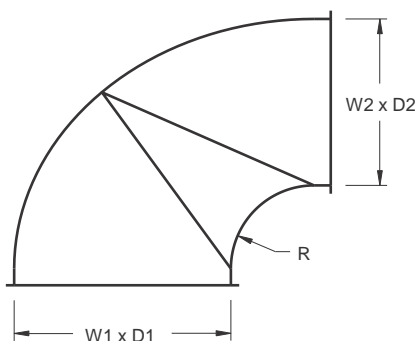
Similar but Radius = Width
Can be applied to any Angle



D

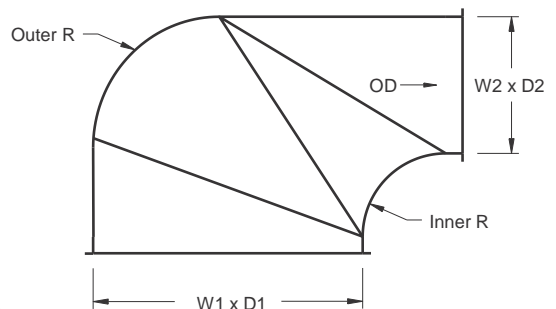
Drop Cheek Bend

Can be applied to any Angle



E

Master Bend



F

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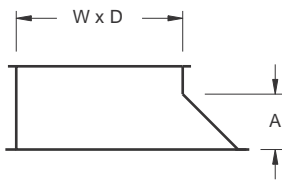
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Website: www.gcse.vn - Email: me-workshop@gcse.vn

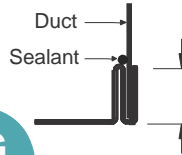
DUCT FITTINGS

Shoe Branch

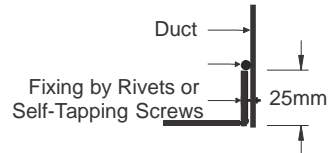


Width (W) mm	Dim. (A) mm
Up to 200	75
.. 300	100
.. 400	125
.. 600	150
Over 600	200

Clinch Lock (Optional)

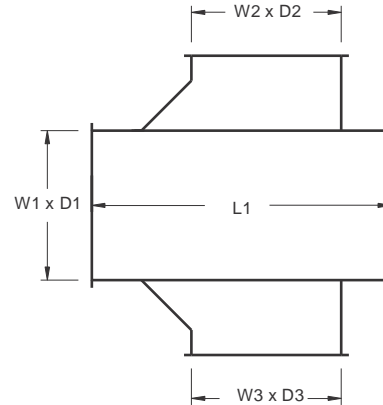


Straight tap (Green Care Standard)



G

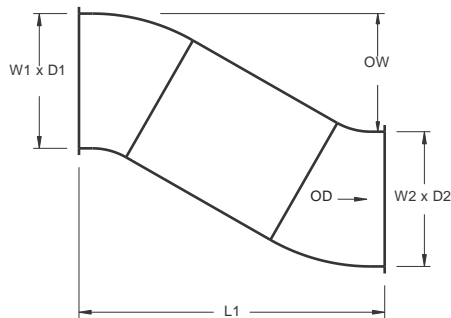
Straight + 2 Branches



H

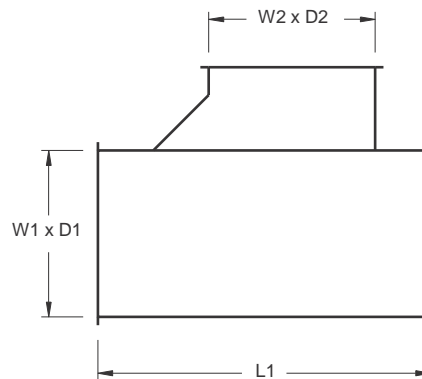
Radius 2-Way Offset

Minimum Throat Radius = 150mm



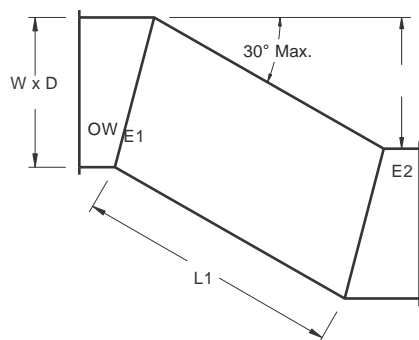
I

Straight + Branch



J

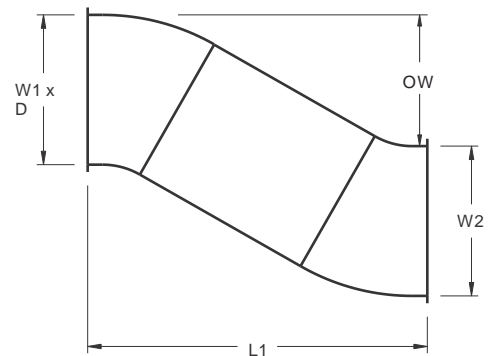
Mitered Offset



K

Radius Offset

Minimum Throat Radius = 150mm



L

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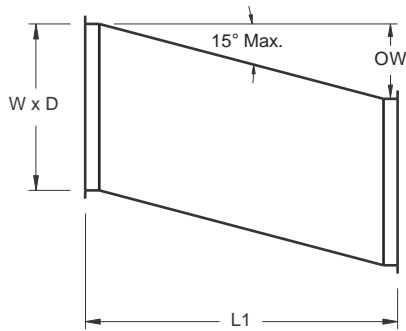
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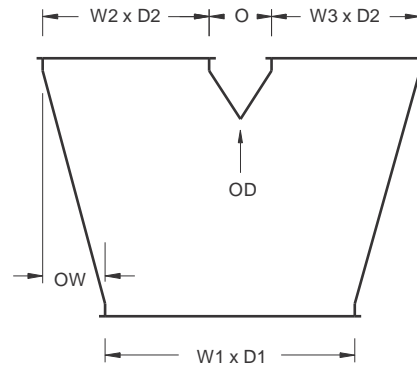
DUCT FITTINGS

Angled Offset



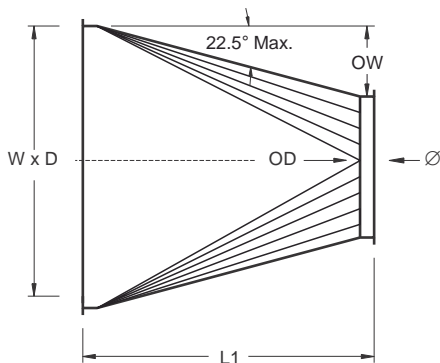
M

Trousers Piece



N

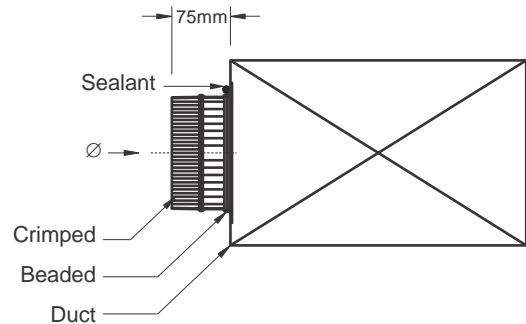
Square to Round



O

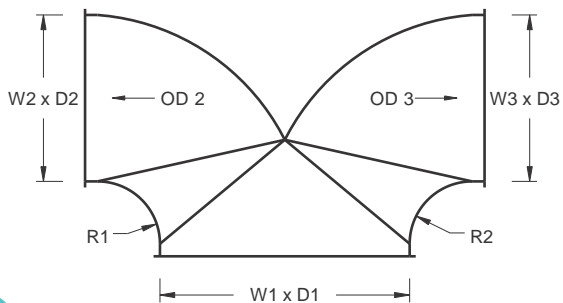
Collar (Dovetail)

VCD Optional



P

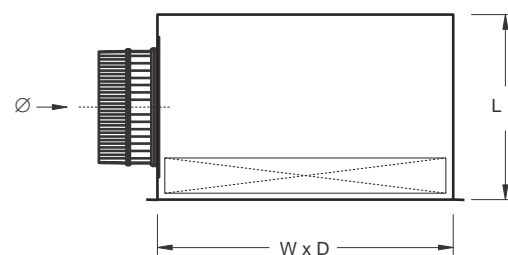
Drop Cheek Breeches Piece



Q

Plenum Box

Side or Top Connection



R

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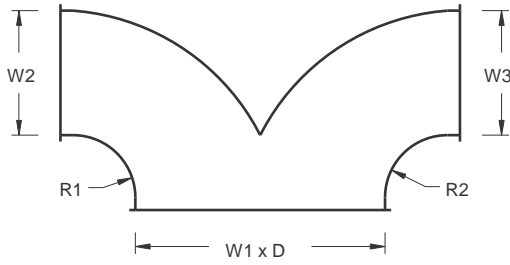
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DUCT FITTINGS

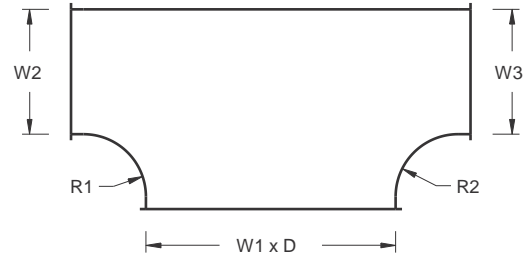
Breeches Piece

Splitter Damper Optional



S

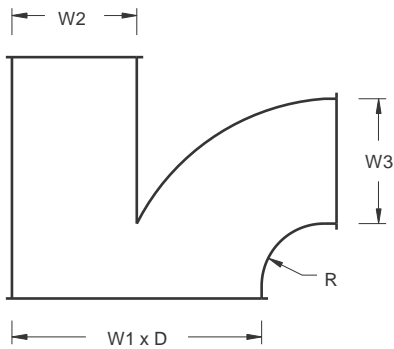
Radius Tee



T

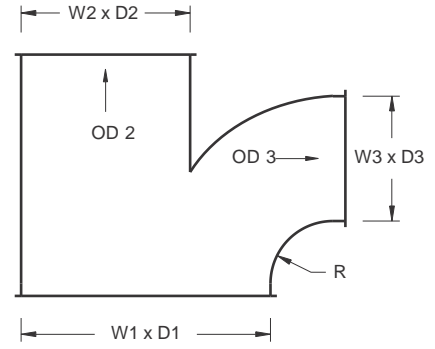
Side Branch

Splitter Damper Optional



U

2-Way Breeches



V

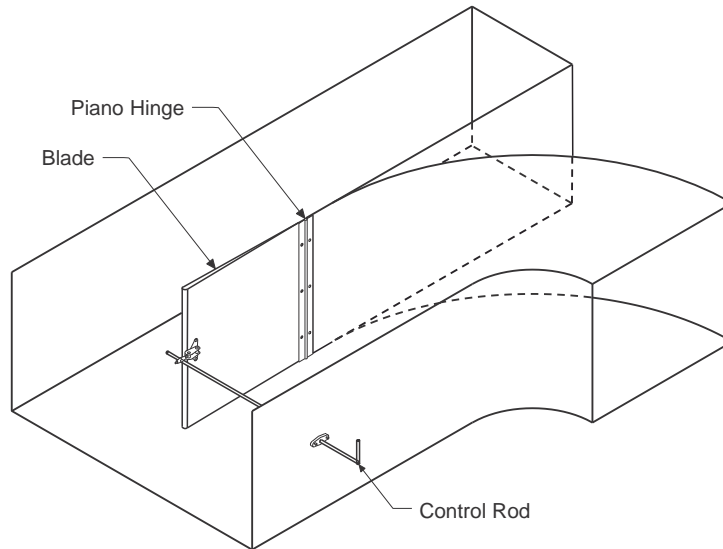
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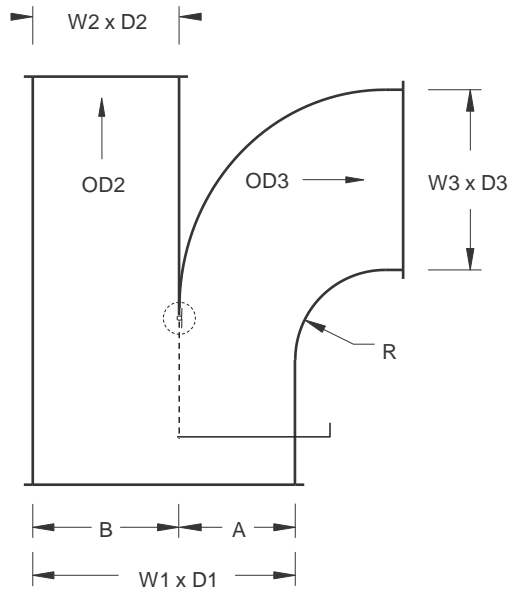
Factory: 117 Vo Van Bich, Hamlet 11, Tan Thanh Dong Commune, Cu Chi District, HCM City

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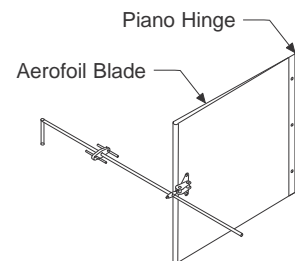
SPLITTER DAMPER



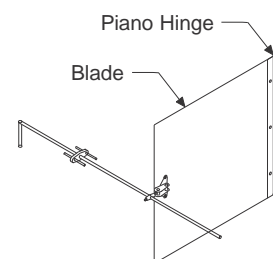
Splitter Damper Length (A x 1.5)



Aerofoil Blade Splitter Damper
(Green Care Standard)



Single Blade Splitter Damper



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ACOUSTIC LINER INSTALLATION

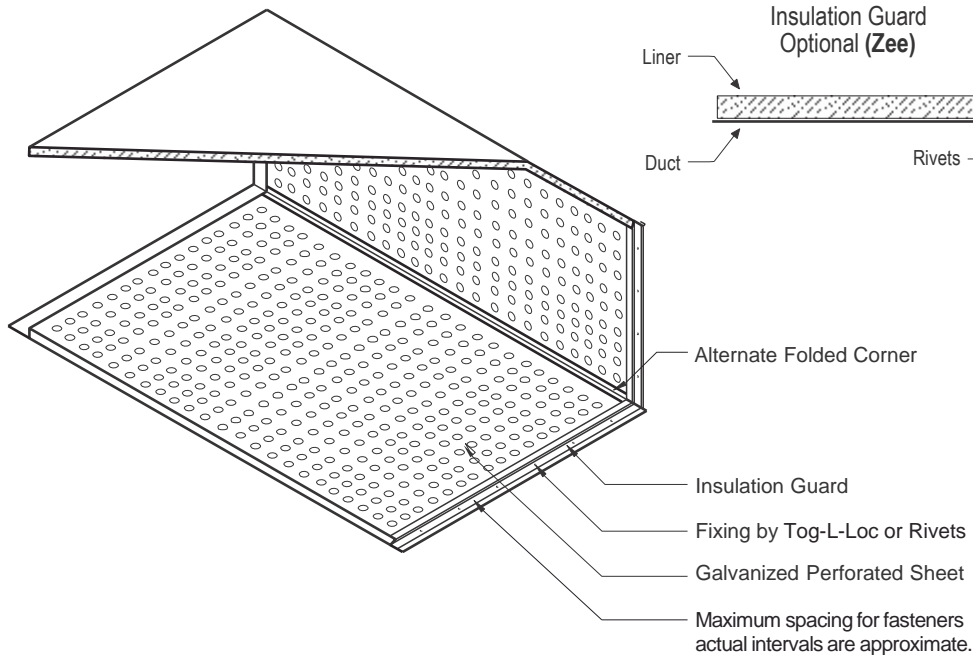
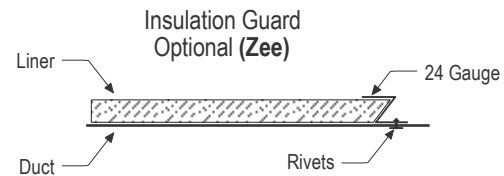
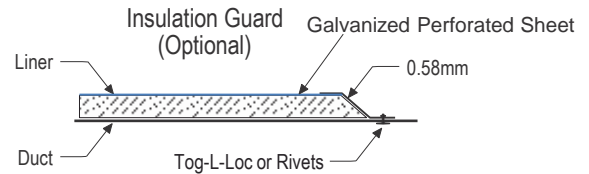
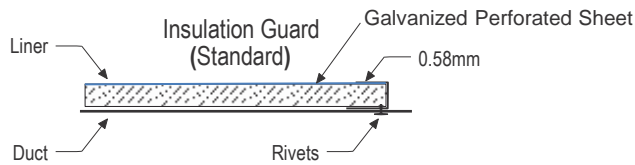
Inside Insulation Covered with Galvanized Perforated Sheet Insuring Full Protection.

Acoustic Liner Thickness & Density as per Client Request

Acoustic Liner: Rockwool - Thickness: 25mm, 32mm, 50mm, 100mm

- Density: 32kg/m³, 60kg/m, 80 kg/m

Galvanized Perforated Sheet: 0.38mm/0.48mm



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PLENUM BOX

Inside Insulation Covered with Galvanized Perforated Sheet Insuring Full Protection.

Acoustic Liner Thickness & Density as per Client Request

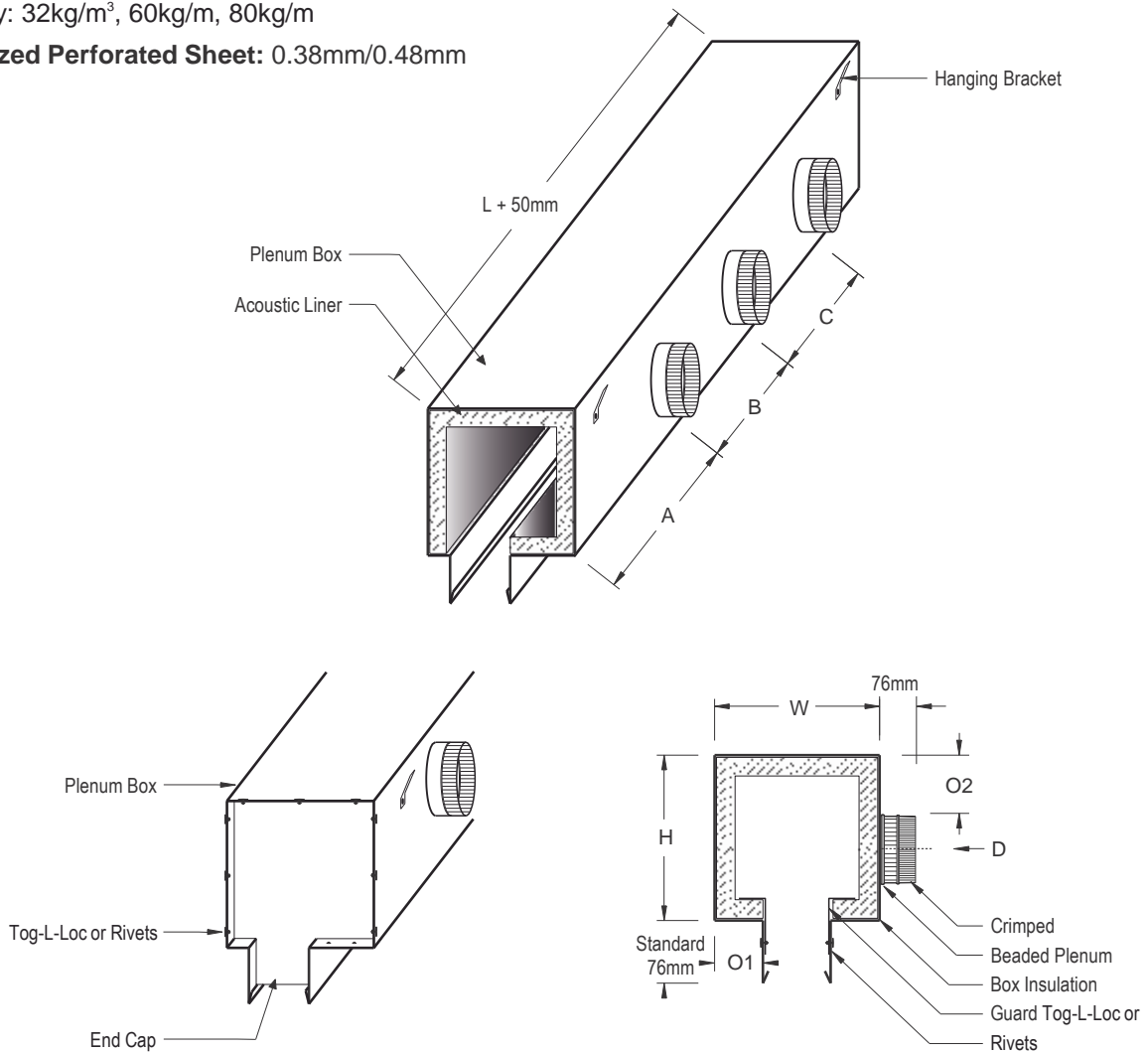
Plenum Box : Fabricated of Galvanized Steel/ Stainless Steel

Acoustic Liner : Rockwool/Insulation

- Thickness: 15mm, 25mm, 32mm, 50mm, 100mm

- Density: 32kg/m³, 60kg/m, 80kg/m

Galvanized Perforated Sheet: 0.38mm/0.48mm



* Liner Adhered to the Plenum Box with 100% Area Coverage of Adhesive.

* Welding Pins Fixation from Center to Center: 300mm.

GREEN CARE SOLUTION ENGINEERING

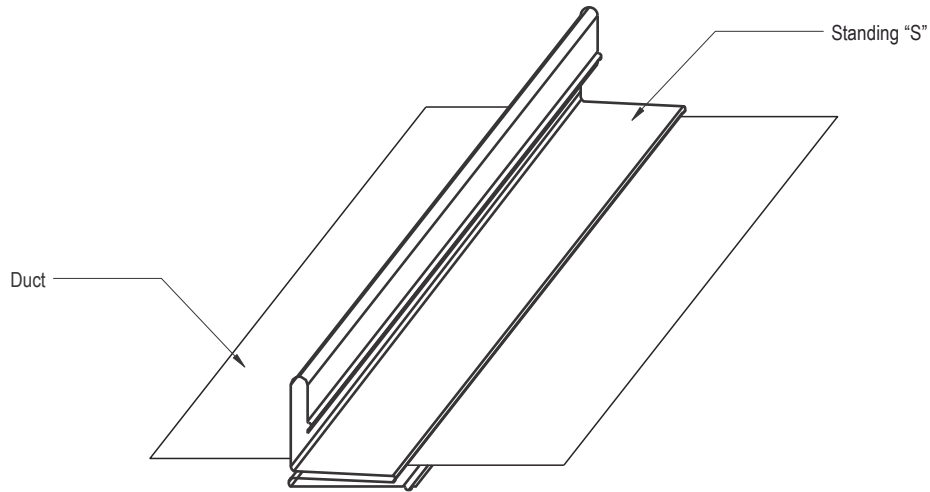
Office: J90 Road B5, An Phu Ward, Thu Duc City, Ho Chi Minh City

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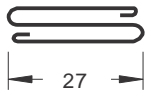
Website: www.gcse.vn - **Email:** me-workshop@gcse.vn

TRANSVERSE JOINTS

Slip & Drive

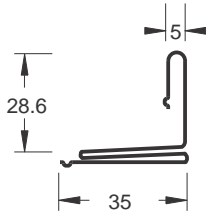


Hemmed "S" Slip
(Standard)
C1 / T-6



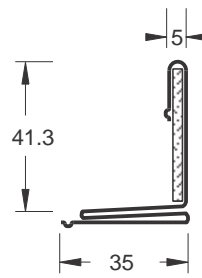
Thickness 0.6mm

Standing "S" 28.6
(Standard)
C2 / T-10



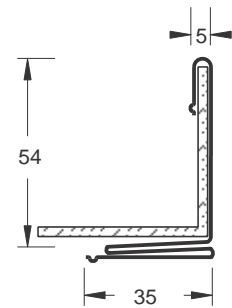
Thickness 0.6 to 1.0mm

Standing "S"
(Optional)
T-13



Thickness 0.7 to 1.2mm

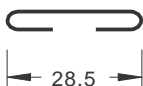
Standing "S"
(Optional)
C3 / C4 / T-14



Thickness 1.0mm

Drive Slip
C1 / T-1

Standard



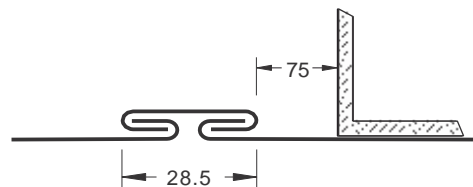
Thickness 0.6 to 1.0mm

Optional



Thickness 0.8 to 1.2mm

Backup Angle for Drive Slip
T-3



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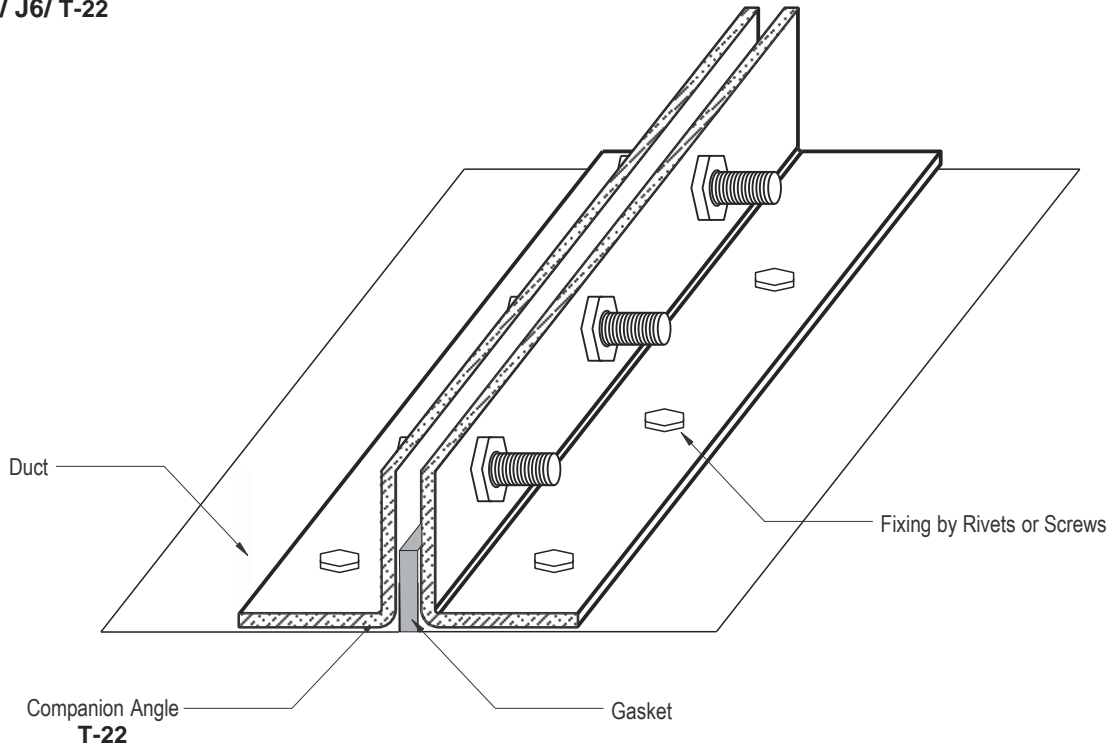
Factory: 117 Vo Van Bich, Hamlet 11, Tan Thanh Dong Commune, Cu Chi District, HCM City

Website: www.gcse.vn - **Email:** me-workshop@gcse.vn

TRANSVERSE JOINTS

Companion Angles

J3 / J4 / J5 / J6 / T-22

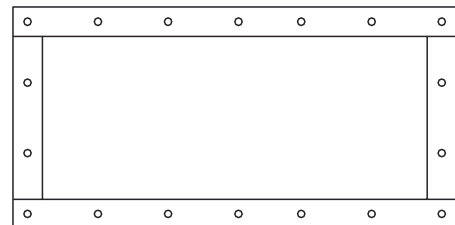


Angle Flanged Joint, with Welded Corners

Dimensions	Rating
25x25x3mm	J3
30x30x4mm	J4
40x40x4mm	J5
50x50x5mm	J6
Fixing Bolts	
25x25x3mm	6mm
30x30x4mm	8mm
40x40x4mm	8mm
50x50x5mm	10mm

Angle Flanged Joint

- Duct Ends Turn up of 10mm
- Fixing Bolts at Each Corner and intermediately Centers at 150mm



Companion Angle & Reinforcement are made of Galvanized or Hot Dip Galvanized Steel Angle

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SPECIFICATION FOR SHEET METAL DUCTWORK

**LOW PRESSURE CLASS “A”
(limited to 500 Pa positive and 500 Pa negative)**

TABLE 2.1 SOCKET AND SPIGOT CONNECTIONS											
Dimensions in mm											
1	2	3	4	5	6	7	8	9	10	11	
MINIMUM SHEET THICKNESS		0.6			0.8			1.0			1.2
DUCT LONGEST SIDE		400	600	800	1000	1250	1600	2000	2500	3000	
RATING	SHEET	MAXIMUM SPACINGS BETWEEN STIFFENERS									
A1	PS	3000									
	SS	3000									
A2	PS	3000	2000	1600	1250						
	SS	3000	3000	1600	1250						
A3	PS	3000	2000	1600	1250	1000	800				
	SS	3000	3000	2000	1600	1250	800				

TABLE 2.2 FLANGED JOINTS											
Dimensions in mm											
1	2	3	4	5	6	7	8	9	10	11	
MINIMUM SHEET THICKNESS		0.6			0.8			1.0			1.2
DUCT LONGEST SIDE		400	600	800	1000	1250	1600	2000	2500	3000	
RATING	SHEET	MAXIMUM SPACINGS BETWEEN FLANGES AND/OR STIFFENERS									
J1/S1	PS	3000	1600	1250	625						
	SS	3000	3000	1250	625						
J2/S2	PS	3000	2000	1600	1250	625					
	SS	3000	3000	1600	1250	625					
J3/S3	PS	3000	2000	1600	1250	1000	800				
	SS	3000	3000	2000	1600	1250	800				
J4/S4	PS	3000	2000	1600	1250	1000	800	800			
	SS	3000	3000	2000	1600	1250	1000	800			
J5/S5	PS	3000	2000	1600	1250	1000	800	800	800	625	
	SS	3000	3000	2000	1600	1250	1000	800	800	800	
J6/S6	PS	3000	2000	1600	1250	1000	800	800	800	800	
	SS	3000	3000	2000	1600	1250	1000	800	800	800	

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SPECIFICATION FOR SHEET METAL DUCTWORK

**MEDIUM PRESSURE CLASS “B”
(limited to 1000 Pa positive and 750 Pa negative)**

TABLE 3.1 SOCKET AND SPIGOT JOINTS											
Dimensions in mm											
1	2	3	4	5	6	7	8	9	10	11	
MINIMUM SHEET THICKNESS		0.6			0.8			1.0			1.2
DUCT LONGEST SIDE		400	600	800	1000	1250	1600	2000	2500	3000	
RATING	SHEET	MAXIMUM SPACINGS BETWEEN STIFFENERS									
A1	PS	3000									
	SS	3000									
A2	PS	3000									
	SS	3000									
A3	PS	3000	1600	1250	1000	800					
	SS	3000	3000	1600	1250	800					

TABLE 3.2 FLANGED JOINTS AND STIFFENERS											
Dimensions in mm											
1	2	3	4	5	6	7	8	9	10	11	
MINIMUM SHEET THICKNESS		0.6			0.8			1.0			1.2
DUCT LONGEST SIDE		400	600	800	1000	1250	1600	2000	2500	3000	
RATING	SHEET	MAXIMUM SPACINGS BETWEEN FLANGES AND/OR STIFFENERS									
J1/S1	PS	3000	1250	625							
	SS	3000	1250	625							
J2/S2	PS	3000	1250	1250	625						
	SS	3000	1600	1250	625						
J3/S3	PS	3000	1600	1250	1000	800					
	SS	3000	3000	1600	1250	800					
J4/S4	PS	3000	1600	1250	1000	800	800				
	SS	3000	3000	1600	1250	1000	800				
J5/S5	PS	3000	1600	1250	1000	800	800	800	625		
	SS	3000	3000	1600	1250	1000	800	800	800		
J6/S6	PS	3000	1600	1250	1000	800	800	800	800	625	
	SS	3000	3000	1600	1250	1000	800	800	800	625	

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SPECIFICATION FOR SHEET METAL DUCTWORK

HIGH PRESSURE CLASS “C”

(limited to 2000 Pa positive and 750 Pa negative)

TABLE 4.1 SOCKET AND SPIGOT JOINTS						Dimensions in mm					
1	2	3	4	5	6	7	8	9	10		
MINIMUM SHEET THICKNESS		0.8				1.0		1.2			
DUCT LONGEST SIDE		400	600	800	1000	1250	1600	2000	2500		
RATING	SHEET	MAXIMUM SPACINGS BETWEEN STIFFENERS									
A1	PS	3000									
	SS	3000									
A2	PS	3000									
	SS	3000									
A3	PS	3000									
	SS	3000									

TABLE 4.2 FLANGED JOINTS AND STIFFENERS						Dimensions in mm					
1	2	3	4	5	6	7	8	9	10		
MINIMUM SHEET THICKNESS		0.8				1.0		1.2			
DUCT LONGEST SIDE		400	600	800	1000	1250	1600	2000	2500		
RATING	SHEET	MAXIMUM SPACINGS BETWEEN FLANGES AND/OR STIFFENERS									
J1/S1	PS	3000	625								
	SS	3000	625								
J2/S2	PS	3000	1250	800							
	SS	3000	1250	800							
J3/S3	PS	3000	1250	1250	800						
	SS	3000	1250	1250	800						
J4/S4	PS	3000	1250	1250	1000	800					
	SS	3000	1250	1250	1000	800					
J5/S5	PS	3000	1250	1250	1000	800	800	625			
	SS	3000	1250	1250	1000	800	800	625			
J6/S6	PS	3000	1250	1250	1000	800	800	800	625		
	SS	3000	1250	1250	1000	800	800	800	625		

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SPECIFICATION FOR SHEET METAL DUCTWORK

ADDITIONAL INFORMATION RELATING TO TABLES

Low Pressure class "A" Ductwork - tables 2.1 & 2.2

Medium Pressure class "B" Ductwork - tables 3.1 & 3.2

High Pressure class "C" Ductwork - tables 4.1 & 4.2

- 1) the joints and stiffeners have been rated in terms of duct longest side and maximum spacing. Manufacturers may choose to position stiffeners at un-equal distances but must ensure the maximum spacing, as listed in columns 3 to 11 and illustrated in Fig 1, is not exceeded. refer to clause 9.4 for joints and 9.5 for stiffeners.
- 2) in column 1, 'A' = Socket and spigot joints, 'J' = Flanged cross joint and 'S' = Single stiffeners.
- 3) in column 2, 'PS' = Plain sheet and 'SS' = Stiffened sheet by means of any of the following methods:
 - (a) Beading at 400mm maximum centres;
 - (b) cross-Breaking within the frame formed joints and/or stiffeners;
 - (c) Pleating at 150mm maximum centres.

Longitudinal seams

fig. 1 grooved seam

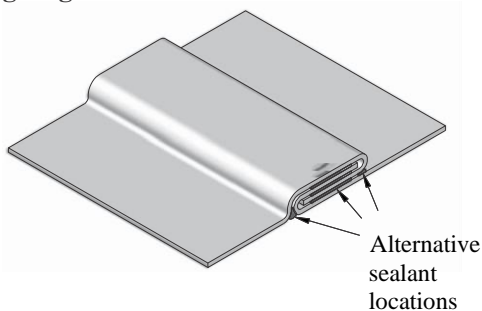
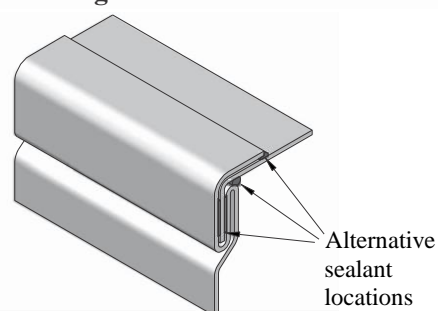


fig. 2 Pittsburgh lock seam



Sealant shall be applied either internally or externally to the seam edge or internal to the joint seam itself. the most appropriate method will be determined by the manufacturer relative to their product and will be associated with traditional fabrication/assembly methods, factory or site based, and/or proprietary methods.

note: Figures 1-2 apply, where appropriate, to cross joints and sheet joints in general

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COATING MASS, GALVANIZED STEEL THICKNESSES & WEIGHT

Galvanized Steel manufactured according to Japanese industrial Standards JIS G3302

Coating Mass of Galvanized Steel		Galvanized Steel Thicknesses & Weight	
Coating Designation	Minimum Coating Mass (including both sides)	Standard Thickness	Weight per Square Meter
Zinc Coatings (Z)	g/m ²	mm	kg/m ²
Z80	80	0.58	4.50
Z120	120	0.75	5.88
Z180	180	0.95	7.45
Z275	275	1.15	9.02
Z300	300	1.48	11.61

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