

The Kingspan **KoolDuct** System

TRAINING MANUAL



Manufactured to BS EN ISO 9001: 2000
Certificate No. 388

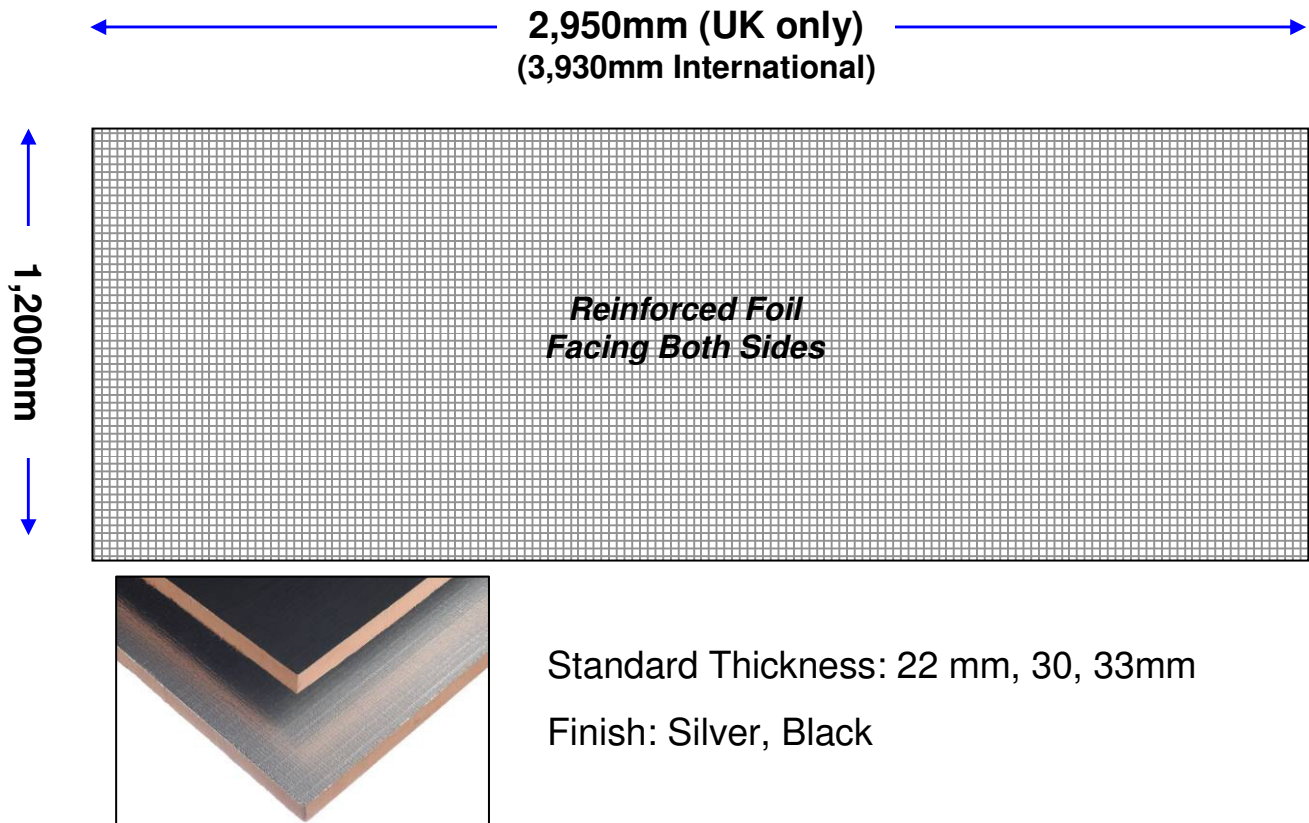


Contents

	Page
KoolDuct	3
Jack Planes	5
Straight Duct (Methods 1-4)	7
Tiger Closure	8
Dual Duct	14
End Caps, Transition, Offset	15
Reducers	16
Straight Elbow with Turning Vanes	18
Radiused Elbows	19
Elbow, 45 Deg Throat, Radius Heel	24
Dynamic Branch	26
Tee Branch	28
4 Bolt Flange	31
Grip Flange	32
Structural Profiles	38
Profiles for Connections	39
Connections with Tiger Unit	42
Take Off	43
Shoe Branch Fitting	46
Inspection Doors	47
Bayonet Installation	48
“Invisible” Flange	49
Tiger Connectors	50
Tiger Support	51
Duct Reinforcement	52

The Kingspan **KoolDuct**[®] System

Standard KoolDuct[®] Panel Dimensions



KoolDuct[®] Application and Limitation

- Supply and Return air ductwork for heating, ventilation and air conditioning
- Fresh air intake ducts to plant
- Swimming Pools
- Non Ferrous Applications
- Outdoor applications, provided the specified external finish is applied

KoolDuct[®] Operational Limits

- Total pressure: -750 to +1000 Pascals max
- Size: unlimited (as per design manual)
- Temperature: 80°C max during continuous operation

Not Applicable

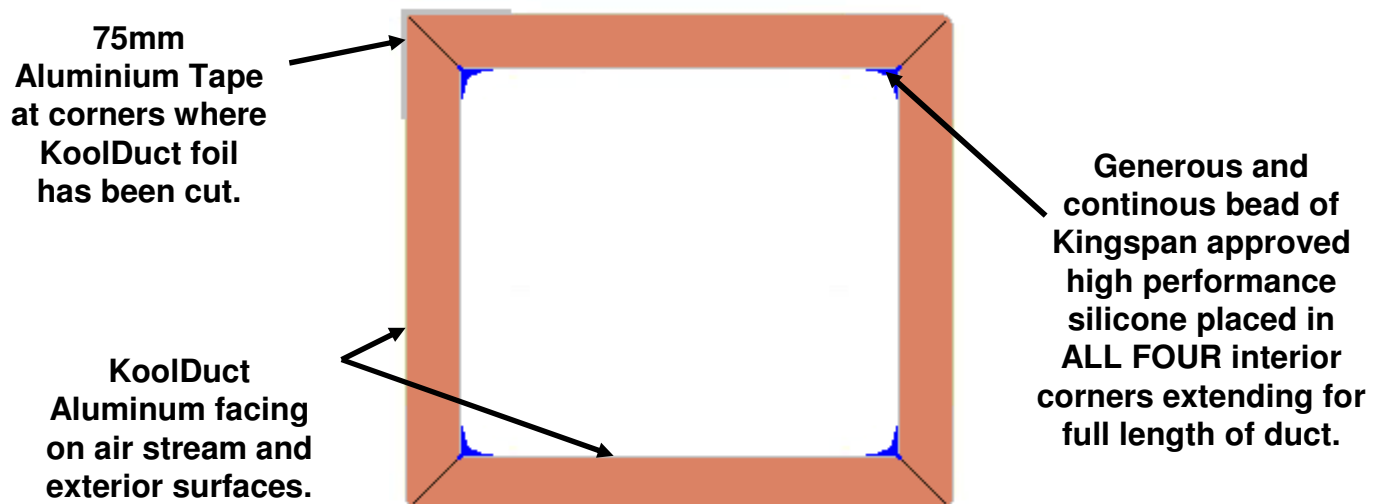
- Kitchen extract ducting
- Conveyance of solid particles
- Chemical or fume exhaust systems
- For use with extreme heat
- High Pressure systems above 1000 Pascal
- Outdoor use without additional protection

The Kingspan KoolDuct® System

Basic KoolDuct® Fabrication Procedure

- 1) TRACING: Trace the duct outline onto KoolDuct (duct fittings only).
- 2) CUTTING: Cut 90° v-grooves or 45° miters at corner locations.
- 3) ASSEMBLY:
 - Always apply **Adhesive** at longitudinal joints, unless **Tiger Closures** are used with small ducts, low pressure only.
 - If adhesive is used, wait until it is dry to the touch before folding edges into contact with each other. Use the stiff spatula.
 - Air stream facings are to be carefully aligned to ensure specified internal duct dimensions are achieved.
- 4) TAPING: Apply **Aluminium Tape** at joint, where KoolDuct foil has been cut, using the soft spatula.
- 5) CONNECTING: Apply **Flange/Connectors/End cap** as required.
- 6) REINFORCING: Apply Reinforcement when required .
- 7) SEALING: All four inside corners are always sealed with a continuous bead of Kingspan approved high performance **Silicone sealant**.

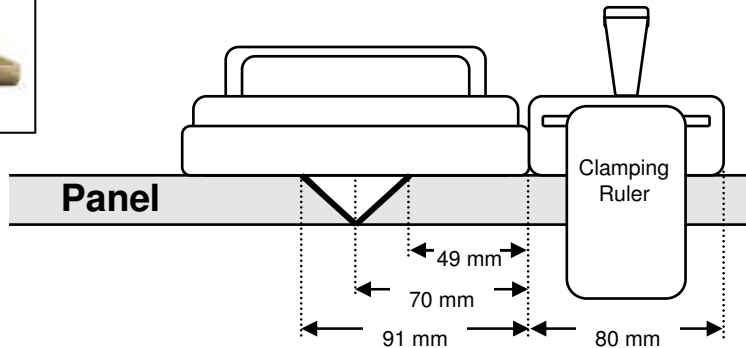
KoolDuct® Section – End View



The Kingspan KoolDuct® System

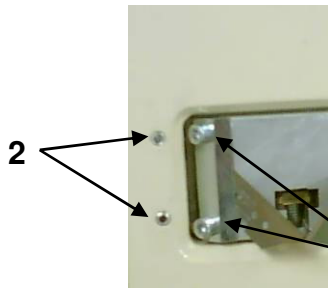
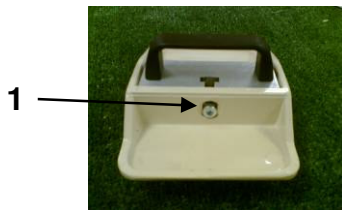
Jack Planes for 22 mm Panels

LKDA 511 - Jack Plane, two blades
Adjustable for 20 to 24 mm thickness



To Set the Cut Height:

- A) Unloose big screw (1) on the back of Jack Plane
- B) Operate on smaller screws (2) at the bottom of Jack Plane
- C) Tighten big screw (1)

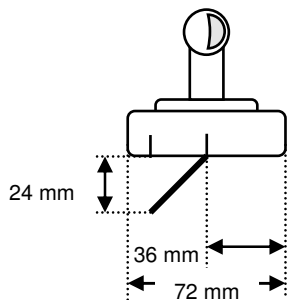


To Change Blades:

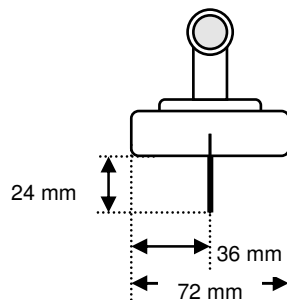
- D) Operate on stopping screws (3) at the bottom of Jack Plane

LKDA 513, 514, 515 - Small Jack Planes, one blade
Cut 22 mm thickness with Blade LKDA 741

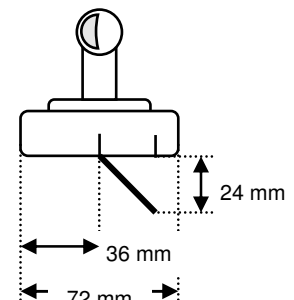
Ref.514 - Small Jack Plane
45 Degrees Left



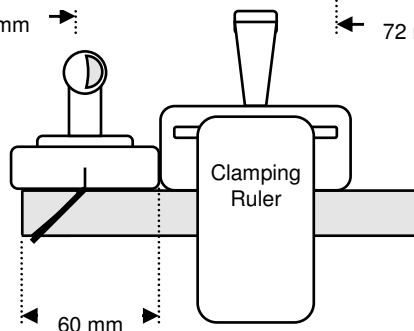
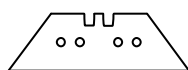
Ref.513 - Small Jack Plane
90 Degrees



Ref.515 - Small Jack Plane
45 Degrees Right



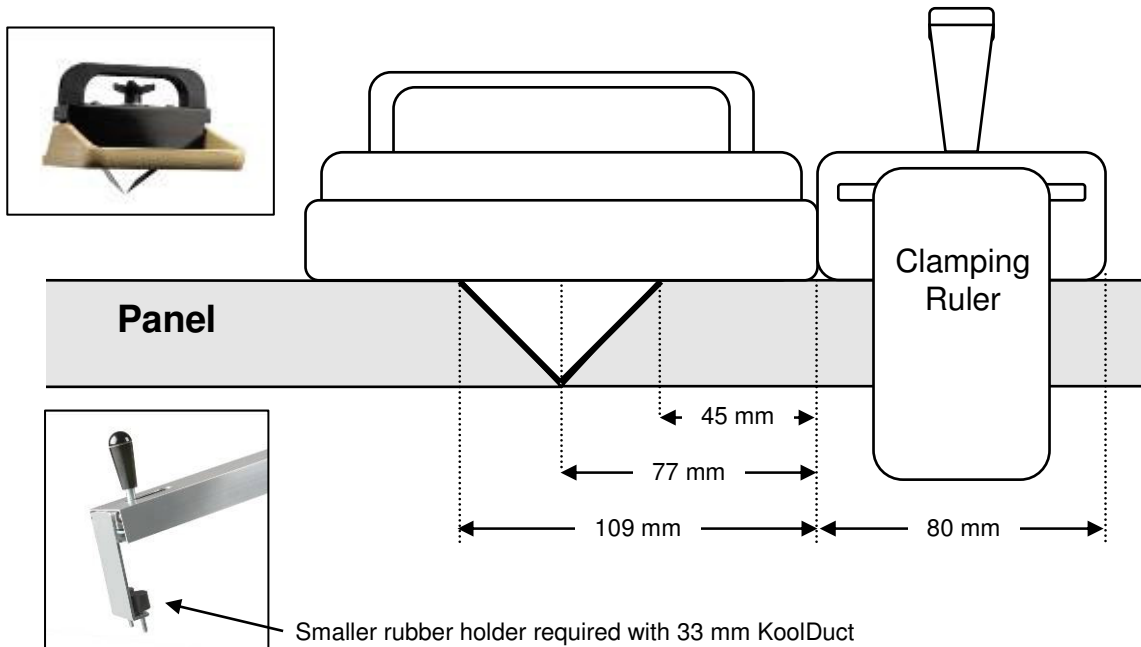
LKDA 741 – Blade for 22mm Panel



The Kingspan KoolDuct® System

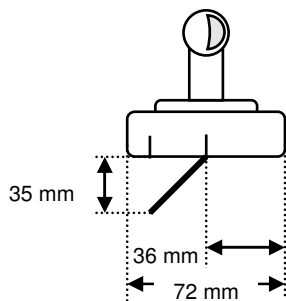
Jack Planes for 30/33 mm Panels

LKDA 517 - Jack Plane, two blades
Adjustable for 30/33 mm thickness

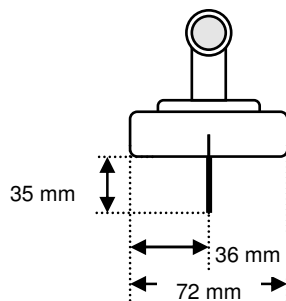


LKDA 513, 514, 515 - Small Jack Planes, one blade Cut 30/33 mm thickness with Blade LKDA 744

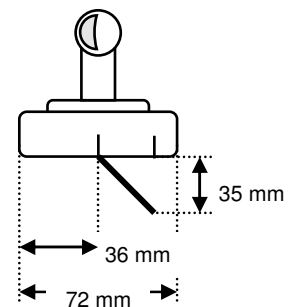
Ref.514 - Small Jack Plane
45 Degrees Left



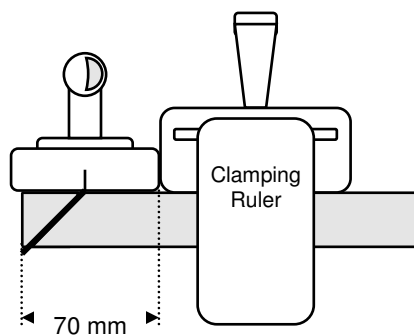
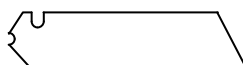
Ref.513 - Small Jack Plane
90 Degrees



Ref.515 - Small Jack Plane
45 Degrees Right



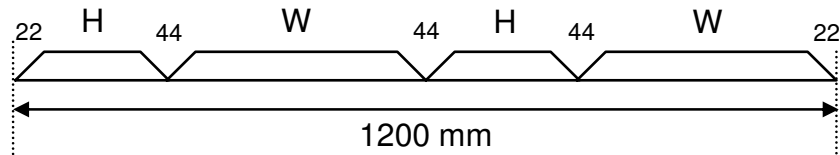
LKDA 744 – Blade for 33mm Panel



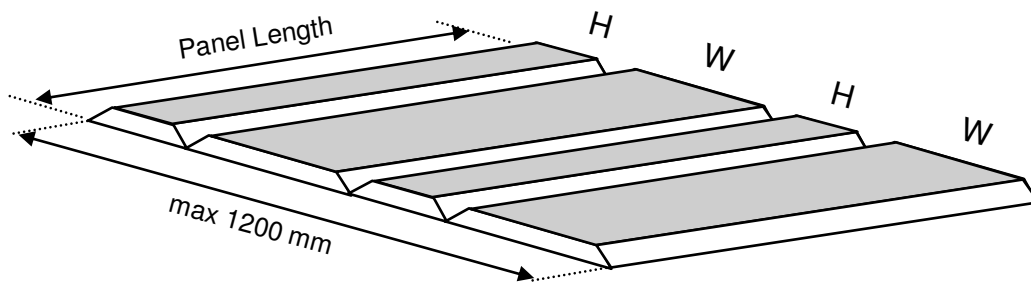
The Kingspan KoolDuct® System

Straight Duct

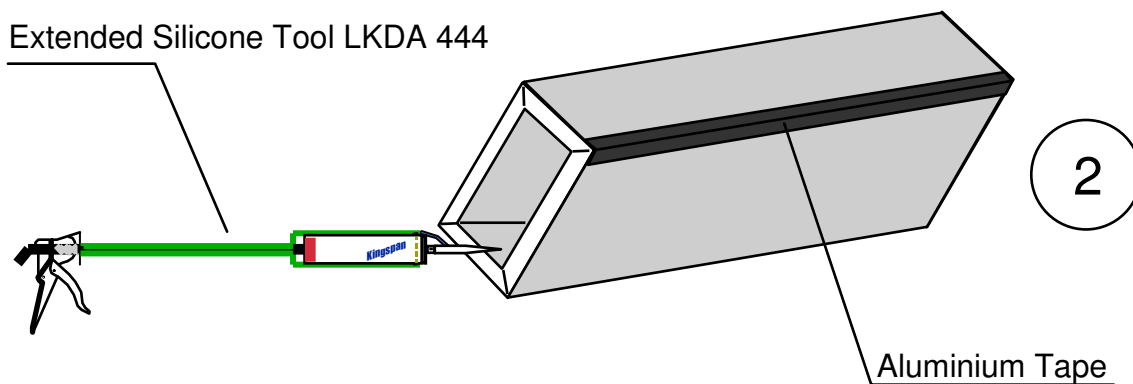
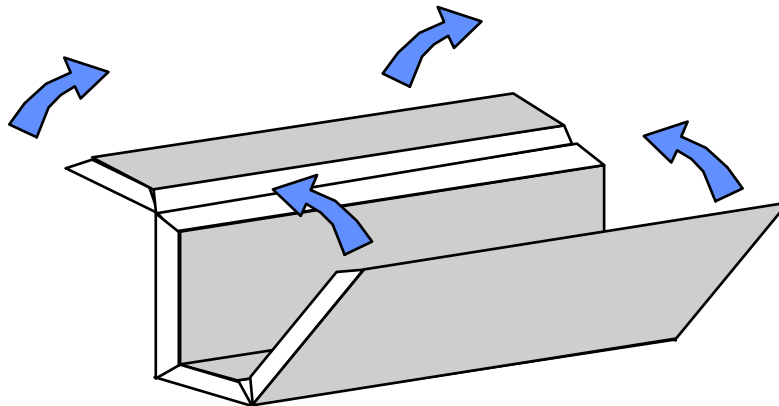
Cutting METHOD 1 - 22mm



- Cutting along the panel length
- The sum of 4 sides less than 1024 mm ($2H + 2W$)

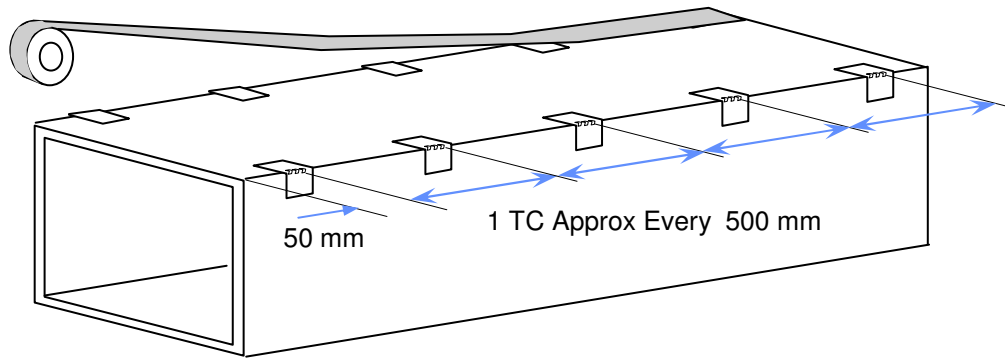
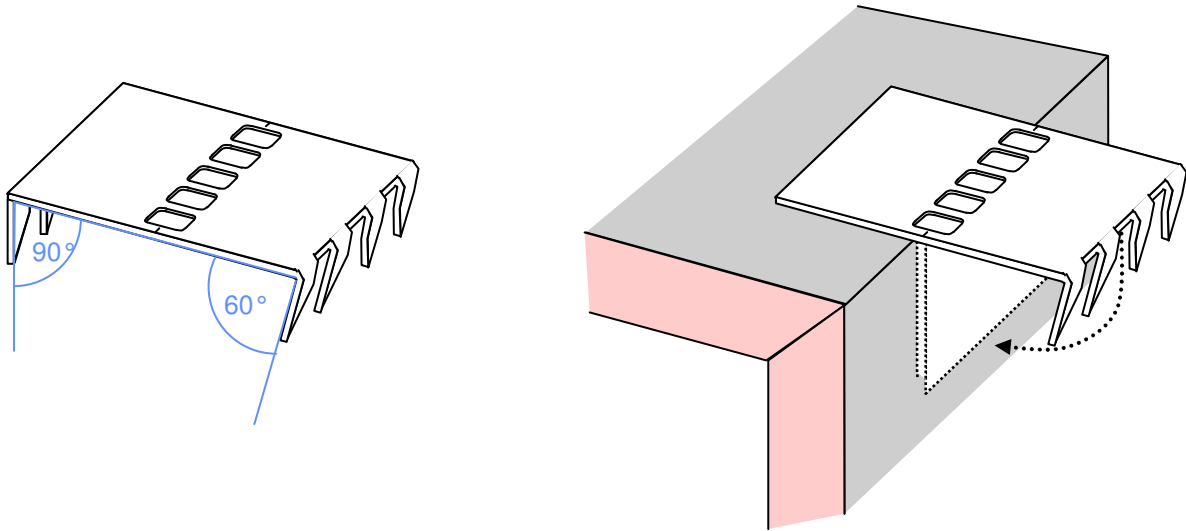


SEQUENCE OF ASSEMBLY



The Kingspan KoolDuct® System

Tiger Closures (patented) – LKDA 362
Can be used instead of the Adhesive for Small Ducting, Low Pressure <500 Pascal

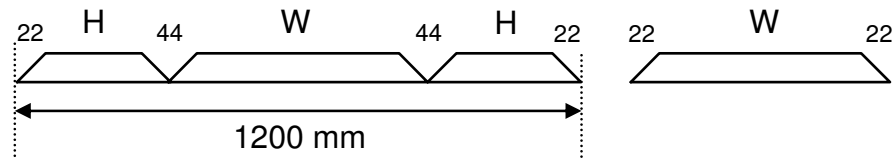


MAXIMUM TIGER CLOSURE SPACING		
Straight Duct Size	Max Spacing	Max Pressure
100 – 500 mm	500 mm	500 Pa
550 - 750 mm	500 mm	250 Pa

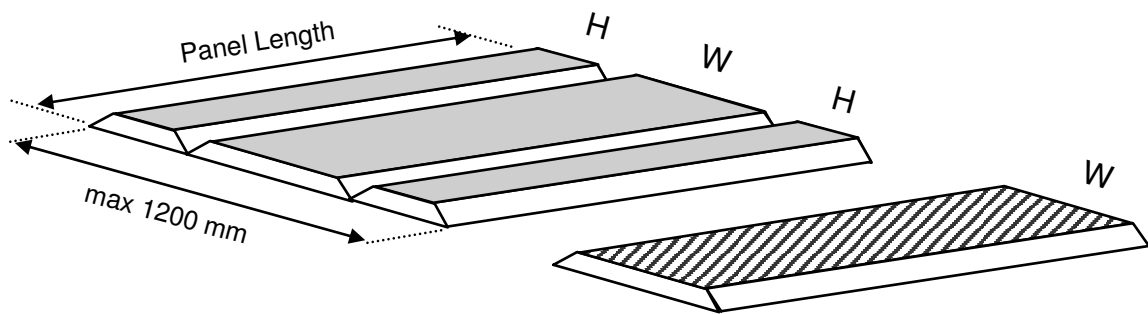
The Kingspan KoolDuct® System

Straight Duct

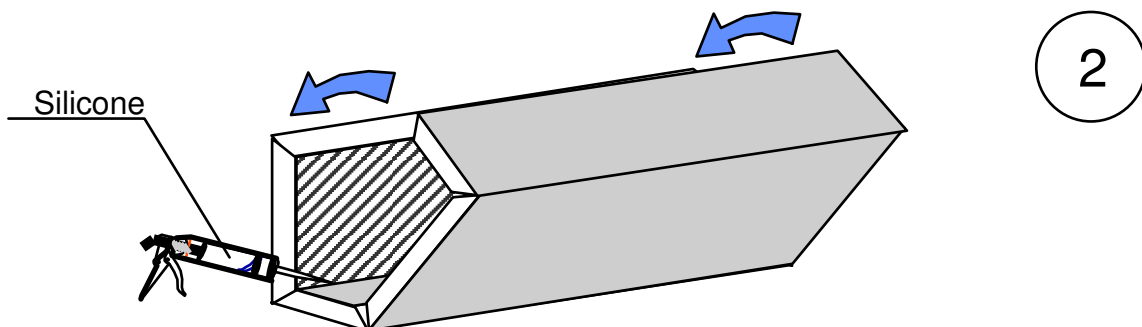
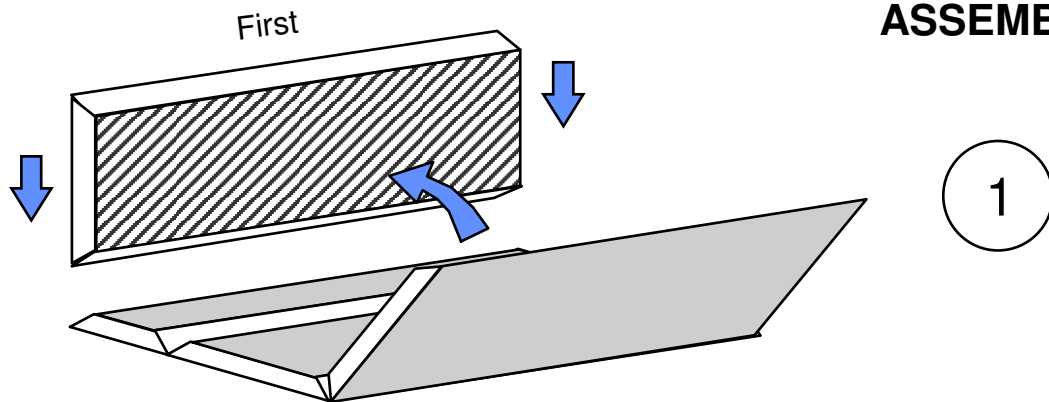
Cutting METHOD 2A - 22mm



- Cutting along the panel length
- The sum of 3 sides less than 1068 mm ($2H + W$ or $2W + H$)



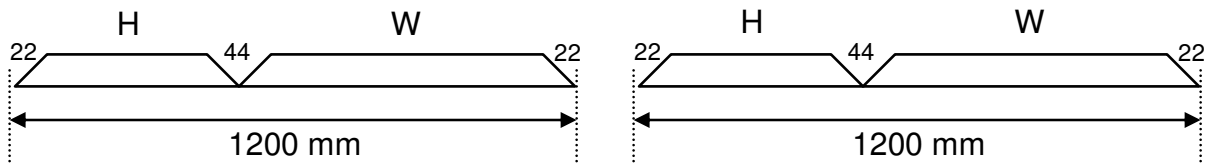
SEQUENCE OF ASSEMBLY



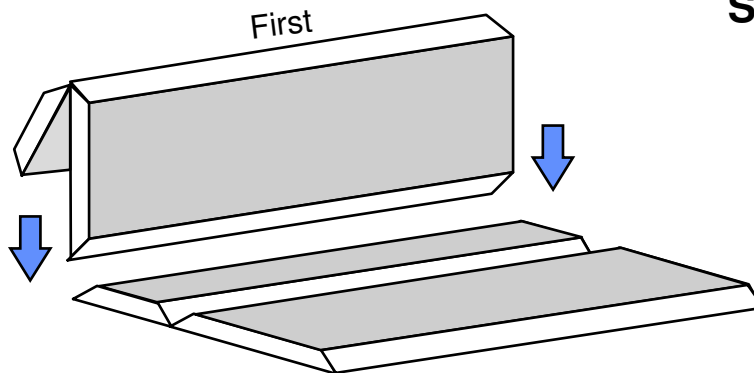
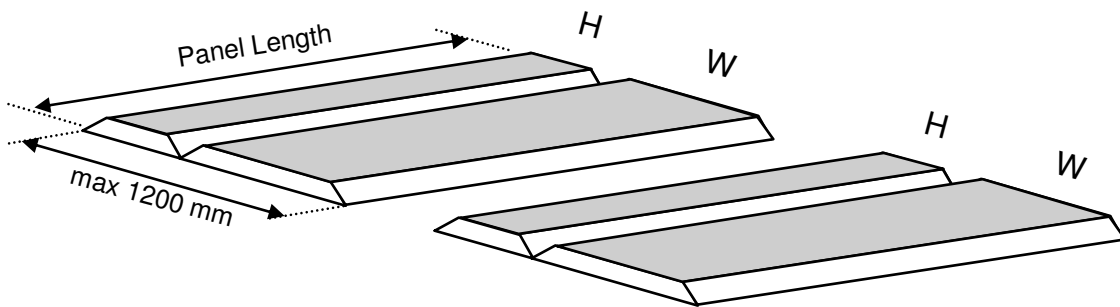
The Kingspan KoolDuct® System

Straight Duct

Cutting METHOD 2B - 22mm

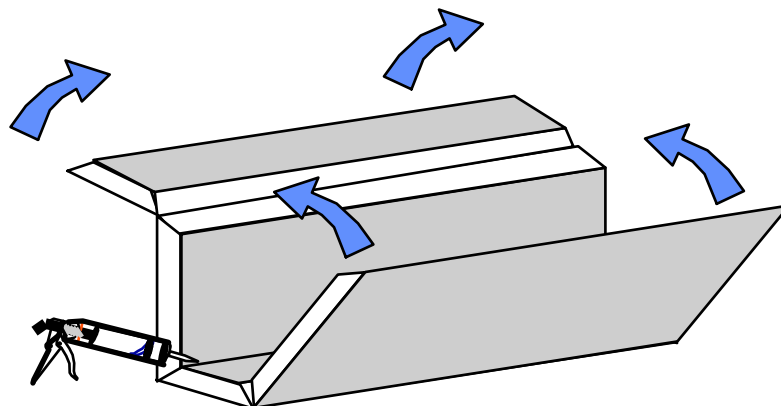


- Cutting along the panel length
- The sum of 2 sides less than 1112 mm ($W + H$)



SEQUENCE OF ASSEMBLY

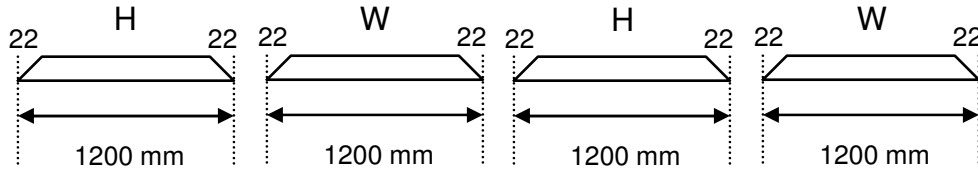
1



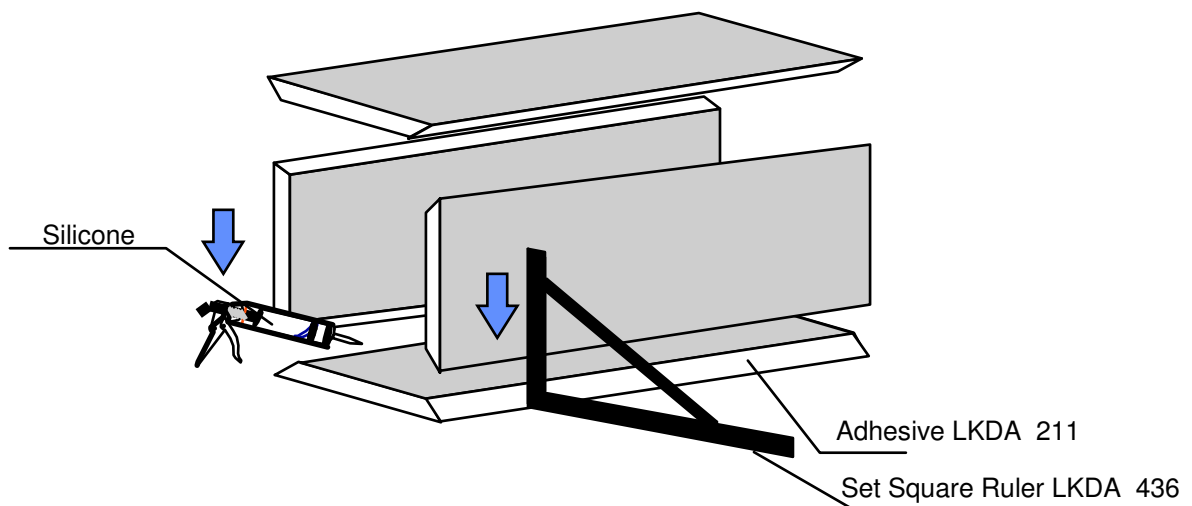
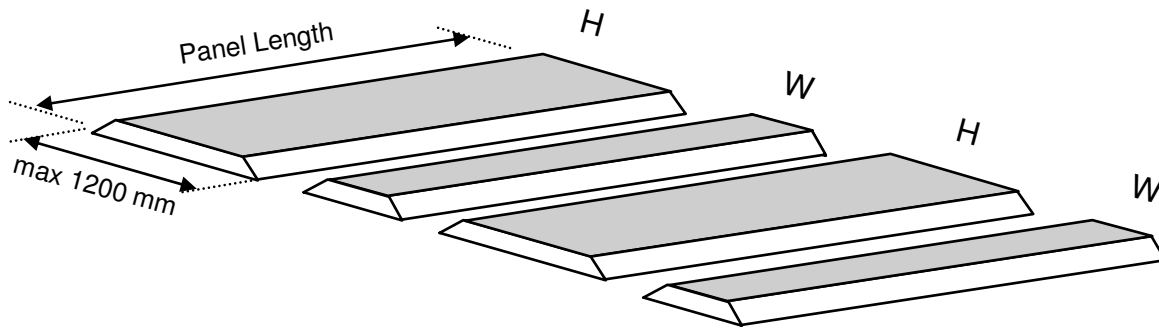
2

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Straight Duct Cutting METHOD 2C - 22mm



- Cutting along the panel length
- Each side to be less than 1156 mm



NOTE

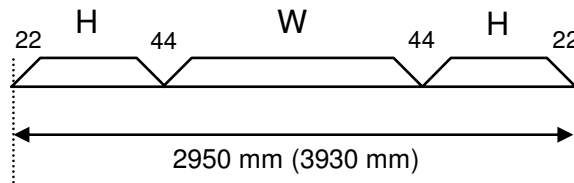
- Use extra silicone (bigger tip cut)
- When assembling the four sides, the duct should be checked (with the T square ruler) and held in position

The Kingspan KoolDuct® System

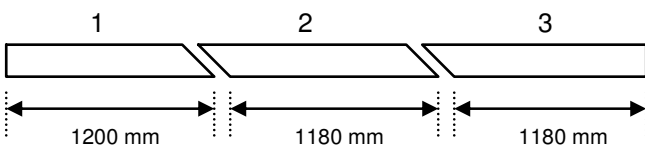
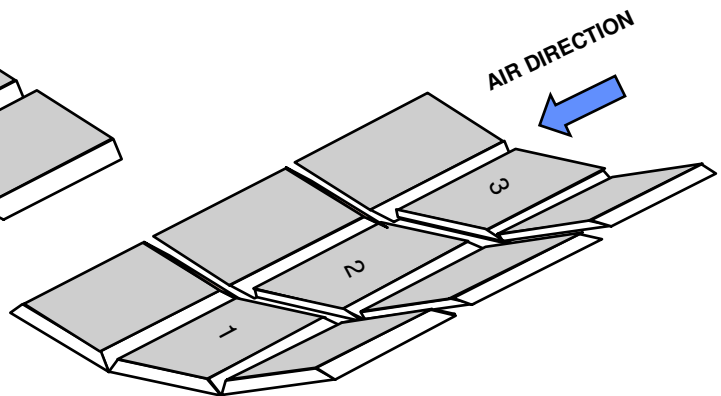
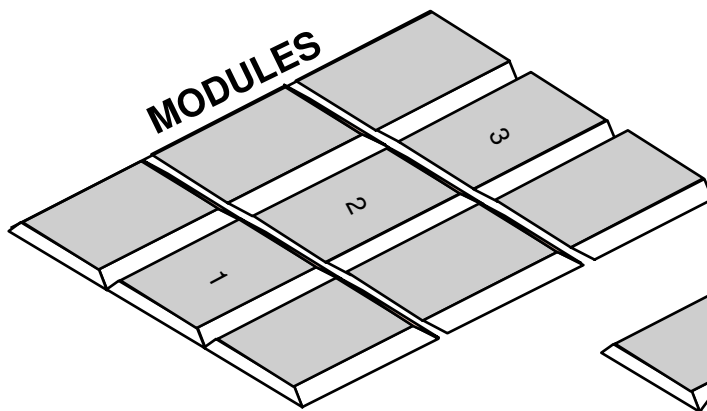
Straight Duct

Cutting METHOD 3 - 22mm (Rarely Used)

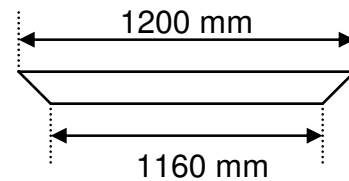
Low pressure only, less than 250 Pascal max



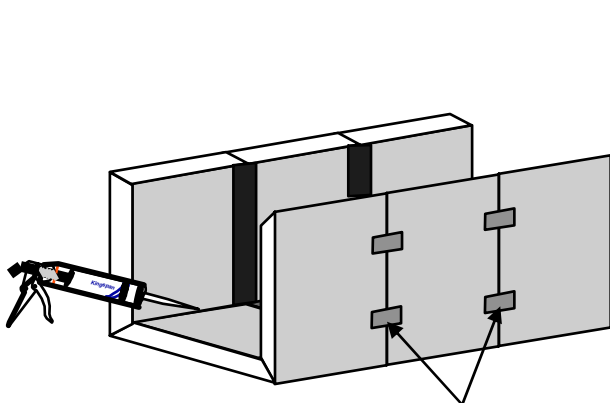
- Duct Size over 1200 mm
- Cutting along 1200 mm
- The sum of 3 sides less than 2818 mm (3798 mm)



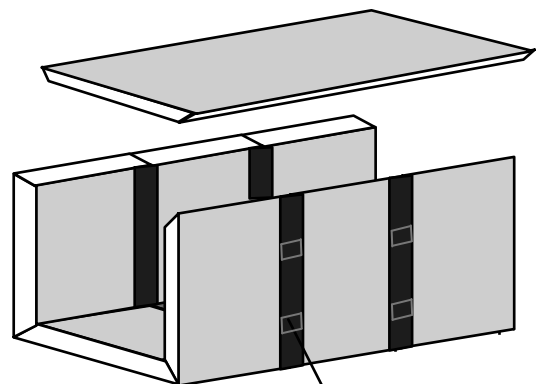
MODULES



COVER



Tiger Connectors spaced at max 500mm centres, outside only

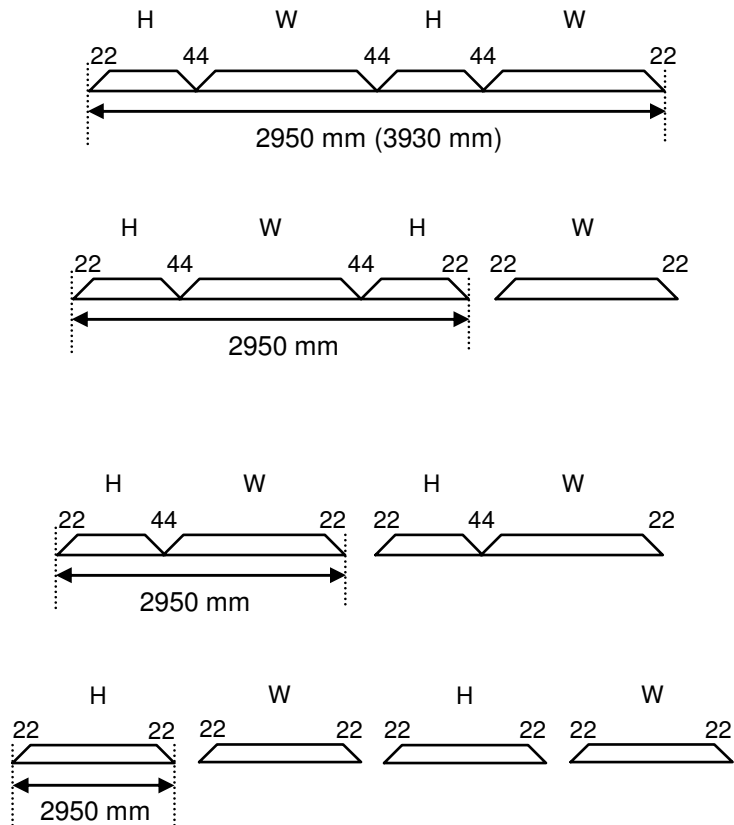


Aluminium Tape

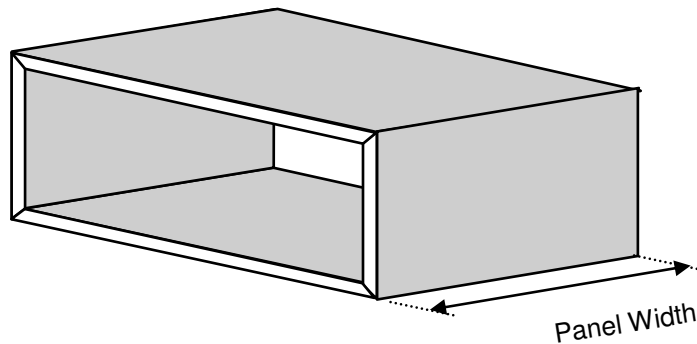
The Kingspan KoolDuct® System

Straight Duct Cutting METHOD 4 - 22mm

- Duct Size over 1200 mm



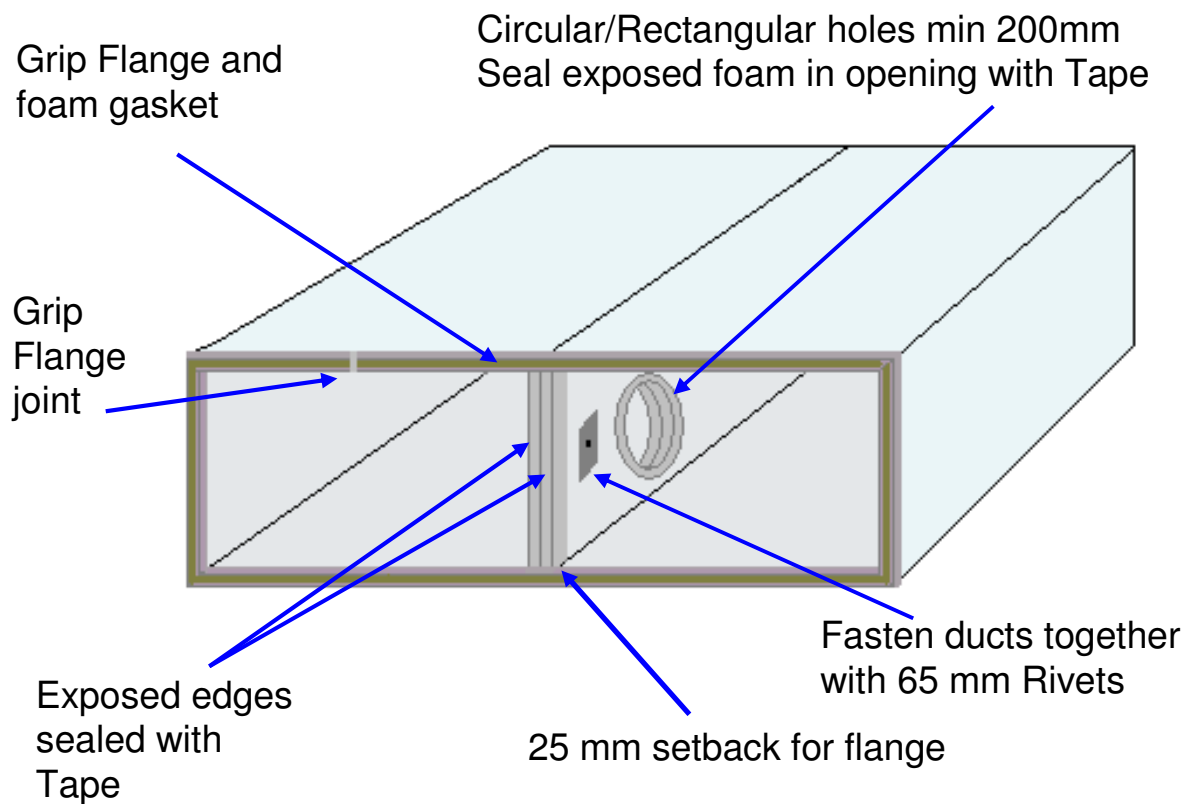
- Cutting along 1200 mm
- Duct Length limited to 1200 mm



The Kingspan KoolDuct® System

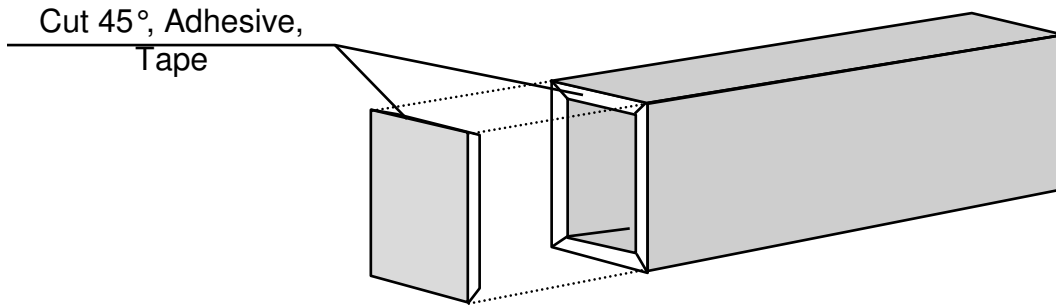
Straight Duct Dual Duct Design - 22mm

Application: Alternative fabrication method for large duct Over 1400mm.
Likely to require less reinforcement than Method 4 duct.
Will require flanges.

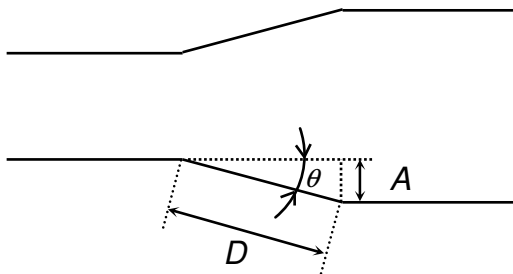


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End Cap

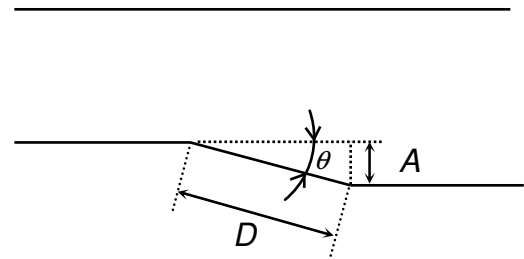


Transition



Concentric transition

θ max. 22.5° ($D = 2.5 \times A$)
 θ suggested 15° ($D = 4 \times A$)

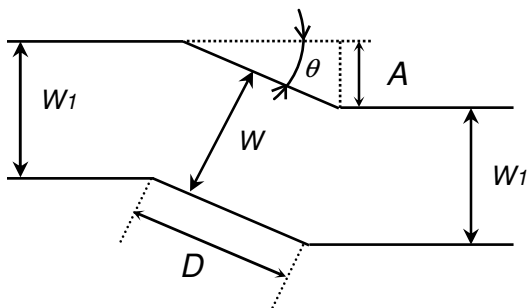


Eccentric transition

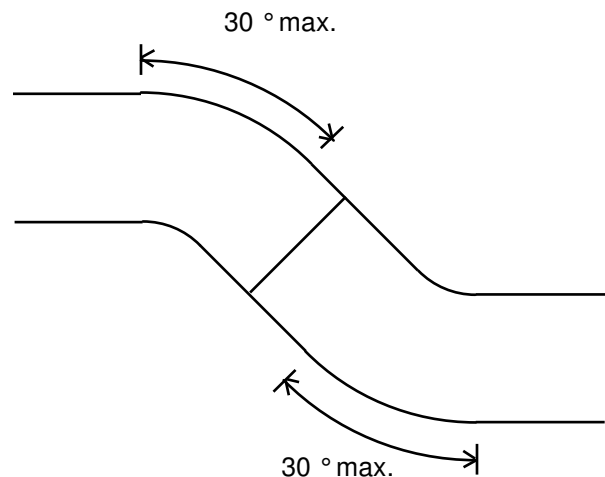
θ max. 22.5° ($D = 2.5 \times A$)
 θ suggested 15° ($D = 4 \times A$)

Splitters are required for angles greater than 22.5°.

Offset



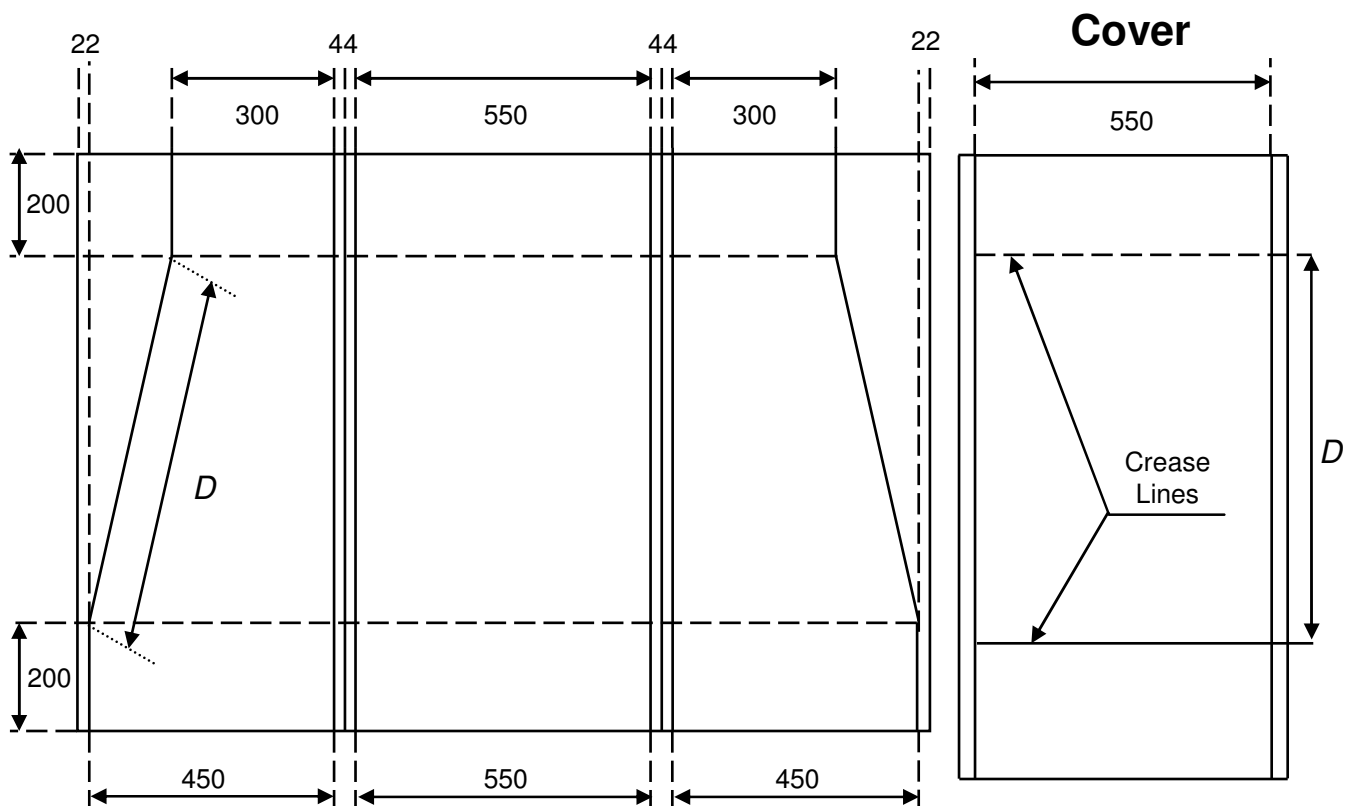
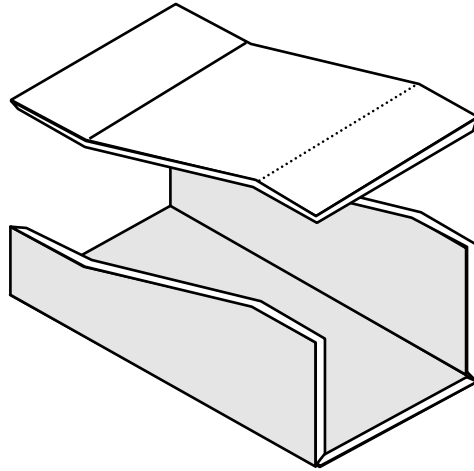
Offset - angled
 θ max. 30° ($D = 2 \times A$)



Offset - radiused

The Kingspan KoolDuct® System

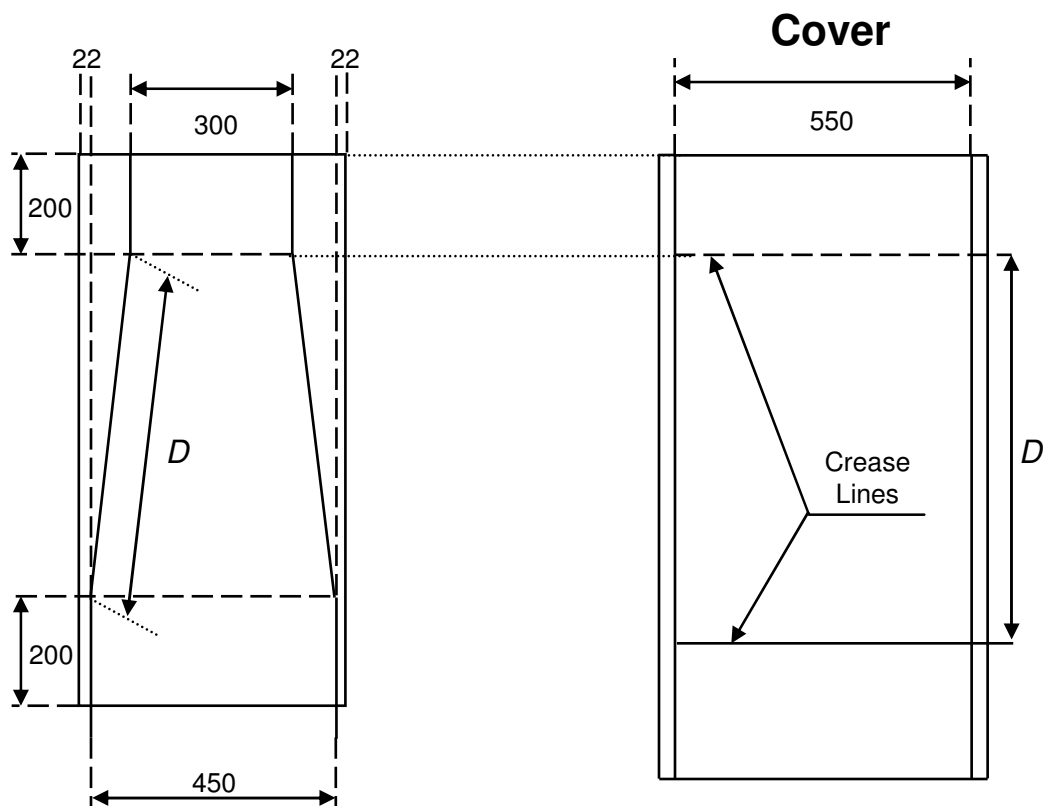
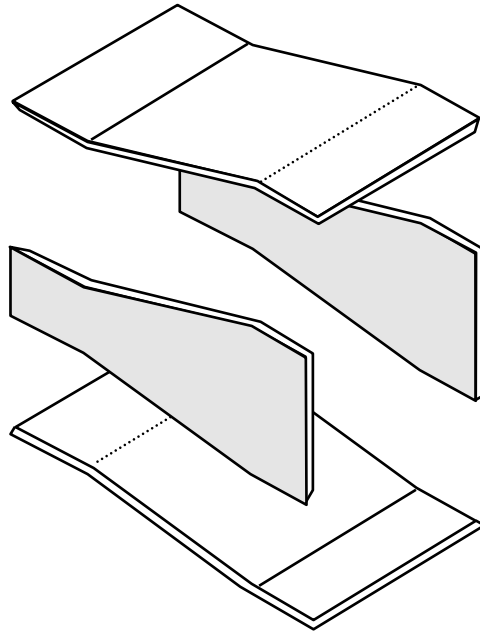
Eccentric Reducer - 22mm



- Dimensions in mm
- D suggested = $4 \times (450 - 300) = 600$; D minimum = $2.5 \times (450 - 300) = 375$

The Kingspan KoolDuct® System

Concentric Reducer - 22mm

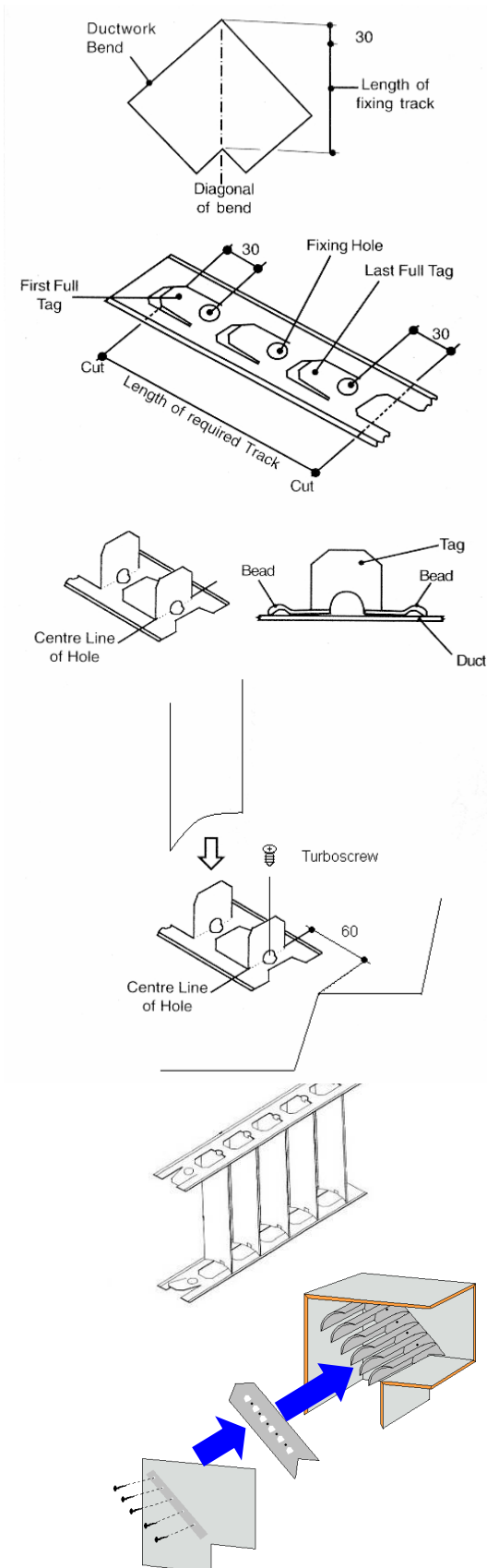


- Dimensions in mm
- D suggested = $2 \times (450 - 300) = 300$; D minimum = $1.25 \times (450 - 300) = 200$

The Kingspan KoolDuct® System

Straight Elbow With Turning Vanes

Turning Vanes required when either duct dimension greater than 200 mm



1) The elbow top and bottom sides are cut in a 90° “L” shape
2) Measure the diagonal of the square elbow less 30 mm: it will be the length of the fixing Track.

3) Bend the first full tag, measure 30 mm from the centre line of the fixing hole and cut the Track.
4) From the cut, measure the required length of Track, from the last available full tag, measure 30 mm from the centre line of the fixing hole and cut the Track. (Do not cut through the next tag)

5) Bend the tags 90 degrees on the fixing holes centre line, in the same direction as the bead of the Track.

6) Cut the Vanes using the internal height of the duct less 8 mm.

7) Push all the vanes onto one Track with the curve as shown in the picture.

8) Beginning at one end, enter all the vanes onto the second Track.

9) Using a mallet, tap the tags into the Vane until all the tags are fully entered

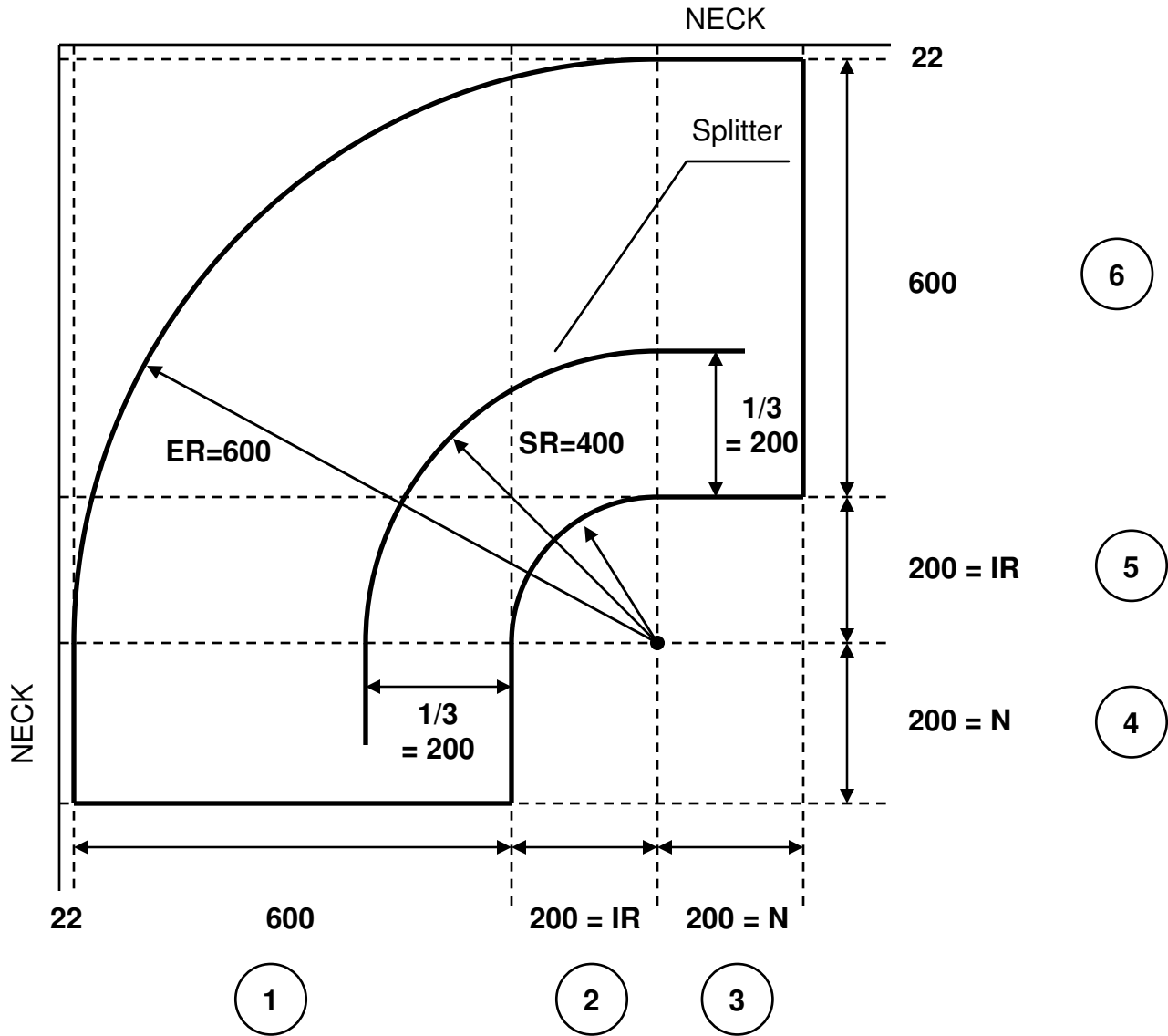
10) Fit the completed turning vane assembly into the duct with the first turning vane set at 60 mm from the inside throat of the elbow

11) Fix the Tracks on the square elbow using silicone (optional: turboscrews).

12) Secure permanently the Turning Vane Track via rivets through aluminium strips positioned on the outer surface of the elbow (NOT required for duct size less than 500 mm - low pressure only).

The Kingspan KoolDuct® System

Symmetric Elbow - 22 mm



Crimp every 75mm / 100mm

LEGEND

N = Neck
 ER = External Radius
 IR = Internal Radius (min 200 mm)
 SR = Splitter Radius

- Dimensions in mm
- Numbers in the hoop show suggested tracing procedure

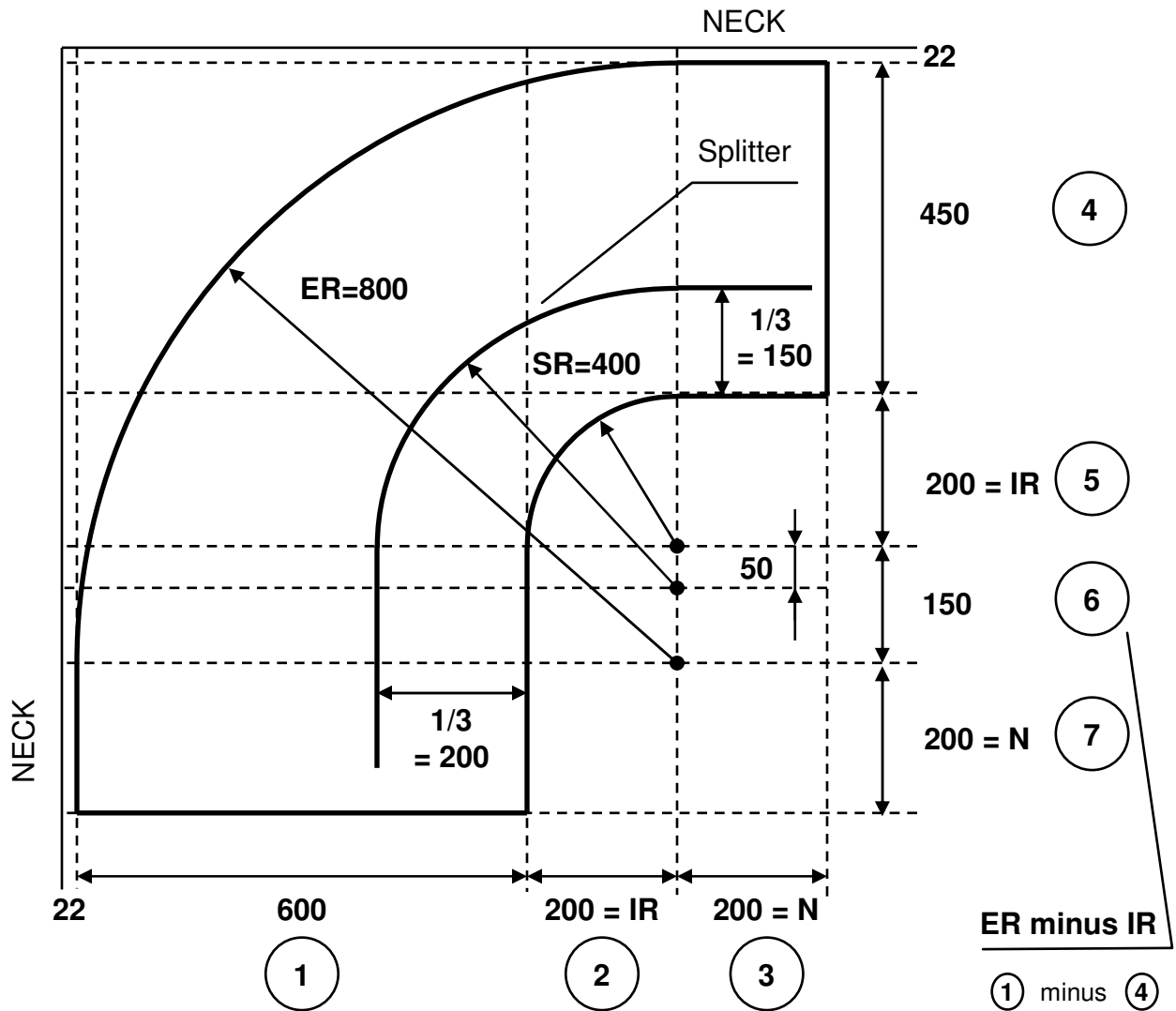
SPLITTER not required in angles less than 45°:

Elbow side (mm)	Splitters	Position
0 – 500	0	-
501 - 800	1	W/3
801 - 1600	2	W/4 W/2
Over 1600	3	W/8 W/3 W/2

Minimum Bend Radius: 200 mm

The Kingspan KoolDuct® System

Asymmetric Elbow - 22 mm



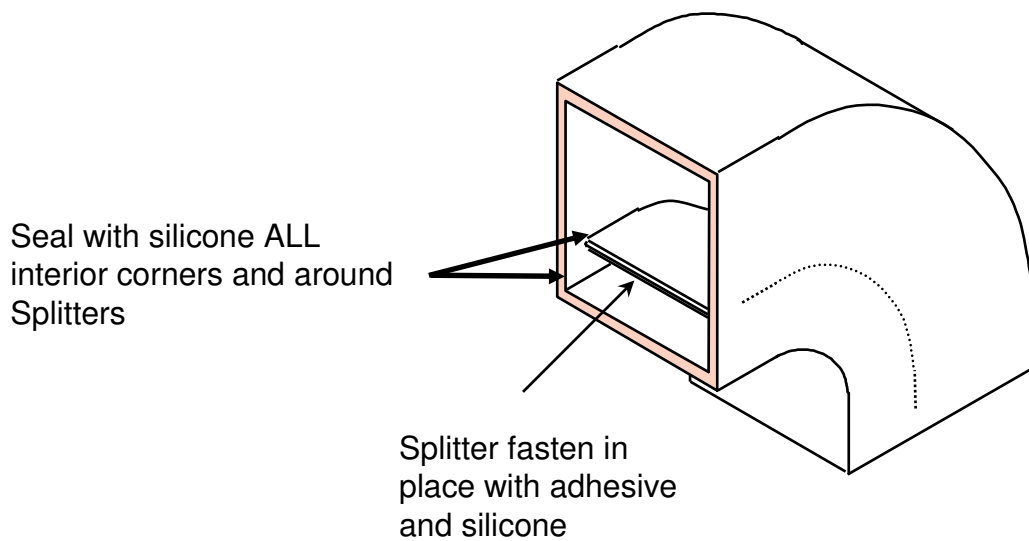
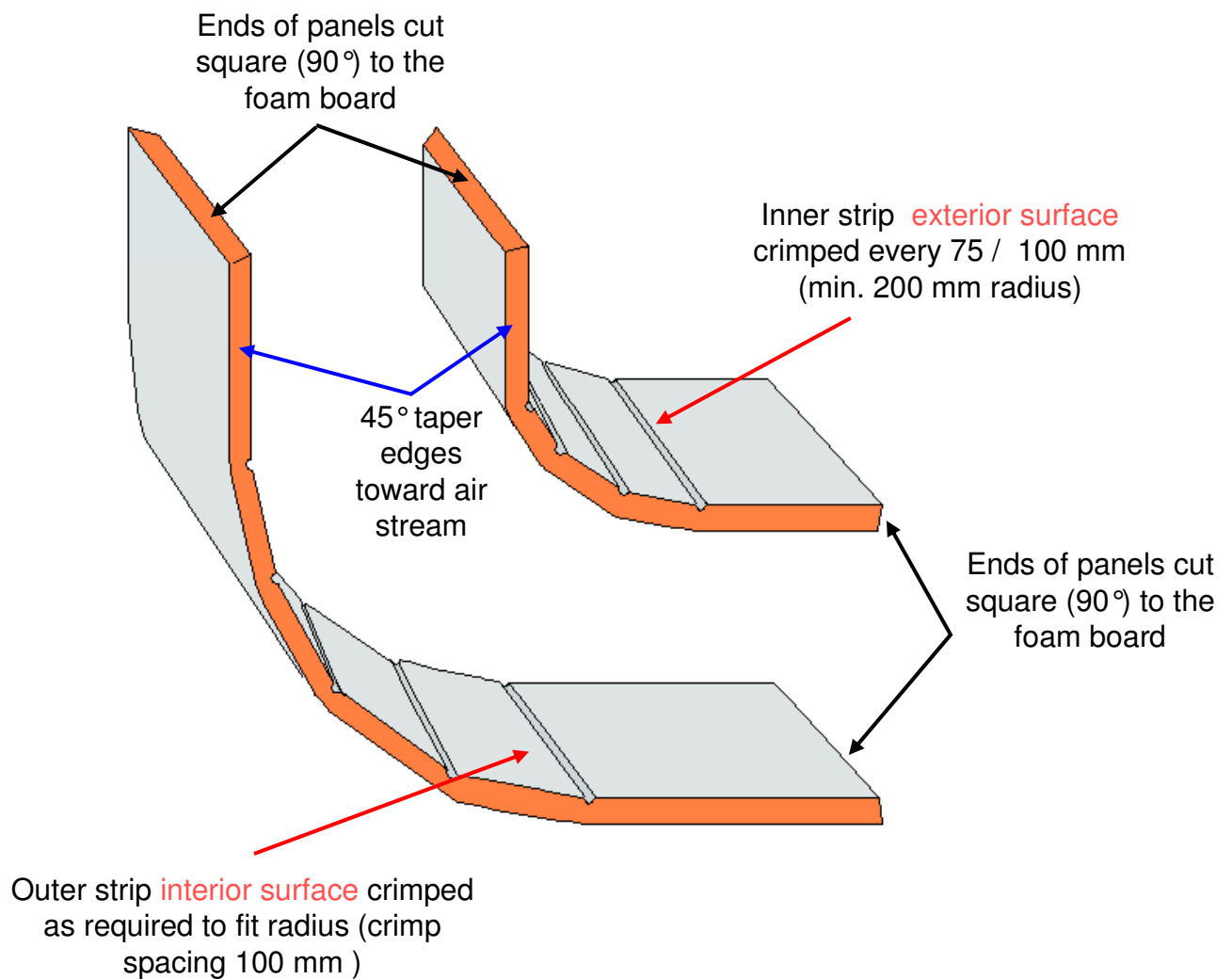
LEGEND

- N = Neck
- ER = External Radius
- IR = Internal Radius (minimum 200 mm)
- SR = Splitter Radius

- Dimensions in mm
- Numbers in the hoop show suggested tracing procedure

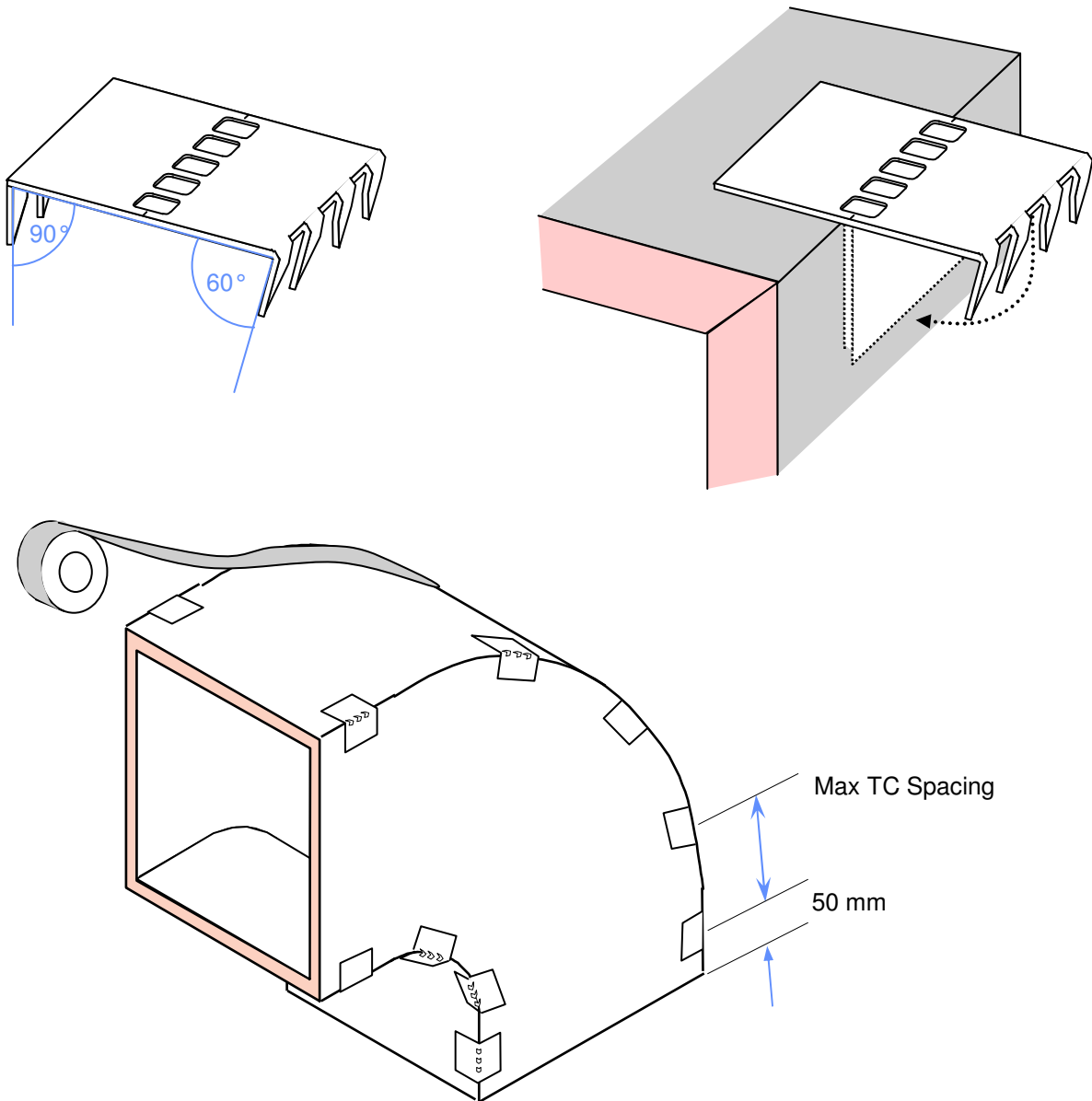
The Kingspan KoolDuct® System

Symmetric/Asymmetric Elbow - 22 mm



The Kingspan KoolDuct® System

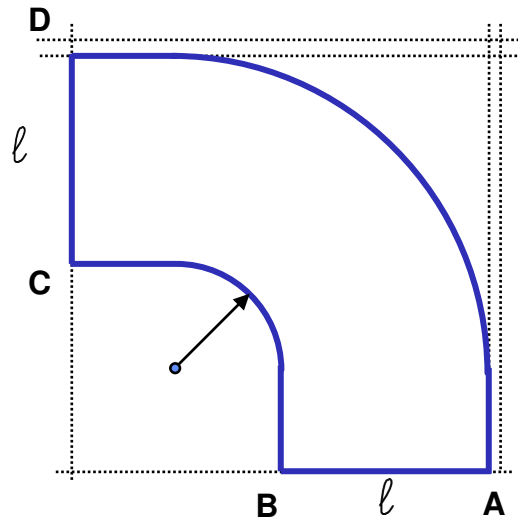
Tiger Closures (patented) – LKDA 362
Can be used instead of the Adhesive for Small Ducting, Low Pressure <500 Pascal



MAXIMUM TIGER CLOSURE SPACING			
Duct Size (Elbow, Tee, Take-Off, etc)	External Radius Max Spacing	Internal Radius Max Spacing	Max Pressure
100 – 500 mm	300 mm	100 mm	500 Pa
550 - 750 mm	300 mm	100 mm	250 Pa

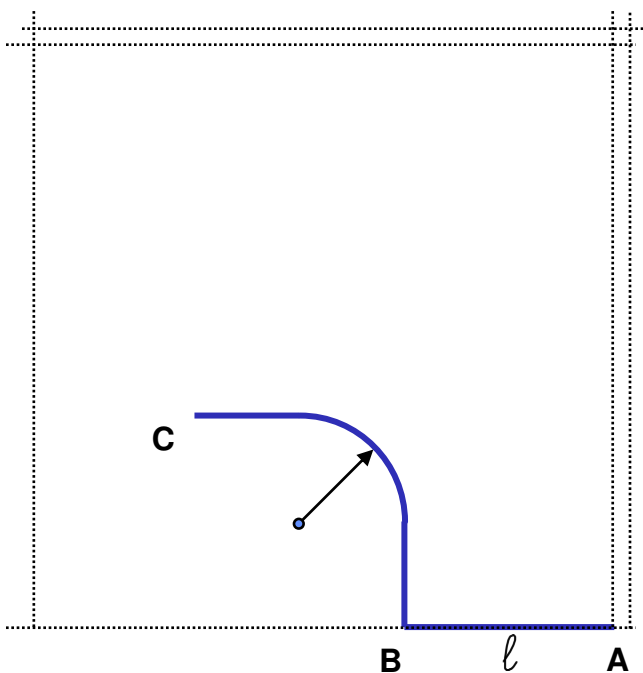
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Symmetric Elbow with Templates – LKDA 446

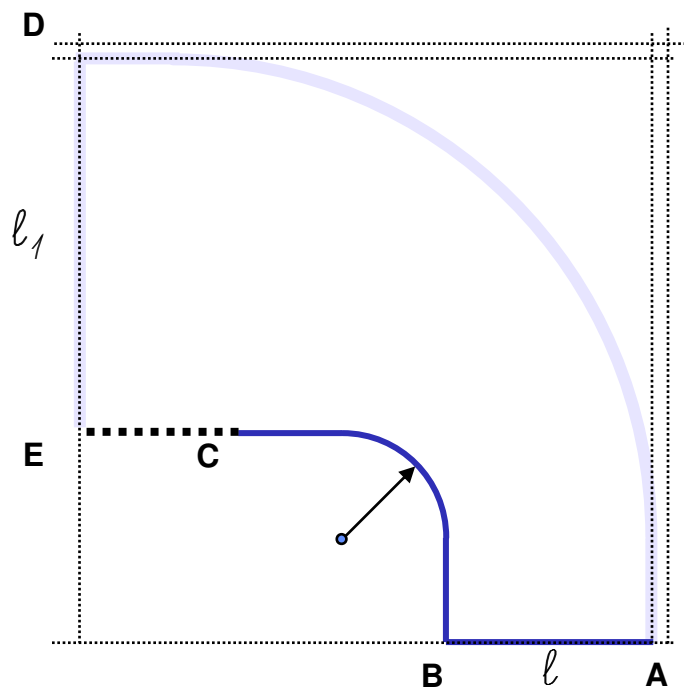


Use the Elbow Template with side l required

Asymmetric Elbow with Templates



1 - Use the Elbow Template with smaller side l to trace the lines AB and BC

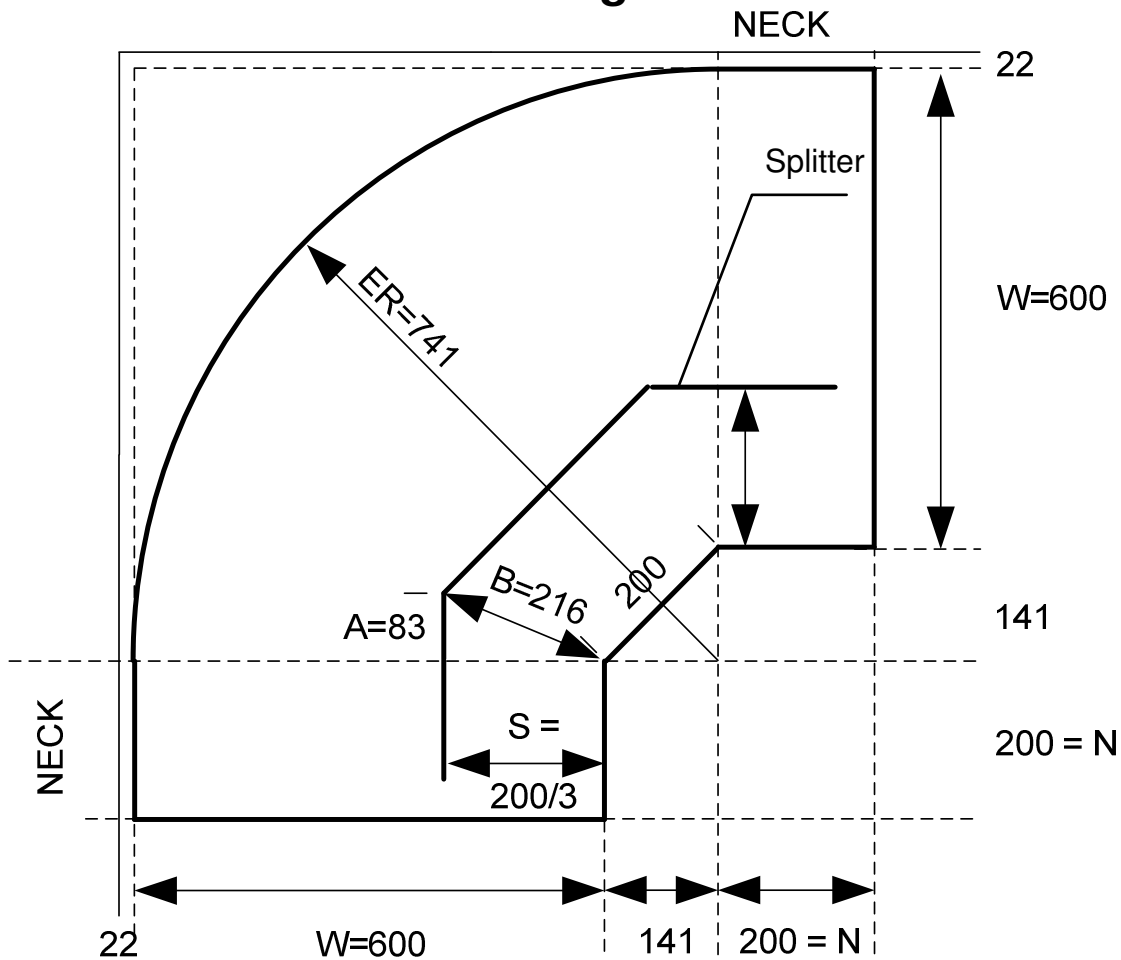


2 - Use the Elbow Template with bigger side l_1 to trace the lines AD and DE

3 - Use a ruler to trace the segment EC

The Kingspan KoolDuct® System

Elbow, 45 Deg Throat, Radius Heel - 22 mm Alternative Elbow Design*



* NOTE:
The total pressure losses for this elbow would need to be compared to the losses for the elbow it is replacing.

45 DEG. SPLITTER DESIGN

SPLITTER not required in angles less than 45°:		
Elbow side (mm)	Splitters	Position
0 – 500	0	-
501 - 800	1	W/3
801 - 1600	2	W/4 W/2
Over 1600	3	W/8 W/3 W/2

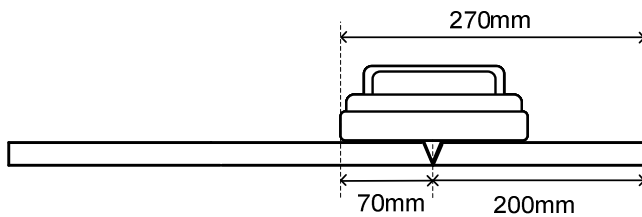
S	A*	B*
mm	mm	mm
150	62	162
200	83	216
250	104	271
300	124	325
350	145	379
400	166	433
450	186	487
500	207	541

$22.5 \text{ deg} \times \text{PI} / 180 = \text{RADIANS} (22.5) = 0.39269$
W = Duct side
*A = $\sin (0.39269) \times B$
*B = $W / \cos (0.39269)$

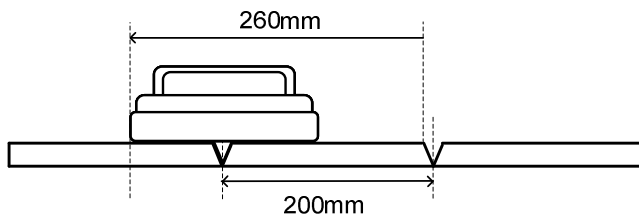
The Kingspan KoolDuct® System

Elbow, 45 Deg Throat, Radius Heel - 22 mm Alternative Elbow Design

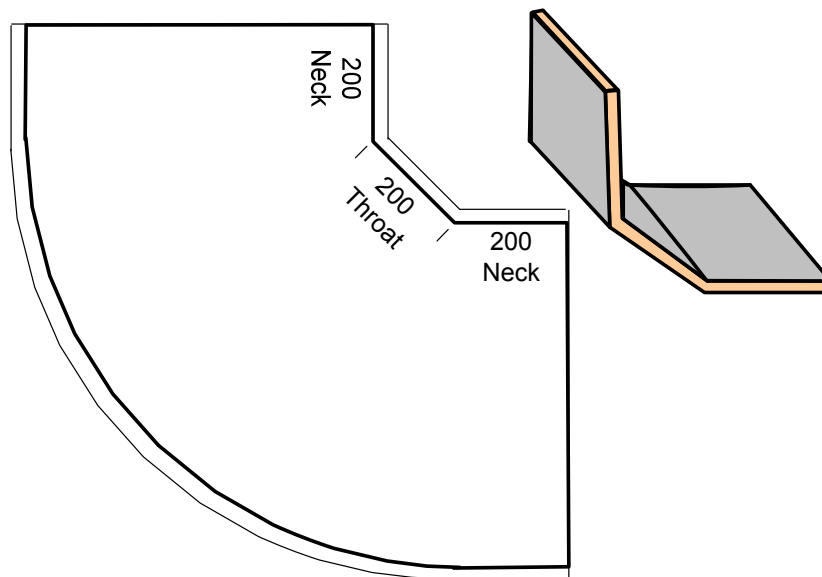
Jack Plane 22.5 degrees LKDA 512



Cut 1:
Setup tool
Neck size +70mm
from panel end

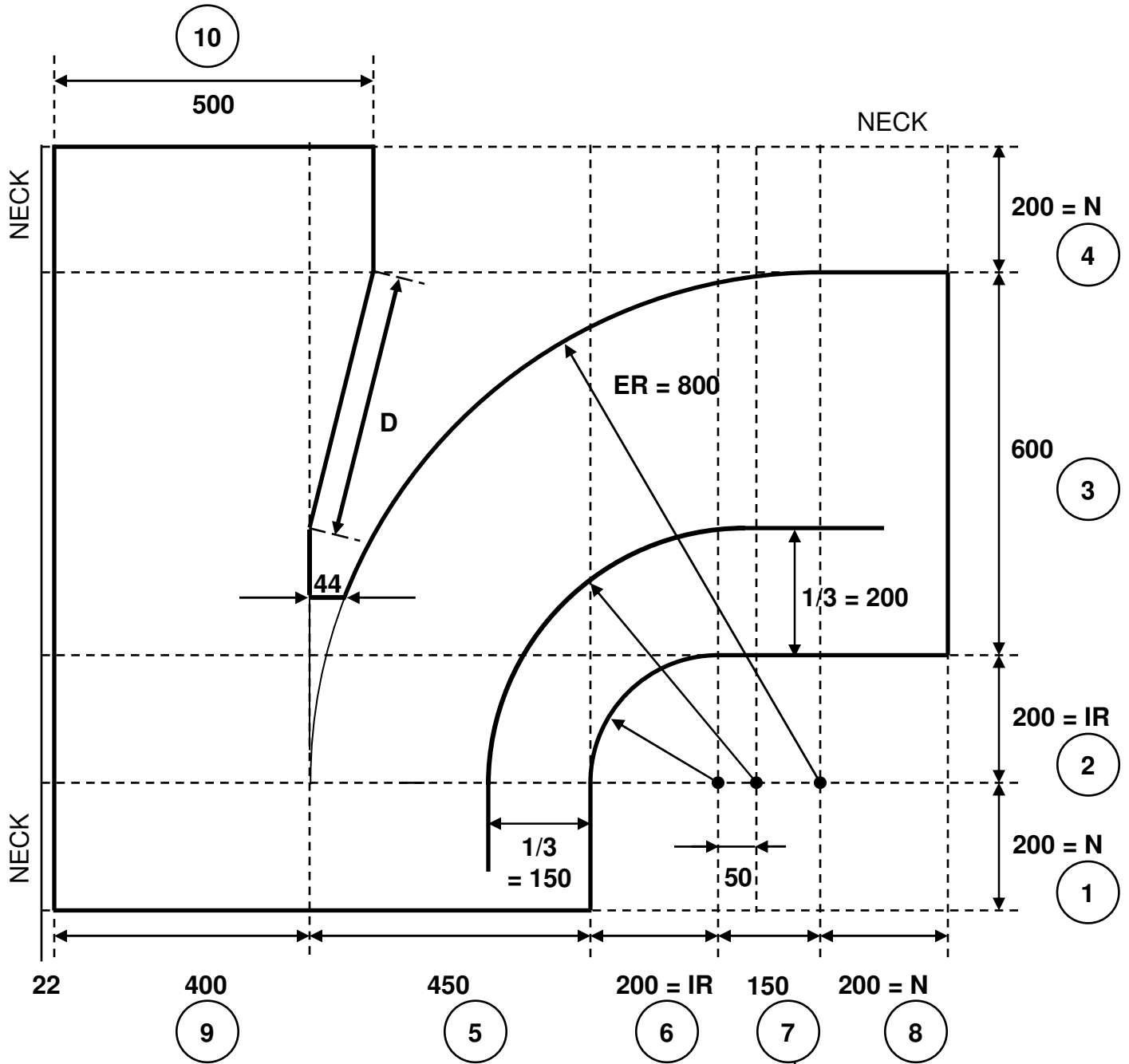


Cut 2
Setup tool
Throat size +60mm
from cut 1



The Kingspan KoolDuct® System

Dynamic Branch

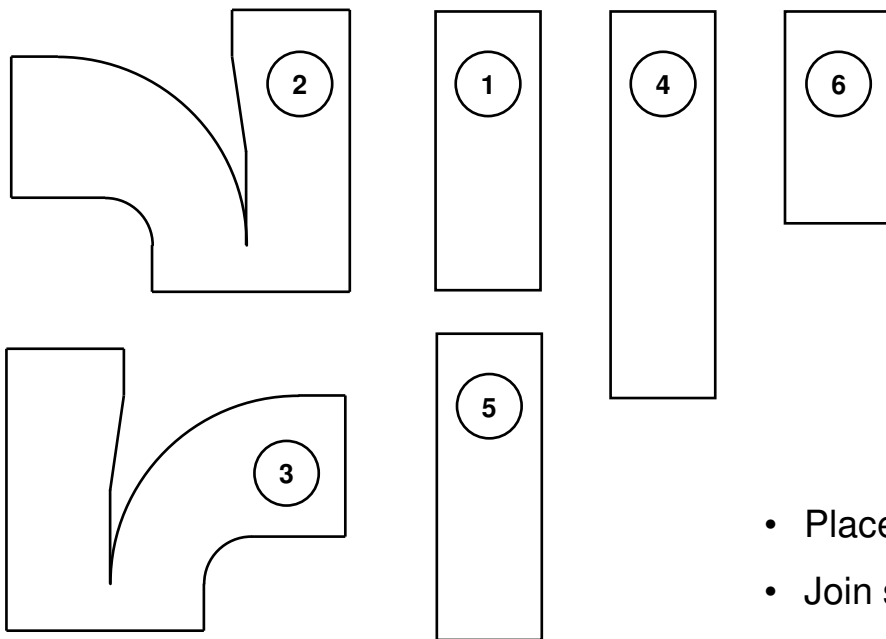


- Dimensions in mm
- Numbers in the hoop show suggested tracing procedure
- D suggested = $4 \times (500-400) = 400$; D minimum = $2.5 \times (500-400) = 250$

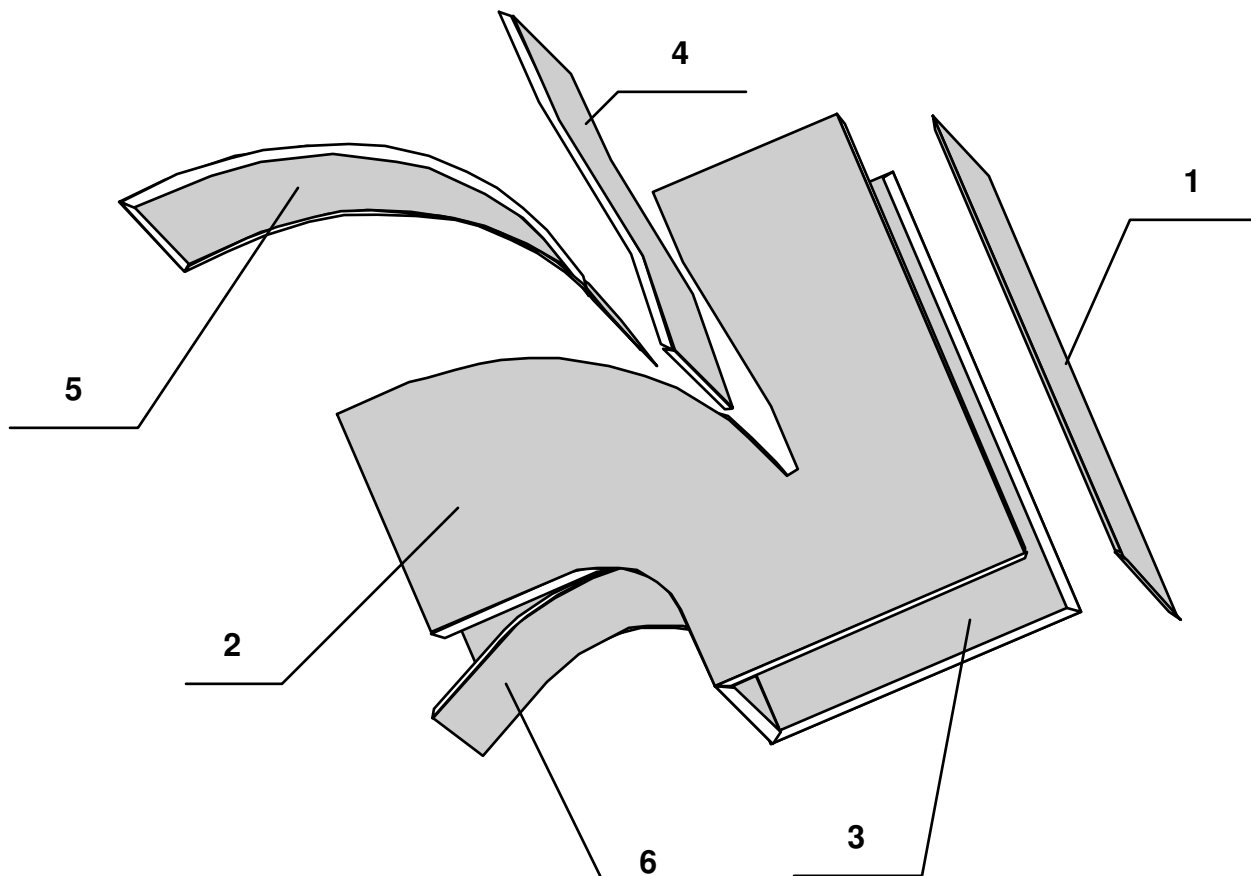
(3) minus (5)

The Kingspan KoolDuct® System

Assembly Procedure

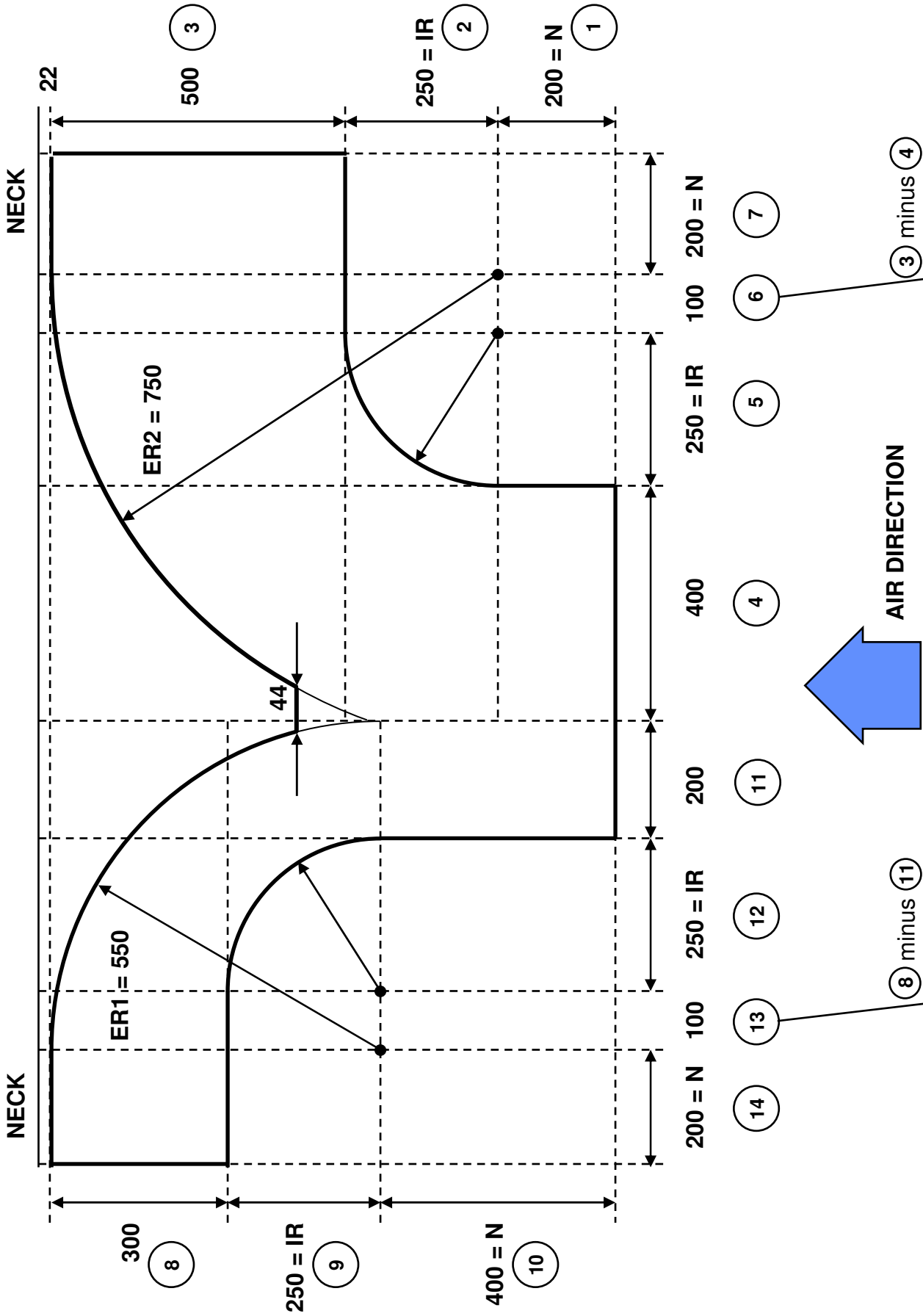


- Place 1 on the table
- Join section 2 and section 3 to 1
- Install section 4
- Install section 5
- Install section 6



The Kingspan KoolDuct® System

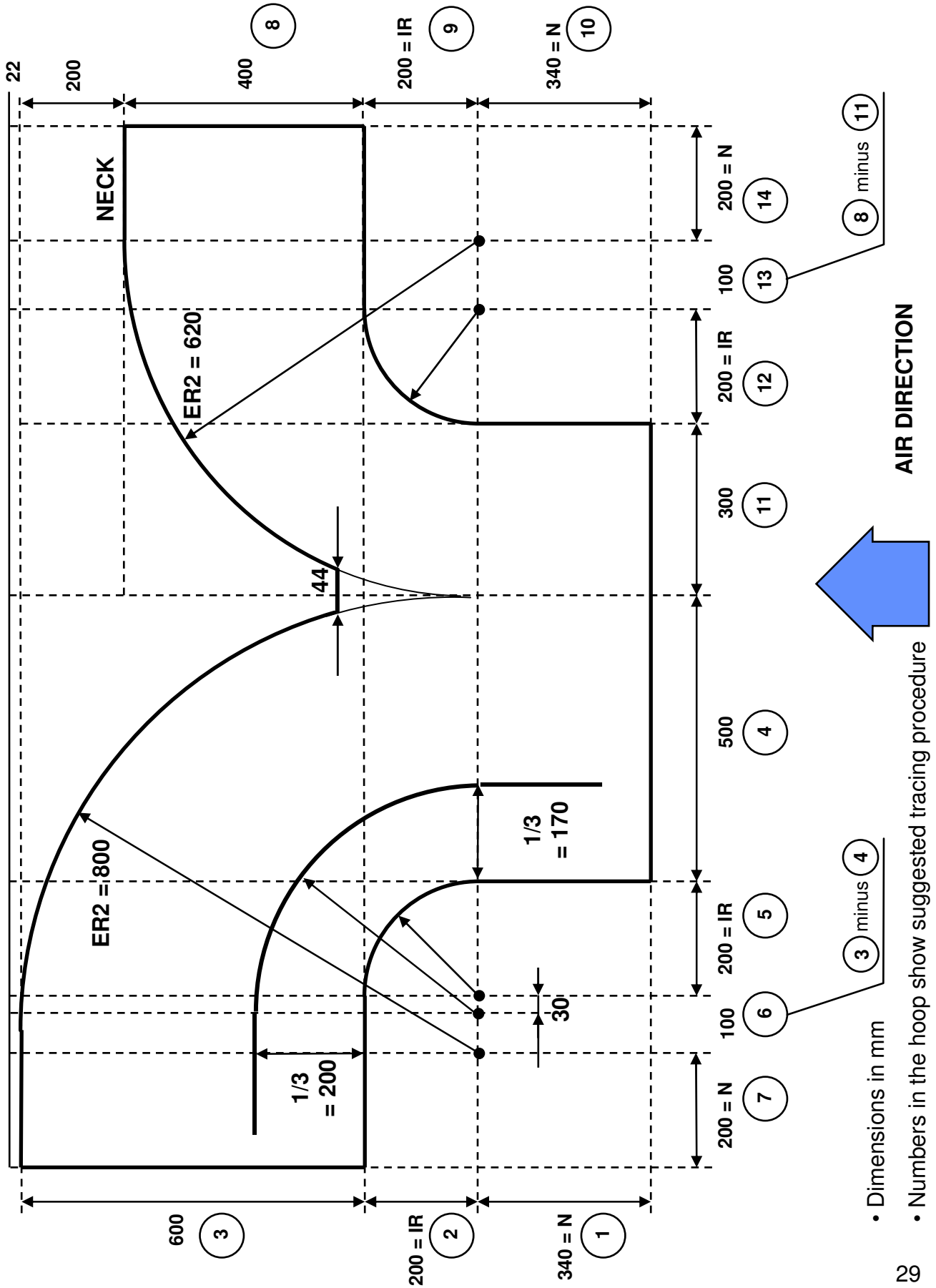
Tee Branch (external sides flushed)



- Dimensions in mm
- Numbers in the hoop show suggested tracing procedure

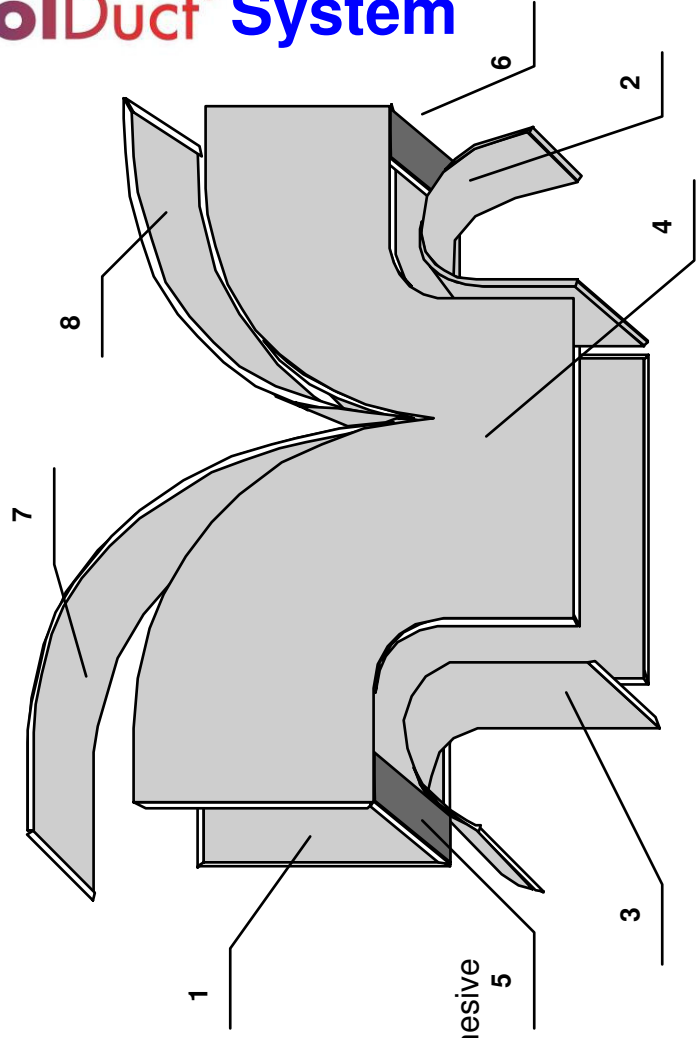
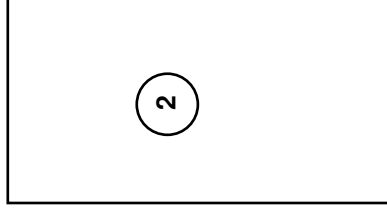
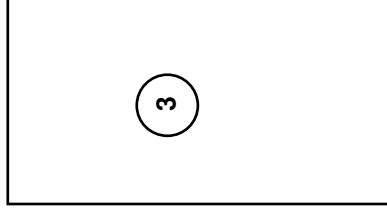
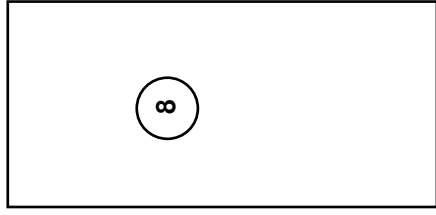
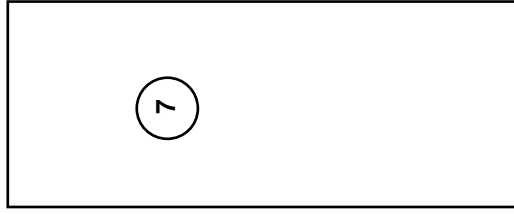
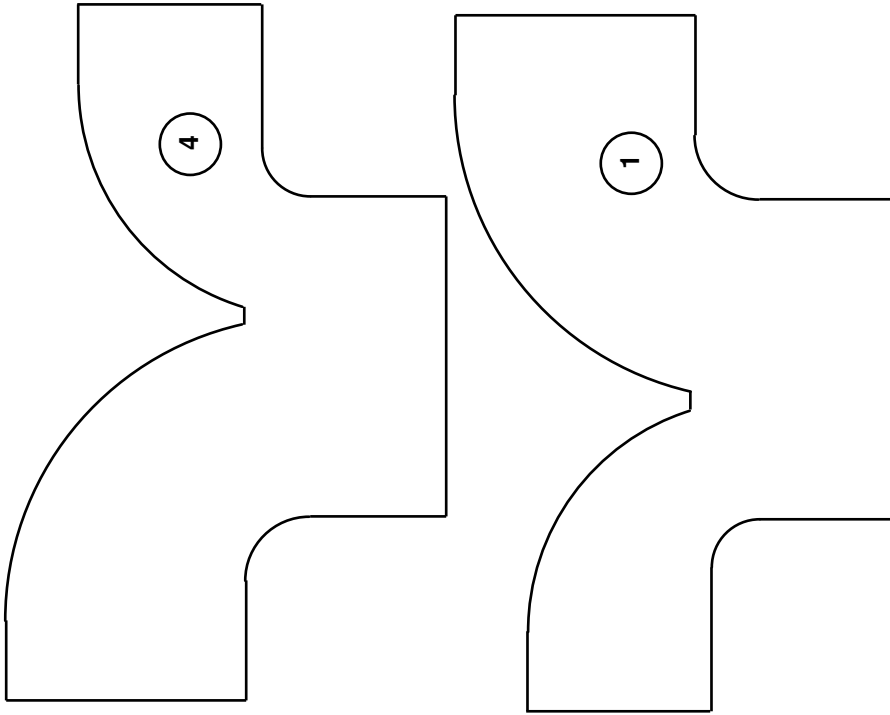
The Kingspan KoolDuct® System

Tee Branch (internal sides flushed)



The Kingspan KoolDuct® System

ASSEMBLY PROCEDURE



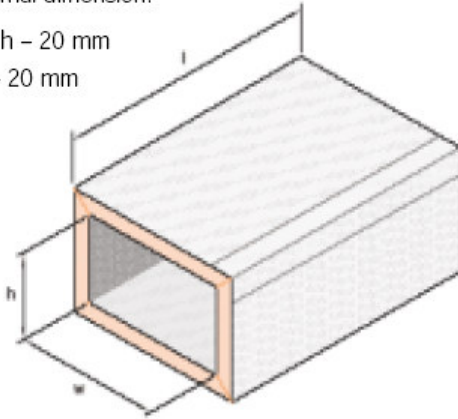
- Place section 1 on the table
- join section 2 and 3 only the neck section
- add holder pieces (scraps) 5 e 6 with just tape and no adhesive
- install bigger circumference section with cover 7
- install section 8
- remove section 5 and adhesive section 3
- remove section 6 and adhesive section 2

The Kingspan KoolDuct® System

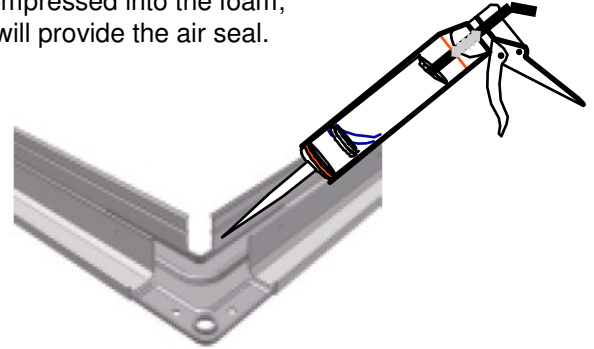
4 Bolt Flange – LKDA 380, 381, 382

1. Cut flange to 20 mm short of the length of the internal dimension.

i.e. $h - 20 \text{ mm}$
 $w - 20 \text{ mm}$



5. Tap into position, ensuring that the edge of the board is tight up against the flange and the dimple is **pressed** into the foam. When the dimple fully compressed into the foam, it will provide the air seal.



2. Cover the ends of the duct section with **Aluminium Tape** and gently taper with the black Rigid Spatula.
3. Fit corners into the flange to make up the full rectangular shape.
4. Apply **silicone** between the flange and the aluminium facing inside the duct.

Joining of Flanges

- Attach **gasket** to one flange face. Attach in one piece working around the corners.
- The preferred gasket shall be polyurethane 15mm wide and minimum 15mm thick.
- Apply silicone to exposed corner edges
- Loosely fit **Bolts** to 2 diagonally opposite corners
- Insert **Clamps** at 300mm centres about 75 mm from corners
- Fit remaining bolts and tighten all 4



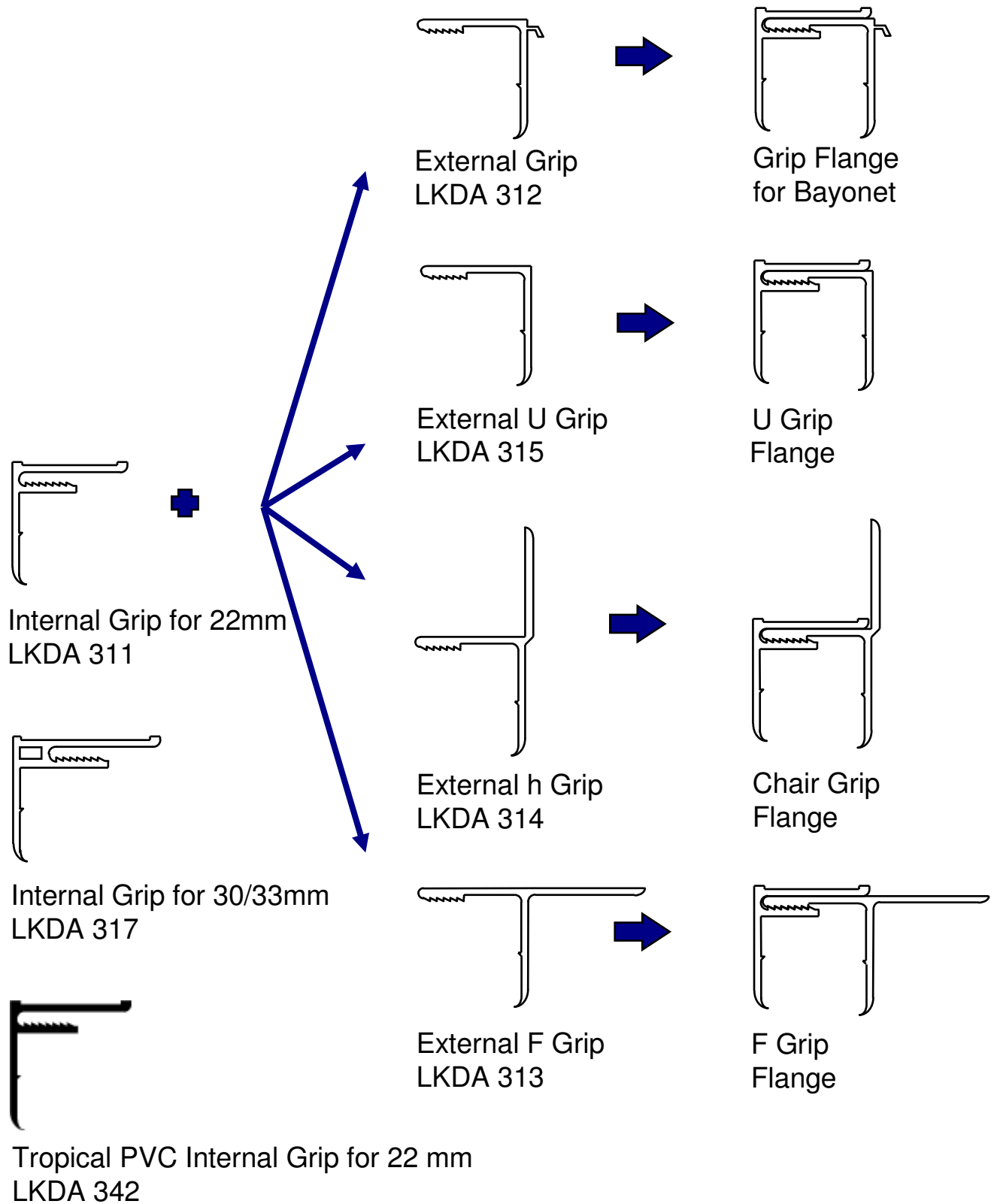
LKDA 258 Corner Piece for 22m Panel
LKDA 269 Corner Piece for 30/33m Panel

Clamp (not supplied by Kingspan)



The Kingspan KoolDuct® System

Aluminium Grip Flange System

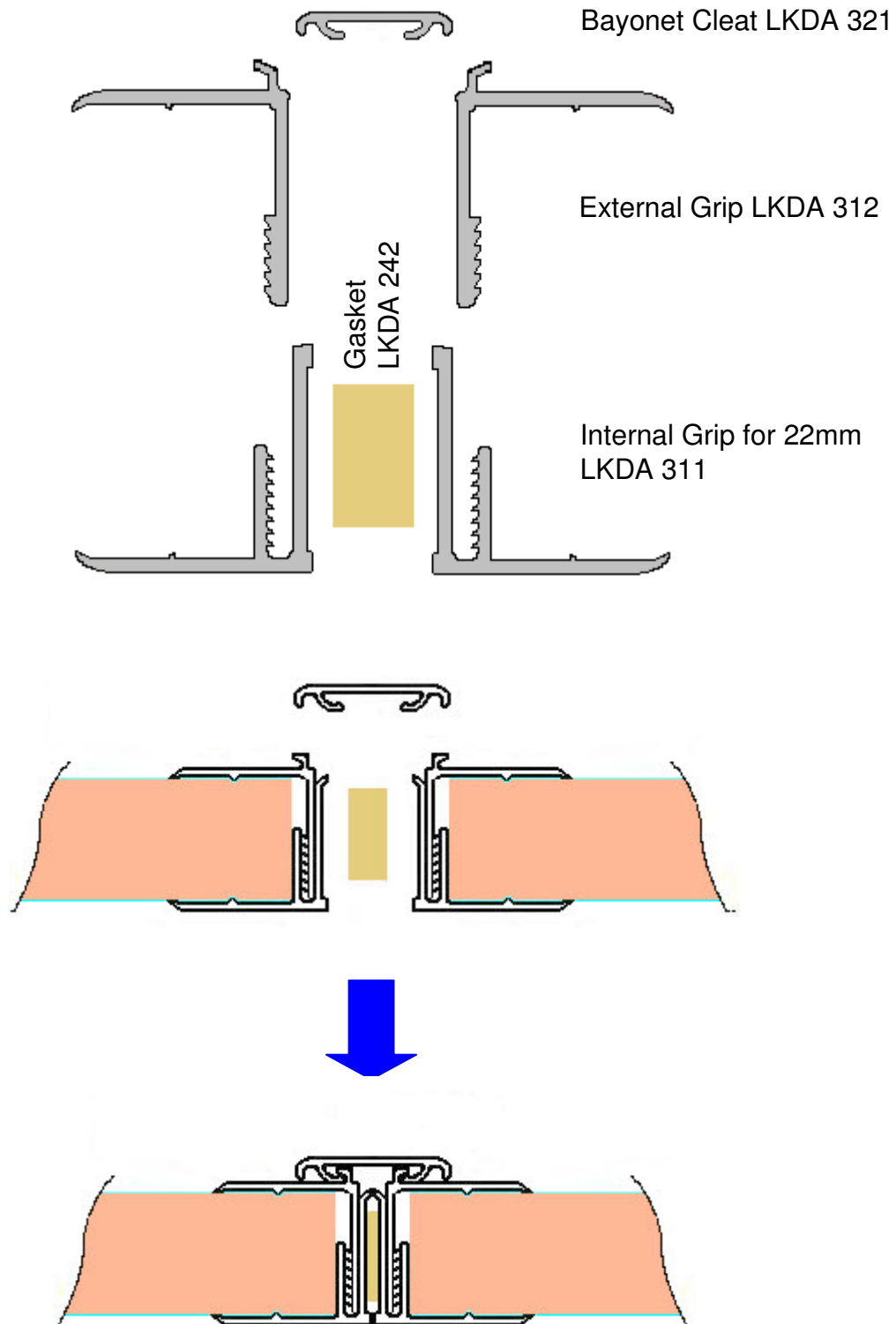


The Kingspan KoolDuct® System

Grip Flange System (Patented) – 22mm

May be used with pressure up to 500 Pa (or use Tiger Connector when possible)

With 22mm KoolDuct: Grip, Structural or 4-Bolt flange **Must be used** on duct with dimension >500mm or static pressure > 500 Pa.

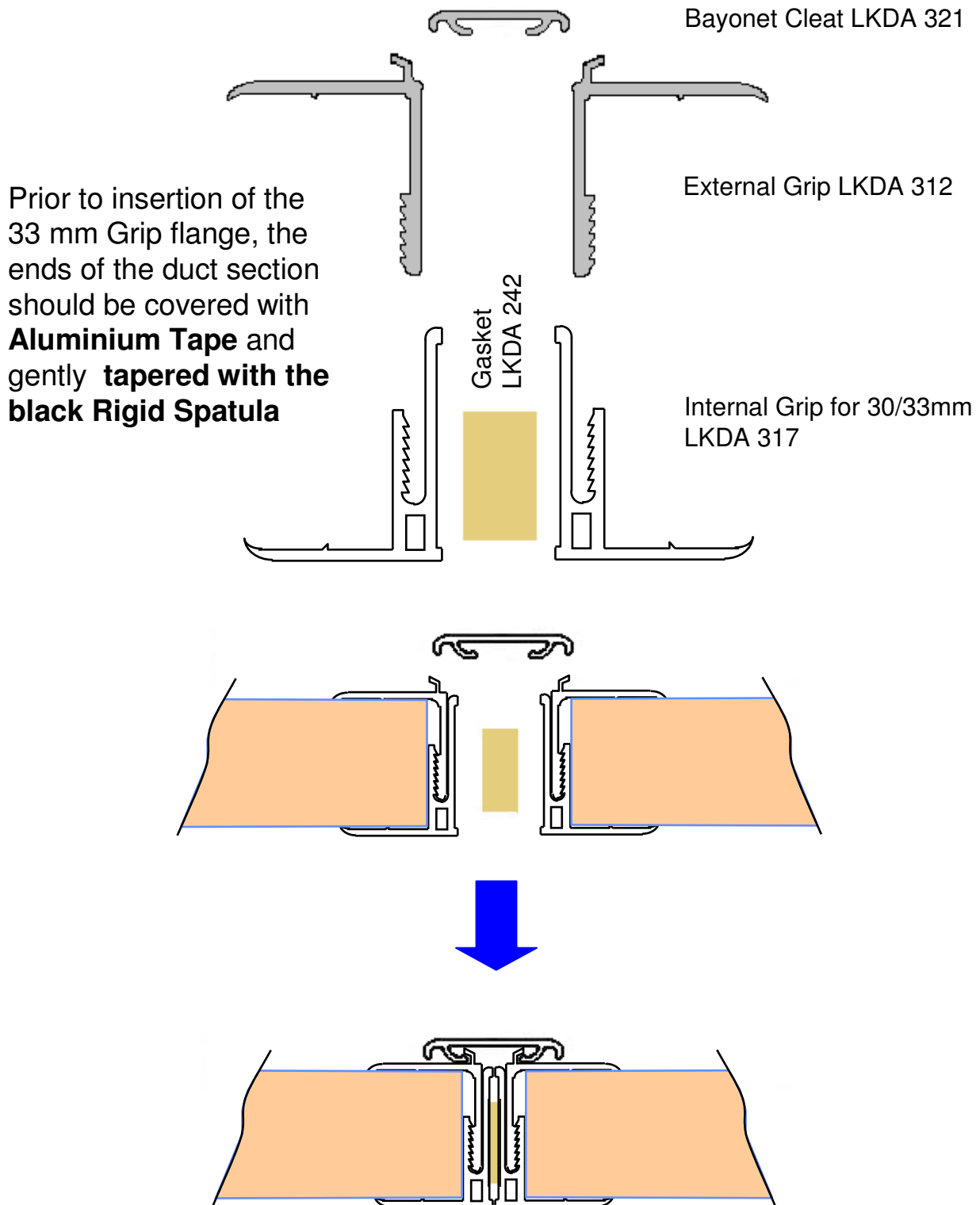


The Kingspan KoolDuct® System

Grip Flange System (Patented) – 30/33mm

May be used with pressure up to 500 Pa (or use Tiger Connector when possible).

With 33mm KoolDuct: Grip, or 4-Bolt flange **Must be used** on duct with dimension >500mm or static pressure > 500 Pa.



The Kingspan KoolDuct® System

Grip Flange Assembly (Patented)

Features:

- Positive air-tight joint on panels of varying thickness (20 to 24 mm and 30 to 33 mm)
- No need of adhesive or rivets.
- Strengthen the ends of the duct
- Aerodynamic

External Grip Profile:

One section equal to the external perimeter dimension of the duct less 4 mm.

- A. Mark a point equal to about half the external duct width.
- B. From this point, mark another point equal to the external duct height.
- C. Now mark a point equal to the external duct width
- D. Another equal to the external duct height.
- E. The remainder should, of course, equal about half the external duct width.

Each dimension mark represents the centre line of a “V” 90° cut.

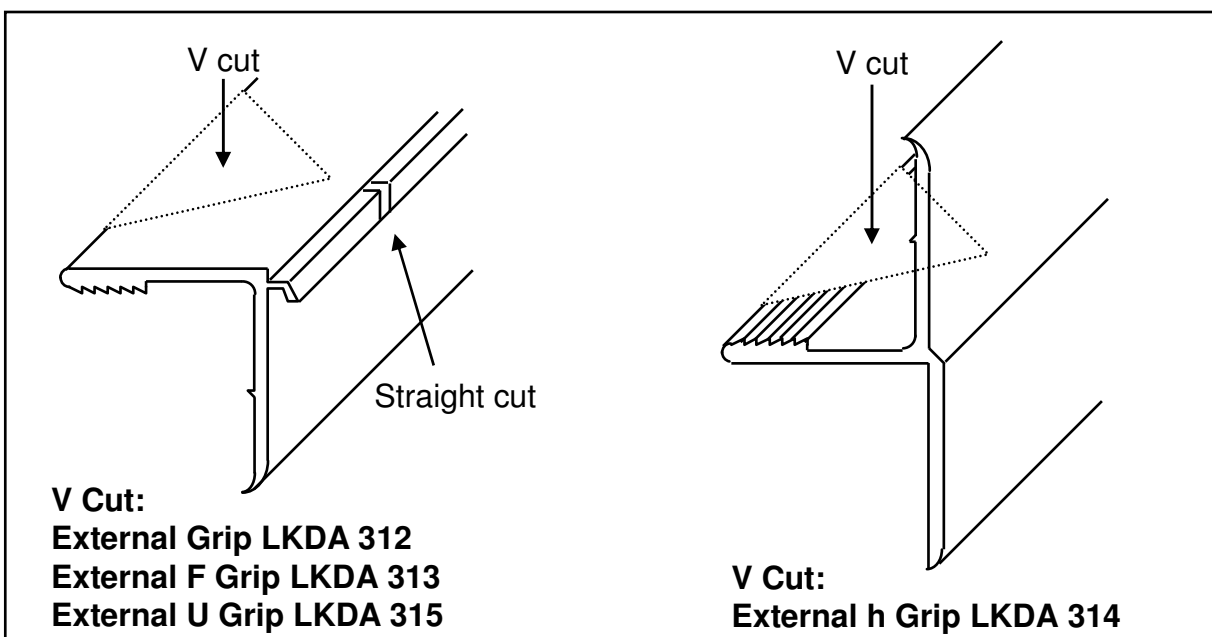
F. Fold the external male flange section at each cut to form a rectangular shape.

Internal Grip Profile:

- A. Two sections of internal (female) flange are square cut to a dimension equal to the internal duct width less 5 mm.
- B. Two sections are square cut to a dimension equal to the internal duct height less 5 mm.

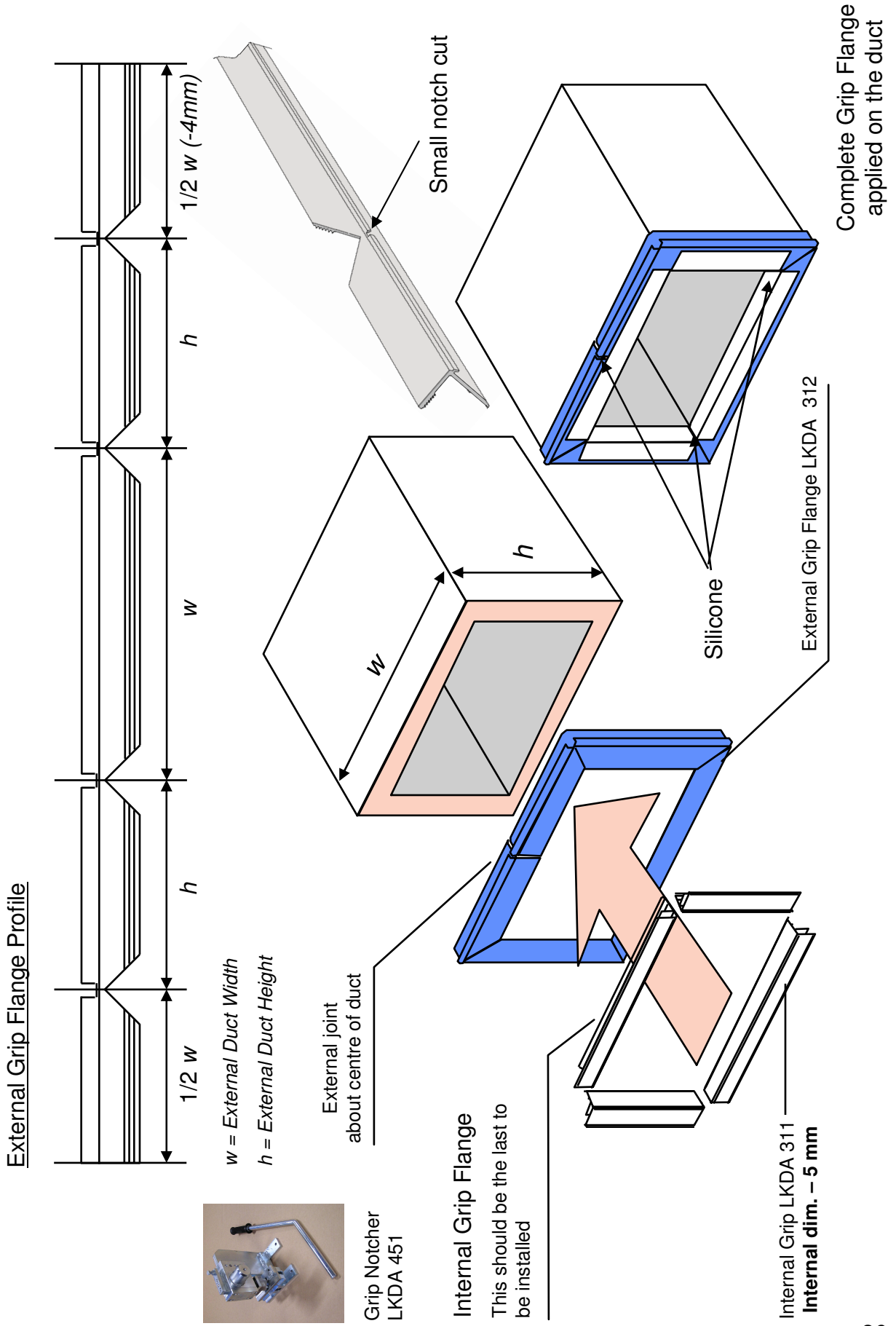
Installation:

All internal Grip (female) pieces are applied with light pressure until the total flange assembly is formed. Only when one piece is properly engaged and correctly positioned, it should be forced into the final locking grip using a rubber mallet.



The Kingspan KoolDuct® System

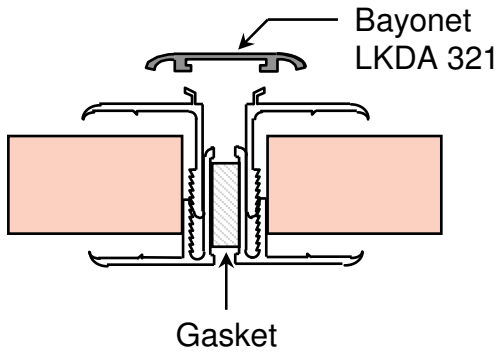
Grip Flange Cuts



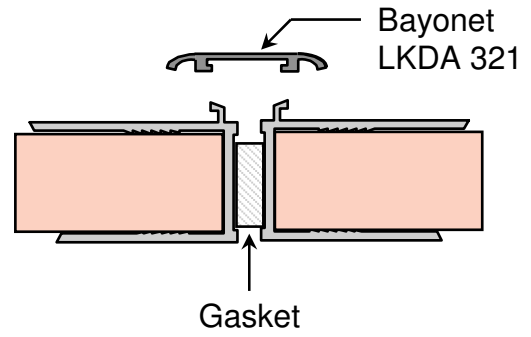
The Kingspan KoolDuct® System

Aluminium Flange Profiles

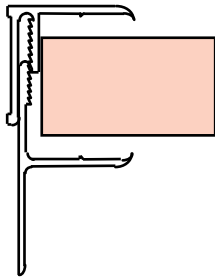
GRIP FLANGE LKDA 311 + 312



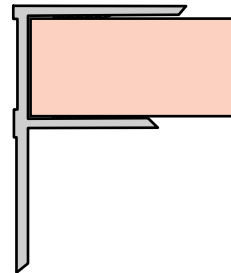
STRUCTURAL FLANGE LKDA 331



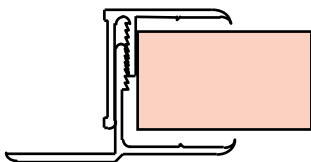
“F” GRIP FLANGE LKDA 311 + 313



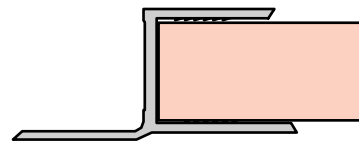
“F” STRUCTURAL FLANGE LKDA 332



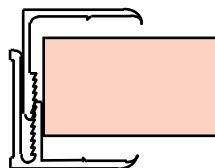
“h” GRIP FLANGE LKDA 311 + 314



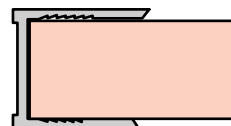
“h” STRUCTURAL FLANGE LKDA 333



“U” GRIP FLANGE LKDA 311 + 315



“U” STRUCTURAL FLANGE LKDA 334

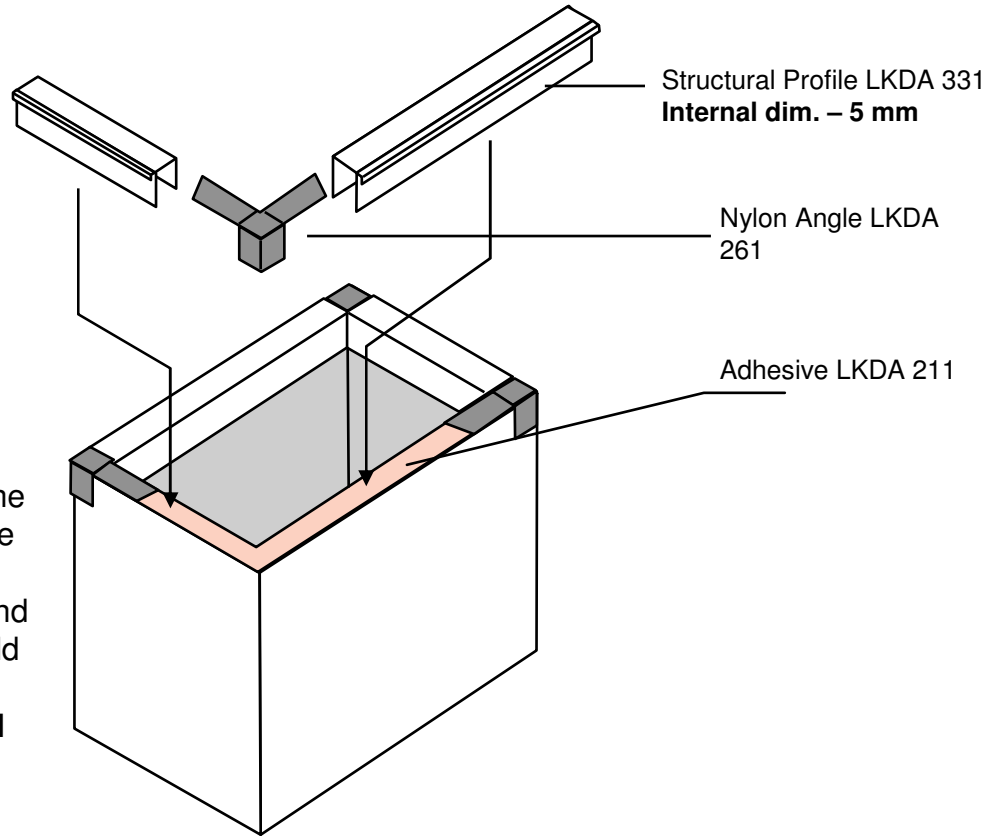


The Kingspan KoolDuct® System

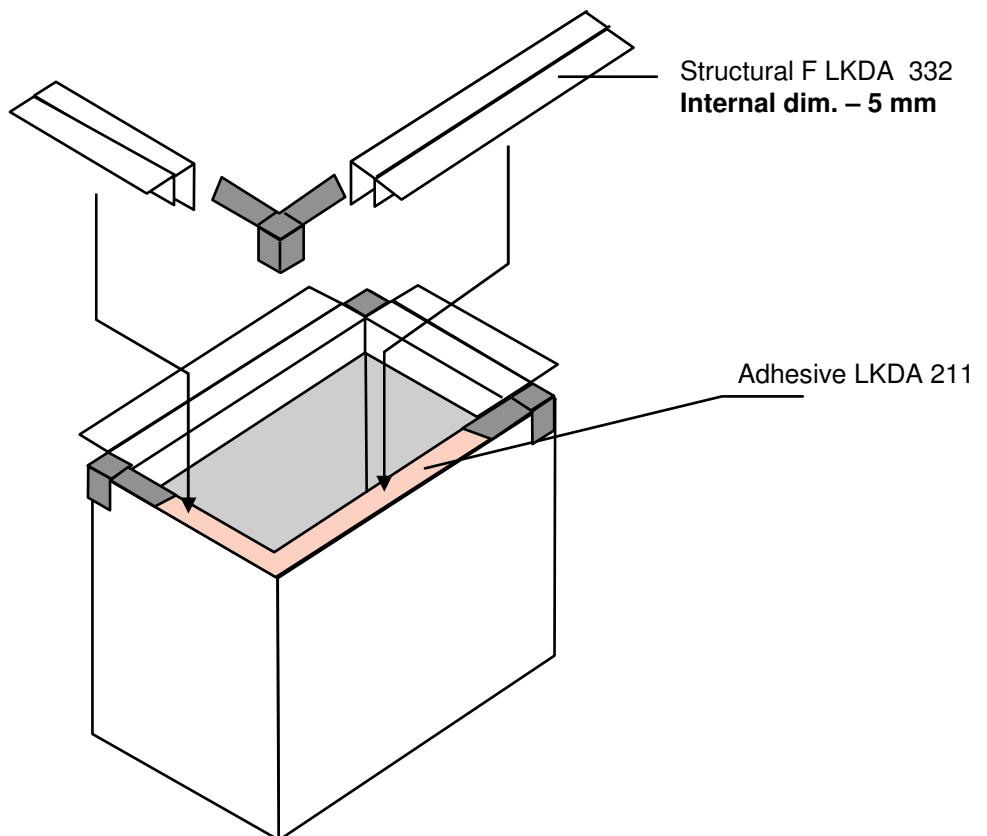
Structural Aluminium Profiles (Alternative to Grip for 22mm KoolDuct only)

EXAMPLE: STRUCTURAL FLANGE

Prior to insertion of the Structural flanges, the ends of the duct section (both inner and outer surfaces) should be gently **tapered** with the **black Rigid Spatula**

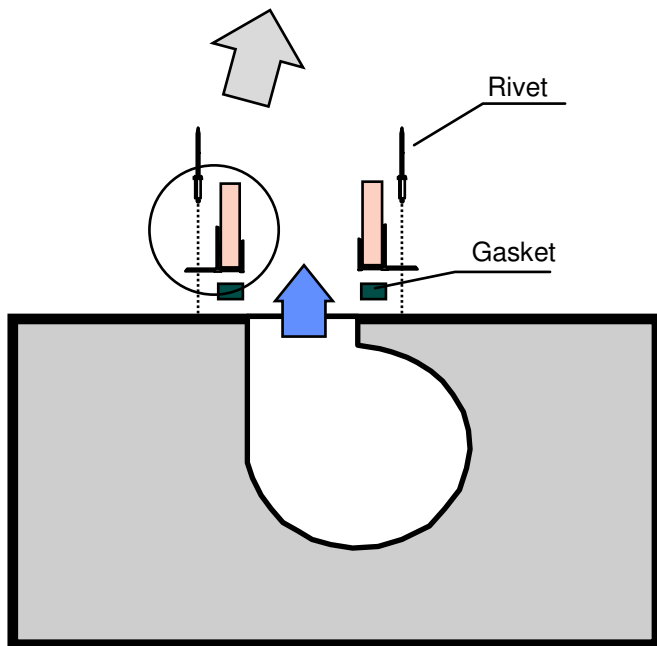
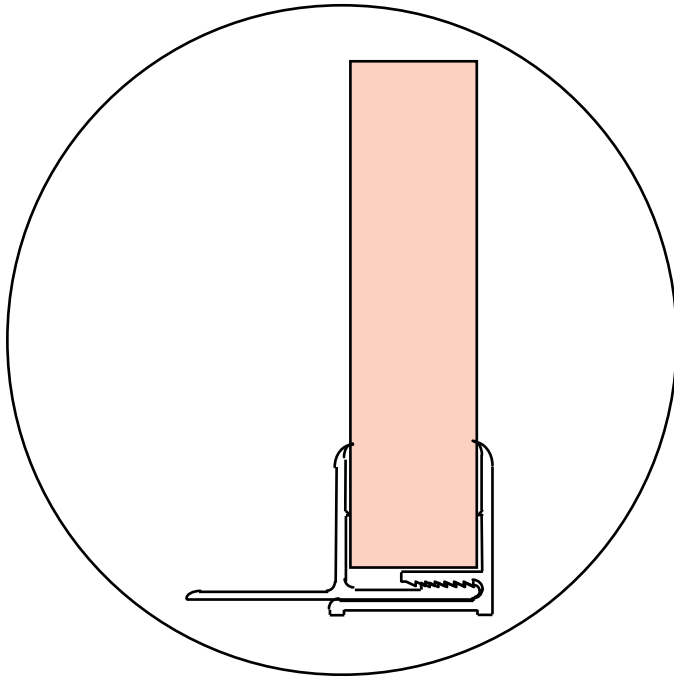


EXAMPLE: “F” STRUCTURAL FLANGE

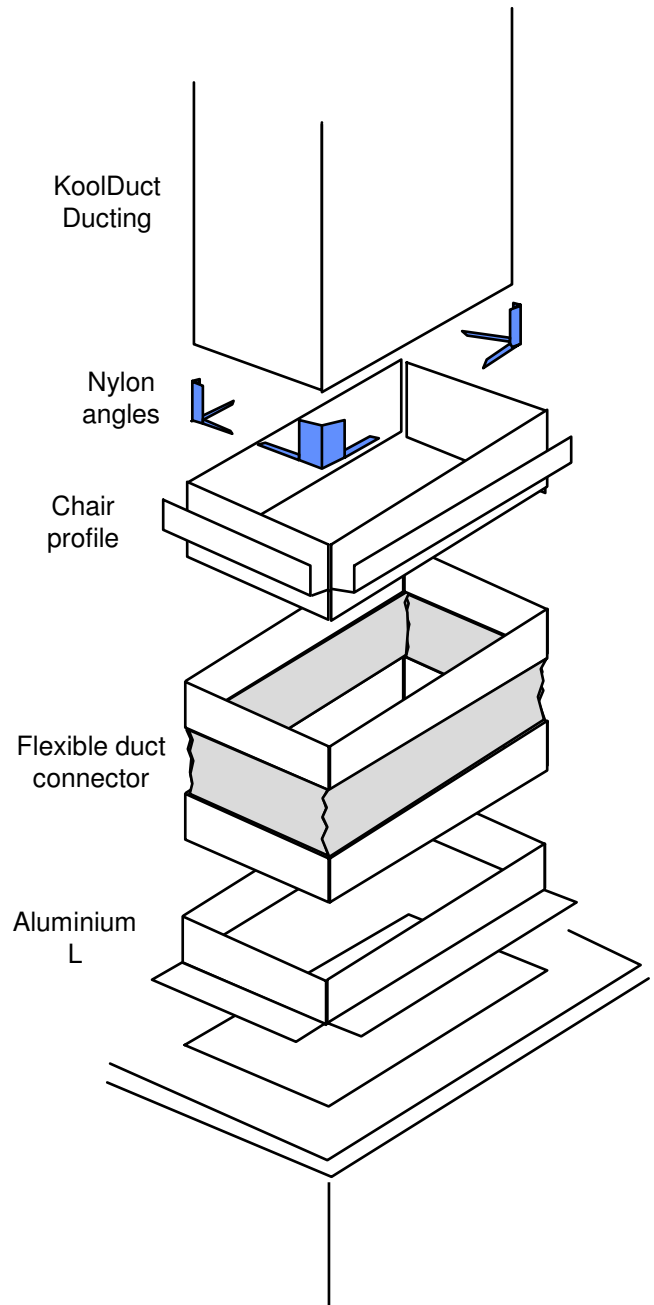


The Kingspan KoolDuct® System

Profile in Aluminium For Flush Connections To Machines



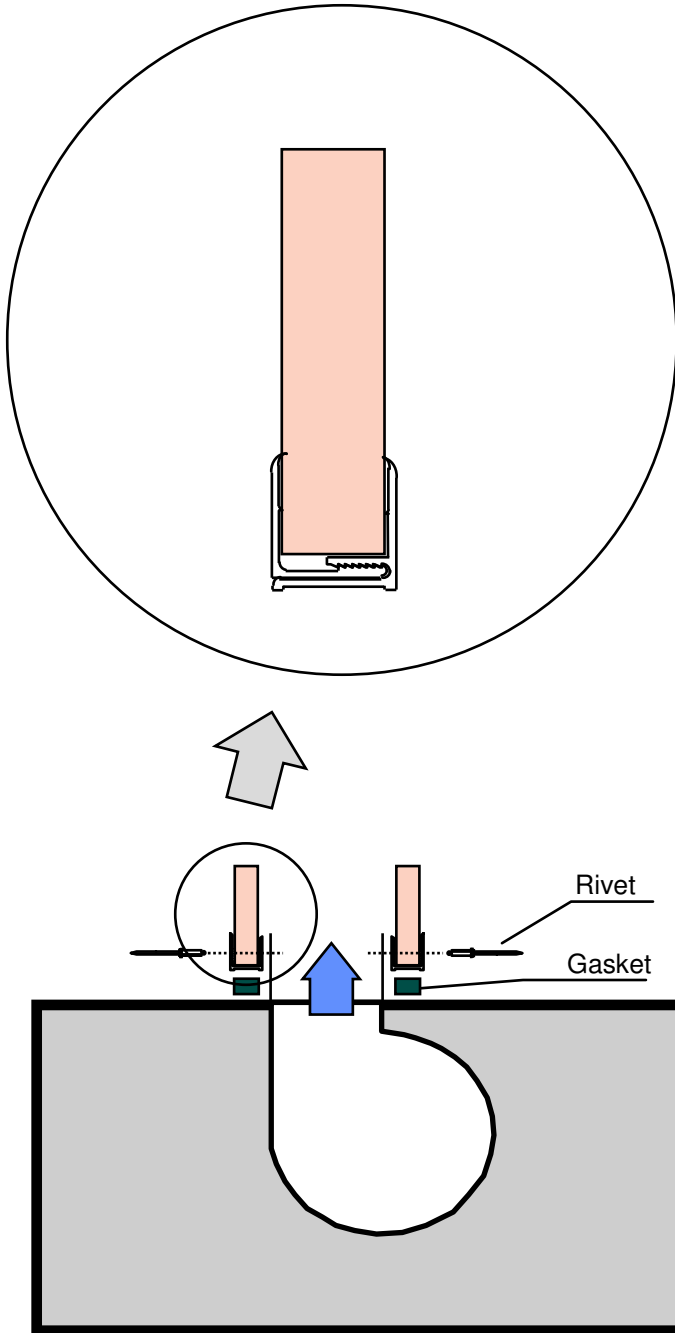
**direct connection
using "F" profile**



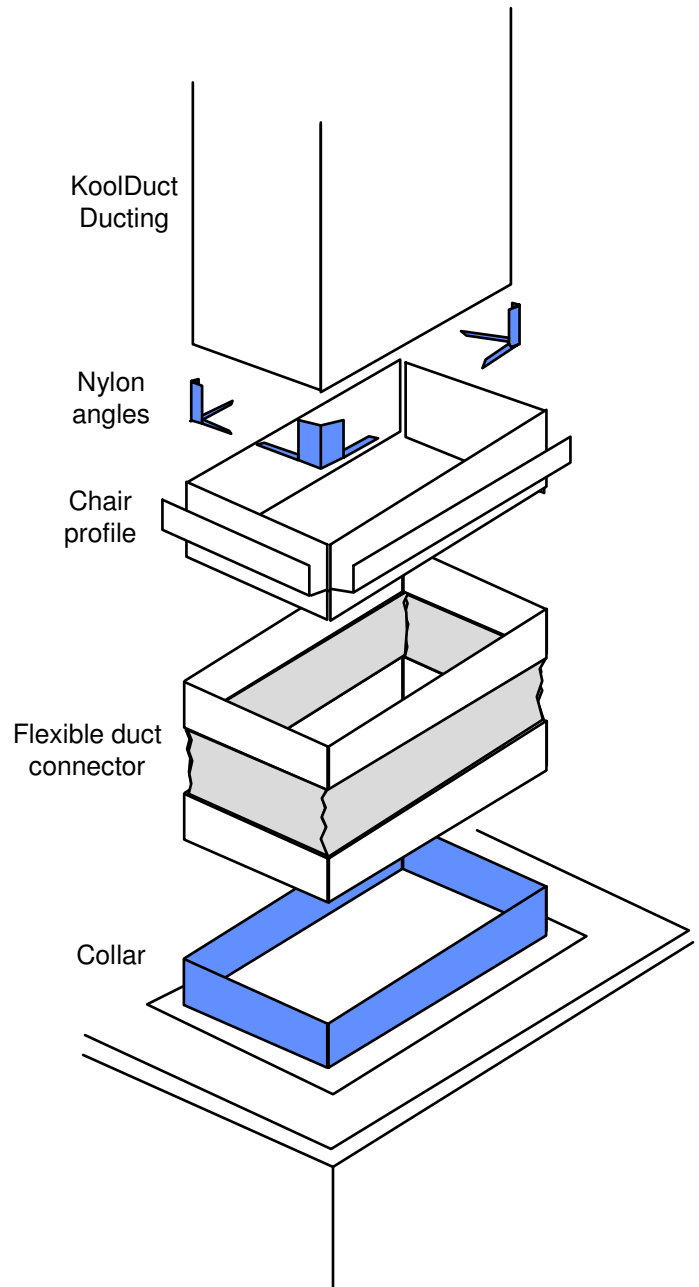
**with flexible duct
connector using
"h" profile**

The Kingspan KoolDuct® System

Profile in Aluminium For Connections To Machines With Collar



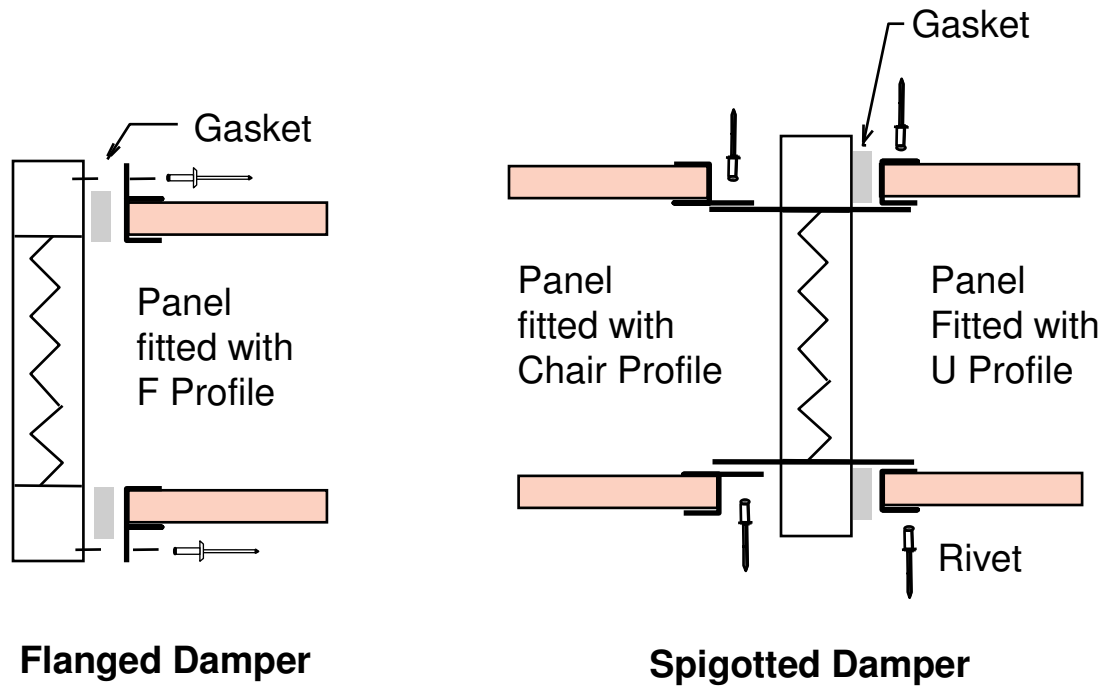
**direct connection
using "U" profile**



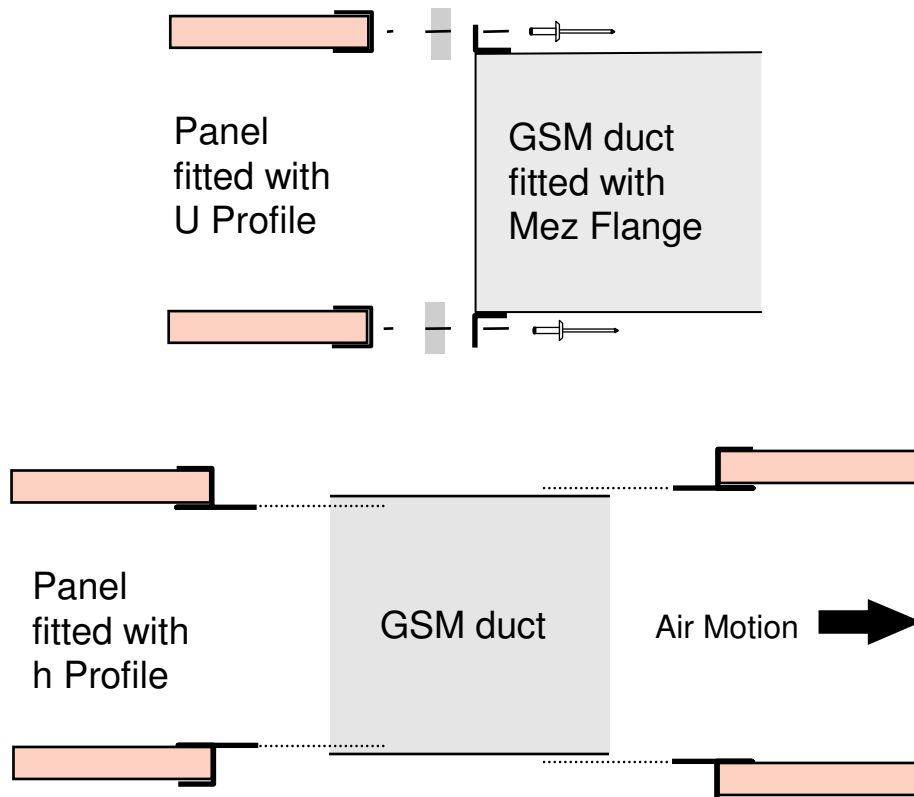
**with flexible duct
connector using
"h" profile**

The Kingspan KoolDuct® System

Connection To Accessories



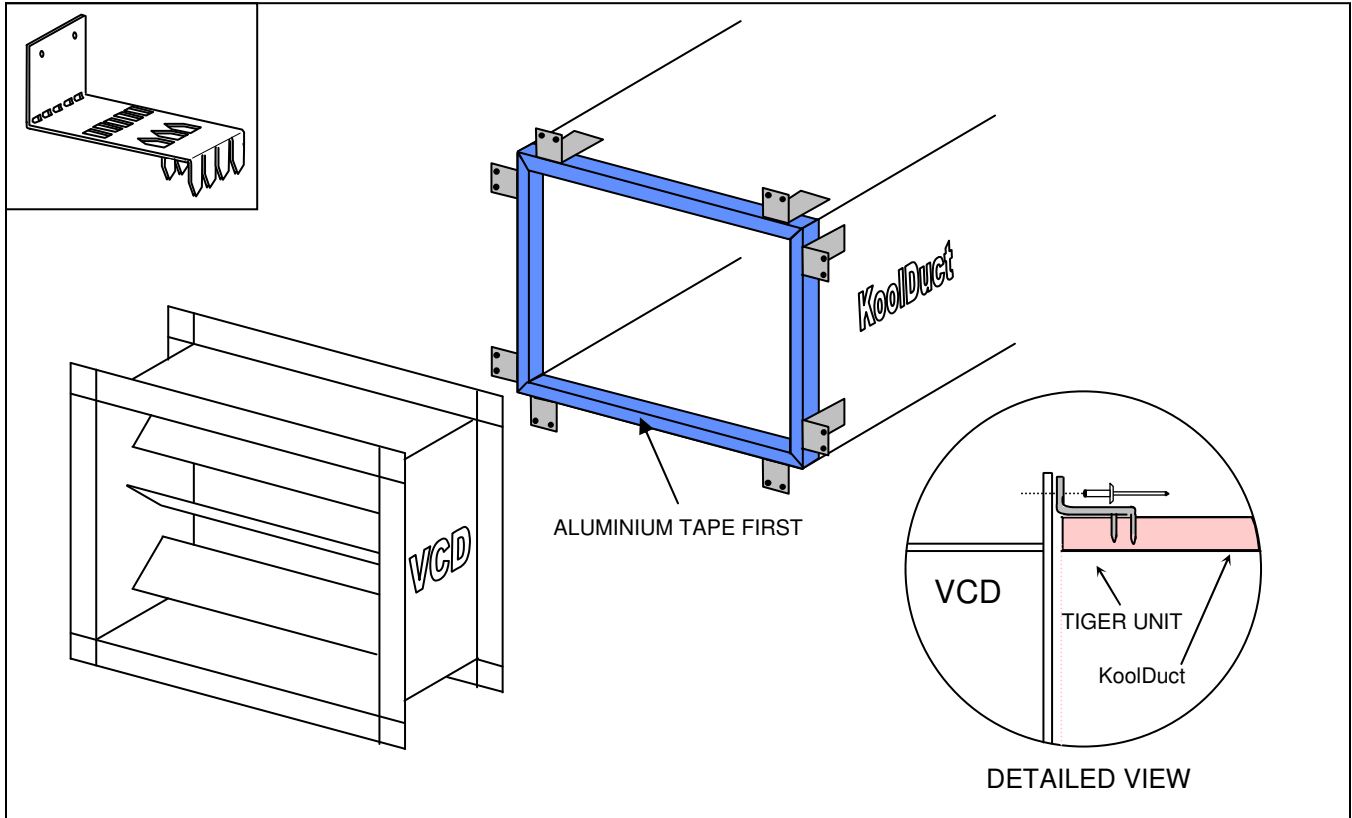
CONNECTION TO SHEET METAL



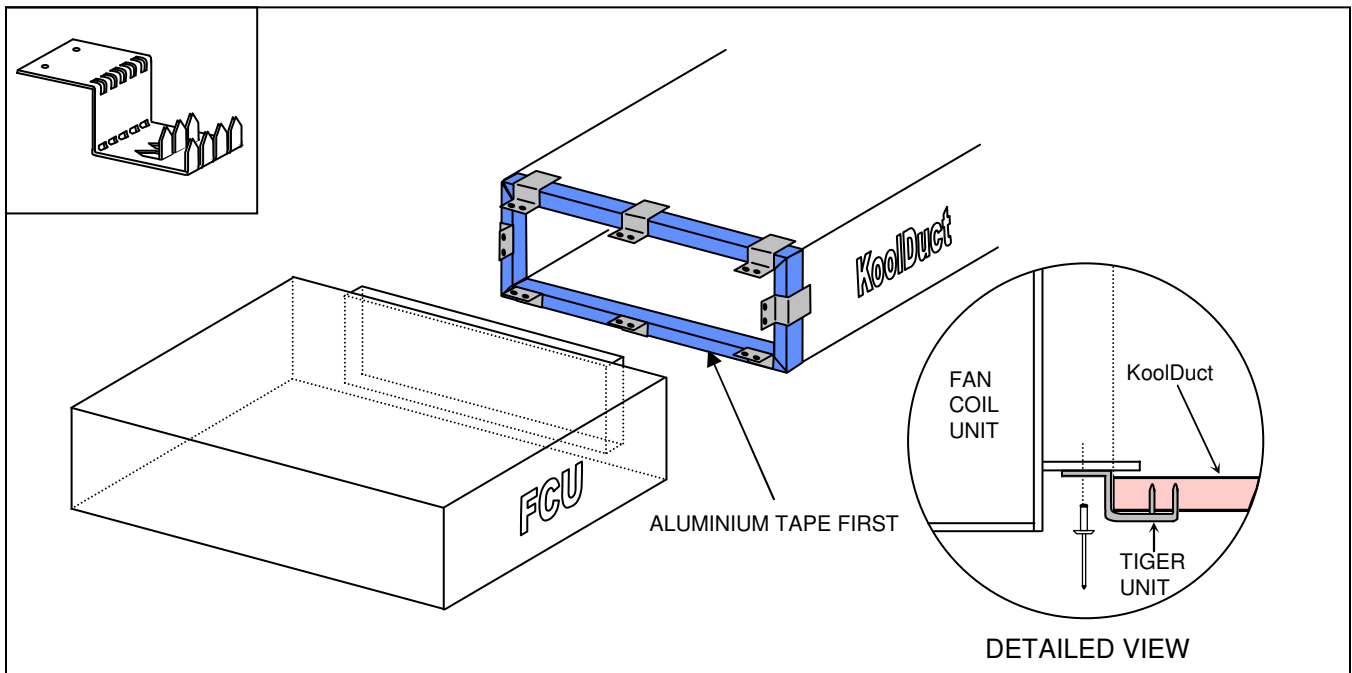
The Kingspan KoolDuct® System

Alternative Connection With Tiger Unit LKDA 363

Small Ducting <2m Perimeter, Low Pressure <250 Pascal



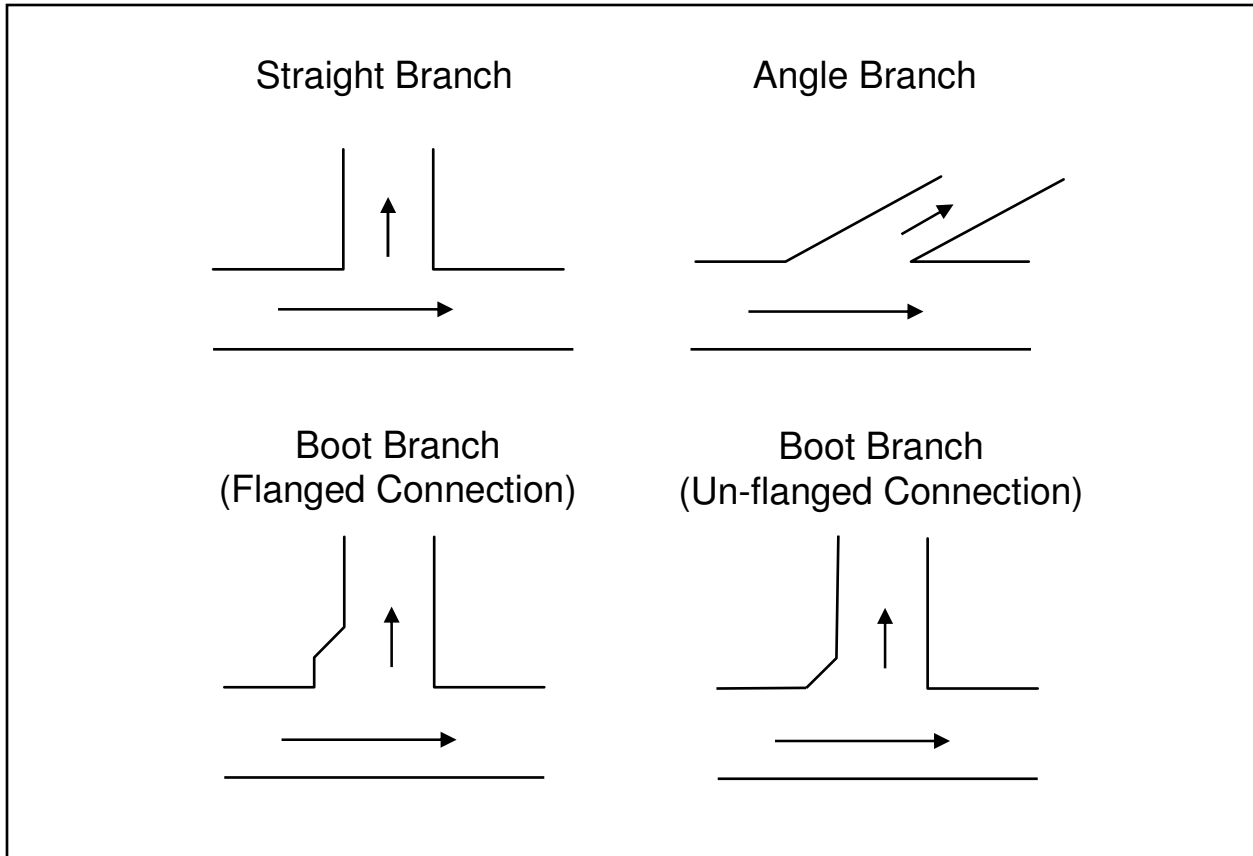
Duct Connection to VCD (Volume Control Damper)



Duct Connection to Fan Coil Unit

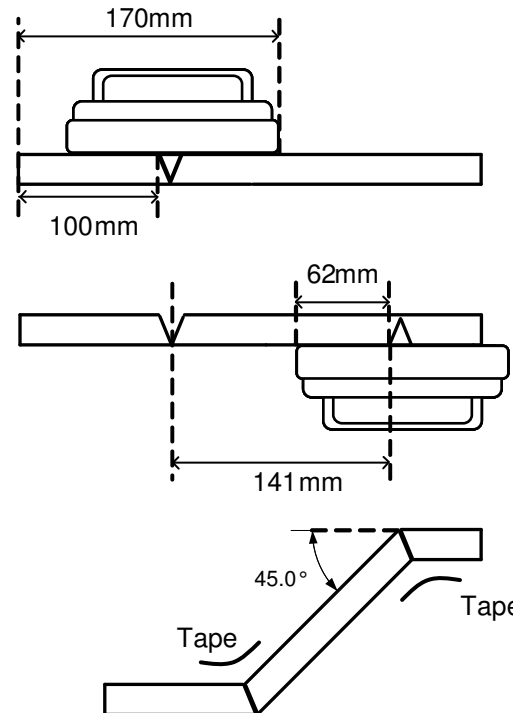
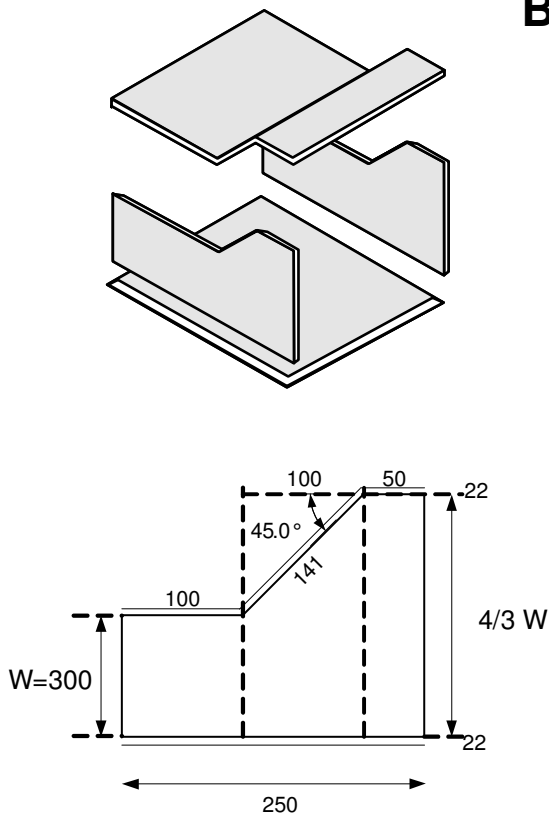
The Kingspan KoolDuct® System

Take-Off



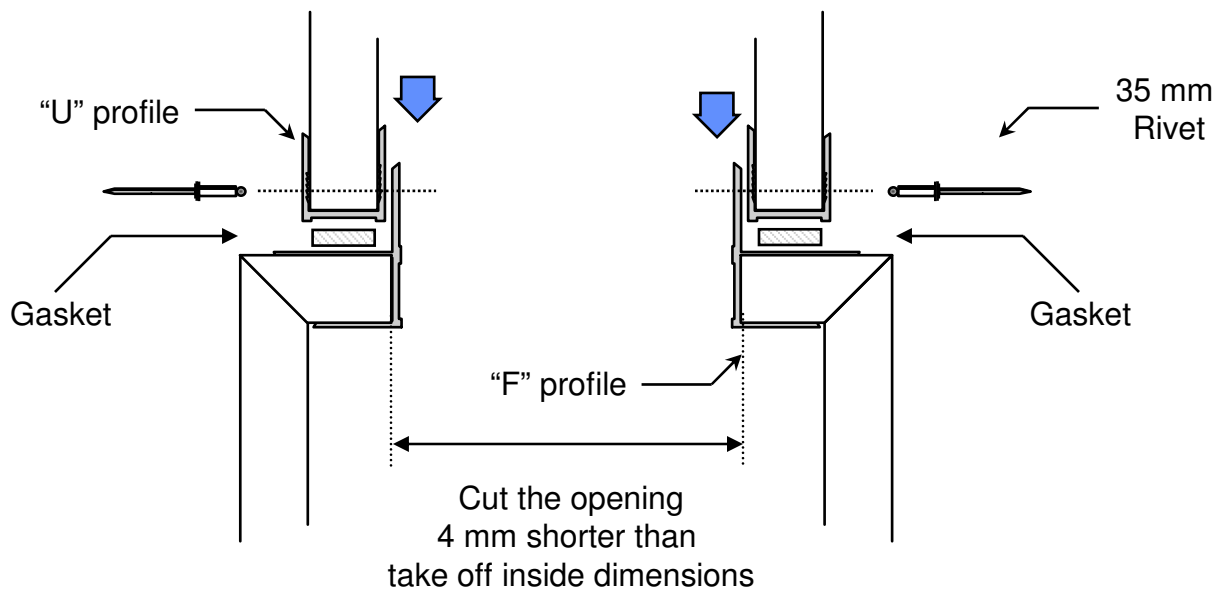
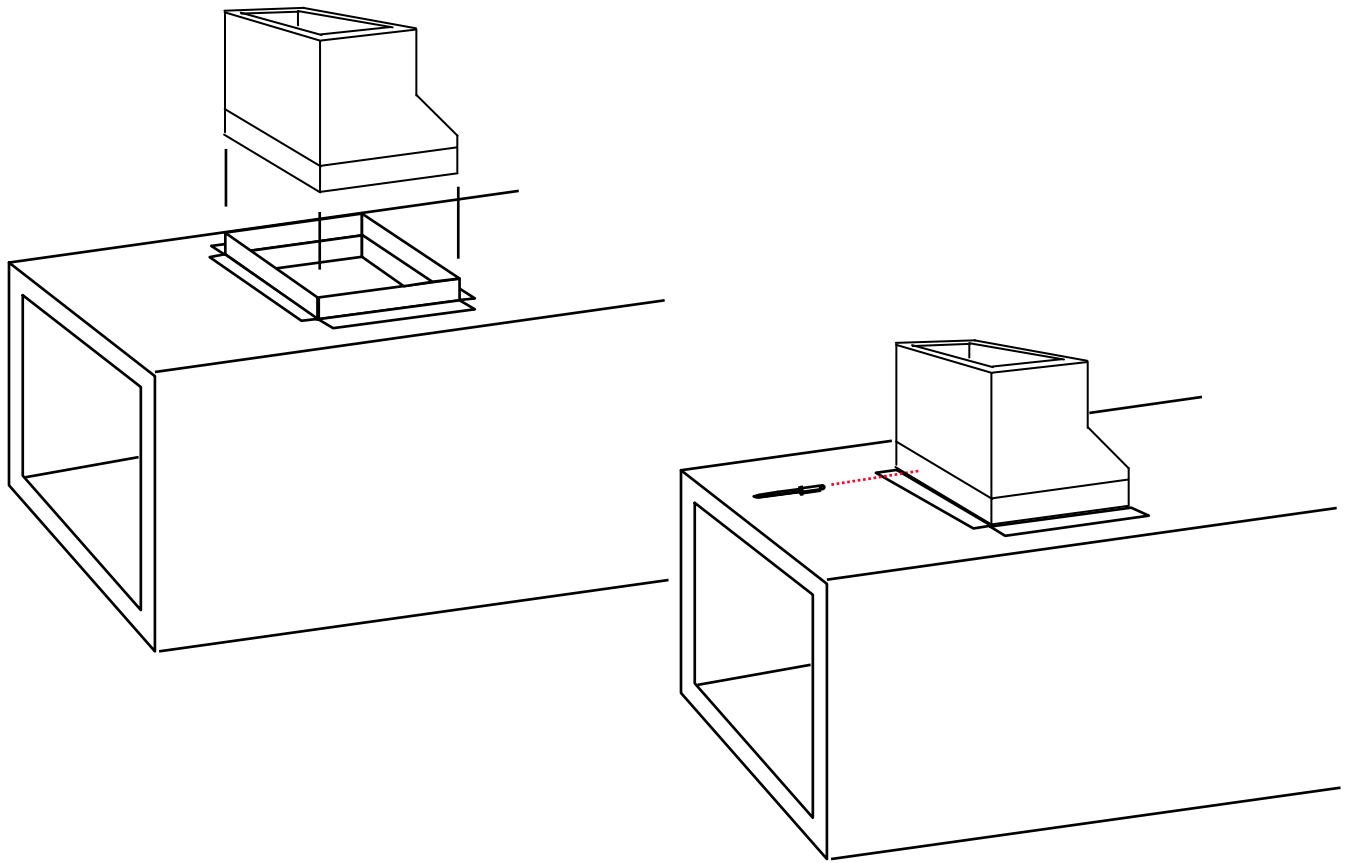
Boot Branch

Jack Plane 22.5° LKDA 512



The Kingspan KoolDuct® System

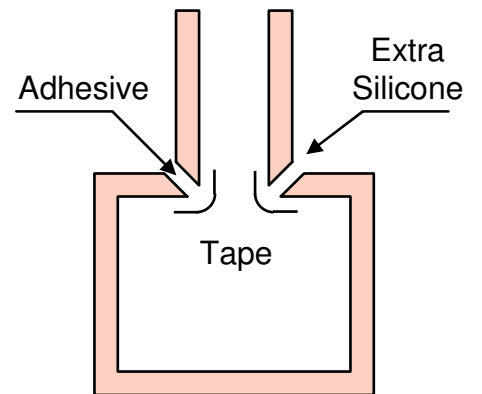
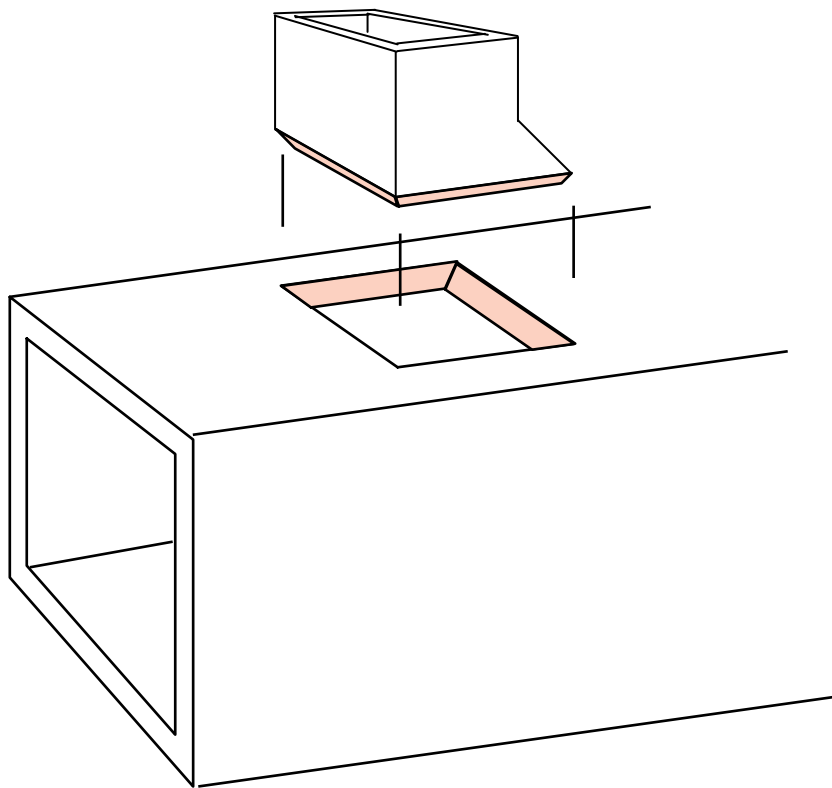
Take-Off – Flanged Connection



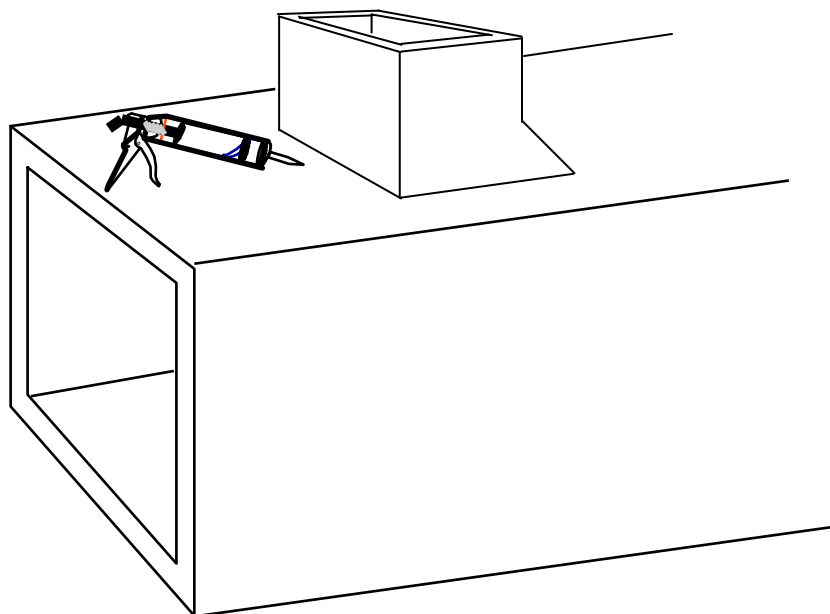
The Kingspan KoolDuct® System

Small Take-Off – Un-flanged Connection

Duct side less than 500 mm, max length 3 metres, less than 500 Pascal

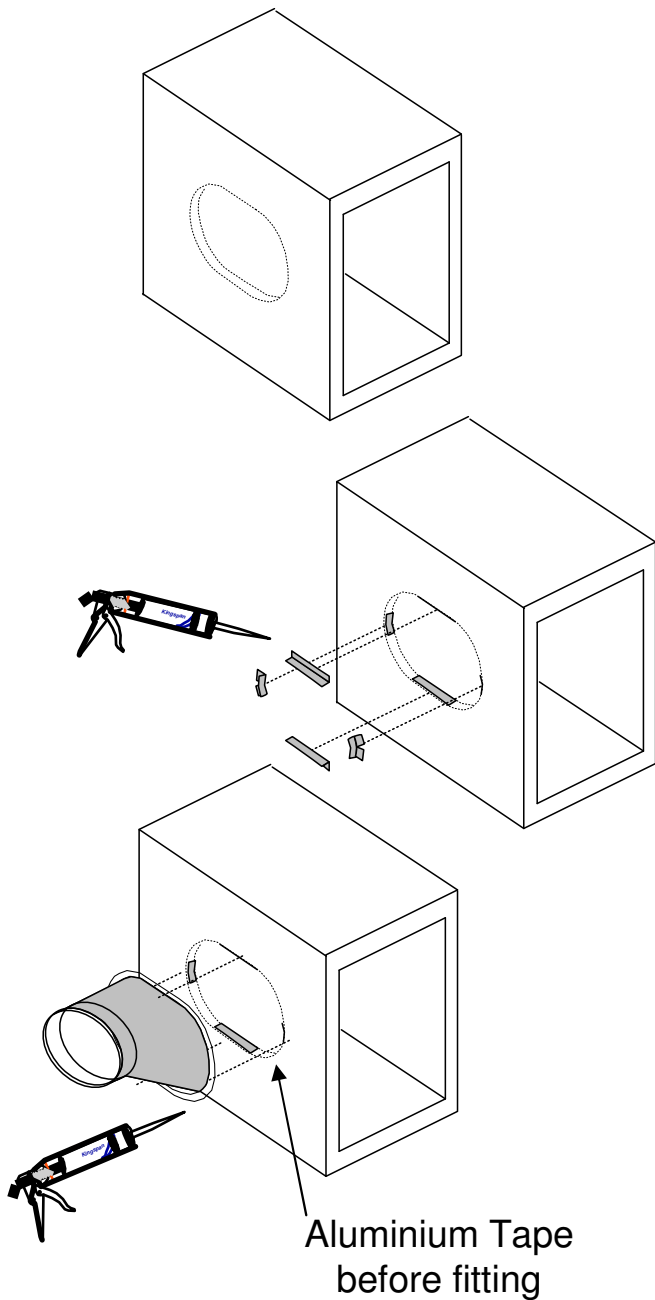
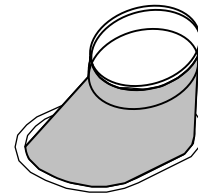


Male - Female Connection

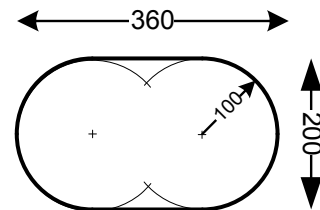


The Kingspan KoolDuct® System

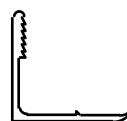
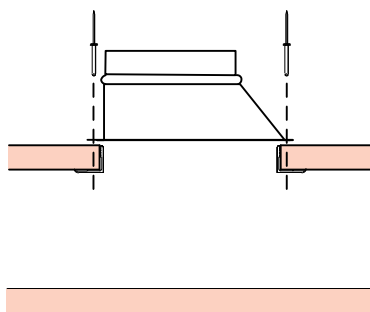
Shoe Branch Fitting – Mechanical fixing for Flexible Ducts, Spiral Ducts, Round Diffusers.



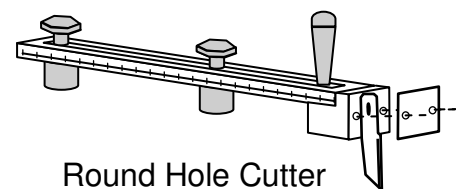
- 1) Cut a hole in the main duct to suit the internal dimensions of the metal shoe.



- 2) Cut metal “L” shape profile (such as External U Grip flange), and secure them inside the duct with silicone on the inner side of the cut hole
- 3) Cover the “L” shape profile and the insulation with **aluminium tape**
- 4) Secure the metal shoe fitting to the duct using rivets or screws as appropriate, passing through the lap of the shoe branch, through the phenolic insulation and the “L” shape profile.
- 5) Seal with silicone around the fitting



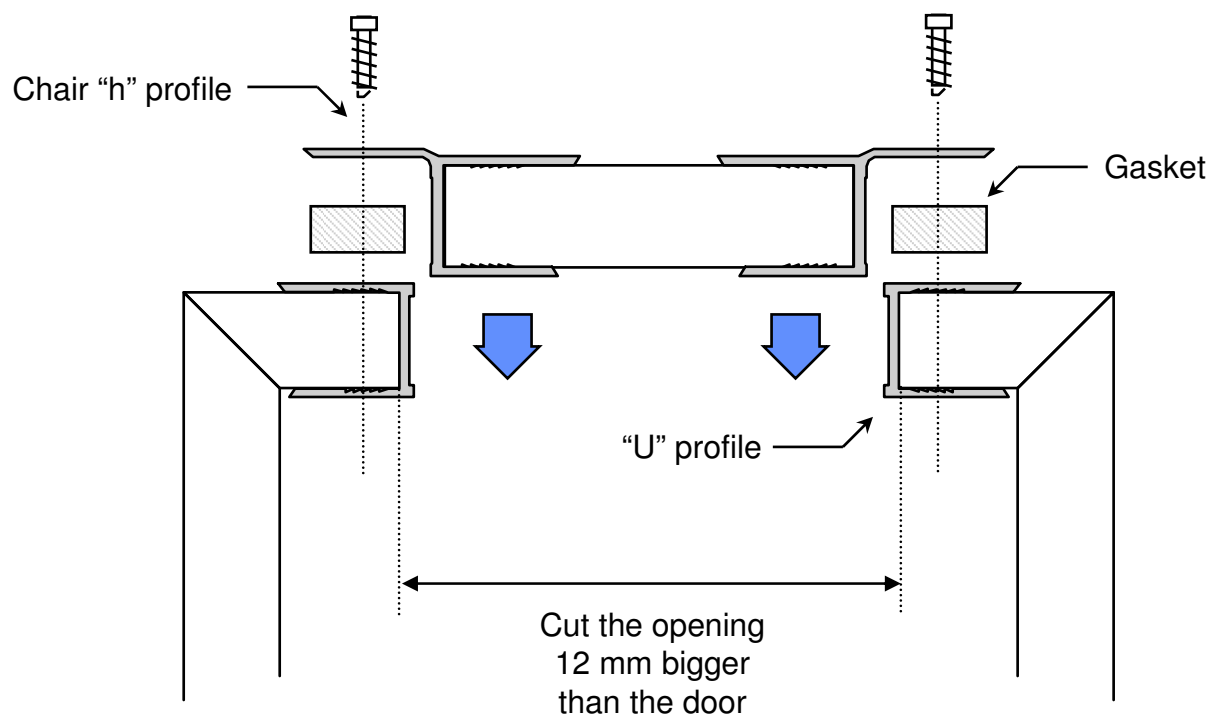
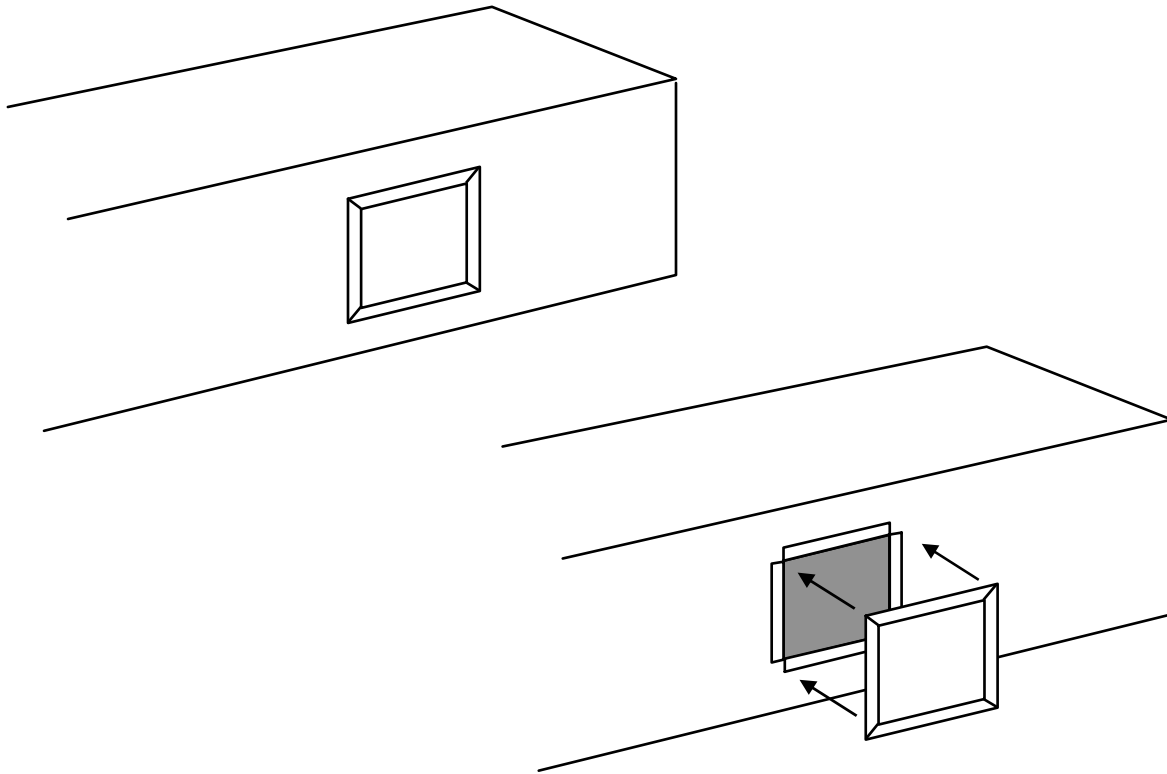
External U Grip
LKDA 315



Round Hole Cutter
LKDA 443

The Kingspan KoolDuct® System

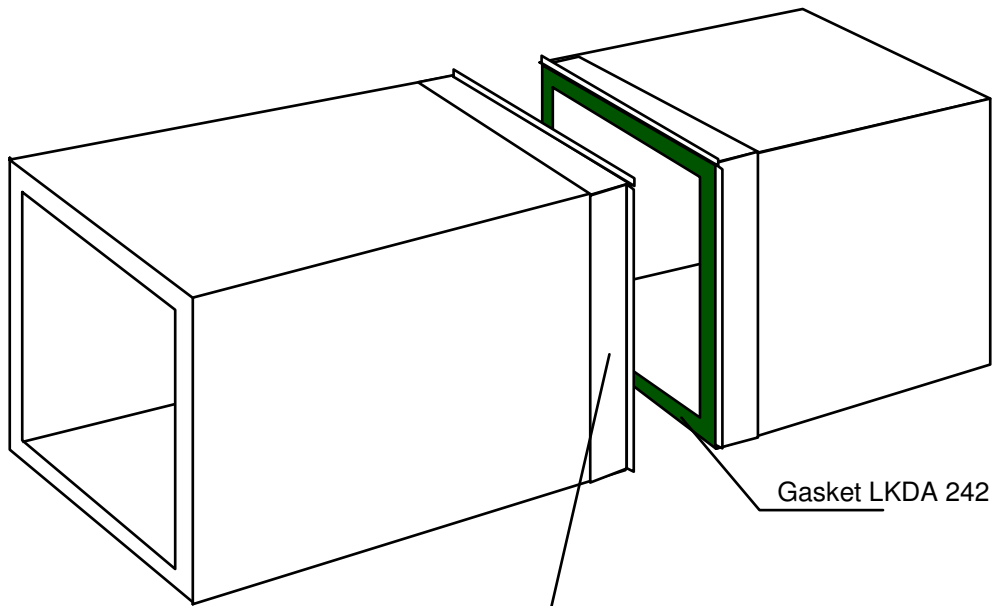
Profiles for Inspection Doors



The Kingspan KoolDuct® System

Bayonet Installation

1

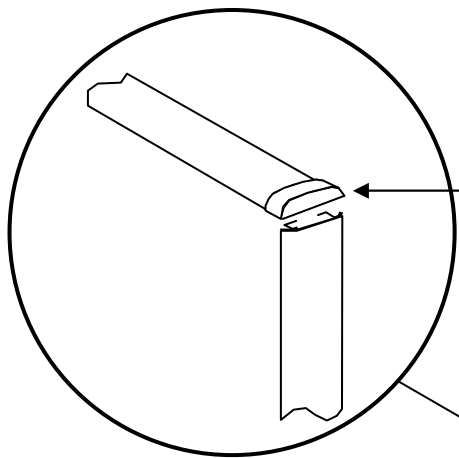


Grip Flange

Gasket LKDA 242

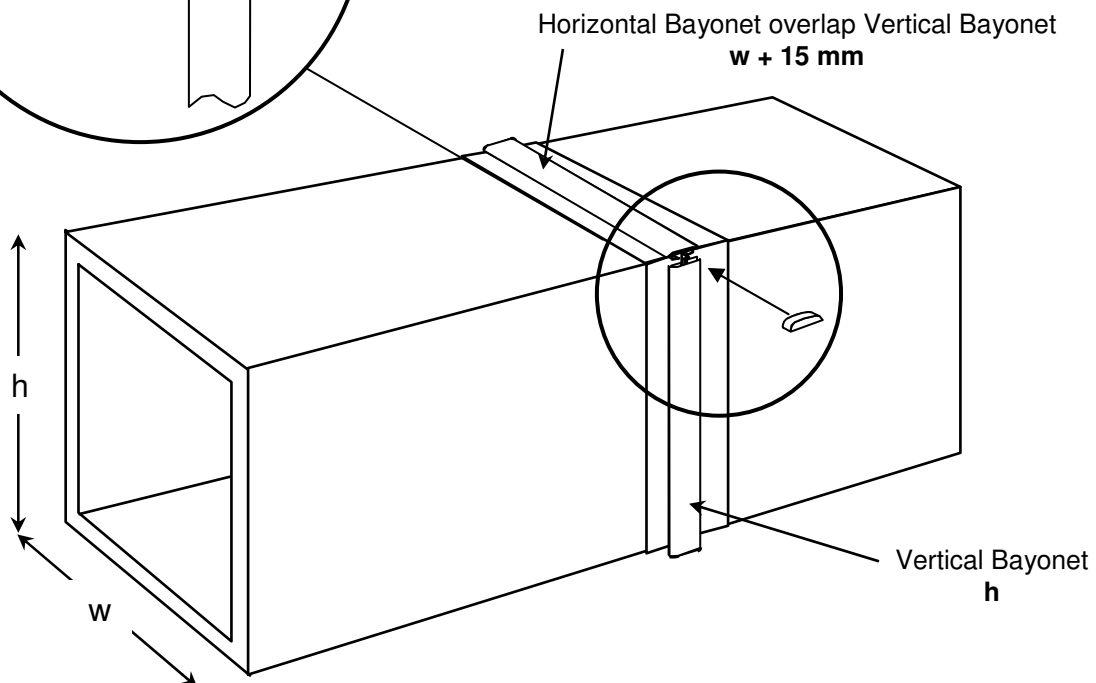


Note: Kool Clamp LKDA 453 and WD-40 can assist with Bayonet application.



Nylon Cap LKDA 281 for visibly mounted installations

2



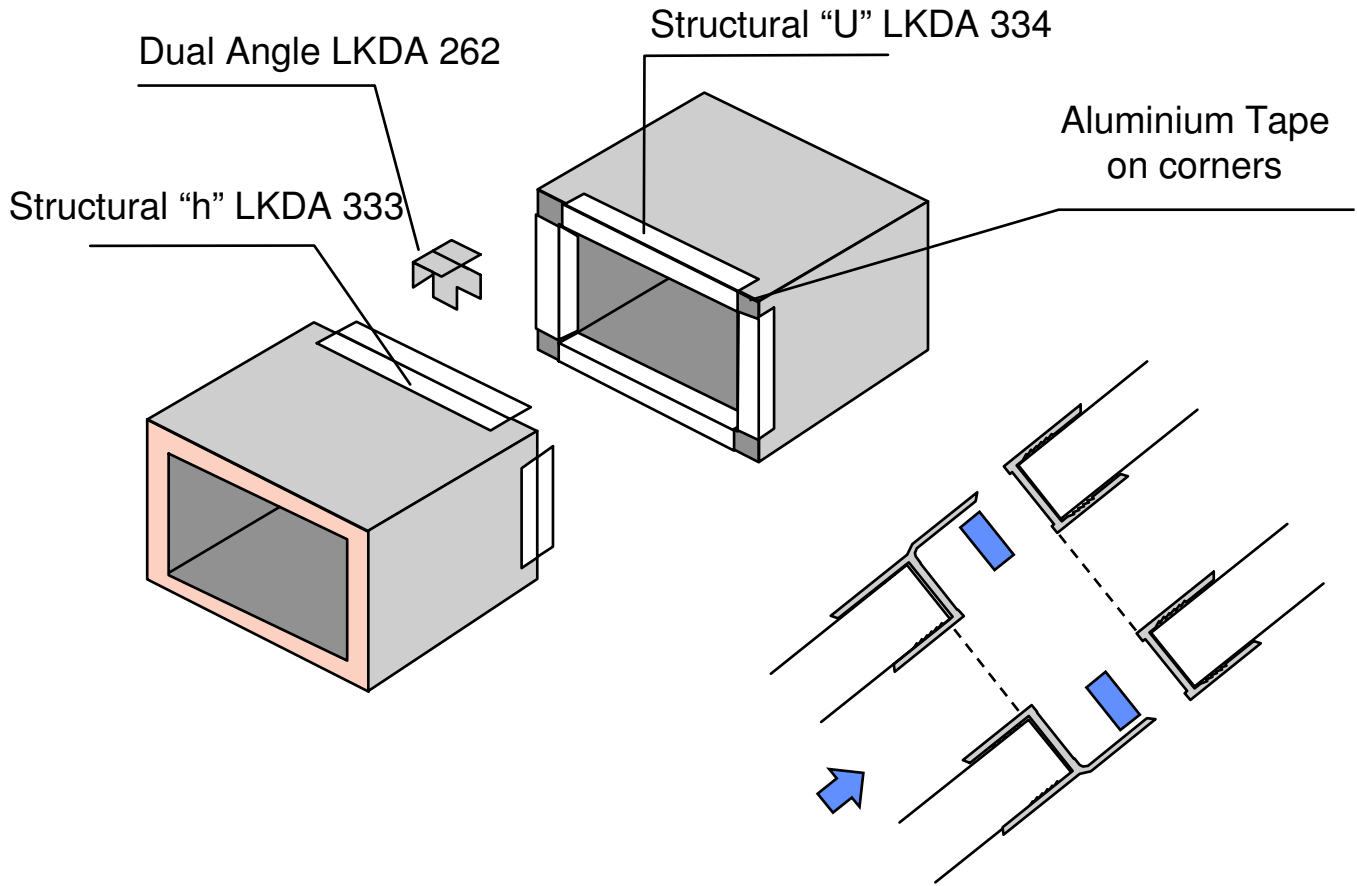
Horizontal Bayonet overlap Vertical Bayonet $w + 15 \text{ mm}$

Vertical Bayonet h

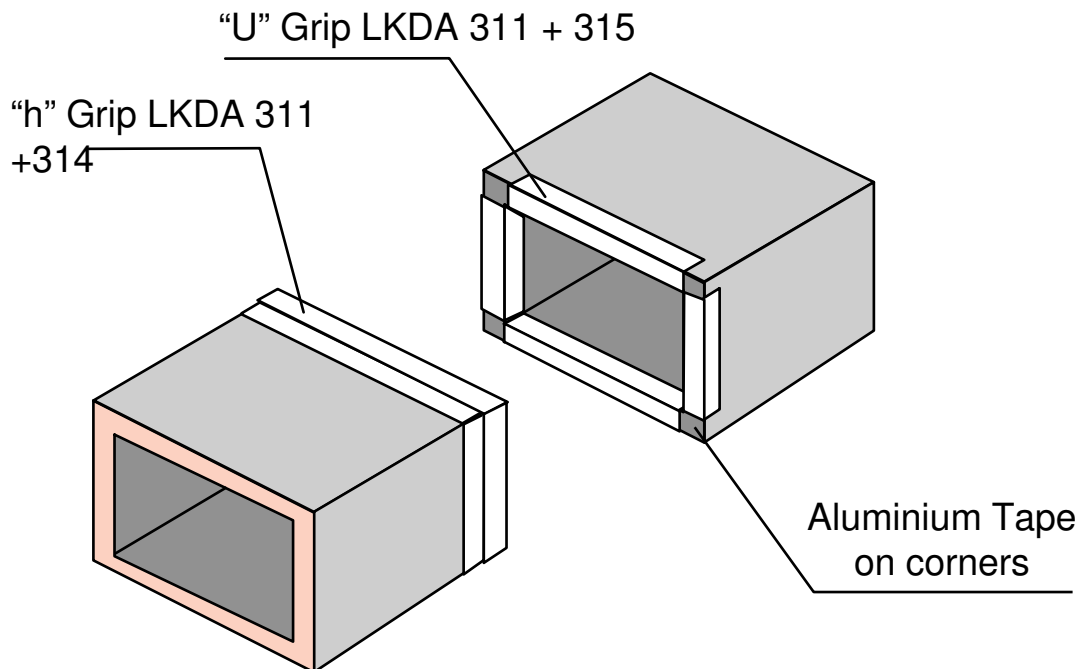
The Kingspan KoolDuct® System

“Invisible” Flange

Option 1 (for 22mm KoolDuct only)



Option 2

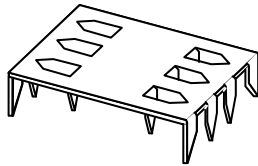


The Kingspan KoolDuct® System

Tiger Connector (Patented) – LKDA 361

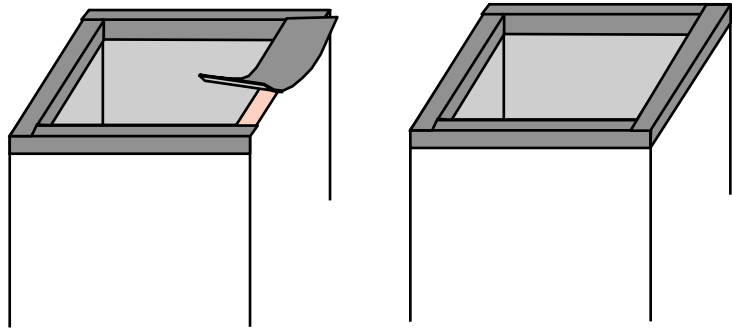
LIMITATIONS:

- Low Pressure applications only (below 500 Pa)
- Max duct size 500 mm



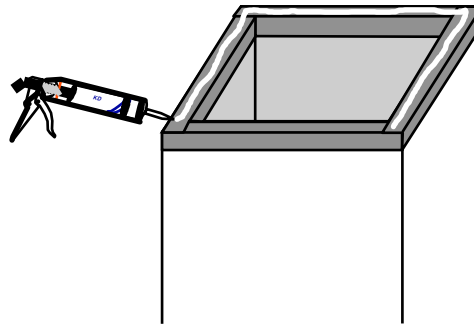
STEP 1

Both ends of the Koolduct duct must be flat and perfectly squared. Aluminium tape is applied on both ends of the duct segments.



STEP 2

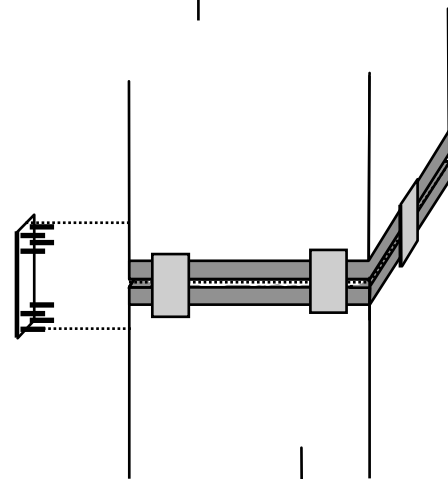
Apply a continuous bead of Kingspan approved silicone to one end of one segment.



STEP 3

The two duct segments are joined together and Tiger Connectors are placed on all four sides of the duct.

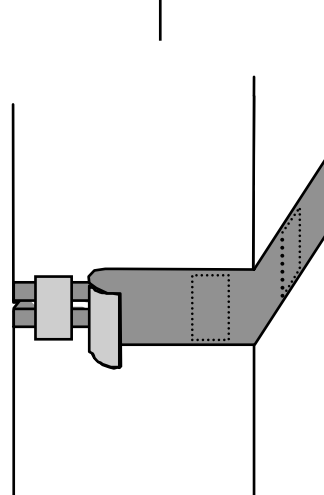
Duct Width or Height	No. of Tiger Conn. per side
100 – 200 mm	1
201 – 400 mm	2
401 - 500 mm	3



NOTE: **Tiger Closures (LKDA 362)** can be used at the four corners of the ducts joint. Then, reduce by one the number of Tiger Connectors per side.

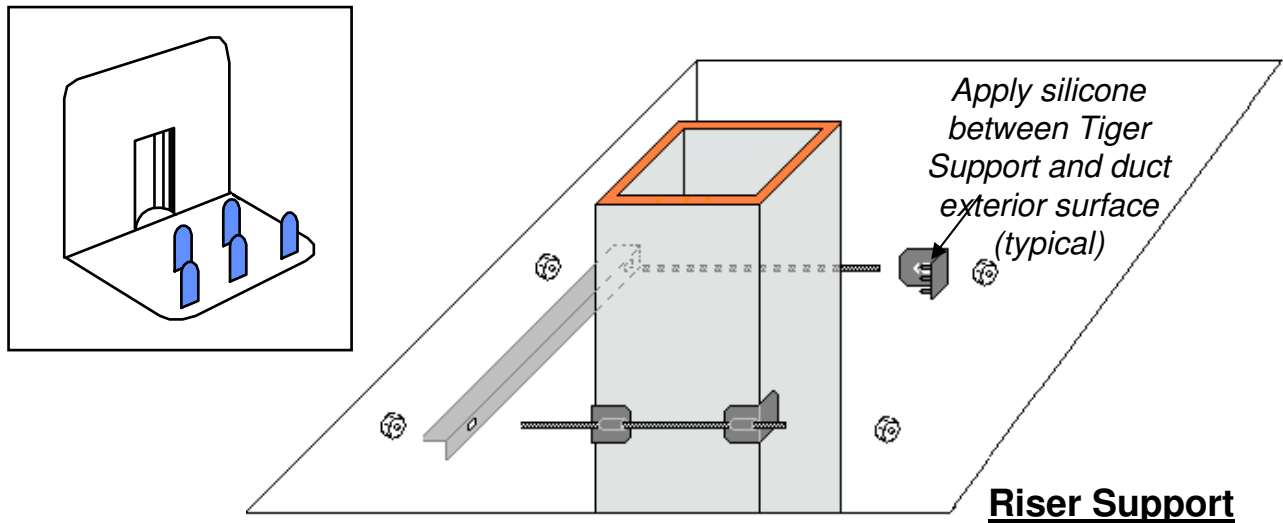
STEP 4

Apply aluminium tape around the connection of the two duct segments

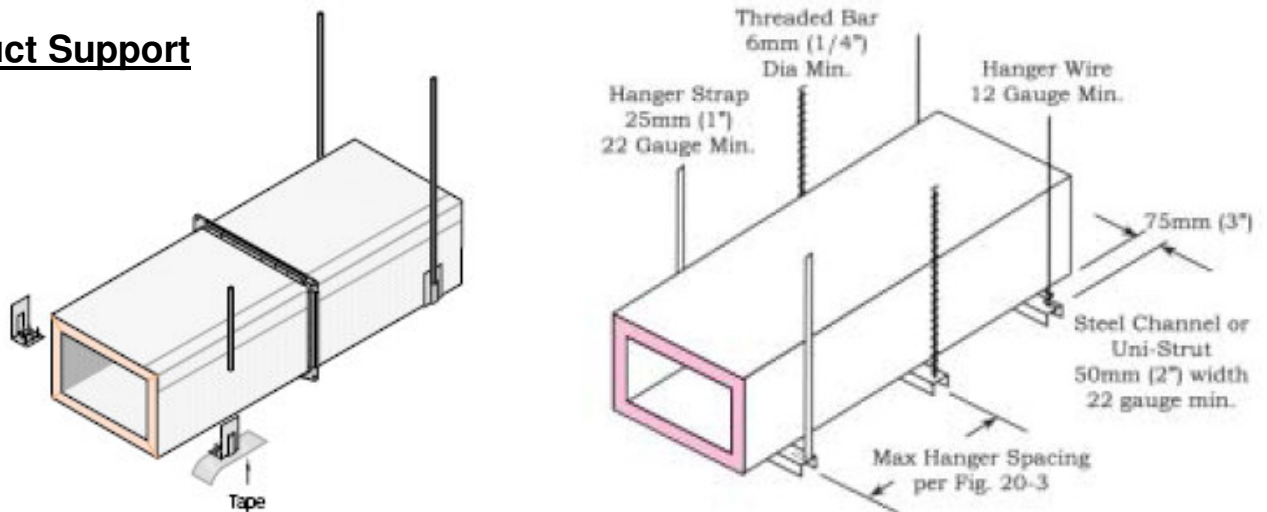


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Tiger Support in Aluminium – LKDA 266



Duct Support



Tiger Support: Designed to support small and medium size ductworks (duct side up to 700 mm) and risers of any size.

Threaded bars max. diam. 6 / 8 mm.

As a finish, apply aluminium tape on the bottom of the Tiger Support.

Conventional Duct Support: Channel Steel or Uni Strut.

Spacing Between Supports

Duct Section length	Largest Duct Side	Max. Spacing Centres
2950 mm or 3930 mm single duct	Less than 1200 mm	3000 mm or 4000 mm max
1200 mm	Less than 1500 mm	1800 mm max
1200 mm	Over 1500 mm	1200 mm max

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Duct Reinforcement

It is required to ensure that the true rectangular cross section of the duct is maintained.

Reinforcement Requirements

The ductwork may require reinforcement, check the following:

- Duct Size (both width and height)
- Total System Pressure (static plus dynamic)

Refer to the following Schedule.

Installation of Duct Reinforcement

- Panel as reinforcement, Negative Pressure ONLY, duct side less than 500 mm.
- Reinforcing bars, both Positive and Negative Pressure, any duct side

Duct Reinforcement close to AHUs

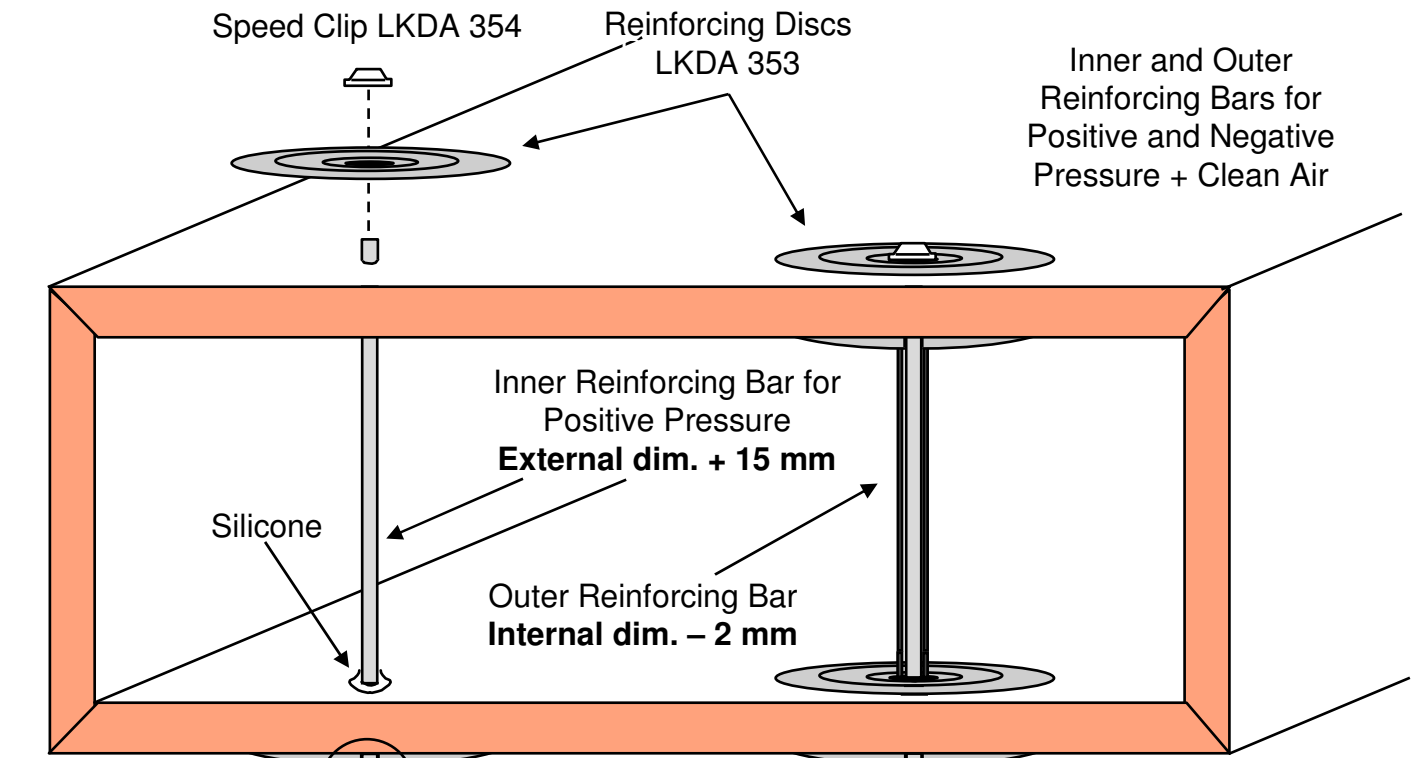
Reinforcement of Ductworks connected to Air Handling Units (AHUs)

Particular care required for the first 3 metres of the KoolDuct System connected to AHUs. Recommendations:

- Assume that the pressure be 50% higher than design pressure
- Applying reinforcements accordingly.
- Consider the Dual Duct design for any duct size larger than 1200 mm.

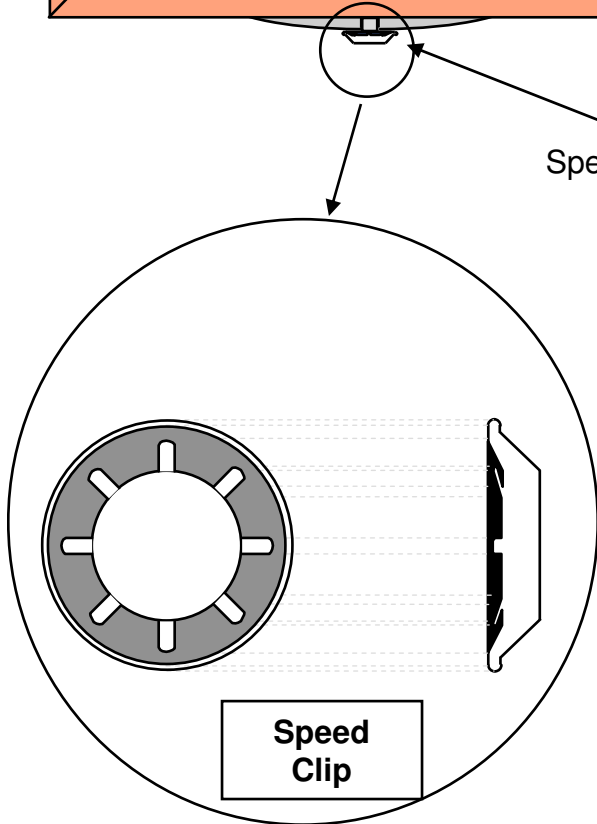
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Reinforcement System

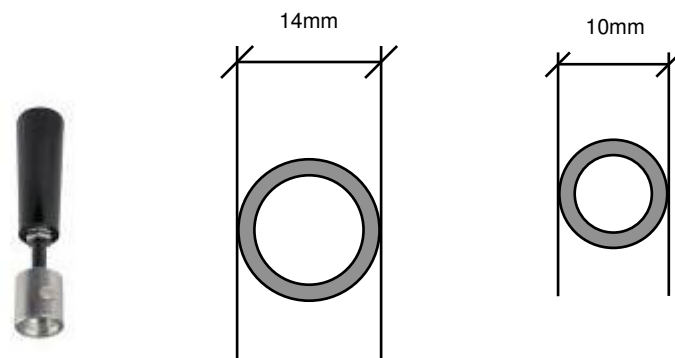


Example: 22 mm KoolDuct

Duct internal size (mm)	Outer Bar (mm)	Inner Bar (mm)
300	298	359
400	398	459
500	498	559



Reinforcing Bars Dimensions



Speed Clip Tool LKDA 452

Outer Bar LKDA 351

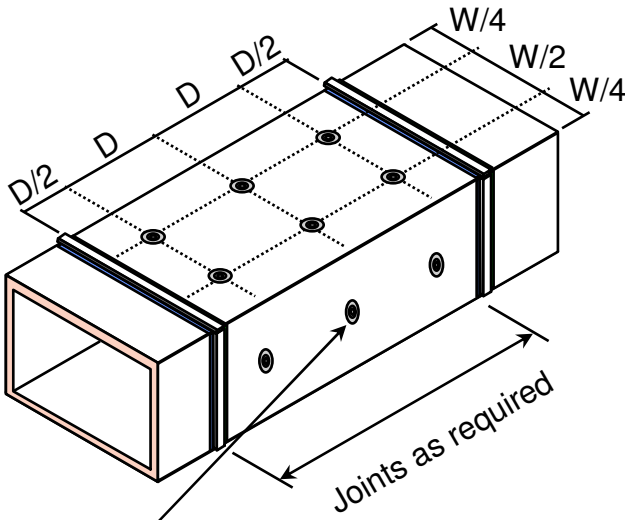
Inner Bar LKDA 352 53

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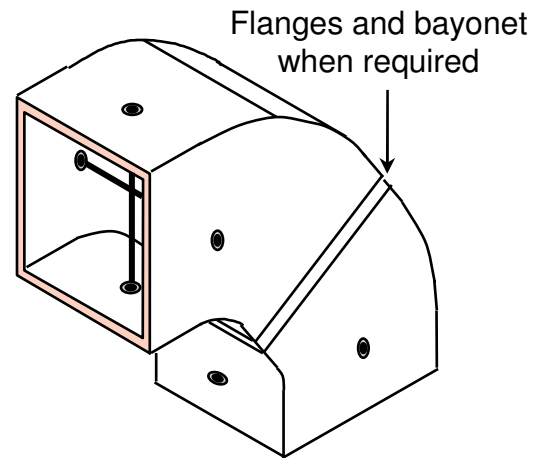
Reinforcement Application

Aluminium Reinforcement

The need for reinforcement must be verified within the KoolDuct Fabrication Manual, based on duct side and pressure.



Reinforcements on the sides required

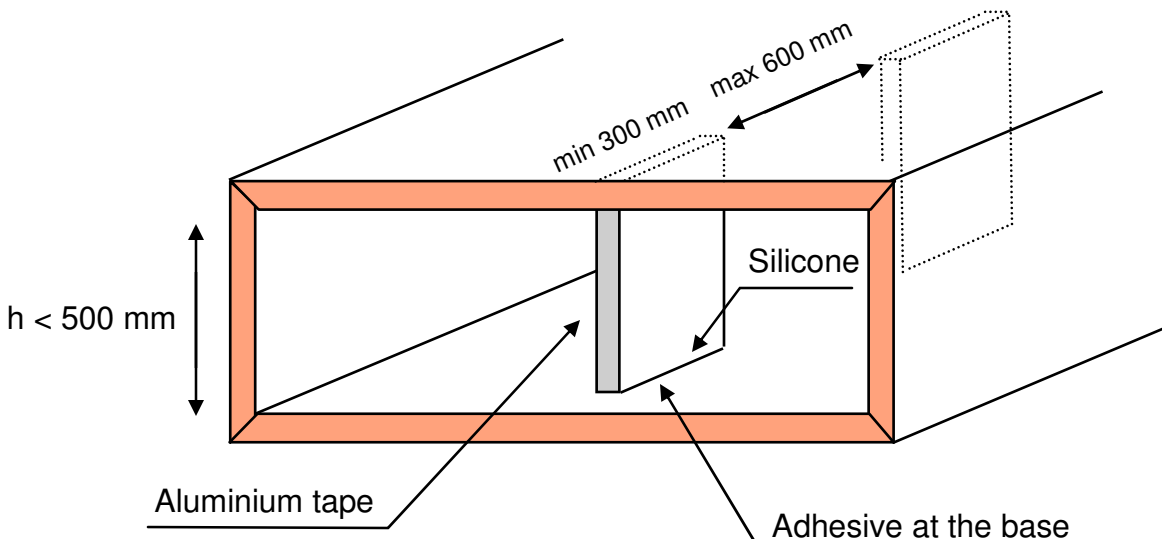


Reinforcements on elbows, reduction, tee, etc.

D = Recommended Step Interval (see Schedule of Duct Reinforcement)
 W = Width of Duct

The use of Panel as reinforcement (negative low pressure only)

In low pressure application it is possible to use the panel as reinforcement against the **negative pressure**: cut panel segments about 300 mm wide to be glued and sealed inside the duct, spaced every 600 mm. Tape all exposed foam surfaces.



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Schedule of Duct Reinforcement

