



RIGID, SEMI RIGID, & FLEXIBLE DUCTING

SPIRO-LOC Galvanised Steel Rigid Duct	350 - 353J
Round Duct Flange Connector System	352J
SPIRO-SET Plain, Insulated or Acoustic Semi-Rigid Duct	354 - 357J
SPIRO-FLEX Plain, Insulated or Acoustic Flexible Duct	358 - 361J
Product Ordering Key, Specifications and Weights	362 & 363J

SPIRO-LOC – Rigid Steel Duct

SPIRO-LOC

Spiro-loc is a light weight sheet metal tubing, which is machine made in a spiral form from metal strip coil stock. Forming dies are held for common sizes between 100 mm and 1500 mm diameter. Special dies can be produced for larger or non standard sizes.

The four ply lock seam adds sufficient strength for the circular shape to be rigidly maintained up to 600 diameter in 0.95 mm material, or 500 diameter in lighter gauge. Additional rigidity and crushing strength can be achieved by the incorporation of one or two external swages. Common applications include ducting for heating, ventilating and air conditioning, void forming in concrete, irrigation pipe and rubbish shutes on high rise buildings.

Standard Construction

Diameter	Material	Wall (BMT)	Swages	Section Length
100-300	Galv. Steel	0.45 or 0.55	Nil	3 m
301-600	Galv. Steel	0.55 or 0.95	Nil	3 m
601-1500	Galv. Steel	0.95	1 (External)	3 m

Standard Die Sizes 'D' In mm

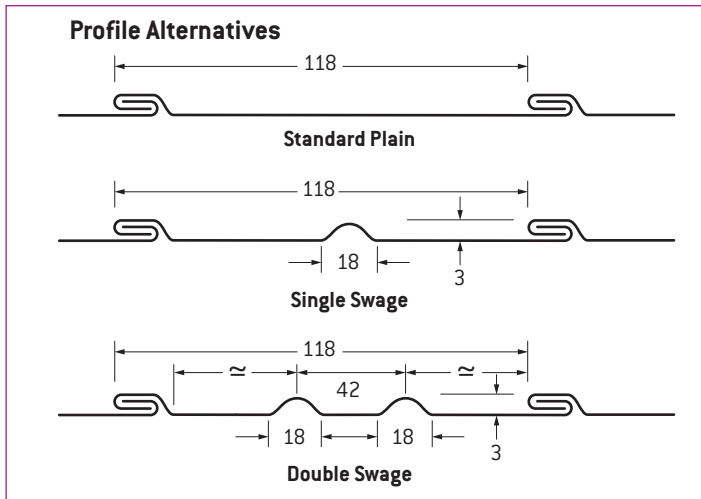
100	125	150	175	200	225	250	300	350	
400	450	500	550	600	650	700	750	800	850
900	950	1000	1050	1100	1150	1200	1300	1400	1500

Special Construction Options

(1) Wall Thickness (BMT): 0.45 mm to 0.95 mm.

Lockseam Detail		BMT mm	H mm
		0.45	= 2.05
		0.55	= 2.35
		0.95	= 3.10

(2) Swage: Diameters 450 mm and above, 1 or 2 external.



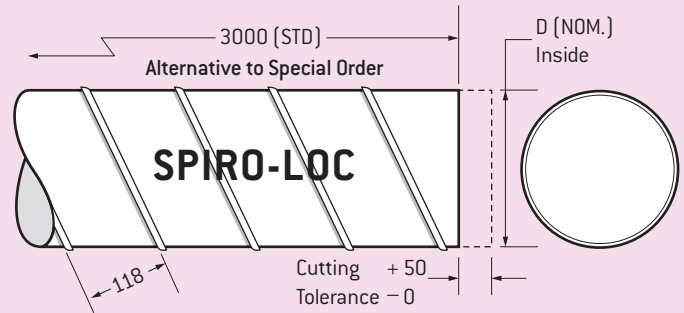
(3) Section Length: 750 mm to 6 m [maximum length is limited by practical considerations of handling].

(4) Insulated: Plain, Insulated with a lofted Polyester blanket and 100 micron Polyethylene vapour barrier outer sleeve.

Insulated Die Sizes 'D' In mm

100	125	150	175	200	225	250	300	350	400	450	500
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Dimensional Data

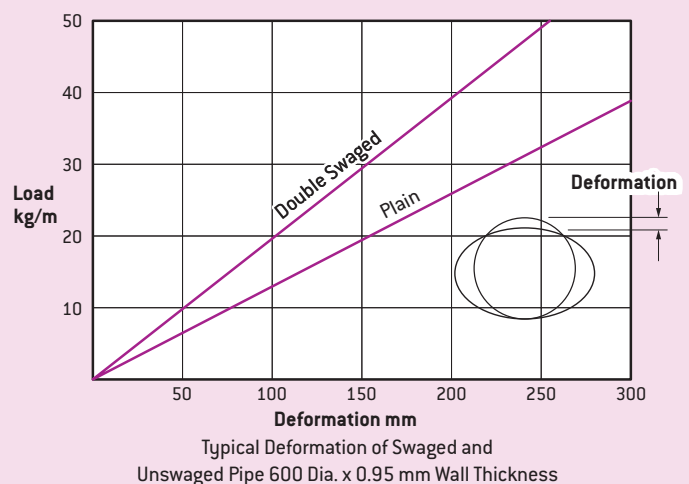


Leakage

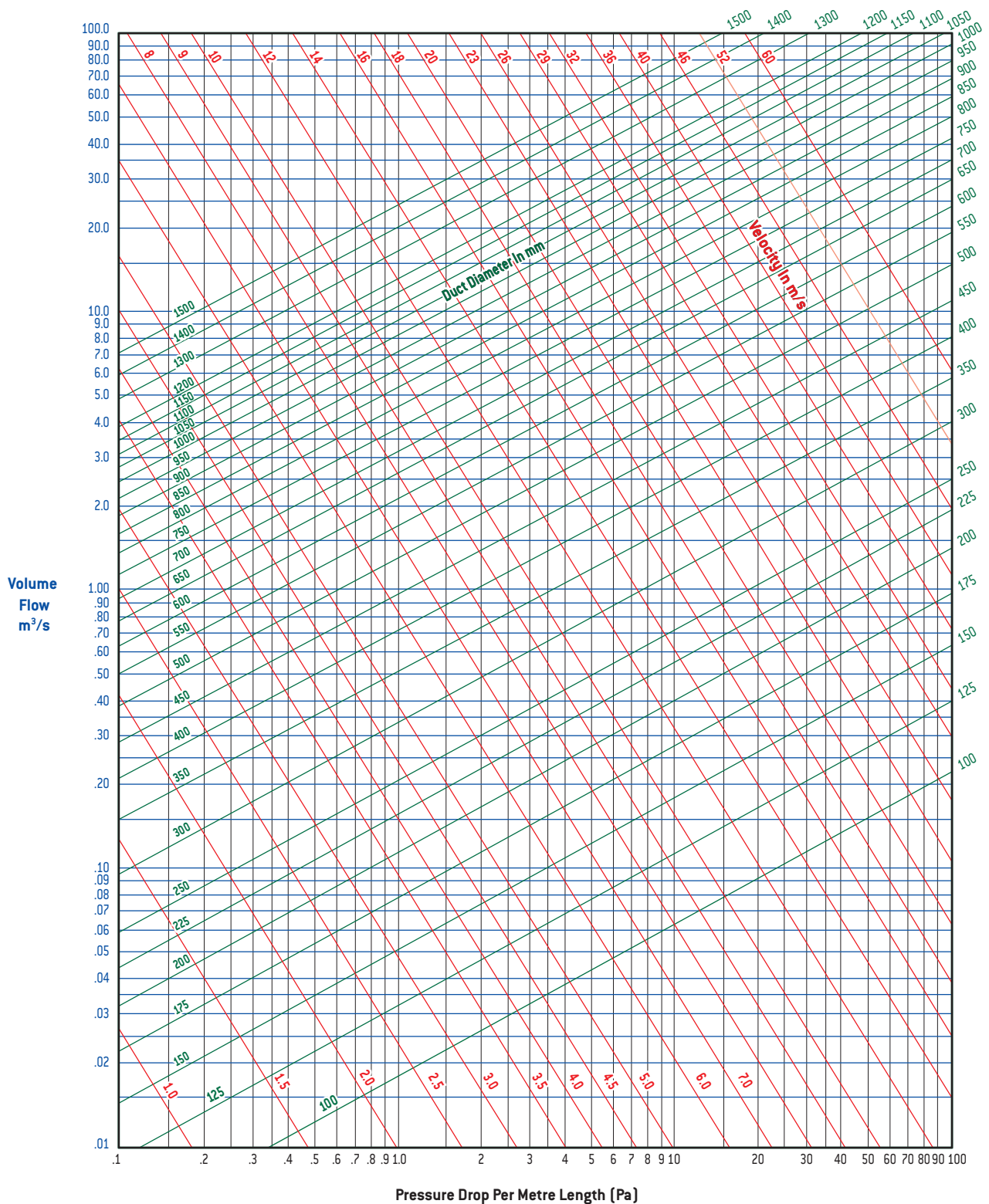
The longitudinal (spiral) four ply seam and the circumferential traverse joints in the Spiro-loc should be sealed after installation to the various pressure rating requirements of standards used in the HVAC industry. Such standards are SMACNA and AS 4254. We recommend that the SMACNA high and low pressure ducting standards are followed for sealing requirements. Where leakage is critical, e.g. in high pressure conditioned air supply ducts, each length should be inspected for either impact or fatigue damage. Any looseness of the seam will allow the pipe length to bend slightly under its own weight when lifted by its ends. If the section is not rigid it should not be used in critical high pressure locations.

On Site Manufacture

Machines and operators are available for on site manufacture where large quantities of tubing are required in relatively inaccessible locations, either within New Zealand or overseas. Such projects as underground ventilation of mine shafts and tunnels for hydro power stations usually warrant this approach. Each must be separately evaluated for material sourcing, transportation and other special requirements. For further information, contact your local Holyoake branch.



Friction Resistance



Spiro-loc - Rigid Duct

Notes

1. Above data is for air density of 1.2 kg/m^3 .
2. For swaged pipe use multiplier of 1.05.

Due to a policy of continuous development and improvement the right is reserved to supply products which may differ slightly from those illustrated and described in this publication.

SPIRO-LOC – Installation Data

This data is primarily intended for HVAC application of Spiro-loc Ducting. Contact your local Holyoake branch for information on other applications such as conveying, void forming etc.

Selection of Wall Thickness and Girth Joints

The following table presents data which is acceptable under Australian Standard AS 4254.2 - 2012, 'Ductwork for air-handling systems in buildings, Part 2: Rigid duct'. For more complete information refer to the above Standard.

Duct Size (mm)	Minimum Metal Thickness			
	Max. 500Pa positive pressure	Max. 500Pa negative pressure	Max. 1000Pa positive pressure	Max. 2500Pa positive pressure
Up to 200	0.4	0.4	0.4	0.5
201 to 350	0.4	0.5	0.4	0.5
351 to 650	0.5	0.6	0.5	0.6
651 to 900	0.6	0.8	0.6	0.8
901 to 1250	0.8	1.0	0.8	1.0
1251 to 1500	1.0	1.2	1.0	1.2

Note

Where slip joints or spigots are used, heat shrinkable band is regarded as an effective sealant. This material should be used in accordance with the following table:-

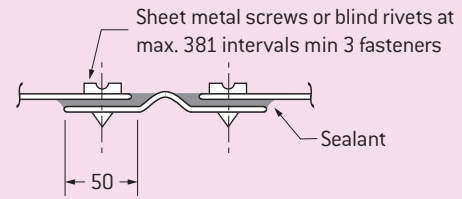
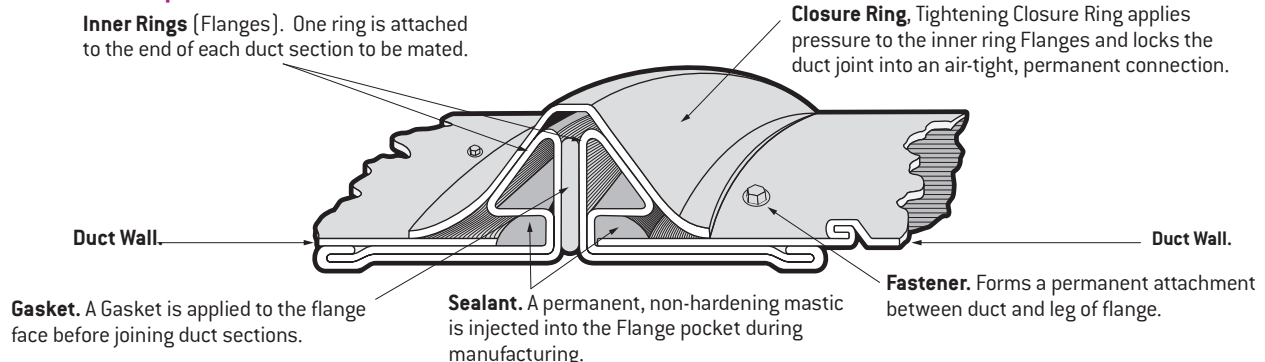
Duct Diameter	Band Width
100 - 250	50
251 - 500	75
501 and above	100

Round Duct Flange Connector System, General Description

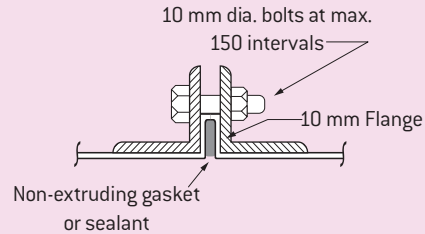
The proprietary Round Duct Flange Connector System consists of 2 inner rings (Flanges) and 1 outer ring (Closure). The Flanges have a pocket with factory installed mastic. The duct end must penetrate the mastic to avoid leakage. The leg of the Flange is attached to the duct by mechanical means such as screws or spot welds. The upstanding, triangular - shaped part of the Flange receives a gasket before mating with second duct section. The closure ring is equipped with a bolt and brackets which permit tightening of the closure ring over the 2 mated inner Flanges creating permanent, air-tight joints for round (spiral) ductwork.

Available in sizes from 200 mm to 1500 mm diameter.

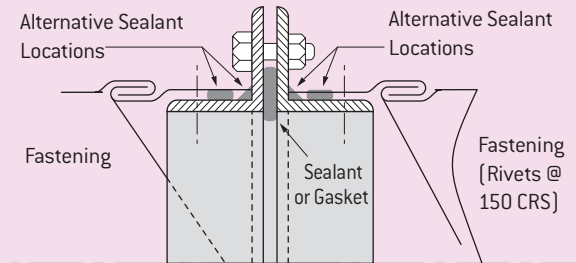
Cross Section and Components



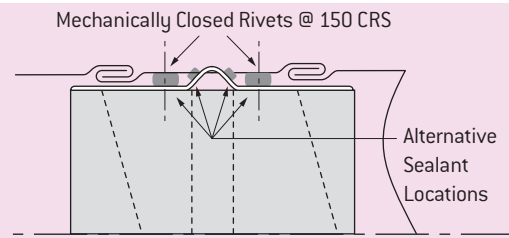
U.S.A Slip Joint



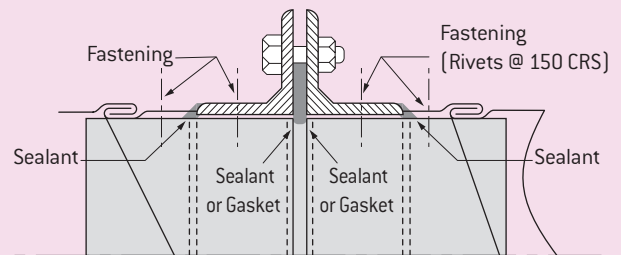
U.S.A Loose Flange or Vanstone Joint



U.K. Internal Flange



U.K. Spigot



U.K. External Flange

Hangers and Supports

The selection of a hanging system should take into consideration the possibly disastrous consequences of its failure. It is a characteristic of any multiple hanger system, that the failure of one hanger transfers that hanger's load to adjacent hangers. If one of these fail, then an even greater load is transferred to the next and so on. The result is a cascading failure in which an entire run of duct might fall.

For these reasons the following is intended as a guide for the use of designers or contractors, who must consider all available factors and adjust to suit. All duct is assumed to be carrying only its own weight.

Refer to page 371K for Holyoake duct hangers.

Supports for Horizontal Installation of Spiro-loc

Duct Diameter (mm).	Maximum Spacing (mm).	Drop rod, or Studding Dia (mm).	Flat Steel Strap Hanger Size (mm).	Single Rod System Dia (mm).	Horizontal Tie Rod with one rod System Diameter (mm).
Up to 250	3600	6	25 x 0.8	-	-
251 - 450	3600	6	25 x 0.8	-	-
451 - 600	3600	6	25 x 0.8	-	-
601 - 900	3600	2 x 8	25 x 0.8	10 + F/B	10
901 - 1250	3600	2 x 10	2 x 25 x 1.0	12 + F/B	12
1251 - 1500	3600	2 x 10	2 x 25 x 1.2	12 + F/B	12

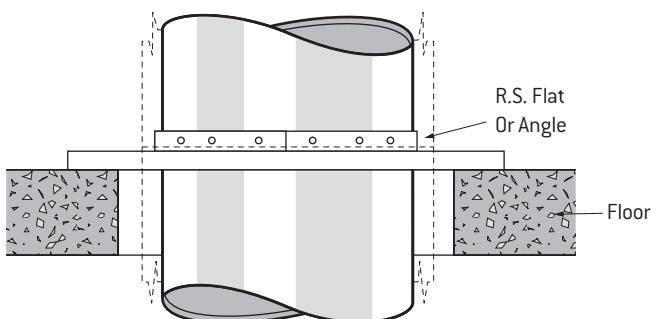
F/B = Flat Bar Band.

Also, refer to AS 4254.2 - 2012 'Ductwork for air-handling systems in buildings, Part 2: Rigid duct'.

Typical Support for Vertical Ducts

Supports for Vertical Installation of Spiro-loc

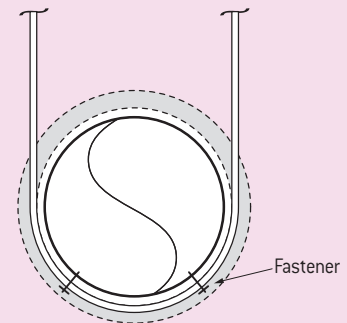
The design of supports for vertical ducts is dictated by site conditions. They are usually located to coincide with floor slabs, subject to a maximum spacing of 4 metres. Supports should be attached to stiffening angles, or to separate supporting angles fixed to the duct.



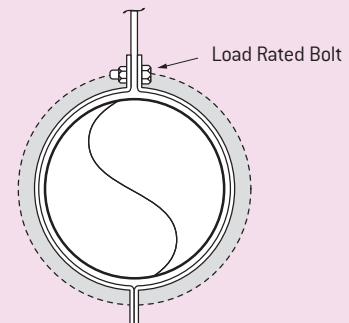
Note

All hangers and supports. Supply and fit by others.

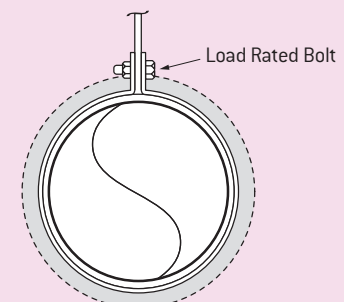
Hangers and Supports – Horizontal Ducts



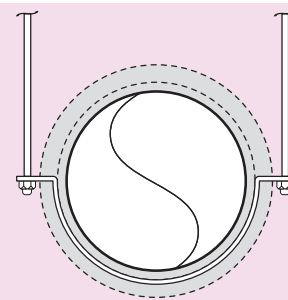
Double Strip U-Hanger Suitable For Pipe
Up To 200 Dia. Only



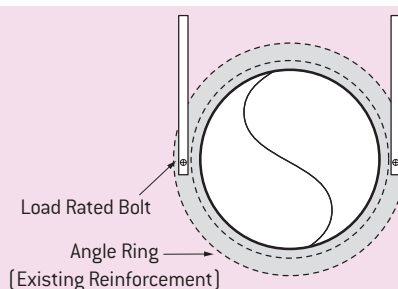
Split-Clip and Hanger



Wrap-Around and Hanger



Stirrup Bearer



Double Hanger: Wrap-Around

SPIRO-SET – Semi-Rigid Aluminium Duct

SPIRO-SET

Spiro-set is a light weight air duct, machine formed in a continuous spiral from aluminium strip coil stock, corrugated and seamed with a four ply lock seam, creating an airtight tube which can be easily cut to length and bent by hand to conform to a desired duct route, without altering its full circular cross section. It is a characteristic of Spiro-set that it will retain whatever configuration is required and is self supporting over its normal maximum length of 3m. Spiro-set is available plain (without insulation), thermally insulated, or acoustic (perforated) insulated.

The New Zealand Building Code does not differentiate between rigid and flexible ducts. Inside acceptable solution C/AS1 Part 6 control of internal fire and smoke spread, ducts for all HVAC systems are to be made of a material with E.F.H. Indices of no higher than 0 for spread of flame and 3 for smoke developed (these indices relate to the internal duct surface). As a non-combustible material, Spiro-set easily meets this requirement. An independent "opinion" in confirmation of this is available for inspection.

When insulated, both plain and acoustic outer surfaces also readily meet the above E.F.H.I. criteria (which is the same for both New Zealand and Australia) with early fire hazard indices of: ignitability 0; heat evolved 0; spread of flame 0; smoke developed 1. It is important to note that the jacket will not sustain combustion or contribute to a fire while there are many systems which, because of their reflectivity, are marked as "4-zero", but which burn fiercely when touched by flame.

Test Certificates

BRANZ Test certificates FE1681 to AS 1530.3 and Opinion Number 92/264.

Standard Options Available

- Type SPU:** Plain, Uninsulated.
- Type SPI-FP:** Plain, Insulated with a lofted polyester blanket and 100 micron polyethylene vapour barrier outer sleeve.
- Type SAI-FP:** Acoustic, Insulated with a lofted polyester blanket and 100 micron polyethylene vapour barrier outer sleeve (sizes 300 mm diameter & smaller).

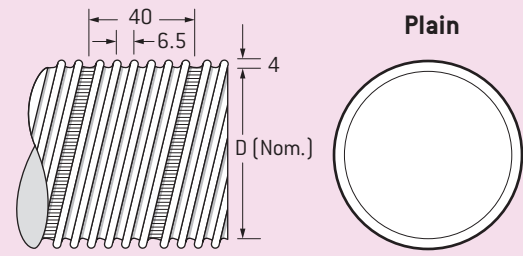
Standard Construction

- Liner:** Aluminium.
- Insulation:** Lofted polyester blanket, tested to AS/NZS 4859.1 Thermal resistance rating R1.0 m² K/W
- Outer Sleeve:** 100 micron, flame retarded, Low density, high impact, Polyethylene vapour barrier, Printed with white lettering.
- Maximum Velocity:** 20 m/s
- Maximum Positive Working Pressure:** 1.5 kPa (plain liner)
- Maximum Negative Working Pressure:** 1.5 kPa (plain liner)
- Temperature Range:** -7°C to +70°C (polyethylene jacket)
- Standard Lengths:** 3 metres (others available to special order).

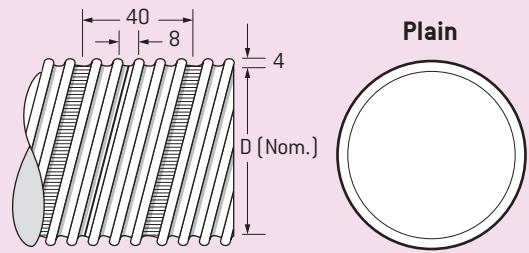
Standard Die Sizes 'D' In mm												
75*	100	125	150	175	200	225	250	300	350+	400+	450+	500+

* Plain Only + Not Acoustic

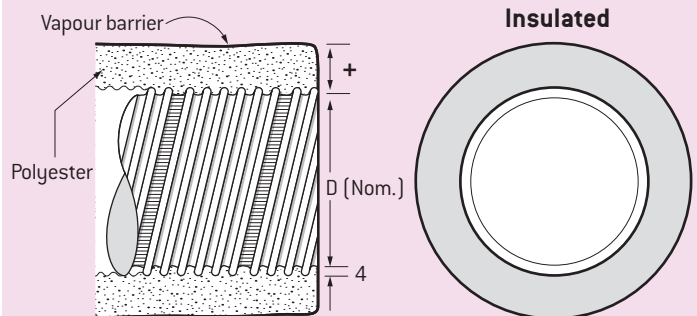
Dimensional Data



Type SPU Sizes 75 to 300 mm.

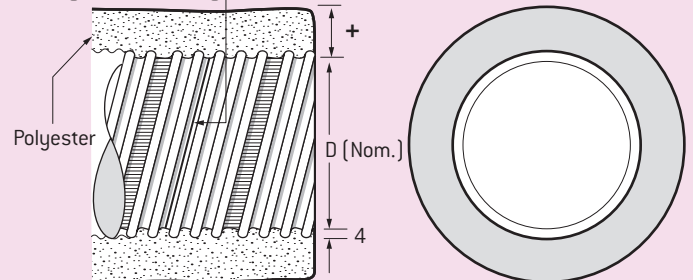


Type SPU Sizes 301 to 500 mm.

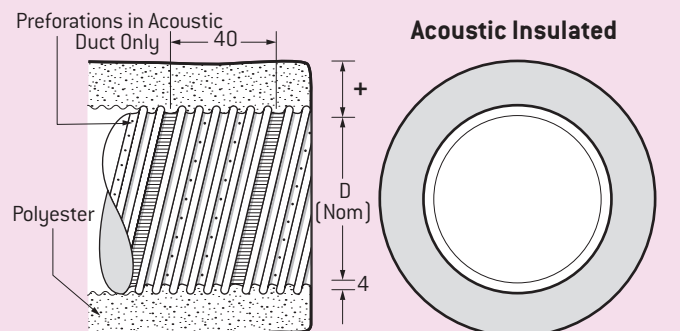


Type SPI-FP. Sizes 100 to 300 mm.

Special expansion fold for tight bends on large diameters.



Type SPI-FP. Sizes 301 to 500 mm.



Type SAI-FP. Sizes 100 to 300 mm only.

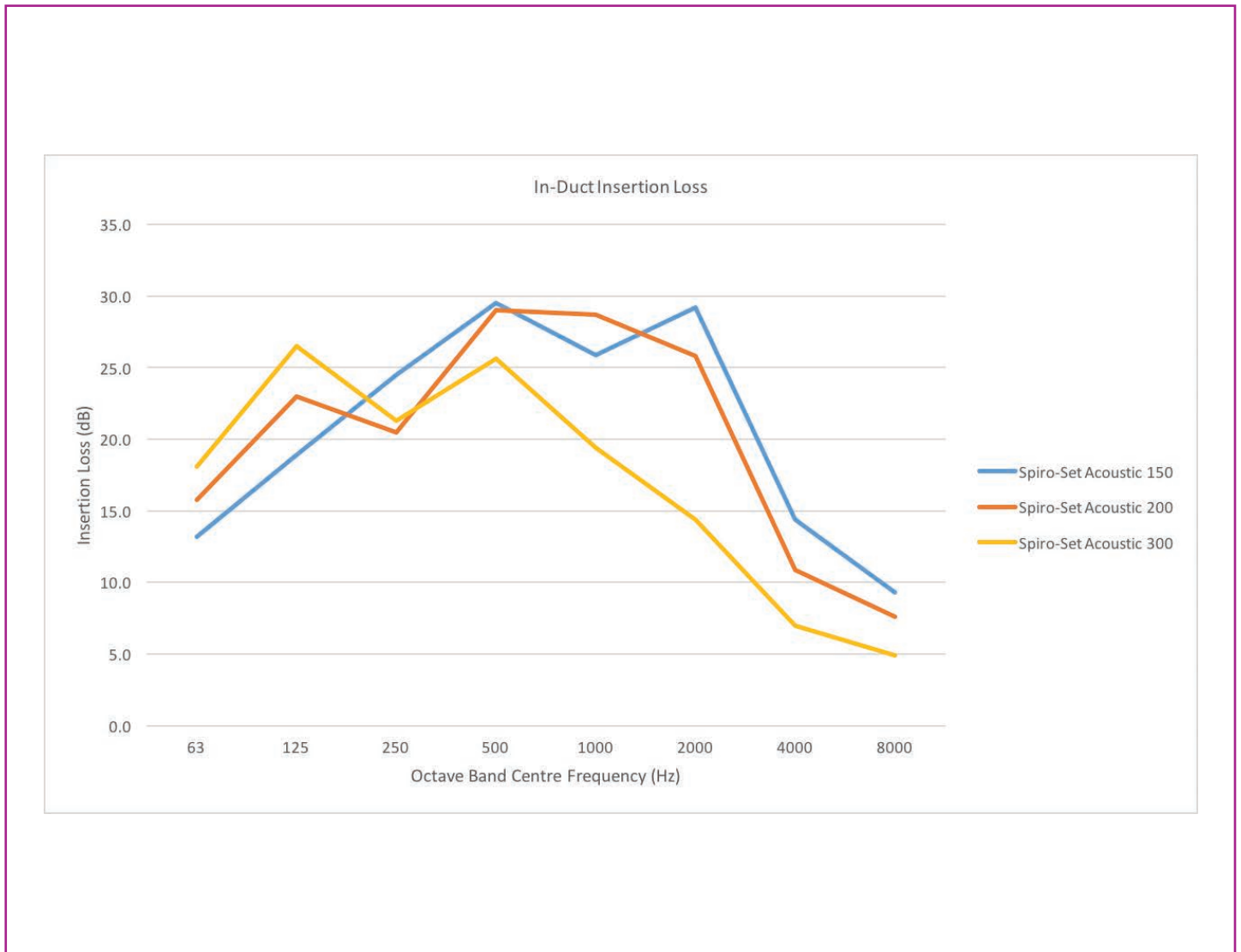
+ = Insulation thickness dependant on 'R' value.

Acoustic Performance

Acoustic Spiro-set ducting utilises perforations in the inner aluminium core to increase the inherent attenuation of the duct. As a consequence, acoustic duct relies upon an unpunctured vapour barrier for its leakage performance and site conditions frequently mitigate against this.

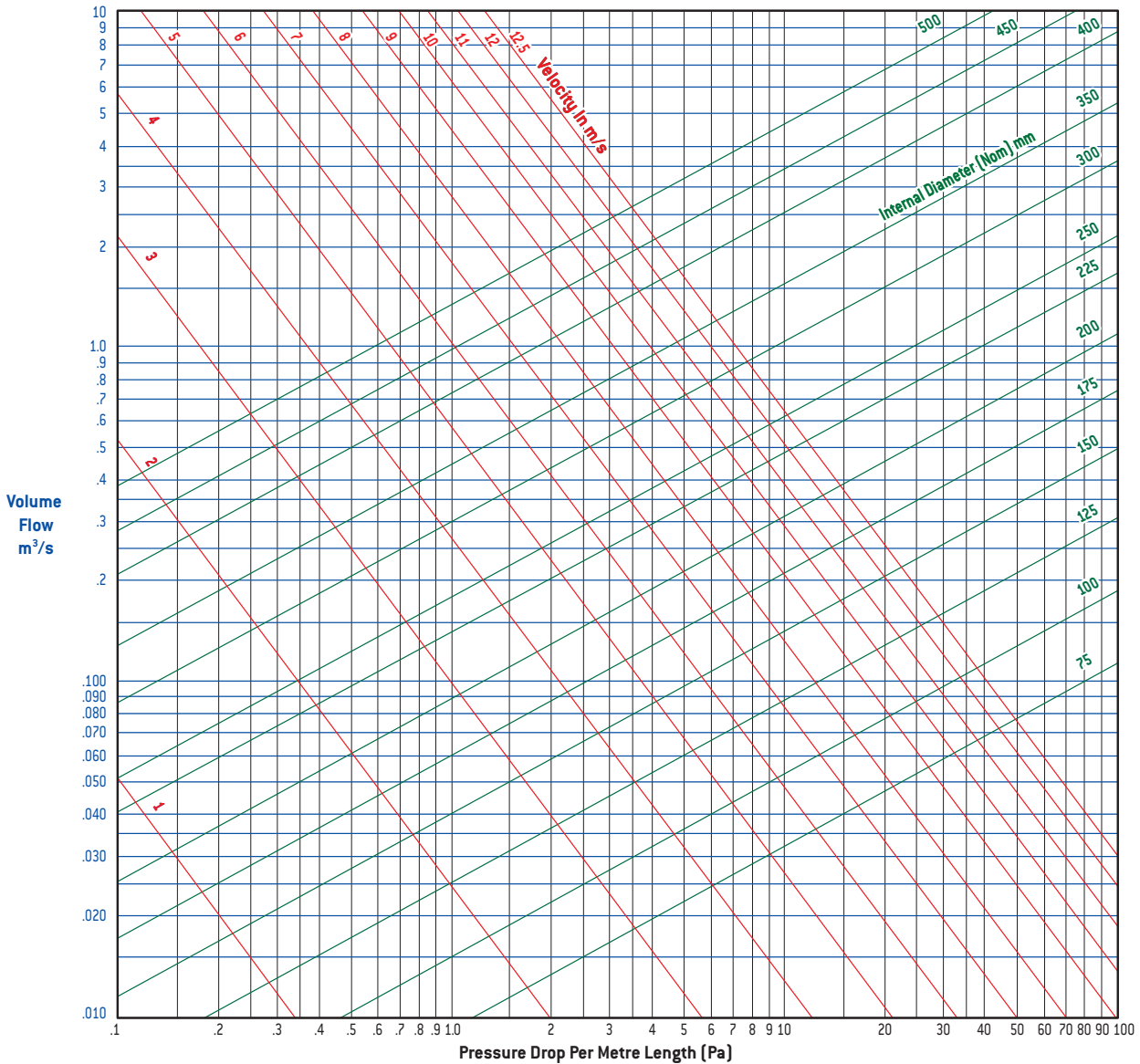
The following table gives an estimate of the insertion loss of a 3 meter length of various diameter Spiro-set acoustic when tested in accordance with Air Diffusion Council Flexible Air Duct Test Code FD 72-R1. The ducting was tested in ideal laboratory conditions, fully extended and straight. Installation conditions on site such as bends and connections will increase the overall attenuation of the duct.

Diameter (mm)	In-Duct Insertion Loss (dB)							
	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Spiro-Set Acoustic 150	13.2	18.9	24.5	29.5	25.9	29.2	14.4	9.3
Spiro-Set Acoustic 200	15.8	23.0	20.5	29.0	28.7	25.8	10.9	7.6
Spiro-Set Acoustic 300	18.1	26.5	21.3	25.6	19.4	14.4	7.0	4.9



Note: A complete range of Ductwork Accessories and Tools are available, refer to Section K (Accessories).

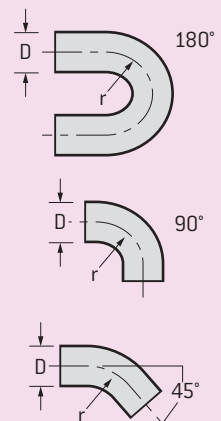
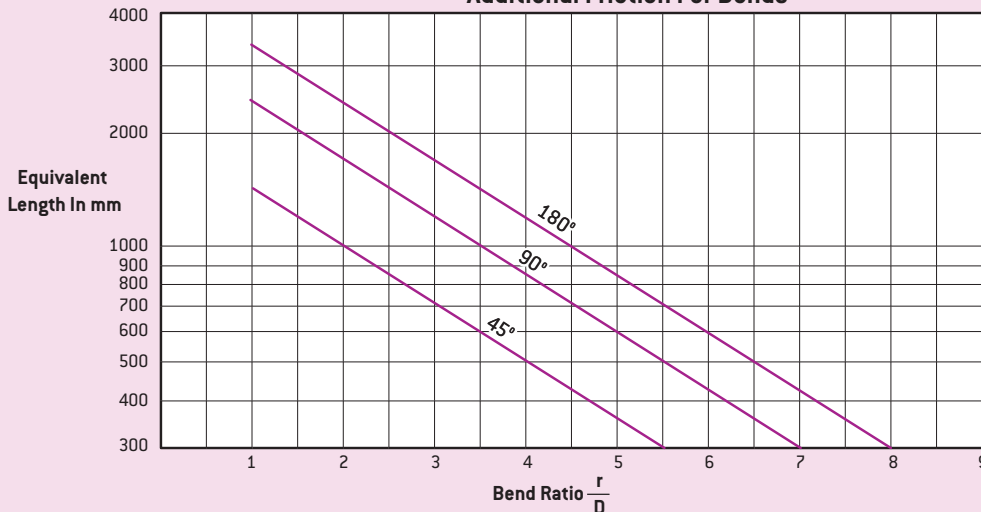
Friction Resistance



Notes

1. For pressure drop calculations, measure the full length of duct around the centre line, or to centre line intersection points. The pressure drop created by changes in direction as determined by the equivalent length chart is additional to the pressure drop of the measured length.
2. Above data is for air density of 1.2kg/m³.

Additional Friction For Bends



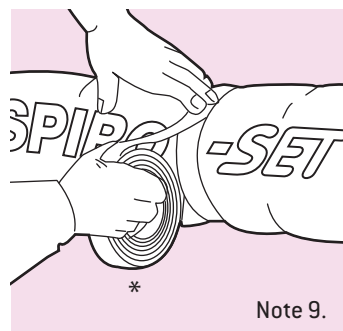
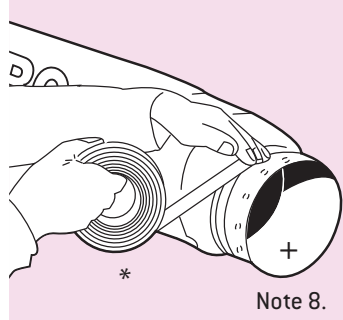
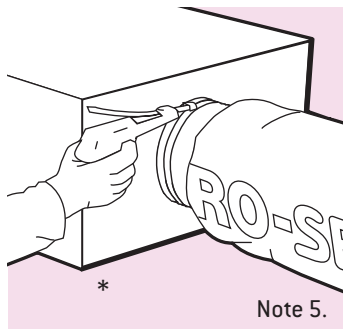
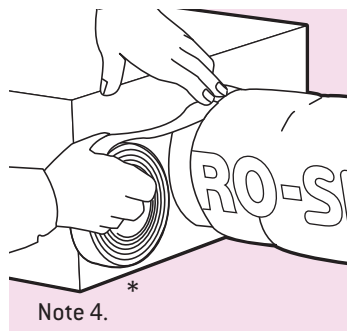
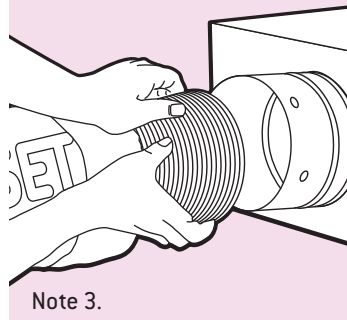
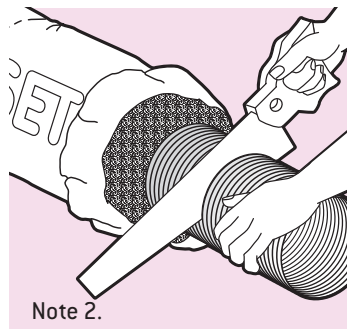
Spiro-set is deeply corrugated and incorporates a lock-seam spiral of great strength. It will therefore withstand considerable repeated flexing. The following installation notes are intended to ensure maximum benefit from its use.

Lockseam Detail.



Cutting, Joining and Fixing. Plain or Insulated Spiro-Set.

1. Install the duct in accordance with AS 4254.1-2012, using Holyoake Duct Tape and suitable Plastic Duct Ties or Stainless Steel clamping bands.
2. Cut through the duct, whether plain or insulated, with a long, broad bladed, sharp knife. An ideal tool for this purpose is a carpenter's hand saw with the teeth ground off, leaving a sharp edge. If insulated, roll back the insulation and jacket to expose about 300 mm of liner, ready for the next step.*
3. Slide the duct over the fitting.
4. Using Holyoake Duct Tape*, apply a minimum of three overlapping, tensioned, crease free wraps around the duct and fitting, each layer overlapping the previous layer by approximately 50%. The first centred equally to the duct core and the spigot of the fitting. The second enhances this bond and seal to the fitting, by overlapping the first joint. The third further binds the first and second layers, improving the bond and air seal between the duct core and fitting.
5. Further mechanical fixing should be applied to the duct core using suitable Plastic Duct Ties or Stainless Steel clamping bands, over the top of the taped air seal, behind the fittings retaining swage, to permanently fasten this to the spigot.



6. On Oval collars the duct core shall be permanently fastened with corrosion-resistant self-tapping screws and 25 mm diameter washers, at a maximum of 75 mm centres, located behind the collars retaining swage. To provide an air seal, repeat step 4.
7. If installing Spiro-set Insulated, unroll the insulation and jacket and pull over the finished air seal and mechanical fixing and then repeat step 4, to provide a total vapour seal.
8. If joining two duct lengths, use a Holyoake spin connector+ and then repeat steps 4 & 5, (and 7 if applicable).
9. If Insulated the final 3 layers of Holyoake Duct Tape* is applied after butting the insulation together and overlapping the jacket ends, to ensure insulation and vapour sealing continuity.

* += A full range of HVAC Duct Tools, Duct Ties, Duct Tape, Duct Hangers and Spin Collars/ Connectors are available – Refer to Section K.

General Rules For Installation

1. When bending Spiro-set, lay the straight length on the floor and hold in position with the palm of the hand. Draw the free end upwards about 30° and move the hand back along the pipe slightly and repeat until the desired angle is achieved. Do not bend across the knee or square edge, in one movement.
2. Distance between any two adjacent suspension points should not exceed 1.5 metres.
3. Maximum sag between any two adjacent suspension points should not exceed 40 mm per metre.
4. Ducting shall extend 100 mm minimum from a connection before any change of direction.
5. A semi-rigid, fire resistant load bearing strip, a minimum width of 75 mm shall be in contact with the duct for at least a quarter of its circumference and be placed between the duct and the hanger/saddle material, (this being a minimum of 25 mm), to spread the flexible duct weight.
6. For minimum friction resistance, form pipe with as long a radius as possible and do not use longer sections than necessary.

Note: Take suitable safety precautions for Hand and Eye protection.

SPIRO-FLEX – Flexible Duct

SPIRO-FLEX

Spiro-flex is a super light weight flexible, compressible air duct consisting of fibreglass reinforced aluminised PET foil tape, helically wound to encapsulate a spring steel wire. It can be supplied plain or insulated. In its insulated form it is sheathed with a printed, flame retarded, seamless outer sleeve. This duct has the ability to conform to any desired duct route and its cross section may be deformed.

Spiro-flex does not retain any configuration it is formed to, being of non-metallic construction and has the advantage of compressibility for convenient packaging. A length of three metres of insulated duct can easily be compressed by hand to 300 mm and when released after storage, immediately returns to its original length.

Spiro-flex is not self-supporting over its length and without adequate fixing ties, can move with changes in pressure. It should not be used on VAV diffuser connections where branch duct pressure may fluctuate, nor should it be used as high pressure (inlet) ducting to VAV boxes or other pressure reducing devices.

Spiro-flex complies with AS 4254, "Ductwork for air handling systems in buildings" and with the New Zealand Building Code requirements given in C3: Spread of Fire.

The test results for Spiro-flex, both plain and insulated, are:

Ignitability 0, spread of flame 0, heat evolved 0, and smoke developed 1 for plain Spiro-flex and 3 for insulated Spiro-flex.

These tests were carried out in accordance with AS 1530.3. "Simultaneous determination of ignitability, flame propagation, heat release and smoke release".

Spiroflex complies with ISO9705 in accordance with NZBC C/VM2 Appendix A and has a group classification number 1-S (highest available).

Standard Construction

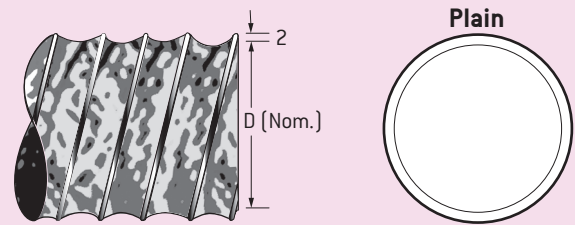
Tape:	Fibreglass reinforced aluminised PET foil laminate
Insulation:	Lofted polyester blanket, tested to AS/NZS 4859.1. Thermal resistance rating R1.0 m ² K/W
Outer Sleeve:	100 micron, flame retarded, Low density, high impact, Polyethylene vapour barrier, Printed with white lettering.

Maximum Working Velocity:	14 m/s
Maximum Positive Working Pressure:	375 Pa
Maximum Negative Working Pressure:	125 Pa
Temperature Range:	-7°C to +70°C
Standard Lengths:	3 and 6 metres (others available to special order).
Packaging:	Printed polyethylene bags.

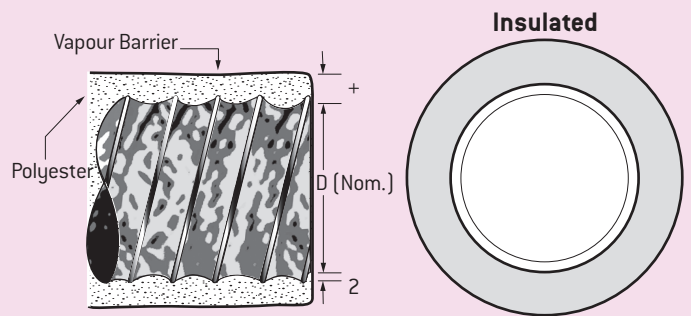
Standard Options Available

Plain:	Plain, Uninsulated.
Insulated:	Plain, Insulated with a lofted polyester blanket and 100 micron polyethylene vapour barrier outer sleeve.
Acoustic:	Perforated inner, Insulated with a lofted polyester blanket and 100 micron polyethylene vapour barrier outer sleeve.

Acoustic ducting is a made to order product, contact your local Holyoake branch for more information.

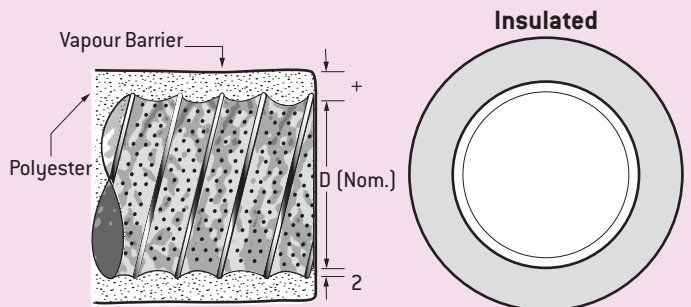


Spiro-Flex Plain: Sizes 100 to 500 mm.



Spiro-Flex Insulated: Sizes 100 to 500 mm.

+ = Insulation Thickness dependant on 'R' value.



Spiro-Flex Acoustic: Sizes 100 to 500 mm.

Perforated Inner

Standard Sizes Available (mm Diameter)

100	125	150	175	200	225	250	300	350	400	450	500
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Test Certificates

AWTA Textile Testing - Report of Testing, in accordance with AS 4254.

BRANZ - Report of Testing in accordance with NZBC C/VM2 Appendix A to ISO9705.

Acoustic Performance

Acoustic ducting utilises perforations in the inner PET foil to increase the inherent attenuation of the duct. As a consequence, acoustic duct relies upon an unpunctured vapour barrier for its leakage performance and site conditions frequently mitigate against this.

The following table gives an estimate of the insertion loss of a 3 meter length of various diameter spiro-flex acoustic when tested in accordance with Air Diffusion Council Flexible Air Duct Test Code FD 72-R1. The ducting was tested in ideal laboratory conditions, fully extended and straight. Installation conditions on site such as bends and connections will increase the overall attenuation of the duct.

Diameter (mm)	In-Duct Insertion Loss (dB)							
	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
150	15.7	22.5	29.4	26.3	25.0	33.2	30.0	17.2
200	18.6	22.4	25.9	25.6	18.7	22.4	26.6	13.8
250	24.3	26.2	26.25	23.6	19.2	21.1	25.8	13.6
300	24.8	31.8	26.6	23.0	18.7	22.4	25.0	16.3

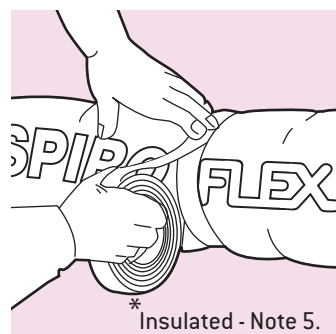
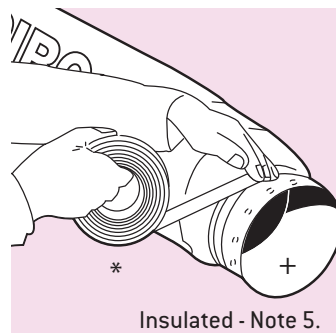
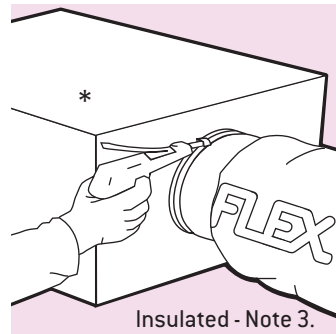
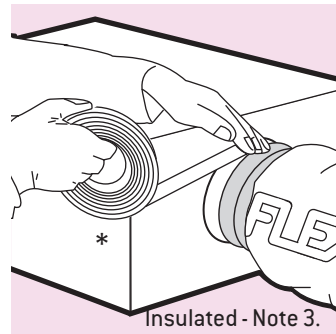
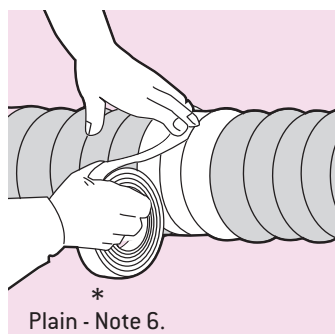
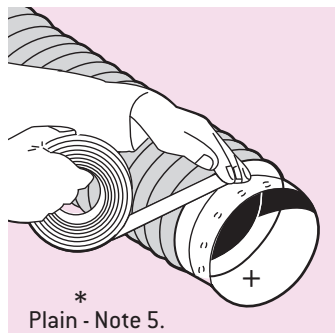
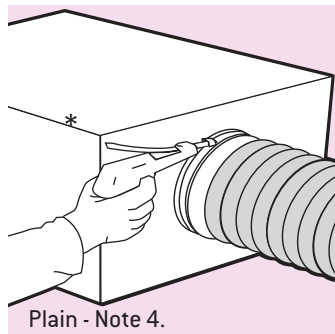
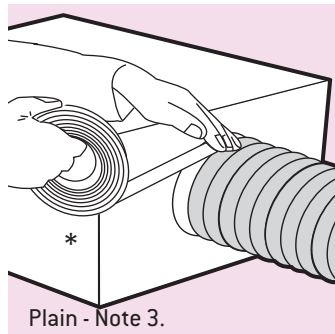


Note: A complete range of Ductwork Accessories and Tools are available, refer to Section K (Accessories).

SPIRO-FLEX – Installation Instructions

Plain Ducting

1. Install the duct in accordance with AS 4254.1-2012.
2. Grasp the duct close to the end and twist it onto the duct spigot or fitting.
3. Using Holyoake Duct Tape*, apply a minimum of three overlapping, wraps around the duct and fitting, each layer overlapping the previous layer by approximately 50%.
4. Further mechanical fixing should be applied to the duct core using suitable Plastic Duct Ties or Stainless Steel clamping Bands.
5. For joining lengths, push and twist the end of the duct over a Holyoake Spin Connector+, tape and band, as in steps 3 and 4.
6. Slide the second length over the opposing end and repeat 5.
7. Finally attach the end of the duct to the terminal device or fitting, ensuring it is fully supported and extended in accordance with the 'General Rules For Installation' below.
8. If this necessitates cutting, fully extend duct, allowing sufficient surplus to slide over fitting and mark cut position.
9. With a sharp knife or scissors slide this between two adjacent supporting ribs and cut through duct membrane, finally cutting the inner support rib with diagonal cutting pliers and tuck the end of the rib back inside the duct.
10. Finish by smoothing the inside edge of the duct and sliding over the fitting, repeating steps 3 and 4.
11. On Oval collars the duct core shall be permanently fastened with corrosion-resistant self-tapping screws and 25mm diameter washers, at a maximum of 75 mm centres, located behind the collars retaining swage. To provide an air seal, repeat step 3 above.



Insulated Ducting

1. Install the duct in accordance with AS 4254.1-2012.
2. Pull out the inside core sufficient to cover the duct spigot or fitting and smooth the inside edge of the duct by running the hand around the rim. Grasp the duct close to the end and twist it onto the duct spigot or fitting.
3. Follow steps 3 and 4 under Plain Ducting.
4. Pull the insulation forward to butt against the fitting and cover cuff of the jacket. Repeat step 3 under Plain Ducting.
5. For joining lengths, pull out inside core and fit to a Holyoake Spin Connector+, as per 2 - 4 above, repeat for second length, overlapping the jacket ends, to ensure insulation and vapour sealing continuity.
6. Finally attach the end of the duct to the terminal device or fitting, as 7 - 10 under Plain Ducting, ensuring insulation extends fully and mark cut position on inner liner and outer sleeve.
7. Pull out inside core and repeat 9 under Plain Ducting.
8. Carefully cut around the outer sleeve and through the insulation with a suitable knife and scissors.
9. Smooth the inside edge of the duct liner and slide over the fitting, repeating step 3 above, whilst ensuring the outer sleeve and insulation butt up to the fitting, repeating step 3 under Plain Ducting.

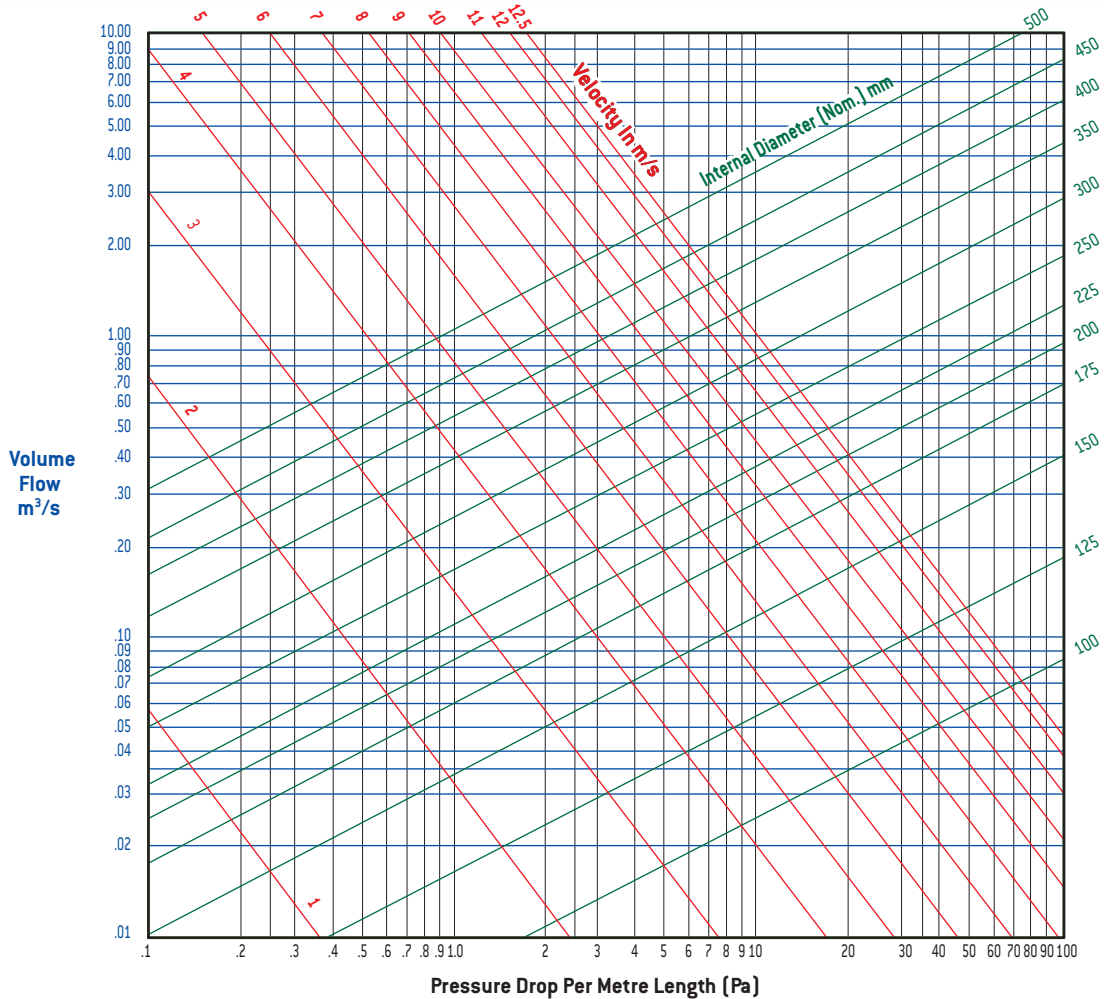
* += A full range of HVAC Duct Tools, Duct Ties, Duct Tape, Duct Hangers and Spin Collars/ Connectors are available – Refer to Section K.

General Rules For Installation

1. Spiro-flex must be installed fully extended to produce optimum results. Pressure Loss can increase greatly if this is not done.
2. Maximum sag between any two adjacent suspension points should not exceed 40 mm per metre.
3. Distance between any two adjacent suspension points should not exceed 1.5 metres.
4. Definite changes in direction should be anchored to prevent movement with changes in static pressure.
5. A semi-rigid, fire resistant load bearing strip a minimum width of 75 mm shall be in contact with the duct for at least a quarter of its circumference and be placed between the duct and the hanger/saddle material, (this being a minimum of 25 mm), to spread the flexible duct weight.
6. Connections to branch spigots or spin collars/spin connectors, should be given further support within 300 mm to avoid stress on the joint.
7. Take care to avoid direct contact with hot surfaces, such as steam or hot water pipes, etc.
8. Ducting shall extend 100 mm Minimum from a connection before any change of direction.
9. Terminal Devices shall be independently supported of the ductwork.
10. In Sub Floors, no part of the duct shall come into contact with the ground.
11. It is recommended that flexible duct be installed in lengths not exceeding 6 m between duct spigot and terminal.

Note: Take suitable safety precautions for Hand and Eye protection.

Friction Resistance



Test data upon which the above chart was produced, was obtained in ideal laboratory conditions, with each tube fully extended and straight.

This type of duct is chosen instead of semi-rigid Spiro-set in most cases because of its ease of handling and the amount of field abuse it can withstand. As a compressible (floppy) duct, it is impossible to predict exactly what its configuration will ultimately be, and therefore impossible to predict pressure loss.

Where pressure loss is important, Spiro-set (semi-rigid) aluminium ducting should be used. Where Spiro-flex (or any similar type of duct) is chosen, the following should be borne in mind:-

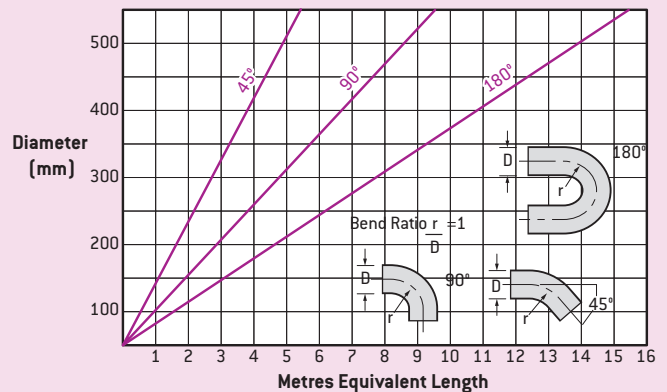
1. No excess pipe should be left in a run. Where a length is allowed to reduce by just 20%, the increase in pressure loss can be anywhere between 3 and 7 times the extended straight duct figure.
2. If excess duct is left in a run, it will be likely to expand to somewhere near its nominal length with back pressure from a diffuser damper or when air velocity reaches about 6 m/s. This will result in two or more sharp bends and the consequent increase in friction.
3. It is impractical to expect the installer to ensure a bend radius with a ratio of better than $r/D = 1$. Unless some form of guide bar is taped to the duct, it will not retain a longer radius, especially in the typical case where a run out has to turn through 90° vertically to connect to a diffuser. A duct anchor should be used in these cases to prevent a bend closer to 180° and a reverse set to line up with its feeder spigot.

Note

Above data is for air density of 1.2kg/m³.

4. "Floppy" duct should never be used on high pressure connections to duct terminals such as VAV or mixing box inlets. While the duct is physically strong enough to withstand 1000 Pa static pressure, it will move as pressures change, and will naturally resist anything other than sharp changes of direction.

Additional Friction For Bends



For pressure drop calculations, measure the full length of duct around the centre line, or to centre line intersection points.

The pressure drop created by changes in direction as determined by the equivalent length chart is additional to the pressure drop of the measured length.

Product Ordering Key and Suggested Specifications

SPIRO-LOC	300 mm	3 m	WALL THICKNESS	PROFILES	OPTION	ACCESSORIES
Galvanised Steel Rigid Duct.	Nominal Duct Diameter.	Standard Stock Length, (Others To Special Order).	0.45 mm 0.55 mm 0.95 mm	Standard Plain, Single Swage or, Double Swage.	‘Insulated.’	Spin Collar. Spin Connector. Duct Tape*. HVAC Tools. Duct Ties.

Series Spiro-Loc

Lightweight plain galvanised steel construction, spirally wound ductwork, with a four ply lock seam joint, suitable for HVAC applications, concrete void forming, irrigation pipe and rubbish chutes.

Additional single, or double swages can be incorporated to improve rigidity and crushable strength.

Complies with AS 4254, AS 1530.3, and UL 181, where applicable.

All shall be Series Spiro-Loc as manufactured by Holyoake.

SPIRO-SET	300 mm	3 m	STANDARD OPTIONS AVAILABLE	ACCESSORIES
Aluminium Semi Rigid Duct.	Nominal Duct Diameter.	Standard Stock Length, (Others To Special Order).	SPU, Plain, Uninsulated. SPI-FP, Plain, Insulated. (R1.0). or SAI-FP, Acoustic, Insulated. (R1.0).	Spin Collar. Spin Connector. Duct Tape. HVAC Tools. Duct Ties.

Series Spiro-Set

Lightweight aluminium construction, spirally wound corrugated ductwork, with a four ply lock-seam to provide an airtight tube, suitable for HVAC applications. It can easily be cut and bent by hand and maintain the configuration required, without deforming its circular cross section.

With the inclusion of a lofted polyester blanket and a polyethylene external vapour barrier, it is available as an Insulated, or Acoustic Insulated Option.

Complies with AS 4254, AS 1530.3, and UL 181, where applicable.

All shall be Series Spiro-Set as manufactured by Holyoake.

SPIRO-FLEX	500 mm	3 m/6 m	STANDARD OPTIONS AVAILABLE	ACCESSORIES
Flexible Duct.	Nominal Duct Diameter.	Standard Stock Lengths, (Others To Special Order).	Plain, Un-insulated. Acoustic, Insulated. (R1.0) or Plain, Insulated. (R1.0).	Spin Collar. Spin Connector. Duct Tape. HVAC Tools. Duct Ties.

Series Spiro-Flex

Super lightweight, compressible flexible air duct of two layer construction; two polyester tapes, one metallised, helically wound, encapsulating a spring steel wire. Suitable for use in low pressure HVAC systems.

Complies with ISO9705, AS 4254, AS 1530.3, and UL 181, where applicable.

All shall be Series Spiro-Flex as manufactured by Holyoake.

* Not to be used as the primary sealing agent connecting rigid duct to rigid duct.

'Spiroloc' - Approximate Weight in Kg (3 m Lengths)

Diameter	100	125	150	175	200	225	250	300	350	400	450	500
0.45 mm	4.2	5.3	6.3	7.3	8.3	9.4	10.4	12.5	N/A	N/A	N/A	N/A
0.55 mm	5.3	6.5	7.8	9.1	10.4	11.6	13.0	15.5	18.2	21.6	22.7	25.9
0.95 mm	7.8	10.1	11.7	13.7	15.5	17.8	19.4	23.3	27.2	31.0	32.5	38.9
Insulated	0.44	0.59	0.63	0.79	0.85	0.90	0.96	0.98	1.27	1.53	1.78	2.03
Diameter	550	600	650	700	750	800	850	900	950	1000	1050	1100
0.95 mm	42.7	46.5	51.0	54.4	58.3	62.1	66.3	70.2	74.1	78.0	81.9	85.8
Diameter	1150	1200	1300	1400	1500							
0.95 mm	89.7	93.6	101.4	109.2	117.0							

Notes

- For weights, gauges, sizes, and lengths other than listed, refer to your local Holyoake branch.
- For **Insulated** duct weights 'add' weight of relevant gauge to '**Insulated**' weight = **Total Weight**.
(e.g. 100 mm diameter in 0.45 mm gauge is 4.2 + Insulation 0.44 = 4.64 Kg per 3 m Insulated length).
- Spiroloc Insulated duct is only available in the sizes shown.

'Spiroset' - Approximate Weight in Kg (3 m Lengths)

Diameter	100*	125	150	175	200	225	250	300	350	400	450	500
Plain	0.87	1.00	1.30	1.48	1.70	1.90	2.11	2.47	2.77	3.29	3.71	4.11
Insulated	1.310	1.592	1.930	2.365	2.520	2.785	3.070	3.450	4.040	4.820	5.489	6.138

*75 mm diameter available in Plain only. 0.57 Kg per 3 m length.

Notes

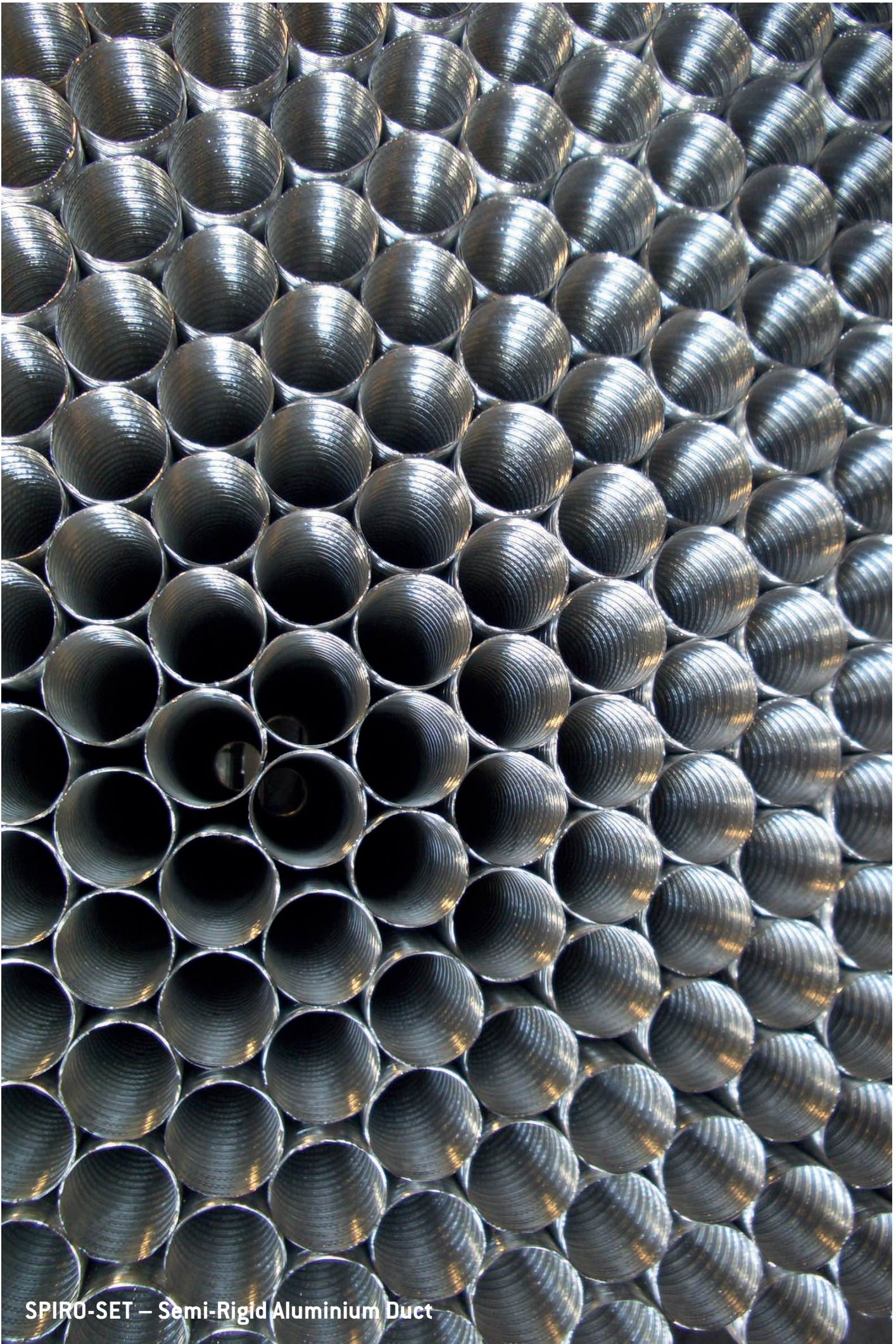
- For weights, sizes, and lengths other than listed, refer to your local Holyoake branch.
- Insulated Weights are the combined weight of the Plain Liner, Insulation, and Outer Sleeve.
- Acoustic Insulated only available in 100 - 300 mm diameter.
- For Acoustic Insulated Weights, use Insulated Weights.
- Spiroset Insulated duct is only available in the sizes shown.

'Spiroflex' - Approximate Weight in Kg (3 m Lengths)

Diameter	100	125	150	175	200	225	250	300	350	400	450	500
Plain	0.28	0.37	0.48	0.54	0.92	1.03	1.13	1.90	2.24	2.55	2.97	3.38
Insulated	0.720	0.962	1.110	1.425	1.740	1.915	2.090	2.880	3.510	4.080	4.744	5.408

Notes

- For weights, sizes, and lengths other than listed, refer to your local Holyoake branch.
- Insulated Weights are the combined weight of the Plain Liner, Insulation, and Outer Sleeve.
- Spiroflex Insulated duct is only available in the sizes shown.



SPIRO-SET – Semi-Rigid Aluminium Duct