

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, with-out 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 3 metres. 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

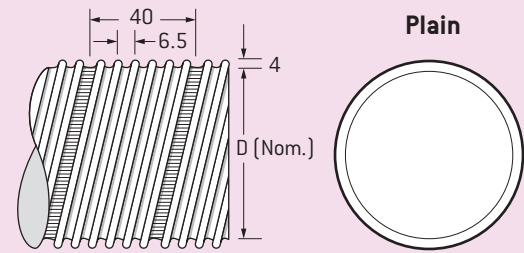
- Liner:** Aluminium.
Insulation: Lofted polyester blanket, tested to AS/NZS 4859.1
 Thermal resistance rating $RI.0 \text{ m}^2 \text{ K/W}$
 Thermal resistance rating $RO.6 \text{ m}^2 \text{ K/W}$
Outer Sleeve: 100 micron, flame retarded,
 Low density, high impact,
 Polyethylene vapour barrier,
 Printed 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).

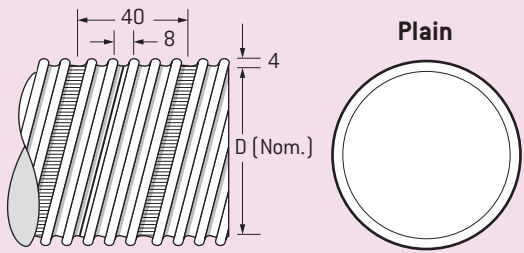
Standard Die Sizes 'D' In mm												
75*	100	125	150	175	200	225	250	300	350+	400+	450+	500+

* Plain Only + Not Acoustic

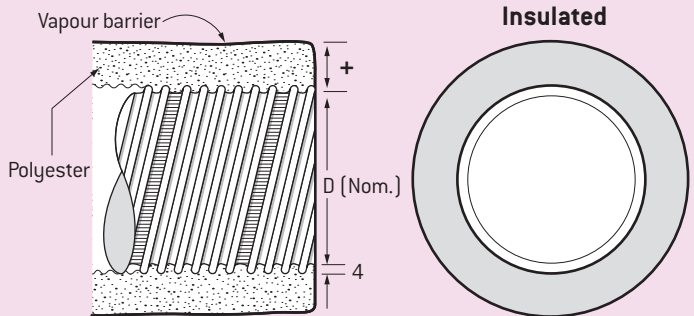
Dimensional Data



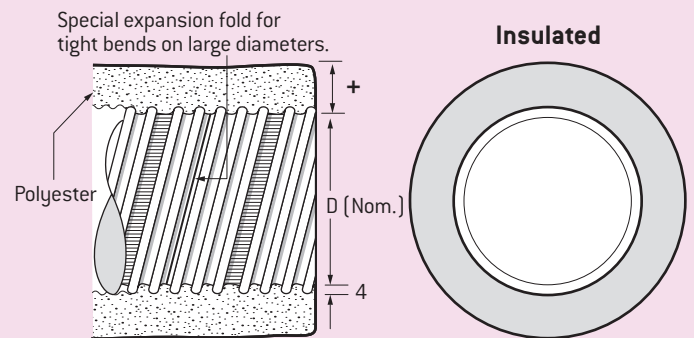
Type SPU Sizes 75 to 300 mm.



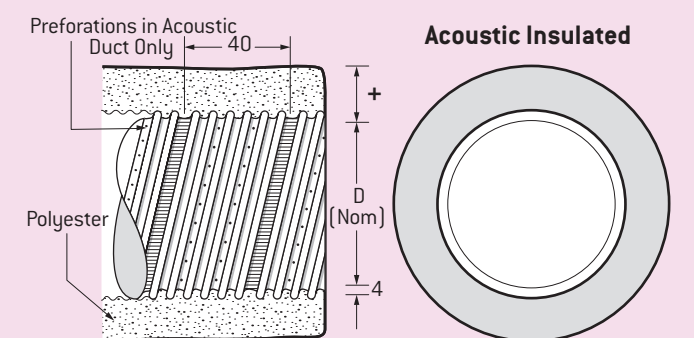
Type SPU Sizes 301 to 500 mm.



Type SPI-FP Sizes 100 to 300 mm.



Type SPI-FP Sizes 301 to 500 mm.



Type SAI-FP Sizes 100 to 300 mm only.

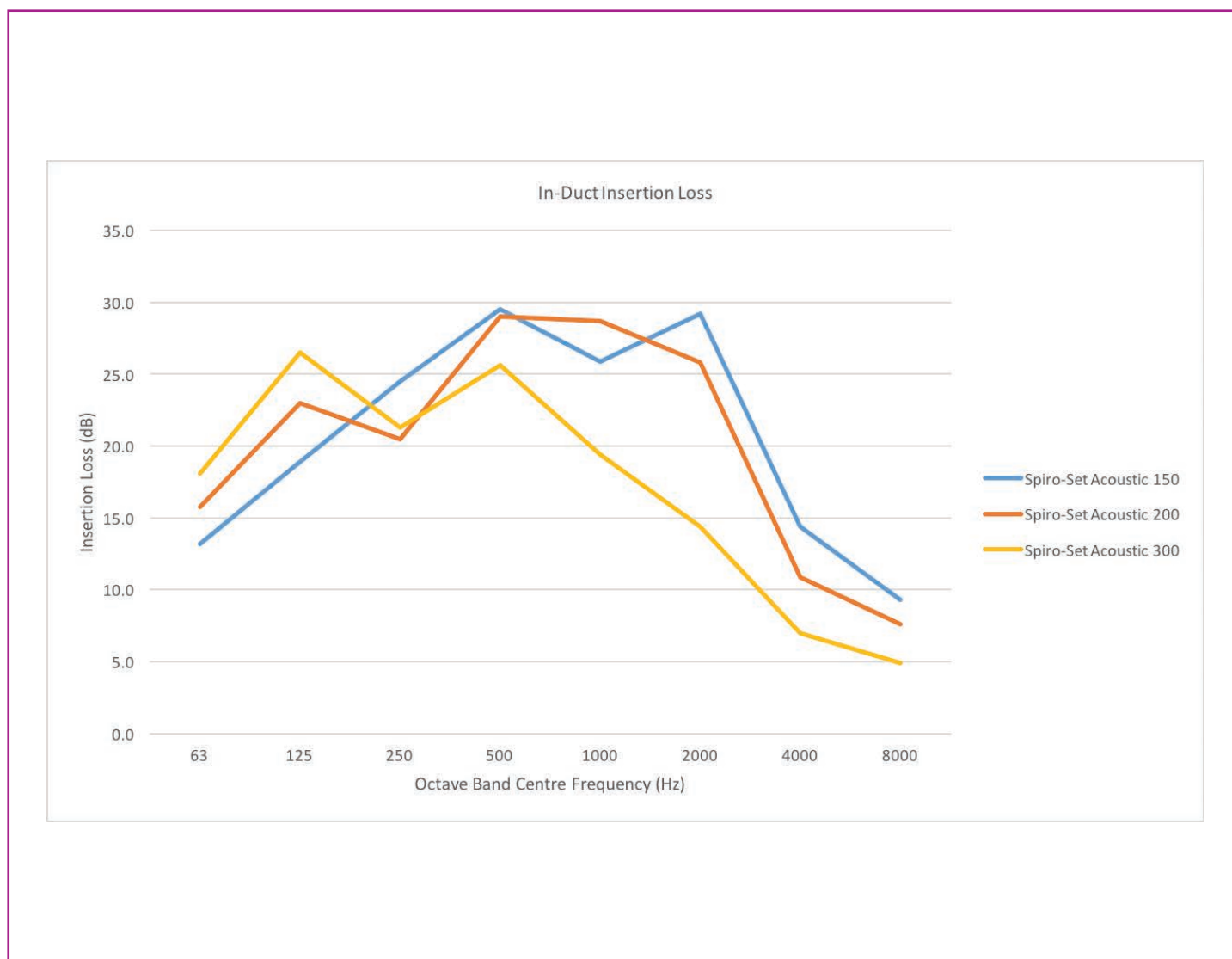
+ = Insulation thickness dependant on 'R' value.

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.

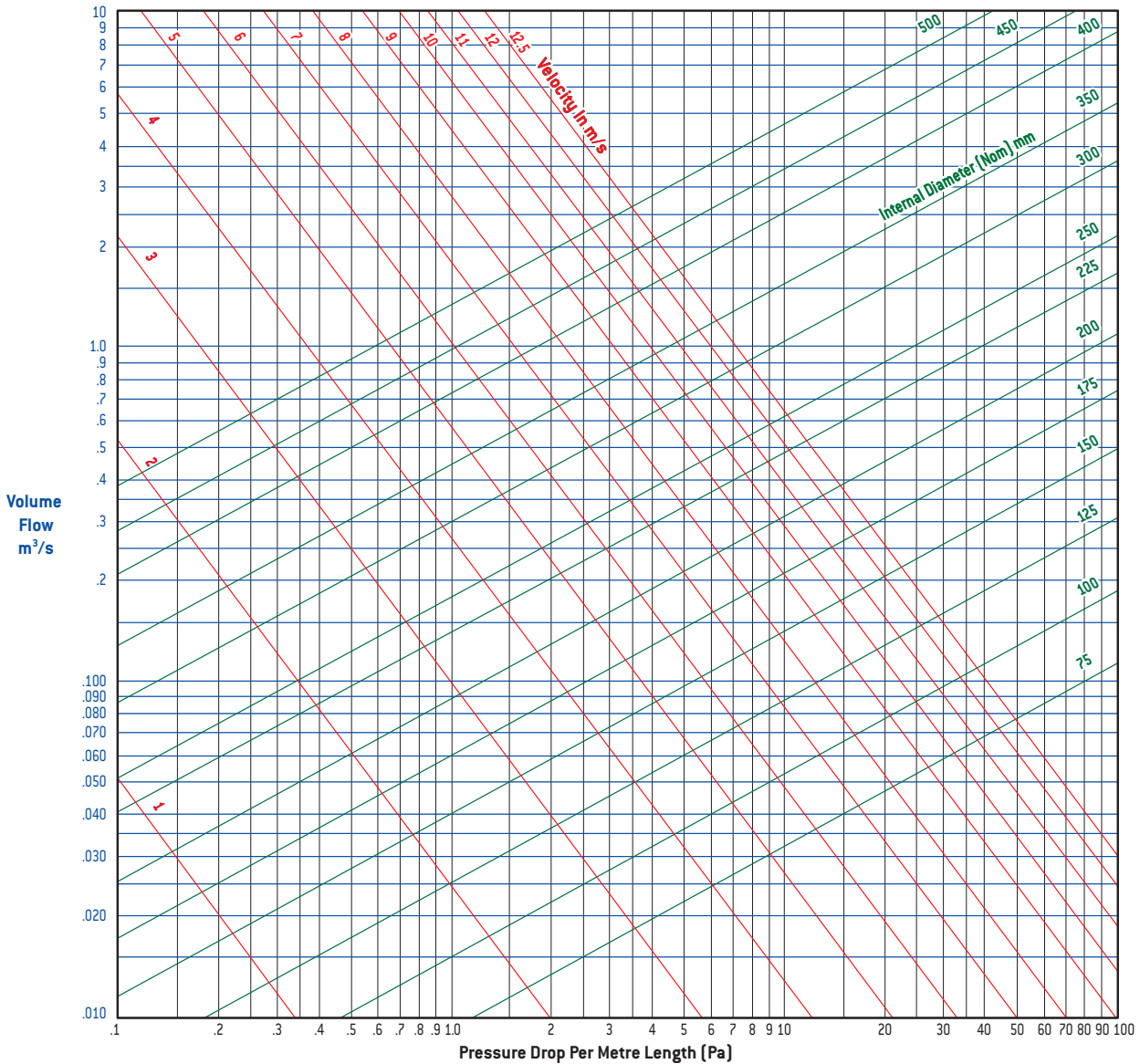
The following table gives an estimate of the insertion loss of a 3 meter length of various diameter Spiro-set acoustic when tested in accordance with Air Diffusion Council Flexible Air Duct Test Code FD 72-R1. The ducting was tested in ideal laboratory conditions, fully extended and straight. Installation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

In-Duct Insertion Loss (dB)								
Diameter (mm)	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).

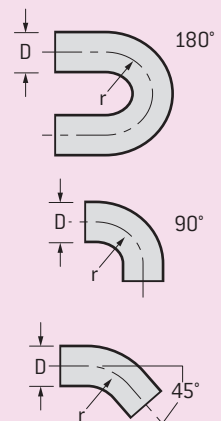
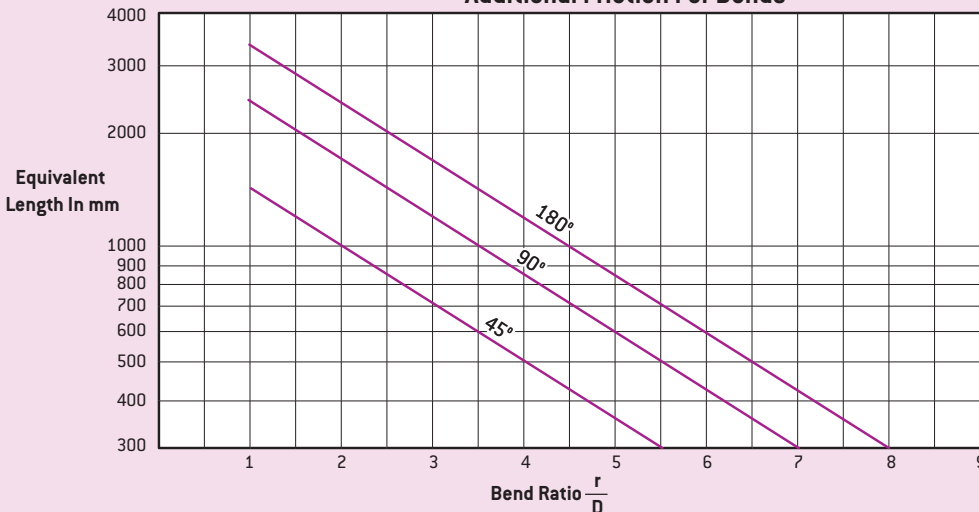
Friction Resistance



Notes

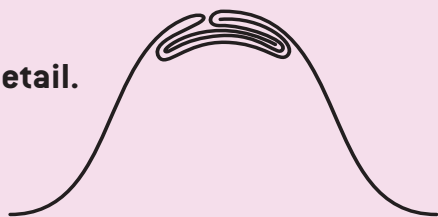
1. For pressure drop calculations, measure the full length of duct around the centre line, or to centre line intersection points. The pressure drop created by changes in direction as determined by the equivalent length chart is additional to the pressure drop of the measured length.
2. Above data is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

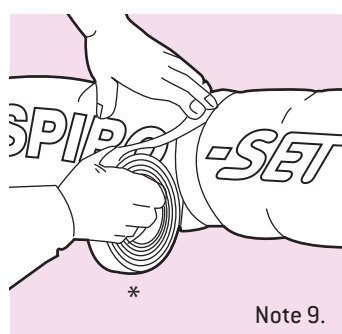
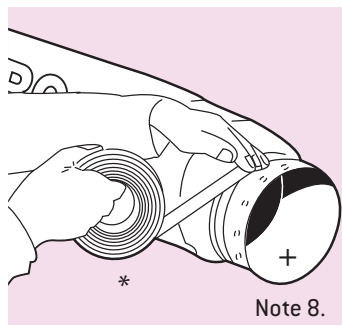
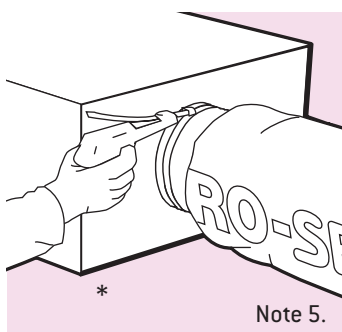
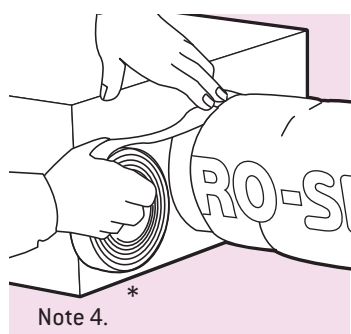
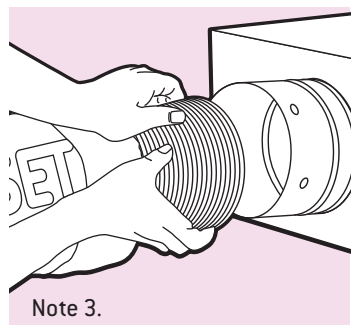
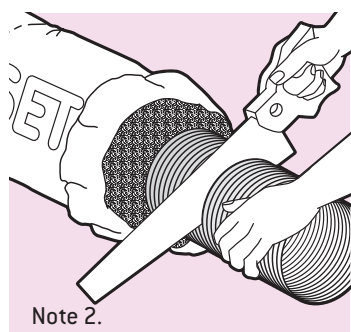
4. Using Holyoake Duct Tape*, apply a minimum of three overlapping, tensioned, crease free wraps around the duct and fitting, each layer overlapping the previous layer by approximately 50%.

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.