

# LipSeal

## Duct Sealing Rings

With the worldwide drive to save energy, much effort is being put into preventing air leakage from HVAC ducting. Air leakage causes fans to work harder thereby increasing their power consumption. In Europe duct sealing systems for round ducting (e.g. Spiro) have been introduced. Smooth-Air now has the 'LipSeal'. These systems have a rubber ring that seals between the two lengths of duct when a small end is slid into a big end.

Smooth-Air can manufacture LipSeal joins from 100 to 600mm dia:  
**100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500 & 600 mm diameters**



Slide the rubber LipSeal end inside the BE



*Due to a policy of continuous development, prices and specifications are subject to change without notice.*

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## Applications

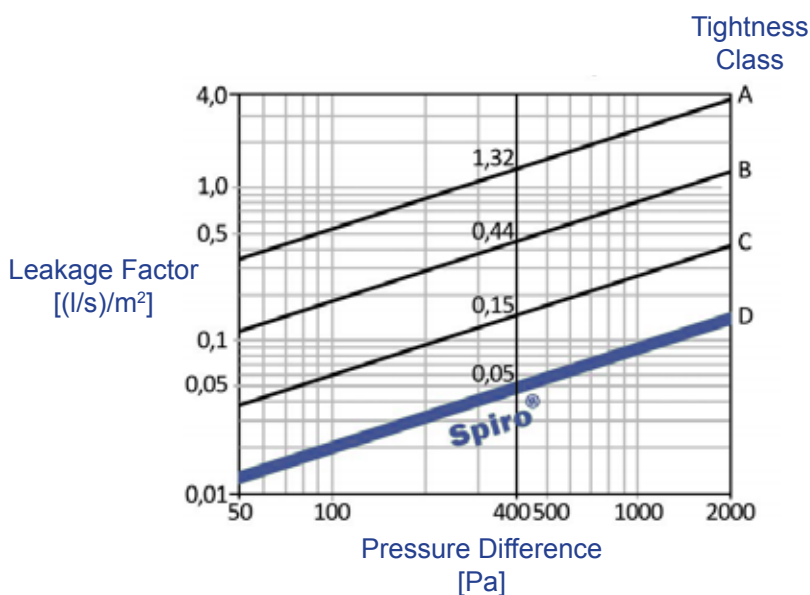
### Traditional Ducting Systems

When two lengths of Spiro or round duct are joined together, the small end of one tube is slid into the big end of the other. The two ducts are pushed together as hard as possible and an “interference” fit is formed. The outer edge of the large tube is then sealed with duct tape. Over the years the small ends have been adapted to make the interference fit seal better i.e. swaging or crimping.

However, with the pieces of ducting expanding and contracting due to temperature differences (along with size differences caused by manufacturing), the seal between the two pieces of duct could easily be broken and air leak out. The duct tape would seal initially but after time can start to peel off and let any leaking air out of the joint.

Having a rubber ring provides an airtight seal that will last indefinitely. It is fitted into the groove in the small end of the fitting, spigot or piece of duct. When the small end is pushed into the big end of the piece of duct to be joined, the rubber ring is compressed and forms an airtight seal between the two layers of metal to be joined. It will continue to seal even when the joint is moved or with temperature changes.

Smooth-Air’s LipSeal joints have been tested by Holmes Solutions to high pressures (1000Pa+) with negligible leakage. This is higher than the requirements of DW144, the international standard for such systems.



Fittings come SE/SE with Rubber LipSeals

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## Componentry

The system comprises of a rubber ring that sits in a groove on the small end of a piece of round duct, a metal (or TD) fitting (which has round ends or spigots).

The rubber ring is made from EPDM (a polymer of ethylene, propylene, and a diene monomer). This means it has excellent resistance to oxygen, ozone and sunlight. It has resistance to things such as phosphate eaters, many ketones and alcohol. It has good electrical properties, low temperature flexibility and will withstand heat, steam and water. Its useful temperature range is -50°C to +150°C.

It is worth noting that it has poor resistance to petroleum products.

Duct Pressure Class	Static pressure limit		Maximum air velocity	Air leakage limit C in equation (2)
	Positive	Negative		
	Pa	Pa	m/s	L/s/m <sup>2</sup> duct surface area
Low pressure – Class A	500	500	10	$0.027 \cdot \Delta p^{0.65}$
Medium pressure – Class B	1000	750	20	$0.009 \cdot \Delta p^{0.65}$
High pressure – Class C	2000	750	40	$0.003 \cdot \Delta p^{0.65}$

Figure 1: Shows equation (2) plotted for the pressure ranges above.

Equation (2) is:  $Q_{leak} = C \cdot A_s \cdot \Delta p^{0.65}$

Where  $Q_{leak}$  is the quantity of the leaked air,  $C$  is a constant related to the duct tightness (which relates to the details of manufacture, installation and sealing),  $A_s$  is the duct surface area,  $\Delta p$  is the pressure difference between the inside and the outside of the duct and  $n$  is an exponent related to the geometry of the holes through which air leaks.

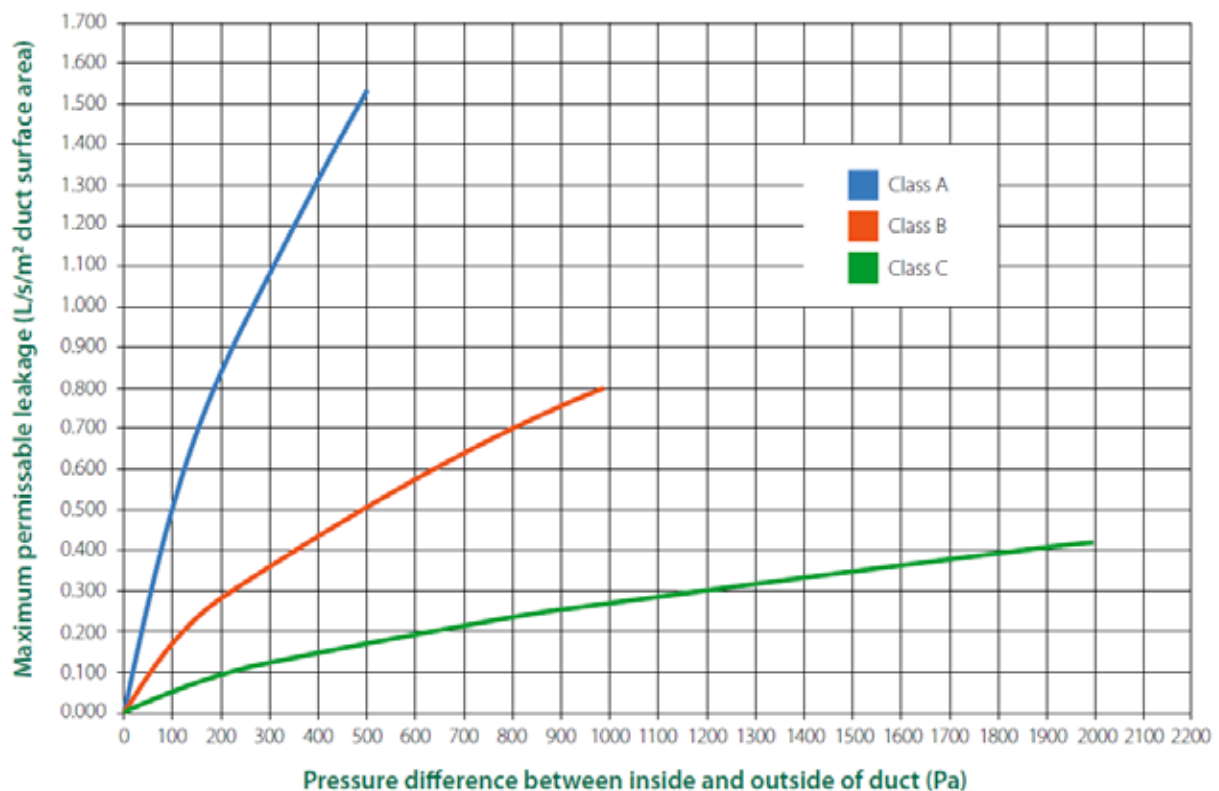


Figure 2: Permissible duct leakage as a function of Class and pressure.

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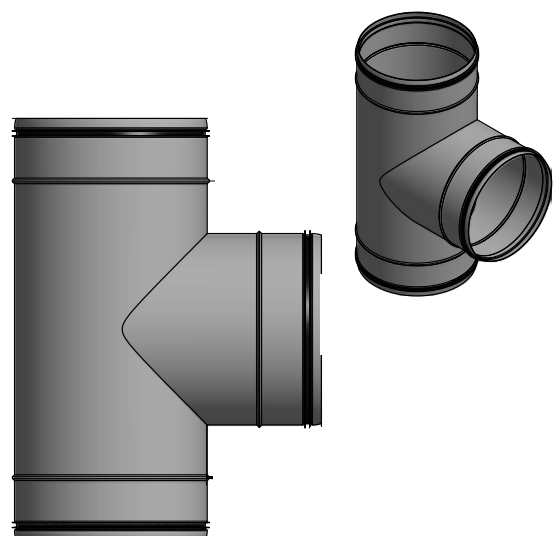
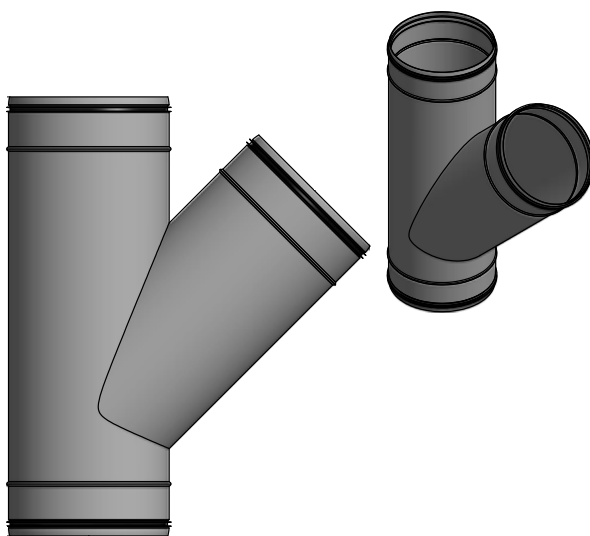
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Lipseal ring ends can be made for most fittings, including:

- Spiroduct – all sizes
- Adjustable bends – all sizes
- Fixed bends – all sizes
- Square or rectangular to round fittings – all sizes
- Round reducers – all sizes
- Metal Y-branches – all sizes
- Metal BTOs – all sizes
- TD or metal plenums
- TD or metal grille boxes
- Echidnas
- Metal end caps – all sizes
- Metal joiners – all sizes
- Saddle take-offs – all sizes
- Metal spigots (dampered and non-dampered) – all sizes
- Metal in-line dampers (manual or motorised) – all sizes
- Round Kilargo fire dampers (all sizes)
- Fesit tubes – all sizes
- Madonna and Monica tubes – all sizes



Fittings Metal



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