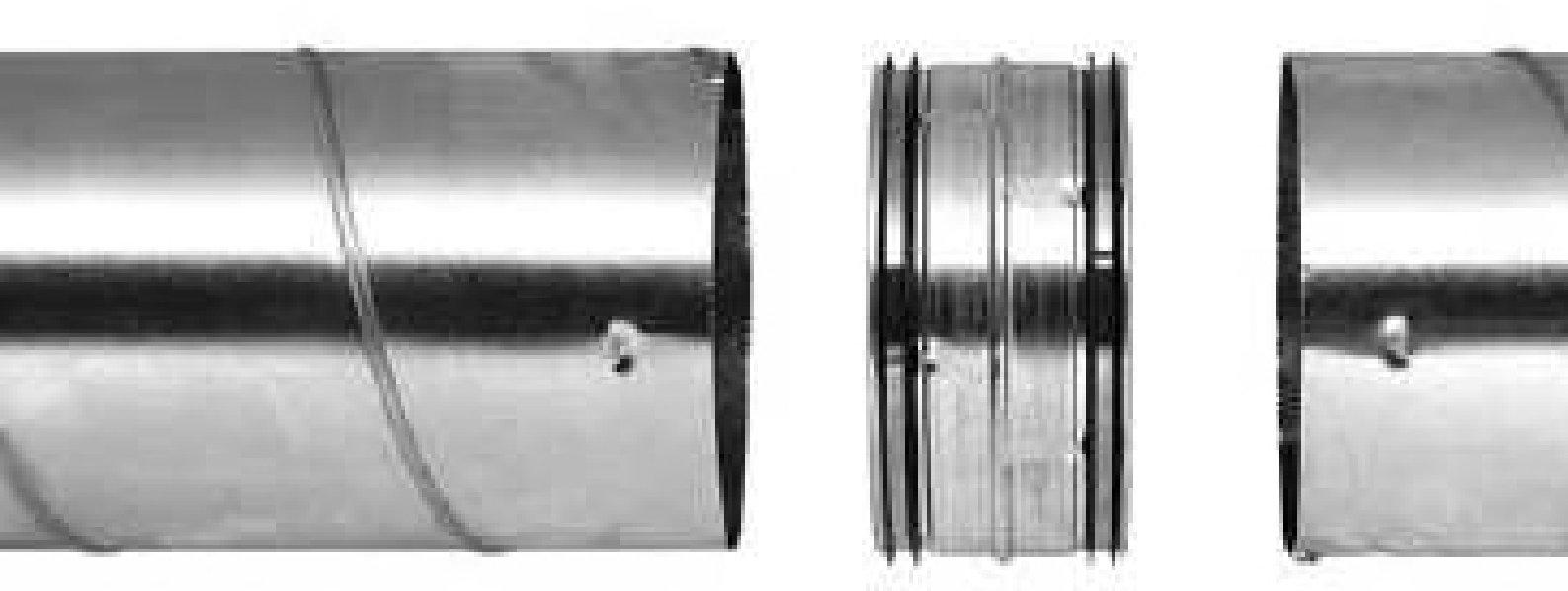

Lindab Ronde Kanalen

Technische Fiche – **gegalvaniseerd staal (Sendzimir verzinkt)**

volgens EN 1505 , EN 1507 en TB105 (versie 2014)

TECHNISCHE FICHE

Ronde Luchtkanalen type Lindab*Safe*®

FABRIKANT : **LINDAB**

MATERIAAL : **Gegalvaniseerd staal volgens EN 10237 Dx51 D- Sendzimir verzinkt - met zinkcoating Z275**

TOEPASSINGSGEBIED :

De beschrijving hieronder is geldig voor kokers lage druk en middendruk (<1000 Pa) en voor hoge druk (<2500Pa) en voor ventilatietoepassingen in volgende gebouwen

- Residentiële gebouwen
- Commerciële gebouwen (kantoren, winkelruimtes, …)
- Industriële gebouwen die corrosieklasse C2 vereisen
- Overheidsgebouwen (scholen, kantoren, ziekenhuizen, …)

PLAATKWALITEIT :

- Voor het vervaardigen van verzinkte luchtkanalen wordt plaatstaal toegepast in de kwaliteit Z275, met een tweezijdige zinklaag volgens het Sendzimirprocédé aangebracht met een laagdikte van 275 g/m2 tweezijdig volgens drievlakkenproef gemeten. Gemiddelde zinklaag van 19 micron per zijde
- Toleranties volgens EN 10.142 , tolerantie volgens EN 10.143
- De kanalen zijn van spiraalgefelste type en worden uitgevoerd in volgende minimale plaatdikte, geschikt voor een onderdruk en overdruk van maximaal 3000Pa:

Dia 80 tot 125	0,45 mm
Dia 150 tot 250	0,50 mm
Dia 315 tot 400	0,55 mm
Dia 450 tot 630	0,70 mm
Dia 710 tot 800	0,80 mm
Dia 900 tot 1250	0,90 mm

De luchtkanalen en hulpstukken voldoen aan het typebestek art.C14 Type Bestek 105, editie 2014, van de Regie der Gebouwen, en aan EN 1506 en EN12237.

UITVOERING :

De kanalen worden verbonden met hulpstukken (bochten , T-stukken, piquages , ed..) die voorzien zijn van een fabrieksgemonteerde dubbele lip uit EPDM die op zijn plaats gehouden wordt door een stalen strip waardoor de opgegeven luchtdichtheid gegarandeerd wordt tussen +3000Pa en –3000Pa. Elk hulpstuk is eveneens voorzien van een 180° omgeplooide kraag.
Voor de mechanische bevestiging van de hulpstukken in de kanalen zijn luchtdichte poprivetten of zelfborende schroeven toegelaten (zie bijlage). Alle dimensies zijn volgens Eurovent 2/3 en EN1506.

LUCHTDICHTHEID :

De luchtdichtheid van de fabrieksomponenten in klasse B en C volgens EN12237 wordt verzekerd door gebruik te maken van siliconenvrije mastiek. Voor het bereiken van de luchtdichtheid na montage dienen de Lindab-montagevoorschriften gevolgd te worden. (zie bijlage). De verbindingen behalen, zonder gebruik te maken van een tape of koudkrimpmof, een luchtdichtheid klasse C volgens Eurovent wat overeenkomt met onderstaande luchtlekdebieten bij de gespecificeerde testdrukken:

Drukverschil	400 Pa	1000 Pa	2000 Pa
Luchtlekdebiet klasse C	(l/s)/m²	(l/s)/m²	(l/s)/m²
	0.16	0.28	0.41

Voor lekdebiettesten en rapportering volgens EN12237 dient gebruik gemaakt te worden van de Lindab lektestmachine LT600 (zie bijlage)

FABRIEKSKEURING :

Wij bevestigen dat de proeven uitgevoerd door AIB VINCOTTE voor gegalvaniseerde staalplaat, thermisch verzinkt (275g/m^2), volgens procedure TB 105 (2014) gelden voor:

- Doorbuigingsproef
- Overdruktest
- Lektest

Actuele certificaten volgens TB105 (2014):
http://www.lindab.com/be/pro/software/print/pages/certificaten.aspx

VOOR LINDAB

Dirk Van den Branden
MANAGING DIRECTOR

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KBC 445-7605531-19 - FORTIS 290-0399915-05 - BTW BE-464.910.211 - HRG 195.228

The Safe system

The Safe-system

- Safe is a quickly assembled system for round ventilation ducts.
- Safe is type approved to class D by SITAC, no. 1358/88.
- The complete programme has dimensions according to Eurovent 2/3 and Swedish Standard SS-EN 1506.
- The system is based on a double-lipped, factory-installed seal made from EPDM rubber. The moulding, which can withstand rough handling, and is almost insensitive to temperature changes, gives a very air-tight seal.

Advantages of the Safe-system

- Quick assembly.
- Factory fitted seal with no loose fittings.
- Can be twisted and adjusted with tightness unaffected.
- Installation without sealant or solvents.
- Can be used in all climates.
- Seal moulding remains tight from 5 000 Pa negative pressure to 3 000 Pa positive pressure.
  Duct resistance to collapse differs from these pressures, and is noted on page 51.
- Type approved to sealing class D.

Click function

The Click function exists in principle on all Safe-products.
The exeptions are stated under each product.
The Click function exists on the dimensions Ø 80–315.
The Click function means;

a. that an end with male measure has an open turned-over end and
b. that an end with female measure has a number of notches.

Type approval

Approval no 1358/88 means that the Safe-system complies with the requirements for tightness class D without any demand for pressure testing after installation.
The approval is only valid on condition that all fittings are marked by us in accordance with the example and are installed in accordance with the accompanying installation instruction.

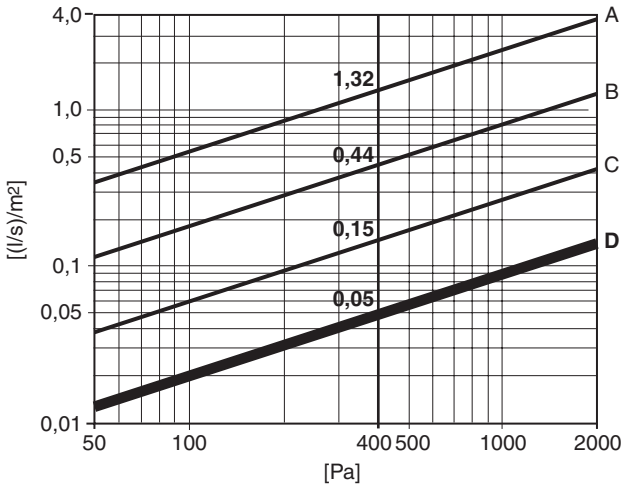
Marking

Each individual product is marked with a special label or stamped in the metal.

Tightness

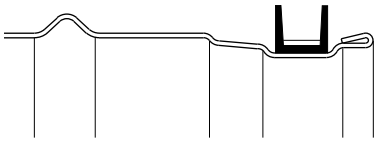
A duct system will never be “completely tight”. The system will normally have some leaks at joints between ducts and fittings. The leakage will also increase as the pressure difference between the in- and outside of the duct sides increases.

The leakage factor in (l/s)/m^2 is always specified in relation to the pressure difference in Pa. (The unit (l/s)/m^2 denotes the leakage flow in l/s in or out of the system in relation to its duct area in m^2.) The graph below shows the leakage factor for the sealing classes A–D as a function of the pressure difference.



The graph shows that sealing class D is 3 times better than class C, which in turn is 3 times better than class B etc. Class D thus entails demands on not only the seal moulding but also the fittings and how well the system is installed.

This is one reason why we have given all fittings a turned-over edge and have given still more fittings a stop bead. This gives us stable products which are better suited to withstand handling on site at the same time as the risk of skewed assembly falls.



Turned-over edge design

The Safe system

Economy – Tightness

Present-day stringent demands for interior climate entail expensive air treatment. Leakage leads to uneconomical operation, adjustment difficulties and over-dimensioned equipment. For this reason, it is important that ventilation systems are very well sealed, to keep overall costs down. This is why official requirements for sealing vary with the size and use of systems.

Inspection/Testing

In order to make Safe comply with the requirements of sealing class D, we have constant inspection procedures where we do daily sampling. Inspection is done on goods received from sub-contractors and our own production of ducts and fittings.

Goods reception inspection complies with Swedish Standard for testing methods and batch acceptance levels. The inspection points include:

1. Inspection of seal moulding inner diameter. This is particularly important for ageing resistance of the rubber. The greater the load on the rubber, either stretching or pressure, the faster the rubber ages, causing brittleness and cracking.
2. The seal moulding profile is measured in a profile projector, where the dimensions of the seal moulding are checked against agreed tolerances.
3. The seal moulding material is tested by accelerated ageing in heat oven.

Manufacturing inspection is logged. The inspection includes a diameter check of ducts and fittings, a check of the groove where the seal moulding has been fixed, and a check of its fixing. Pressure testing is done in our air laboratory, to check the leakage flow from our products. This does not give the whole picture, however, so the best inspection of the Safe system is the pressure testing that The Swedish National and Testing Institute undertakes on randomly sampled products. In all these pressure tests, the Safe system has always exceeded the relevant sealing requirements.

Fittings

Products under the Safe insert and fittings with Safe seals under the Silencers, Dampers and measure units, and Isol inserts are included in the type approval for sealing class D. In addition, some fittings, under the Other circular products insert, are included.

A handful of fittings with the Safe seal can only manage up to tightness class C. This is marked on each of these products.

Fittings in this catalogue with a “U” in their designations have Safe seals, with only a few exceptions.

Degreased

Fittings can be supplied degreased on the inside, to order.

Dimensions

Almost all products in the Safe-programme can also be delivered in intermediate dimentions. For further informations see page 15.

Negative pressure

At big negative pressure there is a risk for a ventilation system to collapse. This risk is greater the bigger dimensions you have.

In order to increase the strength of *the ducts* you can e.g. increase their sheet metal thickness. This is a simple way but the effect is rather small. It exists other ways with higher result. For bigger dimensions then the ducts may be stronger than the fittings.

In order to increase the strength of *the fittings* other ways than thicker sheet metal thickness are more suitable.

Lindab has experience and knowledge about this and is willing to offer help at special cases. We can, as special, deliver duct systems that can withstand at least 5 000 Pa negative pressure.

The Safe system

Design

Our Safe seal system is based on a U-shaped profile of solid rubber. The seal moulding rests in a groove at the end of the fitting and is fixed with a steel strap.

As standard are Safe-fittings always supplied with an EPDM (ethylene-propylene rubber) seal moulding. The material has been chosen due to its long service life and the best possible resistance to ozone and UV radiation. It is also highly tolerant to temperature variations. Under normal conditions, the moulding can withstand:

-30 °C to +100 °C continuous
-50 °C to +120 °C intermittent

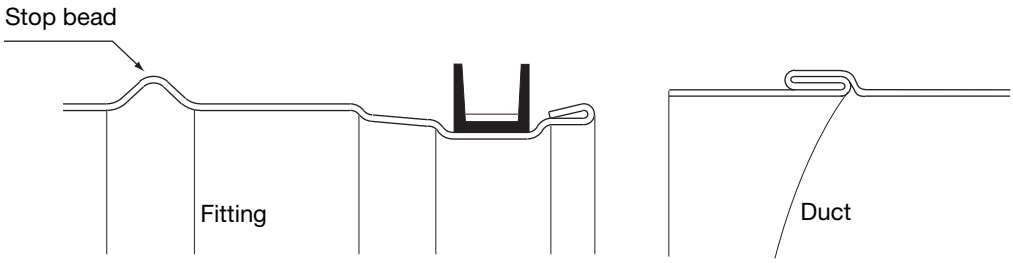
As special for installations which demand high temperature tolerance and somewhat higher oil resistance, Safe fittings can be supplied with a special silicone rubber moulding. This moulding is recognized by its blue colour. Mastic sealed fittings for higher temperatures are also produced with a more temperature resistand mastic.
Temperature tolerance:

-70 °C to +150 °C continuous
-90 °C to +200 °C intermittent

When fittings are installed in ducts, the seal moulding lips will be bent backwards. This means that the seal will be better at withstanding negative pressure than positive pressure, since the negative pressure will tend to press the lips harder against the duct walls. The following pressure differences must not be exceeded, to cope with tightness class D.

Positive pressure in duct 3000 Pa
Negative pressure in duct 5000 Pa

Both Swedish and European standards allow a greater tolerance range between the duct and matching fittings as the diameter increases. In order to achieve maximum sealing for all dimensions, we have chosen to use successively bigger seal mouldings as duct dimensions increase.



The Safe system

Resistance of seal mouldings to various substances

The table below gives a basic guide to how the rubber is affected by various substances.
A figure for each type of rubber indicates its suitability.

4	Scarcely affected	Recommended
3	Lightly affected	Normally usable
2	Strongly affected	Only usable in certain cases
1	Badly affected	Unsuitable
–	No information	

		EPDM	Silicone
A			
Acetaldehyde		4	4
Acetic acid	dilute 30%	4	3
	crystalline acetic acid	4	3
Acetic anhydride		3	2
Acetone		4	3
Acetylene		3	3
Aluminium salts (non-oxidizing)		4	4
Alun		4	4
Ammonia, liquid		4	1
Ammonia gas, cold		4	4
Ammonia gas, hot 65 °C		3	3
Ammonium hydroxide, dil. ammonia		3	3
Ammonium salts (non-oxidising)		4	3
Amyl acetate		4	1
Aniline		3	–
Aniline dyes		4	–
Animal fats		2	3
Arsenic acid		4	4
Asphalt		1	1
B			
Barium salts (non-oxidizing)		4	4
Beer		4	4
Benzene, bensol		1	1
Black liquor		1	–
Black water, waste water		4	3
Bleaching liquor, see Potassium hypochlorite			
Borax		4	3
Boric acid		4	4
Bromide, liquid		–	1
Bromic acid		4	1
Butane		1	4
Butanol, butyl alcohol		4	3
Butter oils		1	1
Butyl acetate		4	1
C			
Caustic soda, sodium hydroxide		4	2
Calcium salts (non-oxidizing)		4	3
Cellosolve, ethylene glycol		3	–
Cellosolve acetate		3	–
Chlorine gas	dry	2	–
	damp	2	–
Chlorine solutions	0,1 g/l free chlorine	4	–
	0,1-1 g/l free chlorine	4	–
	1-10 g/l free chlorine	3	–
	over 10 g/l free chlorine	2	–
Chlorine sulphonate acid		1	1
Chromic acid		2	2
CFC (e.g. Freon)		11	11
		12	31
		13	4–
		21	1–
		22	41
		31	4–
		32	4–
	112		1–
	113		11
	114		41
	115	4	–
Copper salts (non-oxidizing)			44
Citric acid		4	4
D			
Detergent		4	4
Diesel oil		1	2
Dilutin (White spirit)		1	1
Developing solutions		3	–
E			
Ethanol, ethyl alcohol		4	4
”Ether”, diethyl ether, ethyl ether		2	–
Ethyl acetate		3	2
Ethylene glycol		4	3
Ethylene chloride		**1**	**–**
Ethyl glycol, cellosolve		3	–
Ethyl chloride		4	1
Ethane, ethylene		1	–
F			
Fluoric silicate		4	2
Formic acid		4	2
Formaldehyde, formalin		4	–
Freon, see CFC			
Furan, furfuran		2	–
Furfural		3	–
G			
Glucose		4	4
Glycerine, glycerol		4	4
Green liquor, white liquor		4	3
H			
Heating oil		1	2
Hydraulic oil, mineral oil based		1	3
Hydraulic oil, phosphate ester based		4	4
Hydrogen		4	4
Hydrogen peroxide	3%	4	4
	30% 20 °C	4	4
	90% 20 °C	2	4
Hydrochloric acid	dilute	4	1
	conc 37% room temp	4	1
	conc 37% 70 °C	2	1
Hydrogen sulphide	dry, room temp	4	4
	damp, room temp	4	2
	damp, hot	3	1
Hydrofluosilicic acid		4	1
Hydrofluoric acid 50%		4	1
Hydrofluoric acid, conc.		4	1
I			
Iodine		–	–
Iron salts (non-oxidizing)		4	3
L			
Lactic acid		4	4
Lead salts (non-oxidizing)		4	2
Linseed oil		3	4
Liquid manure		4	3
LPG (Propane/butane)		1	1
M			
Magnesium salts (non-oxidizing)		4	4
Manganese salts (non-oxidizing)		4	4
Mercury		4	4
Mercury salts (non-oxidizing)		4	4
Methanol, methyl alcohol, wood alcohol		4	4
Methylene chloride		1	1
Methyl chloride		2	1
Methyl ethyl ketone MEK		4	–
Methyl isobutyl ketone		3	2
Methyl isopropyl ketone		3	2
Milk		4	4
N			
Natural gas		1	4
Nickel salts (non-oxidizing)		4	4
Nitrobenzene, Nitrobenzol		2	1
Nitric acid	20% room temp.	4	–
	20% 50 °C	3	1
	40% 50 °C	3	1
	50% 50 °C	2	1
	60% room temp.	2	1
	70% room temp.	1	1
	red fuming	1	1
Nitrogen		4	4
Nitrous gases		2	2
O			
Olive oil		3	3
Oleic acid		4	–
Oxalic acid		**4**	**3**
Ozone		4	4
Oxygen		4	4
P			
Palmitinic acid		3	–
Paraffin (kerosine)		1	1
Perchlorethylene		1	3
Perchloric acid		3	1
Petrol (gasoline), 65 octane		1	1
Petrol (gasoline), 100 octane		1	1
Petroleum ether		1	1
Petroleum oils	high aromatic content	1	1
	low aromatic content	1	3
Phenol		3	2
Phosphoric acid 45%		4	1
Phosphoric acid 85%		4	1
Plating solutions without chromium		4	3
Potassium hypochlorite,			
	pH 7 below 10 g/l	4	1
	over 10 g/l	3	1
Potassium hydroxide, potash		4	3
Potassium salts (non-oxidizing)		4	3
Propane, LPG		1	1
Propanol, Propyl alcohol		4	4
R			
Radioactive radiation		3	2
Rape seed oil (canola oil)		4	4
Rosin oil		1	1
S			
Salicylic acid		4	4
Sodium salts (non-oxidizing)		4	4
Sodium hydroxide, sodium hydrate		4	2
Sodium hypochlorite max 10 g/l free Cl		4	–
	over 10 g/l free Cl	3	–
Sugar solutions		4	4
Styrene		1	1
Sulphur, melted		4	4
Sulphur dioxide, dry gas		4	3
Sulphur chloride		1	–
Sulphuric acid	60% room temp.	4	1
	60% 50 °C	4	1
	60-75% 50 °C	3	1
	75-80% 50 °C	2	1
	85-96% 50 °C	1	1
	fuming, Oleum	1	1
Sulphurous acid		4	1
Sulphur trioxide, dry gas		3	2
T			
Tar		1	2
Tannic acid		4	1
Terpentine, terpenes		1	1
Toluene, toluol		1	1
Trichloretane, “thinner”		1	2
Transformer oil	mineral oil based	1	3
	chlorated hydrocarbon	1	1
V			
Vegetable oils		4	4
W			
Water	fresh	4	4
	distilled	4	4
	salt	4	4
	fresh & dist. 100 °C	4	2
White spirit (Dilutin)		1	1
Wine		4	4
X			
Xylene, xylol		1	1
Z			
Zinc salts (non-oxidizing)		4	4

Circular duct

SR

Description

Circular duct.

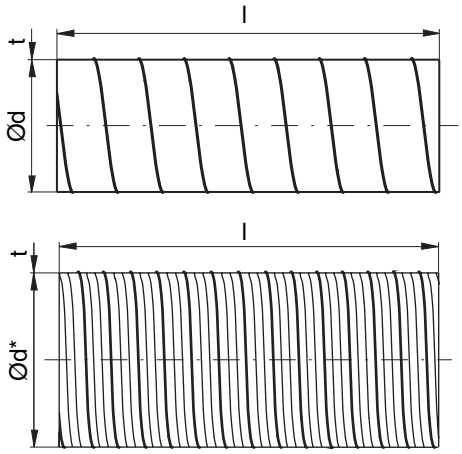
Ducts are always produced locally and can therefore have different thicknesses and other specifications per country.

Has normally not any Click function – hasn't any notches. Can to order be delivered with Click function – i.e. with notches.

Ordering example

SR	200	3000
Product		
Dimension Ød		
Lenght l		

Dimensions



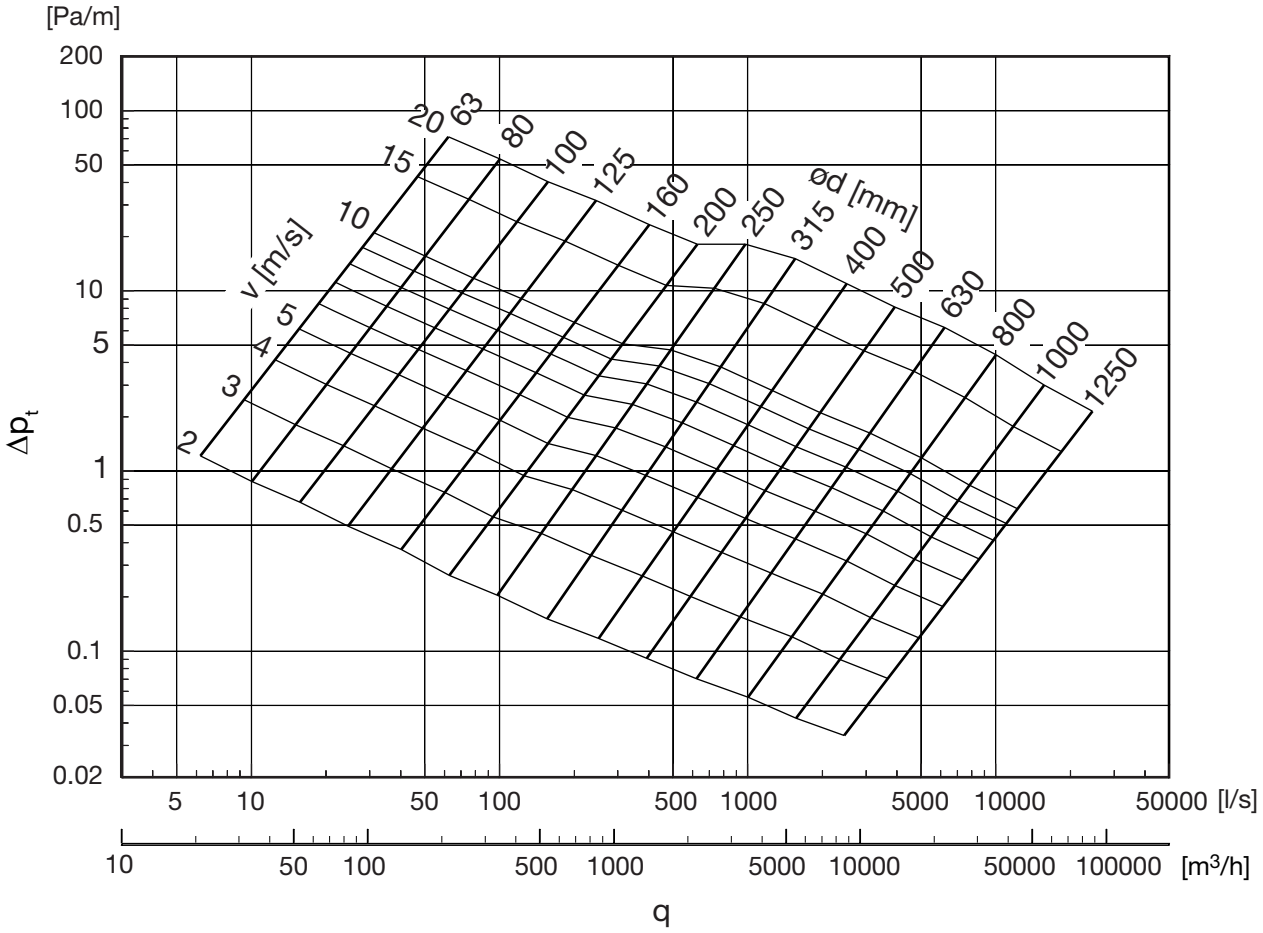
Ød std nom		O πd m	A πd²/4 m²	t std mm	l std mm	ml std kg/m
63		0,198	0,003	0,5	3000	0,89
80		0,251	0,005	0,45	3000	0,91
100		0,314	0,008	0,45	3000	1,14
112		0,352	0,010	0,5	3000	1,42
125		0,393	0,012	0,45	3000	1,41
140		0,440	0,015	0,5	3000	1,76
150		0,471	0,018	0,5	3000	1,89
160		0,503	0,020	0,5	3000	2,02
180		0,565	0,025	0,5	3000	2,26
200		0,628	0,031	0,5	3000	2,56
224		0,704	0,039	0,6	3000	3,42
250	*	0,785	0,049	0,5	3000	3,18
280		0,880	0,062	0,55	3000	3,92
300	*	0,942	0,071	0,55	3000	4,20
315	*	0,990	0,078	0,55	3000	4,41
355	*	1,115	0,099	0,55	3000	4,96
400	*	1,257	0,126	0,55	3000	6,01
450	*	1,414	0,159	0,7	3000	8,60
500	*	1,571	0,196	0,7	3000	9,54
560	*	1,759	0,246	0,8	3000	12,2
600	*	1,885	0,283	0,7	3000	13,1
630	*	1,979	0,312	0,7	3000	12,0
710	*	2,231	0,396	0,8	3000	15,5
800	*	2,513	0,503	0,8	3000	17,4
900	*	2,827	0,636	0,9	3000	21,7
1000	*	3,142	0,785	0,9	3000	24,1
1120	*	3,519	0,985	0,9	3000	27,0
1250	*	3,927	1,227	0,9	3000	30,2
1400	*	4,398	1,539	1,25	2400	48,0
1500	*	4,712	1,767	1,25	2400	51,4
1600	*	5,027	2,011	1,25	2400	54,8

* With outturned stiffening corrugation

Circular duct

SR

Technical data



Lindab

Circular duct SR

Technical data

Special versions

We can supply ducts with the following special designs:

- In intermediate dimensions, see page 15.
- Extra tight, with nitrile rubber seal in the lock seam
- In other sheet metal thicknesses

Extra tight, with seam seal
When extremely good sealing is required in the spiral seam, the ducts can also be supplied with a special rubber seal in the seam.

This seal is very effective at stopping leakage of vegetable oils and greases, and most petroleum products including white spirit.

Other sheet metal thicknesses
If extra stability is needed in ducts, because of high negative pressure etc., they can be supplied with thicker sheet metal than standard. Remember that the thickness increase always reduces the inner diameter. Fittings for such special ducts must be specified separately and sometimes have to be made specially.

Reinforcement corrugations
Ducts of Ø250 mm and above are normally given stiffening corrugations to increase radial stiffness.

Strength

Positive pressure
in case of high positive pressure, the seal moulding lips will first start to whistle. At considerably higher pressure, the joints between the ducts will be forced apart. If you manage to fix the connections very well, the ducts will burst at their seams at even higher pressure. The high pressures needed for this to happen are not relevant to ventilation installations.

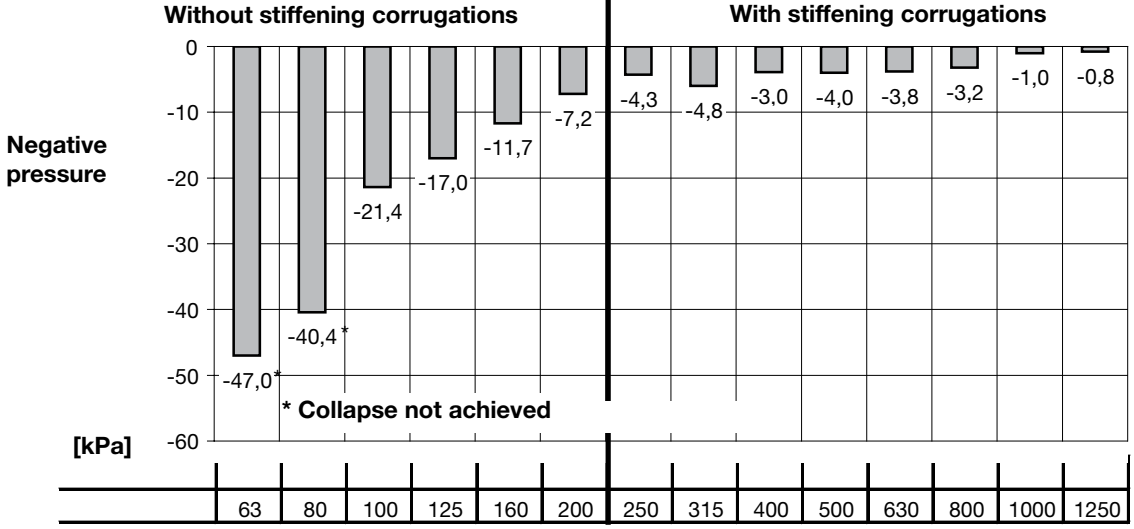
Negative pressure
In installations with high negative pressure, there is a risk that the ducts could collapse.

This phenomenon is referred to as buckling, and can suddenly happen at the weakest point in the system. Buckling wanders along the duct, which can be completely flattened. The weakest point is frequently a "transport dent" on a duct. For this reason, only use undamaged ducts in systems which are close to the critical pressure!

Sealing
The ability of the seal moulding to seal is different from these pressures, and is noted on page 39.

Collapsing pressure for duct SR

Diameter	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250
Sheet metal	0,5	0,45	0,45	0,45	0,5	0,5	0,5	0,55	0,55	0,7	0,7	0,8	0,9	0,9



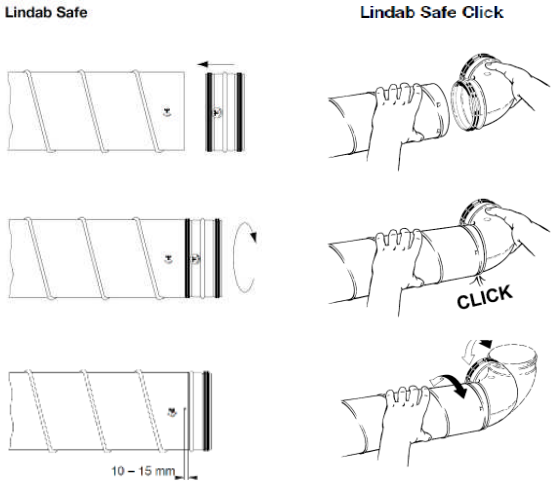
Lindab Ronde Luchtkanalen

Montagehandleiding

volgens EN 1506, EN12237 en TB105 (versie 2014)

Montage ronde kanalen in klasse C

Lindab hulpstukken met Safe rubberdichting zijn klasse D ! (3x minder lekverlies dan C) Voor een eindresultaat met gegarandeerd klasse C na montage, gebruik je best enkel Lindab Safe hulpstukken.



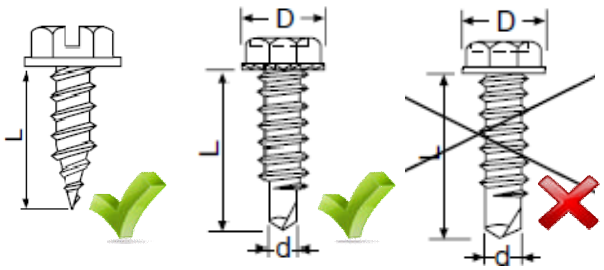
Lindab Safe bestaat zowel in de standaard uitvoering als in de Click uitvoering.

Voor montage van Lindab Safe

- Plaats het hulpstuk met de rand in het kanaal
- Draai het hulpstuk in het kanaal
- Bevestig de schroef 10 tot 15mm van de rand van het kanaal

Voor montage van Lindab Safe Click

- Idem als Lindab Safe, maar er zijn geen schroeven nodig. Dit geeft een uitstekende luchtdichtheid. De hulpstukken blijven bovendien draaibaar.



Gebruik enkel schroeven met een scherpe punt of zelftappende schroeven met een gereduceerde punt. Schroeven met een boorpunt gelijk aan de schroefdraad maken een niet luchtdichte verbinding. Aanbevolen aantal schroeven :

Diameter van / tot	aantal schroeven
63 – 125	2
160 – 250	3
315 – 630	4
800 – 1250	6
1600	10

Uitvoeren van de lekdichtheidstest

Voer een automatische lektest uit met de Lindab Lekdichtheidstester LT600 .

- Controleer het calibratiecertificaat
- Stel de testdruk in en start de test
- Bereken de oppervlakte van het kanaal volgens EN 14239
- Print het rapport volgens EN 1507 en EN12237 met de bijgeleverde printer.

Lindab Safe® Click
Assemble easy and fast

The new, innovative duct system from Lindab is based on a principle well known to you. A simple click is all it takes to assemble ducts and fittings. Save time and create a perfect ventilation solution.

The new system is installed quickly and improves working conditions especially where space is limited. Lindab Safe Click is based on our well-known, tested and documented Safe system. We just added simplicity. One click and the job is done.

Advantages during installation

- Quick assembly
- Minimised use of screws or rivets
- Easy to install, especially where space is limited
- Better ergonomics
- Assembling and adjusting is made easier

Advantages during use

- Fewer holes from screws or rivets in the duct system and thereby a tighter system
- Fewer sharp parts from screws or rivets in the duct
- The ducts are easier to clean and the risk of bacteria growth is reduced
- Based on our well-known, tested and well-documented Lindab Safe system
- Compatible with other systems

Assembly Instruction
Lindab Safe and Lindab Safe Click

The Lindab Safe and the Lindab Safe Click duct system are type-approved, as per certificate no. 1358/88 issued by SITAC and are subject to continuous production checks.

This means that the requirements for air tightness class D are met if ducts and fittings of the systems are used and if assembly is performed as per these instructions.

The products covered by the type approval are either specified on the delivery note or are supplied with the following labelling. Labelling can comprise a sticker or an embossing on the sheet metal

NOTE! The assembly methods described herein only cope with the forces from the “Static pressure limits” defined in EN 12237. Forces from other sources, e.g. gravity or wind, have to be dealt with using other means, e.g. suspensions or supports.

NOTE! If the system shall be tested for air tightness, this shall be done before integration and insulation so that there is an opportunity for inspection and taking action. Any complaints regarding air tightness will only be dealt with provided the system is fully accessible for inspection.

Joining systems (general characteristics)

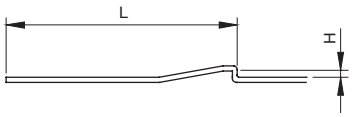
Lindab Safe	Lindab Safe Click
Is joined with screws or blind rivets.	Is joined with snapping heels, below called notches. Is based on Lindab Safe.
Spans all dimensions.	Spans only a restricted number of dimensions. See table 2. For the other dimensions use Lindab Safe.
	Lindab Safe Click can be complementary joined with screws or blind rivets. This may be done in order to: • achieve a stronger joint • prevent a joint from twisting • join a Click product with a non-Click product • join a Click product with a non-Click product to create an openable joint.

Preparations for assembly

- Check that ducts and fittings to be used in the system are labelled as shown above.
- Store ducts and fittings in a well-ordered and weatherproof storage area to minimize the risk of damage. Do not use ducts or fittings that have been damaged in such a way that they jeopardise the air tightness or structural strength of the system.

Lindab Safe	Lindab Safe Click
• Cut ducts at right angles. Carefully remove any burrs from cut edges. Installation is easier and the risk of damaging the gasket is reduced if there are no burrs. Also cut away the two needles created from the fold.	• Cut ducts at right angles. This is an uncompromisable demand for Lindab Safe Click. Carefully remove any burrs from cut edges. Installation is easier and the risk of damaging the gasket is reduced if there are no burrs.Also cut away the two needles created from the fold.
	• If a duct is cut – make notches around its circumference. See table 1 and 2.
• Carefully seal any holes left by measurements, removed screws, blind rivets, etc.	• Carefully seal any holes left by measurements etc.

Table 1. Size and location of notches



	Click Pliers		
	40.1 	60.1 	
Ø [mm]	$H_{min[mm]}$	$H_{min[mm]}$	L [mm]
80–224	2,0	–	30,5–32,5
250–315	–	2,5	50,5–52,5

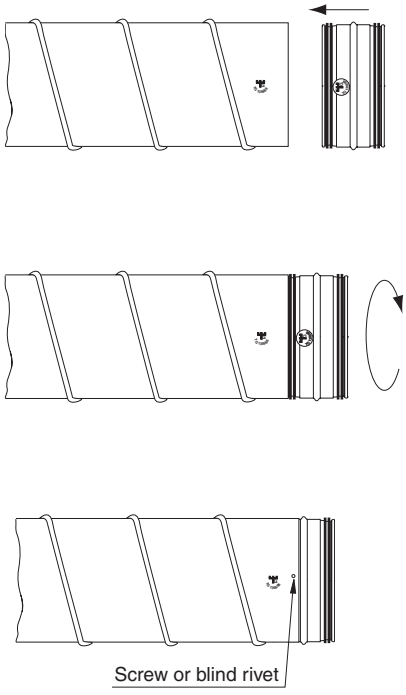
Table 2. Number of fasteners and notches

	Lindab Safe	Lindab Safe Click	
		Click Pliers	
		40.1 	60.1 
Ø [mm]	Minimum number of fasteners required to achieve sufficient strength.	Recommended number of notches required to achieve sufficient strength.	
63	2	–	–
80–112	2	2	–
125–160	3	4	–
180–224	3	4	–
250–315	4	–	4
355–630	4	–	–
710–1250	6	–	–
	Depending on the means of suspension, a larger number of fasteners than this may be required to achieve sufficient structural strength of a duct system.	Depending on the means of suspension, a larger number of notches than this may be required to achieve sufficient structural strength of a duct system. A greater number of notches makes it harder to assemble the parts.	

Assembly

Lindab Safe	Lindab Safe Click
1. Start by inserting the turned-over edge of the fitting into the duct.	1. Insert the fitting´s turned-over edge into the duct.
2. Check that the first lip of the gasket is in contact with the edge of the duct all the way around and sticks straight out so that the lip is not twisted in one direction or the other.	2. Check that the gasket's first lip is in contact with the duct's edge all the way around and points straight out so that the lip is not twisted in any direction.
3. Push the end of the fitting into the duct. Twisting the fitting slightly aids insertion.	3. Push the first part of the fitting into the duct to just before the notches. Twisting the fitting slightly aids insertion.
4. Secure the fitting in the duct using self-tapping screws or airtight blind rivets. NOTE! Use only the types alllowed by Lindab when going for tightness class C or D. See table 3.	4. Push the rest of the fitting into the duct and over the notches. Bend the fitting or duct back and forward slightly in order not to pass all notches at the same time aids insertion.
5. Fasteners should be positioned 10–15 mm from the end of the duct to prevent damage to the gasket.	5. The fitting is secured to the duct when the fitting's end has snapped behind all the notches.
6. Always position fasteners at the present largest radial gap be-tween fitting and duct. Be sure to achieve an even distribution around the circumference.	6. After assembly it's possible to rotate the fitting.

Lindab Safe



Lindab Safe Click

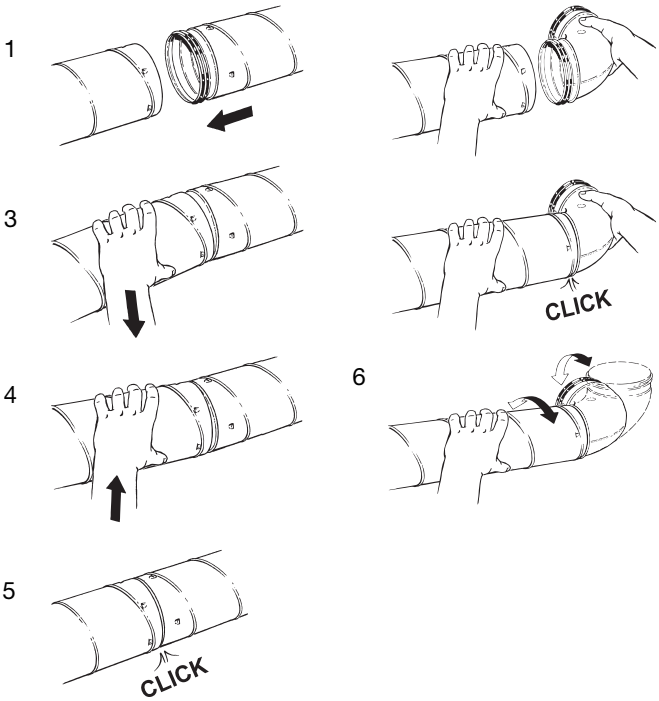
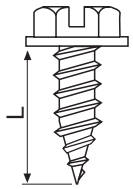
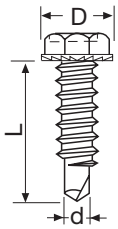
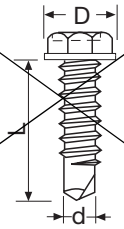


Table 3. Allowed and banned screws and blind rivets

	**Screw with sharp tip** • Very tight • Strong since it forms a collar in the thin sheet metal	**Allowed by Lindab**
	**Screw with reduced drill tip** • Very tight • Strong since it only drills off a small part of the thin sheet metal	**Allowed by Lindab**
	**Screw with drill tip** • Not tight • Weak since it drills off a big part of the thin sheet metal	**Banned by Lindab**
	**Pressure-tight blind rivet** • Very tight • Strong • Very laborious to install	**Allowed by Lindab**
	**Blind rivet** • Not tight if the inner splint falls out • Strong • Laborious to install	**Banned by Lindab**

Hints!

Turning and bending the fitting slightly as you insert it into the duct aids assembly and removal.

If ducts and fittings are round, assembly is much easier. Lindab has placed high demands on roundness during the design and production stages, but large heavy fittings in particular have a tendency to be slightly oval because of their weight. These often become round when suspended, which is why you should use the brackets to make the components round and in this way simplify assembly.

Carefully tapping the surface of the duct with your hand normally makes assembly a lot easier, as it reduces the friction between duct and fitting, and the fitting tries to move to the right side if there are burrs and irregularities.

When cutting, be sure to remove burrs properly. Also cut away the two needles created from the fold.

For larger dimensions, Lindab has moved the gasket away from the edge, which makes assembly much easier.

If you have to reinstall a product, take care to seal old holes from screws or blind rivets which can cause leaks and noise.

Products with special seals

Some fittings, such as the collar saddle PSU, T-pieces TSTCU, TSTU and take-offs ILRU, ILU, ILF, have one more connection than Lindab Safe or Lindab Safe Click. This connection must be sealed so that they definitely meet the requirements for air-tightness class C or D. Sealing material used must be durable and permanently elastic.

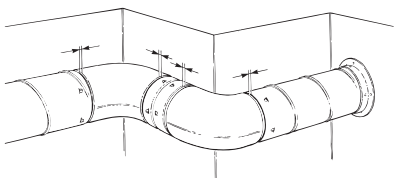
Products without Click

Some fittings, such as the slide-in female coupling SMFU, the end caps EPF and ESU and of course the cleaning covers EPFH, ESHU, KCU and KCIVU, do not have any Click function in order to make them easier to remove.

Use of products other than Lindab Safe or Lindab Safe Click

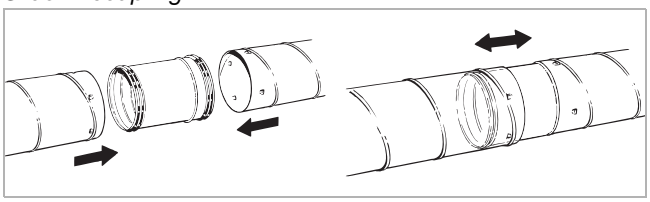
Products that do not formally fulfil the requirements for air tightness class C or D may only be used to a small extent. If such items are used, they must be carefully checked with regard to seal design and strength. They must be sealed so that they definitely meet the requirements for air-tightness class C or D. Sealing material used must be durable and permanently elastic.

To join parts temporarily to check if length of duct or system run is all right.	
Lindab Safe	**Lindab Safe Click**
Solution: 1 Join together to check. 2 Then take apart – and cut if necessary the duct length. 3 Join together with screws or blind rivets.	Solution 1: 1 Use a duct without notches in the end/ends. 2 Join together to check. 3 Then take apart – and cut if necessary the duct length. 4 Make notches in the duct. 5 Click-join together. Solution 2: 1 Use a duct with notches in the end/ends. 2 Join together to check – but don't join the parts completely so they click together. 3 Then take apart – and cut if necessary the duct length and make new notches. 4 Click-join together.

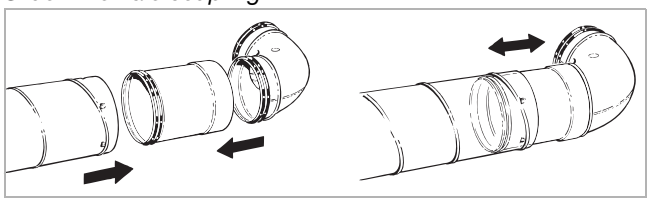


To lengthwise adjust joined products instead of cutting the duct.	
Lindab Safe	**Lindab Safe Click**
Solution: 1 Use products with sliding property. E.g. slide-in coupling SNPU or slide-in female coupling SMFU. 2 Join together with screws or blind rivets.	Solution: 1 Use products with sliding property. E.g. slide-in coupling SNPU or slide-in female coupling SMFU. 2 Join together with screws or blind rivets.

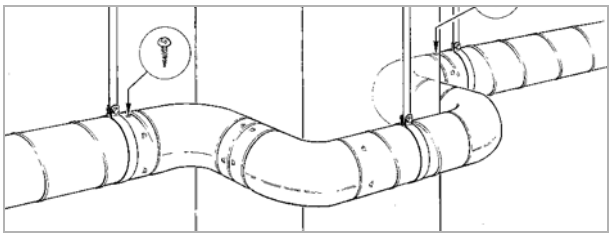
Slide-in coupling



Slide-in female coupling

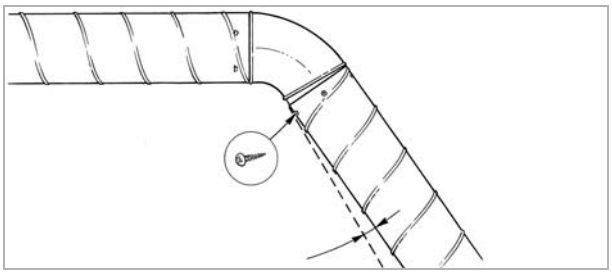


The joint must be locked



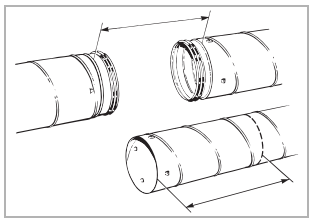
In situations where the mounting must be locked, e.g. when a bend is mounted to a duct and it twists downwards the floor. Mount the first hanger and mount the bend, then lock the joint with a screw or blind rivet.

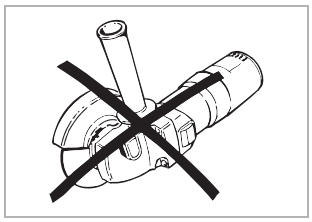
Corners out of angle and curved walls

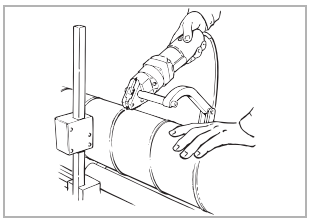


Mount the next piece of duct at an angle, but make sure that the rubber sealant is not visible. Put screws or blind rivets where the notches have not clicked in position.

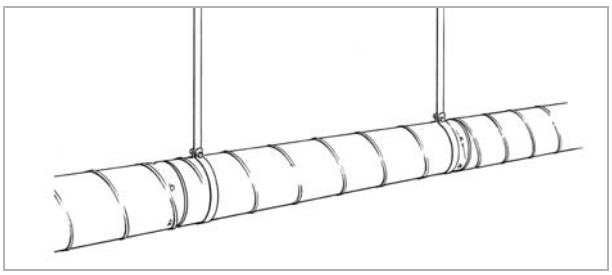
Cutting duct with the SR Cutter







Suspension



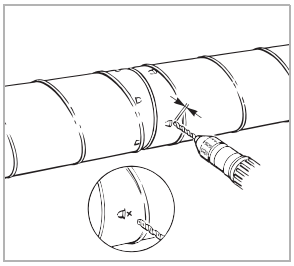
Mount the hangers in a straight line and as close to every joint as possible. Fix with an extra screw when needed for extra stability.

Dismantling

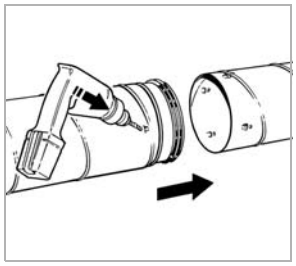
To separate joined products.	
Lindab Safe	**Lindab Safe Click**
Solution: 1 Unscrew the screws or drill away the blind rivets. 2 Twist the product loose. 3 The fitting will now have leaking holes but can be reused if these holes are carefully sealed off with mastic or tape.	Solution: 1 Drill a 5 mm hole in the duct 4 mm behind the notch with the drill angled backward and 2 turn in the same moment the drill back so the fitting and duct are separated somewhat from each other. With the right technique the fitting remains undamaged and can be reused. 3 Repeat if necessary at more notches. 4 Twist the product loose. 5 Cut away the drilled through duct end.

Lindab Safe Click

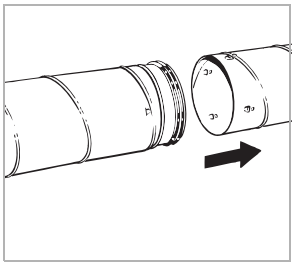
5 mm drill

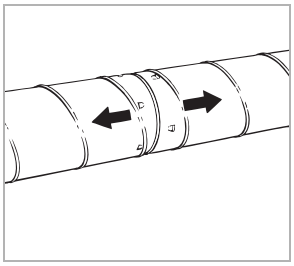


Angle and press the drill backwards



Take apart





Lindab Ronde Luchtkanalen

Certificaten GALVA

volgens TypeBestek 105 (versie 2014) / EN1505 / EN 12237

Certificaten volgens TB105 - versie 2014

Alle actuele certificaten zijn te downloaden op :

http://www.lindab.com/be/pro/software/print/pages/certificaten.aspx