

## Lindab **Safe & SafeClick**

A quick assembled system for round ventilation ducts.  
Third party certified to tightnessclass D.

# We simplify construction

At Lindab we are driven by a strong desire to continuously generate improvements and to simplify construction. We do that by developing products and systems that are easy to use and energy efficient, together with industry-leading knowledge, support, logistics and efficient availability.

We want to simplify everything – from designing, ordering, delivery, goal achievement and installation to the entire way of doing business with us. By simplifying in every stage of the construction process, we also contribute to energy-efficiency.

## **A good thinking company**

Good thinking is a deeply rooted philosophy that guides us in everything we do. We firmly believe that good thinking makes good solutions to the challenges we all face. Taking responsibility for what we do and how we do things is therefore important to us. Because good thinking is not only about making life easier and more comfortable for our customers and end users. It is also a matter of thinking in a global perspective, all the time. Knowing that we at Lindab are helping to make the world a better place.

## Lindab Safe & Safe Click

As a result of this tight and high quality ventilation system with quick mounting time you will save both time and cost. And this is not all, you will also contribute to a sustainable future with energy savings.



# The Safe-system



Lindab Safe is a complete range of circular ducts, fittings, silencers, t-pieces etc. The system is based on a double, factory-installed gasket made of EPDM rubber. This gasket makes the system not just quick and easy to mount, but also airtight and is Eurovent certified to tightness class D. The product range covers a wide field of applications within industry-, comfort- and residential ventilation. In special materials or coatings it can also be used in environments with extreme demands on hygiene, such as clean room-, hospital- and food and beverage industries.

## What is the Safe-system?

- Safe is a quickly assembled system for circular ventilation ducts.
- Safe is Eurovent certified to tightness class D.
- The complete programme has dimensions according to EN 1506.
- The system is based on a double-lipped, factory-installed gasket made of EPDM rubber. The gasket, which can withstand rough handling, and is almost insensitive to temperature changes, gives a very air-tight system.

## Advantages

- Quick assembly.
- Can be twisted and adjusted with tightness unaffected.
- Installation without sealant or solvents.
- Can be used in all environments.
- Gasket remains tight from 5 000 Pa negative pressure to 3 000 Pa positive pressure.
- Can withstand high pressure which are specified in the SR duct data sheet.
- Eurovent certified to tightness class D.
- Energy saving.

## Available materials

The system is available in several material such as; Galvanized Z275, [Stainless steel](#) EN 1.4301 (AISI 304) and EN 1.4404 (AISI 316L), Aluminium 1050 A, [Aluminium Zink](#) AZ 185, [Magnesium](#) ZM 310, and powder coated polyester epoxy.

Click on the material for link to detailed technical information or visit [www.lindab.com](http://www.lindab.com)

## Joining

The connections should be screwed or riveted to firmly fix the ducts to the fittings. In many cases the click function can be suitable for example in shafts and in standardised factory made systems. The Click function exists in principle on all Safe products on the dimensions Ø80–315. The exceptions are stated under each product.

The Click function means;

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







## Eurovent certification

Lindab's circular duct system with rubber gasket connections Lindab Safe and Lindab Safe Click is certified to strength and leakage in tightness class D according to the Eurovent Certified Performance program for circular metallic duct systems (DUCT-MC). Check ongoing validity of certificate:

[www.eurovent-certification.com](http://www.eurovent-certification.com)



The purpose of Eurovent third party Certification is to create a common set of criteria to all relevant features for the rating of products in this system and ensure the constancy of performance over time.

Through specification of products in Lindab's certified

system, Lindab Safe and Lindab Safe Click, the engineer's tasks become easier, since there is no need to carry out detailed comparison and performance qualification testing. Consultants, specifiers and users can select products with the assurance that the catalogue data are accurate to a certain level.

Lindab products that are Eurovent certified have the Eurovent logotype in the footer of the technical documentation.

Note: Most Lindab Safe and Lindab Safe Click and the most commonly used product in a ventilation system are essentially better than class D, however some products are according to EN 15727 not class D as a single product. These products are stated in the documentation as class C and can be used in D class systems to a limited extension.

# The first air duct system in the world to be Eurovent certified to tightness class D.

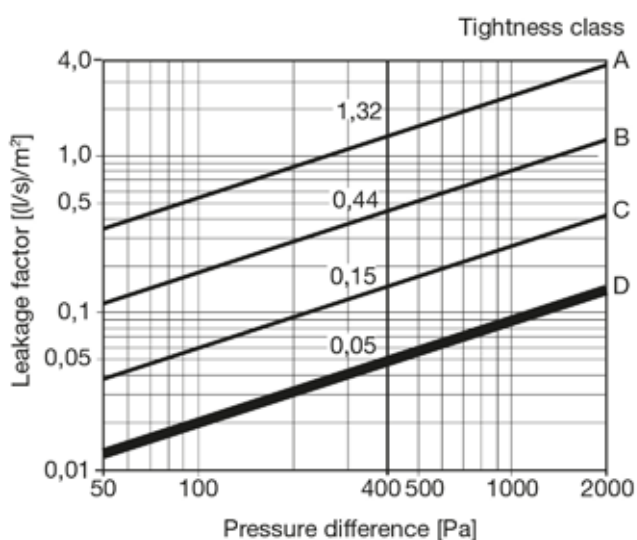


# Build tight, ventilate right

## Tightness

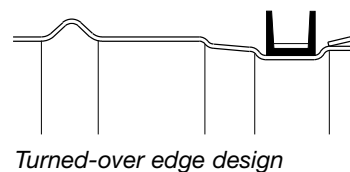
A duct system will never be “completely tight”. The system will normally have some leaks at joints between ducts and fittings. The leakage will also increase as the pressure difference between the in- and outside of the duct sides increases.

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



The graph shows that tightness 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 gasket 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.



The current stringent demands for indoor 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 and minimize environmental impact.

This is why official requirements for sealing vary with the size and use of systems.

## Air tightness classes

Air tightness classes		
Certification	Calculation	Comment
	ATC 1	One better class than before but not used anywhere so far
Class D	ATC 2	
Class C	ATC 3	
Class B	ATC 4	
Class A	ATC 5	
	ATC 6	To be used in energy calculation if the class is not measured on site
	ATC 7	Not classified

### Certification Classes

The certification classes A to D are used in all standards for metallic ducts. For the purpose of certify our products and for the customer to buy the appropriate products.

### Calculation Classes

Classes ATC1 to ATC7 are calculation classes according to the EPBD (Energy Performance in Building Directive) standard EN 16798-3 for Ventilation systems performance requirement. They are used in the calculation standards EN 16798-5-1 and EN 16798-5-2. These classes are used in the design phase of the ventilation system and helps the designer and the building owner to agree on what level is suitable and what the effect will be of their decision. These standards also promote the leakage test of the system when handing over the building and include the assembly of the system.

## Inspection/Testing

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

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

1. Inspection of gasket 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 gasket profile is measured in a profile projector, where the dimensions of the gasket are checked against agreed tolerances.
3. The gasket 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 gasket 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, so the best inspection of the Safe system is the pressure testing that Eurovent undertakes on randomly sampled products. In all these pressure tests, the Safe system has always exceeded the relevant air tightness requirements.

## Dimensions

Almost all products in the Safe-system can also be delivered in intermediate dimensions. For further information see the product overview further back.

## 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.

Lindab has great experience and knowledge about strength 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.

## Design

Our Safe gasket system is based on a U-shaped profile of solid rubber. The gasket is fixed with a steel band in a groove at the end of the fitting.

As standard are Safe-fittings always supplied with an EPDM (ethylene-propylene rubber) gasket. 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 gasket 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 gasket. This gasket is recognized by its blue colour. Mastic sealed fittings for higher temperatures are also produced with a more temperature resistant mastic.

Temperature tolerance:

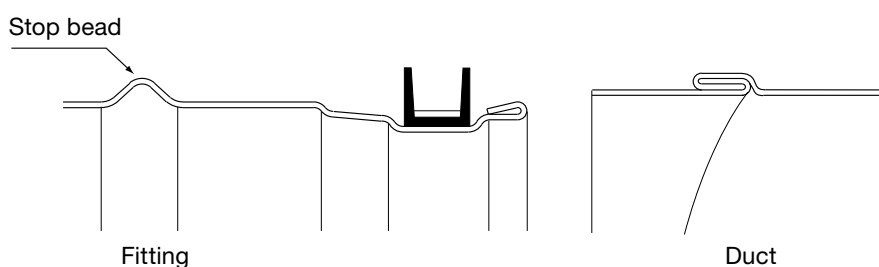
- 70 °C to +150 °C continuous
- 90 °C to +200 °C intermittent



When fittings are installed in ducts, the gasket lips will be bent backwards. This means that the gasket 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

The European standards allow a greater tolerance range between the duct and matching fittings as the diameter increases. In order to achieve maximum air tightness for all dimensions, we have chosen to use successively bigger gaskets as duct dimensions increase.





# Product overview

Circular duct, reducers and take-offs

Click on the product for link to detailed technical information and accessories, or visit [www.lindab.com](http://www.lindab.com)

## Circular duct

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



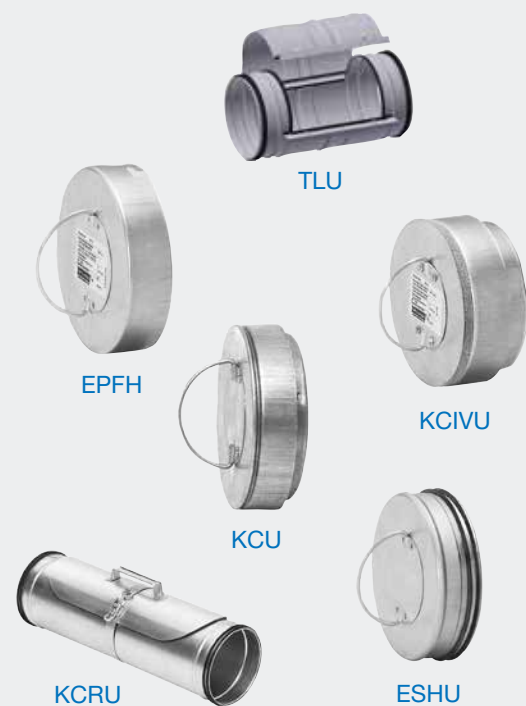
## Reducers



## Take-offs









## Access doors














# Product overview

## Bends

Bends — ordinary						
	Short radius $r_m \approx 0,6 \cdot d_1$		Normal radius $r_m \approx 1 \cdot d_1$		Long radius $r_m \approx 1,5 \cdot d_1$	
$\varnothing d_1$	Pressed and seam welded	Segmented and lockseamed	Pressed and seam welded	Segmented and lockseamed	Pressed and seam welded	Segmented and lockseamed
63						
80	 BKU 90°		 BU			
100						
125					 BSU	
160						
200						
250		 BKFU 90°		 BFU °		
315						
400						 BSFU°
500						
630						
800						
1000						
1250						

Bends — others									
	Short radius $r_m \approx 0,6 \cdot d_1$		Normal radius $r_m \approx 1 \cdot d_1$						
$\varnothing d_1$	Pressed and seam welded	Segmented and lock-seamed	Pressed and seam welded	Segmented and lock-seamed	Segmented seam welded	Segmented and lockseamed	Segmented and lock-seamed	Pressed and seam welded	Pressed and seam welded
63									
80	 BKMU 90°							 BU GJUT	 BSIU GJUT
100			 BKCU 90°		 BMU	 BBKCU 90°			
125									
160									
200									
250	 BKFMU 90°			 BFKCU 90°			 BFBKCU 90°		
315									
400									
500									
630									
		Female end			Cleaning stud at side				Cleaning stud at back

# Product overview

Access doors, couplings, X-pieces, Y-pieces and end caps

## X-pieces



XCPU



XCU



XU



XVU45°



XBPU



XBPRU

## Couplings



NPU



SNPU

## Female couplings



MF



SMFU

Click on the product for link to detailed technical information and accessories, or visit [www.lindab.com](http://www.lindab.com)

## Accessories



FL



FL 4404



FLH



TVILU



TVIL



SRC



IMSKU



STR

## Y-pieces



YVU45°

## End caps



EPF







ESU







EP

# Product overview

## T-pieces and saddles

T-pieces – ordinary			
	Short installation length	Normal installation length	
Ød <sub>1</sub>	Pressed and seam welded	Pressed and seam welded	Segmented and lockseamed
63	 TCPU KORT	 TCPU	 TCU   TU
80			
100			
125			
160			
200			
250			
315			
400			
500			
630			
800			
1000			
1250			

Saddles and T-piece	
Normal installation length	
Pressed and seam welded	Segmented and lockseamed
 PSU	 TSTCU   TSTU

T-pieces – others				
	Short installation length	Normal installation length		
Ød <sub>1</sub>	Pressed and seam welded	Pressed and seam welded	Pressed and seam welded	Pressed and seam welded
63	 TCPU GIPS	 TCPMU	 TCPU GJUT	 TCSIU GJUT
80				
100				
125				
160				
200				
250				
315				
400				



Click or scan to view the assemble instruction for Lindab Safe and Lindab Safe Click >>





## Good Thinking

**At Lindab**, good thinking is a philosophy that guides us in everything we do. We have made it our mission to create a healthy indoor climate – and to simplify the construction of sustainable buildings. We do that by designing innovative products and solutions that are easy to use, as well as offering efficient availability and logistics. We are also working on ways to reduce our impact on our environment and climate. We do that by developing methods to produce our solutions using a minimum of energy and natural resources, and by reducing negative effects on the environment. We use steel in our products. It's one of few materials that can be recycled an infinite number of times without losing any of its properties. That means less carbon emissions in nature and less energy wasted.

**We simplify construction**