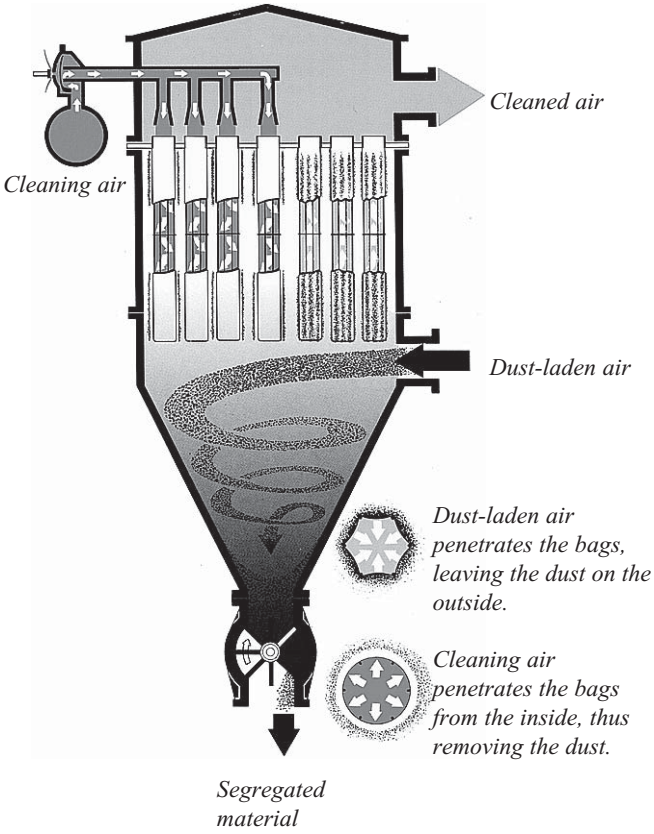


Cleaning of dust-laden air

The dust-laden air is led into the filter chamber and penetrates the filter bags from the outside.

The cleaned air passes through the filter cages and the clean-air chamber to the clean air-outlet.

Cleaning of filter bags

The filter bags are cleaned during operation, using compressed air. The cleaning system is based on electronically controlled membrane valves.

A number of solenoid membrane valves is placed on the compressed-air receiver, from where the compressed air is led to the filter bags through manifold pipes.

Filter control

A pause time is set in the filter control, i.e. the interval between activation of the membrane valves (see separate descriptions).

When the pause time in the control box runs out, a short electric impulse is transferred to one of the valves, which in turn gives a powerful blast of compressed-air through a number of filter bags.

Upon this, a new pause time is measured. When this runs out, the next valve is activated, and so on.

Introduction

As a supplement to the existing classifications of filters, the definition „codes“ is applied for series 3C and 4T1 filters.
The filters in question are characterized by their flat top covers with circular - or circular section shape, all designed for top removal of filter bags.
The codes describe the design of the top section with covers and insulation, if any.

Code 1

Code 1 is the designation of top sections manufactured according to the current standard till the introduction of the code system. The top section has flat top covers made from aluminium chequer plate. In certain cases the covers are equipped with supports at the underside, perhaps combined with detachable steel beams, having their base at the centre of the filter top.

Code 2

Code 2 is the designation of top sections with thermal insulation of top covers as well as supports at the upper horizontal surface of the top section. The design provides for an elimination of thermal bridges. Thus the radial bearers are insulated and covered up, and the sandwiched product of the top covers is equipped with insulating fillers preventing metallic contact between the clean-air chamber and the outside of the covers. The top side of the covers is made from aluminium chequer plate, while the supports and the underside are in steel. Insulation is performed with mineral wool, classified for a minimum of 250°C. The covering-up of bearers is in steel.

Code 3

Code 3 is the designation of a code 2 execution, extended for outdoor installation. The concept is basically the code 2 concept, in addition to which the filter top has been enlarged in height and equipped with an extra set of non-insulated top covers protecting the rest of the top section against the weather. Consequently a zone is created between the two sets of top covers as a further reduction of the effect of thermal bridges.
The extra set of top covers is made from aluminium chequer plate.

Code 4

Code 4 is the designation of top sections with a large conical, pressure-shock resistant cover and with 4 lifting eyes. Code 4 is only applicable for series 3C filters.
Some kind of lifting device is needed for the removal of the cover.
Code 4 may furthermore be equipped with a horisontal deck made from aluminium chequer plate, not only providing a good "gang-way" but also improving the vacuum resistance.

Application

The code 1 execution is applied for gases at ambient temperature or gases involving no condensation or corrosion.

The code 2 execution is typically applied for indoor flue-gas cleaning at temperatures up to app. 250°C. The combination of a suitable seal type and steel quality secures a good resistance to corrosion. Furnished with a surrounding housing of „standing height“ around the top section, this type is also applicable for outdoor installation.

The code 3 execution is applied for the same tasks as the code 2 execution, but this one is immediately suited for outdoor installation.

The code 4 execution is applied for pressure-shock resistant (or vacuum resistant) filters, covering the same gas types as described under code 1. Furthermore, code 4 is applied for tasks where a large top cover for easy access at service jobs is required. This type is applicable for both indoor and outdoor installation.

Construction Form

The choice of construction form is based on the character and quantity of the dust.
The construction form indicates how dust-laden air is led into the filter chamber (dust chamber) and how segregated material is removed from the filter.

Characteristics

The dust-laden air is led through a tangential inlet just below the filter bags. Heavy particles are extracted in the cyclone. The air bearing the light dust particles rises into the filter chamber and penetrates the filter bags from the outside.
Extracted dust is accumulated in the bottom cone and and delivered in a round connection at the bottom of the cone.

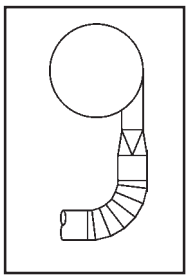


Fig. 1.

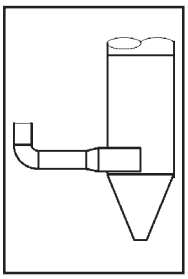


Fig. 2.

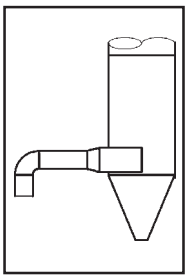


Fig.3.

Correct piping before inlet.
The horizontal pipe between bend and inlet is as long as possible.

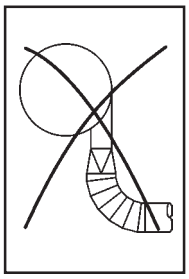


Fig.4.

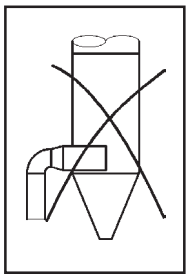


Fig.5.

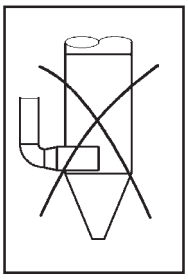


Fig.6.

Wrong piping!
A pipe bend just before the inlet must be horozontal with direction as in fig. 1.

Application

The location of the inlet below the filter bags causes an upward air flow. The velocity of the air flow is highest at the bottom of the bags and decreasing as it moves upwards.

The air velocity should be rather low by products containing light, floating particles, as these may stay floating around the filter bags, thus causing a high pressure drop.
The air velocity is affected by the filter load, the bag length, and by oversize diameter of filter chamber, if applicable.
The problem of floating particles may - to a certain extent - be helped by leaving the filter cleaning for a while after the rest of the plant has been stopped, - especially when the plant is stopped regularly.

Construction form 01 is well suited for fatty or otherwise sticky products, and where bigger lumps occasionally occur.
This construction form is suited for dust loads up to app. 100 g/m^3, however, the dust load must be lower by light floating particles.
For heavy dust loads and abrasive material, construction form 02 is applied.

Location of Inspection Door

If the filter is designed for bag change from below through the inspection door, the door should be placed as high as possible on the filter chamber.
If the filter is designed for bag change from above, the inspection door may be placed freely heightwise (except in flange connections).

Piping

The horizontal pipe before the inlet must be as long as possible, resulting in a laminar air flow at the filter inlet.
If a pipe bend just before the inlet is necessary, the piping must be horizontal. The direction of the bend must be as in fig. 1.
Under no circumstances may the piping be as in fig. 4, 5, or 6.

If the above rules cannot be adhered to, it must be otherwise ensured that the product flow does not touch the filter bags causing increased wear of the bags. The filter may be provided with an extended housing, thus lifting the filter bags; - or construction form 02 may be chosen.

Construction Form

The choice of construction form is based on the character and quantity of the dust.
The construction form indicates how dust-laden air is led into the filter chamber (dust chamber) and how segregated material is removed from the filter.

Characteristics

The dust-laden air is led through a spiral-shaped inlet just below the filter bags. Heavy particles are extracted in the cyclone. The air bearing the light dust particles rises into the filter chamber and penetrates the filter bags from the outside.
Extracted dust is accumulated in the bottom cone and and delivered in a round connection at the bottom of the cone.

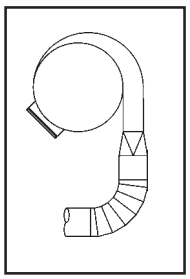


Fig. 1.

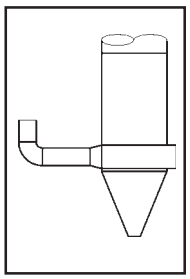


Fig. 2.

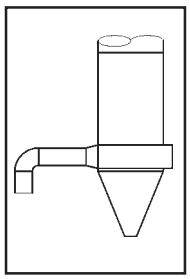


Fig.3.

Correct piping before inlet.
The horizontal pipe between bend and inlet is as long as possible.

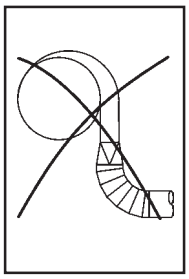


Fig.4.

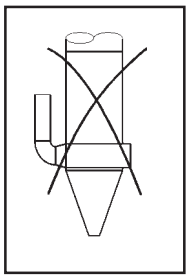


Fig.5.

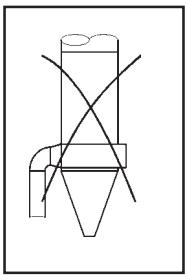


Fig.6.

Wrong piping!
A pipe bend just before the inlet must be horozontal with direction as in fig. 1.

Application

The location of the inlet below the filter bags causes an upward air flow. The velocity of the air flow is highest at the bottom of the bags and decreasing as it moves upwards.

The air velocity should be rather low by products containing light, floating particles, as these may stay floating around the filter bags, thus causing a high pressure drop.
The air velocity is affected by the filter load, the bag length, and by oversize diameter of filter chamber, if applicable.
The problem of floating particles may - to a certain extent - be helped by leaving the filter cleaning for a while after the rest of the plant has been stopped, - especially when the plant is stopped regularly.

Construction form 02 is well suited for coarse, and maybe lumpy products.
This construction form is suited for dust loads up to app. 1000 g/m^3, however, the dust load must be lower by light floating particles.
For heavy dust loads and very abrasive material, the filter should be constructed with a pre-separator. In this case, top inlet should be considered.

Location of Inspection Door

If the filter is designed for bag change from below through the inspection door, the door should be placed as high as possible on the filter chamber.

If the filter is designed for bag change from above, the inspection door may be placed freely heightwise (except in flange connections).

Piping

The horizontal pipe before the inlet must be as long as possible, resulting in a laminar air flow at the filter inlet.
If a pipe bend just before the inlet is necessary, the piping must be horizontal. The direction of the bend must be as in fig. 1.

Under no circumstances may the piping be as in fig. 4, 5, or 6.

If the above rules cannot be adhered to, it must be otherwise ensured that the product flow does not touch the filter bags causing increased wear of the bags. The filter may be provided with an extended housing, thus lifting the filter bags.

Construction Form

The choice of construction form is based on the character and quantity of the dust.
The construction form indicates how dust-laden air is led into the filter chamber (dust chamber) and how segregated material is removed from the filter.

Characteristics

Construction form 03 is designed for direct installation on the main powder source, e.g. a silo. This must be designed to resist the pressure conditions inside the filter, including the pressure pulses arising from bag cleaning.
The dust-laden air flows from the source into the filter through the entire cross section of the filter.
The air bearing the light dust particles rises into the filter chamber and penetrates the filter bags from the outside.
Extracted dust falls back into the main powder source, as is is cleaned off the bags.

Application

The air flow in the filter moves upward, the velocity being highest at the bottom of the bags and decreasing as it moves upwards.

The air velocity should be rather low by products containing light, floating particles, as these may stay floating around the filter bags, thus causing a high pressure drop.
The air velocity is affected by the filter load, the bag length, and by oversize diameter of filter chamber, if applicable.
The problem of floating particles may - to a certain extent - be helped by leaving the filter cleaning for a while after the rest of the plant has been stopped, - especially when the plant is stopped regularly.

Location of Inspection Door

If the filter is designed for bag change from below through the inspection door, the door should be placed as high as possible on the filter chamber.

If the filter is designed for bag change from above, the inspection door may be placed freely heightwise (except in flange connections). ■

Construction Form

The choice of construction form is based on the character and quantity of the dust.
The construction form indicates how dust-laden air is led into the filter chamber (dust chamber) and how segregated material is removed from the filter.

Characteristics

The dust-laden air is led through a spiral inlet at the filter top. Heavy particles continue rotating alongside the periphery of the filter chamber, ending up in the cone.
The air bearing the light dust particles penetrates the filter bags, the dust being collecting on the outside.
The inlet position should be the highest possible, in order to obtain a descending air flow in the filter, thus making it ideal for fine dusts.
Extracted dust is accumulated in the bottom cone and and delivered in a round connection at the bottom of the cone.

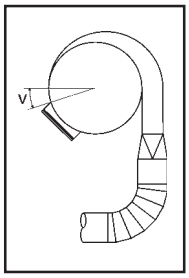


Fig. 1.

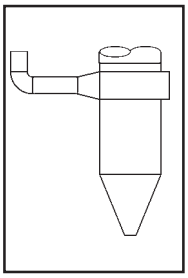


Fig. 2.

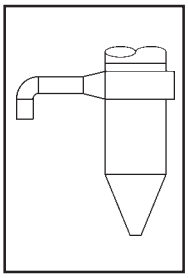


Fig.3.

Correct piping before inlet.
The horizontal pipe between bend and inlet is as long as possible.

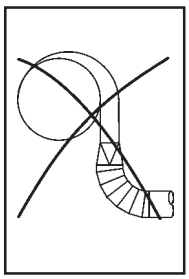


Fig.4.

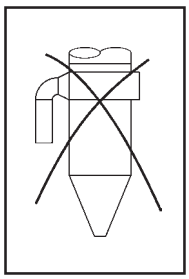


Fig.5.

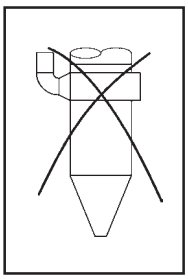


Fig.6.

Wrong piping!
A pipe bend just before the inlet must be horozontal with direction as in fig. 1.

Application

Construction form 04 is ideal for most filtering jobs.
It works well with fine, abrasive material, provided that the dust has no wearing effect on piping and filter housing.
Construction form 04 should not be applied for coarse products. It is well suited for dust loads up to app. 100 g/m^3, if the dust has no particular abrasive effect.
For heavy dust loads and very abrasive material, a pre-separator should be considered.

Location of Inspection Door

If the filter is designed for bag change from below through the inspection door, the door should be placed as high as possible on the filter chamber.

The door will then be at the same level as the inlet, for which reason the possible door locations are limited by the inlet.
The door may be placed where the "V"-angle at fig. 1 equals zero or more. Enough space must be left for the door to open.

If the filter is designed for bag change from above, the inspection door may be placed freely heightwise (except in flange connections). It may then be turned freely, as long as the top edge of the door is below the bottom edge of the inlet.

Piping

The horizontal pipe before the inlet must be as long as possible, resulting in a laminar air flow at the filter inlet.
If a pipe bend just before the inlet is necessary, the piping must be horizontal. The direction of the bend must be as in fig. 1.

Under no circumstances may the piping be as in fig. 4, 5, or 6.

Construction Form

The choice of construction form is based on the character and quantity of the dust.
The construction form indicates how dust-laden air is led into the filter chamber (dust chamber) and how segregated material is removed from the filter.

Characteristics

The dust-laden air is led through a spiral inlet at the filter top. Heavy particles continue rotating alongside the periphery of the filter chamber, ending up in the cone.
The air bearing the light dust particles penetrates the filter bags, the dust being collecting on the outside.
The inlet position should be the highest possible, in order to obtain a descending air flow in the filter, thus making it ideal for fine dusts.
Extracted dust is accumulated in the bottom cone and and delivered in a round connection at the bottom of the cone.

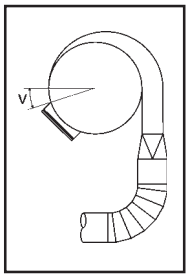


Fig. 1.

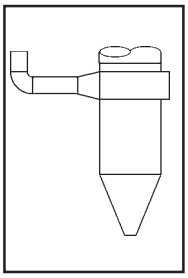


Fig. 2.

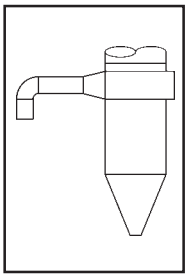


Fig.3.

Correct piping before inlet.
The horizontal pipe between bend and inlet is as long as possible.

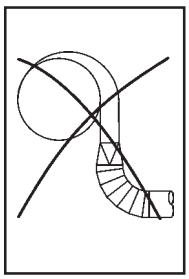


Fig.4.

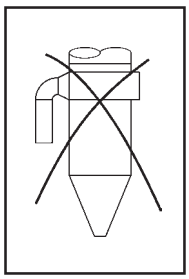


Fig.5.

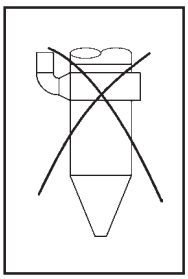


Fig.6.

Wrong piping!
A pipe bend just before the inlet must be horozontal with direction as in fig. 1.

Application

Construction form 04 is ideal for most filtering jobs.
It works well with fine, abrasive material, provided that the dust has no wearing effect on piping and filter housing.
Construction form 04 should not be applied for coarse products. It is well suited for dust loads up to app. 100 g/m^3, if the dust has no particular abrasive effect.
For heavy dust loads and very abrasive material, a pre-separator should be considered.

Location of Inspection Door

If the filter is designed for bag change from below through the inspection door, the door should be placed as high as possible on the filter chamber.

The door will then be at the same level as the inlet, for which reason the possible door locations are limited by the inlet.
The door may be placed where the "V"-angle at fig. 1 equals zero or more. Enough space must be left for the door to open.

If the filter is designed for bag change from above, the inspection door may be placed freely heightwise (except in flange connections). It may then be turned freely, as long as the top edge of the door is below the bottom edge of the inlet.

Piping

The horizontal pipe before the inlet must be as long as possible, resulting in a laminar air flow at the filter inlet.
If a pipe bend just before the inlet is necessary, the piping must be horizontal. The direction of the bend must be as in fig. 1.

Under no circumstances may the piping be as in fig. 4, 5, or 6.

Construction Form

The choice of construction form is based on the character and quantity of the dust.
The construction form indicates how dust-laden air is led into the filter chamber (dust chamber) and how segregated material is removed from the filter.

Characteristics

The dust-laden air is led through a spiral inlet at the filter top. Heavy particles continue rotating alongside the periphery of the filter chamber, ending up in the scraper bottom. The air bearing the light dust particles penetrates the filter bags, the dust being collecting on the outside.
The inlet position should be the highest possible, in order to obtain a descending air flow in the filter, thus making it ideal for fine dusts.
Extracted dust is accumulated in the scraper bottom and and delivered in a vertical socket at the periphery of the scraper bottom.

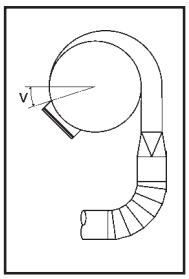


Fig. 1.

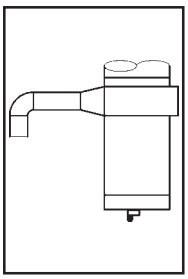


Fig. 2.

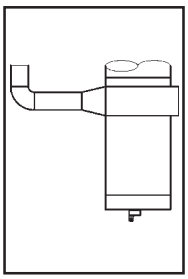


Fig.3.

Correct piping before inlet.
The horizontal pipe between bend and inlet is as long as possible.

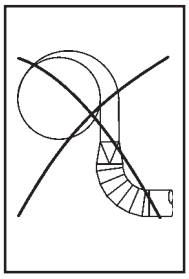


Fig.4.

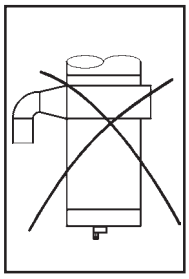


Fig.5.

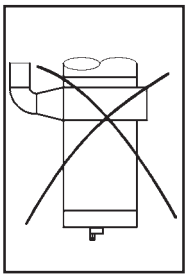


Fig.6.

Wrong piping!
A pipe bend just before the inlet must be horozontal with direction as in fig. 1.

Application

Construction form 05 is ideal for most filtering jobs, where the filter height is limited.
It works well with fine, abrasive material, provided that the dust has no wearing effect on piping and filter housing.
Construction form 05 should not be applied for coarse products. It is well suited for dust loads up to app. 50 g/m^3, if the dust has no particular abrasive effect.
For heavy dust loads and very abrasive material, a different construction form or a pre-separator should be considered.

Location of Inspection Door

If the filter is designed for bag change from below through the inspection door, the door should be placed as high as possible on the filter chamber.

The door will then be at the same level as the inlet, for which reason the possible door locations are limited by the inlet.
The door may be placed where the "V"-angle at fig. 1 equals zero or more. Enough space must be left for the door to open.

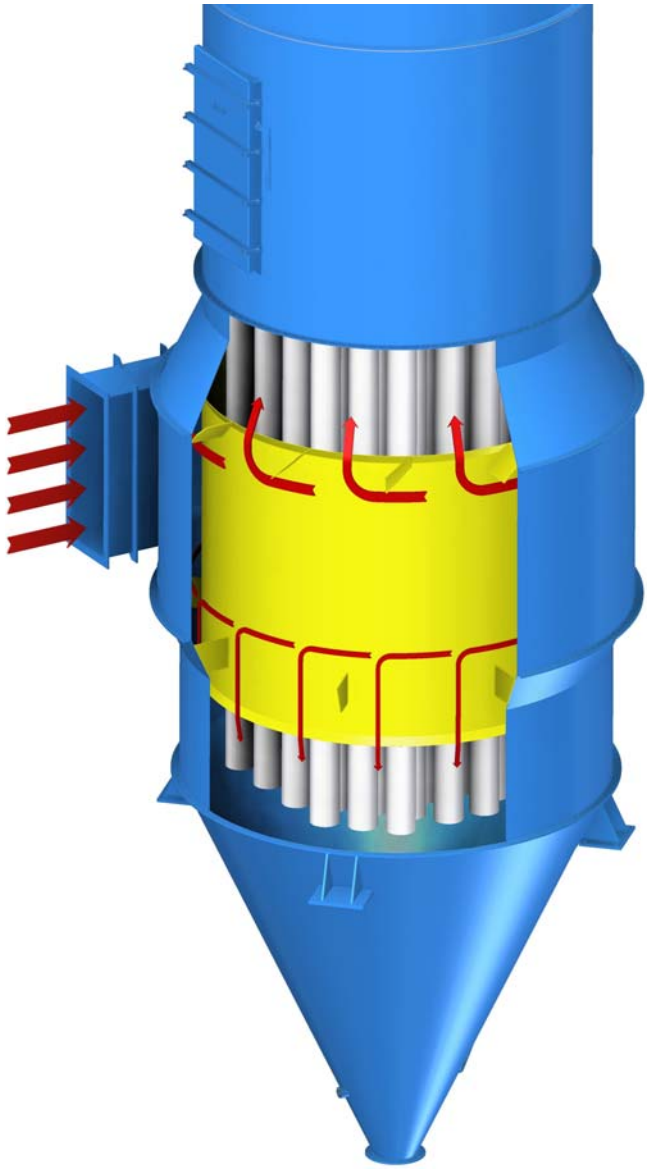
If the filter is designed for bag change from above, the inspection door may be placed freely heightwise (except in flange connections). It may then be turned freely, as long as the top edge of the door is below the bottom edge of the inlet.
An ideal solution would normally be having the inspection door work as an entrance to the scraper bottom.

Piping

The horizontal pipe before the inlet must be as long as possible, resulting in a laminar air flow at the filter inlet.
If a pipe bend just before the inlet is necessary, the piping must be horizontal. The direction of the bend must be as in fig. 1, or a vertical descending pipe may be applied.

Under no circumstances may the piping be as in fig. 4, 5, or 6.

Filter Technology
Technical Description, Construction Form 12



Construction Form

The choice of construction form is based on the character and quantity of the dust.
The construction form indicates how dust-laden air is led into the filter chamber (dust chamber) and how segregated material is removed from the filter.

Characteristics

The dust-laden air is led through a tangential inlet and circulates between the inner and outer cylinder.
The more heavy particles follow a minor air flow passing through the narrow slot at the bottom of the inner cylinder.
From here they follow the outer cylinder and the bottom cone to the powder outlet.
The major part of the air passes the wide slot at the top of the inner cylinder.
When the air carrying the lighter dust particles has passed the slots, it distributes between the filter bags and the air penetrates the bags from outside.

If the filter bags are to be changed from below, the filter housing incorporates a cylindrical section with an inspection door on top as illustrated.
If the filter bags are to be changed from above, the inlet section are preferably inserted right below the top section.
If there is a risk that the air contains sparks, the inner cylinder may be stretched downwards covering the filter bags.

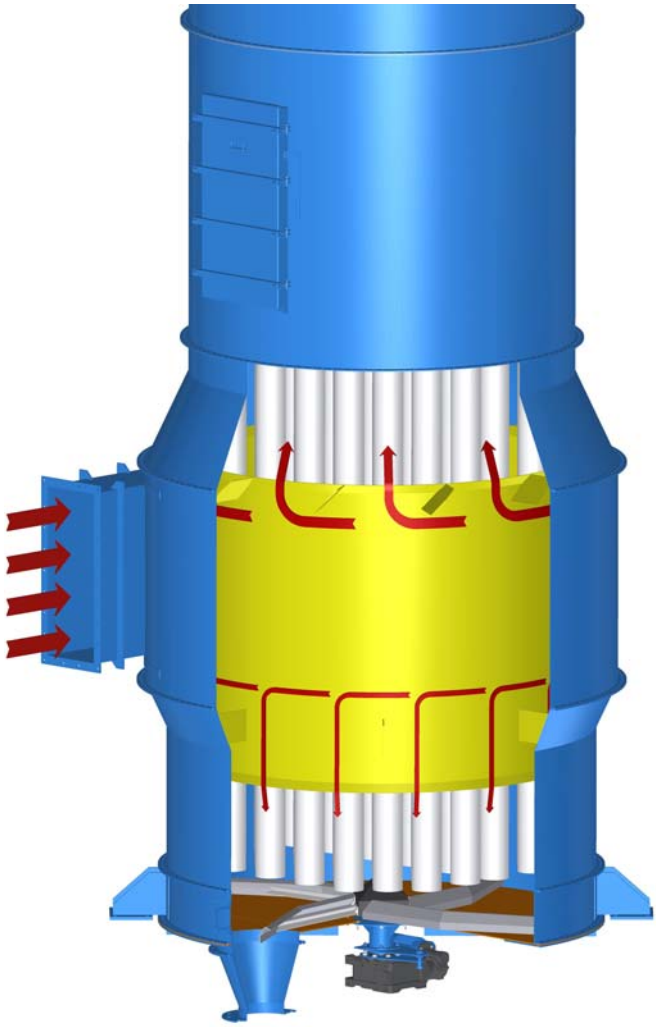
Application

Construction form 12 works well with most dust types which do not contain longer fibres - and up to approximately 1000 g/m³.
The inner cylinder protects the filter bags against wear.

For heavy dust loads and very abrasive material, a different construction form or a pre-separator should be considered.

Piping

This construction form is not so demanding with respect to the geometry of the duct system leading to the filter inlet. If possible, however, it is always an advantage to have a piece of straight horizontal pipe pointing directly into the filter inlet.



Construction Form

The choice of construction form is based on the character and quantity of the dust.
The construction form indicates how dust-laden air is led into the filter chamber (dust chamber) and how segregated material is removed from the filter.

Characteristics

The dust-laden air is led through a tangential inlet and circulates between the inner and outer cylinder.
The more heavy particles follow a minor air flow passing through the narrow slot at the bottom of the inner cylinder.
From here they follow the outer cylinder until they reach the bottom plate. The dust is now pushed by the mechanical scraper arms eventually dropping into the outlet hopper.
The major part of the air passes the wide slot at the top of the inner cylinder.
When the air carrying the lighter dust particles has passed the slots, it distributes between the filter bags and the air penetrates the bags from outside.
If the filter bags are to be changed from below, the filter housing incorporates a cylindrical section with an inspection door on top as illustrated.
If the filter bags are to be changed from above, the inlet section are preferably inserted right below the top section.
If there is a risk that the air contains sparks, the inner cylinder may be stretched downwards covering the filter bags.

Application

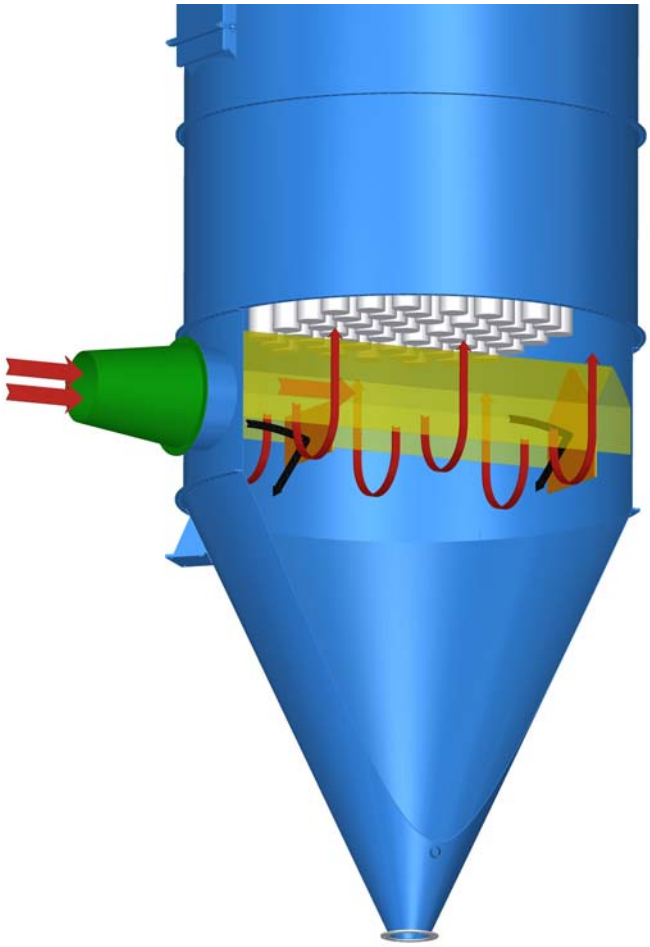
Construction form 14 works well with most dust types which do not contain longer fibres - and up to approximately 100g/m³. The dust quantity is restricted by the capacity of the scraper bottom.
The inner cylinder protects the filter bags against wear.

For heavy dust loads and very abrasive material, a different construction form or a pre-separator should be considered.

Piping

This construction form is not so demanding with respect to the geometry of the duct system leading to the filter inlet. If possible, however, it is always an advantage to have a piece of straight horizontal pipe pointing directly into the filter inlet.

Filter Technology
Technical Description, Construction Form 17



Construction Form
The choice of construction form is based on the character and quantity of the dust.
The construction form indicates how dust-laden air is led into the filter chamber (dust chamber) and how segregated material is removed from the filter.

Characteristics
The dust-laden air is led through a cylindrical radial connection just below the filter bags. The air flow continues at the inside of the filter housing, now inside an inlet duct with open bottom. The inlet duct is designed with a number of guide plates forcing the dust and air to leave the duct in the requested flow pattern.

The majority of dust drops directly into the bottom cone. Part of the lighter dust particles follow the air flow which rises into the filter chamber and penetrates the filter bags from the outside.
Extracted dust is accumulated in the bottom cone and is delivered in a round connection at the bottom of the cone.

Application
The location of the inlet below the filter bags causes an upward air flow. The velocity of the air flow is highest at the bottom of the bags and decreasing as it moves upwards.

The air velocity should be rather low for products containing light, floating particles, as these may stay floating around the filter bags, thus causing a high pressure drop.
For submicron products the velocity of the raising air flow should be less than 0.5 m/sec. Otherwise it should be less than 1 m/sec.
The air velocity is affected by the filter load, the bag length, and by oversize diameter of filter chamber, if applicable.
Especially when long filter bags are used, an increased filter housing diameter may be required. This solution is available in the construction form 17WB (Wide body).

The problem of floating particles may - to a certain extent - be helped by leaving the filter cleaning for a while after the rest of the plant has been stopped, - especially when the plant is stopped regularly.

Construction form 17 is suited for even very high dust loads.

Location of Inspection Door
If the filter is designed for bag change from below through the inspection door, the door should be placed as high as possible on the filter chamber.

If the filter is designed for bag change from above, the inspection door may be placed freely height wise (except in flange connections).

Piping
This construction form is not too demanding with respect to the geometry of the duct system leading to the filter inlet. If possible, however, it is always an advantage to have a piece of straight horizontal pipe pointing directly into the filter inlet.
It is recommended that the pipe diameter is adapted to the filter inlet diameter using a slim cone (approximately 8°) as illustrated in green colour.

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