

# Filter elements

## Type 46., CELLUDISC for microfiltration

**RE 51537**

Edition: 2021-04

Replaces: -



- ▶ Nominal size: 10"
- ▶ Maximum differential pressure: 4 bar [60 psi]
- ▶ Filter rating: 2 and 10  $\mu\text{m}$
- ▶ Operating temperature +0 °C ... +80 °C [32°F ... +176°F]

### Features

CELLUDISC filter elements are used for the microfiltration of hydraulic and lubricating oil, preferably as bypass filter.

They have the following characteristics:

- ▶ Module set-up consisting of 16 interchangeable cells
- ▶ Support tube in one-part design
- ▶ Filter material made of pressed cellulose fibers
- ▶ High dirt holding capacity thanks to deep filtration

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## Ordering code

### Filter element

#### Filter element type 46.

01	02	03	04	05	06
<b>46.</b>	<b>10</b>		<b>- S00</b>	<b>- 0</b>	<b>- V</b>

#### Design

01	Filter element (for the admissible temperature ranges, refer to chapter "Technical data")	<b>46.</b>
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#### Nominal size

02	According to <b>Hengst standard</b>	<b>10</b>
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#### Filter rating

03	Cellulose fibers, not cleanable	<b>Z02</b>
		<b>Z10</b>

#### Differential pressure

04	Max. admissible differential pressure of the filter element	5 bar [73 psi]	<b>S00</b>
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#### Bypass valve

05	without	<b>0</b>
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#### Seal

06	FKM	<b>V</b>
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#### Order example:

**46.10 Z02-S00-0-V**

**Material no.: R928055795**

Material no.	Description
<b>R928055795</b>	46.10 Z02-S00-0-V
<b>R928055796</b>	46.10 Z10-S00-0-V

## Filter design

Easy selection of the filter size is made possible by the FilterSelect online tool. The filter can be designed using the operating pressure, flow and fluid system parameters. The required filter rating is based on the application, the sensitivity to contamination of the components and the environmental conditions.

The program leads you through the menu on a step-by-step basis.






A documentation of the filter selection can finally be created in the form of a PDF file. This file contains the entered parameters, the designed filter with material number including spare parts, and the pressure loss curves.

Link FilterSelect:

<http://www.filterselect.de>

Other languages can be selected using the page navigation.

### standard search

application:	<input type="text" value="hydraulics for industrial use and applications with lubricating oil"/>
Product category:	<input type="text" value="please select"/>
type:	<input type="text" value="please select"/>
pressure range:	<input type="text" value="please select"/>
filter material:	<input type="text" value="please select"/> 
fineness:	<input type="text" value="please select"/>
volume flow rate:	<input type="text"/> [l/min] <input type="text"/>
viscosity: * = working point	<input checked="" type="radio"/> kin viscosity 1: <input type="text" value="32"/> [mm <sup>2</sup> /s]  <input type="radio"/> search via type of medium <span style="float: right;">full-text search medium</span> <input type="text" value="please select"/> <input type="text"/> <input type="text" value="please select"/> <input type="text"/> temp 1: <input type="text"/> [°C] <input type="text"/> [°F] kin viscosity 1: <input type="text"/> [mm <sup>2</sup> /s]  <input type="radio"/> dyn. Viscosity 1: <input type="text"/> [cP] density 1: <input type="text"/> [kg/dm <sup>3</sup> ] kin viscosity 1: <input type="text"/> [mm <sup>2</sup> /s] 
collapse pressure resistance according to ISO 2941:	<input type="text" value="30 bar"/> <input type="text"/>
<input type="button" value="Start search"/> 	

## Product description

Hengst depth filter elements CELLUDISC are used for the microfiltration of fluids requiring a very high oil cleanliness.

Typical applications are: filling filtration, supporting filtration in the bypass and flushing of hydraulics and lubricating oil systems.

The main filter variables, such as retention rate, dirt holding capacity and pressure loss are determined by the inserted filter elements and the filter media used in them. Due to the high retention rate, the main flow filter is supported by a supplementary filtration in the bypass (multipass).

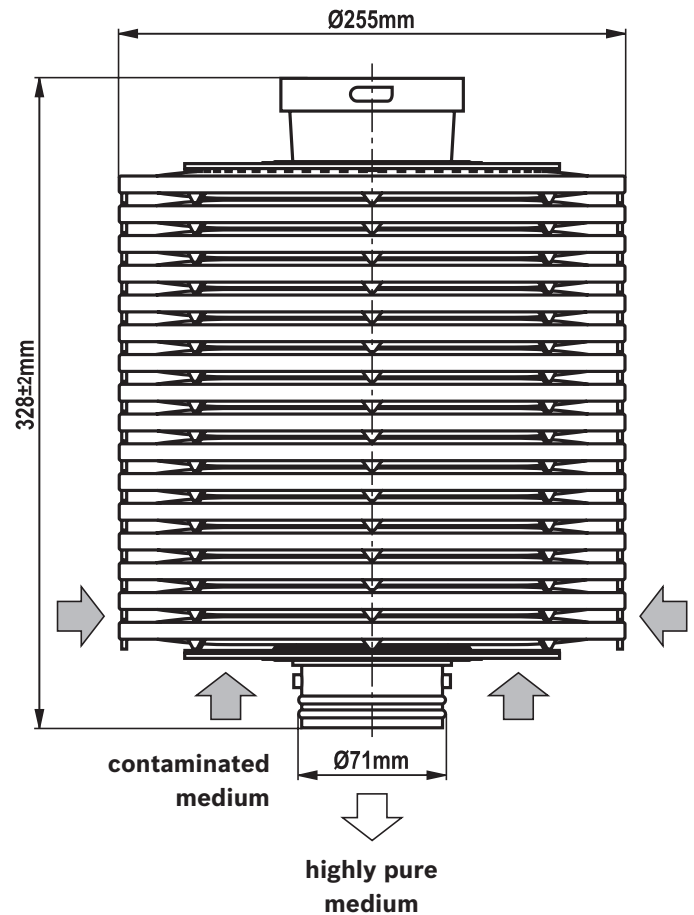
A high retention rate is reached during a singlepass, for example in filling applications.

The filter element consists of 16 single cells forming a disc.

The filter material consists of pressed and impregnated cellulose fibers.

Filtration takes place from the outside to the inside of the filter element.

Two seal rings are provided between the filter element and the filter housing as a sealing.



**Technical data**

(for applications outside these values, please consult us!)

general		
Weight	NG	<b>46.10</b>
	kg [lbs]	3.56 [7.84]
Filtration direction		from the outside to the inside
Storage temperature range	°C [°F]	-30 ... +100 [-22 ... +212]
Number of filter cells		16
Diameter	mm [in]	254 [10]
Filter area	m <sup>2</sup> [in <sup>2</sup> ]	1.4 [2.17]
Seal material		FKM
hydraulic		
Hydraulic fluid temperature range	°C [°F]	0 ... +80 [32 ... +176]

**Compatibility with permitted hydraulic fluids**

Hydraulic fluid	Classification	Standards
Mineral oils	HLP	DIN 51524
Bio-degradable ▶ Insoluble in water	HETG	ISO 15380

**Important information on hydraulic fluids:**

- ▶ For further information and data on the use of other hydraulic fluids, please refer to data sheet 90220 or contact us!
- ▶ There may be limitations regarding the technical valve data (temperature, pressure range, life cycle, maintenance intervals, etc.)!

- ▶ The flash point of the hydraulic fluid used must be 40 K higher than the maximum solenoid surface temperature.
- ▶ **Bio-degradable:** When using bio-degradable hydraulic fluids that are zinc-solvent, zinc may accumulate in the fluid (700 mg zinc per pole tube).

## Filter media

### Technical data

#### Cellulose fibers, Z...

If the filter medium is professionally designed and applied, it achieves a high degree of cleanliness for hydraulic fluids and lubricants. Due to its defined retention capacity (ISO 16889), it offers highly effective protection for machine and system components which are sensitive to contamination.

- ▶ The filter material consists of pressed and impregnated cellulose fibers.
- ▶ Absolute filtration/defined retention capacity according to ISO 16889

- ▶ High dirt holding capacity thanks to a distinct deep filtration as well as a material density increasing with depth
- ▶ Disposable filter (not cleanable due to the depth filtration effect)
- ▶ Attainable oil cleanliness class according to ISO 4406 up to 12/9/7.

#### Filter rating and attainable oil cleanliness

The following table provides recommendations for the selection of a filter medium dependent on the application

and indicates the average oil cleanliness class attainable according to ISO 4406.

Application	Recommended oil cleanliness according to ISO 4406	Recommended filter media
Bypass filtration as a depth filter in connection with an extremely high dirt holding capacity. e.g.: Machine tools, plastic injection molding machines, test stands	12/9/7 ... 16/12/9	Z02
	15/13/9 ... 19/14/11	Z10

#### Filtration ratio $\beta_{x(c)}$

Typical  $\beta$  values of up to 2.2 bar [31.9 psi]

$\Delta p$  pressure increase on the filter element

Filter media	Particle size "x" for different $\beta$ values, measurement according to ISO 16889	
	$\beta_{x(c)} \geq 200$	$\beta_{x(c)} \geq 1000$
Z02	4.1 $\mu\text{m}(c)$	5.2 $\mu\text{m}(c)$
Z10	6.1 $\mu\text{m}(c)$	8.1 $\mu\text{m}(c)$

## Assembly, commissioning, maintenance

### When should the filter element be replaced or cleaned?

As soon as the back pressure or the differential pressure setting of the maintenance indicator has been reached, the red pushbutton of the mechanical/visual maintenance indicator pops out. If an electronic switching element is present, an electric signal will be generated. In this event, the filter element should be replaced or cleaned. It is not advisable to operate a filter housing without a filter element maintenance indicator, however, in the event that the filter housing is not fitted with an indicator, we recommend changing or cleaning the filter elements at least every 6 months.

### Filter element exchange

- ▶ For single filters:  
Switch off the system and discharge the filter on the pressure side.
- ▶ For duplex switch filters:  
See relevant maintenance instructions according to the data sheet.

Detailed instructions with regard to the filter element exchange can be found in the data sheet of the relevant filter series.

## Environment and recycling

- ▶ The used filter element has to be disposed of according to the country-specific legal regulations for environmental protection.

### **WARNING!**

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>▶ Filters are containers under pressure. Before opening the filter housing, check whether the system pressure in the filter has been decreased to ambient pressure. Only then may the filter housing be opened for maintenance.</li> </ul> | <ul style="list-style-type: none"> <li>▶ Filter elements must be unpacked outside ATEX zones</li> </ul> |
|---|---|

### **Notice:**

- ▶ Due to the high viscosity at cold start conditions, the pre-set signal value of the visual maintenance indicator may be exceeded at start-up. Once the operating temperature has been reached, the mechanical/visual indicator can be reset manually. The electrical signal will reset once the operating temperature has been reached.
- ▶ If the maintenance indicator alarm is disregarded, the disproportional, increasing differential pressure may damage the filter element (collapse).
- ▶ Information on dirt holding capacity characteristic values exclusively refer to the measurement results obtained under laboratory conditions according to ISO 16889. These may deviate from measurements obtained in real applications due to various influencing factors.

It is expected that a higher comparable dirt holding capacity, according to ISO 16889 at a comparable filtration ratio  $\beta_{x(c)}$ , can be achieved under real operating conditions.

- ▶ Warranty expires in the event that the delivered item is changed by the ordering party or third parties or improperly mounted, installed, maintained, repaired, used or exposed to environmental conditions that do not comply with the installation conditions.
- ▶ Technical characteristic values such as retention rate and dirt holding capacity have been determined at a temperature of 40 °C (+/- 5 °C).

## Directives and standardization

### Product validation

Hengst filter elements are tested and quality-monitored according to different ISO test standards:

Filtration performance test (multipass test)	ISO 16889:2008-06
$\Delta p$ (pressure loss) characteristic curves	ISO 3968:2001-12
Compatibility with hydraulic fluid	ISO 2943:1998-11
Collapse pressure test	ISO 2941:2009-04
Fluid Technology; Hydraulic Filter – Part 2; Assessment Criteria and Requirements	DIN 24550-2:2006-09

The development, manufacture and assembly of Hengst industrial filters and Hengst filter elements is carried out within the framework of a certified quality management system in accordance with ISO 9001:2015.

### Use in potentially explosive atmospheres according to directive 2014/34/EU (ATEX):

The filter elements are not equipment or components in the sense of directive 2014/34/EU and are not provided with the CE marking.

It has been proven with the ignition risk analysis that these filter elements do not have own ignition sources according to DIN EN ISO 80079-36.

The filter elements can be used for the following potentially explosive atmospheres:

	Zone suitability	
Gas	1	2
Dust	21	22

### **WARNING!**

- ▶ For use of the filter elements in potentially explosive atmospheres, ATEX suitability of the complete filter assembly is an imperative requirement.
- ▶ Conductivity of the medium: at least 300 pS/m
- ▶ During filter element exchange, the packaging material is to be removed from the replacement element outside the potentially explosive atmosphere.
- ▶ Maintenance to be conducted only by specialists, as per the instruction by the machine end-user according to DIRECTIVE 1999/92/EC appendix II, section 1.1



## **Intended use**

The filter elements serve as components as per the EC Machinery Directive 2006/42/EC in hydraulic machinery for the separation of dirt particles.

The filter elements are to be used under the following boundary conditions and limits:

- ▶ only in hydraulic systems with fluids of group 2, according to Pressure Equipment Directive 2014/68/EU
- ▶ only according to the application and environmental conditions in the chapter "Technical data"
- ▶ only in compliance with the specified performance limits in the section "Technical data"; extended operational durability/load cycles on request
- ▶ only with hydraulic fluids and the intended seals according to the section "Compatibility with hydraulic fluids"
- ▶ Use in potentially explosive atmospheres according to the chapter "Guidelines and standards"
- ▶ Compliance with application and environmental conditions according to the technical data
- ▶ Compliance with the specified performance limits
- ▶ The filter elements are intended exclusively for professional use and not for private use.

## **Improper use**

Any use deviating from the intended use is deemed as improper and thus not admissible.

Improper use of the filter elements includes:

- ▶ Incorrect storage
- ▶ Incorrect transport
- ▶ Lack of cleanliness during storage and assembly
- ▶ Incorrect installation
- ▶ Use of inappropriate/non-admissible hydraulic fluids
- ▶ Exceedance of the specified maximum pressures and load cycles
- ▶ Operation outside the approved temperature range
- ▶ Installation and operation in inadmissible device group and category

Hengst Filtration GmbH does not assume any liability for damage caused by improper use. The user assumes all risks involved with improper use.

## Notes

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