

# Filter elements

## Type 9., for the installation into Hydac filter housings

**RE 51529**

Edition: 2021-04

Replaces: -



- ▶ Nominal size 60 ... 660
- ▶ Nominal size 30LA ... 1500LA
- ▶ Differential pressure 30 or 210 bar
- ▶ Filter rating from 1  $\mu\text{m}$
- ▶ Replacement for Hydac D filter elements

### Features

- ▶ Filter media made of glass fiber material (optionally water-absorbing), filter paper, wire mesh and non-woven metal fiber for various fields of application. Information on filter material configuration is available in RE 51548
- ▶ Cleanable wire mesh filter media
- ▶ Attainable oil cleanliness class of up to ISO 10/6/4 (ISO 4406)
- ▶ High dirt holding capacity and filtration performance due to multi-layer glass fiber technology and simultaneous low initial differential pressure
- ▶ Filter elements with high differential pressure stability

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**Ordering code****Filter element type 9.**

01	02	03	04	05	06
<b>9.</b>			-	-	<b>0</b>

**Design**

01	Filter element (for the admissible temperature ranges, refer to chapter "Technical data")	<b>9.</b>
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**Size**

02	According to Hydac size	<b>60</b> <b>110</b> <b>140</b> <b>160</b> <b>240</b> <b>280</b> <b>330</b> <b>500</b> <b>660</b>
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**Filter rating in  $\mu\text{m}$** 

	Absolute (ISO 16889)	Glass fiber material PWR... Generation 5, not reusable, not cleanable	<b>PWR1</b> <b>PWR3</b> <b>PWR6</b> <b>PWR10</b> <b>PWR20</b>
		Non-woven metal fiber M, not reusable, not cleanable	<b>M5</b> <b>M10</b>
	Nominal	Stainless steel wire mesh G, cleanable	<b>G10</b> <b>G25</b> <b>G40</b> <b>G60</b> <b>G100</b> <b>G200</b> <b>G500</b> <b>G800</b>
		Paper P, not reusable, not cleanable Only configurable with a max. differential pressure of 60 bar [870 psi]	<b>P10</b> <b>P25</b>

**Differential pressure**

04	max. admissible differential pressure of the filter element	30 bar [435 psi]	<b>A00</b>
		210 bar [3045 psi]	<b>F00</b>

**Bypass valve**

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

06	NBR	<b>M</b>
	FKM	<b>V</b>

**Further filter ratings and seal materials are available on request.**

**More detailed information on Hengst filter material configurations is available in RE 51548.**

**Ordering code****Filter element type 9. ...LA**

01	02	03	04	05	06	07
<b>9.</b>			-	-	<b>0</b>	-

**Design**

01	Filter element (for the admissible temperature ranges, refer to chapter "Technical data")	<b>9.</b>
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**Size**

02	According to Hydac size	<b>30LA</b> <b>0035LA</b> <b>0055LA</b> <b>60LA</b> <b>0075LA</b> <b>0095LA</b> <b>110LA</b> <b>140LA</b> <b>160LA</b> <b>240LA</b> <b>280LA</b> <b>330LA</b> <b>500LA</b> <b>660LA</b> <b>990LA</b> <b>1320LA</b> <b>1500LA</b>
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**Filter rating in µm**

03	Absolute (ISO 16889)	Glass fiber material PWR... Generation 5, not reusable, not cleanable	<b>PWR1</b> <b>PWR3</b> <b>PWR6</b> <b>PWR10</b> <b>PWR20</b>
		Non-woven metal fiber M, not reusable, not cleanable	<b>M5</b> <b>M10</b>
	Nominal	Stainless steel wire mesh G, cleanable	<b>G10</b> <b>G25</b> <b>G40</b> <b>G60</b> <b>G100</b> <b>G200</b> <b>G500</b> <b>G800</b>
		Paper P, not reusable, not cleanable Only configurable with a max. differential pressure of 60 bar [870 psi]	<b>P10</b> <b>P25</b>

**Differential pressure**

04	max. admissible differential pressure of the filter element	30 bar [435 psi]	<b>A00</b>
		210 bar [3045 psi]	<b>F00</b>

**Bypass valve**

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

06	NBR	<b>M</b>
	FKM	<b>V</b>

**Amending information**

07	Protective cage (only in connection with filter material PWR...)	<b>SO3000</b>
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**Further filter ratings and seal materials are available on request.**

**More detailed information on Hengst filter material configurations is available in RE 51548.**

## 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

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

## Product description

The filter element is the main building block of industrial filters. It is in the filter element where the actual filtration takes place. According to the large range of different housing designs and sizes, there is also a large number of different sizes and designs of inserted filter elements. The main filter variables, such as retention capacity, dirt holding capacity and pressure loss are determined by the filter elements construction and the filter media used. Further information on the characteristic values and filter media is available in RE 51548.

Hengst filter elements are used for filtration of various hydraulic fluids, lubricants and other industrial fluids and gases, depending on the series.

The filtration is usually realized from the outside to the inside.

The fluid or gas must flow from the dirt side through the filter element into the clean side.

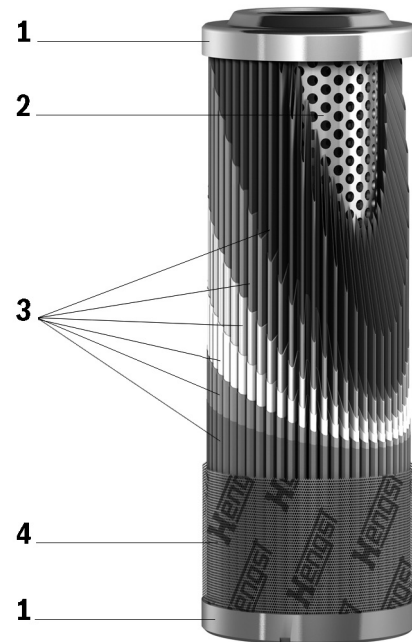
However, in some applications the filtration is also realized from the inside to the outside of the filter element.

In general, Hengst filter elements consist of a combination of star-like, pleated filter media (3) called filter element mat.

The filter element mat is laid around a perforated support tube (2) which gives the set-up the required stability to withstand high pressure differentials.

The filter element mat laid around the support tube is glued to the joint and the two end disks (1) and therefore sealed between the dirt and the clean side. Sealing between the filter element and the filter housing is effectively done by means of seals on the spigot.

The protective cage (4), which is only used for special filter element series, allows for a continuous fluid flow pattern around the filter element mat and, at the same time, provides mechanical protection against external damage.



**Technical data**

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

General			
Storage conditions	- Seal NBR	°C [°F]	-40 ... +65 [-40... +149]; max. relative air humidity 65%
	- Seal FKM	°C [°F]	-20 ... +65 [-4... +149]; max. relative air humidity 65%
Material	- Cover of the filter element		Steel, tin-coated, aluminum or polyamide (depending on the version)
	- Base of the filter element		Steel, tin-coated, aluminum or polyamide (depending on the version)
	- Support tube of the filter element		Tin-coated steel
	- Seals		NBR or FKM
	- Protective cage		Polyester

Hydraulic	
Filtration direction	from the outside to the inside
Maximum differential pressure	bar [psi] 30 [435] or 210 [3045]

**Admissible operating temperature range, depending on material combination**

		Operating temperature range °C [°F]	
Filter material configuration	Code letter	Sealing material NBR "M" Adhesive (standard) "0" Material (standard) "0"	Sealing material (FKM) "V" Adhesive (standard) "0" Material (standard) "0"
Stainless steel wire mesh	G...	-40 ... +100 [-40 ... +212]	-20 ... +100 [-4 ... +212]
Glass fiber material PWR...	PWR...	-40 ... +100 [-40 ... +212]	-20 ... +100 [-4 ... +212]
Non-woven metal fiber	M...	-40 ... +100 [-40 ... +212]	-20 ... +100 [-4 ... +212]
Filter paper	P...	-40 ... +100 [-40 ... +212]	-20 ... +100 [-4 ... +212]

**Compatibility with permitted hydraulic fluids**

Hydraulic fluid	Classification	Suitable sealing materials	Standards
Mineral oil	HLP	NBR	DIN 51524
Bio-degradable	- insoluble in water	HETG	NBR
		HEES	FKM
	- soluble in water	HEPG	FKM
Flame-resistant	- water-free	HFDU, HFDR	FKM
	- containing water	HFAS	NBR
		HFAE	NBR
		HFC	NBR
			VDMA 24317

**👉 Important information on hydraulic fluids!**

- ▶ For further information and data on the use of other hydraulic fluids, please refer to 90220 or contact us!
- ▶ **Flame-resistant - containing water:** due to possible chemical reactions with materials or surface coatings of machine and system components, the service life with these hydraulic fluids may be less than expected.

- Filter materials made of filter paper P may not be used, filter elements with glass fiber filter material are to be used instead.
- ▶ **Bio-degradable:** If filter materials made of filter paper are used, the filter life may be shorter than expected due to material incompatibility of and swelling.

## Assembly, commissioning, maintenance

### When must 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 maintenance indicator is provided, an additional electric signal will sound. 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. 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.

### Environment and recycling

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

### 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.

### WARNING!

- ▶ 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.
- ▶ Filter elements must be unpacked outside ATEX zones

### Notice:

- ▶ 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 areas 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 areas, 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
- ▶ 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 section "Technical data"
- ▶ Only in compliance with the specified performance limits in the section "Technical data"
- ▶ 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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