MANN+HUMMEL EDM filters

For wire and sink erosion

MANN+HUMMEL

MANN+HUMMEL Group

The MANN+HUMMEL Group is an international company with its headquarters in Ludwigsburg, Germany. The group employs more than 10,000 people worldwide at more than 41 locations.

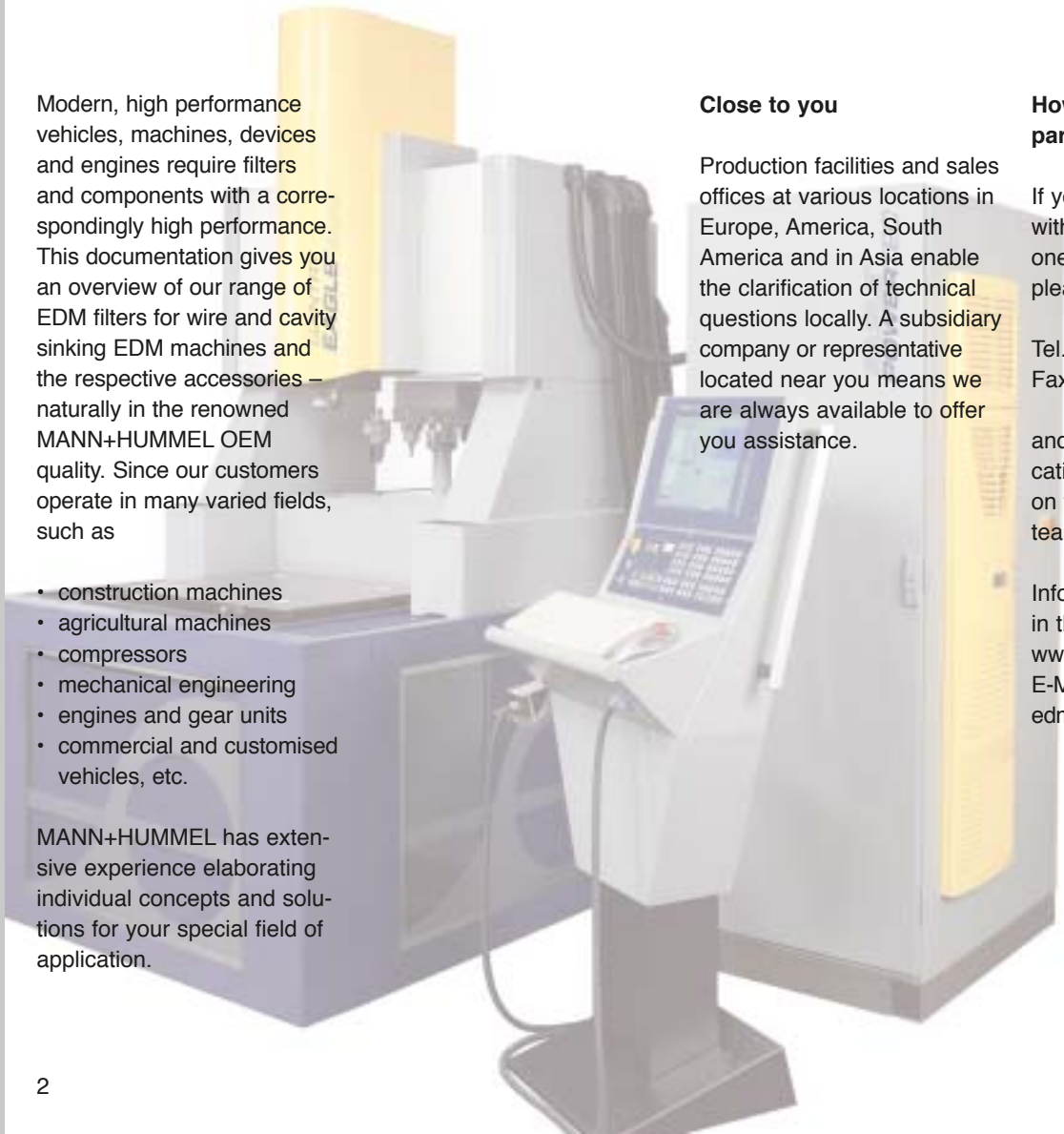
The company develops, produces and sells technically complex components and systems for the automotive industry and many other fields. A key area is high quality filtration products for vehicles, engines and industrial applications. The OEM business with global market leaders and producers of vehicles, machines and installations defines the quality and performance of the products. Filters for the international aftermarket are sold under a variety of international brands as well as under the MANN-FILTER brand.

MANN+HUMMEL Industrial Filters

The Industrial Filters Business Unit has its headquarters in Speyer, Germany. The business unit is specialized in meeting the special requirements of off-highway vehicles and engine applications, compressed air and vacuum technology, mechanical engineering and plant construction.

MANN+HUMMEL Industrial Filters offers high performance for these fields and other fields which have a requirement for the filtration and separation of air, gas and liquids.

Filters for many industrial fields



Modern, high performance vehicles, machines, devices and engines require filters and components with a correspondingly high performance. This documentation gives you an overview of our range of EDM filters for wire and cavity sinking EDM machines and the respective accessories – naturally in the renowned MANN+HUMMEL OEM quality. Since our customers operate in many varied fields, such as

- construction machines
- agricultural machines
- compressors
- mechanical engineering
- engines and gear units
- commercial and customised vehicles, etc.

MANN+HUMMEL has extensive experience elaborating individual concepts and solutions for your special field of application.

Close to you

Production facilities and sales offices at various locations in Europe, America, South America and in Asia enable the clarification of technical questions locally. A subsidiary company or representative located near you means we are always available to offer you assistance.

How to find your contact partner:

If you are not yet in contact with MANN+HUMMEL or one of our representatives, please call

Tel.: +49 (62 32) 53-80
Fax: +49 (62 32) 53-88 99

and name your field of application. We will then pass you on to the appropriate sales team.

Information is also available in the internet at:
www.mann-hummel.com
E-Mail:
edm.info@mann-hummel.com

Be on the safe side with MANN+HUMMEL

The demands made on EDM filters for wire and sink erosion are constantly rising. That is why you should rely on the quality of MANN+HUMMEL products. Years of development expertise and close co-operation with machine producers have made us what we are today: experts in the filtration of dielectric fluids in EDM machines. MANN+HUMMEL can offer you a wide range of products for all renowned producers worldwide, with a filter fineness range of 1 to 25 µm.

Our development engineers work closely together with machine producers to fine tune the filters to the respective EDM machine. This guarantees best possible running of the system. Therefore, when servicing, you should also opt for MANN+HUMMEL original parts. Efficient filtration provides high quality for the processed workpiece and also for economic running costs. Quality defects with filters can become expensive. These defects can be identified through the following effects:

- Bad surface quality and accuracy on the processed workpiece
- Blocked rinsing nozzles
- Increasing resin consumption
- Sediment in the cooler and supply system
- Increased corrosion deposits

The results are increased running costs and extensive wear on your EDM machine. So choose MANN+HUMMEL products for security. Through a specified filter fineness and selection of first class materials you will gain:

- Process reliability
- Excellent machining quality of workpiece
- Smooth running of the EDM machine
- Long filter service life
- Leading to greater efficiency
- Cleaniness of dielectricum as claimed by the producer

Apart from that, opting for MANN+HUMMEL filters also offer you the following advantages:

We can supply quickly and flexibly to your specifications, also for large volumes.

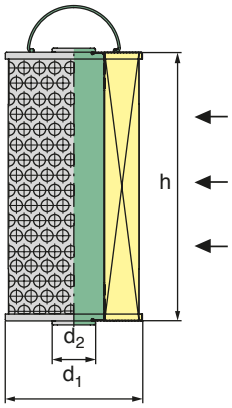
The MANN-FILTER brand name is established and recognized by the producers and operators of EDM machines.

EDM filters up to ø 150 mm

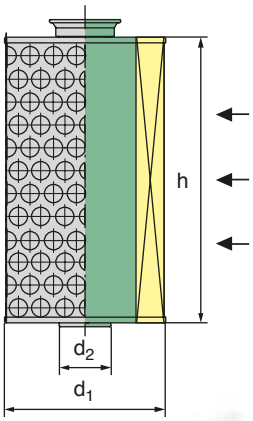
Recommendations / Standards

Manufacturer	Respective MANN+HUMMEL EDM filters
AEG	H 15 135 N, H 15 135 PN, H 15 190, H 15 190/10
Agema	H 15 190, H 15 190/10
Agemaspark	H 1096
Agie + Charmilles	H 15 190/1, H 15 190/16, H 15 190/25, H 15 475/1, H 15 190/10, E-Line, H 15 190/6, H 15 190, H 15 190/12
BES	H 15 190, H 15 190/10
Deckel	H 15 190, H 15 190/10, H 15 190/16, E-Line
EMV Erodiermaschinen	H 15 190, H 15 190/10
Hostek	H 15 190, H 15 190/10, H 15 190/16, E-Line
OPS-Ingersoll	H 15 190, H 15 190/10, H 15 190/16, E-Line
Japax	H 15 190, H 15 190/10, H 15 190/16, E-Line
Jiten	H 15 190, H 15 190/10, H 15 190/16, E-Line
Multiform	H 15 190, H 15 190/10, H 15 190/16, E-Line
Nassovia	H 15 190, H 15 190/10, H 15 190/16, E-Line
Sinitron	H 15 190, H 15 190/10, H 15 190/16, E-Line
Seibu-Walter	H 15 190, H 15 190/10, H 15 190/16, E-Line
Zimmer+Kreim	H 15 190, H 15 190/10, H 15 190/16, E-Line

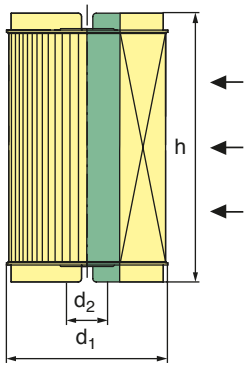
EDM filters up to ø 150 mm



Design A



Design B



Design C

Order no.	Design	Filter surface area in cm² *[in ft²]*	Dimensions in mm *[dimensions in inches]* d_1	d_2	h	Filter fineness [µm]	Flow direction
H 1096[2]	A	9 300 *[10]*	100 *[3.9]*	22 [1] *[0.9]*	202 *[8.0]*	3 – 5	outside to inside
H 15 135 N	B	17 900 *[19]*	150 *[5.9]*	32 [1] *[0.9]*	252 *[9.9]*	10	outside to inside
H 15 135 PN	B	21 200 *[23]*	150 *[5.9]*	32 [1] *[0.9]*	252 *[9.9]*	3 – 5	outside to inside
H 15 190	B	20 500 *[22]*	150 *[5.9]*	32 [1] *[0.9]*	364 *[14.3]*	10	outside to inside
H 15 190/1	C	28 100 *[30]*	150 *[5.9]*	32 [1] *[0.9]*	375 *[14.8]*	1 – 2	outside to inside
H 15 190/6	B	27 500 *[30]*	150 *[5.9]*	32 [1] *[0.9]*	364 *[14.3]*	3 – 5	outside to inside
H 15 190/10	C	27 520 *[30]*	150 *[5.9]*	32 [1] *[0.9]*	375 *[14.8]*	10	outside to inside
H 15 190/12	B	21 600 *[23]*	150 *[5.9]*	32 [1] *[0.9]*	364 *[14.3]*	25	outside to inside
H 15 190/16	C	31 000 *[33]*	150 *[5.9]*	32 [1] *[0.9]*	375 *[14.8]*	3 – 5	outside to inside
H 15 190/25	C	23 020 *[25]*	150 *[5.9]*	32 [1] *[0.9]*	375 *[14.8]*	25	outside to inside
E-Line	C	27 000 *[29]*	150 *[5.9]*	32 [1] *[0.9]*	375 *[14.8]*	3 – 5	outside to inside
H 15 475	B	47 000 *[51]*	150 *[5.9]*	32 [1] *[0.9]*	364 *[14.3]*	3 – 5	outside to inside
H 15 475/1	C	45 320 *[49]*	150 *[5.9]*	32 [1] *[0.9]*	375 *[14.8]*	3 – 5	outside to inside

1) Connection dimension according to DIN EN 10 305
2) with handle

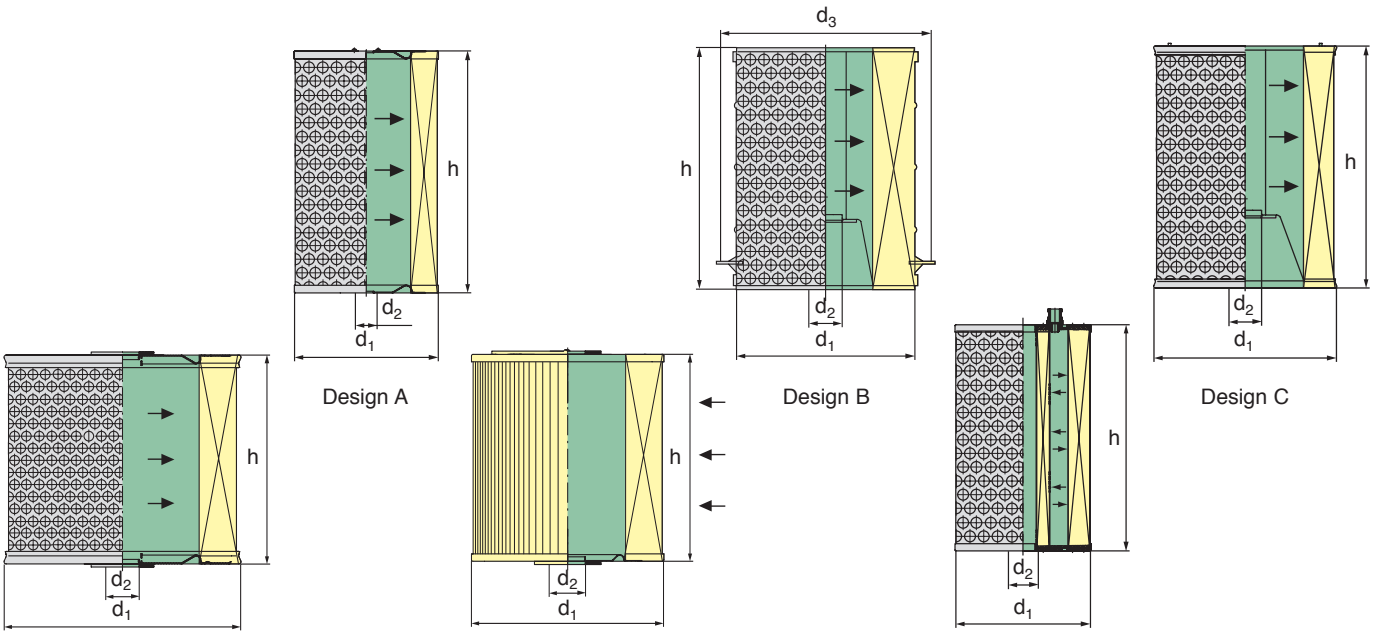
EDM filters from ø 260 mm

Recommendations / Standards

Manufacturer	Conventional paper filters 3 – 5 µm	Long-life filters 3 – 5 µm	High precision filters 1 – 2 µm
Brother	H 31 967/1	–	–
Charmilles	H 34 1158/8 H 34 1790/3	H 34 1790/2 H 34 2090 H 34 2240	H 34 1070/1 H 34 1390/1
Exeron	H 31 967/1	–	–
Fanuc	H 34 1070/9 H 34 1158/8 H 34 1790/3 [1]	H 34 1290/3 H 34 1390 H 34 1790/2 [1]	H 34 1070/1 H 34 1390/1
Hitachi	–	H 31 1680/1 H 34 1390	H 34 1390/1
Makino	H 26 644/1	H 31 1680/1 H 34 1390	H 34 1390/1
Mitsubishi Electric	H 31 967/1	H 34 1390 H 31 1680/1	H 34 1390/1
Nassovia	H 31 967/1	–	–
OPS-Ingersoll	H 31 1033/3	H 31 1680	–
Seibu	–	H 34 1390	H 34 1390/1
Sodick	H 34 1070/9 H 34 1158/8	H 34 1290/3 H 34 1790	H 34 1070/1

[1] Service-kit (order no. 67 000 50 900) required

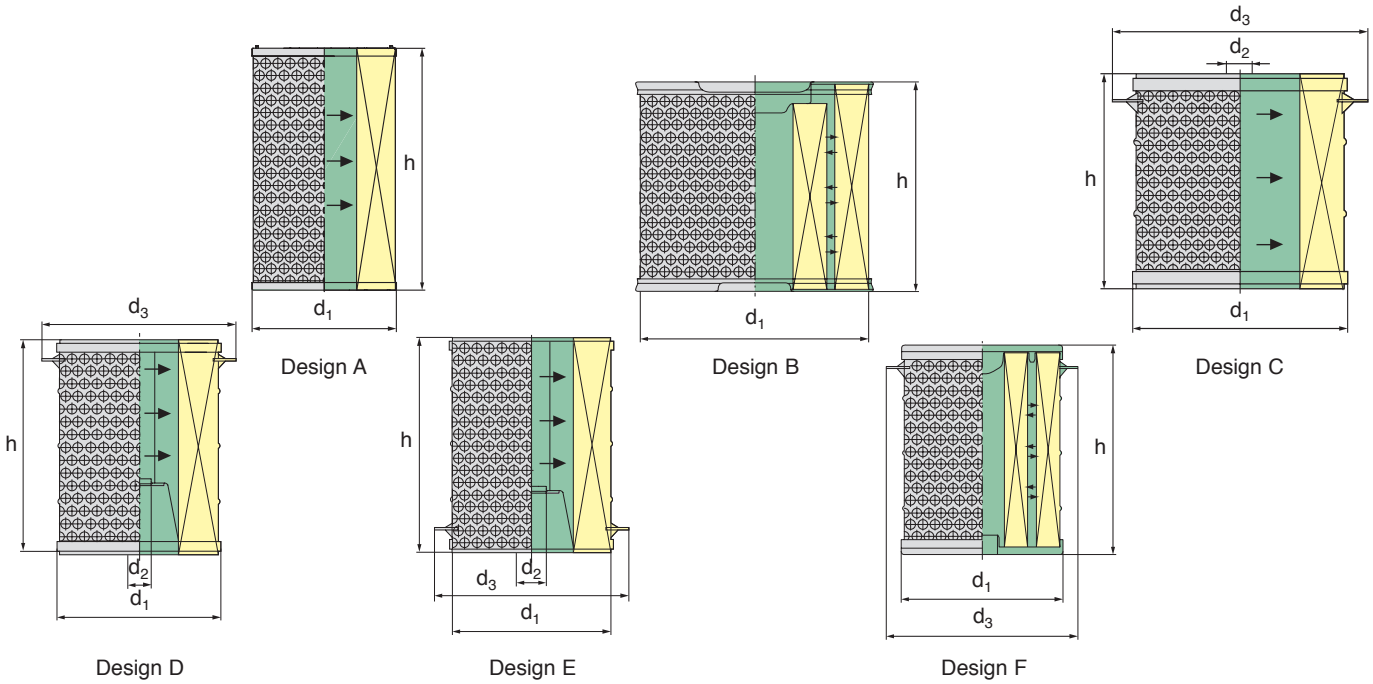
Conventional paper filters from 3 – 5 µm



Order no.	Design	Filter surface area in cm² *[in ft²]*	Dimensions in mm *[dimensions in inches]* d_1	d_2	d_3	h	Flow direction
H 26 644/1 [1]	E	53 700 *[58]*	261 *[10.3]*	46 *[1.8]*	–	280 *[11.0]*	outside to inside
H 31 967	A	95 300 *[103]*	302 *[11.9]*	29 *[1.1]*	–	507 *[20.0]*	inside to outside
H 31 967/1 [3]	A	95 300 *[103]*	302 *[11.9]*	29 *[1.1]*	–	507 *[20.0]*	inside to outside
H 31 1033/3	F	99 125 *[107]*	302 *[11.9]*	54 *[2.1]*	–	503 *[19.8]*	inside to outside
H 34 1070	D	107 000 *[115]*	340 *[13.4]*	45.5 *[1.8]*	–	300 *[11.8]*	inside to outside
H 34 1070/9 [3]	D	107 000 *[115]*	340 *[13.4]*	45.5 *[1.8]*	–	300 *[11.8]*	inside to outside
H 34 1158/4	C	145 000 *[156]*	340 *[13.4]*	45.5 *[1.8]*	–	450 *[17.7]*	inside to outside
H 34 1158/8 [3]	C	145 000 *[156]*	340 *[13.4]*	45.5 *[1.8]*	–	450 *[17.7]*	inside to outside
H 34 1790/3 [2]	B	145 000 *[156]*	340 *[13.4]*	47.5 *[1.9]*	404 *[15.9]*	450 *[17.7]*	inside to outside

1) with handle
2) plastic
3) painted in black, corrosion-resistant

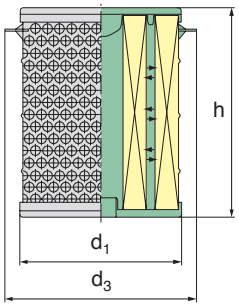
Long-life filters from 3 – 5 µm, 10 µm, 25 µm



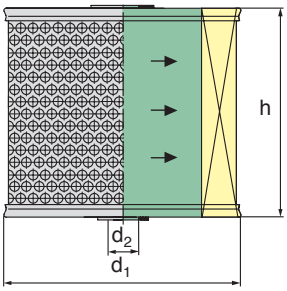
Order no.	Design	Filter surface area in cm² *[in ft²]*	Filter fineness in µm	Dimensions in mm *[dimensions in inches]* d_1	d_2	d_3	h	Flow direction	Connection thread
H 31 1680	A	165 700 *[179]*	3 - 5	302 *[11.9]*	–	–	501 *[19.8]*	inside to outside	G 3/4”
H 31 1680/1 [1]	A	165 700 *[179]*	3 - 5	302 *[11.9]*	–	–	501 *[19.8]*	inside to outside	G 3/4”
H 34 1290 [2]	C	126 000 *[136]*	3 - 5	340 *[13.4]*	47.5 *[1.9]*	404 *[15.9]*	339 *[13.3]*	inside to outside	–
H 34 1290/3 [2]	C	105 000 *[113]*	3 - 5	340 *[13.4]*	60 *[2.4]*	404 *[15.9]*	300 *[11.8]*	inside to outside	–
H 34 1380 [1]	B	142 020 *[153]*	3 - 5	340 *[13.4]*	–	–	300 *[11.8]*	inside to outside	G 3/4”
H 34 1390 [2]	F	135 000 *[145]*	3 - 5	340 *[13.4]*	–	404 *[15.9]*	300 *[11.8]*	inside to outside	G 3/4”
H 34 1390/2 [2]	F	128 000 *[138]*	10	340 *[13.4]*	–	404 *[15.9]*	300 *[11.8]*	inside to outside	G 3/4”
H 34 1390/3 [2]	F	102 000 *[110]*	25	340 *[13.4]*	–	404 *[15.9]*	300 *[11.8]*	inside to outside	G 3/4”
H 34 1790 [2]	D	170 000 *[183]*	3 - 5	340 *[13.4]*	47.5 *[1.9]*	404 *[15.9]*	450 *[17.7]*	inside to outside	–
H 34 1790/2 [2]	E	170 000 *[183]*	3 - 5	340 *[13.4]*	47.5 *[1.9]*	404 *[15.9]*	450 *[17.7]*	inside to outside	–
H 34 2090 [2]	F	206 000 *[222]*	3 - 5	340 *[13.4]*	–	404 *[15.9]*	450 *[17.7]*	inside to outside	G 3/4”
H 34 2240 [1]	B	224 000 *[241]*	3 - 5	340 *[13.4]*	–	–	450 *[17.7]*	inside to outside	G 3/4”

1) painted in black, corrosion-resistant
2) plastic

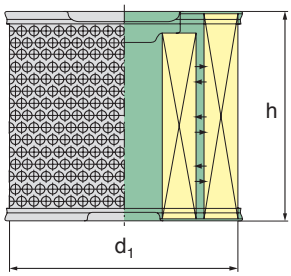
High precision filters from 1 – 2 µm



Design A



Design B



Design C

Order no.	Design	Filter surface area in cm² *[in ft²]*	Dimensions in mm *[dimensions in inches]*				Flow direction	Connection thread
			d_1	d_2	d_3	h		
H 34 1070/1 [1]	B	92 000 *[99]*	340 *[13.4]*	47.5 *[1.8]*	–	300 *[11.8]*	inside to outside	–
H 34 1380/1 [1]	C	142 020 *[153]*	340 *[13.4]*	–	–	300 *[11.8]*	inside to outside	G 3/4”
H 34 1390/1 [2]	A	135 000 *[145]*	340 *[13.4]*	–	404 *[15.9]*	300 *[11.8]*	inside to outside	G 3/4”

1) painted in black, corrosion-resistant
2) plastic

Flexibility through ...

Connections

For filters with threaded connections MANN+HUMMEL supplies reusable connectors. This allows one filter type to be used with different types of EDM machines. Whether for OPS-Ingersoll, Seibu, Fanuc, Mitsubishi Electric, Makino or Hitachi – it always fits!

Advantages:

- Reusable connectors
- Connectors in various materials selectable
- Easy filter logistics
- Economic

Manufacturer	Connector Material	Connection thread	Order no.
Makino Mitsubishi Electric Seibu	 Brass	G 3/4”	**21 027 15 181**
Hitachi	 Brass	G 3/4”	**21 027 15 175**
OPS-Ingersoll	 Aluminium	G 3/4”	**21 027 15 171**
Fanuc	 Brass	G 3/4”	**21 027 15 174**

... reusable accessories

Manufacturer	Connector Material	Connection thread	Order no.
OPS-Ingersoll	 Plastic	G 3/4”	**21 027 15 213**
Makino Mitsubishi Electric Seibu	 Plastic	G 3/4”	**21 027 15 211**
Fanuc	 Plastic	G 3/4”	**21 027 15 212**
Suitable seal	 Copper	G 3/4”	**01 901 20 027**

Handles

Separate reusable handles can now be ordered for all MANN+HUMMEL EDM filters. The handles simplify the removal and fitting of the filter.

Suitable for filter series	Design	Order no.
H 31/.. and H 34/.. metal		**67 092 49 001** [1]
H 15 serie plastic E-Line		**67 830 49 001** [2]

[1] Packaged set with 20 pieces

[2] Packaged set with 50 pieces

Summary – EDM filters – Metal *

H 1096
3-5 µm

H 15 135 N
10 µm

H 15 135 PN
3-5 µm

H 15 190
10 µm

H 15 190/6
3-5 µm

H 15 190/12
25 µm

H 15 475
3-5 µm

H 26 644/1
3-5 µm

H 31 967
3-5 µm

H 31 967/1
3-5 µm

H 31 1033/3
3-5 µm

H 31 1680
3-5 µm

* not to scale

Summary – EDM filters – Metal *

H 31 1680/1
3-5 µm

H 34 1070
3-5 µm

H 34 1070/1
1-2 µm

H 34 1070/9
3-5 µm

H 34 1158/4
3-5 µm

H 34 1158/8
3-5 µm

H 34 1380
3-5 µm

H 34 1380/1
1-2 µm

H 34 2240
3-5 µm

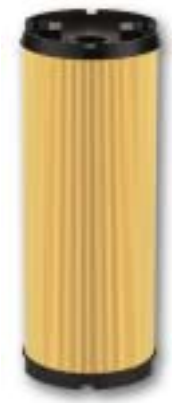
* not to scale

Summary – EDM filters – Plastic *

H 15 190/1
1-2 µm

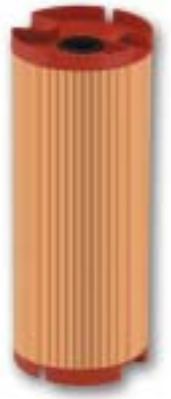
H 15 190/10
10 µm

H 15 190/16
3-5 µm



E-Line
3-5 µm

H 15 190/25
25 µm



H 15 475/1
3-5 µm

H 34 1290
3-5 µm

H 34 1290/3
3-5 µm

H 34 1390
3-5 µm

H 34 1390/1
1-2 µm

H 34 1390/2
10 µm

H 34 1390/3
25 µm

* not to scale

Summary – EDM filters – Plastic *

H 34 1790
3-5 µm

H 34 1790/2
3-5 µm

H 34 1790/3
3-5 µm

H 34 2090
3-5 µm

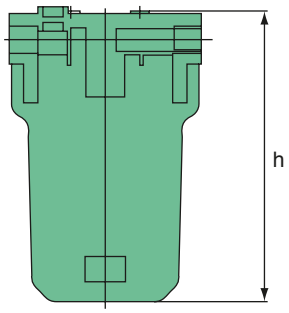
* not to scale

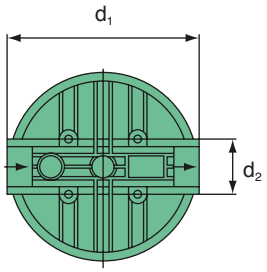
MANN+HUMMEL Fine filters

MANN+HUMMEL has launched a filter series especially for the fine filtration of dielectric fluid in wire-EDM and start-hole drilling machines. It can be used in OEM products and also used as a replacement product – of course in the usual first class MANN+HUMMEL quality.

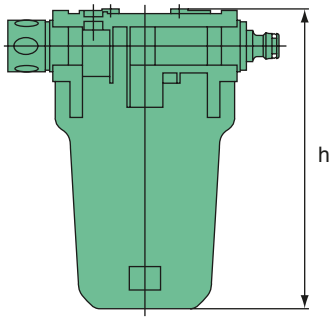
The range offers excellent flexibility for OEM products – new types are quickly generated by varying:

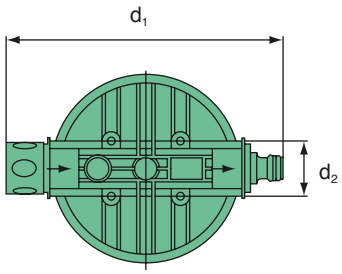
- Housing lengths and element sizes
- Pressure stability values
- Connection threads



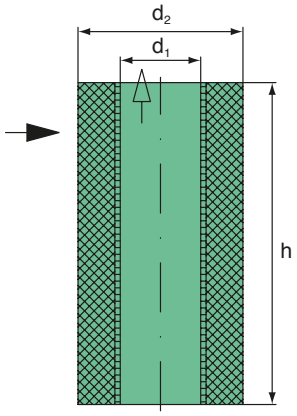


Design A





Design B



Design C

Order no. Housing	Design	Order no. Element	Housing dimensions in mm *[dimensions in inches]*				Element dimensions in mm *[dimensions in inches]*		
			h	d_1	d_2	Connection	d_1	d_2	h
63 400 62 201	A	**63 400 51 131**	188 *[7.4]*	121 *[4.7]*	G 3/4“	Plastic	27 *[1.1]*	62 *[4.4]*	128 *[5.0]*
63 400 62 211	B	**63 400 51 141**	307 *[12.1]*	178 *[7.0]*	Quick fit coupling	Plastic	27 *[1.1]*	62 *[4.4]*	251 *[9.9]*
63 400 62 221	A	**63 400 51 141**	307 *[12.1]*	122 *[4.8]*	G 3/4“	Plastic	27 *[1.1]*	62 *[4.4]*	251 *[9.9]*
63 400 62 231	A	**63 400 51 141**	307 *[12.1]*	122 *[4.8]*	G 3/4“	Brass	27 *[1.1]*	62 *[4.4]*	251 *[9.9]*
–	C	**63 400 51 121** [1)]	–	–	–	–	30 *[1.2]*	62 *[4.4]*	120 *[4.7]*

1) for Agie machines

Summary – Fine filters *

63 400 62 211

63 400 62 221

63 400 62 231

63 400 51 141

63 400 62 201

63 400 51 131

63 400 51 121
for Agie machines

* not to scale

MANN+HUMMEL – Top quality EDM filters

MANN+HUMMEL is a development partner and series supplier to leading manufacturers of EDM machines. Our technical expertise ensures that the products are perfectly matched to the respective application.

Independent of whether the filtration is for the dielectric fluid of a wire EDM or cavity sinking EDM machine, the filtration result and the process reliability have to be correct. This means that with EDM filters from MANN+HUMMEL you are on the safe side.

MANN+HUMMEL EDM filters: The sum of high quality components.

In the development of new filters priority is given to the components such as the filter medium, the external casing and the end cap.

Filter medium

The most important part of an EDM filter is the filter medium. This is individually matched to the high requirements of the EDM process in the MANN+HUMMEL development laboratories.

At the begin of the development of the medium a special MANN+HUMMEL test process examines the dirt particles from an EDM machine. This test quickly indicates whether a medium is suitable for the respective EDM application in respect of the dirt holding capacity, filter fineness and service life.

In the MANN+HUMMEL development laboratory tests are conducted on an EDM machine to examine the service life and filtration quality.

The MANN+HUMMEL range of media for EDM filters covers a filter fineness range from 1 to 25 µm.

MANN+HUMMEL always offers the right medium – whether the material to be machined is tool steel or aluminium.
The MANN+HUMMEL expertise in the field of impregnation and consistent curing of the medium ensures the pressure stability of the filter paper.

MANN+HUMMEL – Top quality EDM filters

The choice of the right filter medium is the basic requirement for the ideal function of the filter. MANN+HUMMEL determines the correct choice of medium in the company's own testing laboratory.

External casing and end caps

Important quality factors for the external casing and the end caps are the pressure stability, resistance to corrosion and chemical stability in connection with the dielectric fluid. In addition, the material must not allow any undesirable ions to enter the dielectric fluid. A low housing weight is a further aspect which provides lower transportation and disposal costs. Light filters offer advantages to operators for machine maintenance. The development and testing laboratories of MANN+HUMMEL are comprehensively equipped with testing facilities and an EDM machine to enable tests to be made under field conditions.

MANN+HUMMEL – Innovative production

The development of high performance filter media is the first step in production and just as crucial for the performance of the filter in the field is the quality of the processing. In the production the filter medium is pleated, pressed into a special structure and cured.

Star-pleated filters can be manufactured with different pleat heights. In order to maximise service life and best utilise the available installation space, MANN+HUMMEL uses macro pleating and double-bellows technology.

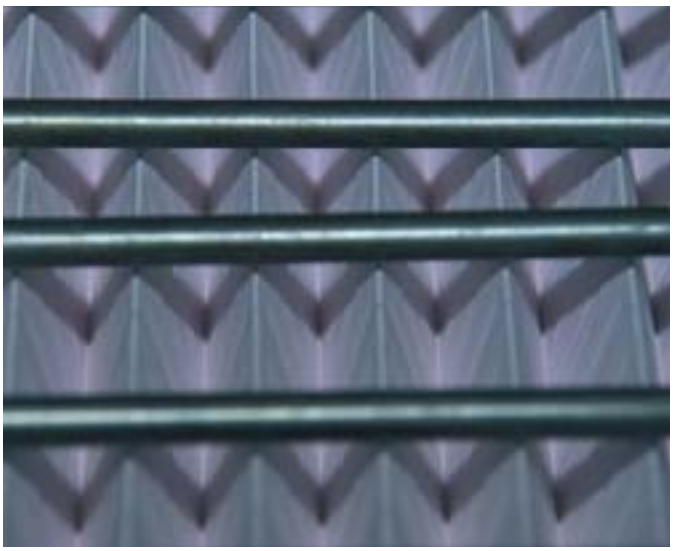
Inserting the filter bellows in the housing

A filter is only as good as its filter medium. Therefore the development of modern, high performance materials is a top priority for MANN+HUMMEL.

Macro-pleating technology is a special production process enabling higher pleats which do not prematurely stick together during operation.

These paper pleats are impregnated and given a special structure which separates the pleats and enables high stability. The result is high operational reliability over the whole life of the filter.

The double-bellows technology also provides a longer service life. Utilising advanced pleating geometry, MANN+HUMMEL is able to maximise the amount of filtration surface area in a given size.



One as exact as the next – special pleat geometry allows the realisation of a large filter surface area in the smallest space.

MANN+HUMMEL – Innovative production

The production processes and technology used at MANN+HUMMEL are proven and reliable. The result is an absolutely consistent and high product quality.
In addition, processes are rationalised. For example, the adhesive dosing is computer-controlled and at the end of the production process the products are stacked on a pallet using a robot.

At the end of the production process a visual inspection ensures that only perfectly produced filters are delivered to the customer.

Innovative: butt-welding to ensure an adhesive-free connection of the paper bellows and filter end cap.

The MANN+HUMMEL Marklkofen production location in Germany is the largest plant in the world producing filter elements. Here production engineers are working to improve and perfect processes. A number of innovative examples are the butt-welding process which enables the adhesive-free connection of the paper bellow and filter end cap or the laser welding used to realise a pressure resistant assembly of metal filter housings.

The MANN+HUMMEL production location at Marklkkofen in Germany

MANN+HUMMEL Industrial Filters worldwide

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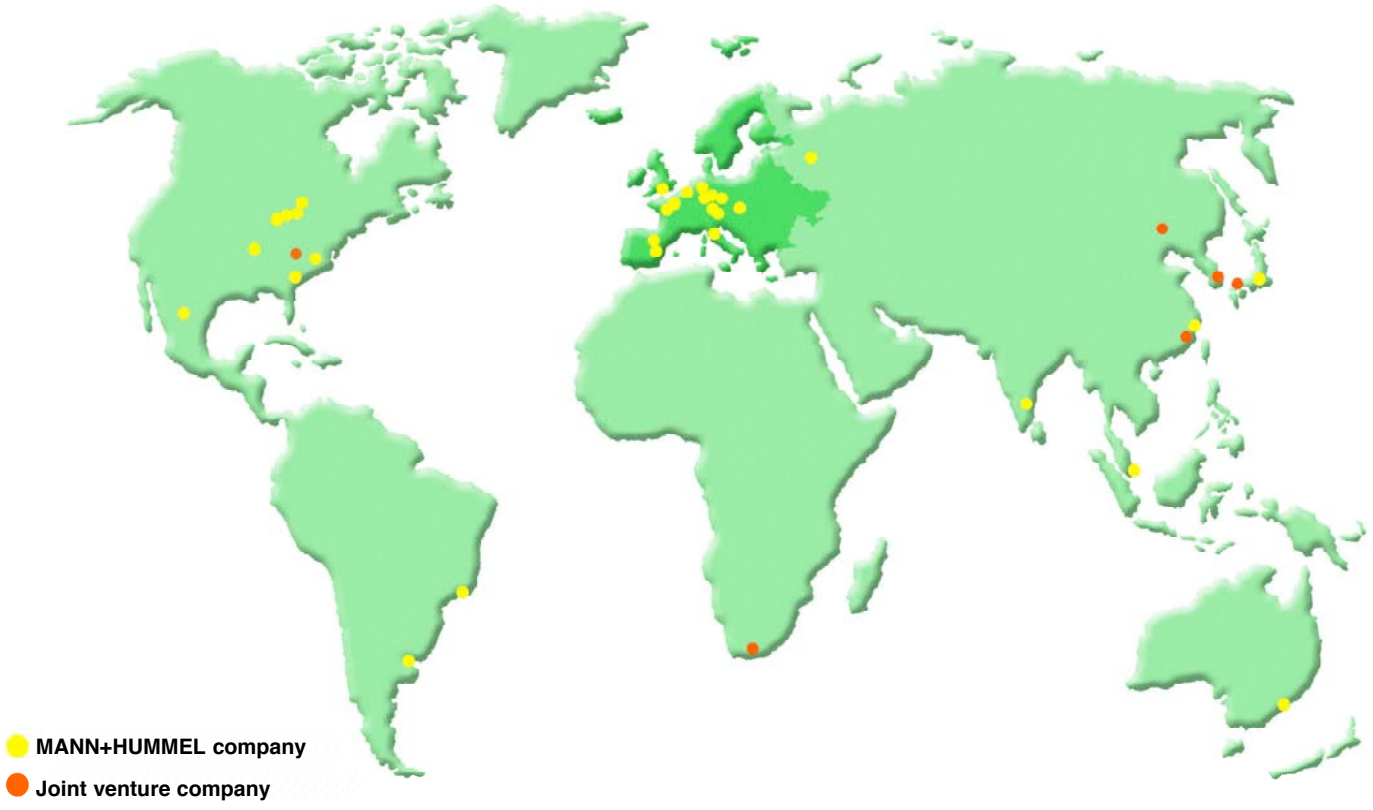

MANN+HUMMEL Group

The MANN+HUMMEL Group is an international company with its headquarters in Ludwigsburg, Germany. The group employs more than 10,000 people worldwide at more than 41 locations.

The company develops, produces and sells technically complex components and systems for the automotive industry and many other fields. A key area is high quality filtration products for vehicles, engines and industrial applications. The OEM business with global market leaders and producers of vehicles, machines and installations defines the quality and performance of the products. Filters for the international aftermarket are sold under a variety of international brands as well as under the MANN-FILTER brand.

MANN+HUMMEL Industrial Filters

The Industrial Filters Business Unit has its headquarters in Speyer, Germany. The business unit is specialized in meeting the special requirements of off-highway vehicles and engine applications, compressed air and vacuum technology, mechanical engineering and plant construction.

MANN+HUMMEL Industrial Filters offers high performance for these fields and other fields which have a requirement for the filtration and separation of air, gas and liquids.

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