



# Product Range

## SMF<sup>®</sup>-AR – Sintered Metal Filter with active regeneration

valid from June 2011



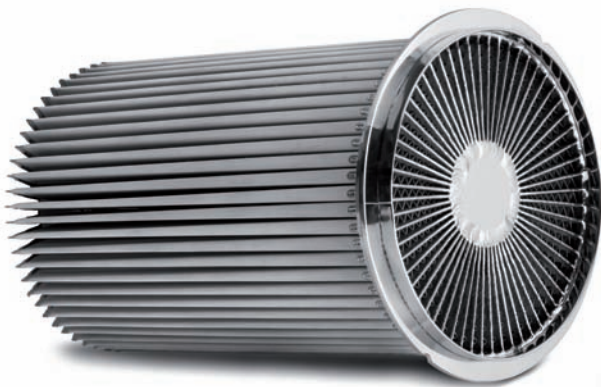
## Light Commercial Vehicles

[www.hjs.com/uk](http://www.hjs.com/uk)

# Exhaust Aftertreatment Systems

## SMF® – Sintered Metal Filter

The core technology of all HJS exhaust treatment systems is the sintered metal filter (SMF®), with which HJS sets new standards in the global marketplace and for which HJS was awarded the 2003 German Environment Prize. This enclosed 100% filter reduces the emissions of soot particles, including fine particulate matter, down to the limit of detection, with a filter efficiency of over 99%.



SMF® - Sintered Metal Filter – 100% soot-free

## Reliable and low on maintenance

The SMF® and the systems based on it are exceptionally reliable in operation, low on maintenance and also benefit from a long service life. HJS systems have proved their worth over many years in thousands of car, bus and truck applications. The advantages offered by an SMF® result from its special design as well as its use of sintered metal. The clogging known from conventional ceramic filters with their honeycomb structure is made impossible by the pocket-type construction of the SMF®. Exhaust backpressure is minimised by the fact that there is an unrestricted inflow of gas into the filter pockets from outside. In addition, the ash holding capacity of an SMF® is three to four times as high as that of a conventional ceramic filter system, which significantly increases the mileage before an HJS filter requires cleaning, including in the case of older commercial vehicles with particularly high oil consumption. For, whereas a ceramic filter requires cleaning after just a short period of operation, an SMF® is capable of several years of operation before maintenance is needed. This makes it possible to minimise the running costs for service and maintenance as well as the associated downtime costs, which means the operator can make considerable cost savings over the life of a vehicle.

## Catalytic coating

For OE applications or in the case of vehicles that are operated at low temperatures, the SMF® can be provided with a specially developed catalytic coating to support the process of filter regeneration.

## Flexible solutions for different applications

Thanks to their modular construction, sintered metal filters can be used in various systems and versions to suit different applications. They are suitable both as original equipment (OE) and also for retrofitting in commercial vehicles.

## SMF® advantages at a glance

- ✓ Over 99% reduction of soot particles, incl. fine particulate matter
- ✓ Suitable for OE and retrofitting applications
- ✓ High ash holding capacity and low exhaust backpressure
- ✓ Catalytic coating provides extended temperature window
- ✓ Absolutely low-maintenance and economical
- ✓ Reliable with long service life
- ✓ 100% recyclable

## Modular SMF®-AR – with active regeneration

Commercial vehicles, in particular, which are frequently driven in inner-city, stop-and-go traffic, often do not reach the minimum exhaust-gas temperature necessary for regeneration of the filter. This means conventional filter systems in most cases can't be fitted, because the danger of 'soot overload', i.e. clogging of the filter, increases rapidly.

### Operating principle SMF®-AR

HJS's SMF®-AR system filters the exhaust-gas flow until an optimum quantity of soot for regeneration has been collected in the filter. The system makes use of the positive active properties of a fuel additive that on the one hand lowers the soot's ignition temperature and on the other hand significantly increases its burn-off speed. The soot held back in the filter can, therefore, be burned off automatically in a spontaneous regeneration process when the exhaust gas has an appropriate temperature of 400°C or higher.

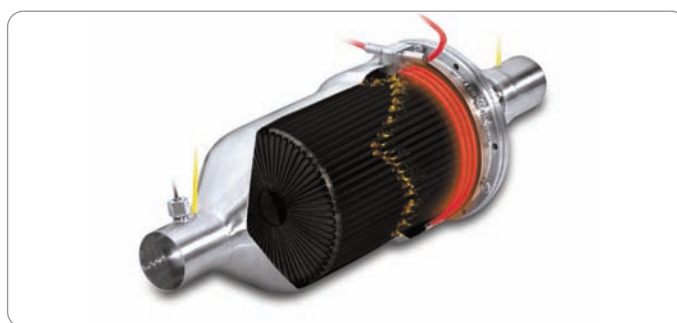
If, however, these temperatures are not reached – which is frequently the case in city traffic – the system's active regeneration assistance function cuts in.



Suitable for such applications are active systems like the SMF®-AR system developed by HJS, in which – independent of the temperature of the exhaust gases – the filter can be regenerated (cleared of the soot) in almost all engine operating conditions.



SMF®-AR system with heating elements that encircle the filter



Soot ignition following initial ignition

### Active, thermoelectric regeneration

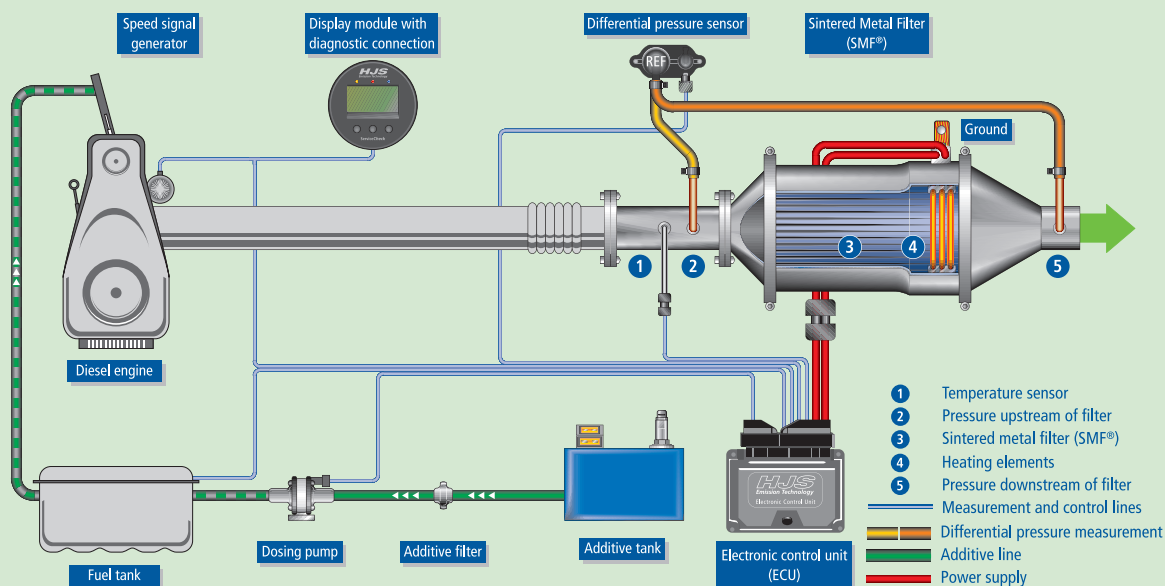
The control unit not only triggers ignition of the soot, but also doses the optimum amount of additive, monitors the filter load and, with the help of sensors, calculates the best timing for regeneration.

In addition, a self-learning driving-cycle recognition functionality generally prevents a regeneration cycle that has already started from being interrupted when the engine is switched off.

What's more, the high soot-holding capacity of the SMF® allows not just one single ideal moment for regeneration, rather regeneration can take place within a wide time slot. If, then, one or even several

regeneration cycles are cancelled owing to the engine being switched off, this poses absolutely no problem in respect of safe and reliable operation of the SMF® system.

A further advantage of the SMF® is its high ash holding capacity, which allows for long servicing and cleaning intervals.



## Servicing and maintenance

### Automatic monitoring and maintenance indicator

The **HJS Service Unit** monitors a filter automatically by measuring the backpressure and temperature of the exhaust gases. Both pieces of information are displayed by the **HJS "ServiceCheck" display module**, which means the status of the filter is immediately visible at all times. The Service Unit is included in the scope of delivery and ensures the filter functions at optimum efficiency.

### Benefits

- ✓ Constant monitoring of the exhaust backpressure and temperature
- ✓ Overload detection for the particulate filter
- ✓ Automatic indication that the filter needs to be cleaned
- ✓ Lower maintenance costs



- Automatic monitoring with the electronic Service-Check

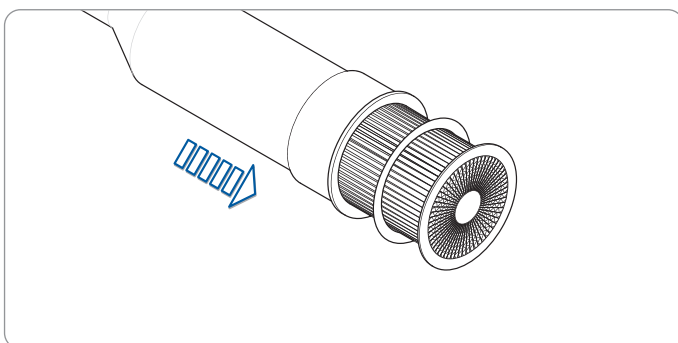
### Maintenance

In addition to combustible soot particles, filter systems also remove all other solid particulate matter from the exhaust gases, above all ash from engine oils and additives. These residues must be removed from the filter at specific intervals by cleaning.

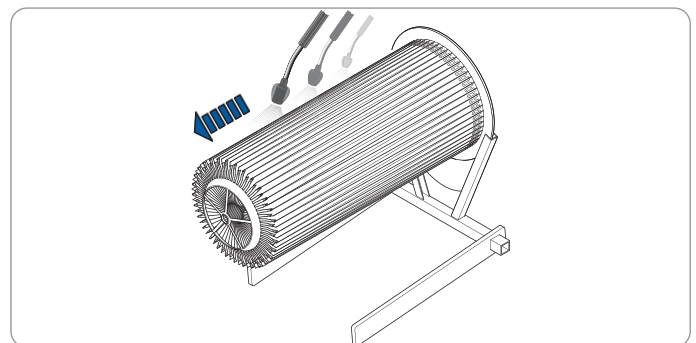
### Quick and simple filter cleaning

When a filter requires cleaning, you or your local garage can take care of it. The filter modules are simple and quick to remove and are then cleaned and freed of all residues with the aid of a **commercially available high-pressure cleaner** (the residues must be collected in an oil separator). Neither is it necessary to send the systems back to HJS, nor is there any need for complex and expensive cleaning equipment, such as a heat treatment furnace or filter cleaning system.

**Observe the national waste disposal regulations applicable in your country.**



Remove SMF® Filter from casing



SMF® Filter cleaning with high pressure washer



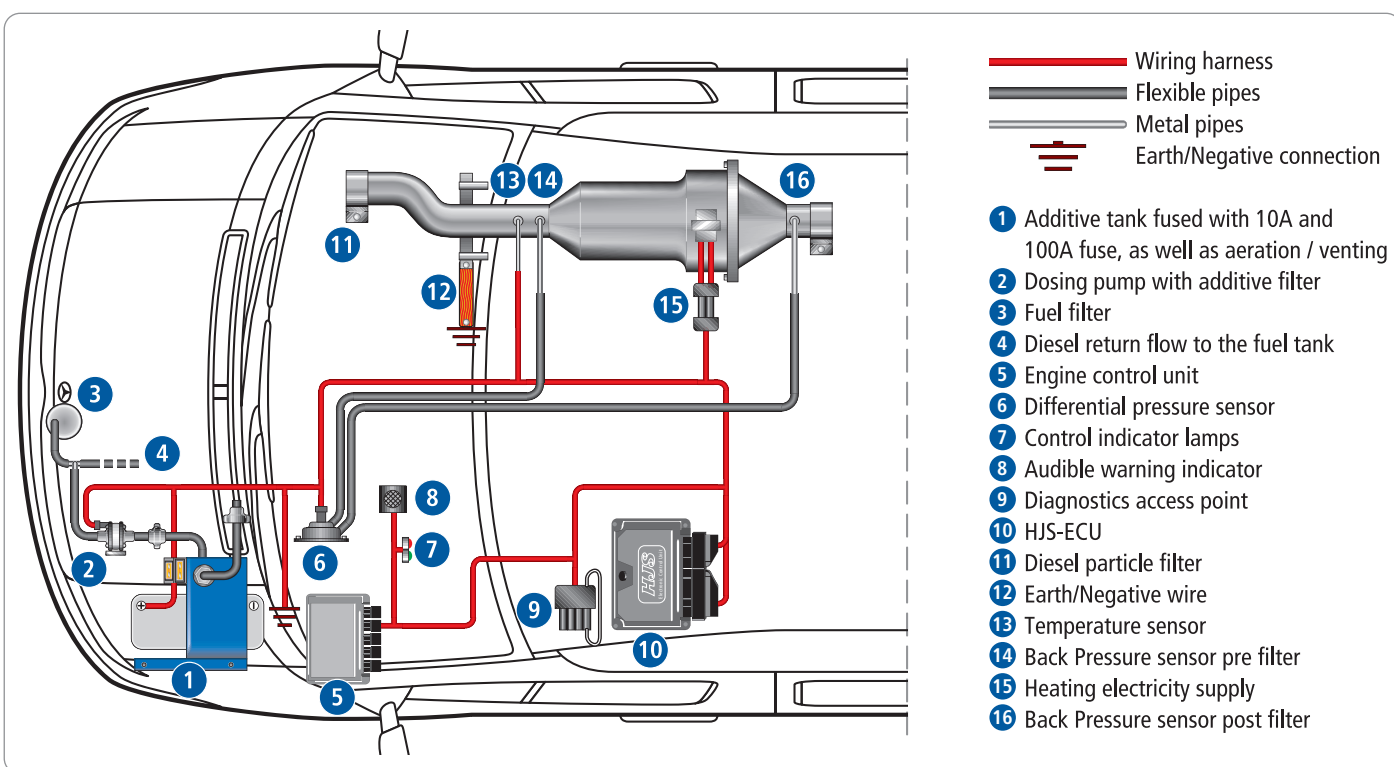
### Market coverage and product range

Many commercial vehicles can be fitted or retrofitted with the HJS SMF®-AR particulate filter system. The HJS SMF®-AR system has proved itself in many applications and in tough fleet operation, both as original (OE) and retrofit equipment.

The existing HJS product range is subject to ongoing review and expansion, which means that there will be constant additions of new vehicle models, especially EURO II and EURO III vehicles.

### SMF®-AR advantages at a glance

- ✓ Suitable for OE and retrofitting applications
- ✓ Over 99% reduction of soot particles, incl. fine particulate matter
- ✓ Particularly suitable for inner-city stop-and-go traffic
- ✓ Fully automatic, active regeneration
- ✓ Modular construction
- ✓ Reliable operation and low maintenance



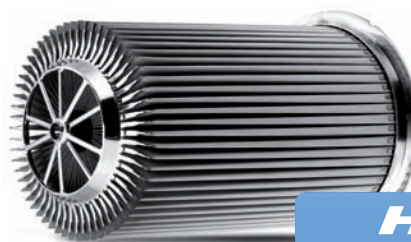
SMF®-AR system in a Mercedes-Benz Sprinter

### Solutions for LEZ III & IV



#### HJS Sintered Metal Technology

- ✓ Easy removal
- ✓ Easy to clean
- ✓ Low lifetime costs
- ✓ Made in Germany



**HJS**  
 Transport for London  
 Certified approved  
 LEZ adaptations

**Retrofit now and get free access to Low Emission Zones**

## Product Range – Direct Fit SMF®-AR

Certifications – Teknologisk Institut (Denmark) / RDW/TNO (Netherlands) / VERT (Switzerland) / LEC through VCA (United Kingdom)

Vehicle	Year of manufacture	Euro level	Engine	Displacement [l]	Performance [kW]	HJS System	HJS Part No.
<b>Citroën</b>							
Jumper 2.8 HDi 130	2002-	III	2.8 HdI 130	2.8	94	SMF®-AR	93 32 2004
<b>Fiat</b>							
Ducato 2.3 JTD	2002-	III	2.3 JTD	2.3	81	SMF®-AR	93 32 2005
Ducato 2.8 JTD	2002-	III	2.8 JTD	2.8	94	SMF®-AR	93 32 2004
<b>IVECO</b>							
Daily III	2003 - 2006	III	2.3 I	2.3	71/100	SMF®-AR	93 71 2013*
Daily III	2000 - 2006	III	2.8 I	2.8	92/107	SMF®-AR	93 71 2011*
Daily III	2004 - 2006	III	3.0 I	3.0	100/122	SMF®-AR	93 71 2011*
<b>Mercedes Benz</b>							
Sprinter 208, 308, 408 CDI	2000 - 2006	III	OM 611 DE 22 LA	2.2	60	SMF®-AR	93 13 2301
Sprinter 211, 311, 411 CDI	2000 - 2006	III	OM 611 DE 22 LA	2.2	80	SMF®-AR	93 13 2302
Sprinter 213, 313, 413 CDI	2000 - 2006	III	OM 611 DE 22 LA	2.2	95	SMF®-AR	93 13 2300
Sprinter 216, 316, 416 CDI	2002 - 2006	III	OM 612 DE 27 LA	2.7	115	SMF®-AR	93 13 2303
						Installation kit for automatic gear box	93 02 4800
Sprinter 616 CDI	2004 - 2006	III	OM 612 DE 27 LA	2.7	115	SMF®-AR	93 13 2303
<b>Peugeot</b>							
Boxer 2.8 HdI	2002-	III	2.8 HDi	2.8	94	SMF®-AR	93 32 2004
<b>VW</b>							
Bus T4	1993 - 2003	III	1.9 I	1.9	50	SMF®-AR	on request
Bus T4	1993 - 2003	III	2.5 I	2.5	75	SMF®-AR	on request
LT 35 A	2001 - 2006	III	BBE 2.5 I	2.5	61	SMF®-AR	93 11 2018

\* The HJS Service Unit must be ordered separately

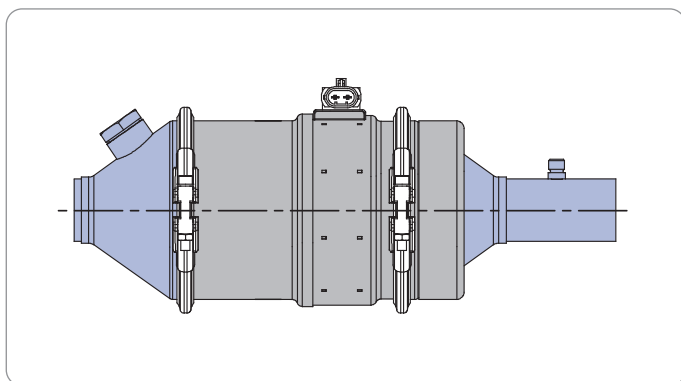
# Product Range – Flex Fit SMF®-AR

Certifications – Teknologisk Institut (Denmark) / RDW/TNO (Netherlands) / VERT (Switzerland) / LEC through VCA (United Kingdom)

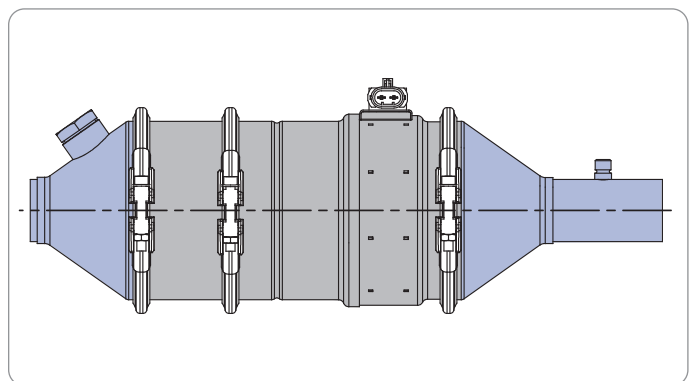
Vehicle class	Euro level	Displacement [l]	Power output [kW]	HJS System	Design	HJS Part No.
N1	II / III	1.0 - 2.5	30 - 55	SMF®-AR 18	ax-ax	93 71 3113
N1	II / III	1.0 - 2.5	30 - 55	SMF®-AR 18	VW LT	93 11 2009
N1	II / III	1.0 - 2.5	30 - 55	SMF®-AR 18	Sprinter	93 13 2312
N1 / M2	II / III	1.5 - 3.2	50 - 115	SMF®-AR 27	ax-ax	93 71 3114
N1 / M2	II / III	1.5 - 3.2	50 - 115	SMF®-AR 27	Sprinter	93 13 2311
N1 / M2	II / III	1.5 - 3.2	50 - 115	SMF®-AR 27	Ducato	93 32 2003
N1 / M2	II / III	1.5 - 3.2	50 - 115	SMF®-AR 27	Iveco	93 32 2009
N1 / N2 / M2	II / III	1.8 - 4.2	75 - 165	SMF®-AR 38	ax-ax	93 71 3115
N1 / N2 / M2	II / III	1.8 - 5.0	85 - 180	SMF®-AR 54	ax-ax	93 71 3116
N1 / N2 / N3 / M2 / M3	II / III	2.0 - 12.0	100 - 240	SMF®-AR 81	ax-ax	93 71 3117

N1 – Commercial Vehicles up to 3.5t      M2 – Minibuses up to 5t  
 N2 – Commercial Vehicles 3.5t to 12t      M3 – Buses more than 5t  
 N3 – Commercial Vehicles more than 12t

## Example Flex Fit SMF®-AR



SMF®-AR – 1.2 m<sup>2</sup> (AXIAL - AXIAL)



SMF®-AR – 1.8 m<sup>2</sup> (AXIAL - AXIAL)

All application specifications, installation guidelines and maintenance manuals provided by HJS Emission Technology GmbH & Co. KG must be complied with.