

## Diesel Particulate Matter (DPM) Control Technologies

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**Table I: Paper/Synthetic Filters**

**Table II: Non-Catalyzed Particulate Filters, Base Metal Particulate Filters, Specially Catalyzed Particulate Filters, and High Temperature Disposable Filters**

**Table III: Catalyzed (Platinum Based) Diesel Particulate Filters**

**Note:** These tables are not all-inclusive and only contain companies who have contacted MSHA in order to list their control technologies.

### **Table I: Paper/Synthetic Filters**

The filters listed below have been evaluated by MSHA and are deemed to be essentially identical (under section 72.503(c)) to the standard paper filter that was previously tested by an independent laboratory for MSHA. MSHA will accept use of these filters as evidence of compliance with the applicable emission limits in sections 72.500 - *Emission limits for permissible diesel-powered equipment*, 72.501 - *Emission limits for nonpermissible heavy-duty diesel-powered equipment, generators and compressors*, or 72.502 - *Requirements for nonpermissible light-duty diesel-powered equipment other than generators and compressors* when properly installed on diesel-powered equipment.

The control device shall be installed and maintained in accordance with the filter supplier's specifications. This includes use at the supplier's specified exhaust gas temperature limit. The limits specified in this table are either 185°F or 302°F to correspond with the Part 36 temperature limits for machines using either water bath scrubbers or dry heat exchangers, respectively, to cool the exhaust gas. Where the filter supplier has not provided information to MSHA on the exhaust gas temperature limit (either 185°F or 302°F), the purchaser needs to contact the filter supplier for this information.

In choosing filters intended for use on permissible machines, contact the machine manufacturer and the filter supplier to ensure the filter is compatible with the machine and sized properly for the engine exhaust flow, temperature, and desired operating life and that the filter meets any specific MSHA approval requirements for filters used on that machine. The filter must be installed and maintained in accordance with the machine manufacturers, the engine manufacturers and the filter supplier's specifications.

In choosing filters intended for use on nonpermissible machines, the filters must be used with exhaust gas cooling systems that limit the exhaust gas temperature to either the filter supplier's specified limit or 302°F, whichever is lower. The efficiency of the filters in Table I is not accepted as meeting the emission limits in sections 72.501 or 72.502 at exhaust gas temperatures above 302°F. Refer to Table II for filters that can be used at higher exhaust gas temperatures and their DPM filtration efficiencies.

The filter tests are performed in a consistent manner on as-received filter samples. However, filter surface area/face velocity and filter life (loading time or number of allowable cleanings) are not considered even though they may affect the filter's in-use efficiency and the choice of a filter for a specific application. The filter is evaluated to ensure that there are no obvious leaks or mechanical failures during the test, the exhaust backpressure does not exceed the engine manufacturer's limit during the test, and that no hazardous off-gassing or combustion occurs at the filter's maximum operating temperature. The test results below are preliminary and MSHA reserves the right to make additions or deletions to this list as new information becomes available.

The filters listed in Table 1 are suitable for use up to a maximum limit of 60 inches of water pressure differential across a dirty filter. Note, the Dry Systems Technologies® filters are limited up to a maximum of 40 inches of water pressure differential across a dirty filter.

<b>Filter Supplier</b>	<b>Filter Manufacturer</b>	<b>Filter Model</b>	<b>Exhaust Temperature Limitation, °F</b>
Atlas Copco Wagner Attn: Dale Harnish 303-217-2817	Atlas Copco	5575074800	Contact Filter Supplier
Baron Filtration Co. 1-800-760-3105	Baron Filtration Co.	Media Spunbond	185
Luber-Finer 1-800-851-3641	Luber-Finer	LAF3931, LAF3931 with fire retardant	Contact Filter Supplier
DBT America, Inc 540-980-4530	DBT	516372, 518404	Contact Filter Supplier
Donaldson Corporation 1-800-374-1374	Donaldson Company, Inc.	P530866, P539366, P549541	Contact Filter Supplier
Donaldson Corporation 1-800-374-1374	Donaldson Company, Inc.	P604516, P607123, P607124	302 <a href="#">See Flyer</a>
Dry Systems Technologies® (Formerly Paas Technologies) 630-427-2051	Dry Systems Technologies®	M30, M40, M70	302
ENK Industrial Ed Molish 205-744-5932	ECO Environmental	ENK13-19280, ENK19-29160, ENK20-29270, ENK24-29200, ENK25-19175, ENK26-19175, ENK26-29150, ENK28-19107, ENK28-19145, ENK28-19175	302 <a href="#">See Flyer</a>
Endustra Filter Manufacturers 800-521-1008	Endustra	R020001	185
Endustra Filter Manufacturers 800-521-1008	Endustra	R030042, R030072, R030137, R040957	302
Filter Service & Testing Corp. (Bunderson) 435-637-3567	Filter Service & Testing Corp. (Bunderson)	FST-115-26, FST-110-28, FST-125-26C, FST-110-22C, FST-100-20, FST-90-16, FST-150-20, FST-220-26	302 <a href="#">See Flyer</a>
Cummins Filtration Attn: Tao You 608-877-3848	Fleetguard	AF25299	185
Cummins Filtration Attn: Tao You 608-877-3848	Microfresh	PF72001 (formerly DA101)	Contact Filter Supplier
Getman Corporation 269-427-5611	Getman	605803, 605803 with 605807 pre-filter, 605810, 605811	Contact Filter Supplier
WIX Filtration Corp / Affinia Group 704-864-6748	WIX	46860FR	Contact Filter Supplier

**Table II: Non-Catalyzed Particulate Filters, Base Metal Particulate Filters, Specially Catalyzed Particulate Filters, and High Temperature Disposable Filters**

Contact the filter supplier to ensure the filter is compatible with the machine and sized properly for the engine exhaust flow, temperature, and desired operating life. The filter must be installed and maintained in accordance with the filter supplier's specifications. The test results below are preliminary and MSHA reserves the right to make additions or deletions to this list as new information becomes available.

Non-Catalyzed Particulate Filters, Base Metal Particulate Filters, Specially Catalyzed Particulate Filters, and High Temperature Disposable Filters	Manufacturer	DPM Filtration Efficiency*
Non-Catalyzed Diesel Particulate Filters, Cordierite, Series FN	CleanAir Systems, Santa Fe, New Mexico 800-355-5513	85
Non-Catalyzed Diesel Particulate Filter, Cordierite, Part Nos. 2000EC, 1800EC, 1500EC, 1100EC, 1050EC, 1000EC, 900EC, 700EC, 500EC	Nett Technologies Toronto, Canada 800-361-6388	85%
Non-Catalyzed Diesel Particulate Filter, Silicon Carbide, Series 3000ES, 2500ES, 2000ES, 1500ES	Nett Technologies Toronto, Canada 800-361-6388	87%
Titan TM and Blue Sky TM (non-catalyzed) Sootfilter System, Silicon Carbide	DCL International Inc. Concord, Canada 800-872-1968	87%
Cattrap TM Diesel Particulate Filter (passively regenerated, base metal catalyst) Cordierite	Engine Control Systems Newmarket, Canada 800-661-9963	85%
Unikat Combifilter TM (actively regenerated), on board regeneration, Cordierite	Engine Control Systems Newmarket, Canada 800-661-9963	85%
Unikat Combifilter TM (actively regenerated), on board regeneration, Silicon Carbide	Engine Control Systems Newmarket, Canada 800-661-9963	87%
Unikat Combifilter TM (actively regenerated), off board regeneration, Cordierite	Engine Control Systems Newmarket, Canada 800-661-9963	85%

Diesel Particulate Filter (noncatalyzed with fuel additive), Cordierite, Model Numbers. SXS-B, SXS-B/F A, and SXS-E	Catalytic Exhaust Products, LTD 800-551-5525	85%
PERMIT™ FBC Filter System (specially catalyzed with fuel borne catalyst), Cordierite	CleanAir Systems, Santa Fe, New Mexico 800-355-5513	85%
High Temperature Disposable Exhaust Filter Part Number P604516	Donaldson Company, Inc. 1-800-374-1374	83% max. temp. 650°F <a href="#">See Flyer</a>
Filter Service & Testing Corp. (Bunderson) 435-637-3567 FST-115-26, FST-110-28, FST-125-26C, FST-110-22C, FST100-20, FST-90-16	Filter Service & Testing Corp. (Bunderson)	80%, max. temp. 650°F <a href="#">See Flyer</a>
PERMIT™ FBC Filter System (specially catalyzed with fuel borne catalyst), Cordierite Installed on a Deutz-MWM Model 916 Diesel Engine	CleanAir Systems, Santa Fe, New Mexico 800-355-5513	87%
Rypos HDPF/C Filter System, Model RH-305-M-C, Sintered Metal Fiber, Electrical heating for on board regeneration	Rypos Incorporated, Holliston, MA 508-429-4552	80%
Nett Catalyzed Diesel Particulate Filter with NO <sub>2</sub> Suppressant (Passive Regeneration), Cordierite Model Nos.: SN500, SN700, SN900, SN1000, SN1050, SN1100, SN1200, SN1500, SN1800, and SN2000	Nett Technologies Inc. Mississauga, ON, Canada 800-361-6388	85%
Nett Catalyzed Diesel Particulate Filter with NO <sub>2</sub> Suppressant (Passive Regeneration), Silicon Carbide Model Nos.: SO500, SO700, SO900, SO1000, SO1050, SO1100, SO1200, SO1500, SO1800, and SO2000	Nett Technologies Inc. Mississauga, ON, Canada 800-361-6388	87%
Mann Hummel Industrial Filters, Model SMF-AR, Sintered Metal Fiber, Electrical heating for on board regeneration with EnerBurn EC 5931 A fuel additive from EnerTeck Chemical Corporation	Mann Hummel Industrial Filters, Ludwigsburg, Germany 269-329-3900	81%
HUSS DPF Type MK with diesel burner, Silicon Carbide wall flow filter	HUSS Palm Springs, CA 888-360-4877	91%**

\*Manufacturer's laboratory based efficiency (Not determined under in-mine test)

\*\*Based on VERT Filter Test, 07/2002

**Table III: Catalyzed (Platinum Based) Diesel Particulate Filters**

**Caution:** MSHA has identified the platinum based catalyzed particulate filters in listed in Table III as a source for generation of increased concentrations of Nitrogen Dioxide (NO<sub>2</sub>) in the mine atmosphere. Actual in-mine NO<sub>2</sub> concentrations will be dependent on the mine's ventilation system. Refer to MSHA's Program Information Bulletin No. P02-4 (<http://www.msha.gov/regs/complian/PIB/2002/pib02-04.htm>) for additional information. For coal mine operators, MSHA's Program Information Bulletin No. P02- 7 (<http://www.msha.gov/regs/complian/PIB/2002/pib02-07.htm>) details the steps that must be taken to ensure that platinum based catalyzed filters installed prior to July 16, 2002 do not increase in-mine NO<sub>2</sub> concentrations.

**After July 16, 2002, coal mine operators should not install filters listed in Table III.**

<b>Catalyzed (Platinum Based) Diesel Particulate Filters</b>	<b>Manufacturer</b>	<b>DPM Filtration Efficiency*</b>
Catalyzed Diesel Particulate Filters, Cordierite, FC, FD	CleanAir Systems, Santa Fe, New Mexico 800-355-5513	85 %
DPX™ and DPX II™ Catalyzed Soot Filter System, Cordierite	Engelhard, Iselin, New Jersey 800-523-3599	85%
Catalyzed Diesel Particulate Filter, Cordierite, Part Nos. 2000SF/SE, 1800SF/SE, 1500SF/SE, 1100SF/SE, 1050SF/SE, 1000SF/SE/, 900SF/SE, 700SF/SE, 500SF/SE	Nett Technologies Toronto, Canada 800-361-6388	85%
Catalyzed Diesel Particulate Filter, Silicon Carbide, Series 3000SC/SS, 2500SC/SS, 2000SC/SS, 1500SC/SS	Nett Technologies Toronto, Canada 800-361-6388	87%
Titan™ and BlueSky™ Sootfilter System, Silicon Carbide	DCL International Inc. Concord, Canada 800-872-1968	87%
MINE-X® Catalyzed Sootfilter, Cordierite	DCL International Inc. Concord, Canada 800-872-1968	85%
Purifilter™ (passively regenerated), Silicon Carbide	Engine Control Systems Newmarket, Canada 800-661-9963	87%
Catalyzed Diesel Particulate Filter, Cordierite, Model Numbers. SXS-CX and SXS-C	Catalytic Exhaust Products, LTD 800-551-5525	85%

\*Manufacturer's laboratory based efficiency (Not determined under in-mine test)