

DPF-retrofit for construction in Berlin and other German cities

8th VERT Forum March 17th 2017

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○ Motivation

- The emission limits for non-road mobile machineries are behind the onroad legislation
- Berlin considers in urban environment the emission of construction machines as a significant contributor to air pollution – fine dust
- After implementation of the environmental zones in Berlin **apr. 142 tons** of soot are produced by the Heavy duty on road vehicles **instead of 255 tons before** the implementation
- Emissions of non-road mobile machineries like construction machines contribute 90 ... 170 ton to the air pollution – it is therefore comparable to onroad
- The emissions are considered more critical because they are emitted locally concentrated

○ Motivation

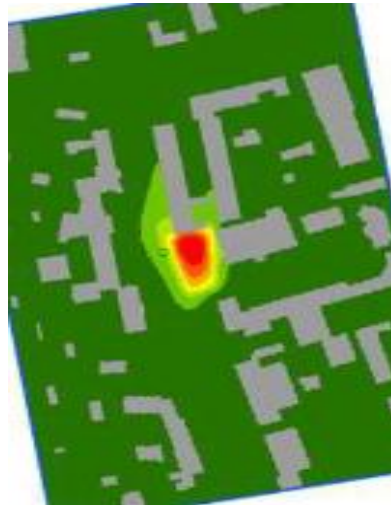
- Implementation of the environmental zones in Berlin
-> apr. 15.000 heavy duty vehicles have been retrofitted between 2009 and 2012
- Reduced for heavy duty vehicles the particle emissions by 40%
- Construction machines are not falling under this regulation
- Decision to make it mandatory to use low emission construction machines
- Regulation for construction areas under the responsibility of the public authorities

Motivation

Kfz-Verkehr



Baustelle



Effect at the edge of a construction area with 5 machines stage II, service 8am ... 4 pm;
 Compared to apr. 46.500 vehicles per day with 1.800 trucks and busses
 → + 2 µg/m³ more fine dust in annual average
 → + 10 days with exceeding the European 24h limit

○ Detailed Environmental Standards are Public

- Complete legislation can be found under

<http://www.stadtentwicklung.berlin.de/service/gesetzestexte/de/beschaffung/>

Or under:

www.berlin.de/baumaschinen-partikelfilter

○ Definition of low emission construction machines

Power	Emission standards	Machines falling under the onroad homologation (heavy duty onroad standard)	Mobile equipment with constant engine speed
ab 19 kW und < 37 kW	Stufe IIIA ¹⁾	minimum Euro IV ²⁾	Partide filter, first fit or retrofit
ab 37 kW und < 56 kW	Stufe IIIB ¹⁾		
ab 56 kW bis 560 kW	Stufe IIIB oder IV		

- Machines which don't apply have to be retrofitted with a diesel particulate filter

○ Requirements for particle filters to retrofit

- Diesel particle filters have to be certified by minimum one of the following certifications
- Stage PMK 2 according „Anlage XXVII zur Straßen-verkehrs-Zulassungs-Ordnung (StVZO)“
- Class 1 or 2, reduction stage 01 of UNECE guideline No. 132 (REC-guideline)
- FAD Quality seal
- On VERT filter list and/or conformity according Swiss LRV (BAFU List)
- Machines which have been retrofitted to fulfill the requirements of TRGS 554.



Implementation of the regulation

- The standards will be implemented in two steps according to the machine types
- First step: defined machine types from January 2016 on
- Second step: defined machine types from July 2017 on
- Only closed DPF systems are allowed for retrofit

Umweltstandards einzuhalten ab	Maschinenkategorie
01.07.2015	<ul style="list-style-type: none"> ■ Radlader, Baggerlader, Raupenlader, Kompaktlader, Teleskoplader, sonstige Lader ■ Kompressoren und Generatoren ■ Mörtelförderer und Verputzgeräte, Betonmischer und Betonpumpen ■ Pumpen zum Wassermanagement ■ Unabhängig von der Maschinenkategorie: selbstfahrende Arbeitsmaschinen mit Typzulassung des Motors nach Richtlinie 88/77/EWG (Abgasnorm für Lkw)
01.07.2016	<ul style="list-style-type: none"> ■ Mobilbagger, Standbagger, Hydraulikbagger, Seilbagger, Schreitbagger, Minibagger, Kompaktbagger, Teleskopbagger, sonstige Bagger ■ Dumper/Muldenkipper ■ Verdichtungsmaschinen ■ Mörtelförderer und Verputzgeräte, Betonmischer und -pumpen

„Plakettenkennzeichnung“ since May 2016



- Machines with variable Speed Maschinen and marked with one of these stickers can be used on Berlin public construction areas
- It is considered that future stage V machines allways are equipped with an closed DPF and these machines get the blue sticker.
- Machines with constand speed engines shall be allowed only with DPF – dark green or blue sticker

○ Current Project Status



**Baumaschine
Motor-Standard III**

Siegel
+ lfd.
Nr.

Motorleistung: kW

ZF-Ident-Nr. (letzten 6 Ziff.)

- ≈1000 stickers – IIIA or IIIB depending on engine power



**Baumaschine
Motor-Standard IV**

Siegel
+ lfd.
Nr.

ZF-Ident-Nr. (letzten 6 Ziff.)

- ≈900 stickers – stage IV without filtersr)



**Baumaschine
mit Partikelfilter**

Siegel
+ lfd.
Nr.

ZF-Ident-Nr. (letzten 6 Ziff.)

Filter-Seriennummer:

- 1400 stickers – closed filter systems, first fit or retrofit

Example for Stickers



Workshops for Operators and Inspectors

- **December 7th 2 pm 2016 | Berlin**
Workshop and training for construction machines users and owners
- **December 8th 2016 | Berlin**
Workshop and training for inspectors
First onsite inspection




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Senatsverwaltung
für Stadtentwicklung
und Umwelt

berlin Berlin

Termin 08.12.2016 | 10:00 - 13:00 Uhr
Optional: Baustellen-Begehung von 14:30 - 16:00 Uhr

Fachveranstaltung in Berlin
Neue Mindeststandards und
Partikelfilternachrüstung für Baumaschinen
im Hoch- und Tiefbau im Rahmen
öffentlicher Aufträge in Berlin



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Senatsverwaltung
für Stadtentwicklung
und Umwelt

berlin Berlin

07.12.2016 | 14:00 - 17:00 Uhr

Fachveranstaltung in Berlin
Partikelfilternachrüstung und Umweltstandards
für Baumaschinen im Hoch- und Tiefbau im
Rahmen öffentlicher Aufträge

○ Onsite workshop with Inspectors



○ Support for building and construction companies

- Guideline for retrofit of construction machines
 - Hotline for companies in Berlin
 - Website for the project
 - Information workshops
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- Find the official complete guideline „Umwelt und Beschaffung“ under:
<http://www.stadtentwicklung.berlin.de/service/gesetzestexte/de/beschaffung/>
or: www.berlin.de/baumaschinen-partikelfilter



○ Germany with Low Emission Construction Machines

- Berlin
- Baden-Württemberg
- Bremen
- Leipzig
- Dresden
- München (in planning)

