



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Federal Department of the Environment, Transport,  
Energy and Communications

**Federal Office for the Environment FOEN**

Air Pollution Control and NIR Division  
Traffic Section

# **Air Pollution Control at Construction Sites**

## **Amendment of the Ordinance on Air Pollution Control (OAPC) dated 19th September 2008**

UNECE GRPE REC Meeting  
27 September 2010, Brussels

Giovanni D'Urbano, Federal Office for the Environment (FOEN)



# OAPC Amendment: area of application

- New provisions are valid for all construction sites in Switzerland independent of their duration or size
  - No difference between A- and B-Sites
- Not concerned are the following similar sites:
  - Sites like construction sites
    - Gravel pits, quarries, brickworks, sites for recycling building material
  - Construction works, which need no planning permission
    - e.g. small gardening



# OAPC Amendment: area of application (II)



Valid for:

- All new applications  $\geq 18$  kW
- All applications built since 2000  $\geq 37$  kW



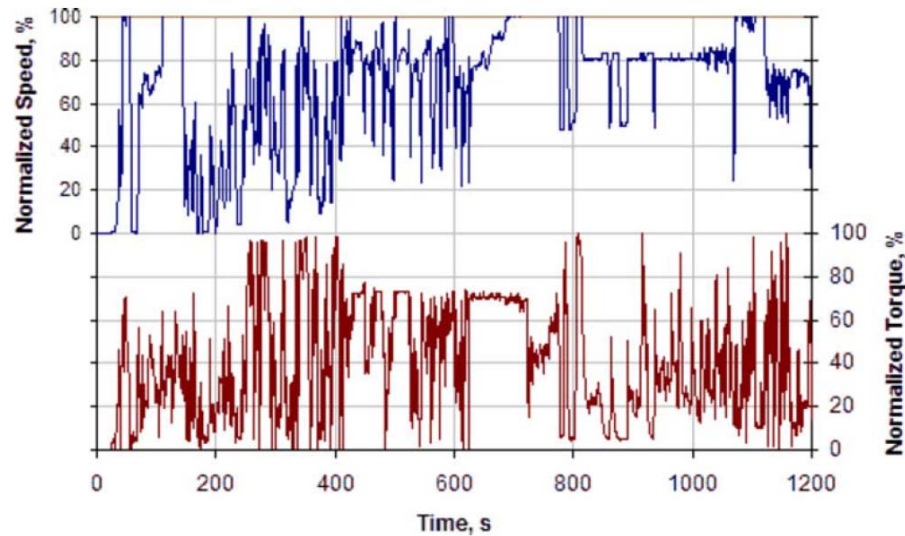
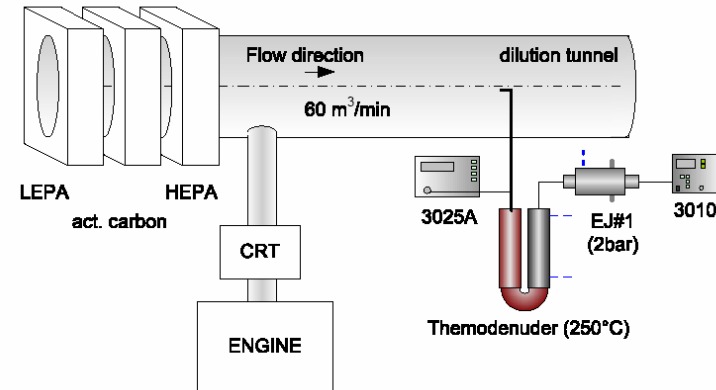
# OAPC: Requirements for Construction Machines

- Emissions from construction machines must meet the relevant requirements for the corresponding year of manufacture for mobile machines and appliances in accordance with Directive 97/68/EC
- In addition, exhaust emissions from construction machines may not exceed the particle count of  $1 \times 10^{12}$  1/kWh for solid particles with a diameter greater than 23nm
- The requirement on particle number emission shall be deemed to be met if the construction machine concerned is operated with an approved particle filter system



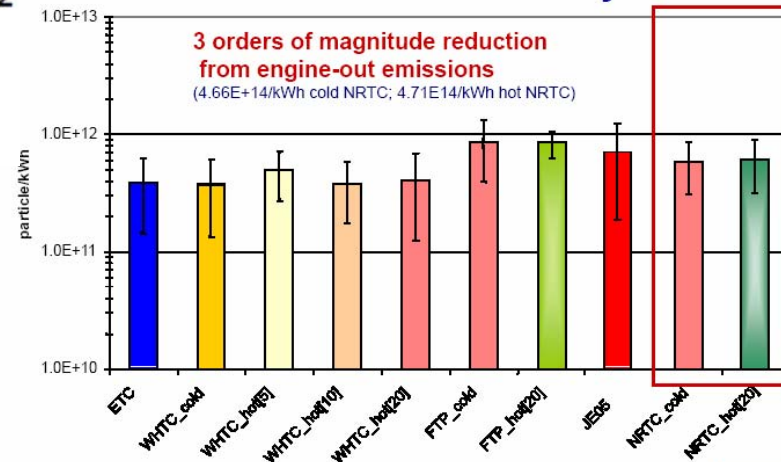
# OAPC: Requirements for Construction Machines - PMP

## Particle Number Measurements



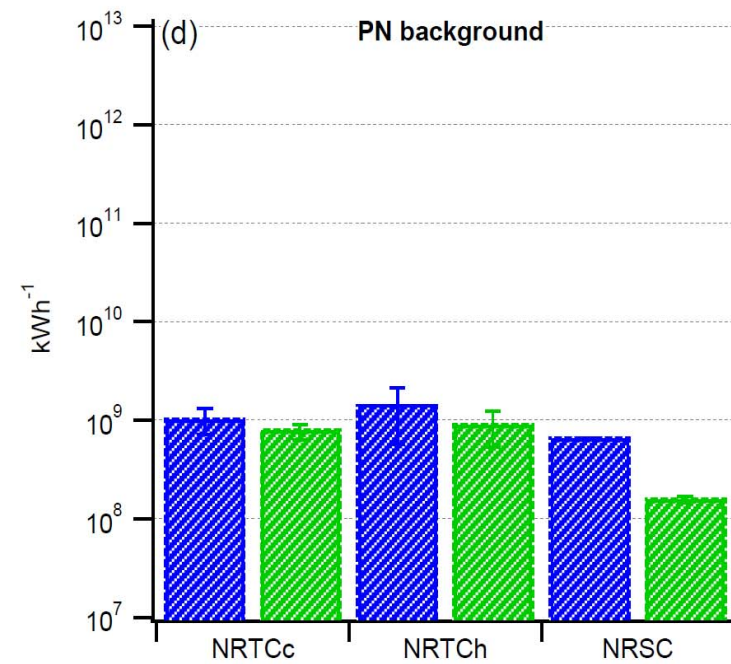
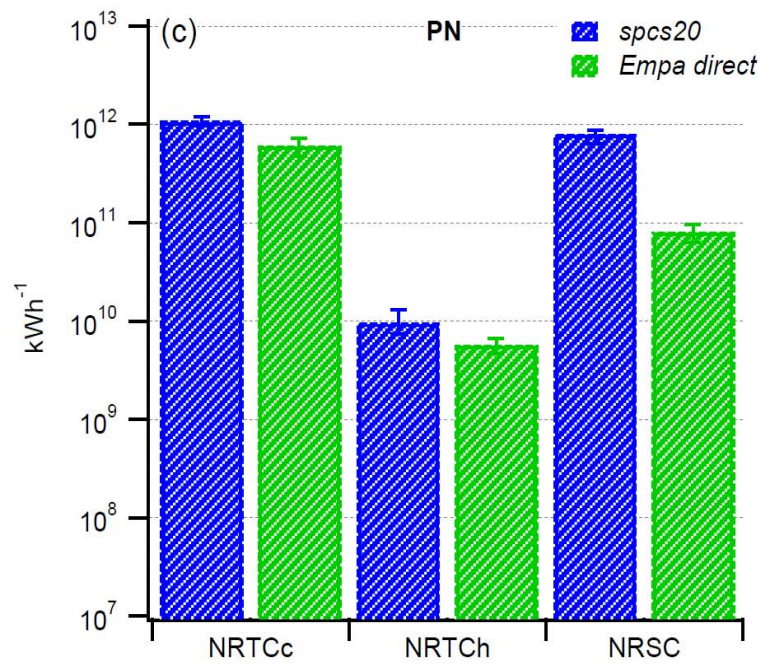
Normalized Speed And Torque Over NRTC Cycle

## Particle numbers measurements over non-road transient cycle





# PMP Results of Non-road testing





# OAPC: Requirements for Particle Filter Systems

- a. They must separate 97 percent of solid particles with a diameter between 20 and 300 nm in new condition and after running uninterruptedly for 1,000 hours in typical operation;
- b. They must separate 90 percent of solid particles during the regeneration process;
- c. They must be equipped with an electronic monitoring device that records pressure losses that could lead to faulty operation and thus trigger an alarm, and which in the case of damage also interrupts the input of additives;
- d. With free acceleration of the engine, they must remain below an opacity coefficient of  $0.15 \text{ m}^{-1}$ ;
- e. They must be constructed in such a manner as to ensure that they cannot be installed in the reverse flow-through direction;
- f. They must be supplied with cleaning and maintenance instructions;
- g. They must be operated without additives containing copper or catalytic coating containing copper in the exhaust treatment system;
- h. They must limit the secondary pollutant emissions that arise during operation to an extent that is technically and practically feasible, and economically tolerable.





# Swiss Standard for Particle Filters

**INB** Interdisziplinärer Normenbereich  
Secteur interdisciplinaire de normalisation

Schweizer Regel  
Règle Suisse  
Regola Svizzera **SNR**  
**SNR 277205**

EINGETRAGENE NORM DER SCHWEIZERISCHEN NORMEN-VEREINIGUNG SNV NORME ENREGISTRÉE DE L'ASSOCIATION SUISSE DE NORMALISATION

Ersatz für / Remplace:  
SNR 277205:2007

Ausgabe/Edition: 2009-11

## Testing of Particle Filter Systems for Internal Combustion Engines

Prüfung von Partikelfiltersystemen für Verbrennungsmotoren

Test de systèmes de filtres à particules pour moteurs à combustion

Collaudo di sistemi di filtri antiparticolato per motori a combustione





# OAPC: Labelling

- The manufacturer or importer shall affix a clearly visible, permanent and clearly legible label/plate to each construction machine **and to each** particle filter system, containing the following information:
  - a. Name of manufacturer or importer;
  - b. Serial number;
  - c. Designation of type;
  - d. Name of certification bureau, insofar as certification is required.



## OAPC: Labelling (II)

- In addition, labels/plates on construction machines must contain the following data:
  - a. Year of manufacture of the machine;
  - b. Engine power output in kW;
  - c. Designation of type of particle reduction system.
- If a construction machine is brought into circulation and subsequently retrofitted with a particle filter system, the installer of the particle filter system must affix a label/plate that contains the information cited above



# OAPC: Certification of Conformity

- New construction machines may only be brought into circulation if their conformity with the requirements has been certified
- The FOEN shall publish a list of approved particle filter system types
- Testing laboratories and certification bureaux are accredited and recognised by FOEN
- Certification of conformity contains:
  - Certificate issued by an official certification bureau
  - Declaration of conformity from the manufacturer/importer
  - Label or plate
- The manufacturer/importer shall retain each declaration of conformity for a period of 10 years



# Laboratories and certification bureaux

- **AFHB**  
Berner Fachhochschule  
Technik und Informatik  
Abgasprüfstelle und Motoren-labor  
**Recognised as:** Testing laboratory
- **AVL MTC**  
Motortestcenter AB  
**Recognised as:** Testing laboratory
- **EMPA**  
Eidg. Materialprüfungs- und Forschungsanstalt  
**Recognised as:** Certification bureau
- Note: The process of officially recognising other testing centres and certification bureaux is currently in progress.



# OAPC: Coming into Force and Transitional Provisions

<b>Power Output</b>	<b>Age of the Machine</b>	<b>Coming into force and transitional provisions</b>
From 37kW	New ones, from year of manufacture 2009	1st January 2009
	In-service ones Year of manufacture 2000 – 2008	1st May 2010  For use on bigger construction sites (so-called B-Sites), the current compulsory retrofit provisions continue to be valid
	Year of manufacture prior to 2000	1st May 2015
From 18kW to 37kW	New ones, from year of manufacture 2010	1st January 2010
	In-service ones	Compulsory retrofit provisions at B-Sites are dropped.



# FOEN Filter List: Current Version

The screenshot shows a web browser window with the URL <http://www.environment-switzerland.ch/filterlist/>. The page is titled "FOEN - Particle Filter List - Particle fil...". The header includes the Swiss flag and the text "Schweizerische Eidgenossenschaft", "Confédération suisse", "Confederazione Svizzera", and "Confederaziun svizra". The main header features the FOEN logo and the text "Federal Administration admin.ch", "Department of the Environment, Transport, Energy and Communications", and "Federal Office for the Environment FOEN". The navigation menu includes "Topics", "Environmental state", "Services", "Documentation", and "The FOEN". The main content area is titled "Particle Filter List" and "Particle filter system types". It includes a search bar and a list of manufacturers under the letter 'A':

- [AIRMEEX](#)
- [ARPA ER - ENDEAVOUR](#)

The page also includes a sidebar with "Aids to enforcement" and "Legal foundations" sections.