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Transmitted by the expert from Switzerland

Entering into Force of the Swiss Guideline on „Air Pollution Control at Construction Sites“

The **“Swiss Agency for the Environment, Forests and Landscape (SAEFL/BUWAL)”** has introduced as from **1st of September 2002** the Guideline on „Air Pollution Control at Construction Sites“. This Guideline enables the consistent implementation of the prescribed precautions to protect air quality at construction sites. The Guideline defines the generally formulated directives in Figure 88 Annex 2 of the Swiss Ordinance on Air Pollution Control (OPAC).

At the moment this Guideline is available in German, Italian and French language only, under the following web-site:

http://www.umwelt-schweiz.ch/buwal/de/fachgebiete/fg_luft/vorschriften/industrie_gewerbe/index.html

An English version will be available soon under the same address.

The following **excerpt** shows **the construction machines related parts** of this Guideline:

“4 Assessing air pollutant emissions at construction sites

4.1 Definition of countermeasure stages

Categories A and B define the stipulations for precautionary curtailment of air pollutants at construction sites. Stage A comprises basic stipulations and represents the «good building practices». Stage B has supplementary stipulations for further specific precautions.

4.2 Categorizing construction proposals

A ***construction proposal*** is categorized depending on the specific emissions and the site circumstances. The pertinent objective parameters **(duration, type and size of the site)** are obtainable from the planning request. The building and population densities determine the parameter **location**. The project is categorized as «B» (basic plus specific countermeasures), when any **one** criterion (duration, area, or volume) is fulfilled for the pertinent project location class (see Table 4.2). Otherwise, the site is categorized «A» (basic countermeasures).

Table 4.2: Criteria to categorize construction sites for B countermeasures

		Duration*	Size of worksite	
			Area*	Cubature*
Site location:	Rural	>18 months	>10’000 m^2	>20'000 m^3
	Urban / city center	>12 months	>4’000 m^2	>10’000 m^3

The authorities can make specific decisions for unusual circumstances (e.g. short duration but very high emissions, extremely high nuisance for nearby residents).

* ~~All terminology is defined in the Glossary (Annex 4)~~ Note: Annex 4 is not contained in this excerpt

5 Emission abatement at construction sites

5.4 Stipulations for machines and equipment

G1	Deploy low-emission equipment, e.g. powered with electrical motors.	A	B
G2	Equip and maintain combustion-engine powered machines and tools according to the manufacturers' specifications.	A	B
G3	Display inspection stickers confirming the scheduled maintenance of machines and equipment powered by combustion engines <18 kW.	A	B
G4	All machines and vehicles with combustion engines ∅18 kW must: ∉# be identifiable; ∉# be periodically inspected as per Annex 2, and have an applicable exhaust gas test document; and ∉# exhibit an exhaust- inspection sticker.	A	B
G5	Directive 97/68/EC or the ECE Regulation No. 96 are mandatory for new machines after the validity date. However, vehicles with traffic number-plates are subject to the road transport directive.	A	B
G6	Equipment powered with 2-stroke gasoline engines, or 4-stroke gasoline engines without catalytic converters, must be fuelled with special equipment gasoline certified to standard SN 181 163 (see vendor list obtainable from EMPA Dübendorf, Dept. 133, www.empa.ch).	A	B
G7	Employ low-sulphur fuels (sulphur content <50ppm) for machines and equipment powered with diesel engines.	A	B
G8	At construction sites categorized B, diesel-powered machines and equipment must, depending on their power rating, have engines fitted with particle trap systems (PTS) complying with recommendations in the Filter List (SAEFL/BUWAL, Suva [1]) or equivalently effective emission curtailment traps. Transition periods: After this Guideline is promulgated, there is a grace period as follows: One year for engines rated >37 kW, or Three years for engines rated 18–37 kW. Exempt from particle-trap fitting are seldom (maximum one working day per site annually) deployed machines and equipment. Excluded are combustion engine powered machines and equipment deployed in underground mines[2].		B
G9	Implement dust abatement (e.g. wetting, trapping, suction, filtering[3]) for dusty mechanical working (e.g. sawing, grinding, etc.) of building materials. Construction sites categorized A must enforce this Construction Guideline Air within 5 years of promulgation.	A	B

[1] See this Internet page for the updated Filter-list:
www.umwelt-schweiz.ch/buwal/de/fachgebiete/fg_luft/vorschriften/industrie_gewerbe/filter/

Note: Suva = Swiss National Accident Insurance Organization

[2] Underground it has been mandatory since 1 Jan. 2002, to retrofit all deployed diesel-powered vehicles and equipment with particle trap systems. See Suva Communiqué AS456 of 30 April 2001 and the Suva Internet page on particle-trap imperative: www.suva.ch/scripts/suva/suvapro/partikelfilterobligatorium_d.asp

[3] See Suva Internet page on technical products «Produkte für die Technik»: www.suva.ch/sapros and the list of approved equipment: www.BIA-HANDBUCHdigital.de/fs.html under the Number 510‘210

Annex 2

Curtailing emissions from combustion engines at construction sites

The emissions from worksite machines must be periodically inspected (see Chapter 5, countermeasure G4). The exhaust inspection document is updated when the stipulations described below are fulfilled.

Regularly registered road vehicles are exempt.

1 Diesel engines

Measuring the smoke emission[4]:

- Smoke is measured as peak value of the exhaust gas opacity, during free acceleration[5].
- Use calibrated opacity meters and the procedures defined in the directive for combustion engine exhaust instrumentation (VAMV)[6].

The Swiss Federal Office for Metrology and Accreditation (METAS) publishes the list of approved calibration instruments[7].

1.1 Diesel engines without particle trap systems

The Guideline stipulation is fulfilled when the measured opacity coefficient *k* is less than 2.5 m^{-1} for aspirated engines and less than 3.0 m^{-1} for supercharged engines[8,9].

1.2 Diesel engines with particle trap systems

The Guideline stipulation is fulfilled when the measured opacity coefficient *k* is less than 0.24 m^{-1}.

2 Spark ignition engines (e.g. gasoline engines)

Following gas components must be measured during idling:

- Carbon monoxide (CO)
- Hydrocarbons (HC).

Measuring the exhaust gas composition:

- Use calibrated instruments and the procedures defined in the directive for combustion engine exhaust instrumentation (VAMV).
- METAS publishes the list of approved calibration instruments for gas composition[10].

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4 To verify the emission stability, it is recommended to also measure the exhaust-gas composition according to the Guideline on exhaust-gas instrumentation for worksite machines, dated 17 March 2000.
Measure the exhaust-gas components oxygen (O_2), carbon monoxide (CO), nitrogen monoxide (NO), nitrogen dioxide (NO_2) and hydrocarbons (HC) at lower idling, upper idling and at full load. The guideline can be obtained from METAS or downloaded from the Internet.

5 This method is identical with the test procedure for periodic exhaust-gas inspection of road vehicles pursuant to Art. 59a of the road transport directive "Verkehrsregelnverordnung (VRV)" of 13 Nov. 1962, SR 741.11. Also the directive on vehicle smoke emissions "Verordnung über Wartung und Nachkontrolle von Motorwagen betreffend Abgas- und Rauchemissionen" of 21 August 2002, SR 741.437.

6 Instrument Specifications: directive on measuring engine exhaust-gases " Verordnung für Abgasmessgeräte für Verbrennungsmotoren (VAMV)" of 20 Oct. 1993, SR 941.242; METAS directives of 27 Oct. 1993. Verordnung über die Qualifizierung von Messmitteln (Eichverordnung) 17 Dec. 1984, SR 941.210.

7 Publication on the METAS web-site: http://www.metas.ch/

8 Guideline 96/96/EC of the European Council dated 20 December 1996 on harmonizing the legislation of member states pertaining to technical inspection of motor vehicles and trailers.

9 Verification of engine setting is recommended when the opacity coefficient *k* exceeds 1.6 m^{-1} .

10 Publication on the METAS web-site: http://www.metas.ch/

The Guideline stipulation is fulfilled when the following limits are not exceeded[11]:
∉# CO: 35‘000 cm^3/m^3
∉# HC: 500 cm^3/m^3

3 Engine inspection

At each emission measurement, the emission-relevant fittings should also be inspected.

The exhaust gas inspection document must include a confirmation that the exhaust gas after-treatment system is correctly installed and gas tight.

4 Inspectors and documentation

The OAPC executive authorities or a designated specialist center shall perform the measurements. The authorities can also delegate this task to trained employees of the contractor.

The measurement results and the inspection findings must be recorded in the exhaust gas inspection document with date and signature of the inspector, according to the official printout from the exhaust-measuring instrument.”

[11] Directive of 21 August 2002 on vehicle maintenance and inspection for exhaust-gas and smoke emissions "Wartung und Nachkontrolle von Motorwagen betreffend Abgas- und Rauchemissionen", SR 741.437