

WLTP-DTP Additional Pollutants Subgroup

Validation phase 2?

*2011 Bern, EU-WLTP
7th DTP Meeting-13 September*

Pollutants to be addressed during phase 2?

NO₂ VALIDATION PHASE 2 SHOULD INCLUDE NO₂ MEASUREMENTS

NH₃ *Row measurements difficult to implement right now*

N₂O *Sampling devices not yet available/mature*

Ethanol (EtOH) and **Aldehydes**: Formaldehyde, Acetaldehyde (RCHO, R = H or Me)

Only relevant for Flex fuel vehicles (not part of validation 2)



1. **NO₂** Performance criteria and list of parameters will be provide by coordinator
2. **NO₂** criteria should be based on NO_x (e.g. variability max twice the variability of No_x; Criteria must also depend on absolute value)
3. Ref document **WLTP-DTP-02-06e.doc** (available on CIRCA).

- Parameter setting lists overview of the test procedure: will be based on gtr doc
- Gathering the required information with respect to performance criteria has been tasked within group.
- Delivery of Data format for exchange for NO₂

Work on going

- **Drafting of GTR for reference methods [*]**
 - NO₂ and NH₃ based on OICA proposals
 - N₂O, Ethanol and Aldehydes based on existing legislation
- Gathering of performance data for **candidate methods**

Tasks have been assigned within group and will be performed until next meeting.

[*] Draft GTR proposal: WLTP-DTP-LabProcICE-061

Ref.: CIRCA documents WLTP-DTP-AP

Draft GTR proposal:

WLTP-DTP-LabProcICE-061

& open questions:

WLTP-DTP-AP-07-02 Open Issues May 2011

Measurement Methods for additional pollutants

Pollutant	Method	bag	diluted	raw	online	off line	LoD [ppm]	LoQ [ppm]	Robustness of measurement	Paper Nr.	Problems
NO2	CLD differential		x		x		0.3	0.9	very good	WLTP-DTP-02-06e	
	NDUV-RAS direct		x		x		0.04	0.12	good	WLTP-DTP-02-06e	
	QCL direct		x		x		0.1	0.3	not yet available	WLTP-DTP-AP-02-02	not yet available
	FTIR direct		x		x		0,9 (0,2 possi	2.7	fair		LoD
N2O	GC-ECD	x				x	0.01	0.03	good	WLTP-AP-02-01 b	off line
	NDIR	x			x		0.1	0.3	poor	WLTP-AP-02-01 b	cross interference and LoD
	QCL	x			x		0.01	0.03	not yet available	WLTP-DTP-AP-02-02	not yet available
	FTIR	x			x		0,9 (0,2 possi	2.7	poor		
	ring down cavity	x			x		0.0003	0.001	good		will be modified for auto. Testing
	Photo Acoustic	x			x				poor		cross interference and stability
NH3 (SCR systems)	LDS (in situ)			x	x				fair	WLTP-DTP-02-07e	only concentration
	LDS (extractive)			x	x		0.2	0.6	fair		only concentration
	FTIR			x	x		0,3 (0,06 poss	0.9	fair	WLTP-DTP-02-07e	only concentration
	QCL			x	x		0.1	0.3	not yet available	WLTP-DTP-AP-02-02	not yet available
Ethanol (E21+)	Impinger + GC-FID		x			x	0,1 µg/ml -> 0,18?		good		off line
	Photo Acoustic	x			x		0.06		good		interference correction
	GC-FID from bag	x				x	0.18		not yet available		
	QCL	x			x		not yet available		not yet available		
	FTIR (bag)	x			x		1 (0,2 possible)		?		
Aldehydes (E21+)	Cartridge + HPLC		x			x	0,0075 µg/ml		good	WLTP-DTP-AP-02-06	off line
	FTIR		x		x		0,3/0,9		poor		only concentration, LoD for dilute
	QCL		?		x		not yet available		not yet available		not yet available
	(reference methods)										

LoD determined by
use of traceable cal. gases

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Table of performance criteria

Pollutant	Range of emission level to be measured	sample from			Distribuion over phases			typical bag concentration 9 m ³ /min CVS Flow assumed					LoQ required (30 % of net conc.) LoD = 1/3 LoQ		ISO 16183	
		bag	diluted	raw	Cold start	stabi-lized	hot start	Cold start [ppm]	stabi-lized [ppm]	hot start [ppm]	back-ground [ppm]	relevant net conc. [ppm]	LoQ required [ppm]	LoD required [ppm]	rise time required [s]	transforma-tion time [s]
NO ₂	40 mg/km	(x)	x		33%	33%	33%	0,7	0,7	0,7	0,02	0,68	0,2	0,06	2,5	na
N ₂ O	10 mg/mi	x			?	?	?	0,6	0,6	0,6	0,3	0,3	0,1	0,03	na	na
NH ₃ (SCR systems)	10 ppm			x	20%	30%	40%	10	10	10	0	na	3	1	5	na
Ethanol (E85)	20 mg/km	x			100%	0%	0%	2	0,05	0,05	0,05	1,95	0,6	0,2	na	na
Aldehydes (E85)	8 mg/mi		x		100%	0%	0%	1	0,05	0,05	0,05	0,95	0,3	0,1	2,5	na



Ref.: CIRCA documents WLTP-DTP-AP

**Draft GTR proposal:
WLTP-DTP-LabProcICE-089**

& open questions:
WLTP-DTP-AP-07-02 Open Issues May 2011