

NL proposal of modified WNTe equations March 2008

5.2 WNTe Limits for Gaseous and Particulate Exhaust Emissions

5.2.1 Exhaust emissions from an engine shall not exceed the applicable WNTe emission limits when the engine is operated under the specified engine speed and load points defined by the WNTe Control Area in section 7. These emission limits apply to engine use under the ambient conditions specified in section 6. The emissions are determined in accordance with the measurement procedures specified in section 7.

5.2.2 For the purposes of section 5.2.1, the applicable WNTe emission limits expressed in g/kWh or mg/kWh for an engine are defined, as follows:

WNTe Emission Limit = WHTC Emission Limit + WNTe Component (or Constituent)

where

“WHTC Emission Limit” is the emission limit (EL) to which the engine is certified pursuant to the WHTC test procedures expressed in g/kWh or mg/kWh; and

“WNTe Component” is determined by equations 1 to 4 in section 5.2.3

5.2.3 The applicable WNTe Components shall be determined using the following equations:

a) for emission limits expressed in g/kWh

- for NO_x: WNTe Component = 0.25 * EL + 0.1 (1)
- for HC: WNTe Component = 0.15 * EL + 0.07 (2)
- for CO: WNTe Component = 0.20 * EL + 0.2 (3)
- for PM: WNTe Component = 0.25 * EL + 0.003 (4)

b) for emission limits expressed in mg/kWh

- for NO_x: WNTe Component = 0.25 * EL + 100 (1a)
- for HC: WNTe Component = 0.15 * EL + 70 (2b)
- for CO: WNTe Component = 0.20 * EL + 200 (3c)
- for PM: WNTe Component = 0.25 * EL + 3 (4d)

The WNTe Component shall be rounded to the number of places to the right of the decimal point indicated by the applicable emission limit, in accordance with ASTM E 29-04

Examples of WNTe Components for current emission limits are shown in Annex I.

Annex I

Example of WNTe Limits for Selected Limit Values

Pollutant	Emission Limit [g/kWh]	Emission Limit [mg/kWh]	WNTe Component [g/kWh]	WNTe Component [mg/kWh]	WNTe Limit [g/kWh]	WNTe Limit [mg/kWh]
NOx	2.0		0.6		2.6	
	1.5		0.5		2.0	
	0.70	700	0.28	275	0.98	975
	0.40	400	0.20	200	0.60	600
	0.30	300	0.18	175	0.48	475
PM	0.10		0.03		0.13	
	0.07		0.02		0.09	
	0.03	30	0.01	11	0.04	41
	0.02	20	0.01	8	0.03	28
	0.01	10	0.01	6	0.02	16
HC	0.55		0.15		0.70	
	0.46		0.14		0.60	
	0.25	250	0.11	108	0.36	358
	0.19	190	0.10	99	0.29	289
	0.16	160	0.09	94	0.25	254
CO	5.5		1.4		6.9	
	4.0	4000	1.0	1000	5.0	5000
	3.0	3000	0.8	800	3.8	3800
	2.2	2200	0.6	640	2.8	2840
	1.5	1500	0.5	500	2.0	2000