

## EU Emission Standards for Light Commercial Vehicles

Category†	Stage	Date	CO	HC	HC+NO <sub>x</sub>	NO <sub>x</sub>	PM	PN
			g/km					
<b>Compression Ignition (Diesel)</b>								
N <sub>1</sub> , Class I ≤1305 kg	Euro 1	1994.10	2.72	-	0.97	-	0.14	-
	Euro 2 IDI	1998.01	1.0	-	0.70	-	0.08	-
	Euro 2 DI	1998.01 <sup>a</sup>	1.0	-	0.90	-	0.10	-
	Euro 3	2000.01	0.64	-	0.56	0.50	0.05	-
	Euro 4	2005.01	0.50	-	0.30	0.25	0.025	-
	Euro 5a	2009.09 <sup>b</sup>	0.50	-	0.23	0.18	0.005 <sup>f</sup>	-
	Euro 5b	2011.09 <sup>d</sup>	0.50	-	0.23	0.18	0.005 <sup>f</sup>	6.0×10 <sup>11</sup>
	Euro 6	2014.09	0.50	-	0.17	0.08	0.005 <sup>f</sup>	6.0×10 <sup>11</sup>
N <sub>1</sub> , Class II 1305-1760 kg	Euro 1	1994.10	5.17	-	1.40	-	0.19	-
	Euro 2 IDI	1998.01	1.25	-	1.0	-	0.12	-
	Euro 2 DI	1998.01 <sup>a</sup>	1.25	-	1.30	-	0.14	-
	Euro 3	2001.01	0.80	-	0.72	0.65	0.07	-
	Euro 4	2006.01	0.63	-	0.39	0.33	0.04	-
	Euro 5a	2010.09 <sup>c</sup>	0.63	-	0.295	0.235	0.005 <sup>f</sup>	-
	Euro 5b	2011.09 <sup>d</sup>	0.63	-	0.295	0.235	0.005 <sup>f</sup>	6.0×10 <sup>11</sup>
	Euro 6	2015.09	0.63	-	0.195	0.105	0.005 <sup>f</sup>	6.0×10 <sup>11</sup>
N <sub>1</sub> , Class III >1760 kg	Euro 1	1994.10	6.90	-	1.70	-	0.25	-
	Euro 2 IDI	1998.01	1.5	-	1.20	-	0.17	-

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	Euro 2 DI	1998.01 <sup>a</sup>	1.5	-	1.60	-	0.20	-
	Euro 3	2001.01	0.95	-	0.86	0.78	0.10	-
	Euro 4	2006.01	0.74	-	0.46	0.39	0.06	-
	Euro 5a	2010.09 <sup>c</sup>	0.74	-	0.350	0.280	0.005 <sup>f</sup>	-
	Euro 5b	2011.09 <sup>d</sup>	0.74	-	0.350	0.280	0.005 <sup>f</sup>	6.0×10 <sup>11</sup>
	Euro 6	2015.09	0.74	-	0.215	0.125	0.005 <sup>f</sup>	6.0×10 <sup>11</sup>
N <sub>2</sub>	Euro 5a	2010.09 <sup>c</sup>	0.74	-	0.350	0.280	0.005 <sup>f</sup>	-
	Euro 5b	2011.09 <sup>d</sup>	0.74	-	0.350	0.280	0.005 <sup>f</sup>	6.0×10 <sup>11</sup>
	Euro 6	2015.09	0.74	-	0.215	0.125	0.005 <sup>f</sup>	6.0×10 <sup>11</sup>

† For Euro 1/2 the Category N<sub>1</sub> reference mass classes were Class I ≤ 1250 kg, Class II 1250-1700 kg, Class III > 1700 kg.

a - until 1999.09.30 (after that date DI engines must meet the IDI limits)

b - 2011.01 for all models

c - 2012.01 for all models

d - 2013.01 for all models

e - applicable only to vehicles using DI engines

f - 0.0045 g/km using the PMP measurement procedure

g - and NMHC = 0.068 g/km

h - and NMHC = 0.090 g/km

i - and NMHC = 0.108 g/km

**Particle Number Emissions.** A solid particle number (PN) emission limit of  $6 \times 10^{11} \text{ km}^{-1}$  becomes effective at the Euro 5b/6 stage for all categories of diesel vehicles (M, N<sub>1</sub>, N<sub>2</sub>). The PN limit must be met in addition to the PM mass emission limits. PN emissions are measured over the NEDC test cycle using the PMP method [UN/ECE Reg. 83 Suppl. 7].

Number-based PN limits—which are much more stringent than the respective mass-based PM limits—were adopted to prevent the possibility that in the future “open particulate filters” are developed that meet the PM mass limit but enable a high number of ultra fine particles to pass.

A particle number emission limit for gasoline vehicles is to be defined by 1 September 2014.

**Durability.** Useful vehicle life for the purpose of emission regulations is:

- Euro 3 stage—80,000 km or 5 years (whichever occurs first); in lieu of an actual deterioration run, manufacturers may use the following deterioration factors:
  - Positive ignition: 1.2 for CO, HC, NO<sub>x</sub>
  - Compression ignition: 1.1 for CO; 1.0 for NO<sub>x</sub> and for HC+NO<sub>x</sub>; 1.2 for PM
- Euro 4 stage—100,000 km or 5 years, whichever occurs first.
- Euro 5/6 stage—in-service conformity: 100,000 km or 5 years; durability testing of pollution control devices for type approval: 160,000 km or 5 years (whichever occurs first); in lieu of a durability test, manufacturers may use the following deterioration factors:
  - Positive ignition: 1.5 for CO; 1.3 for HC; 1.6 for NO<sub>x</sub>; 1.0 for PM and PN
  - Compression ignition, Euro 5: 1.5 for CO; 1.1 for NO<sub>x</sub> and HC+NO<sub>x</sub>; 1.0 for PM and PN. Euro 6 deterioration factors to be determined.

**Other Provisions.** The regulations include several additional provisions, such as:

- EU Member States may introduce tax incentives for early introduction of vehicles that comply with future emission standards.
- Requirement for low temperature emission test ( $-7^{\circ}\text{C}$ ) for gasoline vehicles effective 2002 [*Directive 2001/100/EC*]. The limits for cars are 15 g/km for CO and 1.8 g/km for HC, measured over the urban part of the test only.
- Onboard diagnostic (OBD) requirements for emission systems.

<http://www.dieselnet.com/standards/eu/ld.php>