



# ECUADOR





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## 1. Introduction:

American and European emissions limits, with respective test cycles, are applied.

There are no emissions laboratories in the country, because of this test reports carried out by international homologation agencies are accepted.

## 2. Vehicle categories:

### 2.1. Categories for application with European limits

Category	Sub-category		Passengers Capacity	Gross Vehicle Weight (kg)	Reference Mass (kg)
Light Vehicles	M1	-	≤ 9	≤ 3500	-
	N1	Cat 1	> 9	≤ 3500	≤ 1250
		Cat 2			> 1250
		Cat 3			≤ 1700
Heavy Duty Vehicles	N2		-	> 3500	> 1700
	N3				-
	M2				-
	M3				-

M = Passenger vehicle  
N = Commercial vehicle

### 2.2. Categories for application with Americans limits

Category	Sub-category	Passengers Capacity	Curb Weight (kg)	Frontal Area (m <sup>2</sup> )	Gross Vehicle Weight (kg)	Reference Mass (kg)
Light Vehicles	-	≤ 12	-	-	≤ 3860	-
Medium Vehicles	Type 1	> 12	≤ 2724	≤ 4,18	≤ 3860	≤ 1700
	Type 2					> 1700
Heavy Duty Vehicles	-	-	> 2724	> 4,18	> 3860	-
	Type 1	-	> 2724	> 4,18	> 3860 ≤ 6350	-
	Type 2	-	> 2724	> 4,18	> 6350	-

### 3. Emission limits:

#### 3.1. Limits for light vehicles

European limits

Sub-category	Fuel	Application Date	Phase	CO (g/km)	HC + NOx (g/km)	PM (g/km)	HC Evaporated SHED method (g/test)	
M1	-	Gasoline	In force	Euro 1	2,72	0,97	-	2
	-	Diesel	In force	Euro 1	2,72	0,97	0,14	-
N1 M1 > 6 passeng.	Cat 1	Gasoline	In force	Euro 1	2,72	0,97	-	2
	Cat 2				5,17	1,4	-	2
	Cat 3				6,9	1,7	-	2
	Cat 1	Diesel	In force	Euro 1	2,72	0,97	0,14	-
	Cat 2				5,17	1,4	0,19	-
	Cat 3				6,9	1,7	0,25	-

U.S. limits

Category	Sub-category	Fuel	Application Date	Phase	CO (g/km)	HC (g/km)	NOx (g/km)	PM (g/km)	HC Evaporated SHED method (g/test)
Light Vehicles	-	Gasoline	In force	Tier 0	2,1	0,25	0,62	-	2
		Diesel	In force	Tier 0	2,1	0,25	0,62	0,12	-
Medium Vehicles	Type 1	Gasoline	In force	Tier 0	6,2	0,5	0,75	-	2
	Type 2				6,2	0,5	1,1	-	2
	Type 1	Diesel	In force	Tier 0	6,2	0,5	0,75	0,16	-
	Type 2				6,2	0,5	1,1	0,28	-

#### 3.2. Limits for heavy duty vehicles

European limits

Category	Sub-category	Fuel	Application Date	Phase	CO (g/kW-h)	HC (g/kW-h)	NOx (g/kW-h)	PM (g/kW-h)
Heavy Duty Vehicles	N2, N3 M2, M3	Diesel	In force	Euro II	4,0	1,1	7,0	0,15

U.S. limits

Category	Sub-category	Fuel	Application Date	Phase	CO (g/bHp)	HC (g/bHp)	NOx (g/bHp)	PM (g/bHp)	HC Evaporated SHED method (g/test)
Heavy Duty Vehicles	Type 1	Gasoline	In force	EPA 91	14,4	1,1	5,0	-	3
	Type 2				37,1	1,9	5,0	-	4
	Urban bus	Diesel	In force	EPA 94	15,5	1,3	5,0	0,07	-
	Others				15,5	1,3	5,0	0,1	-

#### 3.3. Limits for motorcycles

Not applicable.

#### 3.4. Off-road vehicles

Not applicable.

#### 4. Other regulations:

##### 4.1. Durability

Not applicable.

##### 4.2. OBD

Not applicable.

#### 5. Control requirements:

##### 5.1. In-use vehicle emissions inspection

Vehicle Type	Fuel	Model Year	Idling Speed				Acceleration				Opacity (free accel.) (%)
			CO (%)	HC (ppm)	O <sub>2</sub> (%)	CO + CO <sub>2</sub> (%)	CO (%)	HC (ppm)	O <sub>2</sub> (%)	CO + CO <sub>2</sub> (%)	
All	Gasoline	< 1990	6,5	1200	6	7 - 18	6,5	1200	6	7 - 18	-
		1990 < 2000	4,5	750	6	7 - 18	4,5	750	6	7 - 18	-
		2000 < 2006	1	200	6	7 - 18	1	200	6	7 - 18	-
		2006	0,5	125	6	7 - 18	0,5	125	6	7 - 18	-
	Diesel	2000	-	-	-	-	-	-	-	-	60
		> 2000	-	-	-	-	-	-	-	-	50

#### 6. Fuels:

##### 6.1. Reference fuel

International specifications are accepted.

##### 6.2. Commercial fuels

###### 6.2.1. Gasoline

Property	Requirement								Unity	Test method
	Extra		Extra (from Aug/2014)		Super		Super (from Aug/2014)			
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.		
RON	81	-	91	-	90	-	95	-	-	NTE INEN 2102
Distillation	-	-	-	-	-	-	-	-	-	-
10% vol. evaporated	-	70	-	70	-	70	-	70	°C	NTE INEN 926
50% vol. evaporated	77	121	77	121	77	121	77	121		
90% vol. evaporated	-	189	-	189	-	190	-	189		
End Point	-	215	-	215	-	220	-	215		
Residue	-	2	-	2	-	2	-	2	% v/v	
Vapor liquid ratio V/L at 60°C	-	20	-	20	-	20	-	20	-	NTE INEN 932 ASTM D5188
RVP (Reid Vapor Pressure)	-	56	-	56	-	56	-	56	kPa	NTE INEN 928 ASTM D4953, D5191
Copper corrosion (3h at 50°C)	-	1	-	1	-	1	-	1	-	NTE INEN 927
Gums	-	3	-	2	-	4	-	3	mg/100cm <sup>3</sup>	NTE INEN 933
Sulfur	-	0,075	-	0,001	-	0,1	-	0,001	% m/m	NTE INEN 929 ASTM D4294
Aromatics	-	30	-	35	-	35	-	35	% v/v	NTE INEN 2252 ASTM D6730
Benzene	-	1	-	0,6	-	2	-	0,6	% v/v	ASTM D3606, D5580, D6277
Olefins	-	18	-	18	-	25	-	18	% v/v	NTE INEN 2252 ASTM D6730
Oxidation Stability	240	-	240	-	240	-	240	-	minutes	NTE INEN 934
Oxygen	-	2,7	-	3,5	-	2,7	-	3,5	% m/m	ASTM D4815, D5845
Lead	Not detectable		Not detectable		Not detectable		Not detectable		mg/l	ASTM D3237, D5185
Magnesium	Not detectable		Not detectable		Not detectable		Not detectable		mg/l	ASTM D3831, D5185
Iron	Not detectable		Not detectable		Not detectable		Not detectable		mg/l	ASTM D5185

## 6.2.2. Diesel

Property	Requirement								Unity	Test method
	No. 1		No. 2		No. 2 (Low Sulfur)		No. 2 (from Aug/2014)			
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.		
Cetane Number	-	-	-	-	-	-	52	-	-	ASTM D613
Cetane Index	40	-	45	-	45	-	52	-	-	ASTM D4737 NTE INEN 1495
Density at 15°C	-	-	-	-	-	-	Report		kg/m <sup>3</sup>	ASTM D4052, D1298 NTE INEN 2319
Kinematics viscosity at 37,8°C	1,3	3	2,5	6	2,5	6	2	5	cSt	NTE INEN 810
Sulfur	-	0,3	-	0,7	-	0,05	-	0,001	% m/m	ASTM D4294, D5453, D2622 NTE INEN 1490
Zinc	-	-	-	-	-	-	Not Detectable		g/l	ASTM D7111
Copper	-	-	-	-	-	-	Not Detectable		g/l	ASTM D7111, 6732
Magnesium	-	-	-	-	-	-	Not Detectable		g/l	ASTM D7111
Calcium	-	-	-	-	-	-	Not Detectable		g/l	ASTM D7111, D3605
Sodium	-	-	-	-	-	-	Not Detectable		g/l	ASTM D7111, D3605
Total Polyaromatic	-	-	-	-	-	-	-	11	% m/m	ASTM D2425 NTE INEN 2252
Distillation - 90% evaporated	-	288	-	360	-	360	-	320	°C	NTE INEN 926
Distillation end point	-	-	-	-	-	-	-	350		
Flash point	40	-	51	-	51	-	55	-	°C	NTE INEN 1047, 1493 (Proc. A)
Carbon Residue in 10% of the residue	-	0,15	-	0,15	-	0,15	-	0,2	% m/m	ASTM D4530 NTE INEN 1491
Cold Filter Plugging Point	-	-	-	-	-	-	-	1,3	°C	ASTM D6371
Pour point	-	-	-	-	-	-	-	3	°C	ASTM D5949 NTE INEN 1982
Cloud point	-	-	-	-	-	-	Report		°C	ASTM D2500
Color	-	-	-	-	-	-	-	2,5	-	NTE INEN 1496
Water	-	-	-	-	-	-	-	200	mg/kg	ASTM D6304
Water and sediments	-	0,05	-	0,05	-	0,05	-	-	% v/v	NTE INEN 1494
Oxidation Stability	-	-	-	-	-	-	-	25	g/m <sup>3</sup>	ASTM D2274
Biodiesel	-	-	-	-	-	-	-	5	% v/v	EM 14078
Copper corrosion (3h at 50°C)	-	2	-	3	-	3	-	1	-	NTE INEN 927
Ash	-	0,01	-	0,01	-	0,01	-	0,01	% m/m	NTE INEN 1492
Total particles	-	-	-	-	-	-	-	10	mg/kg	ASTM D5452
Lubricity	-	-	-	-	-	-	-	400	micron	ASTM D6079

## 7. Trends:

### Emission limits:

Evolution to Euro 3, but no date defined.