



**CHILE**





# CHILE

## 1. Introduction:

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

For light vehicles, homologation tests are performed in CCCV (Vehicle Certification and Control Center), with an emission laboratory located in the town of Maipu, at 470 meters of altitude. For heavy duty vehicles, test reports performed by international homologation agencies are accepted.

## 2. Vehicle categories:

### 2.1. Heavy Duty Vehicles

Category	Sub-category	Passengers Capacity	Curb Weight (kg)	Gross Vehicle Weight (kg)	Regulation
PC (Passenger Car)	-	-	-	< 2700	Europe
		≤ 12	-	-	USA
LCV (Light Commercial Vehicle)	LCV - Class 1	-	≤ 1305	< 2700	Europe
	LCV - Class 2	-	> 1305 ≤ 1760		
	LCV - Class 3	-	> 1760		
	LCV - Type 1	-	≤ 1700	< 2700	USA
	LCV - Type 2	-	> 1700		

### 2.2. Medium Vehicles

Category	Sub-category	Passengers Capacity	Curb Weight (kg)	Load Adjusted Mass (kg)	Gross Vehicle Weight (kg)	Regulation
MV (Medium Vehicle)	MV - Class 1	-	≤ 1305	-	≥ 2700 < 3860	Europe
	MV - Class 2	-	> 1305 ≤ 1760	-		
	MV - Class 3	-	> 1760	-		
	MV - Type 1	-	-	≥ 1700 ≤ 2610	≥ 2700 < 3860	USA
	MV - Type 2	-	-	> 2610		

### 2.3. Heavy Duty Vehicles

Category	Sub-category	Gross Vehicle Weight (kg)	Regulation
HDV (Heavy Duty Vehicles)	Truck (goods transport)	> 3860	Europe and USA
	Bus (passengers transport)		

## 2.4. Motorcycles

Category	Sub-category	Curb Weight (kg)	Obs.
MT (Motorcycle)	2 Wheels	≤ 680	-
	3 Wheels (Tricycle)		
	4 Wheels (ATV)	≤ 400 ≤550 (goods transport)	≤ 15 kW
	4 Wheels (ATV - light)	≤ 350	V <sub>max</sub> ≤ 45 km/h ≤ 50 cc ou ≤ 4 kW

Category	Sub-category	Engine	Regulation	
MT (Motorcycle)	MT 2W (2 wheels)	≤ 50 cc V <sub>max</sub> ≤ 45 km/h	Europe	
		> 50 cc < 150 cc		
		≥ 150 cc		
	MT 3W (3 wheels)	≤ 50 cc V <sub>max</sub> ≤ 45 km/h		
		Others		
	MT 4W (4 wheels)	V <sub>max</sub> ≤ 45 km/h ≤ 50 cc ou ≤ 4 kW		
		> 50cc > 4 kW ≤ 15 kW		
	MT - Class I	≥ 50 cc ≤ 169 cc		USA
	MT - Class II	≥ 170 cc ≤ 279 cc		
	MT - Class III	≥ 280 cc		

## 3. Emission limits:

### 3.1. Limits for light vehicles - Metropolitan region

European limits

Category	Fuel	Application Date	HC (g/km)	HC + NOx (g/km)	CO (g/km)	NOx (g/km)	PM (g/km)	HC Evaporated SHED method (g/test)	Base Regul.
PC	Gasoline	In force	0,1	-	1	0,08	-	2	Euro 4
	Diesel	In force	-	0,23	0,5	0,18	0,005	-	Euro 5a
	NCG/LPG	In force	0,1	-	1	0,08	-	2	Euro 4
LCV Class 1	Gasoline	In force	0,1	-	1	0,08	-	2	Euro 4
	Diesel	In force	-	0,23	0,5	0,18	0,005	-	Euro 5a
	NCG/LPG	In force	0,1	-	1	0,08	-	2	Euro 4
LCV Class 2	Gasoline	In force	0,13	-	1,81	0,1	-	2	Euro 4
	Diesel	In force	-	0,39	0,63	0,33	0,04	-	Euro 4
	Diesel	Sep/2012	-	0,295	0,63	0,235	0,005	-	Euro 5a
	NCG/LPG	In force	0,13	-	1,81	0,1	-	2	Euro 4
LCV Class 3	Gasoline	In force	0,16	-	2,27	0,11	-	2	Euro 4
	Diesel	In force	-	0,46	0,74	0,39	0,06	-	Euro 4
	Diesel	Sep/2012	-	0,35	0,74	0,28	0,005	-	Euro 5a
	NCG/LPG	In force	0,16	-	2,27	0,11	-	2	Euro 4

## U.S. limits

Category	Fuel	Application Date	HC (g/km)	NMHC (g/km)	CO (g/km)	NOx (g/km)	NMOG (g/km)	HCOH (g/km)	PM (g/km)	HC Evaporated SHED method (g/test)	Base Regul.
PC	Gasoline	In force	-	-	2,11	0,087	0,062	0,00932	-	2	Tier 2 Bin 8
	Diesel	In force	-	-	2,11	0,031	0,047	0,00932	0,0062	-	Tier 2 Bin 5
	CNG/LPG	In force	-	-	2,11	0,087	0,062	0,00932	-	2	Tier 2 Bin 8
LCV Tipo 1	Gasoline	In force	-	-	2,11	0,087	0,062	0,00932	-	2	Tier 2 Bin 8
	Diesel	In force	-	-	2,11	0,031	0,047	0,00932	0,0062	-	Tier 2 Bin 5
	CNG/LPG	In force	-	-	2,11	0,087	0,062	0,00932	-	2	Tier 2 Bin 8
LCV Tipo 2	Gasoline	In force	-	-	2,11	0,087	0,062	0,00932	-	2	Tier 2 Bin 8
	Diesel	In force	-	-	2,11	0,031	0,047	0,00932	0,0062	-	Tier 2 Bin 5
	CNG/LPG	In force	-	-	2,11	0,087	0,062	0,00932	-	2	Tier 2 Bin 8

## 3.2. Limits for lightvehicles - Other regions

### European limits

Category	Fuel	Application Date	HC (g/km)	HC + NOx (g/km)	CO (g/km)	NOx (g/km)	PM (g/km)	HC Evaporated SHED method (g/test)	Base Regul.
PC	Gasoline	In force	0,2	-	2,3	0,15	-	2	Euro 3
	Diesel	In force	-	0,56	0,64	0,5	0,05	-	Euro 3
	CNG/LPG	In force	0,2	-	2,3	0,15	-	2	Euro 3
LCV Class 1	Gasoline	In force	0,2	-	2,3	0,15	-	2	Euro 3
	Diesel	In force	-	0,56	0,64	0,5	0,05	-	Euro 3
	CNG/LPG	In force	0,2	-	2,3	0,15	-	2	Euro 3
LCV Class 2	Gasoline	In force	0,25	-	4,17	0,18	-	2	Euro 3
	Diesel	In force	-	0,72	0,8	0,65	0,07	-	Euro 3
	CNG/LPG	In force	0,25	-	4,17	0,18	-	2	Euro 3
LCV Class 3	Gasoline	In force	0,29	-	5,22	0,21	-	2	Euro 3
	Diesel	In force	-	0,86	0,95	0,78	0,1	-	Euro 3
	CNG/LPG	In force	0,29	-	5,22	0,21	-	2	Euro 3

## U.S. limits

Category	Fuel	Application Date	HC (g/km)	NMHC (g/km)	CO (g/km)	NOx (g/km)	NMOG (g/km)	HCOH (g/km)	PM (g/km)	HC Evaporated SHED method (g/test)	Base Regul.
PC	Gasoline/LPG	In force	0,25	0,16	2,11	0,25	-	-	-	2	Tier 1
	Diesel	In force	0,25	0,16	2,11	0,62	-	-	0,05	-	Tier 1
	CNG	In force	-	0,16	2,11	0,25	-	-	-	2	Tier 1
LCV Type 1	Gasolina/LPG	In force	0,25	0,16	2,11	0,25	-	-	-	2	Tier 1
	Diesel	In force	-	0,16	2,11	0,62	-	-	0,05	-	Tier 1
	CNG	In force	-	0,16	2,11	0,25	-	-	-	2	Tier 1
LCV Type 2	Gasolina/LPG	In force	0,25	0,2	2,74	0,44	-	-	-	2	Tier 1
	Diesel	In force	-	0,2	2,74	0,61	-	-	0,05	-	Tier 1
	CNG	In force	-	0,2	2,74	0,44	-	-	-	2	Tier 1

### 3.3. Limits for medium vehicles - Metropolitan region

#### European limits

Category	Fuel	Application Date	HC (g/km)	HC + NOx (g/km)	CO (g/km)	NOx (g/km)	PM (g/km)	HC Evaporated SHED method (g/test)	Base Regul.
MV Class 1	Gasoline	In force	0,1	-	1	0,08	-	2	Euro 4
	CNG/LPG	In force	0,1	-	1	0,08	-	2	Euro 4
	Diesel	In force	-	0,3	0,5	0,25	0,025	-	Euro 4
		Sep/2012	-	0,23	0,5	0,18	0,005	-	Euro 5a
MV Class 2	Gasoline	In force	0,13	-	1,81	0,1	-	2	Euro 4
	CNG/LPG	In force	0,13	-	1,81	0,1	-	2	Euro 4
	Diesel	In force	-	0,39	0,63	0,33	0,04	-	Euro 4
		Sep/2012	-	0,295	0,63	0,235	0,005	-	Euro 5a
MV Class 3	Gasoline	In force	0,16	-	2,27	0,11	-	2	Euro 4
	CNG/LPG	In force	0,16	-	2,27	0,11	-	2	Euro 4
	Diesel	In force	-	0,46	0,74	0,39	0,06	-	Euro 4
		Sep/2012	-	0,35	0,74	0,28	0,005	-	Euro 5a

#### U.S. limits

Category	Fuel	Application Date	HC (g/km)	NMHC (g/km)	CO (g/km)	NOx (g/km)	NMOG (g/km)	HCOH (g/km)	PM (g/km)	HC Evaporated SHED method (g/test)	Base Regul.
MV Type 1	CNG/LPG	In force	-	-	2,11	0,087	0,062	0,00932	-	2	Tier 2 Bin 8
	Gasoline	In force	-	-	2,11	0,087	0,062	0,00932	-	2	Tier 2 Bin 8
	Diesel	In force	-	-	2,11	0,087	0,062	0,00932	0,012	-	Tier 2 Bin 8
		Sep/2012	-	-	2,11	0,031	0,047	0,00932	0,0062	-	Tier 2 Bin 5
MV Type 2	CNG/LPG	In force	-	-	2,11	0,087	0,062	0,00932	-	2	Tier 2 Bin 8
	Gasoline	In force	-	-	2,11	0,087	0,062	0,00932	-	2	Tier 2 Bin 8
	Diesel	In force	-	-	2,11	0,087	0,062	0,00932	0,012	-	Tier 2 Bin 8
		Sep/2012	-	-	2,11	0,031	0,047	0,00932	0,0062	-	Tier 2 Bin 5

### 3.4. Limits for medium vehicles - Other regions

European limits

Category	Fuel	Application Date	HC (g/km)	HC + NOx (g/km)	CO (g/km)	NOx (g/km)	PM (g/km)	HC Evaporated SHED method (g/test)	Base Regul.
MV Class 1	Gasoline	In force	0,2	-	2,3	0,15	-	2	Euro 3
	Diesel	In force	-	0,56	0,64	0,5	0,05	-	Euro 3
	GNV/GPL	In force	0,2	-	2,3	0,15	-	2	Euro 3
MV Class 2	Gasoline	In force	0,25	-	4,17	0,18	-	2	Euro 3
	Diesel	In force	-	0,72	0,8	0,65	0,07	-	Euro 3
	GNV/GPL	In force	0,25	-	4,17	0,18	-	2	Euro 3
MV Class 3	Gasoline	In force	0,29	-	5,22	0,21	-	2	Euro 3
	Diesel	In force	-	0,86	0,95	0,78	0,1	-	Euro 3
	GNV/GPL	In force	0,29	-	5,22	0,21	-	2	Euro 3

U.S. limits

Category	Fuel	Application Date	HC (g/km)	NMHC (g/km)	CO (g/km)	NOx (g/km)	NMOG (g/km)	HCOH (g/km)	PM (g/km)	HC Evaporated SHED method (g/test)	Base Regul.
MV Type 1	Gasoline	In force	-	0,2	2,7	0,44	-	-	-	2	Tier 1
	Diesel	In force	-	0,2	2,74	0,61	-	-	0,06	-	Tier 1
	CNG/LPG	In force	-	0,2	2,7	0,44	-	-	-	2	Tier 1
MV Type 2	Gasoline	In force	-	0,24	3,11	0,68	-	-	-	2	Tier 1
	Diesel	In force	-	0,24	3,11	0,95	-	-	0,07	-	Tier 1
	CNG/LPG	In force	-	0,24	3,11	0,68	-	-	-	2	Tier 1

### 3.5. Limits for heavy duty vehicles - Metropolitan region

European limits

Category	Fuel	Application Date	HC (g/kW-h)	NMHC (g/kW-h)	CO (g/kW-h)	NOx (g/kW-h)	PM (g/kW-h)	CH <sub>4</sub> (g/kW-h)	Obs.	Base Regul.
Truck	Diesel	May/2012	0,46	-	1,5	3,5	0,02	-	ESC	Euro IV
			-	0,55	4,0	3,5	0,03	-	ETC	
		Oct/ 2014 (NM) Oct/2015 (AM)	0,46	-	1,5	2,0	0,02	-	ESC	Euro V
			-	0,55	4,0	2,0	0,03	-	ETC	
Bus	Diesel	In force	0,66	-	2,1	5	0,02	-	ESC	Euro IV (MP)
			-	0,78	5,45	5	0,03	-	ETC	
		Sep/2013	0,46	-	1,5	3,5	0,02	-	ESC	Euro IV
			-	0,55	4,0	3,5	0,03	-	ETC	
		Sep/2015	0,46	-	1,5	2,0	0,02	-	ESC	Euro V
			-	0,55	4,0	2,0	0,03	-	ETC	

## U.S. limits

Category	Fuel	Application Date	HC (g/bHp)	NMHC (g/bHp)	CO (g/bHP-h)	NOx (g/bHp)	NMHC + NOx (g/bHP-h)	PM (g/bHp)	HC Evaporated SHED method (g/test)	Base Regul.
Truck GVW < 15 t	Diesel	May/2012 Option 1	-	-	15,5	-	2,4	0,01	-	EPA 2007 (MP)
		May/2012 Option 2	-	0,5	15,5	-	2,5	0,01	-	EPA 2007 (MP)
	CNG	In force	-	1,2	15,5	4,0	-	0,1	-	EPA 93
Truck GVW ≥ 15 t	Diesel	May/2012 Option 1	-	-	15,5	-	2,4	0,1	-	EPA 2004
		May/2012 Option 2	-	0,5	15,5	-	2,5	0,1	-	EPA 2004
	Diesel	Oct/2014 (NM) Option 1	-	0,5	15,5	-	2,5	0,01	-	EPA 2007 (MP)
		Oct/2014 (NM) Option 2	-	-	15,5	-	2,4	0,01	-	EPA 2007 (MP)
	Diesel	Oct/2015 (AM) Option 1	-	0,5	15,5	-	2,5	0,01	-	EPA 2007 (MP)
		Oct/2015 (AM) Option 2	-	-	15,5	-	2,4	0,01	-	EPA 2007 (MP)
Bus	Diesel	Sep/2013 Option 1	-	-	15,5	-	2,4	0,05	-	EPA 2007 (MP)
		Sep/2013 Option 2	-	0,5	15,5	-	2,5	0,05	-	EPA 2007 (MP)
	CNG	In force	-	1,2	15,5	4,0	-	0,05	-	EPA 98
	Gasoline	In force	1,9	-	37,1	5,0	-	-	4,0	EPA 91

## U.S. limits (alternative procedure)

Category	Fuel	Application Date	NMHC (g/km)	CO (g/km)	NOx (g/km)	MP (g/km)	HCHO (g/km)	Regul. Base
Truck GVW ≥ 3860 kg GVW ≤ 4536 kg	Diesel	May/2012	0,121	4,5	0,1	0,01	0,02	EPA 2008
Truck GVW ≥ 4537 kg GVW ≤ 6350 kg	Diesel	May/2012	0,143	5,0	0,2	0,01	0,02	EPA 2008

## 3.6. Limits for heavy duty vehicles - Other regions

### European limits

Category	Fuel	Application Date	HC (g/kW-h)	NMHC (g/kW-h)	CO (g/kW-h)	NOx (g/kW-h)	PM (g/kW-h)	CH <sub>4</sub> (g/kW-h)	Obs.	Base regul.
Truck	Diesel	In force	1,1	-	4	7	0,15 *	-	13 points	Euro II
	CNG	In force	-	0,78	5,45	5	-	1,6	ETC	Euro III
Bus	Diesel	In force	1,1	-	4	7	0,15 *	-	13 points	Euro II
	CNG	In force	-	0,78	5,45	5	-	1,6	ETC	Euro III

\* Apply correction factor of 1.7 for engines with less than 85 kW

## U.S. limits

Category	Fuel	Application Date	HC (g/bHp)	NMHC (g/bHp)	CO (g/bHP-h)	NOx (g/bHp)	PM (g/bHp)	HC Evaporated SHED method (g/test)	Base regul.
Truck	Diesel	In force	1,3	-	15,5	5	0,1	-	EPA 93
	Gasoline	In force	1,9	-	37,1	5	-	4	EPA 98
	CNG	In force	-	1,2	15,5	4	0,1	-	EPA 93
Bus	Diesel	In force	1,3	-	15,5	5	0,1	-	EPA 93
	Gasoline	In force	1,9	-	37,1	5	-	4	EPA 98
	CNG	In force	-	1,2	15,5	4	0,1	-	EPA 93

### 3.7. Limits for motorcycles - Metropolitan region

European limits

Category	Fuel	Engine	Displacement	Application Date	HC (g/km)	CO (g/km)	NOx (g/km)	HC + NOx (g/km)	Base Regul.
MT 2W	Gasoline	2T e 4T	≤ 50 cc Vmax ≤ 45 km/h	In force	-	1	-	1,2	Euro 2 (ECE R47)
			< 150 cc	In force	0,8	2	0,15	-	Euro 3
			≥ 150 cc	In force	0,3	2	0,15	-	Euro 3
MT 3W and 4W	Gasoline	2T	≤ 50 cc Vmax ≤ 45 km/h	In force	-	3,5	-	1,2	Euro 2 (ECE R47)
			> 50 cc	In force	6	12	0,15	-	Euro 1
		4T	≤ 50 cc Vmax ≤ 45 km/h	In force	-	3,5	-	1,2	Euro 2 (ECE R47)
			> 50 cc	In force	4,5	19,5	0,45	-	Euro 1

ECE Limits (RTM alternative procedure No. 2)

Category	Fuel	Displacement	Application Date	HC (g/km)	CO (g/km)	NOx (g/km)	HC + NOx (g/km)	Base Regul.
MT 2W	Gasoline	≤ 50 cc Vmax ≤ 45 km/h	In force	0,8	2	0,15	-	Euro 3 (ECE R40)
		> 50 cc Vmax < 130 km/h	In force	0,75	2,62	0,17	-	GTR2
		> 50 cc Vmax ≥ 130 km/h	In force	0,33	2,62	0,22	-	GTR2
MT 3W and 4W	Gasoline	≤ 50 cc Vmax ≤ 45 km/h	In force	-	3,5	-	1,2	Euro 2 (ECE R47)
		> 50 cc Vmax < 130 km/h	In force	0,75	2,62	0,17	-	GTR2
		> 50 cc Vmax ≥ 130 km/h	In force	0,33	2,62	0,22	-	GTR2

U.S. limits

Category	Fuel	Application Date	HC (g/km)	CO (g/km)	HC + NOx (g/km)	Base Regul.
MT Class I	Gasoline	In force	1	12	-	EPA 2006
MT Class II	Gasoline	In force	1	12	-	EPA 2006
MT Class III	Gasoline	In force	-	12	0,8	EPA 2010

### 3.8. Limits for motorcycles - Other regions

European limits

Category	Fuel	Engine	Displacement	Application Date	HC (g/km)	CO (g/km)	NOx (g/km)	HC + NOx (g/km)	Base Regul.
MT 2W	Gasoline	2T	≤ 50 cc Vmax ≤ 45 km/h	In force	-	1	-	1,2	Euro 2 (ECE R47)
			> 50 cc	In force	4	8	0,1	-	Euro 1
		4T	≤ 50 cc Vmax ≤ 45 km/h	In force	-	1	-	1,2	Euro 2 (ECE R47)
			> 50 cc	In force	3	13	0,3	-	Euro 1
MT 3W and 4W	Gasoline	2T	≤ 50 cc Vmax ≤ 45 km/h	In force	-	3,5	-	1,2	Euro 2 (ECE R47)
			> 50 cc	In force	6	12	0,15	-	Euro 1
		4T	≤ 50 cc Vmax ≤ 45 km/h	In force	-	3,5	-	1,2	Euro 2 (ECE R47)
			> 50 cc	In force	4,5	19,5	0,45	-	Euro 1



U.S. limits

Category	Fuel	Application Date	HC (g/km)	CO (g/km)	Regul. Base
All	Gasoline	In force	5	12	EPA 1980

\* For motorcycles up to 50cc, apply European limits and procedures

### 3.9. Off-road vehicles

Not applicable.

### 4. Other regulations:

#### 4.1. Durability

Vehicles must respect the limits regulated by at least 80,000 km.  
Deterioration factors are defined by the vehicle manufacturer.

#### 4.2. OBD

Not applicable.

#### 4.3. Emission of crankcase gases

It is not allowed that crankcase ventilation system put gas out to the atmosphere.

#### 4.4. Filter of Particulate Material

Since Jan/2010 is mandatory the use of DPF (Diesel Particulate Filter) for new buses in the metropolitan region.

#### 4.5. Catalyst replacement

Must comply with minimum conversion efficiency shown below.

HC	CO	NOx
70%	70%	30%

### 5. Control requirements:

#### 5.1. Emissions Conformity of Production

CCCV performs randomly in light and medium vehicles, and in motorcycles, following the same procedures adopted for the homologation. Approved vehicles receive a certificate of compliance and rejected vehicles have the homologation canceled.

## 5.2. In-use vehicle emissions inspection

Performed every year.

Category	Fuel	Idling (between 350 and 1100 rpm)				Acceleration (between 2200 and 2800 rpm)				Load test		Unload test
		HC (ppm)	CO (%)	CO + CO <sub>2</sub> (%)	Opacity	HC (ppm)	CO (%)	CO + CO <sub>2</sub> (%)	Opacity	Índice de Escurecimento	Opacity	Opacity
PC LCV	Gasoline LPG CNG	100 *	0,5 *	≥ 6 *	-	100 *	0,5 *	≥ 6 *	-	-	-	-
	Diesel	-	-	-	0	-	-	-	0	-	-	-
MV	Gasoline LPG CNG	100 *	0,5 *	-	-	100 *	0,5 *	-	-	-	-	-
	Diesel	-	-	-	-	-	-	-	-	3,5	6%	15%
HDV Truck	Gasoline LPG CNG	100	0,5	-	-	100	0,5	-	-	-	-	-
	Diesel	-	-	-	-	-	-	-	-	3,5	6% 0,24 m <sup>-1</sup> **	15% 0,24 m <sup>-1</sup> **
HDV Bus Metropolitan region	Gasoline LPG CNG	100	0,5	-	-	100	0,5	-	-	-	-	-
	Diesel	-	-	-	-	-	-	-	-	-	4% 0,24 m <sup>-1</sup> **	1,0 m-1 0,24 m <sup>-1</sup> **
MT	Gasoline LPG CNG	-	-	-	-	-	-	-	-	-	-	-
	Diesel	-	-	-	-	-	-	-	-	-	-	-

\* Does not apply to the metropolitan region, which adopts chassis dynamometer test at 24 and 40 km/h

\*\* For vehicles equipped with Diesel Particulate Filter

## 5.3. Monitoring of emissions in public roads

Vehicles with Otto engine: smoke emission is not allowed, except water steam.

Vehicles with Diesel engine: not allowed smoke emission higher than grade 2 of Ringelmann scale, for more than 5 continuous seconds.

Diesel vehicles can also be inspected with an opacimeter, in free acceleration test.

## 5.4. Identification label

Each registered vehicle must carry on a label affixed to the windshield, identifying the regions in which the vehicle is allowed to circulate. Traffic restriction depends on the color of the label.

Color of the label	Restriction of circulation
Green	No restrictions
Yellow	Not allowed in the metropolitan region
Red	Not allowed in the metropolitan region, as well as 5th and 6th regions

## 6. Fuels:

### 6.1. Reference fuel

There are no standards defining the reference fuels. International specifications are accepted.

### 6.2. Commercial fuels

## 6.2.1. Gasoline

Property	Metropolitan region				Other regions			
	Requirement		Unity	Test method	Requirement		Unity	Test method
	Min.	Max.			Min.	Max.		
Distillation	-	-	-	-	-	-	-	-
10% vol. Evaporated	-	-	°C	ASTM D86	-	70	°C	NCh 66
50% vol. Evaporated	-	-			-	121		
90% vol. Evaporated	-	177			-	190		
PFE	-	-			-	225		
Distillation residue	-	2	% v/v	-	2	% v/v	-	-
Lead	-	0,013	g/l	ASTM D3237, D5059	-	0,013	g/l	NCh 2329 (v), NCh 1897 (vi)
Gums	-	5	mg/100ml	ASTM D381	-	5	mg/100ml	NCh 1844
Sulfur	-	15	ppm	ASTM D5453, D7039, D2622	-	0,003	% m/m	NCh 1896 (vii)
Copper corrosion	-	1	-	ASTM D130	-	1	-	NCh 70
Oxidation Stability	240	-	minuts	ASTM D525	240	-	minuts	NCh 1853
Benzene	-	1	% v/v	ASTM D4053, D3606, D5580	-	1	% v/v	NCh 2195, NCh 2246
Phosphorus (i)	-	inform	-	ASTM D3231	-	inform	-	NCh 2327
Aromatics	-	38	% v/v	ASTM D6293, D1319, D6839	-	38	% v/v	(viii)
Oxygen (ii)	-	2	% m/m	ASTM D6293, D4815	-	2	% m/m	NCh 2326, NCh 2468
Reid Vapor Pressure	-	55 (iii) 69 (iv)	kPa	ASTM D323, D4953, D5191	-	10	psi	NCh 1845, NCh 2328
Olefins	-	12	% m/m	ASTM D6293, D1319, D6839	-	20	% m/m	(viii)
Vapor/Liquid ratio at 47 °C (ix)	-	-	-	-	-	20	-	NCh 1846 (x)

(i)- It is not permitted the addition of phosphorous compounds in gasoline. For confirmation, apply method NCh 2327

(ii) - The use of gasoline with these components is subject to approval of Department of Economy, Development and Reconstruction. Quality certificates must indicate oxygenated composition, as well as the percentage in the mixture.

(iii) - Corresponds to the period between 01/09 to 31/03

(iv) - Corresponds to the period between 01/04 to 31/08

(v) - Alternatively the method NCh 1843 and NCh 2350 can be used.

(vi) - Alternatively the method NCh 2351 can be used. In the field, apply NCh 2352 method.

(vii) - Alternatively the method NCh 2325 can be used.

(viii) - Indicate test method used

(ix) - It does not apply for gasolines produced and commercialized in the regions XI and XII

(x) - To determine the V/L ratio, a calculation procedure based on the Reid vapor pressure and distillation temperatures can be used

## 6.2.2. Diesel

Property	Metropolitan region				Other regions			
	Requirement		Unity	Test method	Requirement		Unity	Test method
	Min.	Max.			Min.	Max.		
Flash point	52	-	°C	ASTM D93, D3828	52	-	°C	NCh 69
Pour point	-	-1	°C	ASTM D97, D5950, D5949	-	-1 -9 (iii)	°C	NCh 1983
Water and sediments	-	0,05	% v/v	ASTM D2709	-	0,1	% v/v	NCh 1982
Carbon Residue over 10% of residue								
- Ramsbottom	-	0,21	% m/m	ASTM D524 (i)	-	0,35	% m/m	NCh 1985 (i)
- Conradson	-	-	-	-	-	0,34	% m/m	NCh 1986
- Micromethod	-	0,2	% m/m	ASTM D4530	-	0,34	% m/m	NCh 2429
Ash	-	0,01	% m/m	ASTM D482	-	0,01	% m/m	NCh 1984
Temperature 90% recovered	282	350	°C	ASTM D86	282	338	°C	NCh 66
Kinematics viscosity @ 40 °C	1,9	4,1	cSt	ASTM D445	1,9	5,5	cSt	NCh 1950
Sulfur	-	15	ppm	ASTM D5453, D2622, D7039	-	0,005	% m/m	NCh 1896, NCh 2294, NCh 2325
Copper corrosion	-	1	-	ASTM D130	-	2	-	NCh 70
Cetane number	50	-	-	ASTM D976, D613(ii)	50	-	-	NCh 1987
Density at 15°C	820	850	kg/m <sup>3</sup>	ASTM D4052, D1298	830 815 (iv)	850	kg/m <sup>3</sup>	NCh 882, NCh 2395
Aromatics	-	35	% m/m	ASTM D5186	-	35	% m/m	NCh 2035, NCh 2037
Polycyclic aromatic	-	8	% m/m	ASTM D5186	-	11	% m/m	NCh 2035, NCh 2037, NCh 2054
Nitrogen	-	-	-	-	-	300	ppm	NCh 2036
Color	-	no coloring	-	ASTM D1500	-	-	-	-
Lubricity	-	460	µm	ASTM D6079	-	460	µm	ASTM D6079
Cold Filter Plugging Point	-	inform	°C	ASTM D6371	-	inform	°C	NCh 2287

(i) - For confirmation, apply Ramsbottom method

(ii) - Calculated cetane number (ASTM D976) can be used, but for confirmation apply the reference method (ASTM D613)

(iii) - For regions XI and XII, from 15/04 to 15/09

(iv) - Authorized limit for regions XI and XII

## 6.2.3. Ethanol

Property	Requirement		Unity
	Min.	Max.	
Ethanol	92,1	-	% v/v
Methanol	-	0,5	% v/v
Washed Gums	-	5	mg/100ml
Water	-	1	% v/v
Denaturant	-	5	% v/v
Inorganic chlorine	-	32	mg/l
Copper	-	0,1	mg/kg
Acidity	-	56	mg/l
pHe	6,5	9	pH
Sulfur	-	0,003	% m/m
Sulfates	-	4	ppm
Appearance	Free of sediment and suspended material and bright at 21 °C		

\* Ethanol may be mixed with gasoline from 2% to 5% in volume

#### 6.2.4. Biodiesel

Property	Requirement		Unity
	Min.	Max.	
Density @ 15 °C	0,86	0,9	g/cm <sup>3</sup>
Viscosity @ 40 °C	3,5	5	cSt
Flash point	120	-	°C
Pour point	-	-1	°C
Sulfur	-	0,005	% m/m
Carbon residue Conradson (CCR) at 100%	-	0,05	% m/m
Sulfated ash	-	0,02	% m/m
Water and sediments	-	0,05	% v/v
Copper corrosion (3h to 50°C)	-	2	-
Neutralization	-	0,5	mg KOH/g
Ester	96,5	-	% m/m
Methanol	-	0,2	% m/m
Free glycerin	-	0,02	% m/m
Total glycerin	-	0,25	% m/m
Phosphorus	-	10	mg/kg
Alkali (Na + K)	-	5	mg/kg
Metals (Ca + Mg)	-	5	mg/kg
Oxidation Stability @ 110 °C	6	-	hours

\* Biodiesel may be mixed with diesel fuel from 2% to 5% in volume

#### 6.2.5. Compressed Natural Gas

Property	Requirement		Unity	Test method
	Min.	Max.		
Gross calorific power	36995	42635	KJ/m <sup>3</sup>	NCh 2380
Wobbe index	47235	52125	KJ/m <sup>3</sup>	NCh 2380
Relative density	informar			NCh 2380
Inert gases	-	4	% v/v	ASTM D1945
Dew point at 5500 kPa	-	-4	°C	ASTM D1142
Carbon dioxide (CO <sub>2</sub> )	-	2	% v/v	ASTM D 1945
Oxygen	-	0,2	% v/v	ASTM D 1945
Hydrogen Sulfide	-	3	mg/m <sup>3</sup>	ISO 6326-4 (i)
Sulfur	-	15 (ii) 65 (iii)	mg/m <sup>3</sup>	ASTM D 5504 (iv)
Water	-	65	mg/m <sup>3</sup>	ASTM D1142

(i) - Alternatively methods ASTM D2775 or ASTM D4810 can be used. For confirmation, apply method ISO 6326-4

(ii) - Before the addition of odorizers

(iii) - After the addition of odorizers

(iv) - Alternatively method ASTM D4468 can be used. For confirmation, apply method ASTM D5504

### 6.2.6. Liquefied Petroleum Gas

Property	Requirement		Unity	Test unit
	Min.	Max.		
Propane	85	-	% v/v	ASTM D2163
Butene	-	2	% v/v	ASTM D2163
Pentane and heavier	-	0,5	% v/v	ASTM D2163
Propane	-	10	% v/v	ASTM D2163
Sulfur	-	80 (i)	ppm	ASTM D2784, D4468, D6667

(i) - Afterodorizer

### 7. Trends:

#### Low Emission Zone:

Implementation of a low emission zone in the Metropolitan Region. Only heavy duty vehicles complying with stringent emissions limits will be allowed to enter in this zone. Access controlled by sticker. It is still under discussion.

#### Truck fleet scrap:

The government is considering the implementing of a new program to scrap old trucks, especially those who do not have emissions certification. The program should also consider mechanisms to facilitate the renewal of the fleet, such as credits for owners of scrapped trucks.

#### Biodiesel content in diesel fuel:

An increased blend of biodiesel in diesel fuel is under study. The definition of a new blend depends on the results of a study that evaluates the impact of new biodiesel blends in the air quality of the metropolitan region.

#### OBD:

OBD for light vehicles is under study. When adopted, trend is to allow OBD II (U.S.) or E-OBD (European), according to vehicle manufacturer or importer preference.

#### Incentives to sell low-emission vehicles:

Chilean government is interested to define an incentive program to increase the sales of zero and ultra-low emission vehicles. A working group, which includes the Ministry of Finance, studies the theme.

#### Energy efficiency:

In study the application of emissions limits for off-road vehicles. Publication and application not yet decided, but is probable that Chile adopts the same that is applied in Brazil.

#### Emissions limits for off-road vehicles:

In study the application of emissions limits for off-road vehicles. Publication and application not yet decided, but is probable that Chile adopts the same that is applied in Brazil.