

Fuel quality standards

The present document does not provide full detail on the very complex issue of fuel quality standards. It is highly recommended to consult the last section in the document - **References** - in order to access detailed information.

EU regulations

For the EU, fuel quality is regulated in the directives

- Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC.
- Commission Directive 2000/71/EC of 7 November 2000 to adapt the measuring methods as laid down in Annexes I, II, III and IV of Directive 98/70/EC of the European Parliament and of the Council to technical progress as foreseen in Article 10 of that Directive.
- Directive 2003/17/EC of the European Parliament and of the Council of 3 March 2003 amending Directive 98/70/EC relating to the quality of petrol and diesel fuels (Text with EEA relevance).

These directives can be accessed through the page <http://europa.eu.int/comm/environment/air/legis.htm>

USA regulations

Fuel quality is regulated according to the table below:

LEGISLATION (PRODUCT STANDARDS) ON FUEL QUALITY; UNITED STATES			
Legislation (in chronological order)	Deadline for implementation of specific measures	Specific measures	Atmospheric pollutant addressed
Federal Reformulated Gas (RFG) program Requirements, Clean Air Act Amendments of 1990 Reformulated gasoline: http://www.epa.gov/otaq/rfg_regs.htm	Phase 1: 1995 Phase 2: 2000	<ul style="list-style-type: none">• Requires cities with the worst smog pollution to use reformulated gasoline (RFG)• Nine major metropolitan areas required to use RFG	Smog-causing pollutants such as NO _x and VOCs, also benzene. Ozone
Oxygenated Fuel Standards, Clean Air Act Amendments of 1990	1995	<ul style="list-style-type: none">• During winter months, all gasoline sold in specified CO nonattainment areas must be oxygenated with a minimum oxygen content of 2.7 weight percent.	CO, NO _x
Highway Diesel Sulfur Control Requirements, 40 Code of Federal Regulations (CFR) 69, 80, 86, 18 January 2001	Middle 2006	<ul style="list-style-type: none">• Requires 97 percent reduction in the sulfur content of diesel fuel to ensure effective operation of new emission control equipment• Requires all diesel fuel supplied to highway vehicles meet a sulfur content limit of no more than 15 parts per million	Sulfur
Nonroad Diesel Sulfur Control Requirements	Varying requirements	<ul style="list-style-type: none">• Requires that all diesel fuel supplied to nonroad vehicles meet a sulphur content of 500 ppm in 2007. All diesel fuel supplied to nonroad engines must meet a sulphur content of 15 ppm in 2010 and 2012 for locomotive and marine diesel fuel.	Sulfur

Limit values

	EU 2000	EU 2005	EU 2009	USA 2004	USA 2006	
Petrol (maximum values)						
Sulphur	150 ppm	50 ppm	10 ppm	120/300 ppm (average/ max)	30/80 (average/max)	
Aromatics	42 %	35 %				
Benzene	1 %	1 %				
Olefins	18 %	18 %				
Lead	0.005 g/l	0.005 g/l				
Oxygen	2.7 %	2.7 %				
MTBE	15 %	15 %		1)		
TAME	15%	15%				
IPA	10%	10%				
TBA	7%	7%				
Ethanol	5%	5%				
Methanol	3%	3%				
Diesel parameters						
Sulphur	350 ppm (max)	50 ppm (max)			15 ppm (max)	
PAH	11% (max)	11% (max)				

Notes

1) In California use of MTBE has been prohibited since January 1, 2004.

References

- As noted above, **EU legislation** on emission standards is available through <http://europa.eu.int/comm/environment/air/legis.htm>
- US regulations on fuels are available through <http://www.epa.gov/otaq/fuels.htm>
- Worldwide specifications of **automotive diesel fuels** can be found on **Dieselnet**, <http://www.dieselnet.com/standards/fuels/index.html>. It includes both fuel quality regulations for market—highway and nonroad—fuels, as well as specifications for certification (reference, homologation) fuels.
- The **Asian Development Bank** provides an entry page to information about worldwide standards for fuel, both **gasoline** <http://www.adb.org/vehicle-emissions/General/gas.asp> and **diesel** <http://www.adb.org/vehicle-emissions/General/diesel.asp>
- Concawe** (<http://www.concawe.be>) publishes highly relevant reports, notably **Report no. 9/04 'Motor vehicle emission regulations and fuel specifications - part 1: 2002/2003 update'**. There is also a companion report, part 2, no. 2/01 'Motor vehicle emission regulations and fuel specifications - part 2: detailed information and historic review (1996-2000)'. These reports are not on the Internet, but can be bought on paper from Concawe.
- In the Annexes of the case studies conducted under the current project on *Assessment of the effectiveness of European air quality policies and measures*, there are sections entitled "Legislation and Measures Implemented". These sections describe how and why standards have developed in EU, US, and to some extent Canada and Japan.