

FUELS

ON ROAD
EMISSIONS STANDARDS

ON ROAD
EMISSIONS RELATED
REQUIREMENTS

NRMM
EMISSIONS STANDARDS

FUELS

This section contains only selected reference test fuel definitions for EU, US, Japan and India markets.

EU REFERENCE TEST FUELS

DIESEL FOR HEAVY DUTY ROAD VEHICLES

Diesel fuel for compression-ignition (CI) engines

Parameter	Unit	Euro I/II/III		Euro IV/V		Euro VI		Test Method
		88/77/EEC Annex IV	Min	Max	2005/55 EC Annex IV	Min	Max	
Cetane Number	–	49	53	52	54	52	56	EN ISO 5165
Density at 15°C	kg/m ³	835	845	833	837	833	837	EN ISO 3675
Distillation 50%	°C	245	–	245	–	245	–	EN ISO 3405
Distillation 95% (90% for Euro I/II/III)	°C	320	340	345	350	345	350	EN ISO 3405
Distillation Final Boiling Point FBP	°C	–	370	–	370	–	360	EN ISO 3405
Viscosity at 40°C	mm ² /s	2.5	3.5	2.5	3.5	2.3	3.3	EN ISO 3104
Sulphur content	mg/kg	–	300	–	300	–	10	EN ISO 20856 / 20884
Flash point	°C	55	–	55	–	55	–	EN 22719
Cold Filter Plug-in Point CFPP	°C	–	-5	–	-5	–	-5	EN 116
Polycyclic aromatic hydrocarbons	% m/m	–	–	3	6	2	4	EN 12916
Copper Corrosion Rating		Class 1		Class 1		Class 1		EN ISO 2160
Conradson carbon residue (10% DR)	% m/m	–	0.2	–	0.2	–	0.2	EN ISO 10370
Ash content	% m/m	–	0.01	–	0.01	–	0.01	EN ISO 6245
Water content	% m/m	–	0.05	–	0.05	–	0.02	EN ISO 12937
Neutralisation (strong acid) nr	mg KOH/g	–	0.20	–	0.02	–	0.10	ASTM D974
Oxidation stability (for middle distillate fuels)	Mass	2.5 mg/100ml		0.025 mg/ml		–	0.025 mg/ml	EN ISO 12205
Oxidation stability (for FAME content >2%)	Hours					20	–	EN 15751
Lubricity (HFRR wear scar at 60°C)	µm					–	400	EN ISO 12156
FAME content	% vol					6	7	EN 14078

If the manufacturer permits to operate the engine to run on market fuels not included in the EN 590 CEN standard, such as running on B100, the manufacturer shall:

- demonstrate the capability of the parent engine to meet the requirements of this Regulation on the fuels declared and
- be liable to meet the requirements of in-service conformity on the fuels declared including any blend between the declared fuels and the market fuels included in the relevant CEN standards

EU REFERENCE TEST FUELS

NATURAL GAS FOR HEAVY DUTY ROAD VEHICLES

Natural Gas / Biomethane

Parameter	Unit	Euro IV, V and VI – 2005/55 EC Annex IV, EU 582/2011 Annex IX			
		Basis	Min	Max	Test Method
Reference fuel G_R					
Methane	%mole	87	84	89	
Ethane	%mole	13	11	15	
Balance	%mole	–	–	1	ISO 6974
Sulphur content	mg/m ³	–	–	10	ISO 6326-5
Reference fuel G₂₃					
Methane	%mole	92.5	91.5	93.5	
Balance	%mole	–	–	1	ISO 6974
N ₂	%mole	7.5	6.5	8.5	
Sulphur content	mg/m ³	–	–	10	ISO 6326-5
Reference fuel G₂₅					
Methane	%mole	86	84	88	
Balance	%mole	–	–	1	ISO 6974
N ₂	%mole	14	12	16	
Sulphur content	mg/m ³	–	–	10	ISO 6326-5

The parent engine shall meet the requirements of this Regulation on the reference fuels. At the manufacturer's request the engine may be tested on a

third fuel when fuel 3 is a market fuel. The results of this test may be used as a basis for the evaluation of the conformity of the production.

EU REFERENCE TEST FUELS**ETHANOL FOR HEAVY DUTY ROAD VEHICLES and NON ROAD MOBILE MACHINERY**Ethanol for diesel engines / dedicated compression-ignition engines (ED95)¹⁾

Parameter	Unit	Euro IV/V		Euro VI (HD) and Stage V (NRMM)		
		2005/55/EC Annex IV		EU 582/2011 Annex IX, EU/2017/654 Annex IX		
		Min	Max	Min	Max	Test Method
Total alcohol	% m/m	92.4	–	92.4	–	EN15721
Other higher saturated mono-alcohols (C ₃ - C ₅)	% m/m	–	2	–	2	EN15721
Methanol	% m/m	–	–	–	0.3	EN15721
Density at 15 °C	kg/m ³	795	815	793	815	EN-ISO 12185
Ash content	% m/m	–	0.001	–	–	ISO 6245
Acidity (calculated as acetic acid)	% m/m	–	0.0025	–	0.0025	EN 15491
Flash point	° C	10	–	10	–	EN 3679
Dry residue	mg/kg	–	15	–	15	EN 15691
Water content	% m/m	–	6.5	–	6.5	EN 15489
Aldehydes calc. as acetaldehyde	% m/m	–	–	–	0.005	ISO 1388-4
Neutralisation (strong acid) number	KOH mg/l	–	1	–	–	–
Esters calc. as Ethylacetate	% m/m	–	0.1	–	0.1	ASTM D1617
Sulphur content	mg/kg	–	10	–	10	EN 15485 / EN 15486
Sulphates	mg/kg	–	–	–	4.0	EN 15492
Particle contamination	mg/kg	–	–	–	24	EN 12662
Phosphorus	mg/kg	–	–	–	0.2	EN 15487
Inorganic chloride	mg/kg	–	–	–	1.0	EN 15484 or EN 15492
Copper	mg/kg	–	–	–	0.1	EN 15488
Electrical Conductivity	µS/cm	–	–	–	2.5	DIN 51627-4 or prEN 15938

¹⁾ Additives, such as cetane improver as specified by the engine manufacturer, may be added to the ethanol fuel, as long as no negative side effects are known. If these conditions are satisfied, the maximum allowed amount is 10 % m/m.

EU REFERENCE TEST FUELS

DIESEL FOR NON-ROAD MOBILE MACHINERY

Parameter	Unit	Stage I/II 97/86/EC Annex IV		Stage IIIA 2004/26/EC Appx. 5 (3)		Stage IIIB/IV 2004/26/EC Appx. 5 (3)		Stage V EU 2017/654 Annex IX		
		Min	Max	Min	Max	Min	Max	Min	Max	Test Method
Cetane Number	–	45	50	52	54	–	54	45	56	EN ISO 5165
Density at 15°C	kg/m ³	835	845	833	837	833	837	833	865	EN ISO 3675
Distillation T50	°C	–	–	245	–	245	–	245	–	EN ISO 3405
Distillation T95	°C	–	370	345	350	345	350	345	350	EN ISO 3405
Distillation Final Boiling Point FBP	°C	–	–	–	370	–	370	–	370	EN ISO 3405
Viscosity at 40°C	mm ² /s	2.5	3.5	2.5	3.5	2.3	3.3	2.3	3.3	EN ISO 3104
Sulphur content	mg/kg	0.1%	0.2%	–	300 ¹⁾	–	10 ¹⁾	–	10 mg/kg	ASTM D5453
Flash point	°C	55	–	55	–	55	–	55	–	EN 22719
Cold Filter Plug-in Point CFPP	°C	–	-5	–	-5	–	-5	–	-5	EN 116
Polycyclic aromatic hydrocarbons	% m/m	–	–	3.0	6.0	3.0	6.0	2.0	6.0	IP 391
Copper Corrosion Rating	–	Class 1		Class 1		Class 1		Class1		EN ISO 2160
Conradson carbon residue (10% DR)	% m/m	–	0.2	–	0.3	–	0.2	–	0.2	EN ISO 10370
Ash content	% m/m	–	0.01	–	0.01	–	0.01	–	0.01	EN ISO 6245
Water content	% m/m	–	0.05	–	0.05	–	0.02	–	0.02	EN ISO 12937
Neutralisation (strong acid) nr	mg KOH/g	0.2	–	–	0.02	–	0.02	–	0.1	ASTM D974
Oxidation stability (for middle distillate fuels) ²⁾	Mass	2.5 mg/100ml		–	0.025 mg/ml	–	0.025 mg/ml	–	0.025 mg/ml	EN ISO 12205
Oxidation stability (for FAME content >2%)	Hours	–		–		–		20	–	EN 15751
Lubricity (HFRR wear scar at 60°C)	µm	–		–		–	400	–	400	CEC F-06-A-96
FAME content	% vol	–		–		Prohibited		–	7.0	EN 14078

¹⁾ The actual sulphur content shall be recorded.

²⁾ Even though oxidation stability is controlled, it is likely that shelf life will be limited. Advice should be sought from the supplier as to storage conditions and life.

EU REFERENCE TEST FUELS

PETROL (E10) FOR NON-ROAD MOBILE MACHINERY

Parameter	Unit	Stage V – EU 2017/654		Test Method
		Annex IX		
		Min	Max	
Research Octane Number RON		91	98	EN ISO 5164:2005
Motor Octane Number MON		83	89	EN ISO 5163:2005
Density at 15°C	kg/m ³	743	756	EN ISO 3675 / EN ISO 12185
Vapour pressure	kPa	45	60	EN ISO 13016-1 (DVPE)
Water content	%v/v	–	0.05	EN 12937
Distillation Evaporated at 70°C	%v/v	18	46	EN-ISO 3405
Distillation Evaporated at 100°C	%v/v	46	62	EN-ISO 3405
Distillation Evaporated at 150°C	%v/v	75	94	EN-ISO 3405
Final boiling point	°C	170	210	EN-ISO 3405
Residue	%v/v	–	2.0	EN-ISO 3405
HC analysis – olefins	%v/v	3	18	EN 14517 / EN 15553
HC analysis – aromatics	%v/v	19.5	35	EN 14517 / EN 15553
HC analysis – benzene	%v/v	–	1	EN 12177 / EN 238 / EN 14517
Induction period	Minutes	480	–	EN-ISO 7536
Oxygen content	%m/m	3.3	3.7	EN 1601 / EN 13132 / EN 14517
Existent gum	mg/ml	–	0.04	EN-ISO 6246
Sulphur content	mg/kg	–	10	EN ISO 20846 / EN ISO 20884
Copper corrosion	rating	–	Class 1	EN-ISO 2160
Lead content	mg/l	–	5.0	EN 237
Phosphorus content	mg/l	–	1.3	ASTM D 3231
Ethanol	%v/v	9.0	10.2	EN 22854

EU REFERENCE TEST FUELS

NATURAL GAS (NG) FOR NON-ROAD MOBILE MACHINERY: Natural gas / biomethane

Parameter	Unit	Stage V – EU 2017/654 Annex IX			
		Basis	Min	Max	Test Method
Reference fuel G_R					
Methane	%mole	87	84	89	
Ethane	%mole	13	11	15	
Balance	%mole	–	–	1	ISO 6974
Sulphur content	mg/m ³	–	–	10	ISO 6326-5
Reference fuel G₂₃					
Methane	%mole	92.5	91.5	93.5	
Balance	%mole	–	–	1	ISO 6974
N ₂	%mole	7.5	6.5	8.5	
Sulphur content	mg/m ³	–	–	10	ISO 6326-5
Reference fuel G₂₅					
Methane	%mole	86	84	88	
Balance	%mole	–	–	1	ISO 6974
N ₂	%mole	14	12	16	
Sulphur content	mg/m ³	–	–	10	ISO 6326-5
Reference fuel G₂₀					
Methane	%mole	100	99	100	ISO 6974
Balance	%mole	–	–	1	ISO 6974
N ₂	%mole	–	–	–	ISO 6975
Sulphur content	mg/m ³	–	–	10	ISO 6326-5
Wobbe Index (net)	mg/m ³	48.2	47.2	49.2	

EU 2017/654 Annex IX section 3.2.2 permits an alternative reference NG fuel supplied from a pipeline with admixture of other gases with gas properties determined by on-site measurement. The basis of each pipeline reference fuel (GR, G20, ...) shall be gas drawn from a utility gas distribution network, blended, where necessary to meet the corresponding lambda-shift (S_{λ}) specification in Table 9.1, with an admixture of one or more of the following commercially available gases: (a) Carbon dioxide; (b) Ethane; (c) Methane; (d) Nitrogen; (e) Propane.

US REFERENCE TEST FUELS**DIESEL FOR HEAVY DUTY ROAD VEHICLES and NON-ROAD MOBILE MACHINERY**

EPA CFR 40 Part 1065.703 – Test Fuel Specifications for Distillate Diesel Fuel from model year 2010

Parameter	Unit	Ultra low sulphur		Low sulphur		High sulphur		Test Method
		Min	Max	Min	Max	Min	Max	
Cetane Number	–	40	50	40	50	40	50	ASTM D613
Distillation range: Initial boiling point	°C	171	204	171	204	171	204	ASTM D86
Distillation range: 10%	°C	204	238	204	238	204	238	ASTM D86
Distillation range: 50%	°C	243	282	243	282	243	282	ASTM D86
Distillation range: 90%	°C	293	332	293	332	293	332	ASTM D86
Distillation range: Endpoint	°C	321	366	321	366	321	366	ASTM D86
Gravity	°API	32	37	32	37	32	37	ASTM D4052
Total sulphur, ultra low sulphur	mg/kg	7	15					See 40 CFR 80.580
Total sulphur, low and high sulphur	mg/kg			300	500	800	2.500	ASTM D2622 or alternates as allowed under 40 CFR 80.580
Aromatics, min. (Remainder shall be paraffins, naphthenes, and olefins)	g/kg	100	–	100	–	100	–	ASTM D5186
Flashpoint, min.	°C	54	–	54	–	54	–	ASTM D93
Kinematic Viscosity	cSt	2.0	3.2	2.0	3.2	2.0	3.2	ASTM D445

Fuels with sulphur levels no greater than 0,2 wt% (2.000 ppm) were used for certification testing of Tier 1-3 engines. From 2011 all Tier 4 engines are tested using

fuels of 7-15 ppm sulphur content. The transition from 2000 ppm specification to the 7-15 ppm specification took place 2006-2010 (see Certification Diesel Fuel).

US REFERENCE TEST FUELS

GASOLINE (E10) FOR HEAVY DUTY ROAD VEHICLES and NON-ROAD MOBILE MACHINERY

EPA CFR 40 Part 1065.710 Test Fuel Specifications for a Low-Level Ethanol-Gasoline Blend (E10)

Property	Unit	Specification			Reference procedure
		General testing	Low-temp testing	High altitude testing	
Antiknock Index (R + M)/2		87.0 - 88.4		87.0 Minimum	ASTM D2699 and D2700.
Sensitivity (R-M)			7.5 Minimum		ASTM D2699 and D2700.
Dry Vapor Pressure Equivalent (DVPE)	kPa	60.0 - 63.4	77.2 - 81.4	52.4 - 55.2	ASTM D5191.
Distillation: 10% evaporated	°C	49 - 60	43 - 54	49 - 60	ASTM D86
Distillation: 50% evaporated	°C		88 - 99		
Distillation: 90% evaporated	°C		157 - 168		
Distillation: Evaporated final boiling point	°C		193 - 216		
Residue	ml		2.0 Maximum		
Total Aromatic Hydrocarbons	volume %		21.0 - 25.0		ASTM D5769
C6 Aromatics (benzene)	volume %		0.5 - 0.7		
C7 Aromatics (toluene)	volume %		5.2 - 6.4		
C8 Aromatics	volume %		5.2 - 6.4		
C9 Aromatics	volume %		5.2 - 6.4		
C10 + Aromatics	volume %		4.4 - 5.6		
Olefins	mass %		4.0 - 10.0		ASTM D6550.
Ethanol blended	volume %		9.6 - 10.0		
Ethanol confirmatory	volume %		9.4 - 10.2		ASTM D4815 or D5599.
Total Content of Oxygenates Other than Ethanol	volume %		0.1 Maximum		ASTM D4815 or D5599.
Sulphur	mg/kg		8.0 - 11.0		ASTM D2622, D5453 or D7039.
Lead	g/l		0.0026 Maximum		ASTM D3237.
Phosphorus	g/l		0.0013 Maximum		ASTM D3231.
Copper Corrosion			No. 1 Maximum		ASTM D130.
Solvent-Washed Gum Content	mg/100 ml		3.0 Minimum		ASTM D381.
Oxidation Stability	minute		1000 Minimum		ASTM D525.

US REFERENCE TEST FUELS

GASOLINE (E0) and NATURAL GAS FOR HEAVY DUTY ROAD VEHICLES and NON-ROAD MOBILE MACHINERY

EPA CFR 40 Part 1065.710 — Test Fuel Specifications for Neat (E0) Gasoline

Property	Unit	Specification		Reference procedure
		General testing	Low-temp testing	
Distillation Range: Evaporated IBP	°C	24 - 35	24 - 36	ASTM D86
Distillation Range: 10% evaporated	°C	49 - 57	37 - 48	
Distillation Range: 50% evaporated	°C	93 - 110	82 - 101	
Distillation Range: 90% evaporated	°C	149 - 163	158 - 174	
Distillation Range: Evaporated FBP	°C	Max. 213	Max. 212	
Hydrocarbon composition: Olefins	volume %	Max. 10	Max. 17.5	ASTM D1319
Hydrocarbon composition: Aromatics	volume %	Max. 35	Max. 30.4	
Hydrocarbon composition: Saturates	volume %	Remainder	Remainder	
Lead	g/l	Max. 0.013	Max. 0.013	ASTM D3237
Phosphorus	g/l	Max. 0.0013	Max. 0.005	ASTM D3231
Total sulphur	mg/kg	Max. 80	Max. 80	ASTM D2622
Dry vapor pressure equivalent	kPa	60.0 - 63.4	77.2 - 81.4	ASTM D5191

EPA CFR 40 Part 1065.715 — Test Fuel Specifications for Natural Gas

Property	Unit	Specification	
		Minimum	Maximum
Methane, CH ₄	mol/mol	0.87	–
Ethane, C ₂ H ₆	mol/mol	–	0.055
Propane, C ₃ H ₈	mol/mol	–	0.012
Butane, C ₄ H ₁₀	mol/mol	–	0.0035
Pentane, C ₅ H ₁₂	mol/mol	–	0.0013
C ₆ and higher	mol/mol	–	0.001
Oxygen	mol/mol	–	0.001
Inert gases (sum of CO ₂ and N ₂)	mol/mol	–	0.051

JAPAN REFERENCE TEST FUELS

AUTOMOTIVE FUEL QUALITY REGULATIONS

Type of Fuel	Fuel Property	Limit	JIS
Gasoline	Lead	Not detected	K22554,5
	Sulphur	Max. 0.001 (mass %)	
	Benzene	Max. 1 (vol %)	
	MTBE	Max. 7 (vol %)	
	Oxygen ¹⁾	Max. 1.3 (mass %)	K2536-2,4,6
Diesel	Sulphur	Max. 0.001 (mass %)	
	Cetane Index	Min. 45	K2280
	Distillation at 90%	Max. 360 (deg C)	K2254

¹⁾ Min 1.3 % and Max 3.7 % for E10 and ETBE22 Fuel.

INDIA REFERENCE TEST FUELS

Diesel fuel For Heavy Duty and Non-Road Mobile Machinery

Parameter	Unit	Heavy-Duty BS III		Heavy-Duty BS IV		EU 582/2011 Annex IX Heavy-Duty BS VI and NRMM BS IV & V		
		Min	Max	Min	Max	Min	Max	Test Method
Cetane Index	-	-	-	-	-	46	-	EN ISO 4264
Cetane Number	-	52	54	53	54	52	56	EN ISO 5165
Density at 15°C	kg/m ³	833	837	833	837	833	837	EN ISO 12185
Distillation Range: 50%	°C	245	-	245	-	245	-	EN ISO 3405
Distillation Range: 95%	°C	345	350	345	350	345	360	EN ISO 3405
Distillation Range: Final Boiling Point FBP	°C	-	370	-	370	-	370	EN ISO 3405
Viscosity at 40°C	mm ² /s	2.5	3.5	2.3	3.3	2.3	3.3	EN ISO 3104
Sulphur Content	mg/kg	-	300	-	10	-	10	EN ISO 20846 / 20884
Flash Point	°C	55	-	55	-	55	-	EN ISO 2719
CFPP	°C	-	-5	-	-5	-	-	EN116
Cloud Point	°C	-	-	-	-	-	-10	EN 23015
Polycyclic Aromatic Hydrocarbons	% m/m	3	6	3	6	2	4	EN 12916
Copper Corrosion Rating 3 hrs @ 50°C		Class 1		Class 1		Class 1		EN ISO 2160
Conradson Carbon Residue (10% DR)	% m/m	-	0.2	-	0.2	-	0.2	EN ISO 10370
Ash Content	% m/m	-	0.01	-	0.01	-	0.01	EN ISO 6245
Water Content	mg/kg	-	500	-	200	-	200	EN ISO 12937
Acid Number	mg KOH/g	-	-	-	-	-	0.10	EN ISO 6618
Neutralisation number	mg KOH/g	-	0.02	-	0.02	-	-	ASTM D974
Oxidation Stability @ 110°C	Hours	-	-	-	-	20	-	EN 15751
Oxidation Stability	mg/ml	-	0.025	-	0.025	-	-	EN ISO 12205
Lubricity (HFRR Wear Scar @ 60°C)	µm	-	-	-	400	-	400	EN ISO 12156
FAME Content	% vol	-	-	Prohibited		6	7	EN 14078

Source: ARAI

INDIA REFERENCE TEST FUELS

Petrol (E5) – BS VI ED95 is same as EU

Parameter	Unit	BS III		BS IV		BS VI		Test Method
		Min	Max	Min	Max	Min	Max	
Research Octane Number RON	–	95	–	95	–	95	–	EN ISO 5164:2005
Motor Octane Number MON	–	85	–	85	–	85	–	EN ISO 5163:2005
Density at 15°C	kg/m ³	748	762	740	754	743	756	EN ISO 3675 / EN ISO 12185
Vapour Pressure	kPa	56	60	56	60	56	60	EN ISO 13016-1 (DVPE)
Water Content	% v/v	–	–	–	–	–	0.015	ASTM 1064
Distillation: Evaporated at 70°C	% v/v	24	40	24	40	24	44	EN ISO 3405
Distillation: Evaporated at 100°C	% v/v	49	57	50	58	48	60	EN ISO 3405
Distillation: Evaporated at 150°C	% v/v	81	87	83	89	82	90	EN ISO 3405
Final Boiling Point	% v/v	190	215	190	210	190	210	EN ISO 3405
Residue	% v/v	–	2.0	–	2.0	–	2.0	EN ISO 3405
HC Analysis: Olefins	% v/v	–	10	–	10	3	13	ASTM D 1319
HC Analysis: Aromatics	% v/v	28	40	29	35	29	35	ASTM D 1320
HC Analysis: Benzene	% v/v	–	1	–	1	–	1	EN 12177
Saturates		Balance		Report		Report		ASTM 1319
Carbon/Hydrogen Ratio		Report		Report		Report		
Carbon/Oxygen Ratio						Report		
Induction Period	Minutes			480	–	480	–	EN ISO 7536
Oxygen Content	% m/m	–	2.3	–	0.1	Report		EN 1601
Existent Gum	mg/ml		0.04		0.04	–	0.04	EN ISO 6246
Sulphur Content	mg/kg	–	100	–	10	–	10	EN ISO 20846 / EN ISO 20884
Copper Corrosion	rating	–	Class 1	–	Class 1	–	Class 1	EN ISO 2160
Lead Content	mg/kg	–	5.0	–	5.0	–	5.0	EN 237
Phosphorus Content	mg/kg	–	1.3	–	1.3	–	1.3	ASTM D 3231
Ethanol	% v/v	–	–	–	–	4.7	5.3	EN 1601 / EN 13132

Source: ARAI

INDIA REFERENCE TEST FUELS

Natural Gas for Heavy Duty Road Vehicles

Parameter	Unit	BS III			BS IV Cat. M & N ≤ 3500 Kg GVW			BS IV Cat. M & N > 3500 Kg GVW			Test Method
		Basis	Min	Max	Basis	Min	Max	Basis	Min	Max	
		Reference fuel G ₂₀			Reference fuel G ₂₀			Reference fuel G _R			
Methane	%mole	100	99	100	100	99	100	100	99	100	ISO 6974
Balance [Inerts (different from N ₂) + C ₂ + C ₂₊]	%mole	–	–	1	–	–	1	–	–	1	ISO 6974
N ₂	%mole	–	–	–	–	–	–	–	–	–	ISO 6974
Sulphur content	mg/m ³	–	–	50	–	–	10	–	–	10	ISO 6326-5
Wobbe Index (net)					48,2	47,2	49,2				
Reference fuel G₂₃		Reference fuel G₂₀			Reference fuel G₂₃			Reference fuel G₂₃			
Methane	%mole	92.5	91.5	93.5				92.5	91.5	93.5	ISO 6974
Balance [Inerts (different from N ₂) + C ₂ + C ₂₊]	%mole	–	–	1				–	–	1	ISO 6974
N ₂	%mole	7.5	6.5	8.5				7.5	6.5	8.5	ISO 6974
Sulphur content	mg/m ³	–	–	50				–	–	10	ISO 6326-5
Reference fuel G₂₅		Reference fuel G₂₅			Reference fuel G₂₅			Reference fuel G₂₅			
Methane	%mole	86	84	88	86	84	88	86	84	89	ISO 6974
Balance [Inerts (different from N ₂) + C ₂ + C ₂₊]	%mole	–	–	1	–	–	1	–	–	1	ISO 6974
N ₂	%mole	14	12	16	14	12	16	14	12	16	ISO 6974
Sulphur content	mg/m ³	–	–	50	–	–	10	–	–	10	ISO 6326-5
Wobbe Index (net)					39.4	38.2	40.6				

Source: ARAI