Approval list of commercial vehicle manufacturers

for operation with biodiesel (B20 | B30 | B100)

Zukunft tanken.

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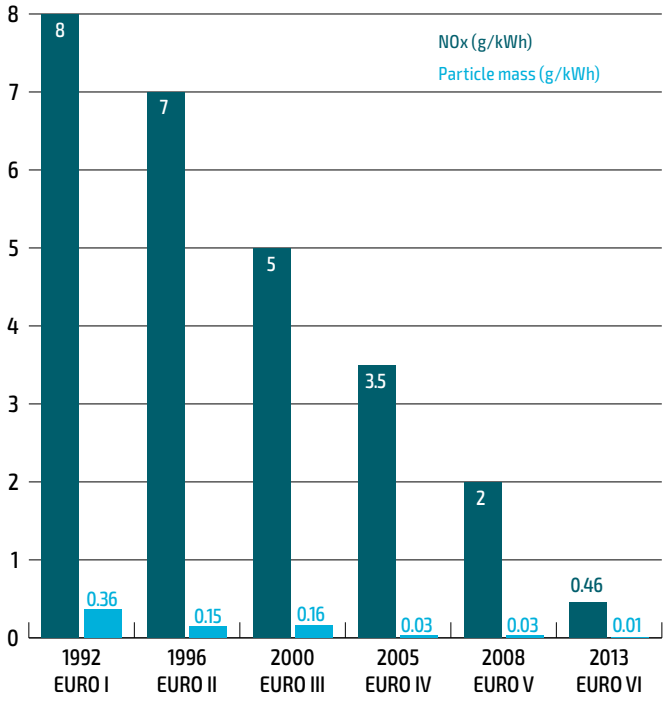
The European Union wants to reduce greenhouse gas emissions in the transport sector until 2030 by at least 30 % compard to 2005. Biofuels are currently the most significant renewable energy alternative in the transportation sector. Although important impetus is given to the production of fuels from waste and residual materials as well as synthetic fuels, biofuels such as biodiesel, bioethanol and biomethane already represent an option for greenhouse gas (GHG) reduction in the market today. In Germany, the use of biofuels in 2016 avoided around 7.3 million tonnes of CO_2 equivalents. Biodiesel is by far the most important biofuel in Europe and fleet operation with pure biodiesel (B100) or as B20 or B30 blend is already a way to significantly reduce GHG emissions.

Nevertheless, the use of biodiesel has changed dramatically in Europe. With stricter emission limits (see Fig. 1) for vehicles in all areas, the introduction of new exhaust gas aftertreatment systems (EGA) was necessary. As a result, the approvals for cars and light commercial vehicles have expired. The importance of biodiesel as a pure fuel has also declined significantly in the areas of heavy commercial vehicles and non-road vehicles, although current research projects show that the use of B100 does not affect EGA.

Although biodiesel is predominantly used as a blend fuel, it is evident that there are still important applications for biodiesel as a pure fuel. Even today, a large number of commercial vehicle engine manufacturers are prepared to create the technical conditions for using biodiesel by releasing their engines for B20, B30 (acc. EN 16709) or B100 (acc. EN 14214).

The current approval list of commercial vehicle manufacturers gives you an overview of approved commercial vehicles and engines as well as the compliance with emission standards.

HDV and bus from 3.5 tonnes



Non-road vehicles with power between 130 and 560 kW

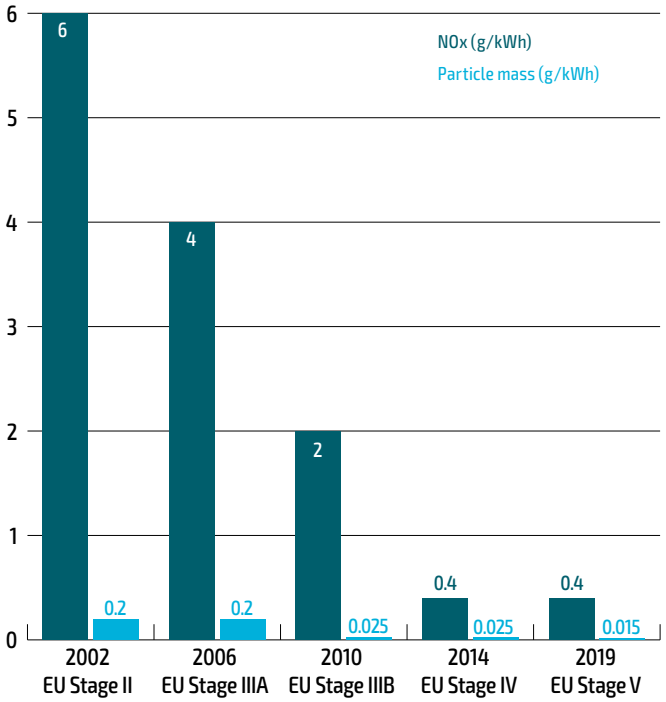


Fig. 1: Development of emission limits and standards for heavy duty vehicles and buses from 3.5 tonnes (left, source: Federal Environment Agency, www.umweltbundesamt.de/verkehr/index.htm) and for mobile machinery / non-road vehicles with an output between 130 kW and 560 kW (right, source: VDMA, www.vdma.org).

Biodiesel Quality

The quality of biodiesel is crucial when vehicles are operated with B100. Fuels must meet the minimum requirements of the applicable standards. In Europe, pure biodiesel is subject to EN 14214, which is also specified in the product information of vehicle manufacturers as a prerequisite for use and warranty. European B20 and B30 blend fuels are based on EN 16709. In America, ASTM D 6751 is specified for B100 and ASTM D7467 for B20.

In addition to purchasing biodiesel according to standard specification, you should also ensure that you receive a current certificate for each supply of biodiesel and that the biodiesel is already additized with oxidation stabilizers during production. Furthermore, make sure that your storage tank is empty when switching from summer to intermediate and winter quality. Next to a safe application an important criterion for the use of biodiesel is the corresponding sustainability certification.

Most engine manufacturers recommend using biodiesel whose suppliers and producers have monitored quality assurance systems. Biodiesel of AGQM members is subject to the quality management system of the Association Quality Management Biodiesel (AGQM). This system ensures that the current requirements of DIN EN 14214 and vehicle manufacturers are met through production, trade and transport. Many engine manufacturers believe that the limits specified in the standards are too high for trouble-free use of biodiesel. AGQM therefore checks its own, stricter quality standards. By unannounced samplings at their members AGQM was able to show that the real values of the critical parameters are well below the standard limits.

Therefore, pay attention to the AGQM logo when purchasing biodiesel.

Note:

The contents of this approval list have been created with the utmost care. Nevertheless, no guarantee can be given for the accuracy, completeness and timeliness of the content provided. The use of the contents of this list is at your own risk. It is therefore strongly recommended to confirm the approval by the respective vehicle or engine manufacturer prior to the use of biodiesel or biodiesel-containing fuels and to obtain information on any special maintenance and service requirements that may exist.

Caterpillar

Engine Types	Vehicle Types	Emission level	Approved Blend Level	Special Remarks
Cat® C3.4B Cat® C4.4 ACERT™ Cat® C7.1 ACERT™ Cat® C9.3 ACERT™ Cat® C15 ACERT™ Cat® C18 ACERT™	• dump truck 725C2, 735C • hydraulic excavator 311F L RR, 313F L, 313F L GC, 314E L CR, 315F L, 316F L, M318F, 318F L, M320F, 323F LN, 325F L, 326F L, 326F LN, 330F L, 336E H • roller 816K • track loader 953K, 963K, 973K • track-type D6N WH, D6K2, D6T, D6T WH, D8T WH • wheel loader 988K XE	**EU Stage IIIB and IV Tier 4 interim and final**	**Max. 20 % FAME (B20) acc. to EN 16709**	Only in combination with ultra low sulfur diesel (max. 10 mg/kg)
Up to production year 2006: Cat® C7 ACERT™ Cat® C9 ACERT™ Cat® C11 ACERT™ Cat® C13 ACERT™ Cat® C15 ATAAC ACERT™ Cat® C27 ACERT™ Cat® C32 ACERT™	• articulated dump truck 735/740 • compactor 825H • demolition machine 324/325D L/LN, 330D, 330D L, 345C L, 365C • hydraulic excavator 329/336D L/LN, 345D L, 365C L • industrial excavator M325D MH/LMH • long reach excavator 330D, 345C • motor grader M14 • off-highway truck 770, 777, 773/775F • pipelayer 587/583T • rotary mixer RM300, RM500 • scraper 621/627G • track loader 973C, D10 T,D11T/T CD • track-type D6/D8 T • tunnel excavator 328D LCR • wheel dozer 824H • wheel loader 966/972/980/990H, 992/993K	**EU Stage IIIA and lower**	**100 % FAME (B100) acc. to EN 14214**	–

DAF

Engine Types	Vehicle Types	Emission level	Approved Blend Level	Special Remarks
MX-11, MX-13 (Model year 2017)	XF and CF	Euro VI	Max. 30 % FAME (B30) acc. to EN 16709	For older generations MX-11 and MX-13 engines only diesel according to EN 590 allowed
PX-4, PX-5, PX-7	–	–	Max. 20 % FAME (B20) acc. to EN 16709	–
Airtop 2000 ST (ACH-W3)	Auxiliary Heater	–	100 % FAME (B100) acc. to EN 14214	–

Daimler (EvoBus)

see Mercedes Benz

Deutz

Engine Types	Vehicle Types	Emission level	Approved Blend Level	Special Remarks
DEUTZ Natural Fuel Engine®	Vegetable oil engines	EU Stage IIIA	• 100 % FAME (B100) acc. to EN 14214 • Max. 30 % FAME (B30/ B20) acc. to EN 16709 • Max. 10 % FAME (B10) acc. to EN 16734	• Engines without exhaust aftertreatment • special boundary conditions see TR 0199-99-01218 / 4 • Halved oil change intervals
413, 513, 912, 913 ,914, 1011, 2011, 1012, 1013, 2012, 2013, TCD 2012 2V/4V, TCD 2013 2V/2013 4V, TCD 2015 (after 01.07.2010)	–	Up to EU Stage IIIA	– „ –	– „ –
914 M, 1013 M, 1015 M, 2015 M	–	Marine engines	– „ –	– „ –
TCD 2013 4V	–	Up to EURO III	– „ –	– „ –
TCD 2013 4V	–	EURO IV / EURO V	– „ –	• Engines with exhaust aftertreatment (adaptation EAT replacement interval) • No release for motors with active DPF regeneration (burner) • special boundary conditions see TR 0199-99-01218 / 4 • halved lubricant change intervals
TCD 4.1, TCD 6.1, TCD 7.8	only agricultural engines	EU Stage IIIB	– „ –	– „ –
TCD 12.0 V6, TCD 16.0 V8	–	EU Stage IIIB / EU Stage IV	– „ –	– „ –
D 2.9, TD 2.9, TCD 2.9, TD 3.6, TCD 3.6, TCD 4.1, TCD 6.1, TTCD 6.1, TCD 7.8, TTCD 7.8	–	EU Stage IV	– „ –	– „ –

IVECO / IVECO Bus (formerly Irisbus)

Engine Types	Vehicle Types	Emission level	Approved Blend Level	Special Remarks
Cursor-engines 8/10/13, engines with PDE	EuroTech, EuroStar, EuroTrakker, Stralis, Trakker	**Euro II/III Euro IV/V**	100 % **FAME (B100) acc. to EN 14214**	Approval is connected to certain equipment and service guidelines
Engines with distributor injection pumps and common-rail injection systems	–	–	–	Not approved

John Deere

Engine Types	Vehicle Types	Emission level	Approved Blend Level	Special Remarks
All engines	–	**Up to EU Stage IIIA, Tier 3**	100 % **FAME (B100) acc. to EN 14214**	–
All engines	–	**From EU Stage IIIB, Tier 4**	**Max.** 20 % **FAME (B20) acc. to EN 16709**	–

Liebherr

Engine Types	Vehicle Types	Emission level	Approved Blend Level	Special Remarks
–	–	–	–	Approval depending on engine specification, must be requested at the manufacturer

MAN Trucks

Engine Types	Vehicle Types	Emission level	Approved Blend Level	Special Remarks
D08 from year 10/1998	TGL/TGM Series	**Euro V**	100 % **FAME (B100) acc. to EN 14214**	All trucks with engines approved for FAME operation are equipped with FAME-compatible components on the chassis side (fuel system, fuel gauge) Vehicles with NOx control (OBD1b and OBD2) must be ordered with the sales group „Biodiesel“ Vehicles with CRT filters can only be operated after approval with FAME. For common rail engines, a purchase guarantee for injection components must be purchased Euro 6 engines with SCRT are not approved
D20	TGX/TGS Series	**Euro V**	– „ –	– „ –
D26	TGX/TGS Series	**Euro V**	– „ –	– „ –
D28 from year 10/1998	–	**Euro V**	– „ –	– „ –
D2676L F63, F64, F65	Only the following basic vehicles: TGS: 06S, 08S, 18S TGX: 05X, 06X, 13X, 18X, 21X, 24X, 89X	**Euro VI**	– „ –	– „ –

MAN Bus

Engine Types	Vehicle Types	Emission level	Approved Blend Level	Special Remarks
D1556LUH 10/11/12 D2066LUH 55/56/61/62 D0836LOH 75/76/77/83/84/85/89	–	Euro VI	100 % FAME (B100) acc. to EN 14214	–

Mercedes-Benz Trucks, EvoBus-Daimler

Engine Types	Vehicle Types	Emission level	Approved Blend Level	Special Remarks
BM 471.926 (OM 471)	Actros, Arocs	Euro VI	100 % FAME (B100) acc. to EN 14214	With biodiesel code
BR 500	Actros, Travego	Up to Euro V	— „ —	–
BR 900	Atego, Axor, Econic	— „ —	— „ —	–
BR 900 (OM 926 LA)	Zetros, Tourino	— „ —	— „ —	–
BM 457.9	Axor	— „ —	— „ —	–

MTU

Engine Types	Vehicle Types	Emission level	Approved Blend Level	Special Remarks
S1600Gx0; S2000 Gx2/Gx4/ Gx5/Gx6; S4000 Cx0/Cx1/ Gx2/Gx3/Gx4	All years of construction	–	Max. 20 % FAME (B20) acc. to EN 14214 and ASTM D 6751	Special operating requirements and additional maintenance recommendations
S2000Gx3, S4000Gx1	With low-pressure fuel pipe made of metal	–	— „ —	— „ —
OM 457 LA, 460, 500, 900	From series production	–	100 % FAME (B100) acc. to EN 14214	— „ —

Renault Trucks

Engine Types	Vehicle Types	Emission level	Approved Blend Level	Special Remarks
–	–	–	–	When using Volvo engines, the release information from Volvo Trucks can be used

SCANIA

Engine Types	Vehicle Types	Emission level	Approved Blend Level	Special Remarks
DC09 108 and 112 (after production year 02/2014), DC09 133 and 134 (after production year 03/2015), DC09 320, DC09 360 DC13 124 and 125 (after production year 05/2014) DC16 102 (after production year 07/2014)	–	Euro VI XPI	100 % FAME (B100) acc. to EN 14214, max. 4 mg/kg ash constituents and max. 1 mg/kg phosphorus, modification to biodiesel operation	General exceptions: Rescue vehicles and vehicles with service life >2 months, industrial engines with XPI, buses with HPI engines and non-FAME approved XPI engines
All engines	All types	Up to Euro V	Max. 10 % FAME (B10) acc. to EN 16734	– „ –
All engines	All types	All emission levels	100 % FAME (B100) acc. to EN 14214 with optional release	– „ –

Volvo Trucks

Engine Types	Vehicle Types	Emission level	Approved Blend Level	Special Remarks
D5K, D8K	Volvo FL and FE	Euro VI Stage C	100 % FAME (B100) acc. to EN 14214 with optional release	No general release

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Further information on biodiesel can be obtained from the following associations:

Arbeitsgemeinschaft
Qualitätsmanagement Biodiesel e. V. (AGQM)
Claire-Waldoff-Straße 7
10117 Berlin
info@agqm-biodiesel.de
www.agqm-biodiesel.de

Union zur Förderung von
Oel- und Proteinpflanzen e. V.
Claire-Waldoff-Straße 7
10117 Berlin
info@ufop.de
www.ufop.de

Verband der Deutschen
Biokraftstoffindustrie e. V. (VDB)
Am Weidendamm 1A
10117 Berlin
info@biokraftstoffverband.de
www.biokraftstoffverband.de