Approvals in inland navigation

For operation with biodiesel (B7 | B10 | B20 | B30 | B100)

biofuels

EBB EUROPEAN BIODIESEL BOARD

ewaba European Waste-based & Advanced Biofuels Association

MVaK Mittelstandsverband abfallbasierter Kraftstoffe

PEK Plattform Erneuerbare Kraftstoffe

VDB Zukunft tanken.

Approvals in inland navigation for operation with biodiesel (B7 | B10 | B20 | B30 | B100)

This approval list provides an overview of ship engines that are suitable for refueling with pure biodiesel or with higher biodiesel blends.

In view of the EU climate targets, the question arises as to which climate protection options are available, technically feasible, and practicable for the transport sector.

Biodiesel (FAME = fatty acid methyl ester) is such an option. Whether as an admixture to fossil diesel (B10, B20, or B30) or in pure form (B100), there are numerous approvals from engine manufacturers for refueling inland navigation vessels with biodiesel.

The use of biodiesel can significantly reduce particulate emissions from inland waterway transport. In addition, biodiesel is virtually sulfur-free and easily biodegradable (WGK 1). Due to its high flash point, biodiesel is not classified as a hazardous material.
It is therefore reasonable that numerous engine manufacturers in the inland navigation sector have established the technical requirements for the use of biodiesel, including B7, B10, B20, B30, and pure biodiesel (B100).

Good to know.

For inland waterway operators in Germany

The 10th Federal Immission Control Ordinance (BImSchV) specifies the approved marine fuels in Germany, with the requirements based on DIN ISO 8217 and additional sulfur limits. With the version published in 2024, the so-called DF grades (distillate fuels DFA, DFZ, and DFB) as well as the residue grades (RF20 to RF500 – depending on viscosity) may contain up to 100 % (v/v) biodiesel.

For inland ship operators in Austria

In Austria, the Danube is the largest and most important waterway. In addition to the port facilities in Vienna, there are other major ports in Austria. According to current plans by the responsible ministry ("Danube Action Program 2030"), inland shipping is to be significantly expanded on the one hand and made carbon-neutral on the other. In addition to the increased availability of renewable shore power, sustainable biofuels are the most effective method for quickly and significantly reducing greenhouse gas emissions without costly infrastructure and fleet replacements. Supporting subsidy and information programs are planned. The use of sustainable biofuel is fully exempt from mineral oil tax, creating a win-win situation for both the environment and ship operators.

Biodiesel Quality

The quality of biodiesel is crucial when marine engines are operated with B100 or biodiesel blends. The requirements for biodiesel as a neat fuel or blend component are specified via EN 14214 across Europe. In addition to purchasing biodiesel according to standard specification, you should also ensure that you receive a current certificate of analysis for each supply of biodiesel and that the biodiesel is already additized with oxidation stabilizers during production.

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.

The AGQM whitepaper for inland navigation demonstrates how a transition from B0 to B30 is already possible today in the existing fleet without major modifications.

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

High FAME blends (B30) in Inland Navigation—It works!

VIEW WHITEPAPER NOW!

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 ship 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

Series	Year of manufacture/Tier/Level	Emission level	Approval for FAME	Standard	Remarks
ACERT-Engines; C7 to C32; C-9 to C-18	Engine models with exhaust aftertreatment systems	**EU Stage V**	**B20**	ASTM D7467 or EN 16709 and API gravity 30-45	
Engines C175 Series C280; CM20, CM25 and CM32; Series 3300; 3400; 3500 and 3600	Engine models without exhaust aftertreatment systems		**B100**	Cat specification for biodiesel or ASTM D6751 or EN 14214	Make sure the fuel meets the specifications; contact your Cat dealer
Engines: 3003 to 3066	All engine models		**B7**	Cat specification for distillate diesel fuel, ASTM D975 or EN 590	Higher blending ratios can lead to premature wear of the fuel pump and damage to components of the low-pressure fuel system
Engine models: C0.5 to C7.1 (mechanichal fuel system (PLN))	Engine models C0.5, C0.7, C1.1, C1.5, C1.6, C2.2, C3.3, C4.4 without exhaust aftertreatment systems	**Tier 2/ EU Stage II / China NR2 or older**	**B7**	Cat specification for distillate diesel fuel, ASTM D975 or EN 590	Higher blending ratios can lead to premature wear of the fuel pump and damage to components of the low-pressure fuel system
	Engine models C1.3, C1.8, C2.4, C2.6, C3.3B, C3.4 without exhaust aftertreatment systems		**B20**	ASTM D7467 or EN 16709 and API gravity 30-45	Higher blending ratios can lead to premature wear of the fuel pump and damage to components of the low-pressure fuel system
	Engine models C0.5, C0.7, C1.1, C1.7 with < 9 kW, without exhaust aftertreatment systems	**EU Stage V**	**B20**	ASTM D7467 or EN 16709 and API gravity 30-45	
	Engine models C0.5, C0.7, C1.1, C1.5, C1.7, C2.2, C3.3, C3.4, C3.6, C4.4, C7.1, without exhaust aftertreatment systems	**Tier 3 / EU STage IIIA / China NR3 or newer**	**B20**	ASTM D7467 or EN 16709 and API gravity 30-45	Where required, higher blends up to B35 may be used

Series	Year of manufacture/Tier/Level	Emission level	Approval for FAME	Standard	Remarks
Engine models: C1.7 bis C7.1 (Common-Rail high pressure fuel system (HPCR))	Engine models C1.7, C2.2, C2.8, C3.4B, C3.6, C4.4, C6.6, C7.1, without exhaust aftertreatment systems	**Tier 4 / EU Stage IV / China NR4 or newer**	**B20**	ASTM D7467 or EN 16709 and API gravity 30-45	
	Engine models C2.8, C3.6, C4.4, C6.6, C7.1, without exhaust after-treatment systems	**Tier 3 / EU Stage IIIA / China NR3 or newer**	**B20**	ASTM D7467 or EN 16709 and API gravity 30-45	Where required, higher blends up to B35 may be used
	Engine models C3.3B, C3.8 with exhaust aftertreatment systems		**B7**	Cat specification for distillate diesel fuel, ASTM D975 or EN 590	Higher blending ratios can lead to premature wear of the fuel pump and damage to components of the low-pressure fuel system
Engine models: C4.4, C6.4 and C6.6 with serial number prefix 444, C4E, 666 C6E	Engines C4.4 (serial numbers 44400001-04303)		**B7**	Cat specification for distillate diesel fuel, ASTM D975 or EN 590	Higher blending ratios can lead to premature wear of the fuel pump and damage to components of the low-pressure fuel system
	Engines C6.6 (serial numbers CE600001-14623 and 66600001-09015)		**B7**	Cat specification for distillate diesel fuel, ASTM D975 or EN 590	Higher blending ratios can lead to premature wear of the fuel pump and damage to components of the low-pressure fuel system
Engine models: C4.4, C6.4 and C6.6 with serial number prefix 444, C4E, 666, C6E	Engines C4.4 (serial number C4E05524-Up and 44404304-Up)		**B20**	ASTM D7467 or EN 16709 and API gravity 30-45	Where required, higher blends up to B35 may be used
	Engines C6.4 and certain C6.6 engines (serial numbers CE614624-Up and 66609016-Up)		**B20**	ASTM D7467 or EN 16709 and API gravity 30-45	Where required, higher blends up to B35 may be used

Cummins

Series	Year of manufacture/Tier/Level	Emission level	Approval for FAME	Standard	Remarks
B/D 3.3, B/D 3.9, B/D 4.5, B/D 5.9, B/D 6.7 QSB	All engines, since 01.2007		**B20**	EN 16709	If an Eliminator™ system is installed to extend oil change intervals, oil samples must be taken. For marine applications, Cummins Inc. requires additional water separation equipment because ballast water can enter the fuel.

Series	Year of manufacture/Tier/Level	Emission level	Approval for FAME	Standard	Remarks
C/L, QSC, QSL	All engines, since 01.2007		**B20**	EN 16709	If an Eliminator™ system is installed to extend oil change intervals, oil samples must be taken. For marine applications, Cummins Inc. requires additional water separation equipment because ballast water can enter the fuel
K19, K23, K30, K38, K45, K50, K60, K78, K95 QSK19, QSK23, QSK30, QSK38, QSK45, QSK50, QSK60, QSK78, QSK95 QST19, QST23, QST30, QST38, QST45, QST50, QST60, QST78, QST95	All engines without exhaust after-treatment systems, since 01.2008.		**B20**	EN 16709	If an Eliminator™ system is installed to extend oil change intervals, oil samples must be taken. For marine applications, Cummins Inc. requires additional water separation equipment because ballast water can enter the fuel. Only B7 fuel is approved for these engines equipped with an exhaust aftertreatment system.

Deutz AG

Series	Year of manufacture/Tier/Level	Emission level	Approval for FAME	Standard	Remarks
914 M		**EU IIIA**	**B10, B20/B30 and B100**	EN 16734, EN 16709 and EN 14214	For special terms and conditions, see TR 0199-99-01218.
1013 M		**EU IIIA**			
2015 M		**EU IIIA**			
2015 M		**EU IIIA**			

MAN

Series	Year of manufacture/Tier/Level	Emission level	Approval for FAME	Standard	Remarks
All engines	IMO III at sea/EU Stage V		**B7**	EN 590	

MTU

Series	Year of manufacture/Tier/Level	Emission level	Approval for FAME	Standard	Remarks
8V 2000 M61	IMO II	CCNR II	B7	EN 590	
12V 2000 M61	IMO II	CCNR II	B7	EN 590	
8V 2000 M72	IMO II	EU Stage IIIA	B7	EN 590	
16V 2000 M61	IMO II	CCNR II	B7	EN 590	
8V 2000 M84	IMO II	CCNR II	B7	EN 590	
10V 2000 M72	IMO II	EU Stage IIIA	B7	EN 590	
8V 2000 M94	IMO II	CCNR II	B7	EN 590	
12V 2000 M72	IMO II	EU Stage IIIA	B7	EN 590	
16V 2000 M72	IMO II	EU Stage IIIA	B7	EN 590	
8V 4000 M53R	IMO II	EU Stage IIIA	B7	EN 590	
8V 4000 M53	IMO II	EU Stage IIIA	B7	EN 590	
8V 4000 M63	IMO II	EU Stage IIIA	B7	EN 590	
12V 4000 M53R	IMO II	EU Stage IIIA	B7	EN 590	
12V 4000 M53	IMO II	EU Stage IIIA	B7	EN 590	
16V 4000 M53R	IMO II	EU Stage IIIA	B7	EN 590	
12V 4000 M63	IMO II	EU Stage IIIA	B7	EN 590	
16V 4000 M53R	IMO II	EU Stage IIIA	B7	EN 590	
16V 4000 M53	IMO II	EU Stage IIIA	B7	EN 590	
16V 4000 M63	IMO II	EU Stage IIIA	B7	EN 590	
16V 4000 M63L	IMO II	EU Stage IIIA	B7	EN 590	

Scania Marine Engines

Series	Year of manufacture/Tier/Level	Emission level	Approval for FAME	Standard	Remarks
DI09 074M			B100	EN 14214	
DI13 074M			B100	EN 14214	
DI13 075M			B100	EN 14214	
DI13 084M			B100	EN 14214	
DI13 089M			B100	EN 14214	
DI13 091M			B100	EN 14214	
DI16 074M			B100	EN 14214	
DI16 084M			B100	EN 14214	
DI16 090M			B100	EN 14214	
DI16 091M			B100	EN 14214	
DI16 094M			B100	EN 14214	
All engines	IMO and EU Stage V - IWW		B10	EN 590 with up to 10 % FAME - equals EN 16734	

Volvo Penta

Series	Year of manufacture/Tier/Level	Emission level	Approval for FAME	Standard	Remarks
All engines	All levels		B7	EN 590	
Engines since 01.2012	IMO II, IMO III		B10, B20/30	EN 16734, EN 16709	Diesel fuels with a high FAME content (>10%) are suitable only for engines without exhaust aftertreatment systems (SCR).

Publishers:

Association Quality Management Biodiesel e.V. (AGQM)
Am Weidendamm 1A · DE-10117 Berlin
info@agqm-biodiesel.de
www.agqm-biodiesel.de

Biofuels Schweiz
Bahnhofstraße 9 · CH-4450 Sissach
office@biofuels-schweiz.org
www.biosprit.org

European Biodiesel Board (EBB)
Rue Belliard 12 · B-1040 Brussels
info@ebb-eu.org
www.ebb-eu.org

European Waste-based & Advanced Biofuels Association (EWABA)
Albert Avenue 93 · B-1190 Brussels
leonidas.kanonis@ewaba.eu
www.ewaba.eu

Mittelstandsverband abfallbasierter Kraftstoffe e. V. (MVaK)
Unter den Linden 10 · DE-10117 Berlin
info@mvak.eu
www.mvak.eu

Plattform Erneuerbare Kraftstoffe (PEK)
Schauflergasse 6 · AT-1015 Wien
info@pek.energy
www.pek.energy

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

Notes:

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