NATO STANDARD

AFLP-1110

ALLOWABLE DETERIORATION LIMITS FOR NATO ARMED FORCES FUELS, LUBRICANTS AND ASSOCIATED PRODUCTS

Edition B, Version 1

DECEMBER 2020

NORTH ATLANTIC TREATY ORGANIZATION

ALLIED FUELS AND LUBRICANTS PUBLICATION

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NORTH ATLANTIC TREATY ORGANIZATION (NATO)

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NATO LETTER OF PROMULGATION

2 December 2020

1. The enclosed Allied Fuels and Lubricants Publication AFLP-1110, Edition B, Version 1, ALLOWABLE DETERIORATION LIMITS FOR NATO ARMED FORCES FUELS, LUBRICANTS AND ASSOCIATED PRODUCTS, which has been approved by the nations in the AC/112 – Petroleum Committee, is promulgated herewith. The agreement of nations to use this publication is recorded in STANAG 1110.

2. AFLP-1110, Edition B, Version 1, is effective upon receipt and supersedes AFLP-1110, Edition A, Version 1, which shall be destroyed in accordance with the local procedure for the destruction of documents.

3. This NATO standardization document is issued by NATO. In case of reproduction, NATO is to be acknowledged. NATO does not charge any fee for its standardization documents at any stage, which are not intended to be sold. They can be retrieved from the NATO Standardization Document Database ((https://nso.nato.int/nso/) or through your national standardization authorities.

4. This publication shall be handled in accordance with C-M(2002)60.

Zoltán GULYÁS
Brigadier General, HUNAF
Director, NATO Standardization Office

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RECORD OF RESERVATIONS

CHAPTER	RECORD OF RESERVATION BY NATIONS

Note: The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Document Database for the complete list of existing reservations.

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RECORD OF SPECIFIC RESERVATIONS

[nation]	[detail of reservation]
BGR	Bulgarian Armed Forces (BAF) will not implement Section 4 of AFLP-1110 because in accordance with the Instruction for POL Quality Control in the BAF the use of air products with any deterioration in their characteristics is not admissible.
DNK	The Danish Navy cannot accept the Allowable Deterioration Limit for F-75 or F-76 Fuel, Naval, Distillate, regarding water and sediment (Section 2, No. 1 of AFLP-1110). The Danish Navy can accept F-75 or F-76 fuel with a water and sediment content of maximum 0.05% v/v, which is equal to the limit set in STANAG 1385.
SVK	The Slovak Republic reserves the right to implement only those paragraphs related to products with NATO Code Numbers as follows: F-34, F-35, F-54, H-573, H-576 and S-1745, which are used in the Armed Forces of the Slovak Republic.
USA	Air Force Reservations: USAF aircraft must receive Program Office approval prior to accepting jet fuel (F-24, F-27, F-34, F-35, F-37) with a conductivity of less than 50 pS/m. Program Offices of aircraft incorporating explosion suppressing foam must carefully weigh the risk of accepting the fuel with the emergency dictating its use. USAF tanker Program Offices should only approve the fuel for flights without planned aerial refueling; or, if aerial refueling is dictated by the nature of the emergency, the lower conductivity must be relayed to the receiver prior to the mission to allow for the receiver to coordinate approval with its respective Program Office.

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SECTION 1 GENERAL

0101. Participating nations agree that:

a. Within the allowable deterioration limits given in Sections 2, 3, and 4, fuels, lubricants and associated products, in bulk or packed, shall continue to be identified by the NATO Code Number.

b. The NATO Code Number may not be used in connection with any stocks deviating from specification beyond these limits. If such stocks have been marked with the NATO Code Number it must be crossed through in accordance with STANAG 3149 and STANAG 4714/AFLP-4714.

c. In assessing whether or not the NATO Code Number is to be crossed through, no deviations are acceptable from requirements which appear in the relevant specifications but are not included in the tables.

d. The deterioration limits in Sections 2, 3, and 4 are absolute and not subject to corrections for tolerance of test methods.

0102. STANAG 1135/AFLP-1135 incorporates identifying national product specifications which define the qualities or the essential characteristics that petroleum products for use by the armed forces of NATO nations should possess. In general, the purchase of these products is not immediately followed by their utilization and, therefore, a certain time will elapse between their acceptance and their use by the armed forces. During this time their physical and chemical properties may change, and, therefore, there is the risk that their characteristics at the time of delivery to actual users (ship, unit, aircraft) may no longer be within the limits prescribed in the product specification of AFLP-1135. The products shall comply with the specified limiting values. The specified limiting values must not be changed. This precludes any allowances for the test method precision and adding or subtracting digits.

0103. The purpose of AFLP-1110 is to define the extent to which these changes are acceptable so that the product may still be used for its intended purpose and to retain the NATO Code Number as defined in STANAG 3149 Annex A, paragraphs 5 and 6, and AFLP-4714, paragraphs 0105 and 0106.

0104. The deterioration limits in Sections 2, 3 and 4 are applicable to products within military supply distribution systems. **Nations shall not use the limits detailed in the Sections for procurement purposes**.

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SECTION 2 TABLE OF ALLOWABLE DETERIORATION LIMITS FOR NAVAL PRODUCTS

No	PRODUCT DESCRIPTION	NATO CODE NUMBER	PROPERTY	UNIT OF MEASUREMENT	DETERIORATION LIMIT	TEST METHODS (1)	
						ASTM	ISO
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1	Fuel, Naval, Distillate	F-75 F-76	Colour Distillation: 90% Recovered Final Boiling Point Water and Sediment	State °C (°F) °C (°F) % v/v	4 (max) 360 (680) (max) 388 (730) (max) 0.1 (max)	D1500 D86 D86(2) D2709	2049 3405 3405 3734
2	Lubricating Oil, Naval Gear, Extreme Pressure	O-262	Water Content	% v/v	0.2 (max)	D95	3733
3	Lubricating Oil, Steam Cylinder	O-252	Ash Content Water Content	% m/m % v/v	0.1 (max) 1.0 (max)	D482 D95	6245 3733
4	Lubricating Oil, Steam Turbine and Gear	O-240 O-249 O-250 O-253	Water Content Emulsion with Water: separation time	% v/v minutes	0.2 (max) 45 (max)	D95 D1401(3)	3733 6614
5	Lubricating Oil, Naval diesel	O-274 O-278	Water Content	% v/v	0.2 (max)	D95	3733

No	PRODUCT DESCRIPTION	NATO CODE NUMBER	PROPERTY	UNIT OF MEASUREMENT	DETERIORATION LIMIT	TEST METHODS (1)	
						ASTM	ISO
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
6	Hydraulic Fluid, Phosphate Ester, Fire Resistant	H-580	Water Content	% v/v	0.2 (max)	D95	3733
7	Hydraulic Fluid, Petroleum	H-572 H-573 H-574 H-575 H-576	Water Content	% v/v	0.1 (max)	D95	3733

NOTES: (1) ASTM and ISO methods are given for reference, but any equivalent national or international methods may be used.
(2) As the end point of the distillation is approached, if either a thermometer reading of 385°C or a decomposition point is observed, the heating shall be discontinued and the procedure resumed as directed in ASTM D86.
(3) Synthetic sea water is to be used as per section 9.3 of ASTM D1401.

SECTION 3 TABLE OF ALLOWABLE DETERIORATION LIMITS FOR ARMY PRODUCTS

No	PRODUCT DESCRIPTION	NATO CODE NUMBER	PROPERTY	UNIT OF MEASUREMENT	DETERIORATION LIMIT	TEST METHODS (1)	
						ASTM	ISO
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1	Diesel Fuel, Military	F-54	Distillation: Recovered at 250˚C Density at 15˚C	 %v/v kg/m^3	 85 (max) 800 (min)	 D86 D1298 or D4052 (2)	 3405

NOTES: (1) ASTM and ISO methods are given for reference, but any equivalent national or international methods may be used.
(2) In case of dispute, this is the referee method.

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SECTION 4 TABLE OF ALLOWABLE DETERIORATION LIMITS FOR AIR PRODUCTS

No	PRODUCT DESCRIPTION	NATO CODE NUMBER	PROPERTY	UNIT OF MEASUREMENT	DETERIORATION LIMIT	TEST METHODS (1)	
						ASTM	ISO
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1	Turbine Fuel, Aviation Wide Cut Type	F-40	Distillation: residue	% v/v	2 (max)	D86	3405
			Existent gum	mg/100 mL	10 (max)	D381	6246
			Vapour pressure (Reid)	kPa	10.5 to 22.5	D323 or D5191	3007
			Fuel system icing inhibitor on delivery to aircraft	% v/v	0.07 to 0.20	D5006	
			Electrical conductivity	pS/m	100 to 700	D2624 or IP274	6297
2	Turbine Fuel, Aviation, High Flash Type	F-44	Distillation: residue	% v/v	2 (max)	D86	3405
			Existent gum	mg/100 mL	10 (max)	D381	6246
			Fuel system icing inhibitor on delivery to aircraft	% v/v	0.07 to 0.20	D5006	
3	Turbine Fuel, Aviation, Kerosene Type	F-24 F-27 F-34 F-35 F-37	Existent gum	mg/100 mL	10 (max)	D381	6246
			Electrical Conductivity	pS/m	25 to 700	D2624 or IP274	6297
			Fuel system icing inhibitor on delivery to aircraft (Does not apply to F-35)	% v/v	0.07 to 0.20	D5006	

No	PRODUCT DESCRIPTION	NATO CODE NUMBER	PROPERTY	UNIT OF MEASUREMENT	DETERIORATION LIMIT	TEST METHODS (1)	
						ASTM	ISO
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
4	Water (demineralized)	S-1739	Total solids on delivery to aircraft	mg/L	20 (max)	D5907	
5	Methanol/Water 44/56	S-1744	Total solids on delivery to aircraft	mg/L	20 (max)	D5907	
6	Fuel System Icing Inhibitor, High Flash Point	S-1745	Total Water	% m/m	0.4 (max)	D1364	

NOTES:
(1) ASTM and ISO methods are given for reference, but any equivalent national method may be used.

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