NATO OTAN

NATO STANDARDIZATION AGENCY
AGENCE OTAN DE NORMALISATION

NSA

29 May 2013 NSA/0729(2013)CFR/3863

STANAG 3863 CFR (EDITION 3) – MINIMUM FIRE PROTECTION REQUIREMENTS FOR AIRCRAFT GROUND OPERATIONS

References:

A. NSA(AIR)1247-CFR/3863 dated 16 Oct 2001
B. AC/92(ATM)WP(2010)0013 (CFR) dated 15 March 2010

1. The enclosed NATO Standardization Agreement, which has been ratified by nations as reflected in the NATO Standardization Document Database (NSDD), is promulgated herewith.

2. The references listed above are to be destroyed in accordance with local document destruction procedures.

ACTION BY NATIONAL STAFFS

3. National staffs are requested to examine their ratification status of the STANAG and, if they have not already done so, advise the ATMC ATM Gp, through their national delegation as appropriate of their intention regarding its ratification and implementation

Dr. Cihangir AKSIT, TUR Civ.
Director, NATO Standardization Agency

Enclosure:
STANAG 3863 (Edition 3)

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STANAG 3863
(Edition 3)

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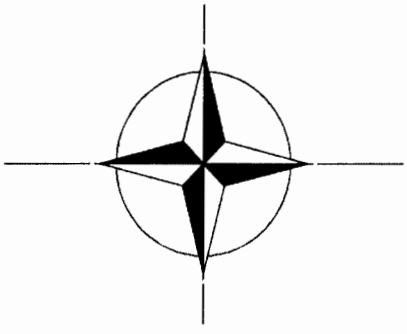
(NATO)



NATO STANDARDIZATION AGENCY
(NSA)

STANDARDIZATION AGREEMENT
(STANAG)

SUBJECT: MINIMUM FIRE PROTECTION REQUIREMENTS FOR AIRCRAFT GROUND OPERATIONS

Promulgated on 29 May 2013

Dr. Cihangir AKSIT, TUR Civ.
Director, NATO Standardization Agency

RECORD OF AMENDMENTS

No.	Reference/date of Amendment	Date Entered	Signature

EXPLANATORY NOTES

AGREEMENT

1. This NATO Standardization Agreement (STANAG) is promulgated by the Director NATO Standardization Agency under the authority vested in him by the NATO Standardization Organization Charter.

2. No departure may be made from the agreement without informing the tasking authority in the form of a reservation. Nations may propose changes at any time to the tasking authority where they will be processed in the same manner as the original agreement.

3. Ratifying nations have agreed that national orders, manuals and instructions implementing this STANAG will include a reference to the STANAG number for purposes of identification.

RATIFICATION, IMPLEMENTATION AND RESERVATIONS

4. Ratification, implementation and reservation details are available on request or through the NSA websites (internet http://nsa.nato.int; NATO Secure WAN http://nsa.hq.nato.int).

RESTRICTIONS TO REPRODUCTION

FEEDBACK

6. Any comments concerning this publication should be directed to NATO/NSA – Bvd Leopold III - 1110 Brussels - BEL

STANAG 3863
(Edition 3)

NATO STANDARDIZATION AGREEMENT (STANAG)

MINIMUM FIRE PROTECTION REQUIREMENTS FOR AIRCRAFT GROUND OPERATIONS

Annexes:
- A. CLASSES OF FIRE
- B. FIRE EXTINGUISHER CLASSIFICATION RATINGS
- C. COMPARATIVE DIFFERENCES BETWEEN US AND EN STANDARDS

Related Documents:

USAF TECHNICAL ORDER (TO) 00-25-172 GROUND SERVICING OF AIRCRAFT AND STATIC GROUNDING/BONDING

EUROPEAN COMMITTEE FOR NORMALIZATION - EUROPEAN STANDARD EN 3-7, PORTABLE FIRE EXTINGUISHERS – PART 7: CHARACTERISTICS, PERFORMANCE REQUIREMENTS AND TEST METHODS

EUROPEAN COMMITTEE FOR NORMALIZATION – EUROPEAN STANDARD EN 1866-1, MOBILE FIRE EXTINGUISHERS – PART 1: CHARACTERISTICS, PERFORMANCE AND TEST METHODS

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 10, STANDARD FOR PORTABLE FIRE EXTINGUISHERS

STANAG 3712	AIRFIELD RESCUE AND FIRE FIGHTING SERVICES IDENTIFICATION CATEGORIES
STANAG 3896	AEROSPACE EMERGENCY RESCUE AND MISHAP RESPONSE INFORMATION (EMERGENCY SERVICES)
STANAG 7051	MINIMUM REQUIREMENTS FOR CFR OPERATIONS IN SUPPORT OF HOME STATION AND DEPLOYED OPERATIONS

AIM

1. The aim of this Standardization Agreement (STANAG) is for participating nations supporting NATO missions to provide minimum, as well as, uniform fire protection services and emergency suppression capabilities during aircraft ground operations. These services include:

   a. The provision of wheeled/mobile (portable) fire extinguishers during routine maintenance activities and the associated training of maintenance personnel in flight line fire extinguisher use, and

b. Maintaining crash fire fighting and rescue (CFR) vehicles on standby during unique and/or dangerous operations that involve unique/abnormal maintenance, fueling, or weapons servicing, and extensive ground servicing.

AGREEMENT

2. Participating nations agree to use comparable fire extinguisher rating systems established by European Committee for Normalization - European Standard EN 3-7 in combination with EN 1866 and/or NFPA 10 criteria to provide wheeled/mobile (portable) fire fighting extinguishers of sufficient capacity and agent type to mitigate and extinguish a fire in its initial stages and/or until the arrival of a CFR vehicle during aircraft ground servicing operations. Additionally, participating nations agree to provide training to aircraft maintenance personnel in the use and application of wheeled portable fire extinguishers. Participating nations agree to provide staffed vehicle stand-by support during unique operations as cited in this STANAG.

GENERAL

3. NATO aircraft involved in ground servicing operations are subject to numerous types of fire incidents when incurring a wide variety of maintenance and support functions performed on parking ramps, inside hangars, protected shelters, and end of runway operations. These ground servicing operations include concurrent servicing, combat sortie generation, hot refueling, and rapid defueling. The following definitions specifically identify the meaning of these operations:

a. Concurrent Servicing: The simultaneous servicing of fuel or oxygen with either passengers on board or the performance of minor maintenance, fleet servicing, or baggage or cargo loading/unloading. Operations may involve commercial, contract, cargo, or passenger aircraft.

b. Combat Sortie Generation: The process by which mission capable fighter aircraft are generated in a minimum amount of time, during peacetime, contingencies, or wartime. Combat sortie generation may include fueling, munitions/ammunition loading/unloading, aircraft reconfiguration, inspections, and other servicing requirements.

c. Hot Refueling/Defueling: The transfer of fuel into or out of the fuel tanks of an aircraft with one or more aircraft engine operating.

d. Rapid Defueling: A means to rapidly off load fuel from aircraft either by operating an outboard engine or external hydraulic test stand to power on-board refueling pumps.

DETAILS OF THE AGREEMENT

4. Wheeled/mobile (portable) fire fighting equipment in and around aircraft ground servicing operations (as defined in paragraph 2) must provide a means of effectively and rapidly controlling and suppressing various classes of fires. The primary threat to aircraft is

the presence of flammable and combustible liquids and sources of ignition. The amount of agent required for wheeled/mobile (portable) fire extinguishers must be calculated and rated based on the extinguishing characteristics and operation to be protected. Classes of fire and fire extinguisher classification ratings are addressed in European Committee for Normalization - European Standard EN 3-7 in combination with EN 1866-1 and NFPA 10. These standards are comparable. Although differences exist within these national standard (i.e., classes of fire and numerical rating designators), the basic premise is to provide aircraft protection with equivalently rated devices. Annex A provides both US and EN classifications of fires, Annex B addresses numerical rating systems, and Annex C addresses comparable differences between US and EN standards.

5. The agreement also incorporates the necessity to train personnel assigned to aircraft ground concurrent servicing, combat sortie generation, hot refueling, and rapid defueling operations. The training includes annual familiarity with extinguishing agent hardware operation and the application of the fire fighting agents.

6. The following paragraphs outline the minimum fire protection for aircraft ground concurrent servicing, combat sortie generation, hot refueling, and rapid de-fueling operations

a. Concurrent servicing operations:

(1) Concurrent Fuel Servicing of Aircraft With/Without Passengers. One 80 BC (US)/II B (EN) rated wheeled/mobile (portable) fire extinguisher will be provided. For large frame aircraft, two 80 BC (US)/II B (EN) rated wheeled/mobile (portable) extinguishers will be provided. A manned CFR vehicle will be capable of responding within two minutes of notification when only one aircraft is involved. When more than one aircraft is involved in concurrent fuel servicing at different locations and the two minute response time cannot be met, the fire chief or equivalent, will determine the positioning of manned CFR vehicles for optimum response capability.

(2) Concurrent Servicing of Medical Evacuation Flights with Passengers/Patients on Board. One 80 BC (US)/ II B (EN) rated wheeled/mobile (portable) fire extinguisher shall be provided for each Single Point Refueling (SPR) connection location being used.

(3) Liquid and Gaseous Oxygen Operations. One 80 BC (US)/ II B (EN) rated wheeled/mobile (portable) fire extinguisher will be placed within 15M (50 feet) of the servicing operation.

b. Combat sortie generation and hot refueling/rapid defueling:

(1) During combat sortie generation operations a minimum of one CFR vehicle with crew, or trained maintenance personnel with a stand alone fire suppression system, will be available and placed immediately outside the fuel servicing safety zone (FSSZ). The location will determined by the fire chief.

(2) During training, exercises, and day-to-day operations, the doors of hangars and protected shelters must remain open for easy access of fire fighting crews.

(3) During multiple combat sortie generation and hot refueling operations a manned CFR vehicle will be located near the operation for optimum response. The fire chief shall determine the positioning of manned CFR vehicles. In addition, one 80 BC (US)/ II B (EN) rated wheeled/mobile (portable) fire extinguisher will be immediately available on each side of the aircraft.

(4) During aircraft rapid refueling or de-fueling operations a minimum of one 80 BC (US)/ II B (EN) rated wheeled/mobile (portable) fire extinguisher shall be provided for each single point refueling connection/location being used. The fire chief or SFO is the primary individual for determining standby posturing requirements and ARFF vehicle standby locations for the various aircraft operations. This will include having an ARFF vehicle on standby status in the fire station or other location for operations as he deems appropriate. The goal for the fire chief is to not take away from other critical firefighter duties i.e., training, equipment maintenance, etc., while still maintaining a heightened state of alert for aircraft involved in the listed operations. Final determination for standby requirements is at the discretion of the installation commander.

c. Aircraft Positioned Outside Hangars or Protected Shelters. Wheeled/mobile (portable) fire extinguishers shall be provided as follows: (Refer to aircraft categories defined in STANAG 3712, *Airfield Rescue and Fire Fighting Services Identification Categories*)

(1) Small Airframe Aircraft (Cat 1 – 5). One 80 BC (US)/ II B (EN) rated wheeled/mobile (portable) fire extinguisher shall be provided per every three aircraft. The wheeled/mobile (portable) extinguisher will be positioned in front of the center aircraft being protected to minimize user travel distance.

(2) Medium Airframe Aircraft (Cat 6 – 7). One 80 BC (US)/ II B (EN) rated wheeled/mobile (portable) fire extinguisher shall be provided per every two aircraft. The wheeled/mobile (portable) extinguishers will be positioned in front and in between the two aircraft being protected to minimize user travel distance.

(3) Large Frame Aircraft (Cat 8 – 10). Two 80 BC (US)/ II B (EN) rated wheeled/mobile portable fire extinguisher shall be provided per aircraft. The wheeled/mobile (portable) fire extinguishers will be positioned on each side of the aircraft. Where maintenance is occurring, one of the extinguishers should be positioned in the maintenance area.

d. Alert Aircraft. One 80 BC (US)/ II B (EN) rated wheeled/mobile (portable) fire extinguisher shall be provided per alert aircraft. The wheeled/mobile (portable)

fire extinguisher should be positioned off the aircraft nose to minimize user travel distance.

e. Aircraft Being Serviced Outside of a Hanger or Protected Shelter.

(1) No Powered Support Equipment Being Operated. One 80 BC (US)/ II B (EN) rated wheeled/mobile (portable) fire extinguisher located in the FSSZ. Large frame aircraft require two wheeled/mobile (portable) extinguishers.

(2) Powered Support Equipment Being Operated. One 80 BC (US)/ II B (EN) rated wheeled/mobile (portable) fire extinguisher shall be located in the FSSZ. Large frame aircraft require two wheeled/mobile (portable) extinguishers.

f. Aircraft with Nuclear Weapons. One 80 BC (US)/ II B (EN) rated wheeled/mobile (portable) fire extinguisher shall be located in the fuel servicing area. If the fire department cannot respond within one minute of a potential incident notification, a manned CFR vehicle will be positioned at the aircraft.

IMPLEMENTATION OF THE AGREEMENT

7. This STANAG is implemented when a nation has issued the necessary orders/instruction for the forces concerned to put the provisions detailed in this agreement into effect.

ANNEX A TO
STANAG 3863
(Edition 3)

CLASSES OF FIRE

1. North America uses NFPA Standards: NFPA 10, *Standard for Portable Fire Extinguishers,* to classify types of fires. This classification system is based on the materials involved. Fires are classed as follows:

Class A Fires:	Class A fires are fires in ordinary combustible materials, such as wood, cloth, paper, rubber, and many plastics.
Class B Fires:	Class B fires are fires in flammable liquids, combustible liquids, petroleum greases, tars, oils, oil-based paints, solvents, lacquers, alcohols, and flammable gases.
Class C Fires:	Class C fires are fires that involve energized electrical equipment.
Class D Fires:	Class D fires are fires in combustible metals, such as magnesium, titanium, zirconium, sodium, lithium, and potassium.
Class K Fires:	Class K fires are fires in cooking appliances that involve combustible cooking media (vegetable or animal oils and fats).

2. European nations use European Standard EN 3-7, *Portable Fire Extinguishers – Part 7: Characteristics, Performance Requirements and Test Methods* to classify types of fires. However, this European Committee for Normalization standard and the North American standard differ on fire classification designations by letter, even though all fire types are addressed.

Class A Fires:	Class A fires are fires in ordinary combustible materials, such as wood, cloth, paper, rubber, and many plastics.
Class B Fires:	Class B fires are fires in flammable liquids, combustible liquids, petroleum greases, tars, oils, oil-based paints, solvents, lacquers, and alcohols.
Class C Fires:	Class C fires are fires in flammable gases.
Class D Fires:	Class D fires are fires in combustible metals, such as magnesium, titanium, zirconium, sodium, lithium, and potassium.
Class E Fires:	Class E fires are fires that involve energized electrical equipment.
Class F Fires:	Class F fires are fires in cooking appliances that involve combustible cooking media (vegetable or animal oils and fats).

Annex B to
STANAG 3863
(Edition 3)

FIRE EXTINGUISHER CLASSIFICATION RATINGS

1. The NFPA and EN standards employ a fire extinguisher classification system. These systems consists of a letter that indicates the class of fire on which a fire extinguisher has been found to be effective and a numerical rating which indicates its relative extinguishing effectiveness.

a. Fire extinguishers classified for use Class A (ordinary combustibles) or Class B (flammable liquids) hazards are required to have a numerical rating preceding the classification letter. This number indicates the relative extinguishing effectiveness based on comparative performance.

b. The following provides an example based on comparison effectiveness:

"A fire extinguisher is rated and classified 4-A:20-B:C".

What does the alphabetic and numerical indicators represent:

(1) 4A: The extinguisher should extinguish approximately twice as much Class A fire as a 2-A [2½ gal (9.46 liters) water] rated fire extinguisher.

(2) 20-B: It should extinguish approximately 20 times as much Class B fire as a 1-B rated fire extinguisher.

(3) C (US): It is suitable for use on electrical equipment.

(4) C (EN): It is suitable for combustible gases.

(4) D: It is suitable for combustible metal fires.

(5) E: (EN): It is suitable for use on electrical equipment.

(6) F (EN) or K (NA): It is suitable for fires in cooking appliances that involve combustible cooking media.

c. Wood crib tests are employed to attain Class A ratings. Fire extinguishers for use on Class A fires have the following ratings. Those in NFPA 10 are 1-A, 2-A, 3-A, 4-A, 6-A, 10-A, 20-A, 30-A, and 40-A, while those in EN 3-7 are 5A, 8A, 13A, 21A, 27A, 34A, 43A, and 55A.

d. Flammable liquid pan tests are employed to attain Class B ratings. Fire extinguishers for use on Class B fires have the following ratings. Those in NFPA 10 are 1-B, 2-B, 5-B, 10-B, 20-B, 30-B, 40-B, 60-B, 80-B, 120-B, 160-B, 240-B,

320-B, 480-B, and 640-B, while those in EN 3-7 are 21B, 34B, 55B, 70B, 89B, 113B, 144B, 183B, and 233B.

e. Ratings from 1-A to 20-A and 1-B to 20-B, inclusive, are based on indoor fire tests.

f. Ratings at or above 30-A and 30-B are based on outdoor fire tests.

g. For fire extinguishers classified for use on Class B fires, it should be understood that the amount of fire that can be extinguished by a particular fire extinguisher is directly related to the operator's level of training and experience.

h. For fire extinguishers classified for use on Class C (US) fires a numerical rating is not assigned since these fires are normally either Class A or Class B fires involving energized electrical wiring and equipment. It should be noted that water-based agents are electrically conductive and agent pooling after discharge may present additional hazards. The size of the different suitable fire extinguishers installed should be commensurate with the size and extent of the Class A or Class B components, or both, of the electrical hazard being protected.

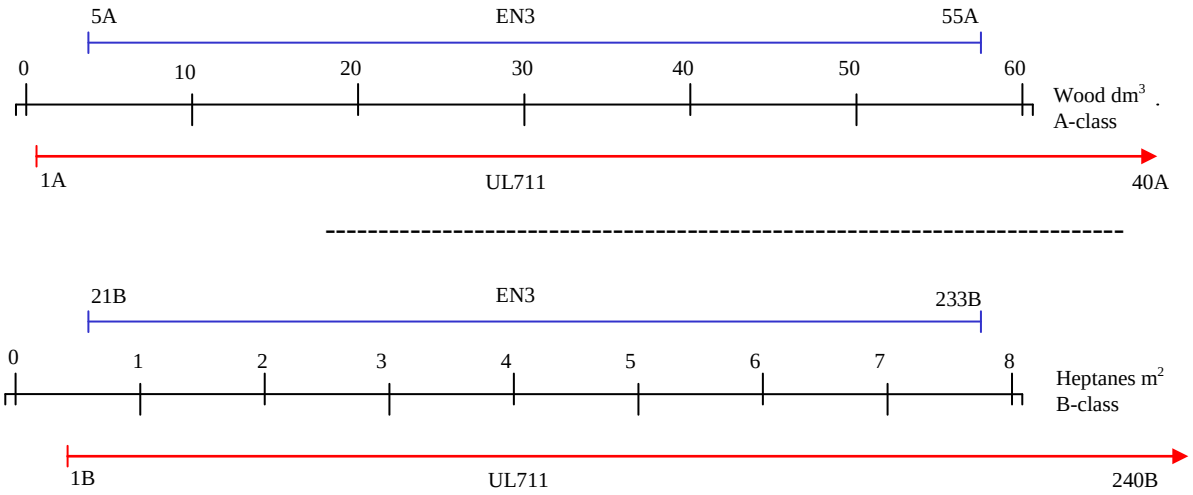
ANNEX C to
STANAG 3863
(Edition 3)

COMPARATIVE DIFFERENCES BETWEEN US AND EN STANDARDS

General

1. Specific fire tests are prescribed to determine the fire rating of a portable fire extinguisher as defined in EN3 and UL711 standards.

2. The US and EN rating systems differ based on fire magnitudes in the rating specification. This comparison is provided for both A-fires (solid fuels) and B-fires (liquid fuels) in the chart below.



Comparison base for A-fires

3. In both standards, the test for A-fires is a wood crib placed in either a square or rectangular shape. This test represents a 3-dimnesional fire shape where the fire load is resulting from a deep seated fire (after pre-ignition time). The cubic dimension of the burning fuel is therefore a indicator for the fire rating.

Comparison base for B-fires

4. In both standards, the test fire for B-fires is a steel pan filled with heptanes and water. EN3 uses round pans while UL711 uses square pans. Both tests represent a 2-dimensional fire shape where the fire load is the result of a surface fire. The surface dimension of the burning fuel is therefore an indicator for the fire rating.

Definitions of portable fire extinguisher

5. EN3 defines a fire extinguisher as a device which is designed to be carried and operated by hand. It has a mass of not more than 20 kg.

6. NFPA10 defines a fire extinguisher as a portable device, carried and/or on wheels and operated by hand. It carries an extinguishing agent than can be expelled under pressure

for the purpose of suppressing or extinguishing a fire. It covers devices less than as well as more than 20 kg.

7. European Standard EN1866, specifies the design criteria, testing and inspection during manufacturing, rating and classification of mobile extinguishers and test methods to be used. It applies to mobile fire extinguishers with a total mass above 20 kg powder, water-based and CO_2 extinguishers. This standard applies to mobile fire extinguishers that are manoeuvred by an operator on foot only.

Class fire test object (EN1866)

Table 1.

Type	Number of 233B	Number of 21 B
I B	1	1
II B	1	2
III B	1	3
IV B	1	4

8. The 21 B trays shall be installed directly alongside the 233 B tray. The arrangement shall be as follows:

a. II B at 0° and 180° of the 233 B;

b. III B at 0°, 120° and 240° of the 233 B;

c. IV B at o°, 90°, 180° and 270° of the 233 B.

9. The powder extinguishers and water based extinguisher according (if class BH rating is required) the classification of B test fires is given in Table 2.

Table 2.

Powder, nominal in charge in kg 25	Water based, nominal in charge in l 20/25	Minimum required in test fire I B
50	45/50	II B
100	90/100	III B
150	135/150	IV B