Fertilizers Europe

GUIDANCE FOR SEA TRANSPORT OF SOLID AMMONIUM NITRATE BASED FERTILIZERS

Issue 2024

Product Stewardship Fertilizers

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1. SCOPE

This guidance describes safety practices recommended by Fertilizers Europe for the sea transport (ship loading, transportation and discharging) of solid ammonium nitrate (AN) based fertilizers. Its purpose is to promote safety and security, preserve the quality of fertilizers during sea transport, safeguard the health of the personnel involved and prevent hazards to the environment.

It contains the relevant guidance for all supply chain operators involved such as manufacturers, merchants, importers, port operators, and haulers. The guidance refers to existing regulatory frameworks, covering legal requirements and recommendations, including best practices for sea transport.

Reference is made to the following official publications:

- **Recommendations on the Transport of Dangerous Goods** *Model Regulations, 23rd edition, United Nations, New York and Geneva, 2023;*
- **Recommendations on the Transport of Dangerous Goods** *Manual of Tests and Criteria, 7th revised edition, Amendment 1, United Nations, New York and Geneva, 2021;*
- **IMO International Maritime Dangerous Goods Code** (IMDG Code 2022)
- **Code of Practice for the Safe Loading and Unloading of Bulk Carriers** (IMSBC 2023 - BLU Code)
- **International Maritime Solid Bulk Cargoes Code** (IMSBC code), 2023
- **International Convention for the Prevention of Pollution from Ships** (MARPOL), consolidated edition, 2022
- **International convention on "Safety of life at sea"** (SOLAS), consolidated edition 2020
- **Guide to Maritime Security and ISPS Code, 2021 Edition**
- **Regulation (EC) No 725/2004 of the European Parliament and of the Council of 31 March 2004 on enhancing ship and port facility security.**

OJ L129 29.4.2004

- **Any other relevant National, Ports and Harbour legislation.**

It is therefore of paramount importance to check the applicable legislative frameworks - national and international. This Fertilizers Europe guidance is periodically revised. However, it should be borne in mind that changes to the legal framework might happen at intermediate stages to the given information. Furthermore, it should be noted that national and international regulations take precedence over this guidance.

To facilitate and make this guidance a practicable tool, several annexes are included covering a broad set of checklists to serve as a practical instrument for verification of the implementation of a complicated set of transport rulings and best industry practice.
While not exhaustive, these annexes cover key topics, facilitating compliance checks against established requirements. For legal requirements that may evolve, a final legislative check is always recommended.

2. CARGO GROUPS – definitions

Cargo groups are defined as per IMSBC 2023 as follows:

Cargo group A: cargoes which may liquefy if shipped at a moisture content exceeding their Transportable Moisture Limit (TML)

Cargo group B: cargoes which possess a chemical hazard which could give rise to a dangerous situation on a ship.

Cargo group C: cargoes which are neither liable to liquefy (Group A) nor possess chemical hazards (Group B).

3. DESCRIPTION OF PRODUCTS

3.1. Types of products

AN-based solid fertilizers are of two main types:

- **Straight nitrogen fertilizers**
  These products contain only nitrogen (N) as the principal plant nutrient. Typical products are ammonium nitrate (AN) and calcium ammonium nitrate (CAN), which are mixtures of AN and dolomite/limestone/calcium carbonate, and ammonium sulphate/ammonium nitrate (ASN) mixtures.

- **Compound fertilizers: NPK/NP/NK**
  Products which contain, in addition to nitrogen, at least one other nutrient such as phosphate (a source of P_2O_5) and/or potash (a source of K_2O).

3.2. Methods of handling

Two main methods of handling are used (variations exist depending on national or port regulations):

- **Packaged**
  - IBCs of 500-1500 kg capacity or in 25 or 50 kg bags;
  - Loose or on pallets with up to 1.5-ton load.

- **Loose bulk**

3.3. Classification and legal requirements

Fertilizers fall into one of the following categories which will be described in the chapters below:

- Class 5.1, UN 2067
- Class 9; UN 2071
- Non UN classified ammonium nitrate based fertilizers

3.3.1. Oxidizers belonging to class 5.1, UN 2067 (IMSBC Cargo group B)

- Straight nitrogen fertilizers containing AN > 80% and dolomite, limestone and/or calcium carbonate and/or mineral calcium sulphate;
- Straight nitrogen fertilizers containing AN > 70% and other inorganic substances not covered above;
- Compound fertilizers (NPK, NP and NK) containing AN > 70%;
- Straight nitrogen fertilizers containing ammonium nitrate and ammonium sulphate (AS) in which 45%<AN<70% and AN+AS>70%.

For classification of solid ammonium nitrate based fertilizers we refer to the UN Manual of tests and criteria – section 39, 2022 for details.

Fertilizers belonging to UN 2067, when transported in bulk by sea, need to pass the official UN Resistance to Detonation Test (IMSBC International Solid Bulk Cargoes Code 2023) and the test certificate must be kept. European countries demand that the test certificate is not older than 3 months.

3.3.2. NPK/NP/NK fertilizers capable of self-sustaining decomposition and belonging to Class 9, UN 2071 (IMSBC Cargo group B)

This entry is for the sea transport of fertilizers which are within the compositions given below and are found to be capable of self-sustaining decomposition (SSD) in the UN Trough Test (IMSBC International Solid Bulk Cargoes Code 2023 or UN Manual of Tests and Criteria – section 38, 37th revised edition):

- NPK fertilizers with 45% < AN < 70%, with no more than 0,4% combustible/organic materials.
- NPK fertilizers with AN < 45% with unrestricted combustible/ organic materials.

For classification of solid ammonium nitrate-based fertilizers we refer to the UN

Manual of tests and criteria – section 39.
Fertilizers belonging to UN 2071 must be tested using the Trough Test to determine the speed of self-sustaining decomposition. Products with a rate of propagation of decomposition in excess of 25 cm/h as measured in this test, are not allowed to be transported by sea in bulk. (IMSBC International Solid Bulk Cargoes Code 2023).

3.3.3. Non-UN classified ammonium nitrate based fertilizers

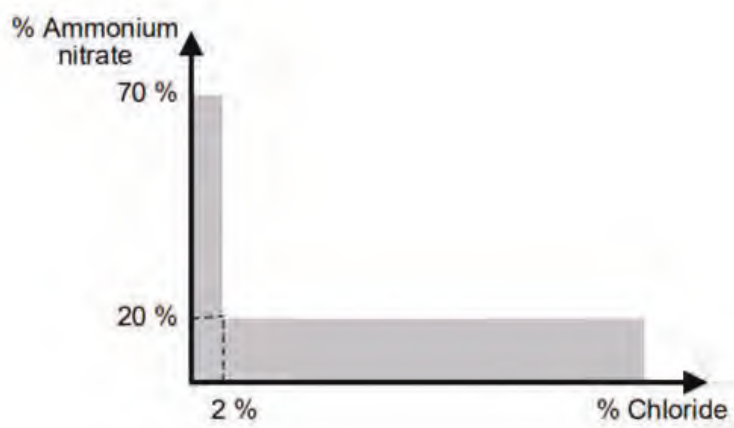
These products are divided into two separate IMSBC schedules for which the split is based on composition:

- **Ammonium nitrate based fertilizers (Cargo group C as per IMSBC):**
  Straight nitrogen fertilizers or compound fertilizers within the following composition limits:

  Straight nitrogen fertilizers containing less than 2% chloride, and
  1. not more than 70% ammonium nitrate with other inorganic materials; or
  2. not more than 80% ammonium nitrate mixed with calcium carbonate and/or dolomite and/or mineral calcium sulphate and not more than 0.4% total combustible organic material calculated as carbon; or
  3. mixtures of ammonium nitrate and ammonium sulphate with not more than 45% ammonium nitrate and not more than 0.4% total combustible organic material calculated as carbon.

  Compound NPK/NK/NP fertilizers
  1. mixtures of nitrogen with phosphate and/or potash containing not more than 70% ammonium nitrate and not more than 0.4% total combustible organic material calculated as carbon or not more than 45% ammonium nitrate and unrestricted combustible material; and

2. either less than 20% of ammonium nitrate content or less than 2% of chloride (as indicated in the grey area of the figure for NPK/NP/NK fertilizers below).

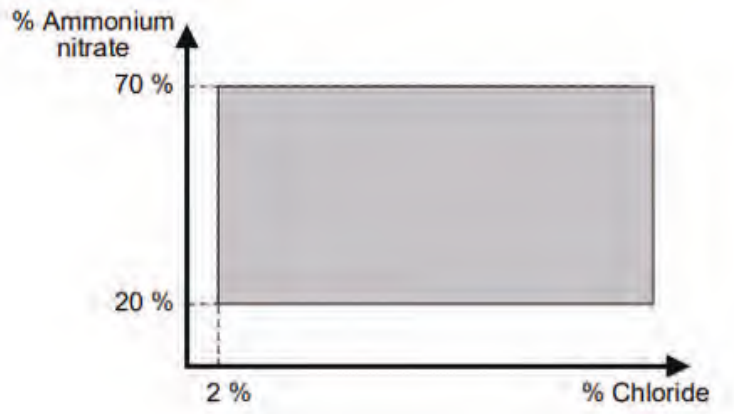


❋ **Ammonium nitrate based fertilizers MHB* (Cargo group B as per IMSBC):**
(*) MHB = Materials hazardous only in bulk

Uniform mixtures of nitrogen with or without potash and/or phosphate within the following composition limits:

1. not more than 70% ammonium nitrate and not more than 0.4% total combustible organic material calculated as carbon or not more than 45% ammonium nitrate and unrestricted combustible material; and

2. both the ammonium nitrate content is equal to or greater than 20% and the chloride content is equal to or greater than 2% (as indicated in the grey area of the figure below).



The shipper shall declare the ammonium nitrate content and the chloride content in accordance with IMSBC 2023.

Some fertilizers not fulfilling the criteria to be considered self-sustaining decomposition can be subject to a decomposition that might gradually spread through the remainder of the cargo, producing large volumes of toxic gases. This is the reason why they are considered as MHB(OH).

4. POTENTIAL HAZARDS OF AN - BASED FERTILIZERS

The three main potential hazards of relevance to AN-based fertilizers are:

Fire

Ammonium nitrate itself does not burn but is an oxidising substance and as such can support combustion. Therefore, combustible material must be present to have a fire involving ammonium nitrate. When an AN-based fertilizer is involved in a fire, or if it is heated to a certain extent, the AN will decompose and provide oxygen, thus increasing the fire hazard. The decomposition hazard can increase if the product, particularly spillage, is contaminated with combustible materials such as coal, grain, sawdust or oil spills.

In a fire incident the fertilizer will decompose with the release of toxic gases such as NO_X, ammonia, hydrogen chloride and nitric acid vapours.

Decomposition

AN-based fertilizers can chemically break down under the influence of heat and this is known as decomposition. The presence of a combustible substance is not necessary for decomposition to take place. The decomposition hazard is dependent on the type of product, the temperature of the heat source, the duration of exposure to the heat source, and the containment of the fertilizer.

There are certain compositions of compound fertilizers (NPK/NP/NK) which are capable of undergoing self-sustaining decomposition, i.e. once a hot source (e.g. a hot electric light bulb or hot welding material) has initiated the decomposition, the reaction in the fertilizer is sufficiently thermally energetic to continue on its own without further heat input from any outside source. Such fertilizers are described as self-sustaining decomposition type or 'cigar-burners'. Because of their relatively higher potential hazard they are classified as dangerous goods for sea transport. They are classified as UN 2071, class 9. The official UN Trough

Test has been developed to determine this behaviour.

The decomposition hazard in straight- N fertilizers such as AN, CAN, ASN and in non-SSD type compound fertilizers (NPK, NP, NK) is dependent on contamination with sensitising materials such as chromates, chlorinated chemicals and various metals such as zinc and copper and their salts.

Decomposition is generally accompanied by the evolution of toxic gases such as NOx, ammonia, hydrogen chloride and nitric acid vapours.

❙ Explosion/Detonation

AN and AN-based fertilizers are capable of detonating under certain conditions, requiring a strong source of initiation. Standard good- quality fertilizer products have high resistance to denotation as shown by the official UN Resistance to Detonation Test. This resistance, however, can be adversely affected by a number of factors, such as:

- Substantially smaller particle size,
- Higher porosity (hence a lower bulk density),
- High levels (above safe limits) of combustible, organic and other sensitising materials.

The addition of ammonium sulphate within certain limits generally increases the sensitivity to detonation.

Heating under severe confinement can also give rise to a potential explosion hazard.

5. RECOMMENDED SAFETY PRACTICES

5.1. Safety principles

With regard to the potential hazards described on the previous pages the main safety principles applicable are:

- No storage of combustible substances near fertilizers;
- No storage of incompatible substances near fertilizers;
- Avoid cross contamination with the remains of previous cargoes;
- Avoid cross contamination of the next cargo with fertilizer;
- No sources of heat likely to affect the fertilizer;
- No application of heat (e.g. welding) in areas adjacent to cargo holds containing fertilizers or to any section which may have trapped/confined fertilizer.

5.2. Chartering

Vessels to be chartered for carrying fertilizers should be assessed and approved by Shippers based on company criteria for safety (e.g. Equasis database), in addition to official statutory requirements.

Shippers shall deliver the cargo information and documentation listed in the IMSBC code under “Assessment of acceptability of consignments for safe shipment; Provision of information” including the correct Bulk Cargo Shipping Name (BCSN).

Reference to precautions to avoid the risk of decomposition of fertilizers shall be part of the documentation provided by Shippers (see IMSBC).

In addition, reference shall be made that vessel Owners shall adhere to all IMSBC

schedule rules as per the product group to be loaded.

5.3. Checklists for loading and unloading operations

Exporters, importers and crew/master are advised to use IMSBC's checklists to ensure that all necessary safety precautions are taken during the loading/ transportation/unloading of AN-based fertilizers. Comprehensive checklists are given in Annexes 1 to 6 covering the main activities:

- Annex 1 - Inspection of cargo holds prior to loading;
- Annex 2 - Ship/shore safety checklist;
- An additional checklist should be completed for the loading of
  - Fertilizers classified as dangerous goods:
    - Annex 3 - for fertilizers UN 2067, IMSBC Cargo Group B
    - Annex 4 - for fertilizers UN 2071, IMSBC Cargo Group B
  - Annex 5 - for ANBF, IMSBC Cargo Group C;
  - Annex 6 - for ANBF (MHB) IMSBC Cargo Group B

These checklists follow a gradual build-up of requirements and should always be completed in order, starting from the basic requirements under Annex 1 and Annex 2, followed by the additional checkpoints in Annex 3-6 depending on the hazard profile and associated risks of the fertilizer products.

5.4. Information to the Ship's Master

Prior to the loading of a ship, the following information shall be communicated to the Ship's Master by a terminal representative and/or by Agent and/or be part of the inspection documentation:

- Safety data sheet for the product(s) to be loaded, including a reference

to the emergency contact on shore;

- Annex 7 - Instruction on avoidance of heat sources;
- Annex 8 - Instruction on handling emergencies in case of a decomposition onboard.

In addition to the relevant checklists, the Master shall sign for receipt of the above mentioned information.

5.5. Use of compact shovels, loaders or similar equipment in the ship's hold

The following precautions should be taken where a compact shovel or similar equipment is used for removing the bulk fertilizer and emptying the vessel's hold:

- Provide a fire extinguisher on the loader;
- Fit a collecting device for spilt oil and grease underneath;
- Inspect flexible oil tubes and check for leaks;
- Fit spark arrestors on the exhaust;
- Refuelling of any discharge equipment shall not take place in the cargo hold.

5.6. Emergency preparedness

For the best possible preparedness, it is recommended that the terminal operator, the port authority and the local fire services collaborate in the development of an emergency plan and in the training of personnel handling incidents with AN-based fertilizers.

Terminals and ships storing/handling/carrying AN-based fertilizers should be equipped with high-pressure water lances (commonly known as the Victor lance) to penetrate into a heap of fertilizer in case of a decomposition incident.

5.7. Action in case of decomposition and fire

Decomposition is indicated by the release of white/brownish fumes from the fertilizer mass. If a zone of slow decomposition of the AN-based fertilizer should occur, the following steps should be taken immediately, whether this occurs at the terminal or onboard the ship:

- Look for the source of heat and, if found, turn it off or remove it.
- If the area (zone) of decomposing material is still small and easily accessible, make an attempt to remove it from the main heap of the fertilizer by the use of picks, shovels or ship's grab, and to cool it down by localized quenching with water, at all times using appropriate PPE, including self-contained breathing apparatus (SCBA).
- If it is impossible to remove the decomposing mass, soak the fertilizer involved as rapidly as possible with a large quantity of water preferably directed through high pressure jets against the centre of the decomposition. Fighting the decomposition by other means such as foam, carbon dioxide, steam, covering with sand or fertilizer, is useless and dangerous as it may even promote the decomposition.
- Take special care when entering the ship's hold in case of fumes: SCBA shall be used
- If the decomposition takes place on board of the ship, the following additional actions should be considered:
- Choose the course of the ship so that any harmful fumes evolved
- will drift as little as possible over the ship, especially towards the crew's quarters and the bridge. If the ship lies in a port it may be necessary to move it away from the inhabited area.
- Open the hatches to provide ventilation. Avoid a gas-tight closure of
- the affected hold.
- If large quantities of water are necessary to control the decomposition, consider flooding the hold, with due regard to induced forces and ship

stability.

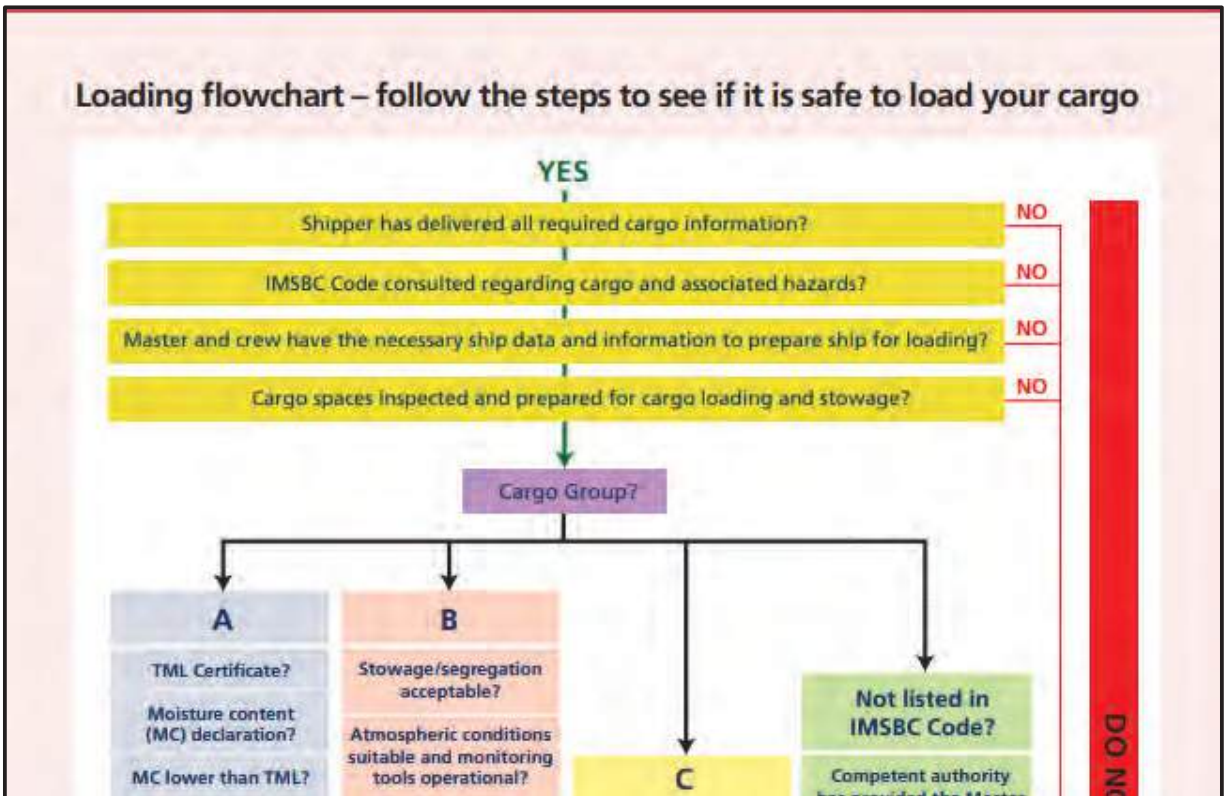
Suitable precautions should be taken to prevent the spread of decomposition or fire to cargoes in adjacent holds.

If a fire occurs on board or in storage areas and there is no fertilizer affected, use suitable means to extinguish the fire depending on the nature of the combustible material concerned. If however fertilizers are involved and are decomposing, only water must be applied as per the guidance given above.

Instructions for dealing with fires taking place in other parts of the ship, such as the engine room or living quarters, are outside the scope of this guidance and other appropriate guidance must be used.

All above recommendations have been gathered in the below flowchart from Lloyd's register's guidance Carrying solid bulk cargoes safely © Lloyd's Register/UK P&I Club/Intercargo, 2016.

"Carrying solid bulk cargoes safely, Guidance for crews on the International Maritime Solid Bulk Cargoes Code".



ANNEX 1 Checklist for the inspection of cargo holds prior to loading (for all fertilizers)

This inspection checklist has been issued solely for the purpose of charterer's internal use and may not be relied upon by the owners or any other party as evidence with respect to the condition of the vessel. It may not be construed as a waiver of any of the charterer's rights under the Charter Party, applicable laws and or conventions.

Name of vessel:		Type of cargo:	
Year built:		UN No./IMDG class:	
Tonnes:		Loading port:	
Previous cargo:		Destination:	

Type of holds: Single deck ☐ Tweendeck ☐ Box shaped ☐

Type of hatch covers: Steel folding ☐ Steel pontoons ☐ Other: ☐

Type of tank top: Steel ☐ Other: ☐

Tick off cell if compliant with IMSBC schedules and any other Shippers' requirements ✓
Mark cell when not in compliance ✗

	The following holds have been inspected:	HOLD 1	HOLD 2	HOLD 3	HOLD 4	HOLD 5
A	Condition of rubber gaskets					
B	Condition of compression bars					
C	Condition of draining canals/holes/pipes					
D	Condition of wedges/cleats					
E	Condition of hatch covers					
F	Condition of trimming holes on hatch covers					
G	Condition of hatch coaming					
H	Condition of hold					
I	Condition/Tightness of moveable bulkhead					
J	Hold ventilation closed					
K	Condition of entrance hatches/ladders					
L	Bilges empty					
M	Heat sources (lights, engines/pipelines etc)					
N	Availability of stevedores platform					
O	Electric circuits/lights in the holds shall electrically be disconnected from the power source					
P	Ultrasound leak detector (ULD) test					
Q	No protruding angle in the ship's holds in case of packaged fertilizers. Make a visual inspection					

The following deficiencies must be rectified in order to comply with the terms agreed in the Charter Party:

This inspection checklist has been issued solely for the purpose of charterer's internal use and may not be relied upon by the owners or any other party as evidence with respect to the condition of the vessel. It may not be construed as a waiver of any of the charterer's rights under the Charter Party, applicable laws and or conventions.

	Name	Signature	Date	Time
Inspector				
Master				
Holds accepted for loading				

ANNEX 2

Operational Checklist (for all fertilizers*)

Name of vessel:			
Berth:	**Port:**	**Arrival draught:**	**Calculated departure draught:**
Date of arrival:	**Time of arrival:**	**Arrival air draught:**	**Departure air draught:**
Type of cargo for loading/unloading (delete as appropriate):		**Quantity for loading/unloading (delete as appropriate):**	

Disclaimer:

This checklist has been issued solely for the charterer's internal use and may not be relied upon by the owners or any other party as evidence with respect to the condition of the vessel. It may not be construed as a waiver of any of the charterer's rights under the Charter Party, applicable laws and or conventions.

Instructions for completion:

The safety of operations requires that all questions are answered affirmatively by ticking the box, by both the vessel representative and the terminal representative. If an affirmative answer is not possible, the reason should be given and an agreement should be reached upon the appropriate precautions to be taken between the ship and the terminal. Where a question is not considered applicable, a note to this effect shall be inserted in the remarks column.

No.	Check point	Vessel	Terminal	Remarks
1	Weather precautions This cargo shall be kept as dry as practicable. This cargo shall not be handled during precipitation. During handling of this cargo, all non-working hatches of the cargo spaces into which this cargo is loaded, or is to be loaded, shall be closed.			
2	Is the depth of water at the berth, and the air draught, adequate for the cargo operations to be completed? (Air draught refers to max mast height for passing under bridges, and height required under loaders/unloaders at the berth)			
3	Are mooring arrangements adequate for all local effects of tide, current, weather, traffic and craft alongside?			
4	In emergency, is the ship able to leave the berth at any time?			
5	Is there safe access between the ship and wharf? *Tended by Ship/Terminal* (delete as appropriate)			
6	Is the agreed ship/terminal communication system operative? *Communication method*: *Language*: *Radio channels/phone numbers*:			
7	Are the liaison contact persons during operations positively identified? *Ship contact person(s)*: *Shore contact person(s)*: *Location*:			

8	Are adequate crew onboard, and adequate staff in the terminal, for emergency?			
9	Have any bunkering operations been advised and agreed, with restrictions if loading ammonium nitrate based fertilizers?			

10	Have any intended repairs to wharf or ship whilst alongside been advised and agreed, with restrictions on hot work when fertilizer containing ammonium nitrate is being loaded or onboard?			
11	Has the procedure for reporting and recording damage from cargo operations been agreed?			
12	Has the ship been provided with copies of port and terminal regulations, including safety and pollution requirements and details of emergency services from the port/ terminal representative?			
13	Has the shipper provided the Master with the properties of the cargo in accordance with the requirements of Chapter VI of SOLAS?			
14	Is the atmosphere safe in holds and enclosed spaces to which access may be required, have fumigated cargoes been identified, and has the need for monitoring of the atmosphere been agreed by ship and terminal?			
15	Have the cargo handling capacity and any limits of travel for each loader/unloader been passed by the ship/terminal? Loader no. Rate tonnes/hour Loader no. Rate tonnes/hour Loader no. Rate tonnes/hour			
16	Has the cargo loading/unloading plan been calculated for all stages of loading/ballasting or unloading/ballasting? Copy lodged with:			
17	Have the holds to be worked been clearly identified in the loading and unloading plan defined by the Master and the terminal representative, showing the sequence of work, and the grade and tonnage of cargo to be transferred each time the hold is worked?			
18	Has the need for trimming of cargo in the holds been discussed, and the method and extent been agreed between the Master and the terminal representative?			
19	Has the need for trimming of bulk cargo and/or lashing and securing of packaged goods in the holds been discussed, and the method and extent been agreed between the Master and the terminal representative?			
20	Do both ship and terminal understand and accept that if the ballast program becomes out of step with the cargo operation, it will be necessary to suspend cargo operation until the ballast operation has caught up?			
21	Have the intended procedures for removing cargo residues lodged in the holds while unloading, been explained to the ship and accepted?			
22	Have the procedures to adjust the final trim of the loading ship been decided and agreed between the Master and the Terminal? Tonnage held by the terminal conveyor system:			

23	Has the terminal been advised of the time required for the ship to prepare for sea, on completion of cargo work?			
24	Has the ship been advised on how to protect the fertilizer cargo from product quality damage during the voyage?			

25	Has the ship received and accepted the following information prior to loading: (1) Safety Data Sheet? (2) Instruction to ship's crew concerning the avoidance of heat sources when loading/unloading and carrying ammonium nitrate based fertilizers? (3) Instruction to ship's crew for handling of emergencies involving the decomposition of ammonium nitrate based fertilizers?			
26	Clean-up After discharge of this cargo, the bilge wells and the scuppers of the cargo spaces shall be checked and any blockage in the bilge wells and the scuppers shall be removed."			

Declaration: We have checked, where appropriate jointly, the items on this checklist and have satisfied ourselves that the entries we have made are correct to the best of our knowledge, and arrangements have been made to carry out repetitive checks if necessary.	
For Vessel: Name and rank: Signature: Date and time:	**For Terminal:** Name and position: Signature: Date and time:

(*) this operational checklist is applicable for all types of solid fertilizers, including non-ammonium nitrate based products.

ANNEX 3

Ship/Shore Safety Checklist for fertilizers classified under UN 2067

In addition to Annex 1 (Checklist for the inspection of cargo holds prior to loading) and Annex 2 operational Checklist)

Name of vessel:	
Berth:	**Port:**
Date of arrival:	**Time of arrival:**
Type of cargo for loading/unloading (delete as appropriate): UN Number:	**Quantity for loading/unloading (delete as appropriate):**

Disclaimer:

This checklist has been issued solely for the charterer's internal use and may not be relied upon by the owners or any other party as evidence with respect to the condition of the vessel. It may not be construed as a waiver of any of the charterer's rights under the Charter Party, applicable laws and or conventions.

Instructions for completion:

The safety of operations requires that all questions are answered affirmatively by ticking the box, by both the vessel representative and the terminal representative. If an affirmative answer is not possible, the reason should be given and an agreement should be reached upon the appropriate precautions to be taken between the ship and the terminal. Where a question is not considered applicable, a note to this effect shall be inserted in the remarks column.

No.	Check point	Vessel	Terminal	Remarks
1	If carrying organic and/or combustible materials, is the fertilizer cargo separated from the organic/combustible cargo by a complete compartment or hold?			
2	If also organic / combustible cargoes are loaded: are local port restrictions on tonnage restriction threshold for UN2067 adhered to?			
3	If other cargo is present or will be loaded in the same cargo hold as the fertilizer, is the other cargo compatible with the fertilizer material?			
4	Is the crew on the vessel aware that no welding, burning, cutting, or other operation involving the use of fire, open flame, spark or arc producing equipment should be carried out on deck, in the hold entrance or in the neighbouring hold as long as the fertilizer is onboard?			
5	Is it ensured that no bunkering or pumping of fuel will occur whilst loading or if the cargo hold is not closed sea tight?			
6	Has the fire pump sufficient water capacity, preferably $1m^3$ per minute or more? (SOLAS requires fire pumps			

	providing not less than 25 m3/h with at least discharge of water with 2 jets)			
7	Are fire hoses laid out and ready for immediate use?			
8	Is the crew informed that smoking is forbidden on deck and in the cargo holds as long as fertilizer is onboard?			
9	Are "No smoking" signs displayed onboard and ashore? (The sign onboard should stay in position as long as the fertilizer is onboard.)			
10	Are Port authorities' requirements being considered e.g. the need for a permanent fire watch?			
11	Is the bulkhead between the cargo space and the engine room insulated according to class "A-60" standard or an equivalent arrangement approved by the competent authority?			
12	Is the official certificate stating that the vessel is approved for loading of the fertilizers, available onboard or made available by the agent?			
13	Is the cargo space free of wood and other combustible material?			
14	Have the fuel tanks next to and/or under the cargo hold been pressure tested and found free of any leakage prior commencement of loading? Is the test certificate available onboard? (the test shall be repeated for every voyage)			
15	Are electric lamps, cables and other electric equipment in the fertilizer cargo holds disconnected and fuses removed? (This situation must be maintained as long as fertilizer is onboard.)			
16	Are cargo holds for fertilizers clear of steam pipes and similar heat sources?			
17	Is the temperature of the product before loading below 40°C?			

Declaration: We have checked, where appropriate jointly, the items on this checklist, and have satisfied ourselves that the entries we have made are correct to the best of our knowledge, and arrangements have been made to carry out repetitive checks if necessary.	
For Vessel:	**For Terminal:**
Name and rank:	Name and position:
Signature:	Signature:
Date and time:	Date and time:

ANNEX 4

Ship/Shore Safety Checklist for fertilizers classified under UN 2071

In addition to Annex 1 (Checklist for the inspection of cargo holds prior to loading) and Annex 2 (operational Checklist)

Name of vessel:	
Berth:	**Port:**
Date of arrival:	**Time of arrival:**
Type of cargo for loading/unloading (delete as appropriate):	**Quantity for loading/unloading (delete as appropriate):**

Disclaimer:

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Instructions for completion:

The safety of operations requires that all questions are answered affirmatively by ticking the box, by both the vessel representative and the terminal representative. If an affirmative answer is not possible, the reason should be given and an agreement should be reached upon the appropriate precautions to be taken between the ship and the terminal. Where a question is not considered applicable, a note to this effect shall be inserted in the remarks column.

No.	Check point	Vessel	Terminal	Remarks
1	If carrying organic and/or combustible materials, is the fertilizer cargo separated from the organic/combustible cargo by a complete compartment or hold?			
2	If other cargo is present or will be loaded in the same cargo hold as the fertilizer, is the other cargo compatible with the fertilizer material?			
3	Is the crew on the vessel aware that no welding, burning, cutting, or other operation involving the use of fire, open flame, spark or arc producing equipment should be carried out on deck, in the hold entrance or in the neighbouring hold as long as the fertilizer is onboard?			
4	Is it ensured that no bunkering or pumping of fuel will occur whilst loading or if the cargo hold is not closed sea tight?			
5	Has the fire pump sufficient water capacity, preferably 1 m^3 per minute or more? (SOLAS requires fire pumps providing not less than 25 m3/h with at least discharge of water with 2 jets)			
6	Are fire hoses laid out and ready for immediate use?			
7	Is the crew informed that smoking is forbidden on deck and in the cargo holds as long as fertilizer is onboard?			

8	Are “No smoking” signs displayed onboard and ashore? (The sign onboard should stay in position as long as the fertilizer is onboard.)			
9	Are Port authorities’ requirements being considered e.g. the need for a permanent fire watch?			
10	The temperature of this cargo shall be monitored and recorded daily during the voyage to detect decomposition resulting in spontaneous heating and oxygen depletion.			
11	If the bulkhead between the cargo space and the engine-room is not insulated to class “A-60” standard, this cargo shall be stowed “away from” the bulkhead. Stowed “away from” = 3m horizontally away			
12	Is the official certificate stating that the vessel is approved for loading of the fertilizers, available onboard or made available by the agent?			
13	Is the cargo space free of wood and other combustible material?			
14	Is fuel oil contained in tanks adjacent to the fertilizer cargo hold prevented from being heated to more than 50°C?			
15	Are electric lamps, cables and other electric equipment in the fertilizer cargo holds disconnected and fuses removed? (This situation must be maintained as long as fertilizer is onboard.)			
16	Are cargo holds for fertilizers clear of steam pipes and similar heat sources?			
17	Are cargo holds with bagged fertilizers equipped with fans with ventilating capacity of 6 air changes per hour? (as per SOLAS requirements)			

Declaration: We have checked, where appropriate jointly, the items on this checklist, and have satisfied ourselves that the entries we have made are correct to the best of our knowledge, and arrangements have been made to carry out repetitive checks if necessary.	
For Vessel: Name and rank: Signature: Date and time:	**For Terminal:** Name and position: Signature: Date and time:

ANNEX 5

Ship/Shore Safety Checklist for ammonium nitrate based fertilizers

In addition to Annex 1 (Checklist for the inspection of cargo holds prior to loading) and Annex 2 (operational Checklist)

Name of vessel:	Port of loading:
Cargo to be loaded:	
Instructions for completion: The safety of operations requires that all questions be answered YES by ticking the box, by the vessel representative. If a YES answer is not possible, the reason should be given. Where a question is not considered applicable, a note to this effect shall be inserted in the remarks section.	

No.	Check point	Vessel
1	Is the compatibility of this cargo checked with other materials which maybe stowed in the same cargo space? Remarks:	
2	Is the cargo "separated from" sources of heat or ignition (e.g. thermal heating oil pipeline)? Remarks:	
3	When heated, AN based fertilisers produce TOXIC GASES. In order to avoid heating the cargo, all electrical equipment or other equipment capable of developing heat, other than that of approved safe type, in the cargo spaces to be used for this cargo shall be electrically disconnected from the power source, by appropriate means other than a fuse, at a point external to the space. This situation shall be maintained while the cargo is on board. Remarks:	
4	No welding, burning, cutting or other operations involving the use of fire, open flame, spark or arc-producing equipment **shall** be carried out on equipment or structures in direct contact with the fertilizer. Remarks:	
5	"NO SMOKING" signs **shall** be displayed on deck whenever this cargo is on board. Smoking shall not be allowed on deck and in the cargo spaces. Remarks:	
6	Bilge wells of the cargo spaces **shall** be protected from ingress of cargo. Is this done accordingly? Remarks:	
7	Cargo in the cargo spaces **shall** not be ventilated during the voyage, except in an emergency. Remarks:	
8	The cargo **shall** be covered with plastic sheets after completion of loading. Remarks:	

Ship/Shore Safety Checklist for ammonium nitrate based fertilizers

(Continued)

	When this cargo is heated strongly, it will decompose and give off toxic gases with the risk of toxic fumes in the cargo hold, adjacent spaces and on deck. If decomposition is initiated in a localized area, it is highly unlikely to spread throughout the mass of the fertilizer For the hazards associated with the spread of decomposition, see the individual schedule for AMMONIUM NITRATE-BASED FERTILIZER MHB	

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Declaration:
We have checked, where appropriate jointly, the items on this checklist, and have satisfied ourselves that the entries we have made are correct to the best of our knowledge, and arrangements have been made to carry out repetitive checks if necessary

For Vessel:	**For Terminal:**
Name :	Name and position:
Signature:	Signature:
Date and time:	Date and time:

ANNEX 6

Ship/Shore Safety Checklist for ammonium nitrate based fertilizers - MHB

In addition to Annex 1 (Checklist for the inspection of cargo holds prior to loading)

Name of vessel:	Port of loading:
Cargo to be loaded:	
Instructions for completion: The safety of operations requires that all questions be answered YES by ticking the box, by the vessel representative. If a YES answer is not possible, the reason should be given. Where a question is not considered applicable, a note to this effect shall be inserted in the remarks section.	

No.	Check point	Vessel
1	Is the compatibility of this cargo checked with other materials which maybe stowed in the same cargo space? Remarks:	
2	Is the cargo "separated from" sources of heat or ignition (e.g. thermal heating oil pipeline)? Remarks:	
3	The cargo **shall** not to be stowed immediately adjacent to any tank, double bottom or pipe containing heated fuel oil, unless there are permanent means and procedures to monitor and control the temperature so that it does not exceed 50°C. Check temperatures of pipes, bulkheads and steel work during inspection. In case of doubt a thermal camera might prove to be useful. Check how the vessel monitors and controls the fuel oil temperatures – ask the engineers. Remarks:	
4	The cargo **shall** be stowed out of direct contact with the metal engine room boundary. Segregation can be an insulation barrier approved by competent authorities i.e. Vessels' class. Ideally an A60 bulkhead is fitted Remarks:	
5	The hatches of the cargo spaces, including those of 'tween decks, **shall** be kept free at all times. In case of an emergency, whenever this material is on board, opening the hatches must be enabled. Due consideration **shall** be given to the necessity to open hatches in case of decomposition to provide maximum ventilation, release pressure and heat, and slow down the reaction. The master and officers are to note that the ship's fixed gas fire-fighting installation will be ineffective on decompositions involving this cargo and must not be used. If decomposition is identified, water must be applied without delay. Injection to the seat of decomposition is the first control measure because it uses less water and can be more effective in early decomposition stages. Total flooding is the final control measure but can introduce stability and stress issues. The consequential risk to the stability of the ship through fluidization of the cargo must be taken into account in both cases. Application of water to the surface of the cargo is much less effective and can give a false sense of safety. Remarks:	

and Annex 2 (operational Checklist)

Ship/Shore Safety Checklist for ammonium nitrate based fertilizers

MHB (Continued)

6	There **shall** be a daily monitoring, recording and assessing the trends of the cargo temperature and oxygen concentration in the cargo space(s) throughout the voyage. Increase of temperature and decrease of oxygen concentration give an early indication of a decomposition. In addition, should decomposition occur, the residue left after decomposition may have only half the mass of the original cargo. Due consideration **shall** be given to the effect of the loss of mass on the stability of the ship. Remarks:	
7	When heated, AN based fertilisers produce TOXIC GASES. In order to avoid heating the cargo, all electrical equipment or other equipment capable of developing heat, other than that of approved safe type, in the cargo spaces to be used for this cargo **shall** be electrically disconnected from the power source, by appropriate means other than a fuse, at a point external to the space. This situation **shall** be maintained while the cargo is on board. Remarks:	
8	No welding, burning, cutting or other operations involving the use of fire, open flame, spark or arc-producing equipment **shall** be carried out on equipment or structures in direct contact with the fertilizer. Remarks:	
9	Bunkering of fuel oil **shall not** be allowed during loading or discharging. Pumping of fuel oil in spaces adjacent to the cargo spaces for this cargo, other than the engine room, **shall not** be allowed. Remarks:	
10	"NO SMOKING" signs **shall** be displayed on deck whenever this cargo is on board. Smoking shall not be allowed on deck and in the cargo spaces. Remarks:	
11	Bilge wells of the cargo spaces **shall** be protected from ingress of cargo. Is this done accordingly? Remarks:	
12	Cargo in the cargo spaces **shall** not be ventilated during the voyage, except in an emergency. Remarks:	
13	The cargo **shall** be covered with plastic sheets after completion of loading. Remarks:	

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Declaration:
We have checked, where appropriate jointly, the items on this checklist, and have satisfied ourselves that the entries we have made are correct to the best of our knowledge, and arrangements have been made to carry out repetitive checks if necessary

For Vessel:	**For Terminal:**
Name :	Name and position:
Signature:	Signature:
Date and time:	Date and time:

ANNEX 7

IMPORTANT NOTICE FOR SHIP AND PRODUCT SAFETY

INSTRUCTION
LIGHT & HEAT SOURCES OFF

LEAVING HEAT SOURCES SWITCHED ON CAN HAVE SERIOUS CONSEQUENCES

AS LONG AS CARGO IS ON BOARD

NO welding
NO hot works

ALL cargo lights and ALL hold ladder lights physically DISCONNECTED from the power source

NO heated surfaces
In the hold

NO Smoking

NO live electric cables
In the hold

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Instruction Received and Understood

Date:- Time:- Master:-

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ANNEX 8

What to do in emergencies – for the Master's attention

INSTRUCTION TO THE SHIP'S CREW FOR THE HANDLING OF EMERGENCIES INVOLVING THE DECOMPOSITION OF AMMONIUM NITRATE BASED FERTILIZERS

- **If in port, contact the local emergency services.**
- **If at sea, contact the ship agent, shipping company or the supplier as mentioned on the safety data sheet.**
- **Avoid breathing fumes, as they may be toxic.**
- **Open hatches immediately to maximise ventilation.**
- **Immediately remove the heat source and extinguish the fire or decomposition. Water must be applied without delay. Injection to the seat of decomposition is the first control measure (e.g. using Victor lances)**
- **If possible, remove or separate the decomposing fertilizer material from the rest of the cargo, and drench it with water (salt or fresh).**
- **If not possible to remove or separate, drench the fertilizer in the cargo hold with water (salt or fresh). It is recommended to use water lances to penetrate the crust of decomposed fertilizers.**

In addition, when a decomposition occurs, the residue left after decomposition may have only half the mass of the original cargo. Due consideration shall be given to the effect of the loss of mass on the stability of the ship or to the addition of water to fight the decomposition.

~~DO NOT fight the decomposition by using foam, carbon dioxide, steam, sand or fertilizer.~~

USE WATER ! NOT foam, CO_2, steam, sand, fertilizer

List of abbreviations:

ANBF	Ammonium nitrate based fertilizers
BLU Code	Bulk Loading and Unloading / Code of Practice for the Safe Loading and Unloading of Bulk Carriers
IMDG Code	International Maritime Dangerous Goods Code
IMO	International Maritime Organization
IMSBC Code	International Maritime Solid Bulk Cargoes Code
ISPS	International Ship and Port Facility Security
MARPOL	International Convention for the Prevention of Pollution from Ships
MHB	Materials Hazardous only in Bulk
MHB (OH)	Materials Hazardous only in Bulk (Other Hazards)
P&I Club	Protection and Indemnity (for vessels)
SCBA	Self-contained breathing apparatus
SOLAS	Safety of Life at Sea
SSD	Self-sustaining decomposition
ULD test	Ultrasonic Leak Detection test

NOTES

Fertilizers Europe

Fertilizers Europe

Avenue des Nerviens,
9-31, 1040, Brussels

Tel. +32 2 675 35 50
main@fertilizerseurope.com

www.productstewardship.eu
www.fertilizerseurope.com

twitter.com/FertilizersEuro

Group Fertilizers Europe

Product Stewardship Fertilizers