

ANNEX I

Product Function Categories (PFCs) of EU fertilising products

PART I

DESIGNATION OF PFCs

1. Fertiliser
 - A. Organic fertiliser
 - I. Solid organic fertiliser
 - II. Liquid organic fertiliser
 - B. Organo-mineral fertiliser
 - I. Solid organo-mineral fertiliser
 - II. Liquid organo-mineral fertiliser
 - C. Inorganic fertiliser
 - I. Inorganic macronutrient fertiliser
 - (a) Solid inorganic macronutrient fertiliser
 - (i) Straight solid inorganic macronutrient fertiliser
 - (A) Straight solid inorganic macronutrient ammonium nitrate fertiliser of high nitrogen content
 - (ii) Compound solid inorganic macronutrient fertiliser
 - (A) Compound solid inorganic macronutrient ammonium nitrate fertiliser of high nitrogen content
 - (b) Liquid inorganic macronutrient fertiliser
 - (i) Straight liquid inorganic macronutrient fertiliser
 - (ii) Compound liquid inorganic macronutrient fertiliser
 - II. Inorganic micronutrient fertiliser
 - (a) Straight inorganic micronutrient fertiliser
 - (b) Compound inorganic micronutrient fertiliser
2. Liming material
3. Soil improver
 - A. Organic soil improver
 - B. Inorganic soil improver
4. Growing medium

Changes to legislation: There are currently no known outstanding effects for the Regulation (EU) 2019/1009 of the European Parliament and of the Council, ANNEX I. (See end of Document for details)

5. Inhibitor
 - A. Nitrification inhibitor
 - B. Denitrification inhibitor
 - C. Urease inhibitor
6. Plant biostimulant
 - A. Microbial plant biostimulant
 - B. Non-microbial plant biostimulant
7. Fertilising product blend

PART II

REQUIREMENTS RELATED TO PFCs

1. This Part sets out the requirements related to the PFCs to which EU fertilising products belong by virtue of their claimed function.
2. The requirements laid down in this Annex for a given PFC apply to EU fertilising products in all subcategories of that PFC.
3. The claim that an EU fertilising product complies with the function set out in this Annex for the relevant PFC shall be supported by the product's mode of action, the relative content of its various components, or any other relevant parameter.
4. Where compliance with a given requirement (such as absence of a given contaminant) follows certainly and uncontestedly from the nature or manufacturing process of an EU fertilising product, that compliance can be presumed in the conformity assessment procedure without verification (such as testing), at the responsibility of the manufacturer.
5. Where the EU fertilising product contains a substance for which maximum residue limit values for food and feed have been established in accordance with:
 - (a) Council Regulation (EEC) No 315/93⁽¹⁾,
 - (b) Regulation (EC) No 396/2005 of the European Parliament and of the Council⁽²⁾,
 - (c) Regulation (EC) No 470/2009 of the European Parliament and of the Council⁽³⁾, or
 - (d) Directive 2002/32/EC of the European Parliament and of the Council⁽⁴⁾

the use of the EU fertilising product as specified in the use instructions must not lead to the exceedance of those limit values in food or feed.

6. Phosphonates shall not be intentionally added to any EU fertilising product. Unintentional presence of phosphonates shall not exceed 0,5 % by mass.
7. The requirements in this Annex are expressed in oxidised form for certain nutrients. Where compliance is assessed based on the presence of the nutrient in question in its elemental form, the following conversion factors shall be used:

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phosphorus (P)	= phosphorus pentoxide (P ₂ O ₅) × 0,436;
potassium (K)	= potassium oxide (K ₂ O) × 0,830;
calcium (Ca)	= calcium oxide (CaO) × 0,715;
magnesium (Mg)	= magnesium oxide (MgO) × 0,603;
sodium (Na)	= sodium oxide (Na ₂ O) × 0,742;
sulphur (S)	= sulphur trioxide (SO ₃) × 0,400.

8. The requirements in this Annex are expressed by reference to organic carbon (C_{org}). Where compliance is assessed based on organic matter the following conversion factor applies:

organic carbon (C_{org}) = organic matter × 0,56.

PFC 1: FERTILISER

A fertiliser shall be an EU fertilising product the function of which is to provide nutrients to plants or mushrooms.

PFC 1(A): ORGANIC FERTILISER

1. An organic fertiliser shall contain:
- organic carbon (C_{org}) and
 - nutrients

of solely biological origin.

An organic fertiliser may contain peat, leonardite and lignite, but no other material which is fossilized or embedded in geological formations.

2. Contaminants in an organic fertiliser must not exceed the following limit values:

(a) cadmium (Cd)	: 1,5 mg/kg dry matter,
(b) hexavalent chromium (Cr VI)	: 2 mg/kg dry matter,
(c) mercury (Hg)	: 1 mg/kg dry matter,
(d) nickel (Ni)	: 50 mg/kg dry matter,
(e) lead (Pb)	: 120 mg/kg dry matter, and
(f) inorganic arsenic (As)	: 40 mg/kg dry matter.

Biuret (C₂H₅N₃O₂) must not be present in an organic fertiliser.

3. The copper (Cu) content in an organic fertiliser must not exceed 300 mg/kg dry matter, and the zinc (Zn) content in an organic fertiliser must not exceed 800 mg/kg dry matter.
4. Pathogens in an organic fertiliser must not exceed the limits set out in the following table:

Micro-organisms to be tested	Sampling plans			Limit
	n	c	m	
<i>Salmonella</i> spp.	5	0	0	Absence in 25 g or 25 ml
<i>Escherichia coli</i> or <i>Enterococcaceae</i>	5	5	0	1 000 in 1 g or 1 ml

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Where:

- n = number of samples to be tested,
 c = number of samples where the number of bacteria expressed in colony forming units (CFU) is between m and M,
 m = threshold value for the number of bacteria expressed in CFU that is considered satisfactory,
 M = maximum value of the number of bacteria expressed in CFU.

PFC 1(A)(I): SOLID ORGANIC FERTILISER

1. A solid organic fertiliser shall be in solid form.
2. A solid organic fertiliser shall contain at least one of the following declared primary nutrients: nitrogen (N), phosphorus pentoxide (P₂O₅) or potassium oxide (K₂O).

Where a solid organic fertiliser contains only one declared primary nutrient, that nutrient content shall be at least the following:

- (a) 2,5 % by mass of total nitrogen (N),
- (b) 2 % by mass of total phosphorus pentoxide (P₂O₅), or
- (c) 2 % by mass of total potassium oxide (K₂O).

Where a solid organic fertiliser contains more than one declared primary nutrient, those nutrient contents shall be at least the following:

- (a) 1 % by mass of total nitrogen (N),
- (b) 1 % by mass of total phosphorus pentoxide (P₂O₅), or
- (c) 1 % by mass of total potassium oxide (K₂O).

The sum of those nutrient contents shall be at least 4 % by mass.

3. Organic carbon (C_{org}) content in a solid organic fertiliser shall be at least 15 % by mass.

PFC 1(A)(II): LIQUID ORGANIC FERTILISER

1. A liquid organic fertiliser shall be in liquid form.
2. A liquid organic fertiliser shall contain at least one of the following declared primary nutrients: nitrogen (N), phosphorus pentoxide (P₂O₅) or potassium oxide (K₂O).

Where a liquid organic fertiliser contains only one declared primary nutrient, that nutrient content shall be at least the following:

- (a) 2 % by mass of total nitrogen (N),
- (b) 1 % by mass of total phosphorus pentoxide (P₂O₅), or
- (c) 2 % by mass of total potassium oxide (K₂O).

Where a liquid organic fertiliser contains more than one declared primary nutrient, those nutrient contents shall be at least the following:

- (a) 1 % by mass of total nitrogen (N),
- (b) 1 % by mass of total phosphorus pentoxide (P₂O₅), or
- (c) 1 % by mass of total potassium oxide (K₂O).

The sum of those nutrient contents shall be at least 3 % by mass.

3. Organic carbon (C_{org}) content in a liquid organic fertiliser shall be at least 5 % by mass.
PFC 1(B): ORGANO-MINERAL FERTILISER

1. An organo-mineral fertiliser shall be a co-formulation of:
 - (a) one or more inorganic fertilisers, as specified in PFC 1(C), and
 - (b) one or more materials containing:
 - organic carbon (C_{org}); and
 - nutrients
 of solely biological origin.

An organo-mineral fertiliser may contain peat, leonardite and lignite, but no other material which is fossilized or embedded in geological formations.

2. Where one or more of the inorganic fertilisers in the co-formulation is a straight or compound solid inorganic macronutrient ammonium nitrate fertiliser of high nitrogen content, as specified in PFC 1(C)(I)(a)(i-ii)(A), an organo-mineral fertiliser shall not contain 16 % or more by mass of nitrogen (N) as a result of ammonium nitrate (NH_4NO_3).
3. Contaminants in an organo-mineral fertiliser must not exceed the following limit values:
 - (a) cadmium (Cd) : (i) where an organo-mineral fertiliser has a total phosphorus (P) content of less than 5 % phosphorus pentoxide (P_2O_5)-equivalent by mass: 3 mg/kg dry matter, or
(ii) where an organo-mineral fertiliser has a total phosphorus (P) content of 5 % phosphorus pentoxide (P_2O_5)-equivalent or more by mass ('phosphate fertiliser'): 60 mg/kg phosphorus pentoxide (P_2O_5);
 - (b) hexavalent chromium (Cr VI) : 2 mg/kg dry matter;
 - (c) mercury (Hg) : 1 mg/kg dry matter;
 - (d) nickel (Ni) : 50 mg/kg dry matter;
 - (e) lead (Pb) : 120 mg/kg dry matter;
 - (f) inorganic arsenic (As) : 40 mg/kg dry matter; and
 - (g) biuret ($C_2H_5N_3O_2$) : 12 g/kg dry matter.
4. The copper (Cu) content in an organo-mineral fertiliser must not exceed 600 mg/kg dry matter, and the zinc (Zn) content in an organo-mineral fertiliser must not exceed 1 500 mg/kg dry matter. However, these limit values shall not apply where copper (Cu) or zinc (Zn) has been intentionally added to an organo-mineral fertiliser for the purpose of correcting a soil micronutrient deficiency and is declared in accordance with Annex III.
5. Pathogens in an organo-mineral fertiliser must not exceed the limits set out in the following table:

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Micro-organisms to be tested	Sampling plans			Limit
	n	c	m	M
<i>Salmonella</i> spp.	5	0	0	Absence in 25 g or 25 ml
<i>Escherichia coli</i> or <i>Enterococcaceae</i>	5	5	0	1 000 in 1 g or 1 ml

Where:

- n = number of samples to be tested,
c = number of samples where the number of bacteria expressed in CFU is between m and M,
m = threshold value for the number of bacteria expressed in CFU that is considered satisfactory,
M = maximum value of the number of bacteria expressed in CFU.

PFC 1(B)(I): SOLID ORGANO-MINERAL FERTILISER

1. A solid organo-mineral fertiliser shall be in solid form.
2. A solid organo-mineral fertiliser shall contain at least one of the following declared primary nutrients: nitrogen (N), phosphorus pentoxide (P₂O₅) or potassium oxide (K₂O).

Where a solid organo-mineral fertiliser contains only one declared primary nutrient, that nutrient content shall be at least the following:

- (a) 2,5 % by mass of total nitrogen (N), out of which 1 % by mass shall be organic nitrogen (N_{org}),
- (b) 2 % by mass of total phosphorus pentoxide (P₂O₅), or
- (c) 2 % by mass of total potassium oxide (K₂O).

Where a solid organo-mineral fertiliser contains more than one declared primary nutrient, those nutrient contents shall be at least the following:

- (a) 2 % by mass of total nitrogen (N), out of which 0,5 % by mass shall be organic nitrogen (N_{org}),
- (b) 2 % by mass of total phosphorus pentoxide (P₂O₅), or
- (c) 2 % by mass of total potassium oxide (K₂O).

The sum of those nutrient contents shall be at least 8 % by mass.

3. Organic carbon (C_{org}) content in a solid organo-mineral fertiliser shall be at least 7,5 % by mass.
4. In a solid organo-mineral fertiliser, each physical unit shall contain organic carbon (C_{org}) and all the nutrients in their declared content. A physical unit refers to one of the component pieces of a product, such as granules or pellets.

PFC 1(B)(II): LIQUID ORGANO-MINERAL FERTILISER

1. A liquid organo-mineral fertiliser shall be in liquid form.

Changes to legislation: There are currently no known outstanding effects for the Regulation (EU) 2019/1009 of the European Parliament and of the Council, ANNEX I. (See end of Document for details)

2. A liquid organo-mineral fertiliser shall contain at least one of the following declared primary nutrients: nitrogen (N), phosphorus pentoxide (P₂O₅) or potassium oxide (K₂O).

Where a liquid organo-mineral fertiliser contains only one declared primary nutrient, that nutrient content shall be at least the following:

- (a) 2 % by mass of total nitrogen (N), out of which 0,5 % by mass shall be organic nitrogen (N_{org}),
- (b) 2 % by mass of total phosphorus pentoxide (P₂O₅), or
- (c) 2 % by mass of total potassium oxide (K₂O).

Where a liquid organo-mineral fertiliser contains more than one declared primary nutrient, those nutrient contents shall be at least the following:

- (a) 2 % by mass of total nitrogen (N), out of which 0,5 % by mass shall be organic nitrogen (N_{org}),
- (b) 2 % by mass of total phosphorus pentoxide (P₂O₅), or
- (c) 2 % by mass of total potassium oxide (K₂O).

The sum of those nutrient contents shall be at least 6 % by mass.

3. Organic carbon (C_{org}) content in a liquid organo-mineral fertiliser shall be at least 3 % by mass.

PFC 1(C): INORGANIC FERTILISER

1. An inorganic fertiliser shall be a fertiliser containing or releasing nutrients in a mineral form, other than an organic or organo-mineral fertiliser.
2. In addition to the requirements of either PFC 1(C)(I) or PFC 1(C)(II), an inorganic fertiliser which contains more than 1 % by mass of organic carbon (C_{org}), other than organic carbon (C_{org}) from:
- chelating or complexing agents referred to in point 3 of component material category (CMC) 1 in Part II of Annex II,
 - nitrification inhibitors, denitrification inhibitors or urease inhibitors referred to in point 4 of CMC 1 in Part II of Annex II,
 - coating agents referred to in point 1(a) of CMC 9 in Part II of Annex II,
 - urea (CH₄N₂O), or
 - calcium cyanamide (CaCN₂)

shall meet the requirement that pathogens in an inorganic fertiliser must not exceed the limits set out in the following table:

Micro-organisms to be tested	Sampling plans			Limit M
	n	c	m	
<i>Salmonella</i> spp.	5	0	0	Absence in 25 g or 25 ml

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<i>Escherichia coli</i> or <i>Enterococcaceae</i>	5	5	0	1 000 in 1 g or 1 ml
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Where:

- n = number of samples to be tested,
 c = number of samples where the number of bacteria expressed in CFU is between m and M,
 m = threshold value for the number of bacteria expressed in CFU that is considered satisfactory,
 M = maximum value of the number of bacteria expressed in CFU.

PFC 1(C)(I): INORGANIC MACRONUTRIENT FERTILISER

1. An inorganic macronutrient fertiliser shall be aimed at providing plants or mushrooms with one or more of the following macronutrients:
 - (a) primary macronutrients: nitrogen (N), phosphorus (P) or potassium (K),
 - (b) secondary macronutrients: calcium (Ca), magnesium (Mg), sodium (Na) or sulphur (S).
2. Contaminants in an inorganic macronutrient fertiliser must not exceed the following limit values:
 - (a) cadmium (Cd) : (i) where an inorganic macronutrient fertiliser has a total phosphorus (P) content of less than 5 % phosphorus pentoxide (P₂O₅)-equivalent by mass: 3 mg/kg dry matter, or
 (ii) where an inorganic macronutrient fertiliser has a total phosphorus (P) content of 5 % phosphorus pentoxide (P₂O₅)-equivalent or more by mass ('phosphate fertiliser'): 60 mg/kg phosphorus pentoxide (P₂O₅);
 - (b) hexavalent chromium (Cr VI) : 2 mg/kg dry matter,
 - (c) mercury (Hg) : 1 mg/kg dry matter,
 - (d) nickel (Ni) : 100 mg/kg dry matter,
 - (e) lead (Pb) : 120 mg/kg dry matter,
 - (f) arsenic (As) : 40 mg/kg dry matter,
 - (g) biuret (C₂H₅N₃O₂) : 12 g/kg dry matter,
 - (h) perchlorate (ClO₄⁻) : 50 mg/kg dry matter.
3. The copper (Cu) content in an inorganic macronutrient fertiliser must not exceed 600 mg/kg dry matter, and the zinc (Zn) content in an inorganic macronutrient fertiliser must not exceed 1 500 mg/kg dry matter. However, these limit values shall not apply where copper (Cu) or zinc (Zn) has been intentionally added to an inorganic macronutrient fertiliser for the purpose of correcting a soil micronutrient deficiency and is declared in accordance with Annex III.

PFC 1(C)(I)(a): SOLID INORGANIC MACRONUTRIENT FERTILISER

A solid inorganic macronutrient fertiliser shall be in solid form.

PFC 1(C)(I)(a)(i): STRAIGHT SOLID INORGANIC MACRONUTRIENT FERTILISER

1. A straight solid inorganic macronutrient fertiliser shall have a declared content of:

Changes to legislation: There are currently no known outstanding effects for the Regulation (EU) 2019/1009 of the European Parliament and of the Council, ANNEX I. (See end of Document for details)

- (a) only one macronutrient (nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), sodium (Na), sulphur (S)), or
 - (b) only one primary macronutrient (nitrogen (N), phosphorus (P), potassium (K)) and one or more secondary macronutrients (calcium (Ca), magnesium (Mg), sodium (Na), sulphur (S)).
2. Where a straight solid inorganic macronutrient fertiliser contains only one declared macronutrient (nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), sodium (Na), sulphur (S)), that macronutrient content shall be at least the following:
- (a) 10 % by mass of total nitrogen (N),
 - (b) 12 % by mass of total phosphorus pentoxide (P₂O₅),
 - (c) 6 % by mass of total potassium oxide (K₂O),
 - (d) 5 % by mass of total magnesium oxide (MgO),
 - (e) 12 % by mass of total calcium oxide (CaO),
 - (f) 10 % by mass of total sulphur trioxide (SO₃), or
 - (g) 1 % by mass of total sodium oxide (Na₂O).

However, the total sodium oxide (Na₂O) content shall not exceed 40 % by mass.

Where a straight solid inorganic macronutrient fertiliser contains only one declared primary macronutrient (nitrogen (N), phosphorus (P), potassium (K)) and one or more declared secondary macronutrients (calcium (Ca), magnesium (Mg), sodium (Na), sulphur (S)):

- (a) that primary macronutrient content shall be at least the following:
 - (i) 3 % by mass of total nitrogen (N),
 - (ii) 3 % by mass of total phosphorus pentoxide (P₂O₅), or
 - (iii) 3 % by mass of total potassium oxide (K₂O);
- (b) that or those secondary macronutrient contents shall be at least the following:
 - (i) 1,5 % by mass of total magnesium oxide (MgO),
 - (ii) 1,5 % by mass of total calcium oxide (CaO),
 - (iii) 1,5 % by mass of total sulphur trioxide (SO₃), or
 - (iv) 1 % by mass of total sodium oxide (Na₂O).

However, the total sodium oxide (Na₂O) content shall not exceed 40 % by mass.

The sum of all declared primary and secondary macronutrient contents shall be at least 18 % by mass.

PFC 1(C)(I)(a)(ii): COMPOUND SOLID INORGANIC MACRONUTRIENT FERTILISER

1. A compound solid inorganic macronutrient fertiliser shall have a declared content of:
- (a) more than one primary macronutrient (nitrogen (N), phosphorus (P), potassium (K)), or

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- (b) more than one secondary macronutrient (calcium (Ca), magnesium (Mg), sodium (Na), sulphur (S)) and no primary macronutrient (nitrogen (N), phosphorus (P), potassium (K)).
2. A compound solid inorganic macronutrient fertiliser shall contain more than one of the following declared macronutrients in at least the following contents:
- (a) 3 % by mass of total nitrogen (N),
 - (b) 3 % by mass of total phosphorus pentoxide (P₂O₅),
 - (c) 3 % by mass of total potassium oxide (K₂O),
 - (d) 1,5 % by mass of total magnesium oxide (MgO),
 - (e) 1,5 % by mass of total calcium oxide (CaO),
 - (f) 1,5 % by mass of total sulphur trioxide (SO₃), or
 - (g) 1 % by mass of total sodium oxide (Na₂O).

However, the total sodium oxide (Na₂O) content shall not exceed 40 % by mass.

The sum of all declared macronutrient contents shall be at least 18 % by mass.

PFC 1(C)(I)(a)(i-ii)(A): STRAIGHT OR COMPOUND SOLID INORGANIC MACRONUTRIENT AMMONIUM NITRATE FERTILISER OF HIGH NITROGEN CONTENT

1. A straight or compound solid inorganic macronutrient ammonium nitrate fertiliser of high nitrogen content shall be ammonium nitrate (NH₄NO₃)-based and contain 28 % or more by mass of nitrogen (N) as a result of ammonium nitrate (NH₄NO₃).
2. Any matter other than ammonium nitrate (NH₄NO₃) shall be inert towards ammonium nitrate (NH₄NO₃).
3. A straight or compound solid inorganic macronutrient ammonium nitrate fertiliser of high nitrogen content shall be made available to the end-user only in packaged form. The package shall be closed in such a way or by such a device that, when it is opened, the fastening, the fastening seal or the package itself is irreparably damaged. Valve sacks may be used.
4. The oil retention of a straight or compound solid inorganic macronutrient ammonium nitrate fertiliser of high nitrogen content, following two thermal cycles as described under point 4.1 in Module A1 in Part II of Annex IV, must not exceed 4 % by mass.
5. The detonation resistance of a straight or compound solid inorganic macronutrient ammonium nitrate fertiliser of high nitrogen content shall be such, that:
 - following five thermal cycles as described under point 4.3 in Module A1 in Part II of Annex IV,
 - in two detonation resistance tests as described under point 4.4 in Module A1 in Part II of Annex IV,

one or more of the supporting lead cylinders is crushed by less than 5 %.

6. The % by mass of combustible material measured as carbon (C) must not exceed:

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- 0,2 % for a straight or compound solid inorganic macronutrient ammonium nitrate fertiliser of high nitrogen content having a nitrogen (N) content of at least 31,5 % by mass, and
 - 0,4 % for a straight or compound solid inorganic macronutrient ammonium nitrate fertiliser of high nitrogen content having a nitrogen (N) content of at least 28 % but less than 31,5 % by mass.
7. A solution of 10 g of a straight or compound solid inorganic macronutrient ammonium nitrate fertiliser of high nitrogen content in 100 ml of water must have a pH of at least 4,5.
 8. Not more than 5 % by mass shall pass through a 1 mm mesh sieve, and not more than 3 % by mass shall pass through a 0,5 mm mesh sieve.
 9. The copper (Cu) content shall not be higher than 10 mg/kg, and the chlorine (Cl) content shall not be higher than 200 mg/kg.

PFC 1(C)(I)(b): LIQUID INORGANIC MACRONUTRIENT FERTILISER

A liquid inorganic macronutrient fertiliser shall be in liquid form.

PFC 1(C)(I)(b)(i): STRAIGHT LIQUID INORGANIC MACRONUTRIENT FERTILISER

1. A straight liquid inorganic macronutrient fertiliser shall have a declared content of:
 - (a) only one macronutrient (nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), sodium (Na), sulphur (S)), or
 - (b) only one primary macronutrient (nitrogen (N), phosphorus (P), potassium (K)) and one or more secondary macronutrients (calcium (Ca), magnesium (Mg), sodium (Na), sulphur (S)).
2. Where a straight liquid inorganic macronutrient fertiliser contains only one declared macronutrient (nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), sodium (Na), sulphur (S)), that macronutrient content shall be at least the following:
 - (a) 5 % by mass of total nitrogen (N),
 - (b) 5 % by mass of total phosphorus pentoxide (P₂O₅),
 - (c) 3 % by mass of total potassium oxide (K₂O),
 - (d) 2 % by mass of total magnesium oxide (MgO),
 - (e) 6 % by mass of total calcium oxide (CaO),
 - (f) 5 % by mass of total sulphur trioxide (SO₃), or
 - (g) 1 % by mass of total sodium oxide (Na₂O).

However, the total sodium oxide (Na₂O) content shall not exceed 40 % by mass.

Where a straight liquid inorganic macronutrient fertiliser contains only one declared primary macronutrient (nitrogen (N), phosphorus (P), potassium (K)), and one or more declared secondary macronutrients (calcium (Ca), magnesium (Mg), sodium (Na), sulphur (S)):

- (a) that primary macronutrient content shall be at least the following:
 - (i) 1,5 % by mass of total nitrogen (N),

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- (ii) 1,5 % by mass of total phosphorus pentoxide (P₂O₅), or
 - (iii) 1,5 % by mass of total potassium oxide (K₂O); and
- (b) that or those secondary macronutrient contents shall be at least the following:
- (i) 0,75 % by mass of total magnesium oxide (MgO),
 - (ii) 0,75 % by mass of total calcium oxide (CaO),
 - (iii) 0,75 % by mass of total sulphur trioxide (SO₃), or
 - (iv) 0,5 % by mass of total sodium oxide (Na₂O).

However, the total sodium oxide (Na₂O) content shall not exceed 20 % by mass.

The sum of all declared primary and secondary macronutrient contents shall be at least 7 % by mass.

PFC 1(C)(I)(b)(ii): COMPOUND LIQUID INORGANIC MACRONUTRIENT FERTILISER

1. A compound liquid inorganic macronutrient fertiliser shall have a declared content of:
 - (a) more than one primary macronutrient (nitrogen (N), phosphorus (P), potassium (K)), or
 - (b) more than one secondary macronutrient (calcium (Ca), magnesium (Mg), sodium (Na), sulphur (S)), and no primary macronutrient (nitrogen (N), phosphorus (P), potassium (K)).
2. A compound liquid inorganic macronutrient fertiliser shall contain more than one of the following declared nutrients in at least the following contents:
 - (a) 1,5 % by mass of total nitrogen (N),
 - (b) 1,5 % by mass of total phosphorus pentoxide (P₂O₅),
 - (c) 1,5 % by mass of total potassium oxide (K₂O),
 - (d) 0,75 % by mass of total magnesium oxide (MgO),
 - (e) 0,75 % by mass of total calcium oxide (CaO),
 - (f) 0,75 % by mass of total sulphur trioxide (SO₃), or
 - (g) 0,5 % by mass of total sodium oxide (Na₂O).

However, the total sodium oxide (Na₂O) content shall not exceed 20 % by mass.

The sum of all declared nutrient contents shall be at least 7 % by mass.

PFC 1(C)(II): INORGANIC MICRONUTRIENT FERTILISER

1. An inorganic micronutrient fertiliser shall be an inorganic fertiliser other than an inorganic macronutrient fertiliser aimed at providing plants or mushrooms with one or more of the following micronutrients: boron (B), cobalt (Co), copper (Cu), iron (Fe), manganese (Mn), molybdenum (Mo) or zinc (Zn).
2. Inorganic micronutrient fertilisers shall be made available to the end-user only in packaged form.

Changes to legislation: There are currently no known outstanding effects for the Regulation (EU) 2019/1009 of the European Parliament and of the Council, ANNEX I. (See end of Document for details)

3. Contaminants in an inorganic micronutrient fertiliser must not exceed the following limit values:

Contaminant	Limit values of contaminants expressed in mg, in relation to the total micronutrient content expressed in kg(mg/kg of total micronutrient content, which means boron (B), cobalt (Co), copper (Cu), iron (Fe), manganese (Mn), molybdenum (Mo) and zinc (Zn))
Arsenic (As)	1 000
Cadmium (Cd)	200
Lead (Pb)	600
Mercury (Hg)	100
Nickel (Ni)	2 000

PFC 1(C)(II)(a): STRAIGHT INORGANIC MICRONUTRIENT FERTILISER

1. A straight inorganic micronutrient fertiliser shall have a declared content of not more than one micronutrient.
2. A straight inorganic micronutrient fertiliser shall belong to one of the typologies, and shall comply with the corresponding description and minimum micronutrient content requirements in the following table:

Typology	Description	Minimum micronutrient content
Micronutrient salt fertiliser	A chemically obtained straight solid inorganic micronutrient fertiliser containing a mineral ion salt as its essential ingredient	10 % by mass of micronutrient salt fertiliser shall consist of a water-soluble micronutrient
Micronutrient oxide or hydroxide fertiliser	A chemically obtained straight solid inorganic micronutrient fertiliser containing oxide or hydroxide as its essential ingredient	10 % by mass of a micronutrient oxide or hydroxide fertiliser shall consist of a micronutrient
Micronutrient-based fertiliser	A straight inorganic micronutrient fertiliser combining a micronutrient salt fertiliser with one or more other micronutrient salt fertilisers and/or with a single micronutrient chelate	5 % by mass of a micronutrient-based fertiliser shall consist of a micronutrient
Micronutrient solution fertiliser	An aqueous solution of different forms of a straight	2 % by mass of a micronutrient solution

a UVCB: Substance of unknown or variable composition, complex reaction products or biological materials.

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	inorganic micronutrient fertiliser	fertiliser shall consist of a water-soluble micronutrient
Micronutrient suspension fertiliser	A suspension of different forms of a straight inorganic micronutrient fertiliser	2 % by mass of a micronutrient suspension fertiliser shall consist of a micronutrient
Micronutrient chelate fertiliser	A water-soluble straight inorganic micronutrient fertiliser in which the declared micronutrient is chemically combined with chelating agent(s) fulfilling the requirements of CMC 1 in Part II of Annex II	— 5 % by mass of a micronutrient chelate fertiliser shall consist of a water-soluble micronutrient, and — at least 80 % of the water-soluble micronutrient shall be chelated by a chelating agent fulfilling the requirements of CMC 1 in Part II of Annex II
UVCB ^a iron chelates	A water-soluble straight inorganic micronutrient fertiliser in which the declared iron is chemically combined with chelating agent(s) fulfilling the requirements of CMC 1 in Part II of Annex II	— 5 % by mass of UVCB iron chelates shall consist of water-soluble iron, and — at least 80 % of the water-soluble iron shall be chelated and at least 50 % of the water soluble iron shall be chelated by a chelating agent fulfilling the requirements of CMC 1 in Part II of Annex II
Micronutrient complex fertiliser	A water-soluble straight inorganic micronutrient fertiliser in which the declared micronutrient is chemically combined with complexing agent(s) fulfilling the requirements of CMC 1 in Part II of Annex II	— 5 % by mass of a micronutrient complex fertiliser shall consist of a water-soluble micronutrient, and — at least 80 % of the water-soluble micronutrient shall be complexed by a complexing

^a UVCB: Substance of unknown or variable composition, complex reaction products or biological materials.

Changes to legislation: There are currently no known outstanding effects for the Regulation (EU) 2019/1009 of the European Parliament and of the Council, ANNEX I. (See end of Document for details)

		agent fulfilling the requirements of CMC 1 in Part II of Annex II
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a UVCB: Substance of unknown or variable composition, complex reaction products or biological materials.

PFC 1(C)(II)(b): COMPOUND INORGANIC MICRONUTRIENT FERTILISER

1. A compound inorganic micronutrient fertiliser shall have a declared content of more than one micronutrient.
2. The sum of all declared micronutrient contents in a compound inorganic micronutrient fertiliser shall be at least:
 - (a) 2 % by mass for fertilisers in liquid form;
 - (b) 5 % by mass for fertilisers in solid form.

PFC 2: LIMING MATERIAL

1. A liming material shall be an EU fertilising product the function of which is to correct soil acidity.

A liming material shall contain oxides, hydroxides, carbonates or silicates of the nutrients calcium (Ca) or magnesium (Mg).

2. Contaminants in a liming material must not exceed the following limit values:
 - (a) cadmium (Cd) : 2 mg/kg dry matter,
 - (b) hexavalent chromium (Cr VI) : 2 mg/kg dry matter,
 - (c) mercury (Hg) : 1 mg/kg dry matter,
 - (d) nickel (Ni) : 90 mg/kg dry matter,
 - (e) lead (Pb) : 120 mg/kg dry matter,
 - (f) arsenic (As) : 40 mg/kg dry matter.
3. The copper (Cu) content in a liming material must not exceed 300 mg/kg dry matter, and the zinc (Zn) content in a liming material must not exceed 800 mg/kg dry matter.
4. The following parameters determined on the basis of the mass of a liming material shall be met:
 - (a) minimum neutralising value: 15 (equivalent CaO) or 9 (equivalent HO-),
 - (b) minimum reactivity: 10 % (hydrochloric acid test) or 50 % after 6 months (incubation test), and
 - (c) minimum grain size: at least 70 % < 1 mm, except for burnt limes, granulated liming material and chalk (at least 70 % of the liming material shall pass through a 1 mm sieve).

PFC 3: SOIL IMPROVER

A soil improver shall be an EU fertilising product the function of which is to maintain, improve or protect the physical or chemical properties, the structure or the biological activity of the soil to which it is added.

PFC 3(A): ORGANIC SOIL IMPROVER

Changes to legislation: There are currently no known outstanding effects for the Regulation (EU) 2019/1009 of the European Parliament and of the Council, ANNEX I. (See end of Document for details)

1. An organic soil improver shall consist of material 95 % of which is of solely biological origin.

An organic soil improver may contain peat, leonardite and lignite, but no other material which is fossilized or embedded in geological formations.

2. Contaminants in an organic soil improver must not exceed the following limit values:

- (a) cadmium (Cd) : 2 mg/kg dry matter,
- (b) hexavalent chromium (Cr VI) : 2 mg/kg dry matter,
- (c) mercury (Hg) : 1 mg/kg dry matter,
- (d) nickel (Ni) : 50 mg/kg dry matter,
- (e) lead (Pb) : 120 mg/kg dry matter, and
- (f) inorganic arsenic (As) : 40 mg/kg dry matter.

3. The copper (Cu) content in an organic soil improver must not exceed 300 mg/kg dry matter, and the zinc (Zn) content in an organic soil improver must not exceed 800 mg/kg dry matter.

4. Pathogens in an organic soil improver must not exceed the limits set out in the following table:

Micro-organisms to be tested	Sampling plans			Limit
	n	c	m	M
<i>Salmonella</i> spp.	5	0	0	Absence in 25 g or 25 ml
<i>Escherichia coli</i> or <i>Enterococcaceae</i>	5	5	0	1 000 in 1 g or 1 ml

Where:

- n = number of samples to be tested,
c = number of samples where the number of bacteria expressed in CFU is between m and M,
m = threshold value for the number of bacteria expressed in CFU that is considered satisfactory,
M = maximum value of the number of bacteria expressed in CFU.

5. An organic soil improver shall contain 20 % or more dry matter.
6. Organic carbon (C_{org}) content in an organic soil improver shall be at least 7,5 % by mass.

PFC 3(B): INORGANIC SOIL IMPROVER

1. An inorganic soil improver shall be a soil improver other than an organic soil improver.
2. Contaminants in an inorganic soil improver must not exceed the following limit values:

- (a) cadmium (Cd) : 1,5 mg/kg dry matter,

Changes to legislation: There are currently no known outstanding effects for the Regulation (EU) 2019/1009 of the European Parliament and of the Council, ANNEX I. (See end of Document for details)

- (b) hexavalent chromium (Cr VI) : 2 mg/kg dry matter,
 (c) mercury (Hg) : 1 mg/kg dry matter,
 (d) nickel (Ni) : 100 mg/kg dry matter,
 (e) lead (Pb) : 120 mg/kg dry matter,
 (f) inorganic arsenic (As) : 40 mg/kg dry matter.

3. The copper (Cu) content in an inorganic soil improver must not exceed 300 mg/kg dry matter, and the zinc (Zn) content in an inorganic soil improver must not exceed 800 mg/kg dry matter.

PFC 4: GROWING MEDIUM

1. A growing medium shall be an EU fertilising product other than soil in situ, the function of which is for plants or mushrooms to grow in.

For the purpose of this point, plants include algae.

2. Contaminants in a growing medium must not exceed the following limit values:

- (a) cadmium (Cd) : 1,5 mg/kg dry matter,
 (b) hexavalent chromium (Cr VI) : 2 mg/kg dry matter,
 (c) mercury (Hg) : 1 mg/kg dry matter,
 (d) nickel (Ni) : 50 mg/kg dry matter,
 (e) lead (Pb) : 120 mg/kg dry matter, and
 (f) inorganic arsenic (As) : 40 mg/kg dry matter.

3. The copper (Cu) content in a growing medium must not exceed 200 mg/kg dry matter, and the zinc (Zn) content in a growing medium must not exceed 500 mg/kg dry matter.

4. Pathogens in a growing medium must not exceed the limits set out in the following table:

Micro-organisms to be tested	Sampling plans			Limit
	n	c	m	M
<i>Salmonella</i> spp.	5	0	0	Absence in 25 g or 25 ml
<i>Escherichia coli</i> or <i>Enterococcaceae</i>	5	5	0	1 000 in 1 g or 1 ml

Where:

- n = number of samples to be tested,
 c = number of samples where the number of bacteria expressed in CFU is between m and M,
 m = threshold value for the number of bacteria expressed in CFU that is considered satisfactory,
 M = maximum value of the number of bacteria expressed in CFU.

PFC 5: INHIBITOR

Changes to legislation: There are currently no known outstanding effects for the Regulation (EU) 2019/1009 of the European Parliament and of the Council, ANNEX I. (See end of Document for details)

An inhibitor shall be an EU fertilising product the function of which is to improve the nutrient release patterns of a product providing plants with nutrients by delaying or stopping the activity of specific groups of micro-organisms or enzymes.

PFC 5(A): NITRIFICATION INHIBITOR

1. A nitrification inhibitor shall inhibit the biological oxidation of ammoniacal nitrogen ($\text{NH}_3\text{-N}$) to nitrite nitrogen (NO_2^-), thus slowing the formation of nitrate nitrogen (NO_3^-).
2. The ammoniacal nitrogen ($\text{NH}_3\text{-N}$) oxidation rate shall be measured by:
 - (a) ammoniacal nitrogen ($\text{NH}_3\text{-N}$) disappearance, or
 - (b) the sum of nitrite nitrogen (NO_2^-) and nitrate nitrogen (NO_3^-) production with respect to time.

Compared to a control sample where the nitrification inhibitor has not been added, a soil sample containing the nitrification inhibitor shall show a 20 % reduction in ammoniacal nitrogen ($\text{NH}_3\text{-N}$) oxidation rate based on an analysis carried out 14 days after application at the 95 % confidence level.

PFC 5(B): DENITRIFICATION INHIBITOR

1. A denitrification inhibitor shall inhibit the formation of nitrous oxide (N_2O) by slowing down or blocking the conversion of nitrate (NO_3^-) to dinitrogen (N_2) without influencing the nitrification process as described in PFC 5(A).
2. Compared to a control sample where the denitrification inhibitor has not been added, an *in vitro* test containing the denitrification inhibitor shall show a 20 % reduction in rate of the release of nitrous oxide (N_2O) based on an analysis carried out 14 days after application at the 95 % confidence level.

PFC 5(C): UREASE INHIBITOR

1. A urease inhibitor shall inhibit hydrolytic action on urea ($\text{CH}_4\text{N}_2\text{O}$) by the urease enzyme, primarily targeted to reduce ammonia volatilisation.
2. Compared to a control sample where the urease inhibitor has not been added, an *in vitro* test containing the urease inhibitor shall show a 20 % reduction in the rate of hydrolysis of urea ($\text{CH}_4\text{N}_2\text{O}$) based on an analysis carried out 14 days after application at the 95 % confidence level.

PFC 6: PLANT BIOSTIMULANT

1. A plant biostimulant shall be an EU fertilising product the function of which is to stimulate plant nutrition processes independently of the product's nutrient content with the sole aim of improving one or more of the following characteristics of the plant or the plant rhizosphere:
 - (a) nutrient use efficiency,
 - (b) tolerance to abiotic stress,
 - (c) quality traits, or
 - (d) availability of confined nutrients in the soil or rhizosphere.
2. Contaminants in a plant biostimulant must not exceed the following limit values:
 - (a) cadmium (Cd) : 1,5 mg/kg dry matter,

- (b) hexavalent chromium (Cr VI) : 2 mg/kg dry matter,
 (c) lead (Pb) : 120 mg/kg dry matter,
 (d) mercury (Hg) : 1 mg/kg dry matter,
 (e) nickel (Ni) : 50 mg/kg dry matter, and
 (f) inorganic arsenic (As) : 40 mg/kg dry matter.

3. The copper (Cu) content in a plant biostimulant must not exceed 600 mg/kg dry matter, and the zinc (Zn) content in a plant biostimulant must not exceed 1 500 mg/kg dry matter.
4. The plant biostimulant shall have the effects that are claimed on the label for the plants specified thereon.

PFC 6(A): MICROBIAL PLANT BIOSTIMULANT

1. A microbial plant biostimulant shall consist of a micro-organism or a consortium of micro-organisms referred to in CMC 7 in Part II of Annex II.
2. Pathogens in a microbial plant biostimulant must not exceed the limits set out in the following table:

Micro-organisms/ their toxins, metabolites	Sampling plans		Limit
	n	c	
<i>Salmonella</i> spp.	5	0	Absence in 25 g or 25 ml
<i>Escherichia coli</i>	5	0	Absence in 1 g or 1 ml
<i>Listeria monocytogenes</i>	5	0	Absence in 25 g or 25 ml
<i>Vibrio</i> spp.	5	0	Absence in 25 g or 25 ml
<i>Shigella</i> spp.	5	0	Absence in 25 g or 25 ml
<i>Staphylococcus aureus</i>	5	0	Absence in 25 g or 25 ml
<i>Enterococcaceae</i>	5	2	10 CFU/g
Anaerobic plate count unless the microbial plant biostimulant is an aerobic bacterium	5	2	10 ⁵ CFU/g or ml
Yeast and mould count unless the microbial plant biostimulant is a fungus	5	2	1 000 CFU/g or ml

Where:

Changes to legislation: There are currently no known outstanding effects for the Regulation (EU) 2019/1009 of the European Parliament and of the Council, ANNEX I. (See end of Document for details)

- n = number of units comprising the sample,
 c = number of sample units giving values over the defined limit.

3. When the microbial plant biostimulant is in liquid form, the plant biostimulant shall have a pH optimal for contained micro-organisms and for plants.

PFC 6(B): NON-MICROBIAL PLANT BIOSTIMULANT

1. A non-microbial plant biostimulant shall be a plant biostimulant other than a microbial plant biostimulant.
2. Pathogens in a non-microbial plant biostimulant must not exceed the limits set out in the following table:

Micro-organisms to be tested	Sampling plans			Limit
	n	c	m	M
<i>Salmonella</i> spp.	5	0	0	Absence in 25 g or 25 ml
<i>Escherichia coli</i> or <i>Enterococcaceae</i>	5	5	0	1 000 in 1 g or 1 ml

Where:

- n = number of samples to be tested,
 c = number of samples where the number of bacteria expressed in CFU is between m and M,
 m = threshold value for the number of bacteria expressed in CFU that is considered satisfactory,
 M = maximum value of the number of bacteria expressed in CFU.

PFC 7: FERTILISING PRODUCT BLEND

1. A fertilising product blend shall be an EU fertilising product composed of two or more EU fertilising products of PFC 1 to PFC 6 for which the compliance with the requirements of this Regulation of each component EU fertilising product in the blend has been demonstrated in accordance with the conformity assessment procedure applicable to that component EU fertilising product.
2. The blending shall not change the nature of each component EU fertilising product and shall not have an adverse effect on human, animal or plant health, on safety, or on the environment, under reasonably foreseeable conditions of storage or use of the fertilising product blend.
3. The manufacturer of the blend shall assess the conformity of the blend with the requirements set out in points 1 and 2 of this PFC, ensure the blend's compliance with the labelling requirements laid down in Annex III, and assume responsibility pursuant to Article 16(4) of this Regulation for the compliance of the blend with the requirements of this Regulation by:
- (a) drawing up an EU declaration of conformity for the fertilising product blend in accordance with Article 6(2) of this Regulation, and
- (b) being in possession of the EU declaration of conformity of each of the component EU fertilising products.

Changes to legislation: There are currently no known outstanding effects for the Regulation (EU) 2019/1009 of the European Parliament and of the Council, ANNEX I. (See end of Document for details)

4. Economic operators making fertilising product blends available on the market shall respect the following provisions of this Regulation with regard to the EU declaration of conformity of each component EU fertilising product as well as of the blend:
 - (a) Article 6(3) (manufacturers' obligation to keep the EU declaration of conformity);
 - (b) point (a) of Article 7(2) (authorised representatives' obligation to keep the EU declaration of conformity);
 - (c) Article 8(8) (importers' obligation to keep a copy of the EU declaration of conformity at the disposal of the market surveillance authorities).

Changes to legislation: There are currently no known outstanding effects for the Regulation (EU) 2019/1009 of the European Parliament and of the Council, ANNEX I. (See end of Document for details)

- (1) Council Regulation (EEC) No 315/93 of 8 February 1993 laying down Community procedures for contaminants in food ([OJ L 37, 13.2.1993, p. 1](#)).
- (2) Regulation (EC) No 396/2005 of the European Parliament and of the Council of 23 February 2005 on maximum residue levels of pesticides in or on food and feed of plant and animal origin and amending Council Directive 91/414/EEC ([OJ L 70, 16.3.2005, p. 1](#)).
- (3) Regulation (EC) No 470/2009 of the European Parliament and of the Council of 6 May 2009 laying down Community procedures for the establishment of residue limits of pharmacologically active substances in foodstuffs of animal origin, repealing Council Regulation (EEC) No 2377/90 and amending Directive 2001/82/EC of the European Parliament and of the Council and Regulation (EC) No 726/2004 of the European Parliament and of the Council ([OJ L 152, 16.6.2009, p. 11](#)).
- (4) Directive 2002/32/EC of the European Parliament and of the Council of 7 May 2002 on undesirable substances in animal feed ([OJ L 140, 30.5.2002, p. 10](#)).

Changes to legislation:

There are currently no known outstanding effects for the Regulation (EU) 2019/1009 of the European Parliament and of the Council, ANNEX I.