

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
SDS Reference Number: EQ0213
Issue date: 2016/9/7 Revision date: 2025/1/5 Supersedes version of: 2023/8/21 Version: 1.3

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Mixture
Product name : Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720
Product code : EQ0213

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses

Main use category : Industrial use, Professional use
Use of the substance/mixture : Certified reference material for laboratory use
Function or use category : Laboratory chemicals

1.3. Details of the supplier of the safety data sheet

Spectracer UK Ltd.

20 Seymour Mews,
London,
W1H 6BQ,
United Kingdom.

Tel: +44 (0) 207 193 9114
Fax: +44 (0) 203 432 4686
Email: contact@spectracer.com
Web: www.spectracer.com

1.4. Emergency telephone number

Country/Area	Organisation/Company	Address	Emergency number	Comment
Ireland	National Poisons Information Centre Beaumont Hospital	Beaumont Hospital Beaumont Road 9 Dublin	: +353 1 8379964	
Malta	Medicines & Poisons Info Office	Mater Dei Hospital Msida MSD 2090 Msida	112 +356 2545 6508	
United Kingdom	National Poisons Information Service (NHS Direct)	http://www.npis.org	111 (England & Wales only) or 112 (EU) or 08454 24 24 24 (Scotland)	

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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Corrosive to metals, Category 1 H290
Skin corrosion/irritation, Category 1, Sub-Category 1B H314
Serious eye damage/eye irritation, Category 1 H318
Full text of H- and EUH-statements: see section 16

Adverse physicochemical, human health and environmental effects

May be corrosive to metals. Causes severe skin burns and eye damage. Causes serious eye damage.

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP)



GHS05

Signal word (CLP)

: Danger

Contains

: nitric acid

Hazard statements (CLP)

: H290 - May be corrosive to metals.

H314 - Causes severe skin burns and eye damage.

Precautionary statements (CLP)

: P260 - Do not breathe dusts or mists.

P280 - Wear protective gloves/protective clothing/eye protection/face protection.

P301+P330+P331+P310 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

Immediately call a POISON CENTER or doctor.

P303+P361+P353+P310 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Immediately call a POISON CENTER or doctor.

P305+P351+P338+P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.

P390 - Absorb spillage to prevent material damage.

EUH-statements

: EUH208 - Contains nickel dinitrate. May produce an allergic reaction.

2.3. Other hazards

Contains no PBT and/or vPvB substances $\geq 0.1\%$ assessed in accordance with REACH Annex XIII

Component

Substance(s) not meeting the PBT criteria of REACH regulation, in accordance with Annex XIII

nitric acid (7697-37-2), silver nitrate (7761-88-8)(¹), aluminium nitrate (13473-90-0)(¹), arsenic acid (7778-39-4)(¹), barium nitrate (10022-31-8)(¹), beryllium nitrate (13597-99-4)(¹), cadmium nitrate (10325-94-7)(¹), cobalt dinitrate (10141-05-6)(¹), chromium trinitrate (13548-38-4)(¹), copper dinitrate (3251-23-8)(¹), iron trinitrate (10421-48-4)(¹), mercury nitrate (10045-94-0)(¹), indium(III) nitrate, pentahydrate (13465-14-0)(¹), potassium nitrate (7757-79-1)(¹), lithium nitrate (7790-69-4)(¹), manganese dinitrate (10377-66-9)(¹), nickel dinitrate (13138-45-9)(¹), lead nitrate (10099-74-8)(¹), selenious acid (7783-00-8)(¹), strontium nitrate (10042-76-9)(¹), thallium nitrate (10102-45-1)(¹), uranyl acetate dihydrate (6159-44-0)(¹), ammonium metavanadate (7803-55-6)(¹)

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Component	
Substance(s) not meeting the vPvB criteria of REACH regulation, in accordance with Annex XIII	nitric acid (7697-37-2), silver nitrate (7761-88-8)(⁽¹⁾), aluminium nitrate (13473-90-0)(⁽¹⁾), arsenic acid (7778-39-4)(⁽¹⁾), barium nitrate (10022-31-8)(⁽¹⁾), beryllium nitrate (13597-99-4)(⁽¹⁾), cadmium nitrate (10325-94-7)(⁽¹⁾), cobalt dinitrate (10141-05-6)(⁽¹⁾), chromium trinitrate (13548-38-4)(⁽¹⁾), copper dinitrate (3251-23-8)(⁽¹⁾), iron trinitrate (10421-48-4)(⁽¹⁾), mercury nitrate (10045-94-0)(⁽¹⁾), indium(III) nitrate, pentahydrate (13465-14-0)(⁽¹⁾), potassium nitrate (7757-79-1)(⁽¹⁾), lithium nitrate (7790-69-4)(⁽¹⁾), manganese dinitrate (10377-66-9)(⁽¹⁾), nickel dinitrate (13138-45-9)(⁽¹⁾), lead nitrate (10099-74-8)(⁽¹⁾), selenious acid (7783-00-8)(⁽¹⁾), strontium nitrate (10042-76-9)(⁽¹⁾), thallium nitrate (10102-45-1)(⁽¹⁾), uranyl acetate dihydrate (6159-44-0)(⁽¹⁾), ammonium metavanadate (7803-55-6)(⁽¹⁾)

(⁽¹⁾) Substance(s) in concentration below 0.1 % and displayed on a voluntary basis

The mixture does not contain substance(s) included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or substance(s) are not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at a concentration equal to or greater than 0,1 %

Component	
Substance(s) not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605	cobalt dinitrate (10141-05-6)(⁽¹⁾), arsenic acid (7778-39-4)(⁽¹⁾), lead nitrate (10099-74-8)(⁽¹⁾)

(⁽¹⁾) Substance(s) in concentration below 0.1 % and displayed on a voluntary basis

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
nitric acid substance with national workplace exposure limit(s) (AT, BE, BG, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GI, GR, HR, HU, IE, IT, LT, LU, LV, MT, NL, PT, RO, SE, SI, SK, AL, IS, NO, MK, RS, CH, TR); substance with a Community workplace exposure limit	CAS-No.: 7697-37-2 EC-No.: 231-714-2 EC Index-No.: 007-004-00-1 REACH-no: 01-2119487297-23-XXXX	5 – 10	Ox. Liq. 2, H272 Met. Corr. 1, H290 Acute Tox. 1 (Inhalation), H330 Skin Corr. 1A, H314 Eye Dam. 1, H318
beryllium nitrate substance with national workplace exposure limit(s) (AT, BE, BG, CZ, DE, DK, EE, ES, FI, GB, HR, HU, IE, PL, PT, RO, SE, SI, IS, MK); substance with a Community workplace exposure limit	CAS-No.: 13597-99-4 EC-No.: 237-062-5 EC Index-No.: 004-002-00-2	< 0,05	Ox. Sol. 2, H272 Acute Tox. 3 (Oral), H301 Acute Tox. 2 (Inhalation), H330 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Skin Sens. 1, H317 Carc. 1B, H350i STOT SE 3, H335 STOT RE 1, H372 Aquatic Chronic 2, H411

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Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
aluminium nitrate substance with national workplace exposure limit(s) (AT, BE, BG, DE, DK, EE, FR, GB, GR, HR, HU, IE, SE, NO, CH)	CAS-No.: 13473-90-0 EC-No.: 236-751-8	< 0,05	Eye Dam. 1, H318
lithium nitrate substance with national workplace exposure limit(s) (DE, SE, CH)	CAS-No.: 7790-69-4 EC-No.: 232-218-9	< 0,05	Ox. Sol. 3, H272 Acute Tox. 4 (Oral), H302 Eye Irrit. 2, H319
chromium trinitrate substance with national workplace exposure limit(s) (AT, BE, CZ, DE, DK, ES, FI, FR, GB, GI, GR, HR, HU, IE, LT, LU, MT, NL, PL, PT, RO, SE, SI, AL, IS); substance with a Community workplace exposure limit	CAS-No.: 13548-38-4 EC-No.: 236-921-1	< 0,05	Ox. Sol. 3, H272 Acute Tox. Not classified (Oral) Acute Tox. 4 (Inhalation), H332 Skin Sens. 1A, H317 Aquatic Chronic 2, H411
iron trinitrate substance with national workplace exposure limit(s) (BE, DK, ES, GB, GR, HR, IE, PT, IS, NO, CH)	CAS-No.: 10421-48-4 EC-No.: 233-899-5 REACH-no: 01-2119978293-27-XXXX	< 0,05	Skin Corr. 1B, H314 Eye Dam. 1, H318 Aquatic Acute Not classified
manganese dinitrate substance with national workplace exposure limit(s) (AT, BE, BG, CZ, DE, DK, ES, FI, HR, HU, IE, LV, NL, PL, PT, RO, SE, SI, IS, NO, MK, CH); substance with a Community workplace exposure limit	CAS-No.: 10377-66-9 EC-No.: 233-828-8	< 0,05	Ox. Sol. 2, H272 Acute Tox. 4 (Oral), H302 Skin Corr. 1C, H314 Eye Dam. 1, H318 STOT RE 2, H373 Aquatic Chronic 4, H413
cobalt dinitrate substance listed on REACH Candidate List (Cobalt(II) dinitrate) substance with national workplace exposure limit(s) (AT, BE, BG, CZ, DE, DK, EE, ES, FI, GB, GR, HR, HU, IE, LV, NL, PT, RO, SE, IS, CH) Percentage by Weight of the metallic element: 0,000998510000000000%	CAS-No.: 10141-05-6 EC-No.: 233-402-1 EC Index-No.: 027-009-00-2	< 0,05	Ox. Sol. 2, H272 Acute Tox. 4 (Oral), H302 Eye Dam. 1, H318 Resp. Sens. 1, H334 Skin Sens. 1, H317 Muta. 2, H341 Carc. 1B, H350i Repr. 1B, H360FD STOT RE Not classified Aquatic Acute 1, H400 Aquatic Chronic 1, H410
nickel dinitrate substance with national workplace exposure limit(s) (AT, BG, CZ, DE, DK, EE, ES, FI, FR, GB, HR, HU, IE, LT, PL, PT, RO, SE, SI, IS, CH); substance with a Community workplace exposure limit	CAS-No.: 13138-45-9 EC-No.: 236-068-5 EC Index-No.: 028-012-00-1	< 0,05	Ox. Sol. 2, H272 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation), H332 Skin Irrit. 2, H315 Eye Dam. 1, H318 Resp. Sens. 1, H334 Skin Sens. 1, H317 Muta. 2, H341 Carc. 1A, H350i Repr. 1B, H360D STOT RE 1, H372 Aquatic Acute 1, H400 (M=10) Aquatic Chronic 1, H410

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Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
copper dinitrate substance with national workplace exposure limit(s) (AT, BE, BG, CZ, DK, EE, ES, FI, FR, GB, HR, HU, IE, LV, NL, PL, PT, RO, SE, SI, NO, CH); substance with a Community workplace exposure limit	CAS-No.: 3251-23-8 EC-No.: 221-838-5	< 0,05	Ox. Sol. 2, H272 Acute Tox. 4 (Oral), H302 Skin Corr. 1B, H314 Eye Dam. 1, H318 Aquatic Acute 1, H400 (M=10) Aquatic Chronic 2, H411
indium(III) nitrate, pentahydrate substance with national workplace exposure limit(s) (AT, BE, DE, DK, ES, FI, GB, GR, HR, IE, LT, PT, SE, SI, IS, NO, MK, CH)	CAS-No.: 13465-14-0	< 0,05	Ox. Sol. 2, H272 Skin Irrit. 2, H315 Eye Irrit. 2, H319
potassium nitrate substance with national workplace exposure limit(s) (BG, LT, LV)	CAS-No.: 7757-79-1 EC-No.: 231-818-8 REACH-no: 01-2119488224-35-XXXX	< 0,05	Ox. Sol. 3, H272
strontium nitrate substance with national workplace exposure limit(s) (LT)	CAS-No.: 10042-76-9 EC-No.: 233-131-9	< 0,05	Ox. Sol. 1, H271 Eye Dam. 1, H318 STOT RE 2, H373
ammonium metavanadate substance with national workplace exposure limit(s) (AT, CZ, NL, SI, NO)	CAS-No.: 7803-55-6 EC-No.: 232-261-3	< 0,05	Acute Tox. 3 (Oral), H301 Acute Tox. 4 (Inhalation:dust,mist), H332 Eye Irrit. 2, H319 Repr. 2, H361d STOT RE 1, H372 Aquatic Acute 1, H400 Aquatic Chronic 2, H411
cadmium nitrate substance with national workplace exposure limit(s) (AT, BE, BG, CZ, DE, DK, ES, FI, GB, HR, HU, IE, IT, LU, MT, NL, PL, PT, RO, SE, SI, SK, IS, MK); substance with a Community workplace exposure limit	CAS-No.: 10325-94-7 EC-No.: 233-710-6 EC Index-No.: 048-001-00-5	< 0,05	Acute Tox. 3 (Oral), H301 Acute Tox. 4 (Dermal), H312 Acute Tox. 2 (Inhalation), H330 Muta. 1B, H340 Carc. 1B, H350 Repr. 1B, H360FD STOT RE 1, H372 Aquatic Acute 1, H400 (M=10) Aquatic Chronic 1, H410
arsenic acid substance listed on REACH Candidate List substance listed on REACH Annex XIV substance with national workplace exposure limit(s) (AT, BE, CZ, DE, DK, EE, ES, FI, GB, HR, HU, IE, IT, LT, NL, PL, PT, SI, IS, MK, CH); substance with a Community workplace exposure limit	CAS-No.: 7778-39-4 EC-No.: 231-901-9 EC Index-No.: 033-005-00-1	< 0,05	Acute Tox. 3 (Oral), H301 Acute Tox. 4 (Dermal), H312 Acute Tox. 3 (Inhalation), H331 Carc. 1A, H350 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
barium nitrate substance with national workplace exposure limit(s) (AT, BE, CZ, DE, DK, ES, FI, FR, GB, GI, HR, IE, IT, LT, LU, MT, NL, PL, PT, RO, SE, SI, SK, AL, IS, NO, MK, TR); substance with a Community workplace exposure limit	CAS-No.: 10022-31-8 EC-No.: 233-020-5 EC Index-No.: 056-002-00-7	< 0,05	Ox. Sol. 2, H272 Acute Tox. 3 (Oral), H301 Acute Tox. 4 (Inhalation), H332 Eye Irrit. 2, H319

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Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
uranyl acetate dihydrate substance with national workplace exposure limit(s) (BE, BG, DK, EE, ES, FI, IE, LV, PL, PT, IS, CH)	CAS-No.: 6159-44-0 EC-No.: 208-767-5 EC Index-No.: 092-002-00-3	< 0,05	Acute Tox. 2 (Oral), H300 Acute Tox. 2 (Inhalation), H330 STOT RE 2, H373 Aquatic Chronic 2, H411
silver nitrate substance with national workplace exposure limit(s) (AT, BE, BG, CY, CZ, DE, DK, ES, FI, FR, GB, GI, GR, HR, HU, IE, IT, LU, LV, MT, NL, PL, PT, RO, SE, SI, SK, AL, IS, NO, MK, RS, CH); substance with a Community workplace exposure limit	CAS-No.: 7761-88-8 EC-No.: 231-853-9 EC Index-No.: 047-001-00-2	< 0,05	Ox. Sol. 2, H272 Met. Corr. 1, H290 Skin Corr. 1B, H314 Aquatic Acute 1, H400 (M=1000) Aquatic Chronic 1, H410 (M=100)
mercury nitrate substance with national workplace exposure limit(s) (AT, BE, BG, CZ, DE, DK, ES, FI, FR, GB, GI, GR, HR, HU, IE, NL, PT, RO, SE, IS, NO, RS, CH); substance with a Community workplace exposure limit	CAS-No.: 10045-94-0 EC-No.: 233-152-3 EC Index-No.: 080-002-00-6	< 0,05	Acute Tox. 2 (Oral), H300 Acute Tox. 1 (Dermal), H310 Acute Tox. 2 (Inhalation), H330 STOT RE 2, H373 Aquatic Acute 1, H400 (M=100) Aquatic Chronic 1, H410
lead nitrate substance listed on REACH Candidate List (Lead dinitrate) substance with national workplace exposure limit(s) (AT, BG, CZ, DE, DK, EE, ES, FI, FR, GB, GI, GR, HR, HU, IE, NL, PT, RO, SE, IS, MK, CH); substance with a Community workplace exposure limit	CAS-No.: 10099-74-8 EC-No.: 233-245-9 EC Index-No.: 082-001-00-6	< 0,05	Ox. Sol. 2, H272 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation), H332 Eye Dam. 1, H318 Skin Sens. 1B, H317 Carc. 2, H351 Repr. 1A, H360Df STOT RE 2, H373 Aquatic Acute 1, H400 (M=10) Aquatic Chronic 1, H410
selenious acid substance with national workplace exposure limit(s) (AT, BE, BG, CZ, DE, DK, EE, ES, FI, GB, HR, IE, PL, PT, RO, SE, IS, MK, CH)	CAS-No.: 7783-00-8 EC-No.: 231-974-7 EC Index-No.: 034-002-00-8	< 0,05	Acute Tox. 3 (Oral), H301 Acute Tox. 3 (Inhalation), H331 STOT RE 2, H373 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
thallium nitrate substance with national workplace exposure limit(s) (AT, BE, BG, CZ, DK, ES, FI, FR, GB, IE, PL, PT, RO, IS, NO, CH)	CAS-No.: 10102-45-1 EC-No.: 233-273-1 EC Index-No.: 081-002-00-9	< 0,05	Ox. Sol. 2, H272 Acute Tox. 2 (Oral), H300 Acute Tox. 2 (Inhalation), H330 STOT RE 2, H373 Aquatic Chronic 2, H411

Specific concentration limits:		
Name	Product identifier	Specific concentration limits (%)
nitric acid	CAS-No.: 7697-37-2 EC-No.: 231-714-2 EC Index-No.: 007-004-00-1 REACH-no: 01-2119487297-23-XXXX	(5 ≤ C < 20) Skin Corr. 1B; H314 (20 ≤ C < 100) Skin Corr. 1A; H314 (65 ≤ C < 99) Ox. Liq. 3; H272 (99 ≤ C < 100) Ox. Liq. 2; H272
cobalt dinitrate	CAS-No.: 10141-05-6 EC-No.: 233-402-1 EC Index-No.: 027-009-00-2	(0,01 ≤ C ≤ 100) Carc. 1B; H350i

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Specific concentration limits:		
Name	Product identifier	Specific concentration limits (%)
nickel dinitrate	CAS-No.: 13138-45-9 EC-No.: 236-068-5 EC Index-No.: 028-012-00-1	(0,01 ≤ C ≤ 100) Skin Sens. 1; H317 (0,1 < C < 1) STOT RE 2; H373 (1 ≤ C ≤ 100) STOT RE 1; H372 (20 ≤ C ≤ 100) Skin Irrit. 2; H315
cadmium nitrate	CAS-No.: 10325-94-7 EC-No.: 233-710-6 EC Index-No.: 048-001-00-5	(0,01 ≤ C < 100) Carc. 1B; H350 (0,1 ≤ C < 7) STOT RE 2; H373 (7 ≤ C < 100) STOT RE 1; H372
mercury nitrate	CAS-No.: 10045-94-0 EC-No.: 233-152-3 EC Index-No.: 080-002-00-6	(0,1 ≤ C ≤ 100) STOT RE 2; H373
lead nitrate	CAS-No.: 10099-74-8 EC-No.: 233-245-9 EC Index-No.: 082-001-00-6	(0,5 ≤ C ≤ 100) STOT RE 2; H373 (2,5 ≤ C ≤ 100) Repr. 2; H361f

Full text of H- and EUH-statements: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general	: Call a physician immediately.
First-aid measures after inhalation	: Remove person to fresh air and keep comfortable for breathing.
First-aid measures after skin contact	: Rinse skin with water/shower. Take off immediately all contaminated clothing. Call a physician immediately.
First-aid measures after eye contact	: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician immediately.
First-aid measures after ingestion	: Rinse mouth. Do not induce vomiting. Call a physician immediately.
First-aid measures for first aider	: First aid workers will be equipped with suitable personal protective equipment.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects after inhalation	: None under normal conditions.
Symptoms/effects after skin contact	: Burns.
Symptoms/effects after eye contact	: Serious damage to eyes.
Symptoms/effects after ingestion	: Burns.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	: Water spray. Dry powder. Foam. Carbon dioxide.
Unsuitable extinguishing media	: Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

Fire hazard	: No fire hazard.
Explosion hazard	: No direct explosion hazard.
Hazardous decomposition products in case of fire	: Toxic fumes may be released.

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5.3. Advice for firefighters

Firefighting instructions	: Fight fire from safe distance and protected location. Do not enter fire area without proper protective equipment, including respiratory protection.
Protection during firefighting	: Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures	: Stop leak if safe to do so. Notify authorities if product enters sewers or public waters. Absorb spillage to prevent material damage.
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For non-emergency personnel

Protective equipment	: Wear recommended personal protective equipment.
Emergency procedures	: Ventilate spillage area. Avoid contact with skin and eyes. Do not breathe dust/fume/gas/mist/vapours/spray.

For emergency responders

Protective equipment	: Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".
Emergency procedures	: Evacuate unnecessary personnel. Stop leak if safe to do so.

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment	: Absorb spilled material with sand or earth. Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. Stop leak without risks if possible.
Methods for cleaning up	: Take up liquid spill into absorbent material.
Other information	: Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed	: Not expected to present a significant hazard under anticipated conditions of normal use.
Precautions for safe handling	: Ensure good ventilation of the work station. Avoid contact with skin and eyes. Do not breathe dust/fume/gas/mist/vapours/spray. Wear personal protective equipment.
Hygiene measures	: Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures	: Keep in a cool, well-ventilated place away from heat.
Storage conditions	: Store in corrosive resistant container with a resistant inner liner. Keep only in original container. Store locked up.
Incompatible materials	: Metals.
Packaging materials	: Store always product in container of same material as original container.

Germany

Storage class (LGK, TRGS 510)	: LGK 8B - Non-combustible corrosive substances
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Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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Joint storage table

LGK 1	LGK 2A	LGK 2B	LGK 3	LGK 4.1A
LGK 4.1B	LGK 4.2	LGK 4.3	LGK 5.1A	LGK 5.1B
LGK 5.1C	LGK 5.2	LGK 6.1A	LGK 6.1B	LGK 6.1C
LGK 6.1D	LGK 6.2	LGK 7	LGK 8A	LGK 8B
LGK 10	LGK 11	LGK 12	LGK 13	LGK 10-13

Joint storage not permitted for

: LGK 1, LGK 5.1A, LGK 5.2, LGK 6.2, LGK 7

Joint storage with restrictions permitted for

: LGK 4.1A, LGK 4.2, LGK 4.3, LGK 5.1C

Joint storage permitted for

: LGK 2A, LGK 2B, LGK 3, LGK 4.1B, LGK 5.1B, LGK 6.1A, LGK 6.1B, LGK 6.1C, LGK 6.1D, LGK 8A, LGK 8B, LGK 10, LGK 11, LGK 12, LGK 13, LGK 10-13

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

National occupational exposure and biological limit values

nitric acid (7697-37-2)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Nitric acid
IOEL STEL	2,6 mg/m ³
	1 ppm
Regulatory reference	COMMISSION DIRECTIVE 2006/15/EC
Albania - Occupational Exposure Limits	
Local name	Acid nitrik
OEL STEL	2,6 mg/m ³
	1 ppm
Regulatory reference	VENDIM Nr. 522, datë 6.8.2014 PËR MIRATIMIN E RREGULLORES "PËR MBROJTJEN E SIGURISË DHE SHËNDETIT TË PUNËMARRËSVE NGA RISQET E LIDHURA ME AGJENTËT KIMIKË NË PUNË"
Austria - Occupational Exposure Limits	
Local name	Salpetersäure
OEL C	2,6 mg/m ³
	1 ppm
Regulatory reference	BGBI. II Nr. 156/2021
Belgium - Occupational Exposure Limits	
Local name	Acide nitrique # Salpeterzuur
OEL STEL	2,6 mg/m ³
	1 ppm
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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nitric acid (7697-37-2)	
Bulgaria - Occupational Exposure Limits	
Local name	Азотна киселина
OEL STEL	2,6 mg/m³
	1 ppm
Remark	• (Химични агенти, за които са определени гранични стойности във въздуха на работната среда за Европейската общност)
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Croatia - Occupational Exposure Limits	
Local name	Dušična kiselina
KGVI (OEL STEL)	2,6 mg/m³
	1 ppm
Remark	Direktiva: 2006/15/EZ
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, граниčnim vrijednostima izloženosti i biološkim граниčnim vrijednostima (NN 148/2023)
Cyprus - Occupational Exposure Limits	
Local name	Νιτρικό οξύ
OEL STEL	2,6 mg/m³
	1 ppm
Regulatory reference	Κανονισμοί του 2007 (Κ.Δ.Π. 295/2007)
Czech Republic - Occupational Exposure Limits	
Local name	Kyselina dusičná
PEL (OEL TWA)	1 mg/m³
	0,38 ppm
NPK-P (OEL C)	2,5 mg/m³
	0,95 ppm
Remark	I - dráždí sliznice (oči, dýchací cesty) resp. kůže.
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Salpetersyre
OEL STEL	2,6 mg/m³
	1 ppm
Remark	E (betyder, at stoffet har en EF-grænseværdi); S (betyder, at grænseværdien ikke bør overskrides. Værdien gælder for en eksponeringsperiode på 15 minutter)
Regulatory reference	BEK nr 291 af 19/03/2024

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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nitric acid (7697-37-2)	
Estonia - Occupational Exposure Limits	
Local name	Lämmastikhape
OEL STEL	2,6 mg/m³
	1 ppm
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)
Finland - Occupational Exposure Limits	
Local name	Typpihappo
HTP (OEL TWA)	1,3 mg/m³
	0,5 ppm
HTP (OEL STEL)	2,6 mg/m³
	1 ppm
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
France - Occupational Exposure Limits	
Local name	Acide nitrique
VLE (OEL C/STEL)	2,6 mg/m³
	1 ppm
Remark	Valeurs réglementaires indicatives
Regulatory reference	Arrêté du 30 juin 2004 modifié (réf.: INRS ED 6443, 2022; Outil65; Arrêté du 26 octobre 2007)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Salpetersäure
AGW (OEL TWA)	2,6 mg/m³
	1 ppm
Remark	EU - Europäische Union (Von der EU wurde ein Luftgrenzwert festgelegt: Abweichungen bei Wert und Spitzenbegrenzung sind möglich); 13 - Eine Begründung für die Ableitung eines gesundheitsbasierten AGW liegt nicht vor; 16 - Der Arbeitsplatzgrenzwert ist nur als Kurzzeitwert festgelegt. Die betriebliche Überwachung soll durch messtechnische Mittelwertbildung über 15 Minuten erfolgen, z.B. durch eine 15-minütige Probenahme
Regulatory reference	TRGS900
Gibraltar - Occupational Exposure Limits	
Local name	Nitric acid
OEL STEL	2,6 mg/m³
	1 ppm
Regulatory reference	Factories (Control of Chemical Agents at Work) Regulations 2003 (LN. 2018/181)
Greece - Occupational Exposure Limits	
Local name	Νιτρικό οξύ
OEL STEL	2,6 mg/m³

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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nitric acid (7697-37-2)	
	1 ppm
Regulatory reference	Π.Δ. 162/2007 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Hungary - Occupational Exposure Limits	
Local name	SALÉTROMSAV
CK (OEL STEL)	2,6 mg/m³
Remark	i (ingerlő anyag, amely izgatja a bőrt, nyálkahártyát, szemet vagy mindhármat), m (maró hatású anyag, amely felmarja a bőrt, nyálkahártyát, szemet vagy mindhármat); EU2 (2006/15/EK irányelvben közölt érték)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	Nitric acid
OEL STEL	2,6 mg/m³ 1 ppm
Remark	IOELV (Indicative Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2024
Italy - Occupational Exposure Limits	
Local name	Acido nitrico
OEL STEL	2,6 mg/m³ 1 ppm
Regulatory reference	Allegato XXXVIII del Decreto Legislativo 4 settembre 2024, n. 135
Latvia - Occupational Exposure Limits	
Local name	Slāpekļskābe
OEL TWA	2 mg/m³ 0,78 ppm
OEL STEL	2,6 mg/m³ 1 ppm
Regulatory reference	Ministru kabineta 2007. gada 15. maija noteikumiem Nr. 325 (Grozījumi Ministru kabineta 2024. gada 26. martā noteikumiem Nr. 191).
Lithuania - Occupational Exposure Limits	
Local name	Nitrato rūgštis (azoto rūgštis)
TPRV (OEL STEL)	2,6 mg/m³ 1 ppm
Regulatory reference	LIETUVOS HIGIENOS NORMA HN 23:2011 (Nr. V-695/A1-272, 2018-06-12)
Luxembourg - Occupational Exposure Limits	
Local name	Acide nitrique

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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nitric acid (7697-37-2)	
OEL STEL	2,6 mg/m³
	1 ppm
Regulatory reference	Mémorial A N° 226 de 2021 concernant la protection de la sécurité et de la santé des salariés contre les risques liés à des agents chimiques sur le lieu de travail
Malta - Occupational Exposure Limits	
Local name	Nitric acid
OEL STEL	2,6 mg/m³
	1 ppm
Regulatory reference	S.L. 424.24 - Chemical Agents at Work Regulations (L.N. 356 of 2021) # L.S. 424.24 - Regolamenti dwar Agenti Kimiċi fuq il-Post tax-Xogħol (A.L. 356 tal-2021)
Netherlands - Occupational Exposure Limits	
Local name	Salpeterzuur
TGG-15min (OEL STEL)	1,3 mg/m³
	0,5 ppm (Salpeterzuur; Netherlands; Short time value; Public occupational exposure limit value)
Regulatory reference	Arbeidsomstandighedenregeling 2024
Portugal - Occupational Exposure Limits	
Local name	Ácido nítrico
OEL TWA	2 ppm
OEL STEL	4 ppm
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Acid nitric/Acid azotic
OEL STEL	2,6 mg/m³
	1 ppm
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 179/2024)
Serbia - Occupational Exposure Limits	
Local name	азотна киселина
OEL STEL	3 mg/m³
	1 ppm
Remark	ЕУ** – напомена да се ради о хемијским материјама за које су утврђене индикативне граничне вредности изложености према Директиви 2006/15/ЕЗ (друга листа)
Regulatory reference	ПРАВИЛНИК о превентивним мерама за безбедан и здрав рад при излагању хемијским материјама („Службени гласник РС”, бр. 106/09, 117/17 и 107/21)
Slovakia - Occupational Exposure Limits	
Local name	Kyselina dusičná
NPHV (OEL STEL)	2,6 mg/m³

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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nitric acid (7697-37-2)	
	1 ppm
Regulatory reference	Nariadenie vlády č. 355/2006 Z. z. (122/2024 Z. z.)
Slovenia - Occupational Exposure Limits	
Local name	dušikova kislina
OEL TWA	2,6 mg/m³
	1 ppm
OEL STEL	2,6 mg/m³
	1 ppm
Remark	EU
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Spain - Occupational Exposure Limits	
Local name	Ácido nítrico
VLA-EC (OEL STEL)	2,6 mg/m³
	1 ppm
Remark	VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	Salpetersyra
NGV (OEL TWA)	1,3 mg/m³
	0,5 ppm
KGV (OEL STEL)	2,6 mg/m³
	1 ppm
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	Nitric acid
WEL STEL (OEL STEL)	2,6 mg/m³
	1 ppm
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Saltpéturssýra
OEL STEL	2,6 mg/m³
	1 ppm
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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nitric acid (7697-37-2)	
Norway - Occupational Exposure Limits	
Local name	Salpetersyre
Grenseverdi (OEL TWA)	5 mg/m ³
	2 ppm
Remark	E: EU har en veiledende grenseverdi og/eller anmerkning for stoffet.
Regulatory reference	FOR-2024-04-05-581
North Macedonia - Occupational Exposure Limits	
Local name	азотна киселина
OEL TWA	2,6 mg/m ³
	1 ppm
KTV	1
Short time value [mg/m ³]	2,6 mg/m ³
Short time value [ppm]	1 ppm
Remark	(KTV) краткотрајна вредност (КТВ) значи концентрација на опасни хемиски супстанции во воздухот на работното место внатре во зона на дишење, на која работникот без опасност по здравјето може да е изложен на покусно време. Изложеноста на краткотрајни вредности може да трае највеќе 15 минути и не смее да се повтори повеќе од четирипати во работната смена, при што меѓу две изложености на оваа концентрација мора да измине најмалку 60 минути. Краткотрајната вредност е изразена во mg/m ³ или во ml/m ³ (ppm) а е дадена како многукратни дозволени пречекорувања на граничната вредност; (EU) European Union – гранична вредност, определена на ниво на Европската унија; (*) дополнување на граничната вредност заради донесената Директива на Комисијата 2006/15ES од 7 февруари 2006 за создавање на втора листа на индикативни гранични вредности за професионална изложеност според директивата 98/24/ЕС и за измените на директивата 91/322/ЕЕС и директивата 2000/39/ ЕС (Сл. весник бр. 38 од ден 9.2.2006, стр. 36)
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанции („Службен весник на Република Македонија“ бр.46/10)
Switzerland - Occupational Exposure Limits	
Local name	Acide nitrique / Salpetersäure
MAK (OEL TWA)	5 mg/m ³
	2 ppm
KZGW (OEL STEL)	5 mg/m ³
	2 ppm
Remark	NIOSH, OSHA
Regulatory reference	www.suva.ch, 01.01.2024
USA - ACGIH - Occupational Exposure Limits	
Local name	Nitric acid
ACGIH OEL TWA	2 ppm

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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nitric acid (7697-37-2)	
ACGIH OEL STEL	4 ppm
Remark (ACGIH)	TLV® Basis: URT & eye irr; dental erosion
Regulatory reference	ACGIH 2024
silver nitrate (7761-88-8)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Silver (soluble compounds as Ag)
IOEL TWA	0,01 mg/m³
Regulatory reference	COMMISSION DIRECTIVE 2006/15/EC
Albania - Occupational Exposure Limits	
Local name	Argjend, metalik
OEL TWA	0,1 mg/m³
Regulatory reference	VENDIM Nr. 522, datë 6.8.2014 PËR MIRATIMIN E RREGULLORES “PËR MBROJTJEN E SIGURISË DHE SHËNETIT TË PUNËMARRËSVE NGA RISQET E LIDHURA ME AGJENTËT KIMIKË NË PUNË”
Austria - Occupational Exposure Limits	
Local name	Silber
MAK (OEL TWA)	0,1 mg/m³
MAK (OEL STEL)	0,1 mg/m³
Regulatory reference	BGBI. II Nr. 156/2021
Belgium - Occupational Exposure Limits	
Local name	Argent (composés solubles) (en Ag) # Zilver (oplosbare verbindingen, als Ag)
OEL TWA	0,01 mg/m³ (Argent (composés solubles) (en Ag)); Belgium; Time-weighted average exposure limit 8 h)
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Bulgaria - Occupational Exposure Limits	
Local name	Сребро, метал•
OEL TWA	0,1 mg/m³ 0,1 mg/m³ метал 0,01 mg/m³ разтворими съединения (като сребро)
Remark	• (Химични агенти, за които са определени гранични стойности във въздуха на работната среда за Европейската общност)
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Croatia - Occupational Exposure Limits	
Local name	Srebro, metal
GVI (OEL TWA)	0,1 mg/m³ 0,01 mg/m³

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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silver nitrate (7761-88-8)	
Remark	EU* (naznaka da se radi o tvarima za koje su utvrđene indikativne granične vrijednosti izloženosti prema Direktivi 2000/39/ EC (prva lista))
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Cyprus - Occupational Exposure Limits	
Local name	Άργυρος (διαλυτές ενώσεις ως Ag)
OEL TWA	0,01 mg/m³
Regulatory reference	Κανονισμοί του 2007 (Κ.Δ.Π. 295/2007)
Czech Republic - Occupational Exposure Limits	
Local name	Stříbro
PEL (OEL TWA)	0,1 mg/m³
NPK-P (OEL C)	0,3 mg/m³
Remark	S - látka má senzibilizující účinek (s větou H317, H334), T - toxická pro reprodukci kategorie 1A a 1B (s větou H360 včetně příslušných kódů).
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Sølv, pulver, støv og opløselige forbindelser
OEL TWA	0,01 mg/m³ beregnet som Ag
Remark	E (betyder, at stoffet har en EF-grænseværdi)
Regulatory reference	BEK nr 291 af 19/03/2024
Estonia - Occupational Exposure Limits	
Local name	Hõbe, metall, vähelahustuvad ühendid
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)
Finland - Occupational Exposure Limits	
Local name	Hopea, metalli
HTP (OEL TWA)	0,1 mg/m³ Ag
HTP (OEL STEL)	0,03 mg/m³ Ag
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
France - Occupational Exposure Limits	
Local name	Argent (métallique)
VME (OEL TWA)	0,1 mg/m³
Remark	Valeurs réglementaires indicatives
Regulatory reference	Arrêté du 30 juin 2004 modifié (réf.: INRS ED 6443, 2022; Outil65; Arrêté du 26 octobre 2007)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Silber
AGW (OEL TWA)	0,1 mg/m³ E (mg/m3)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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silver nitrate (7761-88-8)	
Peak exposure limitation factor	8(II)
Remark	DFG,EU
Regulatory reference	TRGS900
Gibraltar - Occupational Exposure Limits	
Local name	Silver (soluble compounds as Ag)
OEL TWA	0,01 mg/m³
Regulatory reference	Factories (Control of Chemical Agents at Work) Regulations 2003 (LN. 2018/181)
Greece - Occupational Exposure Limits	
Local name	Αργυρος μεταλλικός
OEL TWA	0,1 mg/m³
Regulatory reference	Π.Δ. 339/2001 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Hungary - Occupational Exposure Limits	
Local name	EZÜST, fém
AK (OEL TWA)	0,1 mg/m³
CK (OEL STEL)	0,4 mg/m³
Remark	EU1 (2000/39/EK irányelvben közölt érték); T (Azok az anyagok, amelyek egészségkárosító hatása TARTÓS expozíciót követően jelentkezik)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	Silver (metallic)
OEL TWA	0,1 mg/m³
Remark	IOELV (Indicative Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2024
Italy - Occupational Exposure Limits	
Local name	Argento, metallico
OEL TWA	0,1 mg/m³
Regulatory reference	Allegato XXXVIII del Decreto Legislativo 4 settembre 2024, n. 135
Latvia - Occupational Exposure Limits	
Local name	Sudrabs,metāliskais
OEL TWA	0,1 mg/m³
Regulatory reference	Ministru kabineta 2007. gada 15. maija noteikumiem Nr. 325 (Grozījumi Ministru kabineta 2024. gada 26. martā noteikumiem Nr. 191).
Luxembourg - Occupational Exposure Limits	
Local name	Argent métallique
OEL TWA	0,1 mg/m³

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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silver nitrate (7761-88-8)	
Regulatory reference	Mémorial A N° 226 de 2021 concernant la protection de la sécurité et de la santé des salariés contre les risques liés à des agents chimiques sur le lieu de travail
Malta - Occupational Exposure Limits	
Local name	Silver,metallic
OEL TWA	0,1 mg/m³
Regulatory reference	S.L. 424.24 - Chemical Agents at Work Regulations (L.N. 356 of 2021) # L.S. 424.24 - Regolamenti dwar Aġenti Kimiċi fuq il-Post tax-Xogħol (A.L. 356 tal-2021)
Netherlands - Occupational Exposure Limits	
Local name	Zilver, oplosbare verbindingen
TGG-8u (OEL TWA)	0,01 mg/m³ (als Ag)
Regulatory reference	Arbeidsomstandighedenregeling 2024
Poland - Occupational Exposure Limits	
Local name	Srebro dymy i pyły
NDS (OEL TWA)	0,05 mg/m³
Remark	Fracja wdychalna – frakcja aerozolu wnikająca przez nos i usta, która stwarza zagrożenie dla zdrowia po zdeponowaniu w drogach oddechowych.
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Portugal - Occupational Exposure Limits	
Local name	Prata
OEL TWA	0,1 mg/m³ Metal, poeiras e fumos 0,01 mg/m³ Compostos solúveis, expressos em Ag
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Argent
OEL TWA	0,1 mg/m³ (Metalic)
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 179/2024)
Serbia - Occupational Exposure Limits	
Local name	сребро, метал
OEL TWA	0 mg/m³
Remark	ЕУ* – напомена да се ради о хемијским материјама за које су утврђене индикативне граничне вредности изложености према Директиви 2000/39/ЕЗ (прва листа)
Regulatory reference	ПРАВИЛНИК о превентивним мерама за безбедан и здрав рад при излагању хемијским материјама („Службени гласник РС”, бр. 106/09, 117/17 и 107/21)
Slovakia - Occupational Exposure Limits	
Local name	Striebro (ako Ag)
NPHV (OEL TWA)	0,1 mg/m³ kovové 0,01 mg/m³ rozpustné zlúčeniny
Regulatory reference	Nariadenie vlády č. 355/2006 Z. z. (122/2024 Z. z.)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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silver nitrate (7761-88-8)	
Slovenia - Occupational Exposure Limits	
Local name	srebro [7440-22-4] (topne spojine, računano kot Ag)
OEL TWA	0,01 mg/m³
OEL STEL	0,02 mg/m³
Remark	EU
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Spain - Occupational Exposure Limits	
Local name	Plata
VLA-ED (OEL TWA)	0,1 mg/m³ metal 0,01 mg/m³ Compuestos solubles de plata, como Ag
Remark	VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo. Todos estos agentes químicos figuran al menos en una de las directivas de valores límite indicativos publicadas hasta ahora (ver Anexo C. Bibliografía). Los estados miembros disponen de un tiempo fijado en dichas directivas para su transposición a los valores límites de cada país miembro. Una vez adoptados, estos valores tienen la misma validez que el resto de los valores adoptados por el país).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	Silver, metall och svårlösliga föreningar (som Ag)
NGV (OEL TWA)	0,1 mg/m³ totaldamm
Remark	3 (Med totaldamm menas de partiklar (aerosoler) som fastnar på ett filter i den provtagare som beskrivs i Metodserien, Provtagning av totaldamm och respirabelt damm, Metod nr 1010, Arbetskyddsstyrelsen, numera Arbetsmiljöverket. Filterdiametern är normalt 37 mm, men kan även vara 25 mm. Trots sitt namn provtas inte den totala mängden luftburna partiklar med denna metod)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
Sweden - Biological limit values	
Local name	Kvicksilver
BLV	50 nmol/l Kvicksilverhalten i blod
Regulatory reference	Medicinska kontroller i arbetslivet (AFS 2019:3)
United Kingdom - Occupational Exposure Limits	
Local name	Silver
WEL TWA (OEL TWA)	0,01 mg/m³ soluble compounds as Ag 0,1 mg/m³ metallic
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Silfur, duft, ryk og leysanleg sambönd, sem Ag
OEL TWA	0,01 mg/m³

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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silver nitrate (7761-88-8)	
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Norway - Occupational Exposure Limits	
Local name	Sølv, metallstøv og røyk
Grenseverdi (OEL TWA)	0,1 mg/m³
Remark	E: EU har en veiledende grenseverdi og/eller anmerkning for stoffet.
Regulatory reference	FOR-2024-04-05-581
North Macedonia - Occupational Exposure Limits	
Local name	Сребро (растворливи соединенија, сметано како Ag)
OEL TWA	0,01 mg/m³
Remark	(EU) European Union – гранична вредност, определена на ниво на Европската унија
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанции („Службен весник на Република Македонија“ бр.46/10)
Switzerland - Occupational Exposure Limits	
Local name	Silber
MAK (OEL TWA)	0,1 mg/m³ 0,01 mg/m³
KZGW (OEL STEL)	0,8 mg/m³ 0,02 mg/m³
Remark	e(mg/m³) - Haut ^{KT HU} - NIOSH, OSHA
Regulatory reference	www.suva.ch, 01.01.2024
USA - ACGIH - Occupational Exposure Limits	
Local name	Silver
ACGIH OEL TWA	0,01 mg/m³ (Silver Soluble compounds, as Ag; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)
Remark (ACGIH)	TLV® Basis: Argyria
Regulatory reference	ACGIH 2024
aluminium nitrate (13473-90-0)	
Austria - Occupational Exposure Limits	
Local name	Aluminium (als Metall)
MAK (OEL TWA)	10 mg/m³ (E)
MAK (OEL STEL)	20 mg/m³ (E, 2x 60(Miw) min)
Regulatory reference	BGBl. II Nr. 156/2021
Belgium - Occupational Exposure Limits	
Local name	Aluminium (sels solubles) (en Al) # Aluminiumzouten (oplosbaar) (als Al)
OEL TWA	2 mg/m³
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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aluminium nitrate (13473-90-0)	
Bulgaria - Occupational Exposure Limits	
Local name	Алуминий
OEL TWA	10 mg/m³ (метален прах и оксиди). (инхалабилна фракция) 1,5 mg/m³ (метален прах и оксиди). (респирабилна фракция) 2 mg/m³ (неорганични разтворими съединения (като алуминий))
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Croatia - Occupational Exposure Limits	
Local name	Aluminij
GVI (OEL TWA)	10 mg/m³ U (ukupna prašina) 4 mg/m³ R (respirabilna prašina)
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Denmark - Occupational Exposure Limits	
Local name	Aluminium, opløselige salte
OEL TWA	1 mg/m³ beregnet som Al
Regulatory reference	BEK nr 291 af 19/03/2024
Estonia - Occupational Exposure Limits	
Local name	Alumiinium, metalliline ja oksiidid
OEL TWA	10 mg/m³ kogu tolm (respireeritav fraktsioon) 4 mg/m³ peentolm (respireeritav fraktsioon)
Remark	1 (Peentolm koosneb alla 2,5-mikromeetrise läbimõõduga osakestest, mis võivad koos sissehingatava õhuga jõuda kopsualveoolidesse)
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)
France - Occupational Exposure Limits	
Local name	Aluminium
VME (OEL TWA)	10 mg/m³ (métal) 5 mg/m³ (pulvérulent)
Remark	Valeurs recommandées/admises
Regulatory reference	Circulaire du Ministère du travail (réf.: INRS ED 6443, 2022; Outil65)
Germany - Biological limit values (TRGS 903)	
Local name	Aluminium
Biological limit value	50 µg/g creatinine Parameter: Aluminium - Untersuchungsmaterial: U = Urin - Probenahmezeitpunkt: c) am Schichtende, bei Langzeitexposition nach mehreren vorangegangenen Schichten - Festlegung/Begründung: 11/2018 DFG
Regulatory reference	TRGS 903
Greece - Occupational Exposure Limits	
Local name	Αργίλιο μεταλλικό & οξειδίο του αργιλίου

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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aluminium nitrate (13473-90-0)	
OEL TWA	10 mg/m³ αναπν. 5 mg/m³ εισπν.
Regulatory reference	Π.Δ. 90/1999 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Hungary - Occupational Exposure Limits	
Local name	ALUMINIUM (oldható, AL-ra számolva)
AK (OEL TWA)	1 mg/m³ respirábilis frakció
Remark	N (Irritáló anyagok, egyszerű fojtógázok, csekély egészségkárosító hatással bíró anyagok)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	Aluminium salts, soluble
OEL TWA	2 mg/m³
Remark	Advisory OELV (Advisory Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2024
Sweden - Occupational Exposure Limits	
Local name	Aluminium, lösliga föreningar (som Al)
NGV (OEL TWA)	1 mg/m³ totaldamm
Remark	3 (Med totaldamm menas de partiklar (aerosoler) som fastnar på ett filter i den provtagare som beskrivs i Metodserien, Provtagning av totaldamm och respirabelt damm, Metod nr 1010, Arbetskyddsstyrelsen, numera Arbetsmiljöverket. Filterdiameteren är normalt 37 mm, men kan även vara 25 mm. Trots sitt namn provtas inte den totala mängden luftburna partiklar med denna metod)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	Aluminium
WEL TWA (OEL TWA)	2 mg/m³ alkyl compounds 2 mg/m³ salts, soluble 10 mg/m³ metal, inhalable dust 4 mg/m³ metal, respirable dust
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Norway - Occupational Exposure Limits	
Local name	Aluminiumløselige salter (beregnet som Al)
Grenseverdi (OEL TWA)	2 mg/m³
Regulatory reference	FOR-2024-04-05-581
Switzerland - BAT	
Local name	Aluminium métal / Aluminium (Metall)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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aluminium nitrate (13473-90-0)	
BAT	50 µg/g creatinine (0.21 µmol/mmol cr.; Paramètre biologique: Aluminium; Substrat d'examen: Urine; Moment du prélèvement: Exposition de longue durée: après plusieurs périodes de travail.) / (0.21 µmol/mmol cr.; Biologischer Parameter: Aluminium; Untersuchungsmaterial: Urin; Probennahmezeitpunkt: Bei Langzeitexposition: nach mehreren vorangegangenen Schichten.)
Regulatory reference	Ordonnance 832.30 (OPA), article 50 al. 3, www.suva.ch/valeurs-limites / Verordnung 832.30 (VUV), Art. 50 Abs. 3, www.suva.ch/grenzwerte
arsenic acid (7778-39-4)	
EU - Binding Occupational Exposure Limit (BOEL)	
Local name	Arsenic acid and its salts, as well as inorganic arsenic compounds
BOEL TWA	0,01 mg/m³ (Inhalable fraction)
Regulatory reference	DIRECTIVE (EU) 2019/983 (amending Directive 2004/37/EC)
Austria - Occupational Exposure Limits	
Local name	Arsensäure und deren Salze: Arsensäure
TRK (OEL TWA)	0,01 mg/m³ (als As berechnet, E)
TRK (OEL STEL)	0,04 mg/m³ (als As berechnet, E, 4x 15(Miw) min)
Remark	Krebserzeugend: III A1
Regulatory reference	BGBI. II Nr. 156/2021
Belgium - Occupational Exposure Limits	
Local name	Arsenic, acide arsénique et ses sels, ainsi que ses composés inorganiques (en As) # Arseen, arseenzuur en zouten daarvan, alsook anorganische arseenverbindingen (als As)
OEL TWA	0,01 mg/m³ (Arsenic et ses composés inorganiques (en As); Belgium; Time-weighted average exposure limit 8 h)
Remark	C: la mention "C" signifie que l'agent en question relève du champ d'application du titre 2 relatif aux agents cancérogènes, mutagènes et reprotoïques du livre VI du code de bien-être au travail. # C: de vermelding "C" betekent dat het betrokken agens valt onder het toepassingsgebied van titel 2 betreffende kankerverwekkende, mutagene en reprotoxische agentia van boek VI van de codex over het welzijn op het werk.
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Croatia - Occupational Exposure Limits	
Local name	Arsen i drugi arsenovi spojevi (izuzev arsina)
GVI (OEL TWA)	0,1 mg/m³
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Croatia - Biological limit values	
Local name	Arsen (elementaran i anorgansk spojevi)
BLV	0,93 µmol/l Karakteristični pokazatelj: arsen - Biološki uzorak: mokraća - Vrijeme uzorkovanja: na kraju smjene ili mokraća skupljena tijekom 24 sata - Napomena: hrana bogata živčnim namirnicama iz mora značajno povišuje nalaz 70 µg/l Karakteristični pokazatelj: arsen - Biološki uzorak: mokraća - Vrijeme uzorkovanja: na kraju smjene ili mokraća skupljena tijekom 24 sata - Napomena: hrana bogata živčnim namirnicama iz mora značajno povišuje nalaz

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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arsenic acid (7778-39-4)	
Regulatory reference	Pravidlník o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 91/2018)
Czech Republic - Biological limit values	
Local name	Arsen
BLV	0,05 mg/g creatinine Ukazatel: Arsen - Biologicky vzorek: moči - Doba odběru: konec pracovního týdne 0,075 µmol/mmol Creatinine Ukazatel: Arsen - Biologicky vzorek: moči - Doba odběru: konec pracovního týdne
Regulatory reference	Vyhláška č. 107/2013 Sb. (kterou se mění vyhláška č. 432/2003 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Arsen og uorganiske forbindelser
OEL TWA	0,0028 mg/m³ beregnet som As
Remark	E (betyder, at stoffet har en EU-grænseværdi); K (betyder, at stoffet anses for at kunne være kræftfremkaldende)
Regulatory reference	BEK nr 291 af 19/03/2024
Estonia - Occupational Exposure Limits	
Local name	Arseen ja anorgaanilised ühendid, v.a arseenhüdroiid (arvutatud arseenile)
OEL TWA	0,03 mg/m³
Remark	C (Kantserogeenne aine), 3 (Värveldioksiid tugevdab arseeni kantserogeenseid omadusi), 4 (Uute tootmisüksuste loomisel ja vanade rekonstrueerimisel on soovitatav arvestada arseeni ja selle anorgaaniliste ühendite piirnormiks tööpäeva jooksul 0,01 mg/m³ (arvutatud arseenile))
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)
Finland - Occupational Exposure Limits	
Local name	Arseeni
HTP (OEL TWA)	0,01 mg/m³ As
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveystministeriö)
Finland - Biological limit values	
Local name	Arseeni
BLV	70 nmol/l Parametri: Virtsan epäorgaaninen arseen - Näytteenottoajankohta: Työväiheen tai työvuoron päätyttyä työviikon tai altistumisjakson loputtua
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveystministeriö)
Germany - Occupational Exposure Limits (TRGS 910)	
Local name	Arsenverbindungen, als Carc. 1A, Carc. 1B eingestuft
Acceptable concentration (Weight conc.)	0,83 µg/m³ (E)
Notes	b) Akzeptanzkonzentration assoziiert mit Risiko 4:10000
Tolerance concentration (Weight conc.)	8,3 µg/m³ (E)
Tolerance concentration excess factor	8

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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arsenic acid (7778-39-4)	
Remark	(4) Die Konzentrationen beziehen sich auf den Elementgehalt des entsprechenden Metalls.; Siehe TRGS 561
Equivalence value for acceptable concentration	14 µg/l
Equivalence value for tolerance concentration	40 µg/l
Parameter	Σ Arsen(III), Arsen(V), Monomethylarsonsäure und Dimethylarsinsäure
Testing material	U - Urin
Testing time	b - Expositionsende bzw. Schichtende, c - Bei Langzeitexposition: am Schichtende nach mehreren vorangegangenen Schichten
Regulatory reference	TRGS 910
Hungary - Occupational Exposure Limits	
Local name	ARZÉN ÉS SZERVETLEN VEGYÜLETEI (arzin kivételével), (As-ra számítva)
AK (OEL TWA)	0,01 mg/m³
Remark	k(1A) (rákkeltő), b (Bőrön át is felszívódik), i (ingerlő anyag, amely izgatja a bőrt, nyálkahártyát, szemet vagy mindhármát), BEM (biológiai expozíciós mutató); EU7 (2019/983/EU irányelvben közölt érték); T (Azok az anyagok, amelyek egészségkárosító hatása TARTÓS expozíciót követően jelentkezik)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Hungary - Biological Exposure Indices	
Local name	Arzén
BEI	0,05 mg/l Biológiai expozíciós (hatás) mutató: arzén - Biológiai minta: vizeletben - Mintavétel ideje: m.v. (műszak végén) 0,67 µmol/l Biológiai expozíciós (hatás) mutató: arzén - Biológiai minta: vizeletben - Mintavétel ideje: m.v. (műszak végén)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	Arsenic acid and its salts
OEL TWA	0,01 mg/m³ I (Inhalable Fraction)
Remark	BOELV (Binding Occupational Exposure Limit Values), Carc.1A (Substances known to have carcinogenic potential for humans)
Regulatory reference	Chemical Agents Code of Practice 2024
Ireland - Biological limit values	
Local name	Arsenic, elemental and soluble inorganic compounds
BMGV	35 µg/l Parameter: Inorganic As plus methylated metabolites - Medium: urine - Notations: B (Background)
Regulatory reference	Biological Monitoring Guidelines (HSA, 2011)
Italy - Occupational Exposure Limits	
Local name	Acido arsenico e i suoi sali e composti inorganici dell'arsenico
OEL TWA	0,01 mg/m³ Frazione inalabile

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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arsenic acid (7778-39-4)	
Regulatory reference	Allegato XLIII del Decreto Legislativo 4 settembre 2024, n. 135 - Protezione da agenti cancerogeni, mutageni o da sostanze tossiche per la riproduzione
Lithuania - Occupational Exposure Limits	
Local name	Arseno rūgštis ir jos druskos, taip pat neorganiniai arseno junginiai
IPRV (OEL TWA)	0,01 mg/m³ (įkvepiamoji frakcija) 0,03 mg/m³ (Vario lydymo sektoriuje)
Remark	K (kancerogeninis poveikis); Kai kurie duomenys rodo, kad sieros dioksidas gali sustiprinti kancerogenines arseno savybes.
Regulatory reference	LIETUVOS HIGIENOS NORMA HN 23:2011 (Nr. V-1203/A1-64, 2019-10-24)
Netherlands - Occupational Exposure Limits	
Local name	Arseen
TGG-8u (OEL TWA)	0,28 µg/m³
Remark	Kankerverwekkende stof
Regulatory reference	Arbeidsomstandighedenregeling 2024
Poland - Occupational Exposure Limits	
Local name	Arsen i jego związki nieorganiczne
NDS (OEL TWA)	0,01 mg/m³ w przeliczeniu na As – frakcja wdychalna
Remark	Frakcja wdychalna – frakcja aerozolu wnikająca przez nos i usta, która stwarza zagrożenie dla zdrowia po zdeponowaniu w drogach oddechowych.
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Portugal - Occupational Exposure Limits	
Local name	Arsénio e compostos inorgânicos, expressos em As
OEL TWA	0,01 mg/m³
Remark	A1 (Agente carcinogénico confirmado no Homem); IBE (Índice biológico de exposição)
Regulatory reference	Norma Portuguesa NP 1796:2014
Portugal - Biological Exposure Indices	
Local name	Arsenio, elemento e compostos inorgânicos solúveis (exclui arseniato de gálio e arsina)
BEI	35 µg As/L Parâmetro: Arsénio inorgânico e metabolitos metilados - Meio: urina - Momento da amostragem: Fim da semana de trabalho - Notação: Vb (Valor basal)
Regulatory reference	Norma Portuguesa NP 1796:2014
Slovenia - Occupational Exposure Limits	
Local name	arzenova kislina (As2O5) in njene soli ter anorganske arzenove spojine
OEL TWA	0,01 mg/m³
OEL STEL	0,4 mg/m³
Remark	Rakotvorne snovi – kategorija 1A. EU, BAT (Biolóška mejna vrednost), EKA (Zveza med koncentracijo rakotvornih snovi v zraku na delovnem mestu in količino snovi in/ali njenih metabolitov v organizmu)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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arsenic acid (7778-39-4)	
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4.4.2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti rakotvornim ali mutagenim snovem
Spain - Occupational Exposure Limits	
Local name	Arsénico elemental
VLA-ED (OEL TWA)	0,01 mg/m³
Remark	VLB® (Agente químico que tiene Valor Límite Biológico), r (Esta sustancia tiene establecidas restricciones a la fabricación, la comercialización o el uso en los términos especificados en el “Reglamento (CE) nº 1907/2006 sobre Registro, Evaluación, Autorización y Restricción de sustancias y preparados químicos” (REACH) de 18 de diciembre de 2006 (DOUE L 369 de 30 de diciembre de 2006). Las restricciones de una sustancia pueden aplicarse a todos los usos o sólo a usos concretos. El anexo XVII del Reglamento REACH contiene la lista de todas las sustancias restringidas y especifica los usos que se han restringido), s (Esta sustancia tiene prohibida total o parcialmente su comercialización y uso como fitosanitario y/o como biocida. Para una información detallada acerca de las prohibiciones consúltese: Base de datos de productos biocidas: http://www.msssi.gob.es/ciudadanos/productos.do?tipo=plaguicidas Base de datos de productos fitosanitarios http://www.magrama.gob.es/agricultura/pags/fitos/registro/fichas/pdf/Lista_sa.pdf).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Spain - Biological limit values	
Local name	Arsénico elemental
BLV	35 µg As/L Parámetro: Arsénico inorgánico más metabolitos metilados - Medio: Orina - Momento de muestreo: Final de la semana laboral - Notas: F (Fondo. El indicador está generalmente presente en cantidades detectables en personas no expuestas laboralmente. Estos niveles de fondo están considerados en el valor VLB)
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
United Kingdom - Occupational Exposure Limits	
Local name	Arsenic
WEL TWA (OEL TWA)	0,1 mg/m³ Arsenic and compounds except arsine (as As); United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005)
Remark	Carc (Capable of causing cancer and/or heritable genetic damage)
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Arsenik og ólífræn sambönd, sem As
OEL TWA	0,01 mg/m³ sjá einnig arsín og kalsíumarsenat
Remark	K (efnið er krabbameinsvaldandi). Vissar upplýsingar benda til að brennisteinsdíoxíð geti aukið krabbameinsvirkni arseníks
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
North Macedonia - Occupational Exposure Limits	
Local name	Арсенова киселина (As2O5) и нејзините соли
OEL TWA	0,1 mg/m³ (l) инхалабилна фракција – дел на вкупно суспендирани материји, кои работникот ги вдишува

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arsenic acid (7778-39-4)	
KTV	4
Short time value [mg/m³]	0,4 mg/m³
Remark	(KTV) краткотрајна вредност (КТВ) значи концентрација на опасни хемиски супстанции во воздухот на работното место внатре во зона на дишење, на која работникот без опасност по здравјето може да е изложен на покусно време. Изложеноста на краткотрајни вредности може да трае највеќе 15 минути и не смее да се повтори повеќе од четирипати во работната смена, при што меѓу две изложености на оваа концентрација мора да измине најмалку 60 минути. Краткотрајната вредност е изразена во mg/m³ или во ml/m³(ppm) а е дадена како многукратни дозволени пречекорувања на граничната вредност; (TDK) техничко достигнување на концентрацијата – е дадено за канцерогените супстанции и значи концентрација на супстанции во воздухот на работното место, кои можат да се достигнат со достапните техники
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанции („Службен весник на Република Македонија“ бр.46/10)
Switzerland - Occupational Exposure Limits	
Local name	Arsenic et ses composés inorg. / Arsen und anorganische Arsenverbindungen
MAK (OEL TWA)	0,01 mg/m³ (i) / (e)
Notation	R, C1 _A , M2, B / H, C1 _A , M2, B
Remark	HSE, NIOSH, BG. Exprimé en As / HSE, NIOSH, BG. Als As berechnet
Regulatory reference	www.suva.ch, 01.01.2024
Switzerland - BAT	
Local name	Arsenic et ses composés inorg. / Arsen und anorganische Arsenverbindungen
BAT	15 µg/l (200 nmol/l; Paramètre biologique: Arsenic inorganique et ses métabolites méthylés; Substrat d'examen: Urine; Moment du prélèvement: Fin de l'exposition, de la période de travail. Exposition de longue durée: après plusieurs périodes de travail.) / (200 nmol/l; Biologischer Parameter: ΣArsen(III), Arsen(V), Monomethylarsonsäure; Untersuchungsmaterial: Urin; Probennahmezeitpunkt: Expositionsende, bzw. Schichtende. Bei Langzeitexposition: nach mehreren vorangegangenen Schichten.)
Regulatory reference	Ordonnance 832.30 (OPA), article 50 al. 3, www.suva.ch/valeurs-limites / Verordnung 832.30 (VUV), Art. 50 Abs. 3, www.suva.ch/grenzwerte
USA - ACGIH - Occupational Exposure Limits	
Local name	Arsenic and inorganic compounds, as As
ACGIH OEL TWA	0,01 mg/m³ (Arsenic, inorganic compounds (except Arsine), as As; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)
Remark (ACGIH)	TLV® Basis: Lung cancer. Notations: A1 (Confirmed Human Carcinogen); BEI
Regulatory reference	ACGIH 2024
barium nitrate (10022-31-8)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Barium (soluble compounds as Ba)
IOEL TWA	0,5 mg/m³

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barium nitrate (10022-31-8)	
Regulatory reference	COMMISSION DIRECTIVE 2006/15/EC
Albania - Occupational Exposure Limits	
Local name	Barium
OEL TWA	0,5 mg/m ³ (përbërje të tretshme, si Ba)
Regulatory reference	VENDIM Nr. 522, datë 6.8.2014 PËR MIRATIMIN E RREGULLORES "PËR MBROJTJEN E SIGURISË DHE SHËNDETIT TË PUNËMARRËSVE NGA RISQET E LIDHURA ME AGJENTËT KIMIKE NË PUNË"
Austria - Occupational Exposure Limits	
Local name	Bariumverbindungen, lösliche (ausgenommen Bariumchromat)
MAK (OEL TWA)	0,5 mg/m ³ (als Ba berechnet, E)
MAK (OEL STEL)	2 mg/m ³ (als Ba berechnet, E, 4x 15(Miw) min)
Regulatory reference	BGBI. II Nr. 156/2021
Belgium - Occupational Exposure Limits	
Local name	Baryum (composés solubles) (en Ba) # Barium (oplosbare verbindingen) (als Ba)
OEL TWA	0,5 mg/m ³
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Croatia - Occupational Exposure Limits	
Local name	Barij (topljivi spojevi kao Ba)
GVI (OEL TWA)	0,5 mg/m ³
Remark	Direktiva: 2006/15/EZ
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Czech Republic - Occupational Exposure Limits	
Local name	Barya sloučeniny rozpustné, jako Ba
PEL (OEL TWA)	0,5 mg/m ³
NPK-P (OEL C)	2,5 mg/m ³
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Bariumforbindelser, opløselige
OEL TWA	0,5 mg/m ³ beregnet som Ba
Remark	E (betyder, at stoffet har en EF-grænseværdi)
Regulatory reference	BEK nr 291 af 19/03/2024
Finland - Occupational Exposure Limits	
Local name	Barium, liukoiset yhdisteet
HTP (OEL TWA)	0,5 mg/m ³ Ba
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)

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barium nitrate (10022-31-8)	
France - Occupational Exposure Limits	
VME (OEL TWA)	0,5 mg/m ³ (Baryum (composés solubles), en Ba; France; Time-weighted average exposure limit 8 h; VRI: Valeur réglementaire indicative)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Bariumverbindungen, löslich (außer Bariumoxid und Bariumhydroxid)
AGW (OEL TWA)	0,5 mg/m ³ (E)
Peak exposure limitation factor	1(I)
Remark	EU - Europäische Union (Von der EU wurde ein Luftgrenzwert festgelegt: Abweichungen bei Wert und Spitzenbegrenzung sind möglich); 13 - Eine Begründung für die Ableitung eines gesundheitsbasierten AGW liegt nicht vor; 10 - Der Arbeitsplatzgrenzwert bezieht sich auf den Elementgehalt des entsprechenden Metalls; 15 - Für die analytische Bestimmung wird folgende Vorgehensweise empfohlen: "Analytische Methoden zur Prüfung gesundheitsschädlicher Arbeitsstoffe", Band 1 "Luftanalysen", 14. Lieferung 2005, und "Spezielle Vorbemerkungen", Kap. 4.7.1, S. 29-30, Wiley-VCH Verlag GmbH & Co.KGaA, Weinheim oder "Messung von Gefahrstoffen", BGIA-Arbeitsmappe, Erich Schmidt Verlag, Bielefeld
Regulatory reference	TRGS900
Gibraltar - Occupational Exposure Limits	
Local name	Barium (soluble compounds as Ba)
OEL TWA	0,5 mg/m ³
Regulatory reference	Factories (Control of Chemical Agents at Work) Regulations 2003 (LN. 2018/181)
Ireland - Occupational Exposure Limits	
Local name	Barium compounds, (soluble compounds as Ba)
OEL TWA	0,5 mg/m ³
Remark	IOELV (Indicative Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2024
Italy - Occupational Exposure Limits	
Local name	Bario (composti solubili come Ba)
OEL TWA	0,5 mg/m ³
Regulatory reference	Allegato XXXVIII del Decreto Legislativo 4 settembre 2024, n. 135
Lithuania - Occupational Exposure Limits	
Local name	Baris (tirpieji junginiai, kaip Ba)
IPRV (OEL TWA)	0,5 mg/m ³
Regulatory reference	LIETUVOS HIGIENOS NORMA HN 23:2011 (Nr. V-695/A1-272, 2018-06-12)
Luxembourg - Occupational Exposure Limits	
Local name	Baryum (composés solubles en Ba)
OEL TWA	0,5 mg/m ³
Regulatory reference	Mémorial A N° 226 de 2021 concernant la protection de la sécurité et de la santé des salariés contre les risques liés à des agents chimiques sur le lieu de travail

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barium nitrate (10022-31-8)	
Malta - Occupational Exposure Limits	
Local name	Barium (soluble compounds as Ba) # Barium (kompost li jinħallu bħala Ba)
OEL TWA	0,5 mg/m³
Regulatory reference	S.L. 424.24 - Chemical Agents at Work Regulations (L.N. 356 of 2021) # L.S. 424.24 - Regolamenti dwar Aġenti Kimiċi fuq il-Post tax-Xogħol (A.L. 356 tal-2021)
Netherlands - Occupational Exposure Limits	
Local name	Barium
TGG-8u (OEL TWA)	0,5 mg/m³ oplosbare verbindingen (als Ba)
Regulatory reference	Arbeidsomstandighedenregeling 2024
Poland - Occupational Exposure Limits	
Local name	Bar i jego związki nieorganiczne w przeliczeniu na Ba
NDS (OEL TWA)	0,5 mg/m³
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Portugal - Occupational Exposure Limits	
Local name	Bário e compostos solúveis, expressos em Ba
OEL TWA	0,5 mg/m³
Remark	A4 (Agente não classificável como carcinogénico no Homem)
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Bariu (compuși solubili exprimați ca Ba)
OEL TWA	0,5 mg/m³
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 179/2024)
Slovakia - Occupational Exposure Limits	
Local name	Bárium zlúčeniny rozpustné ako Ba
NPHV (OEL TWA)	0,5 mg/m³
Remark	Najvyššie prípustné expozičné limity pre pevné aerosóly s prevažne nešpecifickým účinkom. Ak je obsah fibrogénnej zložky > 1 %, v respirabilnej frakcii prachu sa vypočíta NPELr pre respirabilnú frakciu prachu podľa tohto vzorca: NPELr = 10/% Fr (mg/m3)
Regulatory reference	Nariadenie vlády č. 355/2006 Z. z. (122/2024 Z. z.)
Slovenia - Occupational Exposure Limits	
Local name	barij (topne spojine, računano kot Ba)
OEL TWA	0,5 mg/m³
OEL STEL	0,5 mg/m³
Remark	EU
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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barium nitrate (10022-31-8)	
Spain - Occupational Exposure Limits	
Local name	Bario
VLA-ED (OEL TWA)	0,5 mg/m³ elemental 0,5 mg/m³ Compuestos de bario solubles, como Ba
Remark	c (Los términos “soluble” e “insoluble” se entienden con referencia al agua), VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo. Todos estos agentes químicos figuran al menos en una de las directivas de valores límite indicativos publicadas hasta ahora (ver Anexo C. Bibliografía). Los estados miembros disponen de un tiempo fijado en dichas directivas para su transposición a los valores límites de cada país miembro. Una vez adoptados, estos valores tienen la misma validez que el resto de los valores adoptados por el país).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	Barium, lösliga föreningar (som Ba)
NGV (OEL TWA)	0,5 mg/m³ totaldamm
Remark	3 (Med totaldamm menas de partiklar (aerosoler) som fastnar på ett filter i den provtagare som beskrivs i Metodserien, Provtagning av totaldamm och respirabelt damm, Metod nr 1010, Arbetarskyddsstyrelsen, numera Arbetsmiljöverket. Filterdiametern är normalt 37 mm, men kan även vara 25 mm. Trots sitt namn provtas inte den totala mängden luftburna partiklar med denna metod)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	Barium
WEL TWA (OEL TWA)	0,5 mg/m³ compounds, soluble (as Ba)
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Baríumsambönd, uppleysanleg (sem Ba)
OEL TWA	0,5 mg/m³
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Norway - Occupational Exposure Limits	
Local name	Barium og bariumforb. (unntatt bariumsulfat) (beregnet som Ba)
Grenseverdi (OEL TWA)	0,5 mg/m³
Remark	E: EU har en veiledende grenseverdi og/eller anmerkning for stoffet.
Regulatory reference	FOR-2024-04-05-581
North Macedonia - Occupational Exposure Limits	
Local name	Бариум (растворливи соединенија, пресметани како Ba)
OEL TWA	0,5 mg/m³
Remark	(EU) European Union – гранична вредност, определена на ниво на Европската унија

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barium nitrate (10022-31-8)	
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанции („Службен весник на Република Македонија“ бр.46/10)
USA - ACGIH - Occupational Exposure Limits	
Local name	Barium and soluble compounds
ACGIH OEL TWA	0,5 mg/m³
Remark (ACGIH)	TLV® Basis: Eye, skin, & GI irr; muscular stimulation. Notations: A4 (Not classifiable as a Human Carcinogen)
Regulatory reference	ACGIH 2024
beryllium nitrate (13597-99-4)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Beryllium
IOEL TWA	0,0002 mg/m³ (BOEL. Inhalable fraction)
	0,0006 mg/m³ (Limit value until 11 July 2026)
	0,02 µg/m³ (inhalable fraction)
IOEL STEL	0,2 µg/m³ (inhalable fraction)
Remark	Dermal and respiratory sensitisation Sensitisation (dermal and respiratory). (Year of adoption 2017)
Regulatory reference	DIRECTIVE (EU) 2019/983 (amending Directive 2004/37/EC) SCOEL Recommendations
EU - Binding Occupational Exposure Limit (BOEL)	
Local name	Beryllium
BOEL TWA	0,0002 mg/m³ (Inhalable fraction)
	0,0006 mg/m³ (Limit value until 11 July 2026)
Notes	Dermal and respiratory sensitisation (The substance can cause sensitisation of the skin and of the respiratory tract)
Regulatory reference	DIRECTIVE (EU) 2019/983 (amending Directive 2004/37/EC)
EU - Biological Limit Value (BLV)	
Local name	Beryllium
Regulatory reference	SCOEL List of recommended health-based BLVs and BGVs
Austria - Occupational Exposure Limits	
Local name	Beryllium und seine Verbindungen
MAK (OEL TWA)	0,00002 mg/m³ (als Be berechnet, E)
MAK (OEL STEL)	0,0002 mg/m³ (als Be berechnet, E, 4x 15(Miw) min)
TRK (OEL TWA)	0,0006 mg/m³ (als Be berechnet, E)
TRK (OEL STEL)	0,0024 mg/m³ (als Be berechnet, E, 4x 15(Miw) min)
Remark	Sah. Krebszeugend: III A2
Regulatory reference	BGBI. II Nr. 156/2021

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878

beryllium nitrate (13597-99-4)	
Belgium - Occupational Exposure Limits	
Local name	Béryllium et ses composés (en Be) # Beryllium en -verbindingen (als Be)
OEL TWA	0,002 mg/m³
OEL STEL	0,01 mg/m³
Remark	C: La mention C signifie que l'agent en question relève du champ d'application de l'arrêté royal du 2 décembre 1993 concernant la protection des travailleurs contre les risques liés à l'exposition à des agents cancérogènes et mutagènes au travail. # De vermelding C betekent dat het betrokken agens valt onder het toepassingsgebied van het koninklijk besluit van 2 december 1993 betreffende de bescherming van de werknemers tegen de risico's van blootstelling aan kankerverwekkende en mutagene agentia op het werk
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Bulgaria - Occupational Exposure Limits	
Local name	Берилий
OEL TWA	0,002 mg/m³ и съединения (като берилий)
Remark	Кожна и дихателна сенсibiliзация (Веществото може да предизвика сенсibiliзация на кожата и на дихателните пътища)
Regulatory reference	Наредба № 10 от 26.09.2003 г. за защита на работещите от рискове, свързани с експозиция на канцерогени и мутагени при работа (изм. и доп. ДВ. бр. 28 от 2 Април 2024г.)
Croatia - Occupational Exposure Limits	
Local name	Berilij
GVI (OEL TWA)	0,002 mg/m³
Remark	T+ (vrlo otrovno); Karc. kat. 2 (tvari koje su vjerojatno karcinogene za ljude)
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Czech Republic - Occupational Exposure Limits	
Local name	Beryllium
PEL (OEL TWA)	0,001 mg/m³
NPK-P (OEL C)	0,002 mg/m³
Remark	I - dráždí sliznice (oči, dýchací cesty) resp. kůži, K - karcinogen kategorie 1A a 1B (s větou H350, H350i), S - látka má senzibilizující účinek (s větou H317, H334), P - u látky nelze vyloučit závažné pozdní účinky (s větou H372, H373).
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Beryllium, pulver og forbindelser
OEL TWA	0,001 mg/m³ beregnet som Be
Remark	E (betyder, at stoffet har en EU-grænseværdi); K (betyder, at stoffet anses for at kunne være kræftfremkaldende). Hud- og luftvejssensibiliserende
Regulatory reference	BEK nr 291 af 19/03/2024

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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beryllium nitrate (13597-99-4)	
Estonia - Occupational Exposure Limits	
Local name	Berüllium ja berülliumi anorgaanilised ühendid
OEL TWA	0,0002 mg/m³ Sissehingataav fraktsioon (kehtib alates 11.07.2026) 0,0006 mg/m³ (kehtib kuni 10.07.2026)
Remark	C (Kantserogeenne aine), S (Sensibiliseeriv aine), 6 (Metalliline berüllium ei ole sensibiliseeriv)
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)
Finland - Occupational Exposure Limits	
Local name	Beryllium, metalli
HTP (OEL TWA)	0,0001 mg/m³
HTP (OEL STEL)	0,0004 mg/m³
Remark	lho
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Beryllium und seine anorganischen Verbindungen
AGW (OEL TWA)	0,00006 mg/m³ (A) 0,00014 mg/m³ (E)
Peak exposure limitation factor	1(I)
Remark	AGS - Ausschuss für Gefahrstoffe; X - Krebserzeugender Stoff der Kat. 1A oder 1B oder krebserzeugende Tätigkeit oder Verfahren nach § 2 Absatz 3 Nr. 4 der Gefahrstoffverordnung – es ist zusätzlich § 10 GefStoffV zu beachten; 10 - Der Arbeitsplatzgrenzwert bezieht sich auf den Elementgehalt des entsprechenden Metalls
Regulatory reference	TRGS900
Hungary - Occupational Exposure Limits	
Local name	BERILLIUM ÉS VEGYÜLETEI (Be-ra számítva)
AK (OEL TWA)	0,0006 mg/m³
Remark	k(1B) (rákkeltő), b (Bőrön át is felszívódik); T (Azok az anyagok, amelyek egészségkárosító hatása TARTÓS expozíciót követően jelentkezik)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	Beryllium and beryllium compounds (as Be)
OEL TWA	0,0002 mg/m³

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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beryllium nitrate (13597-99-4)	
Remark	BOELV (Binding Occupational Exposure Limit Values), Sens (In the workplace, respiratory or dermal exposures to sensitising agents may occur. Sensitisers may evoke respiratory or dermal reactions, e.g. asthma, rhinitis and allergic contact dermatitis. The “sens” notation alone does not distinguish between respiratory or dermal sensitisation. Chemical agents that are sensitisers present special problems in the workplace. Should an employee become sensitised, subsequent exposure may cause intense responses, even at low exposure concentrations well below the OELV. Exposure should be eliminated or significantly reduced through control measures such as engineering and process controls and use of personal protective equipment (PPE))
Regulatory reference	Chemical Agents Code of Practice 2024
Poland - Occupational Exposure Limits	
Local name	Beryl i jego związki nieorganiczne w przeliczeniu na Be
NDS (OEL TWA)	0,0002 mg/m³
Remark	Substancja może mieć działanie uczulające na skórę i układ oddechowy. Frakcja wdychalna – frakcja aerozolu wnikająca przez nos i usta, która stwarza zagrożenie dla zdrowia po zdeponowaniu w drogach oddechowych.
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Portugal - Occupational Exposure Limits	
Local name	Berílio e compostos, expressos em Be
OEL TWA	0,00005 mg/m³ I (Fração inalável)
Remark	A1 (Agente carcinogénico confirmado no Homem). Compostos solúveis: P, SC. Compostos solúveis e insolúveis: SR
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Beriliu și compuși (exprimați în Be)
OEL TWA	0,002 mg/m³
Slovenia - Occupational Exposure Limits	
Local name	berilij in anorganske berilijeve spojine
OEL TWA	0,0002 mg/m³ 0,0006 mg/m³
Remark	Rakotvorne snovi – kategorija 1B. EU, SK (Snov lahko povzroči preobčutljivost kože), SD (Snov lahko povzroči preobčutljivost dihalnih poti)
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4.4.2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti rakotvornim ali mutagenim snovem
Spain - Occupational Exposure Limits	
Local name	Berilio
VLA-ED (OEL TWA)	0,0002 mg/m³ elemental 0,0002 mg/m³ Compuestos de berilio, como Be, excepto los expresamente indicados

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beryllium nitrate (13597-99-4)	
Remark	Sen (Sensibilizante. Véase Apartado 6), r (Esta sustancia tiene establecidas restricciones a la fabricación, la comercialización o el uso en los términos especificados en el “Reglamento (CE) nº 1907/2006 sobre Registro, Evaluación, Autorización y Restricción de sustancias y preparados químicos” (REACH) de 18 de diciembre de 2006 (DOUE L 369 de 30 de diciembre de 2006). Las restricciones de una sustancia pueden aplicarse a todos los usos o sólo a usos concretos. El anexo XVII del Reglamento REACH contiene la lista de todas las sustancias restringidas y especifica los usos que se han restringido).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	Beryllium, och föreningar (som Be)
NGV (OEL TWA)	0,002 mg/m³ totaldamm
Remark	C (Ämnet är cancerframkallande. Risk för cancer finns även vid annan exponering än via inandning. För vissa cancerframkallande ämnen som inte har gränsvärden gäller förbud eller tillståndskrav enligt föreskrifterna om kemiska arbetsmiljörisker); S (Ämnet är sensibiliserande. Sensibiliserande ämnen kan ge allergi eller annan överkänslighet. Överkänslighetsbesvärerna drabbar främst huden eller andningsorganen. Överkänslighet innebär att man reagerar vid kontakt med ämnen som normalt inte ger besvär. Allergi är en undergrupp av överkänslighet som orsakas av reaktioner i kroppens immunsystem. Särskilt låga gränsvärden har fastställts för ämnen med mer uttalat luftvägssensibiliserande egenskaper. Några ämnen med starkt sensibiliserande egenskaper får endast hanteras efter tillstånd från Arbetsmiljöverket, se föreskrifterna om kemiska arbetsmiljörisker. Dessa ämnen har inga gränsvärden men i vissa fall riktvärden); 3 (Med totaldamm menas de partiklar (aerosoler) som fastnar på ett filter i den provtagare som beskrivs i Metodserien, Provtagning av totaldamm och respirabelt damm, Metod nr 1010, Arbetarskyddsstyrelsen, numera Arbetsmiljöverket. Filterdiametern är normalt 37 mm, men kan även vara 25 mm. Trots sitt namn provtas inte den totala mängden luftburna partiklar med denna metod)
Regulatory reference	Hygieniska gränsvärden (AFS 2020:6)
United Kingdom - Occupational Exposure Limits	
Local name	Beryllium
WEL TWA (OEL TWA)	0,002 mg/m³ Beryllium compounds (as Be); United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005)
Remark	Carc (Capable of causing cancer and/or heritable genetic damage. See paragraphs 49–51)
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Beryllíum og ólífræn beryllíum efna-sambönd, reiknað sem beryllíum (Be)
OEL TWA	0,0006 mg/m³ örfínt ryk (gildir til 11. júlí 2026) 0,0002 mg/m³ örfínt ryk
Remark	H (efnið getur auðveldlega borist inn í líkamann gegnum húð), K (efnið er krabbameinsvaldandi). Ertir öndunarfæri
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 1137/2020)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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beryllium nitrate (13597-99-4)	
North Macedonia - Occupational Exposure Limits	
Local name	Берилиум и неговите соединенија освен алуминиум берилиум силикат и оние што се утврдени други места во овој анекс
OEL TWA	0,005 mg/m ³ мелење; (I) инхалабилна фракција – дел на вкупно суспендирани материји, кои работникот ги вдишува 0,002 mg/m ³ друго; (I) инхалабилна фракција – дел на вкупно суспендирани материји, кои работникот ги вдишува
KTV	4
Short time value [mg/m ³]	0,02 mg/m ³
Remark	(KTV) краткотрајна вредност (КТВ) значи концентрација на опасни хемиски супстанции во воздухот на работното место внатре во зона на дишење, на која работникот без опасност по здравјето може да е изложен на покусо време. Изложеноста на краткотрајни вредности може да трае највеќе 15 минути и не смее да се повтори повеќе од четирипати во работната смена, при што меѓу две изложености на оваа концентрација мора да измине најмалку 60 минути. Краткотрајната вредност е изразена во mg/m ³ или во ml/m ³ (ppm) а е дадена како многукратни дозволени пречекорувања на граничната вредност; (TDK) техничко достигнување на концентрацијата – е дадено за канцерогените супстанции и значи концентрација на супстанции во воздухот на работното место, кои можат да се достигнат со достапните техники
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанции („Службен весник на Република Македонија“ бр.46/10)
USA - ACGIH - Occupational Exposure Limits	
Local name	Beryllium and compounds, as Be
ACGIH OEL TWA	0,00005 mg/m ³
Remark (ACGIH)	Beryllium sens; chronic beryllium; Skin; DSEN; RSEN; A1 (Confirmed Human Carcinogen: The agent is carcinogenic to humans based on the weight of evidence from epidemiologic studies)
Regulatory reference	ACGIH 2024
cadmium nitrate (10325-94-7)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Cadmium and its inorganic compounds
IOEL TWA	0,001 mg/m ³ (BOEL. Inhalable fraction) 0,004 mg/m ³ (Inhalable fraction. Limit value until 11 July 2027)
Remark	Respirable fraction in those Member States that implement, on the date of the entry into force of this Directive, a biomonitoring system with a biological limit value not exceeding 0,002 mg Cd/g creatinine in urine
Regulatory reference	DIRECTIVE (EU) 2019/983 (amending Directive 2004/37/EC)
EU - Binding Occupational Exposure Limit (BOEL)	
Local name	Cadmium and its inorganic compounds

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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cadmium nitrate (10325-94-7)	
BOEL TWA	0,001 mg/m ³ (Inhalable fraction) 0,004 mg/m ³ (Inhalable fraction. Respirable fraction in those Member States that implement, on the date of the entry into force of this Directive, a biomonitoring system with a biological limit value not exceeding 0,002 mg Cd/g creatinine in urine. Limit value until 11 July 2027)
Regulatory reference	DIRECTIVE (EU) 2019/983 (amending Directive 2004/37/EC)
EU - Biological Limit Value (BLV)	
Local name	Cadmium
BLV	2 µg/g creatinine Parameter: Cd - Medium: urine
Regulatory reference	SCOEL List of recommended health-based BLVs and BGVs
Austria - Occupational Exposure Limits	
Local name	Cadmium und seine Verbindungen: Cadmium
TRK (OEL TWA)	0,004 mg/m ³ (als Cd berechnet, E) (Gilt bis 11.07.2027) 0,001 mg/m ³ (als Cd berechnet, E, 4x 15(Miw) min)
TRK (OEL STEL)	0,016 mg/m ³ (als Cd berechnet, E) (Gilt bis 11.07.2027) 0,004 mg/m ³ (als Cd berechnet, E, 4x 15(Miw) min)
Remark	Fortpflanzungsgefährdend: f, d. Krebszeugend: III A2
Regulatory reference	BGBl. II Nr. 156/2021
Austria - Biological limit values	
Local name	Cadmium und seine Verbindungen
BLV	2,5 µg/g creatinine Parameter: Cadmium - Untersuchungsmaterial: Harn
Remark	Eignung mit vorzeitiger Folgeuntersuchung: Bei Überschreiten des Grenzwertes für Cadmium im Harn. Bei Überschreiten des der angewendeten NAG-Bestimmungsmethode entsprechenden Grenzwertes im Harn. Bei wiederholter Überschreitung des Harngrenzwertes für NAG ist eine fachärztliche Abklärung anzuraten. Bei Vorliegen einer wesentlichen Beeinträchtigung der Lungenfunktion. Diese liegt vor, wenn nach mehrmaliger Messung der beste gemessene Wert den für den/die Untersuchte/n maßgebenden Sollwert um 20% unterschreitet bzw. den MEF50-Sollwert um 50% unterschreitet. Eine vorzeitige Folgeuntersuchung ist jedoch nicht erforderlich, wenn im Vergleich zu Vorbefunden der altersabhängige physiologische Abfall der 1-Sekundenkapazität (FEV1) von 40 ml/Jahr nicht überschritten wird oder aus der Beurteilung des Kurvenverlaufes der Forcierten Vitalkapazität (FVC) eine eingeschränkte Mitarbeit des Untersuchten/der Untersuchten ersichtlich ist. Der Zeitabstand zwischen den Untersuchungen beträgt bei Eignung: ein Jahr; bei Eignung mit vorzeitiger Folgeuntersuchung: sechs Monate. Bei der vorzeitigen Folgeuntersuchung ist nur jener Untersuchungsbefund zu erheben, der die vorzeitige Folgeuntersuchung begründet hat.
Regulatory reference	Verordnung über die Gesundheitsüberwachung am Arbeitsplatz 2017 (VGÜ 2017)
Belgium - Occupational Exposure Limits	
Local name	Cadmium et ses composés (en Cd) # Cadmium en verbindingen, als Cd
OEL TWA	0,002 mg/m ³ (particules alvéolaires) # (inadembare deeltjes) 0,004 mg/m ³ (particules inhalables, jusqu'au 11 juillet 2027) # (inhaleerbare deeltjes, tot en met 11 juli 2027) 0,001 mg/m ³ (particules inhalables, à partir du 12 juillet 2027) # (inhaleerbare deeltjes, vanaf 12 juli 2027)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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cadmium nitrate (10325-94-7)	
Remark	C: la mention "C" signifie que l'agent en question relève du champ d'application du titre 2 relatif aux agents cancérigènes, mutagènes et reprotoïques du livre VI du code de bien-être au travail. # C: de vermelding "C" betekent dat het betrokken agens valt onder het toepassingsgebied van titel 2 betreffende kankerverwekkende, mutagene en reprotoxische agentia van boek VI van de codex over het welzijn op het werk.
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Bulgaria - Occupational Exposure Limits	
Local name	Кадмий и неговите неорганични съединения
OEL TWA	0,004 mg/m³ (До 10 юли 2027 г.) 0,001 mg/m³ (Инхалабилна фракция. В сила от 11.07.2027 г.)
Regulatory reference	Наредба № 10 от 26.09.2003 г. за защита на работещите от рискове, свързани с експозиция на канцерогени и мутагени при работа (изм. и доп. ДВ. бр. 28 от 2 Април 2024г.)
Croatia - Occupational Exposure Limits	
Local name	Kadmijevi (nepirofori) spojevi (kao Cd)
GVI (OEL TWA)	0,025 mg/m³
Remark	T+ (vrlo otrovno); N (opasno za okoliš); Karc. kat. 2 (tvari koje su vjerojatno karcinogene za ljude); Muta. kat. 3 (tvari koje izazivaju zabrinutost zbog mogućeg mutagenog djelovanja na ljude); Repr. kat. 3 (tvari za koje se pretpostavlja da bi mogle smanjiti plodnost kod ljudi i/ili – tvari za koje se pretpostavlja da bi mogle iskazati razvojnu otrovnost kod ljudi)
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, граничним vrijednostima izloženosti i biološkim граничним vrijednostima (NN 148/2023)
Croatia - Biological limit values	
Local name	Kadmij
BLV	0,045 µmol/l Karakteristični pokazatelj: kadmij - Biološki uzorak: krv - Vrijeme uzorkovanja: nije kritično - Napomena: pušenje značajno povisuje nalaz 5 µg/l Karakteristični pokazatelj: kadmij - Biološki uzorak: krv - Vrijeme uzorkovanja: nije kritično - Napomena: pušenje značajno povisuje nalaz 5,03 µmol/mol creatinine Karakteristični pokazatelj: kadmij - Biološki uzorak: mokraća - Vrijeme uzorkovanja: jednokratni uzorak ili mokraća skupljen tijekom 24 sata 5 µg/g creatinine Karakteristični pokazatelj: kadmij - Biološki uzorak: mokraća - Vrijeme uzorkovanja: jednokratni uzorak ili mokraća skupljen tijekom 24 sata
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, граничним vrijednostima izloženosti i biološkim граничним vrijednostima (NN 91/2018)
Czech Republic - Biological limit values	
Local name	Kadmium
BLV	0,005 mg/g creatinine Ukazatel: Kadmium - Biologický vzorek: moči - Doba odběru: nerozhoduje 0,005 µmol/mmol Creatinine Ukazatel: Kadmium - Biologický vzorek: moči - Doba odběru: nerozhoduje 0,005 mg/l Ukazatel: Kadmium - Biologický vzorek: krvi - Doba odběru: nerozhoduje 0,045 µmol/l Ukazatel: Kadmium - Biologický vzorek: krvi - Doba odběru: nerozhoduje
Regulatory reference	Vyhláška č. 107/2013 Sb. (kterou se mění vyhláška č. 432/2003 Sb.)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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cadmium nitrate (10325-94-7)	
Denmark - Occupational Exposure Limits	
Local name	Cadmium, pulver, støv, røg og uorganiske forbindelser
OEL TWA	0,001 mg/m³ beregnet som Cd
Remark	E (betyder, at stoffet har en EU-grænseværdi); K (betyder, at stoffet anses for at kunne være kræftfremkaldende)
Regulatory reference	BEK nr 291 af 19/03/2024
Finland - Occupational Exposure Limits	
Local name	Kadmium, metalli
HTP (OEL TWA)	0,02 mg/m³
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveystiete)
Finland - Biological limit values	
Local name	Kadmium, metalli
BLV	20 nmol/l Parametri: Virtsan kadmium - Näytteenottoajankohta: Työviikon lopulla. Vuorokaudenajalla ei merkitystä.
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveystiete)
Germany - Occupational Exposure Limits (TRGS 910)	
Local name	Cadmium und Cd-Verbindungen, als Carc.1A, Carc.1B eingestuft
Acceptable concentration (Weight conc.)	0,9 µg/m³ (A)
Notes	b) Akzeptanzkonzentration assoziiert mit Risiko 4:10000
Tolerance concentration (Weight conc.)	2 µg/m³ (A)
Tolerance concentration excess factor	8
Remark	(2) Die Toleranzkonzentration wurde gemäß Nummer 3.2.1 aufgrund einer nicht krebs-erzeugenden Wirkung festgelegt. Bei Überschreitung gelten die gleichen Maßnahmen wie bei Überschreitung des AGW.; (4) Die Konzentrationen beziehen sich auf den Elementgehalt des entsprechenden Metalls.; Siehe TRGS561; (7) Die Hintergrundkonzentration ist ein vorgefundener Standortfaktor und ist im Rahmen der Gefährdungsbeurteilung (siehe Nummer 4.1) als Konzentration in der Umgebungsluft zu verstehen. Sie kann vom Unternehmen nicht beeinflusst werden und sowohl örtlich auch als zeitlich variieren; siehe TRGS 561
Regulatory reference	TRGS 910
Hungary - Occupational Exposure Limits	
Local name	KADMIUM ÉS SZERVETLEN VEGYÜLETEI (Cd-ra számítva)
AK (OEL TWA)	0,004 mg/m³ respirábilis frakció
Remark	k(1B) (rákkeltő), BEM (biológiai expozíciós mutató); T (Azok az anyagok, amelyek egészségkárosító hatása TARTÓS expozíciót követően jelentkezik)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Hungary - Biological Exposure Indices	
Local name	Kadmium

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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cadmium nitrate (10325-94-7)	
BEI	0,002 mg/g creatinine Biológiai expozíció (hatás) mutató: kadmium - Biológiai minta: vizeletben - Mintavétel ideje: n.k. (nem kritikus) 0,002 µmol/mmol Creatinine Biológiai expozíció (hatás) mutató: kadmium - Biológiai minta: vizeletben - Mintavétel ideje: n.k. (nem kritikus)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	Cadmium and its inorganic compounds
OEL TWA	0,001 mg/m³ Limit value from 11 July 2027. I (Inhalable Fraction) 0,004 mg/m³ Limit value until 11 July 2027
Remark	BOELV (Binding Occupational Exposure Limit Values), Carc.1B (Substances presumed to have carcinogenic potential for humans)
Regulatory reference	Chemical Agents Code of Practice 2024
Ireland - Biological limit values	
Local name	Cadmium and its inorganic compounds
BMGV	2 µg/g creatinine Parameter: Cd - Medium: urine - Sampling time: Not critical
Regulatory reference	Biological Monitoring Guidelines (HSA, 2011)
Italy - Occupational Exposure Limits	
Local name	Cadmio e suoi composti inorganici
OEL TWA	0,001 mg/m³ Frazione inalabile 0,004 mg/m³ Frazione inalabile. Valore limite fino all' 11 luglio 2027
Regulatory reference	Allegato XLIII del Decreto Legislativo 4 settembre 2024, n. 135 - Protezione da agenti cancerogeni, mutageni o da sostanze tossiche per la riproduzione
Luxembourg - Occupational Exposure Limits	
Local name	Cadmium et ses composés inorganiques
OEL TWA	0,004 mg/m³ Fraction inhalable. Valeur limite jusqu'au 11 juillet 2027 0,001 mg/m³ Fraction inhalable
Remark	Fraction alvéolaire applicable en cas de mise en œuvre à partir de l'entrée en vigueur du présent règlement grand-ducal d'un système de biosurveillance avec une valeur limite biologique ne dépassant pas 0,002 mg Cd/g de créatinine dans l'urine.
Regulatory reference	Mémorial A N° 223 de 2021 concernant la protection des salariés contre les risques liés à l'exposition à des agents cancérigènes ou mutagènes au travail
Malta - Occupational Exposure Limits	
Local name	Cadmium and its inorganic compounds # Kadmju u l-komposti inorganici tiegħu
OEL TWA	0,004 mg/m³ (until 11 July 2027 # sal-11 ta' Lulju 2027) 0,001 mg/m³ (Inhalable fraction # Frazzjoni inalabbli)
Remark	Valur limit: 0.004 mg/m3 (Frazzjoni inalbbli. Frazzjoni respirabbli f'dawk l-Istati Membri li, fid-data tad-dhul fis-sehħ ta' din id-Direttiva, jimplimentaw sistema ta' bijomonitoraġġ b'valur limitu bijoloġiku li majaqbiżx 0,002 mg Cd/g ta' kreatinina fl-awrina) sal-11 ta' Lulju 2027

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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cadmium nitrate (10325-94-7)	
Regulatory reference	S.L. 424.22 - Exposure to Carcinogens, Mutagens or Reprotoxic Substances at Work Regulations (L.N. 102 of 2024) # L.S. 424.22 - Regolamenti dwar Espożizzjoni għall-Carcinogens, Mutagens jew Reprotoxic Substances fuq il-Post tax-Xogħol (A.L. 102 tal-2024)
Netherlands - Occupational Exposure Limits	
Local name	Cadmiumchloride
TGG-8u (OEL TWA)	0,005 mg/m³ (als Cd)
Remark	Kankerverwekkende stof
Regulatory reference	Arbeidsomstandighedenregeling 2024
Poland - Occupational Exposure Limits	
Local name	Kadm i jego związki nieorganiczne
NDS (OEL TWA)	0,001 mg/m³ w przeliczeniu na Cd – frakcja wdychalna
Remark	Frakcja wdychalna – frakcja aerozolu wnikająca przez nos i usta, która stwarza zagrożenie dla zdrowia po zdeponowaniu w drogach oddechowych.
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Portugal - Occupational Exposure Limits	
Local name	Cádmio, elemento e ompostos, expressos em Cd
OEL TWA	0,01 mg/m³ 0,002 mg/m³ R (Fração respirável)
Remark	A2 (Agente carcinogénico confirmado nos animais de laboratório con relevância desconhecida no Homem); IBE (Índice biológico de exposição)
Regulatory reference	Norma Portuguesa NP 1796:2014
Portugal - Biological Exposure Indices	
Local name	Cádmio e compostos inorgânicos
BEI	5 µg/g creatinine Parâmetro: Cádmio - Meio: urina - Momento da amostragem: Não crítico - Notação: Vb (Valor basal) 5 µg/l Parâmetro: Cádmio - Meio: sangue - Momento da amostragem: Não crítico - Notação: Vb (Valor basal)
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Cadmiu şi compuşi (exprimaţiîn Cd)
OEL TWA	0,05 mg/m³
Remark	C1B - poate provoca apariţia cancerului; M2 - susceptibil de a provoca anomalii genetice; R2 - susceptibil de a dăuna fertilităţii
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 179/2024)
Slovakia - Biological limit values	
Local name	Kadmium
BLV	2 µg/g creatinine Zisťovaný faktor: Kadmium - Vyšetovaný materiál: moč - Čas odberu vzorky: a) žiadne obmedzenie
Regulatory reference	Nariadenie vlády č. 355/2006 Z. z. (122/2024 Z. z.)

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cadmium nitrate (10325-94-7)	
Slovenia - Occupational Exposure Limits	
Local name	kadmij
OEL TWA	0,001 mg/m³ 0,004 mg/m³
Remark	EU
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4.4.2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti rakotvornim ali mutagenim snovem
Spain - Occupational Exposure Limits	
VLA-ED (OEL TWA)	0,002 mg/m³ (estabilizado) no pirofórico. Fracción respirable 0,01 mg/m³ (pirofórico). Fracción inhalable 0,002 mg/m³ (pirofórico). Fracción respirable 0,01 mg/m³ Compuestos de cadmio, como Cd, excepto los expresamente indicados. Fracción inhalable 0,002 mg/m³ Compuestos de cadmio, como Cd, excepto los expresamente indicados. Fracción respirable
Spain - Biological limit values	
Local name	Cadmio y compuestos inorgánicos
BLV	2 µg/g creatinine Parámetro: Cadmio - Medio: Orina - Momento de muestreo: No crítico - Notas: F (Fondo. El indicador está generalmente presente en cantidades detectables en personas no expuestas laboralmente. Estos niveles de fondo están considerados en el valor VLB) 5 µg/l Parámetro: Cadmio - Medio: Sangre - Momento de muestreo: No crítico - Notas: F (Fondo. El indicador está generalmente presente en cantidades detectables en personas no expuestas laboralmente. Estos niveles de fondo están considerados en el valor VLB)
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	Kadmium, och oorg föreningar (som Cd)
NGV (OEL TWA)	0,02 mg/m³ totaldamm 0,002 mg/m³ respirabelt damm
Remark	C (Ämnet är cancerframkallande. Risk för cancer finns även vid annan exponering än via inandning. För vissa cancerframkallande ämnen som inte har gränsvärden gäller förbud eller tillståndskrav enligt föreskrifterna om kemiska arbetsmiljörisker); M (Medicinska kontroller kan krävas för hantering av ämnet. Se vidare föreskrifterna om medicinska kontroller i arbetslivet. För visa ämnen ska arbetsgivaren erbjuda läkarundersökning och för andra ämnen gäller krav på periodisk läkarundersökning och tjänstbarhetsbedömning); 3 (Den respirabla fraktionen är de inhalerbara partiklar som når längst ner i luftvägarna, till alveolerna i lungorna. Med totaldamm menas de partiklar (aerosoler) som fastnar på ett filter i den provtagare som beskrivs i Metodserien, Provtagning av totaldamm och respirabelt damm, Metod nr 1010, Arbetarskyddsstyrelsen, numera Arbetsmiljöverket. Filterdiameteren är normalt 37 mm, men kan även vara 25 mm. Trots sitt namn provtas inte den totala mängden luftburna partiklar med denna metod); 14 (För bly och kadmium finns biologiska gränsvärden. Även kvicksilver kan mätas biologiskt)
Regulatory reference	Hygieniska gränsvärden (AFS 2020:6)
Sweden - Biological limit values	
Local name	Kadmium

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cadmium nitrate (10325-94-7)	
BLV	75 nmol/l Kadmiumhalten i blod
Regulatory reference	Medicinska kontroller i arbetslivet (AFS 2019:3)
United Kingdom - Occupational Exposure Limits	
Local name	Cadmium
WEL TWA (OEL TWA)	0,025 mg/m ³ and cadmium compounds except cadmium oxide fume, cadmium sulphide and cadmium sulphide pigments (as Cd)
Remark	Carc (Capable of causing cancer and/or heritable genetic damage (cadmium metal, cadmium chloride, fluoride and sulphate))
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Kadmíum og ólífræn kadmíum efna-sambönd, reiknað sem kadmíum (Cd)
OEL TWA	0,03 mg/m ³ örfint ryk (gildir til 11. júlí 2027)
North Macedonia - Occupational Exposure Limits	
Local name	Кадмиум и соединенија (во форма на прав / аеросоли)
OEL TWA	0,03 mg/m ³ производство на батерии, производство на цинк, олово и бакар со термички процес, заварување легури на кадмиум; (I) инхалабилна фракција – дел на вкупно суспендирани материји, кои работникот ги вдишува 0,015 mg/m ³ Други; (I) инхалабилна фракција – дел на вкупно суспендирани материји, кои работникот ги вдишува
KTV	4
Short time value [mg/m ³]	0,12 mg/m ³
Remark	(KTV) краткотрајна вредност (КТВ) значи концентрација на опасни хемиски супстанции во воздухот на работното место внатре во зона на дишење, на која работникот без опасност по здравјето може да е изложен на покусо време. Изложеноста на краткотрајни вредности може да трае највеќе 15 минути и не смее да се повтори повеќе од четирипати во работната смена, при што меѓу две изложености на оваа концентрација мора да измине најмалку 60 минути. Краткотрајната вредност е изразена во mg/m ³ или во ml/m ³ (ppm) а е дадена како многукратни дозволени пречекорувања на граничната вредност; (TDK) техничко достигнување на концентрацијата – е дадено за канцерогените супстанции и значи концентрација на супстанции во воздухот на работното место, кои можат да се достигнат со достапните техники; (BAT) биолошка гранична вредност – праг на биолошка гранична вредност, што значи предупредување на опасна хемиска супстанца и нејзини метаболити во ткивата, телесните течности или издишувањето на воздухот, без оглед на тоа, дали опасната хемиска супстанца е внесена во организмот со вдишување, голтање или преку кожата
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанции („Службен весник на Република Македонија“ бр.46/10)
USA - ACGIH - Occupational Exposure Limits	
Local name	Cadmium and compounds, as Cd
ACGIH OEL TWA	0,01 mg/m ³ (Cadmium, compounds, as Cd; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value; Cadmium, compounds, as Cd; 0.002 mg/m ³ ; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value; Respirable fraction)

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cadmium nitrate (10325-94-7)	
Remark (ACGIH)	TLV® Basis: Kidney dam. Notations: A2 (Suspected Human Carcinogen); BEI
Regulatory reference	ACGIH 2024
USA - ACGIH - Biological Exposure Indices	
Local name	Cadmium and inorganic compounds
BEI	5 µg/g creatinine Parameter: Cadmium - Medium: urine - Sampling time: Not critical - Notations: B 5 µg/l Parameter: Casmium - Medium: blood - Sampling time: Not critical - Notations: B
Regulatory reference	ACGIH 2024
cobalt dinitrate (10141-05-6)	
Austria - Occupational Exposure Limits	
Local name	Cobalt und seine Verbindungen (Cobalt als Cobaltmetall, Cobaltoxid, Cobaltsulfid und Cobaltsulfat, Staub von Cobaltlegierungen)
TRK (OEL TWA)	0,5 mg/m³ (Herstellung von Cobaltpulver und Katalysatoren, Hartmetallund) (als Co berechnet, E) 0,1 mg/m³ (im übrigen) (als Co berechnet, E)
TRK (OEL STEL)	2 mg/m³ (Herstellung von Cobaltpulver und Katalysatoren, Hartmetallund) (als Co berechnet, E, 4x 15(Miw) min) 0,4 mg/m³ (im übrigen) (als Co berechnet, E, 4x 15(Miw) min)
Remark	H, Sah. Krebs erzeugend: III A2
Regulatory reference	BGBl. II Nr. 156/2021
Austria - Biological limit values	
Local name	Cobalt und seine Verbindungen
BLV	10 µg/l Parameter: Cobalt - Untersuchungsmaterial: Harn
Remark	Eignung mit vorzeitiger Folgeuntersuchung: Überschreiten des Grenzwertes für Cobalt im Harn. Bei Vorliegen einer wesentlichen Beeinträchtigung der Lungenfunktion. Diese liegt vor, wenn nach mehrmaliger Messung der beste gemessene Wert den für den/die Untersuchte/n maßgebenden Sollwert um 20% unterschreitet, bzw. den MEF50-Sollwert um 50% unterschreitet. Eine vorzeitige Folgeuntersuchung ist jedoch nicht erforderlich, wenn im Vergleich zu Vorbefunden der altersabhängige physiologische Abfall der 1 Sekundenkapazität (FEV1) von 40 ml/Jahr nicht überschritten wird oder aus der Beurteilung des Kurvenverlaufes der Forcierten Vitalkapazität (FVC) eine eingeschränkte Mitarbeit des Untersuchten/der Untersuchten ersichtlich ist. Der Zeitabstand zwischen den Untersuchungen beträgt bei Eignung: ein Jahr, bei Eignung mit vorzeitiger Folgeuntersuchung: sechs Monate.
Regulatory reference	Verordnung über die Gesundheitsüberwachung am Arbeitsplatz 2017 (VGÜ 2017)
Belgium - Occupational Exposure Limits	
Local name	Cobalt métal (fumées et poussières) (en Co) # Kobaltmetaal (stof en rook) als Co
OEL TWA	0,02 mg/m³
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Bulgaria - Occupational Exposure Limits	
Local name	Кобалт
OEL TWA	0,1 mg/m³ (и неорганични съединения (като кобалт))

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cobalt dinitrate (10141-05-6)	
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Croatia - Occupational Exposure Limits	
Local name	Kobalt i spojevi (kao Co)
GVI (OEL TWA)	0,1 mg/m³
Remark	Alergen (koža (tvar koja može izazvati alergijsku reakciju na koži (H317)) i udisanje (tvar koja udisanjem može izazvati simptome alergije ili astme ili poteškoće s disanjem (H334)))
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Czech Republic - Occupational Exposure Limits	
Local name	Kobalt a jeho sloučeniny, jako Co
PEL (OEL TWA)	0,05 mg/m³ (V - vdechovatelná frakce aerosolu)
NPK-P (OEL C)	0,1 mg/m³ (V - vdechovatelná frakce aerosolu)
Remark	S - látka má senzibilizující účinek (s větou H317, H334), K - karcinogen kategorie 1A a 1B (s větou H350, H350i), T - toxická pro reprodukci kategorie 1A a 1B (s větou H360 včetně příslušných kódů).
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Cobalt, pulver, støv, røg og uorganiske forbindelser
OEL TWA	0,01 mg/m³ beregnet som Co
Remark	K (betyder, at stoffet anses for at kunne være kræftfremkaldende)
Regulatory reference	BEK nr 291 af 19/03/2024
Estonia - Occupational Exposure Limits	
Local name	Koobalt ja anorgaanilised ühendid (arvutatud koobaltile)
OEL TWA	0,05 mg/m³
Remark	S (Sensibiliseeriv aine)
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)
Finland - Occupational Exposure Limits	
Local name	Koboltti ja sen epäorgaaniset yhdisteet
HTP (OEL TWA)	0,02 mg/m³ Co
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
Finland - Biological limit values	
Local name	Koboltti ja sen epäorgaaniset yhdisteet
BLV	130 nmol/l Parametri: Virtsan koboltti - Näytteenottoajankohta: Työvaiheen tai työvuoron päätyttyä työviikon tai altistumisjakson loputtua
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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cobalt dinitrate (10141-05-6)	
Germany - Occupational Exposure Limits (TRGS 910)	
Local name	Cobalt und Cobaltverbindungen, als Carc.1A, Carc.1B eingestuft
Acceptable concentration (Weight conc.)	0,5 µg/m³ (A)
Notes	b) Akzeptanzkonzentration assoziiert mit Risiko 4:10000
Tolerance concentration (Weight conc.)	5 µg/m³ (A)
Tolerance concentration excess factor	8
Remark	(4) Die Konzentrationen beziehen sich auf den Elementgehalt des entsprechenden Metalls.; Siehe TRGS 561
Regulatory reference	TRGS 910
Greece - Occupational Exposure Limits	
Local name	Κοβάλτιο μεταλλικό (σκόνη και καπνοί)
OEL TWA	0,1 mg/m³
Regulatory reference	Π.Δ. 90/1999 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Hungary - Occupational Exposure Limits	
Local name	KOBALT ÉS SZERVETLEN VEGYÜLETEI (Co-ra számítva)
AK (OEL TWA)	0,02 mg/m³
Remark	i (ingerlő anyag, amely izgatja a bőrt, nyálkahártyát, szemet vagy mindhármát), sz (Túlerzékenységet okozó (szenzibilizáló) tulajdonságú anyag. Az anyagra érzékeny egyéneken „túlerzékenységen” alapuló bőr-, légzőrendszeri, esetleg más szervet/szervrendszert károsító megbetegedést okozhat), BEM (biológiai expozíciós mutató); T (Azok az anyagok, amelyek egészségkárosító hatása TARTÓS expozíciót követően jelentkezik)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Hungary - Biological Exposure Indices	
Local name	Kobalt
BEI	0,01 mg/g creatinine Biológiai expozíciós (hatás) mutató: kobalt - Biológiai minta: vizeletben - Mintavétel ideje: m.v. (műszak végén) 0,019 µmol/mmol Creatinine Biológiai expozíciós (hatás) mutató: kobalt - Biológiai minta: vizeletben - Mintavétel ideje: m.v. (műszak végén)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	Cobalt & cobalt compounds (as Co)
OEL TWA	0,02 mg/m³

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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cobalt dinitrate (10141-05-6)	
Remark	Advisory OELV (Advisory Occupational Exposure Limit Values), Sens (In the workplace, respiratory or dermal exposures to sensitising agents may occur. Sensitisers may evoke respiratory or dermal reactions, e.g. asthma, rhinitis and allergic contact dermatitis. The "sens" notation alone does not distinguish between respiratory or dermal sensitisation. Chemical agents that are sensitisers present special problems in the workplace. Should an employee become sensitised, subsequent exposure may cause intense responses, even at low exposure concentrations well below the OELV. Exposure should be eliminated or significantly reduced through control measures such as engineering and process controls and use of personal protective equipment (PPE)), Carc.1B (Substances presumed to have carcinogenic potential for humans), Repr.1B (Substances which are presumed human reproductive toxicants)
Regulatory reference	Chemical Agents Code of Practice 2024
Ireland - Biological limit values	
Local name	Cobalt
BMGV	15 µg/l Parameter: cobalt - Medium: urine - Sampling time: End of shift at end of workweek - Notations: B (Background) 1 µg/l Parameter: cobalt - Medium: blood - Sampling time: End of shift at end of workweek - Notations: Sq (Semi-quantitative)
Regulatory reference	Biological Monitoring Guidelines (HSA, 2011)
Latvia - Occupational Exposure Limits	
Local name	Kobalts
OEL TWA	0,5 mg/m³ 0,5 mg/m³
Remark	Carc. 1B; Muta. 2; Repr. 1B
Regulatory reference	Ministru kabineta 2007. gada 15. maija noteikumiem Nr. 325 (Grozījumi Ministru kabineta 2024. gada 26. martā noteikumiem Nr. 191). Ministru kabineta 2008. gada 29. septembra noteikumi Nr. 803 (Grozījumi Ministru kabineta 2024. gada 26. martā noteikumiem Nr. 190).
Netherlands - Occupational Exposure Limits	
Local name	Kobalt
TGG-8u (OEL TWA)	0,02 mg/m³ (stof en rook) (als Co)
Regulatory reference	Arbeidsomstandighedenregeling 2024
Portugal - Occupational Exposure Limits	
Local name	Cobalto e compostos inorgânicos, expressos em Co
OEL TWA	0,02 mg/m³
Remark	A3 (Agente carcinogénico confirmado nos animais de laboratório con relevância desconhecida no Homem); IBE (Índice biológico de exposição)
Regulatory reference	Norma Portuguesa NP 1796:2014
Portugal - Biological Exposure Indices	
Local name	Cobalto

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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cobalt dinitrate (10141-05-6)	
BEI	15 µg/l Parâmetro: Cobalto - Meio: urina - Momento da amostragem: Fim do turno no fim da semana de trabalho - Notação: Vb (Valor basal) 1 µg/l Parâmetro: Cobalto - Meio: sangue - Momento da amostragem: Fim do turno no fim da semana de trabalho - Notação: Vb (Valor basal), Sq (Semi quantitativo)
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Cobalt
OEL TWA	0,05 mg/m³
OEL STEL	0,1 mg/m³
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 179/2024)
Romania - Biological limit values	
Local name	Cobalt
BLV	15 µg/l Indicatorul biologic: Cobalt - Material biologic: urină - Momentul recoltării: sfârşit de săptămână 1 µg/l Indicatorul biologic: Cobalt - Material biologic: sânge - Momentul recoltării: sfârşit de săptămână
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 179/2024)
Spain - Occupational Exposure Limits	
Local name	Cobalto elemental
VLA-ED (OEL TWA)	0,02 mg/m³
Remark	VLB® (Agente químico que tiene Valor Límite Biológico), Sen (Sensibilizante).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Spain - Biological limit values	
Local name	Cobalto y compuestos inorgánicos excepto óxidos
BLV	15 µg/l Parámetro: Cobalto - Medio: Orina - Momento de muestreo: Final de la semana laboral - Notas: F (Fondo. El indicador está generalmente presente en cantidades detectables en personas no expuestas laboralmente. Estos niveles de fondo están considerados en el valor VLB) 1 µg/l Parámetro: Cobalto - Medio: Sangre - Momento de muestreo: Final de la semana laboral - Notas: F (Fondo. El indicador está generalmente presente en cantidades detectables en personas no expuestas laboralmente. Estos niveles de fondo están considerados en el valor VLB), S (Significa que el indicador biológico es un indicador de exposición al agente químico en cuestión, pero la interpretación cuantitativa de su medida es ambigua (semicuantitativa). Estos indicadores biológicos deben utilizarse como una prueba de selección (screening) cuando no se pueda realizar una prueba cuantitativa o usarse como prueba de confirmación, si la prueba cuantitativa no es específica y el origen del determinante es dudoso)
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	Kobolt, och oorg. föreningar (som Co)
NGV (OEL TWA)	0,02 mg/m³ inhalerbar fraktion

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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cobalt dinitrate (10141-05-6)	
Remark	C (Ämnet är cancerframkallande. Risk för cancer finns även vid annan exponering än via inandning. För vissa cancerframkallande ämnen som inte har gränsvärden gäller förbud eller tillståndskrav enligt föreskrifterna om kemiska arbetsmiljörisker); H (Ämnet kan lätt upptas genom huden. Det föreskrivna gränsvärdet bedöms ge tillräckligt skydd endast under förutsättning att huden är skyddad mot exponering för ämnet ifråga); S (Ämnet är sensibiliserande. Sensibiliserande ämnen kan ge allergi eller annan överkänslighet. Överkänslighetsbesvär drabbar främst huden eller andningsorganen. Överkänslighet innebär att man reagerar vid kontakt med ämnen som normalt inte ger besvär. Allergi är en undergrupp av överkänslighet som orsakas av reaktioner i kroppens immunsystem. Särskilt låga gränsvärden har fastställts för ämnen med mer uttalat luftvägssensibiliserande egenskaper. Några ämnen med starkt sensibiliserande egenskaper får endast hanteras efter tillstånd från Arbetsmiljöverket, se föreskrifterna om kemiska arbetsmiljörisker. Dessa ämnen har inga gränsvärden men i vissa fall riktvärden); 3 (Med inhalerbar fraktion menas den mängd partiklar, av totalmängden partiklar i luften, som man inandas genom näsa och mun)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	Cobalt
WEL TWA (OEL TWA)	0,1 mg/m ³ and Cobalt compounds (as Co)
Remark	Carc (cobalt dichloride and sulphate)(Capable of causing cancer and/or heritable genetic damage), Sen (Capable of causing occupational asthma)
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Kóbalt, ryk, reykur og ólífræn sambönd sem Co
OEL TWA	0,02 mg/m ³
Remark	O (efnið er ofnæmisvaldandi)
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Switzerland - Occupational Exposure Limits	
Local name	Cobalt et ses composés / Cobalt und seine Verbindungen [Kobalt]
MAK (OEL TWA)	0,05 mg/m ³ (i) / (e)
Notation	R, S, C1 _B , M2, R1 _B , B / H, S, C1 _B , M2, R1 _B , B
Remark	HSE, NIOSH, BG. Exprimé en Co. / HSE, NIOSH, BG. Als Co berechnet.
Regulatory reference	www.suva.ch, 01.01.2024
Switzerland - BAT	
Local name	Cobalt et ses composés / Cobalt und seine Verbindungen
BAT	30 µg/l (509 nmol/l; Paramètre biologique: Cobalt; Substrat d'examen: Urine; Moment du prélèvement: Fin de l'exposition, de la période de travail.) / (509 nmol/l; Biologischer Parameter: Cobalt; Untersuchungsmaterial: Urin; Probennahmezeitpunkt: Expositionsende, bzw. Schichtende.)
Regulatory reference	Ordonnance 832.30 (OPA), article 50 al. 3, www.suva.ch/valeurs-limites / Verordnung 832.30 (VUV), Art. 50 Abs. 3, www.suva.ch/grenzwerte

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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cobalt dinitrate (10141-05-6)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Cobalt and inorganic compounds, as Co
ACGIH OEL TWA	0,02 mg/m ³ (I - Inhalable particulate matter)
Remark (ACGIH)	TLV® Basis: Pulm func changes. Notations: DSEN; RSEN; A3 (Confirmed Animal Carcinogen with Unknown Relevance to Humans); BEI
Regulatory reference	ACGIH 2024
USA - ACGIH - Biological Exposure Indices	
Local name	Cobalt and inorganic compounds
BEI	15 µg/l Parameter: Cobalt - Medium: urine - Sampling time: End of shift at end of workweek - Notations: Ns
Regulatory reference	ACGIH 2024
chromium trinitrate (13548-38-4)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Chromium metal
IOEL TWA	2 mg/m ³
Regulatory reference	COMMISSION DIRECTIVE 2006/15/EC
Albania - Occupational Exposure Limits	
Local name	Krom, Metal
OEL TWA	2 mg/m ³
Regulatory reference	VENDIM Nr. 522, datë 6.8.2014 PËR MIRATIMIN E RREGULLORES "PËR MBROJTJEN E SIGURISË DHE SHËNETIT TË PUNËMARRËSVE NGA RISQET E LIDHURA ME AGJENTËT KIMIKË NË PUNË"
Austria - Occupational Exposure Limits	
Local name	Chrommetall, anorganische Chrom(II)-und anorganische Chrom(III)-Verbindungen (unlöslich)
MAK (OEL TWA)	2 mg/m ³
Remark	Sh
Regulatory reference	BGBl. II Nr. 156/2021
Belgium - Occupational Exposure Limits	
Local name	Chrome métal et composés inorganiques (à l'exception des composés Cr VI) # Chroom (metaal) en anorganische verbindingen (met uitzondering van Cr VI verbindingen)
OEL TWA	0,5 mg/m ³
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Croatia - Occupational Exposure Limits	
Local name	Krom, metal (kao Cr)
GVI (OEL TWA)	2 mg/m ³
Remark	EU** (naznaka da se radi o tvarima za koje su utvrđene indikativne granične vrijednosti izloženosti prema Direktivi 2006/15/ EC (druga lista))

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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chromium trinitrate (13548-38-4)	
Regulatory reference	Pravidník o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Czech Republic - Occupational Exposure Limits	
Local name	Prach z chromu
PEL (OEL TWA)	0,5 mg/m ³
Remark	Prachy s převážně dráždivým účinkem.
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Chrom, pulver og opløselige chromi- og chromosalte
OEL TWA	0,5 mg/m ³ beregnet som Cr
Remark	E (betyder, at stoffet har en EF-grænseværdi)
Regulatory reference	BEK nr 291 af 19/03/2024
Finland - Occupational Exposure Limits	
Local name	Kromi, metalli
HTP (OEL TWA)	0,5 mg/m ³ 0,005 mg/m ³
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveystieteiden ministeriö)
France - Occupational Exposure Limits	
Local name	Chrome (métal), composés de chrome inorganiques (II) et composés de chrome inorganiques (insolubles) (III)
VME (OEL TWA)	2 mg/m ³
Remark	Valeurs réglementaires indicatives
Regulatory reference	Arrêté du 30 juin 2004 modifié (réf.: INRS ED 6443, 2022; Outil65; Arrêté du 26 octobre 2007)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Chrom und anorganische Chrom (II) und (III)-Verbindungen
AGW (OEL TWA)	2 mg/m ³ E (mg/m ³)
Peak exposure limitation factor	1(I)
Remark	10,EU
Regulatory reference	TRGS900
Gibraltar - Occupational Exposure Limits	
Local name	Chromium Metal, Inorganic Chromium (II) Compounds and Inorganic Chromium (III) Compounds (insoluble)
OEL TWA	2 mg/m ³
Regulatory reference	Factories (Control of Chemical Agents at Work) Regulations 2003 (LN. 2018/181)
Greece - Occupational Exposure Limits	
Local name	Χρώμιο (μεταλλικό)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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chromium trinitrate (13548-38-4)	
OEL TWA	1 mg/m³
Regulatory reference	Π.Δ. 90/1999 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Hungary - Occupational Exposure Limits	
Local name	KRÓM (fém), SZERVETLEN KRÓM(II) és KRÓM(III) VEGYÜLETEK (nem oldható)
AK (OEL TWA)	2 mg/m³
Remark	i (ingerlő anyag, amely izgatja a bőrt, nyálkahártyát, szemet vagy mindhármat), sz (Túlerzékenységet okozó (szenzibilizáló) tulajdonságú anyag. Az anyagra érzékeny egyéneken „túlerzékenységen” alapuló bőr-, légzőrendszeri, esetleg más szervet/szervrendszert károsító megbetegedést okozhat), BEM (biológiai expozíciós mutató); EU2 (2006/15/EK irányelvben közölt érték); T (Azok az anyagok, amelyek egészségkárosító hatása TARTÓS expozíciót követően jelentkezik)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Hungary - Biological Exposure Indices	
Local name	Króm
BEI	0,01 mg/g creatinine Biológiai expozíciós (hatás) mutató: króm - Biológiai minta: vizeletben - Mintavétel ideje: m.v. (műszak végén) 0,022 µmol/mmol Creatinine Biológiai expozíciós (hatás) mutató: króm - Biológiai minta: vizeletben - Mintavétel ideje: m.v. (műszak végén)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	Chromium metal
OEL TWA	2 mg/m³
Remark	IOELV (Indicative Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2024
Lithuania - Occupational Exposure Limits	
Local name	Chromas, neorganinio chromo (II) junginiai ir neorganinio chromo (III) junginiai (netirpūs)
IPRV (OEL TWA)	2 mg/m³
Regulatory reference	LIETUVOS HIGIENOS NORMA HN 23:2011 (Nr. V-695/A1-272, 2018-06-12)
Luxembourg - Occupational Exposure Limits	
Local name	Métal chrome, composés de chrome inorganiques (II) et composés de chrome inorganiques (insolubles) (III)
OEL TWA	2 mg/m³
Regulatory reference	Mémorial A N° 226 de 2021 concernant la protection de la sécurité et de la santé des salariés contre les risques liés à des agents chimiques sur le lieu de travail
Malta - Occupational Exposure Limits	
Local name	Chromium Metal, Inorganic Chromium (II) Compounds and Inorganic Chromium (III) Compounds (insoluble)
OEL TWA	2 mg/m³

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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chromium trinitrate (13548-38-4)	
Regulatory reference	S.L. 424.24 - Chemical Agents at Work Regulations (L.N. 356 of 2021) # L.S. 424.24 - Regolamenti dwar Agenti Kimiči fuq il-Post tax-Xogħol (A.L. 356 tal-2021)
Netherlands - Occupational Exposure Limits	
Local name	Chroom
TGG-8u (OEL TWA)	0,5 mg/m ³ (metallisch)
Regulatory reference	Arbeidsomstandighedenregeling 2024
Poland - Occupational Exposure Limits	
Local name	Chrom metaliczny
NDS (OEL TWA)	0,5 mg/m ³
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Portugal - Occupational Exposure Limits	
Local name	Crómio e compostos inorgânicos, expressos em Cr
OEL TWA	0,5 mg/m ³ Metal e compostos de crómio (III) 0,05 mg/m ³ Compostos de crómio (VI) solúveis em água 0,01 mg/m ³ Compostos de crómio (VI) insolúveis
Remark	A4 (Agente não classificável como carcinogénico no Homem)
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Crom metalic, compuși anorganici ai cromului (II) și compuși anorganici ai cromului (insolubili) (III)
OEL TWA	2 mg/m ³
Slovenia - Occupational Exposure Limits	
Local name	krom – kovinski, anorganske kromove (II) spojine in anorganske kromove (III) spojine (netopne)
OEL TWA	2 mg/m ³
OEL STEL	2 mg/m ³
Remark	EU
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Spain - Occupational Exposure Limits	
Local name	Cromo
VLA-ED (OEL TWA)	2 mg/m ³ metal 2 mg/m ³ Compuestos inorgánicos de Cr (II) y de Cr (III) insolubles, como Cr 0,05 mg/m ³ Cromo (VI), Compuestos inorgánicos, excepto los expresamente indicados. Compuestos solubles, como Cr 0,01 mg/m ³ Cromo (VI), Compuestos inorgánicos, excepto los expresamente indicados. Compuestos insolubles, como Cr

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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chromium trinitrate (13548-38-4)	
Remark	VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo. Todos estos agentes químicos figuran al menos en una de las directivas de valores límite indicativos publicadas hasta ahora (ver Anexo C. Bibliografía). Los estados miembros disponen de un tiempo fijado en dichas directivas para su transposición a los valores límites de cada país miembro. Una vez adoptados, estos valores tienen la misma validez que el resto de los valores adoptados por el país).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	Krom, och oorg. (II, III)-föreningar (som Cr)
NGV (OEL TWA)	0,5 mg/m³ totaldamm
Remark	3 (Med totaldamm menas de partiklar (aerosoler) som fastnar på ett filter i den provtagare som beskrivs i Metodserien, Provtagning av totaldamm och respirabelt damm, Metod nr 1010, Arbetarskyddsstyrelsen, numera Arbetsmiljöverket. Filterdiametern är normalt 37 mm, men kan även vara 25 mm. Trots sitt namn provtas inte den totala mängden luftburna partiklar med denna metod)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	Chromium
WEL TWA (OEL TWA)	0,5 mg/m³ 0,5 mg/m³ Chromium (II) compounds (as Cr) 0,5 mg/m³ Chromium (III) compounds (as Cr)
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Króm, duft og króm (króm II og III), sambönd sem Cr
OEL TWA	0,5 mg/m³
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Switzerland - Occupational Exposure Limits	
MAK (OEL TWA)	0,005 mg/m³ 0,5 mg/m³ 0,005 mg/m³ 0,005 mg/m³
USA - ACGIH - Occupational Exposure Limits	
Local name	Metallic chromium, as Cr(0)
ACGIH OEL TWA	0,5 mg/m³ (I - Inhalable particulate matter)
Remark (ACGIH)	TLV® Basis: Resp tract irr
Regulatory reference	ACGIH 2024
copper dinitrate (3251-23-8)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Copper
IOEL TWA	0,01 mg/m³ (respirable fraction)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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copper dinitrate (3251-23-8)	
Remark	(Year of adoption 2014)
Regulatory reference	SCOEL Recommendations
Austria - Occupational Exposure Limits	
Local name	Kupfer und seine Verbindungen
MAK (OEL TWA)	1 mg/m³ (als Cu berechnet, E) 0,1 mg/m³ (als Rauch, als Cu berechnet, A)
MAK (OEL STEL)	4 mg/m³ (als Cu berechnet, E, 4x 15(Miw) min) 0,4 mg/m³ (als Rauch, als Cu berechnet, A, 4x 15(Miw) min)
Regulatory reference	BGBI. II Nr. 156/2021
Belgium - Occupational Exposure Limits	
Local name	Cuivre (en Cu) # Koper (als Cu)
OEL TWA	0,2 mg/m³ (fumées) # (rook) 1 mg/m³ (poussières et brouillards de) # (stof en nevel)
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Bulgaria - Occupational Exposure Limits	
Local name	Мед
OEL TWA	0,1 mg/m³ (метални пари (като мед)) 1 mg/m³ (оксиди и неорганични съединения (като мед))
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Croatia - Occupational Exposure Limits	
Local name	Bakar
GVI (OEL TWA)	0,2 mg/m³ dim (kao Cu) 1 mg/m³ prašina (kao Cu)
KGVI (OEL STEL)	2 mg/m³ prašina (kao Cu)
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Czech Republic - Occupational Exposure Limits	
Local name	Měď
PEL (OEL TWA)	1 mg/m³ (prach) (V - vdechovatelná frakce aerosolu) 0,1 mg/m³ (dýmy) (R - respirabilní frakce aerosolu)
NPK-P (OEL C)	2 mg/m³ (prach) (V - vdechovatelná frakce aerosolu) 0,2 mg/m³ (dýmy) (R - respirabilní frakce aerosolu)
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Kobber
OEL TWA	1 mg/m³ pulver og støv 0,1 mg/m³ røg, beregnet som Cu
Regulatory reference	BEK nr 291 af 19/03/2024

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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copper dinitrate (3251-23-8)	
Estonia - Occupational Exposure Limits	
Local name	Vask ja anorgaanilised ühendid (arvutatud vasele)
OEL TWA	1 mg/m³ kogu tolm 0,2 mg/m³ peentolm
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)
Finland - Occupational Exposure Limits	
Local name	Kupari-(II)-nitraatti
HTP (OEL TWA)	0,02 mg/m³ Cu, alveolijae
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
France - Occupational Exposure Limits	
Local name	Cuivre
VME (OEL TWA)	0,2 mg/m³ (fumées) 1 mg/m³ (poussières), en Cu
VLE (OEL C/STEL)	2 mg/m³ (poussières), en Cu
Remark	Valeurs recommandées/admises
Regulatory reference	Circulaire du Ministère du travail (réf.: INRS ED 6443, 2022; Outil65)
Hungary - Occupational Exposure Limits	
Local name	RÉZ és vegyületei (Cu-re számítva)
AK (OEL TWA)	0,1 mg/m³ 0,01 mg/m³ füst, respirábilis frakció
CK (OEL STEL)	0,2 mg/m³
Remark	R (Azok az anyagok, amelyek egészségkárosító hatása RÖVID expozíció hatására jelentkezik)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	Copper (as Cu)
OEL TWA	0,2 mg/m³ Fume 1 mg/m³ Dusts and mists
Remark	Advisory OELV (Advisory Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2024
Latvia - Occupational Exposure Limits	
Local name	Varš
OEL TWA	0,5 mg/m³
OEL STEL	1 mg/m³
Regulatory reference	Ministru kabineta 2007. gada 15. maija noteikumiem Nr. 325 (Grozījumi Ministru kabineta 2024. gada 26. martā noteikumiem Nr. 191).

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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copper dinitrate (3251-23-8)	
Netherlands - Occupational Exposure Limits	
Local name	Koper
TGG-8u (OEL TWA)	0,1 mg/m³ (Koper en anorganische koperverbindingen (inhaleerbaar); Netherlands; Time-weighted average exposure limit 8 h; Public occupational exposure limit value; inhaleerbaar)
Regulatory reference	Arbeidsomstandighedenregeling 2024
Poland - Occupational Exposure Limits	
Local name	Miedź i jej związki nieorganiczne
NDS (OEL TWA)	0,2 mg/m³ w przeliczeniu na Cu
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Portugal - Occupational Exposure Limits	
Local name	Cobre
OEL TWA	0,2 mg/m³ Fumos, expressos em Cu 1 mg/m³ Poeiras e névoas, expressos em Cu
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Cupru
OEL TWA	0,5 mg/m³ (Pulberi)
OEL STEL	0,2 mg/m³ (Fumuri) 1,5 mg/m³ (Pulberi)
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 179/2024)
Spain - Occupational Exposure Limits	
Local name	Compuestos de cobre
VLA-ED (OEL TWA)	0,01 mg/m³ como Cu. Fracción respirable
Remark	d (Véase UNE EN 481: Atmósferas en los puestos de trabajo. Definición de las fracciones por el tamaño de las partículas para la medición de aerosoles).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	Koppar, och oorg. Föreningar (som Cu)
NGV (OEL TWA)	0,01 mg/m³ respirabel fraktion
Remark	3 (Den respirabla fraktionen är de inhalerbara partiklar som når längst ner i luftvägarna, till alveolerna i lungorna)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	Copper and compounds
WEL TWA (OEL TWA)	1 mg/m³ dusts and mists (as Cu)
WEL STEL (OEL STEL)	2 mg/m³ dusts and mists (as Cu)
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE

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copper dinitrate (3251-23-8)	
Iceland - Occupational Exposure Limits	
Local name	Kopar
OEL TWA	1 mg/m³ duft og ryk, (heildarryk) 0,1 mg/m³ reykur, sem Cu, (örfínt ryk)
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Norway - Occupational Exposure Limits	
Local name	Kobber
Grenseverdi (OEL TWA)	0,1 mg/m³ Røyk 1 mg/m³ Støv
Regulatory reference	FOR-2024-04-05-581
Switzerland - Occupational Exposure Limits	
Local name	Cuivre et ses composés inorganiques / Kupfer und seine anorganischen Verbindungen
MAK (OEL TWA)	0,1 mg/m³ (i) / (e)
KZGW (OEL STEL)	0,2 mg/m³ (i) / (e)
Notation	SS _C / SS _C
Remark	NIOSH. Exprimé en Cu. / NIOSH. Als Cu berechnet.
Regulatory reference	www.suva.ch, 01.01.2024
USA - ACGIH - Occupational Exposure Limits	
Local name	Copper, as Cu
ACGIH OEL TWA	0,2 mg/m³ (Fume) 1 mg/m³ (Dusts and mists)
Remark (ACGIH)	TLV® Basis: Irr; GI; metal fume fever
Regulatory reference	ACGIH 2024
iron trinitrate (10421-48-4)	
Belgium - Occupational Exposure Limits	
Local name	Fer (sels solubles) (en Fe) # IJzerzouten (oplosbaar) (als Fe)
OEL TWA	1 mg/m³ (Fer (sels solubles) (en Fe); Belgium; Time-weighted average exposure limit 8 h)
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Croatia - Occupational Exposure Limits	
Local name	Željezove soli (kao Fe)
GVI (OEL TWA)	1 mg/m³
KGVI (OEL STEL)	2 mg/m³
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Denmark - Occupational Exposure Limits	
Local name	Jernsalte, opløselige

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iron trinitrate (10421-48-4)	
OEL TWA	1 mg/m³ beregnet som Fe
Regulatory reference	BEK nr 291 af 19/03/2024
Greece - Occupational Exposure Limits	
Local name	Σιδήρου (διαλυτά άλατα ως Fe)
OEL TWA	1 mg/m³
OEL STEL	2 mg/m³
Regulatory reference	Π.Δ. 90/1999 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Ireland - Occupational Exposure Limits	
Local name	Iron salts (as Fe)
OEL TWA	1 mg/m³
OEL STEL	2 mg/m³
Remark	Advisory OELV (Advisory Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2024
Portugal - Occupational Exposure Limits	
Local name	Ferro, sais solúveis de ferro, expressos em Fe
OEL TWA	1 mg/m³
Regulatory reference	Norma Portuguesa NP 1796:2014
Spain - Occupational Exposure Limits	
Local name	Hierro: Sales solubles
VLA-ED (OEL TWA)	1 mg/m³ como Fe
Remark	c (Los términos “soluble” e “insoluble” se entienden con referencia al agua).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
United Kingdom - Occupational Exposure Limits	
Local name	Iron salts
WEL TWA (OEL TWA)	1 mg/m³ (as Fe)
WEL STEL (OEL STEL)	2 mg/m³ (as Fe)
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Járnsölt, uppleysanleg, sem Fe
OEL TWA	1 mg/m³
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Norway - Occupational Exposure Limits	
Local name	Jernsalter (beregnet som Fe)
Grenseverdi (OEL TWA)	1 mg/m³

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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iron trinitrate (10421-48-4)	
Regulatory reference	FOR-2024-04-05-581
Switzerland - Occupational Exposure Limits	
Local name	Fer (sels solubles) / Eisensalze (löslich)
MAK (OEL TWA)	1 mg/m ³ (i) / (e)
Remark	OSHA. Exprimé en Fe / OSHA. Als Fe berechnet
Regulatory reference	www.suva.ch, 01.01.2024
USA - ACGIH - Occupational Exposure Limits	
Local name	Iron salts, soluble, as Fe
ACGIH OEL TWA	1 mg/m ³ (Iron salts, soluble, as Fe; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)
Remark (ACGIH)	TLV® Basis: URT & skin irr
Regulatory reference	ACGIH 2024
mercury nitrate (10045-94-0)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Mercury
IOEL TWA	0,02 mg/m ³ (Mercury, divalent inorganic compounds; EU; Time-weighted average exposure limit 8 h; Indicative occupational exposure limit value)
Regulatory reference	COMMISSION DIRECTIVE 2009/161/EU
EU - Biological Limit Value (BLV)	
Local name	Mercury and inorganic divalent mercury compounds
BLV	10 µg/l Parameter: Hg - Medium: blood 30 µg/g creatinine Parameter: Hg - Medium: urine
Regulatory reference	SCOEL List of recommended health-based BLVs and BGVs
Austria - Occupational Exposure Limits	
Local name	Quecksilber und anorganische Quecksilberverbindungen
MAK (OEL TWA)	0,02 mg/m ³
MAK (OEL STEL)	0,08 mg/m ³
Remark	H,Sh
Regulatory reference	BGBI. II Nr. 156/2021
Belgium - Occupational Exposure Limits	
Local name	Mercure (composés alkylés) (en Hg) # Kwik (alkylverbindingen) (als Hg)
OEL TWA	2 mg/m ³ (Mercure et composés inorganiques bivalents du mercure, y compris l'oxyde de mercure et le chlorure mercurique (mesurés comme mercure) (8); Belgium; Time-weighted average exposure limit 8 h)
OEL STEL	0,03 mg/m ³

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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mercury nitrate (10045-94-0)	
Remark	D: La mention D signifie que la résorption de l'agent, via la peau, les muqueuses ou les yeux, constitue une partie importante de l'exposition totale. Cette résorption peut se faire tant par contact direct que par présence de l'agent dans l'air. # De vermelding D betekent dat de opname van het agens via de huid, de slijmvliezen of de ogen een belangrijk deel van de totale blootstelling vormt. Deze opname kan het gevolg zijn van zowel direct contact als zijn aanwezigheid in de lucht.
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Bulgaria - Occupational Exposure Limits	
OEL TWA	0,05 mg/m³ Пари на метала в елементно състояние 0,1 mg/m³ Неорганични и арилни съединения 0,01 mg/m³ Органични и алкилни съединения
Bulgaria - Biological limit values	
Local name	Живак, пари на метала в елементно състояние
BLV	100 µg/l Биомаркер за експозиция/биомаркер за ефект: живак - Биологична среда: урина - Време на пробовземане: Не се фиксира - Специфични ефекти: Няма
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Croatia - Occupational Exposure Limits	
Local name	Živa anorganski spojevi (kao Hg)
GVI (OEL TWA)	0,05 mg/m³
Remark	T (otrovno); N (opasno za okoliš)
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Croatia - Biological limit values	
Local name	Živa (elementarna i anorganski spojevi dvovalentne žive)
BLV	0,05 µmol/l Karakteristični pokazatelj: živa - Biološki uzorak: krv - Vrijeme uzorkovanja: nije kritično 10 µg/l Karakteristični pokazatelj: živa - Biološki uzorak: krv - Vrijeme uzorkovanja: nije kritično 16,9 µmol/mol creatinine Karakteristični pokazatelj: živa - Biološki uzorak: mokraća - Vrijeme uzorkovanja: jednokratni uzorak ili mokraća skupljen tijekom 24 sata 30 µg/g creatinine Karakteristični pokazatelj: živa - Biološki uzorak: mokraća - Vrijeme uzorkovanja: jednokratni uzorak ili mokraća skupljen tijekom 24 sata
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 91/2018)
Czech Republic - Occupational Exposure Limits	
Local name	Rtu
PEL (OEL TWA)	0,05 mg/m³
NPK-P (OEL C)	0,15 mg/m³

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mercury nitrate (10045-94-0)	
Remark	B(3) - u látky je zaveden biologický expoziční test (BET) v moči nebo krvi (Při kontrole expozice rtuti a anorganickým sloučeninám dvojmočné rtuti se přihlíží k příslušným biologickým expozičním testům, které doplňují limitní hodnoty expozice na pracovišti), D - při expozici se významně uplatňuje pronikání faktoru kůží, T - toxická pro reprodukci kategorie 1A a 1B (s větou H360 včetně příslušných kódů).
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Czech Republic - Biological limit values	
Local name	Rtuť
BLV	0,1 mg/g creatinine Ukazatel: Rtuť - Biologicky vzorek: moči - Doba odběru: nerozhoduje 0,056 µmol/mmol Creatinine Ukazatel: Rtuť - Biologicky vzorek: moči - Doba odběru: nerozhoduje
Regulatory reference	Vyhláška č. 107/2013 Sb. (kterou se mění vyhláška č. 432/2003 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Kviksølv og uorganiske forbindelser inkl. dampe
OEL TWA	0,02 mg/m³ beregnet som Hg
Remark	E (betyder, at stoffet har en EF-grænseværdi); H (betyder, at stoffet kan optages gennem huden)
Regulatory reference	BEK nr 291 af 19/03/2024
Finland - Occupational Exposure Limits	
Local name	Elohopea-(II)-nitraatti
HTP (OEL TWA)	0,02 mg/m³ Hg
Remark	Iho, melu
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveystieteistie)
Finland - Biological limit values	
Local name	Elohopea-(II)-nitraatti
BLV	140 nmol/l Parametri: Virtsan elohopea - Näytteenottoajankohta: Työpäivän jälkeinen aamu työviikon tai altistumisjakson lopulla. 50 nmol/l Parametri: Veren epäorgaaninen elohopea - Näytteenottoajankohta: Työviikon lopulla. Vuorokaudenajalla ei merkitystä.
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveystieteistie)
France - Occupational Exposure Limits	
Local name	Mercure, en Hg
VME (OEL TWA)	0,01 mg/m³ (composés alkylés) 0,1 mg/m³ (composés arylés et inorganiques)
Remark	Valeurs recommandées/admises. Risque de pénétration percutanée
Regulatory reference	Circulaire du Ministère du travail (réf.: INRS ED 6443, 2022; Outil65)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Quecksilber
AGW (OEL TWA)	0,02 mg/m³
Peak exposure limitation factor	8(II)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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mercury nitrate (10045-94-0)	
Remark	EU,DFG,,H,Sh
Regulatory reference	TRGS900
Germany - Biological limit values (TRGS 903)	
Local name	Quecksilber, metallisches und seine anorganischen Verbindungen
Biological limit value	25 µg/g creatinine Parameter: Quecksilber - Untersuchungsmaterial: U = Urin - Probenahmezeitpunkt: a) keine Beschränkung - Festlegung/Begründung: 11/2012 DFG
Remark	30 µg/l Urin
Regulatory reference	TRGS 903
Gibraltar - Occupational Exposure Limits	
Local name	Mercury and divalent inorganic mercury compounds including mercuric oxide and mercuric chloride (measured as mercury)
OEL TWA	0,02 mg/m³
Remark	During exposure monitoring for mercury and its divalent inorganic compounds, account should be taken of relevant biological monitoring techniques that complement the IOELV
Regulatory reference	Factories (Control of Chemical Agents at Work) Regulations 2003 (LN. 2018/181)
Greece - Occupational Exposure Limits	
Local name	Υδράργυρος και δισθενείς ανόργανες ενώσεις του υδραργύρου, συμπεριλαμβανομένων του οξυγιδίου του υδραργύρου και του χλωριούχου υδράργυρου (μετρημένες ως υδάργυρος)
OEL TWA	0,1 mg/m³
Remark	Η ένδειξη «δέρμα» στις οριακές τιμές επαγγελματικής έκθεσης επισημαίνει το ενδεχόμενο σημαντικής διείσδυσης μέσω του δέρματος.
Regulatory reference	Π.Δ. 12/2012 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Hungary - Biological Exposure Indices	
Local name	Higany (szervetlen)
BEI	0,03 mg/g creatinine Biológiai expozíciós (hatás) mutató: higany - Biológiai minta: vizeletben - Mintavétel ideje: n.k. (nem kritikus) 0,017 µmol/mmol Creatinine Biológiai expozíciós (hatás) mutató: higany - Biológiai minta: vizeletben - Mintavétel ideje: n.k. (nem kritikus)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	Mercury & divalent inorganic mercury compounds
OEL TWA	0,02 mg/m³
OEL STEL	0,03 mg/m³
Remark	Advisory OELV (Advisory Occupational Exposure Limit Values), Skin (Substances which have the capacity to penetrate intact skin when they come in contact with it and be absorbed into the body. A substantial contribution to the total body burden via dermal exposure is possible)
Regulatory reference	Chemical Agents Code of Practice 2024

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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mercury nitrate (10045-94-0)	
Netherlands - Occupational Exposure Limits	
TGG-8u (OEL TWA)	0,02 mg/m ³ (Kwik en tweewaardige anorganische kwikverbindingen (gemeten als kwik); Netherlands; Time-weighted average exposure limit 8 h; Public occupational exposure limit value; als Hg)
Portugal - Occupational Exposure Limits	
OEL TWA	0,1 mg/m ³ 0,025 mg/m ³
OEL STEL	0,03 mg/m ³
Portugal - Biological Exposure Indices	
Local name	Mercúrio
BEI	20 µg/g creatinine Parâmetro: Mercúrio - Meio: urina - Momento da amostragem: Inicio do turno
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Mercur
OEL TWA	0,05 mg/m ³
OEL STEL	0,15 mg/m ³
Serbia - Occupational Exposure Limits	
Local name	жива и двовалентна неорганска једињења живе
OEL TWA	0 mg/m ³ (мерена као жива)
Remark	током праћења изложености живи и њеним двовалентним неорганским једињењима треба узети у обзир релевантне технике биолошког мониторинга којима се допуњују индикативне граничне вредности. ЕУ*** – напомена да се ради о хемијским материјама за које су утврђене индикативне граничне вредности изложености према Директиви 2009/161/ЕУ (трећа листа)
Regulatory reference	ПРАВИЛНИК о превентивним мерама за безбедан и здрав рад при излагању хемијским материјама („Службени гласник РС”, бр. 106/09, 117/17 и 107/21)
Spain - Occupational Exposure Limits	
Local name	Mercurio
VLA-ED (OEL TWA)	0,02 mg/m ³ elemental 0,02 mg/m ³ Compuestos inorgánicos divalentes de mercurio, como Hg 0,01 mg/m ³ Alquil-compuestos, como Hg 0,1 mg/m ³ Aril-compuestos, como Hg
VLA-EC (OEL STEL)	0,03 mg/m ³ Alquil-compuestos, como Hg

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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mercury nitrate (10045-94-0)	
Remark	VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo. Todos estos agentes químicos figuran al menos en una de las directivas de valores límite indicativos publicadas hasta ahora (ver Anexo C. Bibliografía). Los estados miembros disponen de un tiempo fijado en dichas directivas para su transposición a los valores límites de cada país miembro. Una vez adoptados, estos valores tienen la misma validez que el resto de los valores adoptados por el país), VLB® (Agente químico que tiene Valor Límite Biológico específico en este documento), Hg (El mercurio es una sustancia con efectos sanitarios acumulativos posiblemente graves. En consecuencia, la evaluación de la exposición debería complementarse con una vigilancia sanitaria con control biológico de acuerdo con el artículo 6 del RD 374/2001), s (Esta sustancia tiene prohibida total o parcialmente su comercialización y uso como fitosanitario y/o como biocida. Para una información detallada acerca de las prohibiciones consúltase: Base de datos de productos biocidas: http://www.msssi.gob.es/ciudadanos/productos.do?tipo=plaguicidas Base de datos de productos fitosanitarios http://www.magrama.gob.es/agricultura/pags/fitos/registro/fichas/pdf/Lista_sa.pdf), r (Esta sustancia tiene establecidas restricciones a la fabricación, la comercialización o el uso en los términos especificados en el "Reglamento (CE) nº 1907/2006 sobre Registro, Evaluación, Autorización y Restricción de sustancias y preparados químicos" (REACH) de 18 de diciembre de 2006 (DOUE L 369 de 30 de diciembre de 2006). Las restricciones de una sustancia pueden aplicarse a todos los usos o sólo a usos concretos. El anexo XVII del Reglamento REACH contiene la lista de todas las sustancias restringidas y especifica los usos que se han restringido), TR1B (Cuando las pruebas utilizadas para la clasificación procedan principalmente de datos en animales).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Spain - Biological limit values	
Local name	Mercurio elemental y compuestos inorgánicos
BLV	30 µg/g creatinine Parámetro: Mercurio inorgánico total - Medio: Orina - Momento de muestreo: Antes de la jornada laboral - Notas: F (Fondo. El indicador está generalmente presente en cantidades detectables en personas no expuestas laboralmente. Estos niveles de fondo están considerados en el valor VLB), M (El consumo de pescado, especialmente de especies de gran tamaño situadas normalmente al final de la cadena trófica, así como de marisco y moluscos bivalvos, puede aumentar considerablemente los niveles sanguíneos de mercurio, como catión de monometilmercurio, y en muy pequeña proporción (menos del 10% del total) los niveles en Orina. Dado que el VLB está definido para mercurio inorgánico total, debe tenerse en cuenta este hecho si el método analítico empleado determina mercurio total, tanto inorgánico como orgánico) 10 µg/l Parámetro: Mercurio inorgánico total - Medio: Sangre - Momento de muestreo: Final de la semana laboral - Notas: F (Fondo. El indicador está generalmente presente en cantidades detectables en personas no expuestas laboralmente. Estos niveles de fondo están considerados en el valor VLB), M (El consumo de pescado, especialmente de especies de gran tamaño situadas normalmente al final de la cadena trófica, así como de marisco y moluscos bivalvos, puede aumentar considerablemente los niveles sanguíneos de mercurio, como catión de monometilmercurio, y en muy pequeña proporción (menos del 10% del total) los niveles en Orina. Dado que el VLB está definido para mercurio inorgánico total, debe tenerse en cuenta este hecho si el método analítico empleado determina mercurio total, tanto inorgánico como orgánico)
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	Kvicksilver, och oorg. föreningar (som Hg)
NGV (OEL TWA)	0,02 mg/m³ inhalerbart damm

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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mercury nitrate (10045-94-0)	
Remark	B (Ämnet kan orsaka hörselskada. Exponering för ämnet nära det befintliga yrkeshygieniska gränsvärdet och vid samtidig exponering för buller nära insatsvärdet 80 dB kan orsaka hörselskada); M (Medicinska kontroller kan krävas för hantering av ämnet. Se vidare föreskrifterna om medicinska kontroller i arbetslivet. För vissa ämnen ska arbetsgivaren erbjuda läkarundersökning och för andra ämnen gäller krav på periodisk läkarundersökning och tjänstbarhetsbedömning); 14 (För bly och kadmium finns biologiska gränsvärden. Även kvicksilver kan mätas biologiskt)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	Mercury
WEL TWA (OEL TWA)	0,02 mg/m³ Mercury divalent inorganic compounds including mercuric oxide and mercuric chloride (measured as mercury); United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005)
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
United Kingdom - Biological limit values	
Local name	Mercury
BMGV	20 µmol/mol creatinine Parameter: mercury - Medium: urine - Sampling time: Random
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Kvikasilfur og ólífræn sambönd þess, þar með talin gufa sem Hg
OEL TWA	0,025 mg/m³
Remark	H
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Norway - Occupational Exposure Limits	
Local name	Kvikksølv og kvikksølvforb. (unntatt alkylforbindelser) (beregnet som Hg)
Grenseverdi (OEL TWA)	0,02 mg/m³
Remark	A: Kjemikalier som skal betraktes som at de fremkaller allergi eller annen overfølsomhet i øynene eller luftveier, eller som skal betraktes som at de fremkaller allergi ved hudkontakt; R: Kjemikalier som skal betraktes som reproduksjonstoksiske; G: EU har fastsatt en bindende grenseverdi og/eller anmerkning for stoffet.
Regulatory reference	FOR-2024-04-05-581
Switzerland - Occupational Exposure Limits	
MAK (OEL TWA)	0,01 mg/m³
	0,02 mg/m³
	0,005 ppm
KZGW (OEL STEL)	0,16 mg/m³
	0,04 ppm
Remark	S B - ZNS, Niere - HSE, NIOSH, OSHA

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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mercury nitrate (10045-94-0)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Mercury, elemental and inorganic forms, as Hg
ACGIH OEL TWA	0,025 mg/m³ (Mercury, Inorganic forms, as Hg; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)
Remark (ACGIH)	TLV® Basis: CNS impair; kidney dam. Notations: Skin; A4 (Not classifiable as a Human Carcinogen); BEI
Regulatory reference	ACGIH 2024
USA - ACGIH - Biological Exposure Indices	
Local name	Mercury, elemental
BEI	20 µg/g creatinine Parameter: Mercury - Medium: urine - Sampling time: Prior to shift
Regulatory reference	ACGIH 2024
indium(III) nitrate, pentahydrate (13465-14-0)	
Austria - Occupational Exposure Limits	
Local name	Indium und seine Verbindungen
MAK (OEL TWA)	0,1 mg/m³
MAK (OEL STEL)	0,2 mg/m³
Regulatory reference	BGBl. II Nr. 156/2021
Belgium - Occupational Exposure Limits	
Local name	Indium et composés (en In) # Indium en -verbindingen (als In)
OEL TWA	0,1 mg/m³
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Croatia - Occupational Exposure Limits	
Local name	Indij i spojevi (kao In)
GVI (OEL TWA)	0,1 mg/m³
KGVI (OEL STEL)	0,3 mg/m³
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Denmark - Occupational Exposure Limits	
Local name	Indium, pulver, støv og forbindelser
OEL TWA	0,1 mg/m³ beregnet som In
Regulatory reference	BEK nr 291 af 19/03/2024
Finland - Occupational Exposure Limits	
Local name	Indium, metalli
HTP (OEL TWA)	0,1 mg/m³
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveystiete)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Indium

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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indium(III) nitrate, pentahydrate (13465-14-0)	
AGW (OEL TWA)	0,0001 mg/m³ (A)
Peak exposure limitation factor	8(II)
Remark	AGS - Ausschuss für Gefahrstoffe; 10 - Der Arbeitsplatzgrenzwert bezieht sich auf den Elementgehalt des entsprechenden Metalls
Regulatory reference	TRGS900
Greece - Occupational Exposure Limits	
Local name	Ινδίο και ενώσεις του (ως In)
OEL TWA	1 mg/m³
OEL STEL	1 mg/m³
Regulatory reference	Π.Δ. 90/1999 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Ireland - Occupational Exposure Limits	
Local name	Indium & Compounds (as In)
OEL TWA	0,1 mg/m³
OEL STEL	0,3 mg/m³
Remark	Advisory OELV (Advisory Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2024
Lithuania - Occupational Exposure Limits	
Local name	Indis
IPRV (OEL TWA)	0,1 mg/m³ (ir neorganiniai jo junginiai); (kaip In)
Regulatory reference	LIETUVOS HIGIENOS NORMA HN 23:2011 (Nr. V-695/A1-272, 2018-06-12)
Portugal - Occupational Exposure Limits	
Local name	Índio e compostos, expressos em In
OEL TWA	0,1 mg/m³
Regulatory reference	Norma Portuguesa NP 1796:2014
Slovenia - Occupational Exposure Limits	
Local name	indij in njegove spojine
OEL TWA	0,1 mg/m³
OEL STEL	0,0008 mg/m³
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Spain - Occupational Exposure Limits	
Local name	Compuestos de indio
VLA-ED (OEL TWA)	0,1 mg/m³ como In
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	Indium och oorg föreningar (som In)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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indium(III) nitrate, pentahydrate (13465-14-0)	
NGV (OEL TWA)	0,1 mg/m³ totaldamm
Remark	3 (Med totaldamm menas de partiklar (aerosoler) som fastnar på ett filter i den provtagare som beskrivs i Metodserien, Provtagning av totaldamm och respirabelt damm, Metod nr 1010, Arbetarskyddsstyrelsen, numera Arbetsmiljöverket. Filterdiametern är normalt 37 mm, men kan även vara 25 mm. Trots sitt namn provtas inte den totala mängden luftburna partiklar med denna metod)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	Indium
WEL TWA (OEL TWA)	0,1 mg/m³ and compounds (as In)
WEL STEL (OEL STEL)	0,3 mg/m³ and compounds (as In)
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Indium, duft, ryk og bindiefni, sem In
OEL TWA	0,1 mg/m³
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Norway - Occupational Exposure Limits	
Local name	Indium og Indiumforb. (beregnet som In)
Grenseverdi (OEL TWA)	0,1 mg/m³
Regulatory reference	FOR-2024-04-05-581
North Macedonia - Occupational Exposure Limits	
Local name	индиум и негови соединенија
OEL TWA	0,1 mg/m³ (I) инхалабилна фракција – дел на вкупно суспендирани материји, кои работникот ги вдишува
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанции („Службен весник на Република Македонија” бр.46/10)
Switzerland - Occupational Exposure Limits	
Local name	Indium und seine Verbindungen (als In berechnet)
MAK (OEL TWA)	0,1 mg/m³
Remark	e(mg/m³) - Lunge, Zahn - NIOSH, OSHA
Regulatory reference	www.suva.ch, 01.01.2024
USA - ACGIH - Occupational Exposure Limits	
Local name	Indium and compounds, as In
ACGIH OEL TWA	0,1 mg/m³
Remark (ACGIH)	Pulm edema; pneumonitis
Regulatory reference	ACGIH 2024

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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potassium nitrate (7757-79-1)	
Bulgaria - Occupational Exposure Limits	
Local name	Калиев нитрат
OEL TWA	5 mg/m³
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Latvia - Occupational Exposure Limits	
Local name	Kālija nitrāts
OEL TWA	5 mg/m³
Regulatory reference	Ministru kabineta 2007. gada 15. maija noteikumiem Nr. 325 (Grozījumi Ministru kabineta 2024. gada 26. martā noteikumiem Nr. 191).
Lithuania - Occupational Exposure Limits	
Local name	Kalio nitratas
IPRV (OEL TWA)	5 mg/m³
Regulatory reference	LIETUVOS HIGIENOS NORMA HN 23:2011 (Nr. V-695/A1-272, 2018-06-12)
lithium nitrate (7790-69-4)	
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Lithiumverbindungen, anorganische, mit Ausnahme von Lithium und stärker reizenden Lithiumverbindungen
AGW (OEL TWA)	0,2 mg/m³ (E)
Peak exposure limitation factor	1(I)
Remark	Y - Ein Risiko der Fruchtschädigung braucht bei Einhaltung des Arbeitsplatzgrenzwertes und des biologischen Grenzwertes (BGW) nicht befürchtet zu werden; 10 - Der Arbeitsplatzgrenzwert bezieht sich auf den Elementgehalt des entsprechenden Metalls; DFG - Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe der DFG (MAK-Kommission)
Regulatory reference	TRGS900
Sweden - Occupational Exposure Limits	
Local name	Litium och föreningar (som Li)
KGV (OEL STEL)	0,02 mg/m³ inhalerbar fraktion
Remark	3 (Med inhalerbar fraktion menas den mängd partiklar, av totalmängden partiklar i luften, som man inandas genom näsa och mun)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
Switzerland - Occupational Exposure Limits	
Local name	Lithium, comp. inorg. De / Lithiumverbindungen, anorganische
MAK (OEL TWA)	0,2 mg/m³ (i) / (e)
KZGW (OEL STEL)	0,2 mg/m³ (i) / (e)
Notation	SS _C / SS _C
Remark	OSHA. Exprimé en Li / OSHA. Als Li berechnet

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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lithium nitrate (7790-69-4)	
Regulatory reference	www.suva.ch, 01.01.2024
manganese dinitrate (10377-66-9)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Manganese
IOEL TWA	0,2 mg/m ³ (inhalable fraction) 0,05 mg/m ³ (respirable fraction)
Remark	(Year of adoption 2011)
Regulatory reference	SCOEL Recommendations
Austria - Occupational Exposure Limits	
Local name	Mangan und seine anorganischen Verbindungen: Mangan
MAK (OEL TWA)	0,2 mg/m ³ (als Mn berechnet, E) 0,05 mg/m ³ (als Mn berechnet, A)
MAK (OEL STEL)	1,6 mg/m ³ (als Mn berechnet, E, 4x 15(Miw) min) 0,16 mg/m ³ (als Mn berechnet, A, 4x 15(Miw) min)
Regulatory reference	BGBl. II Nr. 156/2021
Austria - Biological limit values	
Local name	Mangan
BLV	20 µg/l Parameter: Mangan - Untersuchungsmaterial: Blut
Remark	Eignung: Blut: nur bei Verdacht auf manganbedingte neurologische Symptomatik Eignung mit vorzeitiger Folgeuntersuchung: Bei Überschreiten des Grenzwertes für Mangan im Blut. Bei anhaltendem Husten oder Abfall des systolischen Blutdrucks. Bei Vorliegen einer wesentlichen Beeinträchtigung der Lungenfunktion. Diese liegt vor, wenn nach mehrmaliger Messung der beste gemessene Wert den für den/die Untersuchte/n maßgebenden Sollwert um 20% unterschreitet bzw. den MEF50-Sollwert um 50% unterschreitet. Eine vorzeitige Folgeuntersuchung ist jedoch nicht erforderlich, wenn im Vergleich zu Vorbefunden der altersabhängige physiologische Abfall der 1-Sekundenkapazität (FEV1) von 40 ml/Jahr nicht überschritten wird oder aus der Beurteilung des Kurvenverlaufes der Forcierten Vitalkapazität (FVC) eine eingeschränkte Mitarbeit des Untersuchten/der Untersuchten ersichtlich ist. Der Zeitabstand zwischen den Untersuchungen beträgt bei Eignung: ein Jahr; bei Eignung mit vorzeitiger Folgeuntersuchung: sechs Monate
Regulatory reference	Verordnung über die Gesundheitsüberwachung am Arbeitsplatz 2017 (VGÜ 2017)
Belgium - Occupational Exposure Limits	
Local name	Manganèse et ses composés (en Mn) # Mangaan, en -verbindingen (als Mn)
OEL TWA	0,2 mg/m ³
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Bulgaria - Occupational Exposure Limits	
Local name	Манган
OEL TWA	0,3 mg/m ³ оксид и неорганични съединения (като манган)
OEL STEL	3 mg/m ³ оксид и неорганични съединения (като манган)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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manganese dinitrate (10377-66-9)	
Croatia - Occupational Exposure Limits	
Local name	Mangan i anorganski spojevi mangana (kao Mn)
GVI (OEL TWA)	0,2 mg/m³ U (ukupna prašina) 0,05 mg/m³ R (respirabilna prašina) (Frakcija koja udisanjem može doprijeti u pluća)
Remark	Direktiva: 2017/164/EU
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Czech Republic - Occupational Exposure Limits	
Local name	Mangan
PEL (OEL TWA)	1 mg/m³
NPK-P (OEL C)	2 mg/m³
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Mangan, pulver, støv og uorganiske forbindelser
OEL TWA	0,2 mg/m³ beregnet som Mn 0,1 mg/m³ respirabel
Remark	E (betyder, at stoffet har en EF-grænseværdi)
Regulatory reference	BEK nr 291 af 19/03/2024
Finland - Occupational Exposure Limits	
Local name	Mangaani, metalli
HTP (OEL TWA)	0,02 mg/m³
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveystieteistön)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Mangan und seine anorganischen Verbindungen
AGW (OEL TWA)	0,02 mg/m³ A (mg/m3) 0,2 mg/m³ E (mg/m3)
Peak exposure limitation factor	8(II)
Remark	DFG,Y,10,20
Regulatory reference	TRGS900
Hungary - Occupational Exposure Limits	
Local name	MANGÁN ÉS SZERVETLEN SÓI (mangán-tetraoxid kivételével, Mn-ra számítva)
AK (OEL TWA)	5 mg/m³
CK (OEL STEL)	20 mg/m³
Remark	EU4 (2017/164 EU irányelvben közölt érték); Por: T (Azok az anyagok, amelyek egészségkárosító hatása TARTÓS expozíciót követően jelentkeznek), füst: R+T (Azok az anyagok, amelyek RÖVID és TARTÓS expozíciója is egészségkárosodást okoz)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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manganese dinitrate (10377-66-9)	
Ireland - Occupational Exposure Limits	
Local name	Manganese, fume (as Mn)
OEL TWA	0,2 mg/m³ I (Inhalable Fraction) 0,02 mg/m³ R (Respirable Fraction)
OEL STEL	3 mg/m³
Remark	Advisory OELV (Advisory Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2024
Latvia - Occupational Exposure Limits	
Local name	Mangānsmetināšanas aerosolos(kondensācijas aerosols)
OEL TWA	0,1 mg/m³
Regulatory reference	Ministru kabineta 2007. gada 15. maija noteikumiem Nr. 325 (Grozījumi Ministru kabineta 2024. gada 26. martā noteikumiem Nr. 191).
Netherlands - Occupational Exposure Limits	
Local name	Mangaan en anorganische mangaan-verbindingen
TGG-8u (OEL TWA)	0,2 mg/m³ (Inhaleerbaar (als mangaan))
TGG-15min (OEL STEL)	0,05 mg/m³ (Respirabel)
Regulatory reference	Arbeidsomstandighedenregeling 2024
Poland - Occupational Exposure Limits	
Local name	Mangan i jego związki nieorganiczne w przeliczeniu na Mn
NDS (OEL TWA)	0,3 mg/m³
Remark	Frakcja wdychalna – frakcja aerozolu wnikająca przez nos i usta, która stwarza zagrożenie dla zdrowia po zdeponowaniu w drogach oddechowych. Frakcja respirabilna – frakcja aerozolu wnikająca do dróg oddechowych, która stwarza zagrożenie dla zdrowia po zdeponowaniu w obszarze wymiany gazowej.
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Portugal - Occupational Exposure Limits	
Local name	Manganês e compostos inorgânicos, expressos em Mn
OEL TWA	0,02 mg/m³ R (Fração respirável) 0,1 mg/m³ I (Fração inalável)
Remark	A4 (Agente não classificável como carcinogénico no Homem)
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Mangan
OEL TWA	0,5 mg/m³
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 179/2024)
Slovenia - Occupational Exposure Limits	
Local name	mangan in njegove anorganske spojine vključno strimanganovim tetraoksidom
OEL TWA	0,5 mg/m³

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manganese dinitrate (10377-66-9)	
OEL STEL	2 mg/m³
Remark	Y (Snovi, pri katerih ni nevarnosti za zarodek ob upoštevanju mejnih vrednosti in bat vrednosti), EU
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Spain - Occupational Exposure Limits	
Local name	Manganeso
VLA-ED (OEL TWA)	0,2 mg/m³ elemental. Fracción inhalable 0,2 mg/m³ Compuestos inorgánicos de Manganeso, como Mn. Fracción inhalable 0,05 mg/m³ elemental. Fracción respirable 0,05 mg/m³ Compuestos inorgánicos de manganeso, como Mn. Fracción respirable
Remark	VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo), d (Véase UNE EN 481: Atmósferas en los puestos de trabajo. Definición de las fracciones por el tamaño de las partículas para la medición de aerosoles).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	Mangan, och oorg. föreningar (som Mn)
NGV (OEL TWA)	0,2 mg/m³ totaldamm 0,1 mg/m³ respirabelt damm
Remark	3 (Med inhalerbar fraktion menas den mängd partiklar, av totalmängden partiklar i luften, som man inandas genom näsa och mun. Den respirabla fraktionen är de inhalerbara partiklar som når längst ner i luftvägarna, till alveolerna i lungorna)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
WEL TWA (OEL TWA)	0,05 mg/m³ and its inorganic compounds (as Mn) respirable dust
Iceland - Occupational Exposure Limits	
Local name	Mangan, duft, ryk (heildarryk) og ólífræn bindiefni, sem Mn
OEL TWA	2,5 mg/m³ heildarryk 1 mg/m³ örfínt ryk
OEL STEL	5 mg/m³ heildarryk
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Norway - Occupational Exposure Limits	
Local name	Mangan og uorganiske manganforb. (beregnet som Mn)
Grenseverdi (OEL TWA)	0,2 mg/m³ Inhalerbar fraksjon 0,05 mg/m³ Respirabel fraksjon
Remark	E: EU har en veiledende grenseverdi og/eller anmerkning for stoffet; 8) Enkelte bedrifter innen smelteverkindustrien vil av teknisk-økonomiske årsaker ikke kunne overholde grenseverdiene. Det er disse bedriftenes ansvar å dokumentere et forsvarlig arbeidsmiljø. Det forutsettes at bedriften(e) har en plan for reduksjon av eksponering og at man kan vise lavere verdier over tid. Arbeidstilsynet, ansattrepresentanter og verneombud skal konsulteres og informeres om årlige planer og oppnådde resultater.

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manganese dinitrate (10377-66-9)	
Regulatory reference	FOR-2024-04-05-581
North Macedonia - Occupational Exposure Limits	
Local name	Манган и неоргански соединенија
OEL TWA	0,5 mg/m ³ (I) инхалабилна фракција – дел на вкупно суспендирани материи, кои работникот ги вдишува
KTV	4
Short time value [mg/m ³]	2 mg/m ³
Remark	(KTV) краткотрајна вредност (КТВ) значи концентрација на опасни хемиски супстанции во воздухот на работното место внатре во зона на дишење, на која работникот без опасност по здравјето може да е изложен на покусо време. Изложеноста на краткотрајни вредности може да трае највеќе 15 минути и не смее да се повтори повеќе од четирипати во работната смена, при што меѓу две изложености на оваа концентрација мора да измине најмалку 60 минути. Краткотрајната вредност е изразена во mg/m ³ или во ml/m ³ (ppm) а е дадена како многукратни дозволени пречекорувања на граничната вредност; (Y)
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанции („Службен весник на Република Македонија“ бр.46/10)
Switzerland - Occupational Exposure Limits	
Local name	Manganèse et ses composés inorg. / Mangan und seine anorganischen Verbindungen
MAK (OEL TWA)	0,2 mg/m ³ (i) / (e) 0,1 mg/m ³ (a) / (a)
Notation	SS _C / SS _C
Remark	NIOSH. Exprimé en Mn / NIOSH. Als Mn berechnet
Regulatory reference	www.suva.ch, 01.01.2024
USA - ACGIH - Occupational Exposure Limits	
Local name	Manganese, elemental and inorganic compounds, as Mn
ACGIH OEL TWA	0,02 mg/m ³ (R - Respirable particulate matter) 0,1 mg/m ³ (I - Inhalable particulate matter)
Remark (ACGIH)	TLV® Basis: CNS impair. Notations: A4 (Not classifiable as a Human Carcinogen)
Regulatory reference	ACGIH 2024
nickel dinitrate (13138-45-9)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Nickel nitrate
IOEL TWA	0,005 mg/m ³ (respirable fraction) 0,01 mg/m ³ (inhalable fraction)
Remark	(Year of adoption 2011)
Regulatory reference	SCOEL Recommendations
EU - Biological Limit Value (BLV)	
Local name	Nickel and nickel compounds

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nickel dinitrate (13138-45-9)	
Regulatory reference	SCOEL List of recommended health-based BLVs and BGVs
Austria - Occupational Exposure Limits	
Local name	Nickel (Stäube von Nickelmetall, Nickelsulfid und sulfidischen Erzen, Nickeloxide und Nickelcarbonat) und Stäube von Nickelverbindungen und Nickellegierungen
MAK (OEL TWA)	0,5 mg/m³
MAK (OEL STEL)	2 mg/m³
TRK (OEL TWA)	0,5 mg/m³ (als Ni berechnet, E)
TRK (OEL STEL)	2 mg/m³ (als Ni berechnet, E, 4x 15(Miw) min)
Remark	Sah. Krebszeugend: III A1
Regulatory reference	BGBI. II Nr. 156/2021
Austria - Biological limit values	
Local name	Nickel
BLV	7 µg/l Parameter: Nickel - Untersuchungsmaterial: Harn
Remark	Eignung mit vorzeitiger Folgeuntersuchung: Bei Überschreiten des Grenzwertes für Nickel im Harn. Bei Vorliegen einer wesentlichen Beeinträchtigung der Lungenfunktion. Diese ist anzunehmen, wenn nach mehrmaliger Messung der beste gemessene Wert den für den/die Untersuchte/n maßgebenden Sollwert um 20% unterschreitet, bzw. den MEF50-Sollwert um 50% unterschreitet. Eine vorzeitige Folgeuntersuchung ist jedoch nicht erforderlich, wenn im Vergleich zu Vorbefunden der altersabhängige physiologische Abfall der 1 Sekundenkapazität (FEV1) von 40 ml/Jahr nicht überschritten wird oder aus der Beurteilung des Kurvenverlaufes der Forcierten Vitalkapazität (FVC) eine eingeschränkte Mitarbeit des Untersuchten/der Untersuchten ersichtlich ist. Der Zeitabstand zwischen den Untersuchungen beträgt bei Eignung: ein Jahr; bei Eignung mit vorzeitiger Folgeuntersuchung: sechs Monate.
Regulatory reference	Verordnung über die Gesundheitsüberwachung am Arbeitsplatz 2017 (VGÜ 2017)
Bulgaria - Biological limit values	
Local name	Никел метал, разтворими съединения, никелов сулфат, никелов хром-фосфат (като никел)
BLV	45 µg/l Биомаркер за експозиция/биомаркер за ефект: никел - Биологична среда: урина - Време на пробовземане: След няколко работни смени - Специфични ефекти: Няма
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Croatia - Occupational Exposure Limits	
Local name	Nikal
GVI (OEL TWA)	0,5 mg/m³
Remark	T (otrovno); Karc. kat. 3 (tvari koje izazivaju zabrinutost zbog mogućeg karcinogenog djelovanja na ljude)
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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nickel dinitrate (13138-45-9)	
Croatia - Biological limit values	
Local name	Nikal (topljivi spojevi)
BLV	0,17 µmol/l Karakteristični pokazatelj: nikal - Biološki uzorak: plazma - Vrijeme uzorkovanja: na kraju radne smjene 10 µg/l Karakteristični pokazatelj: nikal - Biološki uzorak: plazma - Vrijeme uzorkovanja: na kraju radne smjene 15,4 µmol/mol creatinine Karakteristični pokazatelj: nikal - Biološki uzorak: mokraća - Vrijeme uzorkovanja: na kraju radne smjene 8 µg/g creatinine Karakteristični pokazatelj: nikal - Biološki uzorak: mokraća - Vrijeme uzorkovanja: na kraju radne smjene
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 91/2018)
Czech Republic - Occupational Exposure Limits	
Local name	Nikl
PEL (OEL TWA)	0,5 mg/m³
Remark	B - u látky je zaveden biologický expoziční test (BET) v moči nebo krvi, S - látka má senzibilizující účinek (s větou H317, H334), P - u látky nelze vyloučit závažné pozdní účinky (s větou H372, H373).
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Czech Republic - Biological limit values	
Local name	Nikl
BLV	0,04 mg/g creatinine Ukazatel: Nikl - Biologický vzorek: moči - Doba odběru: nerozhoduje 0,077 µmol/mmol Creatinine Ukazatel: Nikl - Biologický vzorek: moči - Doba odběru: nerozhoduje
Regulatory reference	Vyhláška č. 107/2013 Sb. (kterou se mění vyhláška č. 432/2003 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Nikkel, pulver og støv
OEL TWA	0,05 mg/m³ beregnet som Ni
Remark	K (betyder, at stoffet anses for at kunne være kræftfremkaldende)
Regulatory reference	BEK nr 291 af 19/03/2024
Estonia - Occupational Exposure Limits	
Local name	Nikkel, metall
OEL TWA	0,5 mg/m³
Remark	S (Sensibiliseeriv aine)
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)
Finland - Occupational Exposure Limits	
Local name	Nikkeli, metalli
HTP (OEL TWA)	0,01 mg/m³
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)

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nickel dinitrate (13138-45-9)	
Finland - Biological limit values	
Local name	Nikkeli, metalli
BLV	0,1 µmol/l Parametri: Virtsan nikkeli - Näytteenottoajankohta: Työvuoron päätyttyä työviikon tai altistumisjakson loputtua
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
France - Occupational Exposure Limits	
Local name	Nickel (métal)
VME (OEL TWA)	1 mg/m³
Remark	Valeurs recommandées/admises; substance classée cancérogène de catégorie 2
Regulatory reference	Circulaire du Ministère du travail (réf.: INRS ED 6443, 2022; Outil65)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Nickel und Nickelverbindungen
AGW (OEL TWA)	0,006 mg/m³ A (mg/m³)
Peak exposure limitation factor	8(II)
Remark	AGS,10,Sh,Y
Regulatory reference	TRGS900
Germany - Occupational Exposure Limits (TRGS 910)	
Local name	Nickelverbindungen, als Carc. 1A, Carc. 1B eingestuft
Acceptable concentration (Weight conc.)	6 µg/m³ (A)
Notes	b) Akzeptanzkonzentration assoziiert mit Risiko 4:10000
Tolerance concentration (Weight conc.)	6 µg/m³ (A)
Tolerance concentration excess factor	8
Remark	(2) Die Toleranzkonzentration wurde gemäß Nummer 3.2.1 aufgrund einer nicht krebs-erzeugenden Wirkung festgelegt. Bei Überschreitung gelten die gleichen Maßnahmen wie bei Überschreitung des AGW.; (3) Nickelmetall siehe TRGS 900; (4) Die Konzentrationen beziehen sich auf den Elementgehalt des entsprechenden Metalls.; Siehe TRGS 561
Regulatory reference	TRGS 910
Hungary - Biological Exposure Indices	
Local name	Nikkel
BEI	0,003 mg/l Biológiai expozíció (hatás) mutató: nikkel - Biológiai minta: vizeletben - Mintavétel ideje: mhv., m.v. (munkahét végén, műszak végén) 0,051 µmol/l Biológiai expozíció (hatás) mutató: nikkel - Biológiai minta: vizeletben - Mintavétel ideje: mhv., m.v. (munkahét végén, műszak végén)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Biological limit values	
Local name	Nickel
BMGV	3 µg/l Parameter: Ni - Medium: urine - Sampling time: After several consecutive working shifts

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nickel dinitrate (13138-45-9)	
Regulatory reference	Biological Monitoring Guidelines (HSA, 2011)
Lithuania - Occupational Exposure Limits	
Local name	Nikelis
IPRV (OEL TWA)	0,5 mg/m³
Remark	K (kancerogeninis poveikis); J (jautrinantis poveikis)
Regulatory reference	LIETUVOS HIGIENOS NORMA HN 23:2011 (Nr. V-695/A1-272, 2018-06-12)
Poland - Occupational Exposure Limits	
Local name	Nikiel i jego związki, z wyjątkiem tetrakarbonylku niklu (niklu karbonylku) w przeliczeniu na Ni
NDS (OEL TWA)	0,25 mg/m³
Portugal - Occupational Exposure Limits	
Local name	Níquel, expresso em Ni Elementar
OEL TWA	1,5 mg/m³ I (Fração inalável)
Remark	A5 (Agente não suspeito de ser carcinogénico no Homem)
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Nichel și compuși
OEL TWA	0,1 mg/m³
OEL STEL	0,5 mg/m³
Slovenia - Occupational Exposure Limits	
Local name	nikelj – kovina
OEL TWA	0,006 mg/m³
OEL STEL	0,048 mg/m³
Remark	Y (Snovi, pri katerih ni nevarnosti za zarodek ob upoštevanju mejnih vrednosti in bat vrednosti)
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Spain - Occupational Exposure Limits	
Local name	Níquel metal
VLA-ED (OEL TWA)	1 mg/m³
Remark	Sen (Sensibilizante), r (Esta sustancia tiene establecidas restricciones a la fabricación, la comercialización o el uso en los términos especificados en el “Reglamento (CE) nº 1907/2006 sobre Registro, Evaluación, Autorización y Restricción de sustancias y preparados químicos” (REACH) de 18 de diciembre de 2006 (DOUE L 369 de 30 de diciembre de 2006). Las restricciones de una sustancia pueden aplicarse a todos los usos o sólo a usos concretos. El anexo XVII del Reglamento REACH contiene la lista de todas las sustancias restringidas y especifica los usos que se han restringido).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT

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nickel dinitrate (13138-45-9)	
Sweden - Occupational Exposure Limits	
Local name	Nickel, metall
NGV (OEL TWA)	0,5 mg/m³ totaldamm
Remark	S (Ämnet är sensibiliserande. Sensibiliserande ämnen kan ge allergi eller annan överkänslighet. Överkänslighetsbesvären drabbar främst huden eller andningsorganen. Överkänslighet innebär att man reagerar vid kontakt med ämnen som normalt inte ger besvär. Allergi är en undergrupp av överkänslighet som orsakas av reaktioner i kroppens immunsystem. Särskilt låga gränsvärden har fastställts för ämnen med mer uttalat luftvägssensibiliserande egenskaper. Några ämnen med starkt sensibiliserande egenskaper får endast hanteras efter tillstånd från Arbetsmiljöverket, se föreskrifterna om kemiska arbetsmiljörisker. Dessa ämnen har inga gränsvärden men i vissa fall riktvärden); 3 (Med totaldamm menas de partiklar (aerosoler) som fastnar på ett filter i den provtagare som beskrivs i Metodserien, Provtagning av totaldamm och respirabelt damm, Metod nr 1010, Arbetarskyddsstyrelsen, numera Arbetsmiljöverket. Filterdiameteren är normalt 37 mm, men kan även vara 25 mm. Trots sitt namn provtas inte den totala mängden luftburna partiklar med denna metod)
Regulatory reference	Hygieniska gränsvärden (AFS 2022:5)
United Kingdom - Occupational Exposure Limits	
Local name	Nickel
WEL TWA (OEL TWA)	0,1 mg/m³ Nickel, water-soluble inorganic compounds (as Ni); United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005)
Remark	Sk (Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity), Carc (nickel oxides and sulphides)(Capable of causing cancer and/or heritable genetic damage. See paragraphs 49–51), Sen (nickel sulphate)(Capable of causing occupational asthma. See paragraphs 53–56)
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Nikkel, duft og ryk, sem Ni
OEL TWA	0,05 mg/m³
Remark	O,K
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Switzerland - Occupational Exposure Limits	
Local name	Nickel, sels solubles / Nickelsalze, löslich
MAK (OEL TWA)	0,05 mg/m³ (i) / (e)
Notation	S, C1 _A / S, C1 _A
Remark	NIOSH. Exprimé en Ni / NIOSH. Als Ni berechnet
Regulatory reference	www.suva.ch, 01.01.2024
USA - ACGIH - Occupational Exposure Limits	
Local name	Nickel, elemental

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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nickel dinitrate (13138-45-9)	
ACGIH OEL TWA	0,1 mg/m³ (Nickel, Soluble inorganic compounds (NOS), as Ni; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value; Inhalable fraction)
Remark (ACGIH)	TLV® Basis: Dermatitis; pneumoconiosis. Notations: A5 (Not Suspected as a Human Carcinogen)
Regulatory reference	ACGIH 2024
lead nitrate (10099-74-8)	
EU - Biological Limit Value (BLV)	
Local name	Lead and its inorganic compounds
BLV	15 µg/100ml Parameter: Pb - Medium: blood - Notations: BBLV. For workers whose blood lead level exceeds the biological limit value of 15 µg Pb/100 ml blood due to exposure which has occurred before 9 April 2026, but is below 30 µg Pb/100 ml blood, medical surveillance is carried out on a regular basis. If a declining trend towards the limit value of 15 µg Pb/100 ml blood is established in those workers, they may be allowed to continue with work involving exposure to lead. 30 µg/100ml Until 31 December 2028 - Parameter: Pb - Medium: blood - Notations: BBLV. For workers whose blood lead level exceeds the biological limit value of 30 µg Pb/100 ml blood due to exposure which has occurred before 9 April 2026, but is below 70 µg Pb/100 ml blood, medical surveillance is carried out on a regular basis. If a declining trend towards the limit value of 30 µg Pb/100 ml blood is established in those workers, they may be allowed to continue with work involving exposure to lead.
Remark	Medical surveillance is carried out if exposure to a concentration of lead in air is greater than 0,015 mg/m3, calculated as a time-weighted average over 40 hours per week, or a blood lead level greater than 9 µg Pb/100 ml blood is measured in individual workers. Medical surveillance is also carried out with regard to female workers of childbearing age whose blood lead level exceeds 4,5 µg Pb/100 ml blood or the national reference value of the general population not occupationally exposed to lead, if such a value exists.
Regulatory reference	DIRECTIVE (EU) 2024/869 (amending Directive 2004/37/EC)
Austria - Occupational Exposure Limits	
Local name	Blei und seine Verbindungen außer Bleiarsenat, Bleichromat, Bleichromatoxid und Alkylbleiverbindungen
MAK (OEL TWA)	0,1 mg/m³
MAK (OEL STEL)	0,4 mg/m³
Remark	Fortpflanzungsgefährdend: F, D, L
Regulatory reference	BGBI. II Nr. 156/2021
Austria - Biological limit values	
Local name	Blei

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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lead nitrate (10099-74-8)	
BLV	10 g/dl Parameter: Hämoglobin - Untersuchungsmaterial: Blut - Mitarbeiter/innen: Frauen 12 g/dl Parameter: Hämoglobin - Untersuchungsmaterial: Blut - Mitarbeiter/innen: Männer 30 % Parameter: Hämatokrit - Untersuchungsmaterial: Blut - Mitarbeiter/innen: Frauen 35 % Parameter: Hämatokrit - Untersuchungsmaterial: Blut - Mitarbeiter/innen: Männer 120 µg/100ml Parameter: RCB (EPP) - Untersuchungsmaterial: Blut 30 µg/100ml Parameter: Blei - Untersuchungsmaterial: Blut 10 mg/l Parameter: ALA-U - Untersuchungsmaterial: Harn - Mitarbeiter/innen: Davis; Männer, Frauen > 50 a 6 mg/l Parameter: ALA-U - Untersuchungsmaterial: Harn - Mitarbeiter/innen: Davis; Frauen ≤ 50 a
Remark	Eignung: Blut: Erythrozyten: 3,2 Millionen/µl für Frauen, 3,8 Millionen/µl für Männer Eignung mit vorzeitiger Folgeuntersuchung: Bei Überschreiten bzw. Unterschreiten der Grenzwerte im Blut oder im Harn. Der Zeitabstand zwischen den Untersuchungen beträgt bei Eignung: ein Jahr; für Glas- und Akkumulatorenarbeiten drei Monate; für Rostschutzarbeiten (einschließlich Trennen und Schneiden von rostschutzbeschichteten Teilen) vier Wochen, bei Eignung mit vorzeitiger Folgeuntersuchung: drei Monate; für Glas- und Akkumulatorenarbeiten sechs Wochen; für Rostschutzarbeiten zwei Wochen
Regulatory reference	Verordnung über die Gesundheitsüberwachung am Arbeitsplatz 2017 (VGÜ 2017)
Bulgaria - Biological limit values	
Local name	Олово
BLV	400 µg/l Биомаркер за експозиция/биомаркер за ефект: олово - Биологична среда: кръв - Време на пробовземане - Не се фиксира - Специфични ефекти: Няма 300 µg/l Биомаркер за експозиция/биомаркер за ефект: олово - Биологична среда: кръв - Време на пробовземане - Не се фиксира - Специфични ефекти: Няма - Тази стойност е определена за жени на възраст под 45 години (1/10)
Remark	Медицинско наблюдение се извършва, ако експозицията на концентрация на олово във въздуха е по-голяма от 0,05 mg/m ³ , изчислена като средно претеглена във времето стойност за 40 часа седмично, или когато при отделни работници се измерва ниво на олово в кръвта, по-високо от 40 µg Pb/100 ml кръв.
Regulatory reference	Наредба № 10 от 26.09.2003 г. за защита на работещите от рискове, свързани с експозиция на канцерогени и мутагени при работа (изм. и доп. ДВ. бр. 28 от 2 Април 2024г.)
Croatia - Occupational Exposure Limits	
Local name	Olovo i njegovi anorganski spojevi (kao Pb)*
GVI (OEL TWA)	0,15 mg/m ³
Remark	EU0 (naznaka da se radi o tvarima za koje su utvrđene obvezujuće granične vrijednosti izloženosti prema Direktivi 2003/18/ EC, Direktivi 99/38/EC i Direktivi 98/24/EC); T (otrovno); N (opasno za okoliš); Repr. kat. 1 (tvari za koje se zna da smanjuju plodnost kod ljudi i/ili – tvari za koje se zna da iskazuju razvojnu toksičnost kod ljudi); Repr. kat. 3 (tvari za koje se pretpostavlja da bi mogle smanjiti plodnost kod ljudi i/ili – tvari za koje se pretpostavlja da bi mogle iskazati razvojnu otrovnost kod ljudi)
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Croatia - Biological limit values	
Local name	Olovo (elementarno i anorganski spojevi)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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lead nitrate (10099-74-8)	
BLV	400 µg/l Karakteristični pokazatelj: olovo - Biološki uzorak: krv - Vrijeme uzorkovanja: nije kritično - Napomena: muškarci 300 µg/l Karakteristični pokazatelj: olovo - Biološki uzorak: krv - Vrijeme uzorkovanja: nije kritično - Napomena: žene <45 god 15 U/LE Karakteristični pokazatelj: dehidrataza δ – aminolevulinske kiseline - Biološki uzorak: krv - Vrijeme uzorkovanja: nije kritično 2,67 µmol/LE Karakteristični pokazatelj: protoporin u eritrocitima - Biološki uzorak: krv - Vrijeme uzorkovanja: nakon izloženosti tijekom 2-3 mjeseca (uzorak zaštititi od svjetla) - Napomena: interferencija manjka željeza (sideropenična anemija) 1,5 mg/LE Karakteristični pokazatelj: protoporin u eritrocitima - Biološki uzorak: krv - Vrijeme uzorkovanja: nakon izloženosti tijekom 2-3 mjeseca (uzorak zaštititi od svjetla) - Napomena: interferencija manjka željeza (sideropenična anemija)
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 91/2018)
Czech Republic - Occupational Exposure Limits	
Local name	Olovo
PEL (OEL TWA)	0,05 mg/m³
NPK-P (OEL C)	0,2 mg/m³
Remark	B(2) - u látky je zaveden biologický expoziční test (BET) v moči nebo krvi (Pro hodnocení expozice u olova je rozhodující výsledek vyšetření plumbémie), T - toxická pro reprodukci kategorie 1A a 1B (s větou H360 včetně příslušných kódů).
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Czech Republic - Biological limit values	
Local name	Olovo
BLV	15 mg/g creatinine Ukazatel: 5-Aminolevulová kyselina - Biologicky vzorek: moči - Doba odběru: nerozhoduje 13 µmol/mmol Creatinine Ukazatel: 5-Aminolevulová kyselina - Biologicky vzorek: moči - Doba odběru: nerozhoduje 0,2 mg/g creatinine Ukazatel: Koproporfyryn - Biologicky vzorek: moči - Doba odběru: nerozhoduje 0,035 µmol/mmol Creatinine Ukazatel: Koproporfyryn - Biologicky vzorek: moči - Doba odběru: nerozhoduje 0,4 mg/l Ukazatel: Olovo - Biologicky vzorek: krvi - Doba odběru: nerozhoduje
Remark	Vhodné pro krátkodobé kontinuální expozice osob nepřekračující 30 kalendářních dnů.
Regulatory reference	Vyhláška č. 107/2013 Sb. (kterou se mění vyhláška č. 432/2003 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Bly, pulver, støv, røg og uorganiske forbindelser
OEL TWA	0,05 mg/m³ beregnet som Pb
Remark	E (betyder, at stoffet har en EF-grænseværdi)
Regulatory reference	BEK nr 291 af 19/03/2024
Denmark - Biological limit values	
Local name	Bly, pulver, støv, røg og uorganiske forbindelser
BLV	20 µg Pb/100 ml blood Stof: bly - Biologisk materiale: blod
Regulatory reference	BEK nr 291 af 19/03/2024

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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lead nitrate (10099-74-8)	
Estonia - Occupational Exposure Limits	
Local name	Plii j aanorgaanilised ühendid, (arvutatudpliile) kogutolm
OEL TWA	0,1 mg/m ³
Remark	R (Reproduktiivtoksiline aine), 7 (Pliile on kehtestatud ka bioloogiline piirnorm). Pentoolm: 1 (Peentolm koosneb alla 2,5-mikromeetrise läbimõõduga osakestest, mis võivad koos sissehingatava õhuga jõuda kopsualveoolidesse)
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)
Finland - Occupational Exposure Limits	
Local name	Lyijy, metalli
BOEL TWA	0,1 mg/m ³ Pb
Remark	Melu
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
Finland - Biological limit values	
Local name	Lyijy, metalli
BLV	1,4 µmol/l Parametri: Veren lyijy - Näytteenottoajankohta: Vuorokaudenajalla ei merkitystä
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
France - Occupational Exposure Limits	
VME (OEL TWA)	0,1 mg/m ³ (Plomb métallique et composés, en Pb; France; Time-weighted average exposure limit 8 h; VRC: Valeur réglementaire contraignante)
Germany - Biological limit values (TRGS 903)	
Local name	Blei
Biological limit value	150 µg/l Parameter: Blei - Untersuchungsmaterial: B = Vollblut - Probenahmezeitpunkt: a) keine Beschränkung - Festlegung/Begründung: 05/2017 AGS
Regulatory reference	TRGS 903
Gibraltar - Occupational Exposure Limits	
Local name	Inorganic lead and its compounds
OEL TWA	0,15 mg/m ³
Regulatory reference	Factories (Control of Chemical Agents at Work) Regulations 2003 (LN. 2018/181)
Greece - Occupational Exposure Limits	
Local name	Ανόργανος μόλυβδος και ενώσεις του
OEL TWA	0,15 mg/m ³
Regulatory reference	Π.Δ. 339/2001 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Hungary - Occupational Exposure Limits	
Local name	ÓLOM és SZERVETLEN VEGYÜLETEI (Pb-ra számítva)
AK (OEL TWA)	0,15 mg/m ³

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lead nitrate (10099-74-8)	
Remark	i (ingerlő anyag, amely izgatja a bőrt, nyálkahártyát, szemet vagy mindhármat), BEM (biológiai expozíciós mutató), BHM (biológiai hatásmutató); T (Azok az anyagok, amelyek egészségkárosító hatása TARTÓS expozíciót követően jelentkezik)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Hungary - Biological Exposure Indices	
Local name	Ólom (szervetlen)
BEI	300 µg/l Biológiai expozíciós mutató: Ólom - Biológiai minta: vérben - Mintavétel ideje: n.k. (nem kritikus) - Érintettek köre: férfiak és 45 évnél idősebb nők 1,5 µmol/l Biológiai expozíciós mutató: Ólom - Biológiai minta: vérben - Mintavétel ideje: n.k. (nem kritikus) - Érintettek köre: férfiak és 45 évnél idősebb nők 200 µg/l Biológiai expozíciós mutató: Ólom - Biológiai minta: vérben - Mintavétel ideje: n.k. (nem kritikus) - Érintettek köre: 45 évnél fiatalabb nők 1 µmol/l Biológiai expozíciós mutató: Ólom - Biológiai minta: vérben - Mintavétel ideje: n.k. (nem kritikus) - Érintettek köre: 45 évnél fiatalabb nők 100 Biológiai hatás mutató: Cink-protoporfirin előszűrésre - Biológiai minta: vérben - Mintavétel ideje: három hónapnál hosszabb expozíció esetén alkalmazható - Érintettek köre: férfiak és 45 évnél idősebb nők - Megjegyzés: határérték túllépése esetén a vérólom koncentráció meghatározása kötelező 80 Biológiai hatás mutató: Cink-protoporfirin előszűrésre - Biológiai minta: vérben - Mintavétel ideje: három hónapnál hosszabb expozíció esetén alkalmazható - Érintettek köre: 45 évnél fiatalabb nők - Megjegyzés: határérték túllépése esetén a vérólom koncentráció meghatározása kötelező
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Biological limit values	
Local name	Lead and its ionic compounds
BLV	70 µg/100ml Parameter: lead - Medium: blood - Notations: Absorption spectrometry or a method giving equivalent results
Remark	Binding biological limit value. Health surveillance is carried out if: a. exposure to a concentration of lead in air is greater than 0.075mg/m ³ , calculated as a time-weighted average over 40 hours per week, or b. a blood-lead level greater than 40µg Pb/100 ml blood is measured in individual employees.
Regulatory reference	Chemical Agents Code of Practice 2024
Netherlands - Occupational Exposure Limits	
Local name	Lood
TGG-8u (OEL TWA)	0,15 mg/m ³ (en anorganische loodverbindingen)
Remark	(zie tevens artikel 4.19a Arbeidsomstandighedenregeling)
Regulatory reference	Arbeidsomstandighedenregeling 2024
Netherlands - Biological limit values	
Local name	Lood en anorganische loodverbindingen
BLV	70 µg/100ml Het loodgehalte in het bloed
Regulatory reference	Arbeidsomstandighedenregeling 2024

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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lead nitrate (10099-74-8)	
Portugal - Occupational Exposure Limits	
Local name	Chumbo elementar e compostos inorgânicos , expressos em Pb
OEL TWA	0,05 mg/m³
Remark	A3 (Agente carcinogénico confirmado nos animais de laboratório con relevância desconhecida no Homem); IBE (Índice biológico de exposição)
Regulatory reference	Norma Portuguesa NP 1796:2014
Portugal - Biological Exposure Indices	
Local name	Chumbo
BEI	30 µg/100ml Parâmetro: Chumbo - Meio: sangue - Momento da amostragem: Não crítico
Remark	Mulheres em idade de gestação, cujo teor de chumbo no sange exceda 10 µg/dl, estão em risco de gerar uma criança com um teor de chumbo no sangue superior ao valor de referência de 10 µg/dl do CDC ("Centre for Disease Control"). Se o teor de chumbo no sangue dessas crianças permanecer elevado, podem estar sujeitas a um risco agravado de contrair défices cognitivos. O teor de chumbo no sangue dessas crianças deve ser monitorizado e devem ser tomar medidas para que a exposição ao chumbo seja reduzida
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Plumb și compuși (în afară de PbS)
OEL TWA	0,05 mg/m³
OEL STEL	0,1 mg/m³
Slovakia - Occupational Exposure Limits	
NPHV (OEL TWA)	0,5 mg/m³ inhalovateľná frakcia
Spain - Occupational Exposure Limits	
Local name	Plomo
VLA-ED (OEL TWA)	0,15 mg/m³ elemental 0,15 mg/m³ Compuestos inorgánicos de plomo, como Pb
Remark	k (Véase el Real Decreto 374/2001, de 6 de abril (BOE nº 104 de 1 de mayo de 2001), sobre la protección de la salud y seguridad de los trabajadores contra los riesgos relacionados con los agentes químicos durante el trabajo), VLB® (Agente químico que tiene Valor Límite Biológico específico en este documento), TR1A (Cuando las pruebas utilizadas para la clasificación procedan principalmente de datos en humanos).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Spain - Biological limit values	
Local name	Plomo y sus derivados iónicos
BLV	70 µg/dl Parámetro: Plomo - Medio: Sangre - Momento de muestreo: No crítico - Notas: k
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	Bly, och oorg. föreningar (som Pb)
NGV (OEL TWA)	0,05 mg/m³ respirabelt damm 0,1 mg/m³ inhaledbart damm

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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lead nitrate (10099-74-8)	
Remark	B (Ämnet kan orsaka hörselskada. Exponering för ämnet nära det befintliga yrkeshygieniska gränsvärdet och vid samtidig exponering för buller nära insatsvärdet 80 dB kan orsaka hörselskada); M (Medicinska kontroller kan krävas för hantering av ämnet. Se vidare föreskrifterna om medicinska kontroller i arbetslivet. För vissa ämnen ska arbetsgivaren erbjuda läkarundersökning och för andra ämnen gäller krav på periodisk läkarundersökning och tjänstbarhetsbedömning); R (Ämnet är reproduktionsstörande. Med reproduktionsstörande ämnen avses ämnen som kan medföra skadliga effekter på fortplantningsförmågan eller avkommans utveckling); 3 (Med inhalerbar fraktion menas den mängd partiklar, av totalmängden partiklar i luften, som man inandas genom näsa och mun. Den respirabla fraktionen är de inhalerbara partiklar som når längst ner i luftvägarna, till alveolerna i lungorna); 14 (För bly och kadmium finns biologiska gränsvärden. Även kvicksilver kan mätas biologiskt)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
Sweden - Biological limit values	
Local name	Bly
BLV	0,5 µmol/l Blyhalten i blod för kvinnor under 50 år 1,5 µmol/l Blyhalten i blod för kvinnor som har fyllt 50 år och män
Regulatory reference	Medicinska kontroller i arbetslivet (AFS 2019:3)
United Kingdom - Occupational Exposure Limits	
WEL TWA (OEL TWA)	15 mg/cm ³ Lead other than lead alkyls; United Kingdom; Time-weighted average exposure limit 8 h; Occupational exposure limit (Control of lead at work)
Iceland - Occupational Exposure Limits	
Local name	Blý, duft, ryk, reykur, ólífræn sambönd, sem Pb
OEL TWA	0,05 mg/m ³
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
North Macedonia - Occupational Exposure Limits	
Local name	Олово и неговите соединенија (сметано како Pb) освен оловен арсенат, олово хромат и алкилоловни соединенија
OEL TWA	0,1 mg/m ³ (l) инхалабилна фракција – дел на вкупно суспендирани материји, кои работникот ги вдишува
KTV	4
Short time value [mg/m ³]	0,4 mg/m ³

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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lead nitrate (10099-74-8)	
Remark	(KTV) краткотрајна вредност (КТВ) значи концентрација на опасни хемиски супстанции во воздухот на работното место внатре во зона на дишење, на која работникот без опасност по здравјето може да е изложен на покусно време. Изложеноста на краткотрајни вредности може да трае највеќе 15 минути и не смее да се повтори повеќе од четирипати во работната смена, при што меѓу две изложености на оваа концентрација мора да измине најмалку 60 минути. Краткотрајната вредност е изразена во mg/m ³ или во ml/m ³ (ppm) а е дадена како многукратни дозволени пречекорувања на граничната вредност; (BAT) биолошка гранична вредност – праг на биолошка гранична вредност, што значи предупредување на опасна хемиска супстанца и нејзини метаболити во ткивата, телесните течности или издишувањето на воздухот, без оглед на тоа, дали опасната хемиска супстанца е внесена во организмот со вдишување, голтање или преку кожата; (EU) European Union – гранична вредност, определена на ниво на Европската унија
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанции („Службен весник на Република Македонија“ бр.46/10)
Switzerland - Occupational Exposure Limits	
Local name	Blei und seine Verbindungen, außer Alkylverbindungen (als Pb berechnet)
MAK (OEL TWA)	0,1 mg/m ³
KZGW (OEL STEL)	0,8 mg/m ³
Notation	C2, R1 _A , SS _B , B / C2, R1 _A , SS _B , B
Remark	e(mg/m ³) - B C2 R2 _F R1 _{AD} SS _B - NS, Blut - HSE, NIOSH
Regulatory reference	www.suva.ch, 01.01.2024
Switzerland - BAT	
Local name	Plomb et ses composés (sauf les alcoylés) / Blei und seine Verbindungen (ausser Alkylverbindungen)
BAT	100 µg/l (0.48 µmol/l; Paramètre biologique: Plomb (femmes < 45 ans); Substrat d'examen: Sang complet; Moment du prélèvement: Indifférent.) / (0.48 µmol/l; Biologischer Parameter: Blei (Frauen < 45 Jahre); Untersuchungsmaterial: Vollblut; Probennahmezeitpunkt: Keine Beschränkung.) 400 µg/l (1.93 µmol/l; Paramètre biologique: Plomb (hommes; femmes > 45 ans); Substrat d'examen: Sang complet; Moment du prélèvement: Indifférent.) / (1.93 µmol/l; Biologischer Parameter: Blei (Männer; Frauen > 45 Jahre); Untersuchungsmaterial: Vollblut; Probennahmezeitpunkt: Keine Beschränkung.)
Remark	Influence de l'environnement. / Umwelteinflüsse.
Regulatory reference	Ordonnance 832.30 (OPA), article 50 al. 3, www.suva.ch/valeurs-limites / Verordnung 832.30 (VUV), Art. 50 Abs. 3, www.suva.ch/grenzwerte
USA - ACGIH - Occupational Exposure Limits	
Local name	Lead and inorganic compounds, as Pb
ACGIH OEL TWA	0,05 mg/m ³
Remark (ACGIH)	TLV® Basis: CNS & PNS impair; hematologic eff. Notations: A3 (Confirmed Animal Carcinogen with Unknown Relevance to Humans); BEI
Regulatory reference	ACGIH 2024

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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selenious acid (7783-00-8)	
Austria - Occupational Exposure Limits	
Local name	Selen und seine Verbindungen (außer Selenwasserstoff)
MAK (OEL TWA)	0,1 mg/m³
MAK (OEL STEL)	0,3 mg/m³
Regulatory reference	BGBI. II Nr. 156/2021
Belgium - Occupational Exposure Limits	
Local name	Sélénium et ses composés (en Se) # Seleen en -verbindingen (als Se)
OEL TWA	0,2 mg/m³ (Sélénium et ses composés (en Se); Belgium; Time-weighted average exposure limit 8 h)
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Bulgaria - Occupational Exposure Limits	
Local name	Селен
OEL TWA	0,2 mg/m³ и съединения (като селен)
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Croatia - Occupational Exposure Limits	
Local name	Selen
GVI (OEL TWA)	0,1 mg/m³
Remark	T (otrovno)
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Czech Republic - Occupational Exposure Limits	
Local name	Selen
PEL (OEL TWA)	0,1 mg/m³
NPK-P (OEL C)	0,2 mg/m³
Remark	D - při expozici se významně uplatňuje pronikání faktoru kůží, P - u látky nelze vyloučit závažné pozdní účinky (s větou H372, H373).
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Selen og forbindelser
OEL TWA	0,1 mg/m³ beregnet som Se, se dog hydrogenselenid og selenhexafluorid
Regulatory reference	BEK nr 291 af 19/03/2024
Estonia - Occupational Exposure Limits	
Local name	Seleen, anorgaanilisedühendid, v.a vesinikseleniid (arvutatudseleenile)
OEL TWA	0,1 mg/m³
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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selenious acid (7783-00-8)	
Finland - Occupational Exposure Limits	
Local name	Seleeni
HTP (OEL TWA)	0,1 mg/m³
HTP (OEL STEL)	0,3 mg/m³
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Selen
AGW (OEL TWA)	0,05 mg/m³ E (mg/m3)
Peak exposure limitation factor	1(II)
Remark	DFG,Y
Regulatory reference	TRGS900
Germany - Biological limit values (TRGS 903)	
Local name	Selen und seine anorganische Verbindungen
Biological limit value	150 µg/l Parameter: Selen - Untersuchungsmaterial: S = Serum - Probenahmezeitpunkt: a) keine Beschränkung - Festlegung/Begründung: 11/2020 DFG
Regulatory reference	TRGS 903
Ireland - Occupational Exposure Limits	
Local name	Selenium and compounds, except hydrogen selenide (as Se)
OEL TWA	0,1 mg/m³
Remark	Advisory OELV (Advisory Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2024
Poland - Occupational Exposure Limits	
Local name	Selen i jego związki, z wyjątkiem selanu w przeliczeniu na Se
NDS (OEL TWA)	0,1 mg/m³
NDSCh (OEL STEL)	0,3 mg/m³
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Portugal - Occupational Exposure Limits	
Local name	Selénio e compostos, expressos em Se
OEL TWA	0,2 mg/m³
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Seleniu și compuși exprimați în Se
OEL TWA	0,1 mg/m³
OEL STEL	0,2 mg/m³
Spain - Occupational Exposure Limits	
Local name	Selenio

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selenious acid (7783-00-8)	
VLA-ED (OEL TWA)	0,1 mg/m ³ elemental 0,1 mg/m ³ Compuestos de Selenio, como Se (excepto el Seleniuro de hidrógeno)
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	Selen, och oorg. föreningar (som Se) utom väteselenid
NGV (OEL TWA)	0,1 mg/m ³ totaldamm
Remark	3 (Med totaldamm menas de partiklar (aerosoler) som fastnar på ett filter i den provtagare som beskrivs i Metodserien, Provtagning av totaldamm och respirabelt damm, Metod nr 1010, Arbetarskyddsstyrelsen, numera Arbetsmiljöverket. Filterdiametern är normalt 37 mm, men kan även vara 25 mm. Trots sitt namn provtas inte den totala mängden luftburna partiklar med denna metod)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	Selenium
WEL TWA (OEL TWA)	0,1 mg/m ³ and compounds, except hydrogen selenide (as Se)
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Selen og sambönd þess, sem Se
OEL TWA	0,1 mg/m ³
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
North Macedonia - Occupational Exposure Limits	
Local name	селен и негови соединенија
OEL TWA	0,1 mg/m ³ (l) инхалабилна фракција – дел на вкупно суспендирани материји, кои работникот ги вдишува
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанции („Службен весник на Република Македонија“ бр.46/10)
Switzerland - BAT	
Local name	Sélénium / Selen und seine anorganischen Verbindungen
BAT	150 µg/l (2 µmol/l; Paramètre biologique: Sélénium; Substrat d'examen: Sang complet; Moment du prélèvement: Indifférent.) / (2 µmol/l; Biologischer Parameter: Selen; Untersuchungsmaterial: Vollblut; Probennahmezeitpunkt: Keine Beschränkung.)
Regulatory reference	Ordonnance 832.30 (OPA), article 50 al. 3, www.suva.ch/valeurs-limites / Verordnung 832.30 (VUV), Art. 50 Abs. 3, www.suva.ch/grenzwerte
USA - ACGIH - Occupational Exposure Limits	
Local name	Selenium and compounds, as Se
ACGIH OEL TWA	0,2 mg/m ³
Remark (ACGIH)	TLV® Basis: Eye & URT irr
Regulatory reference	ACGIH 2024

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strontium nitrate (10042-76-9)	
Lithuania - Occupational Exposure Limits	
Local name	Stroncio nitratas
IPRV (OEL TWA)	1 mg/m³
Regulatory reference	LIETUVOS HIGIENOS NORMA HN 23:2011 (Nr. V-695/A1-272, 2018-06-12)
thallium nitrate (10102-45-1)	
Austria - Occupational Exposure Limits	
Local name	Thalliumverbindungen lösliche
MAK (OEL TWA)	0,1 mg/m³ (als TI berechnet, E)
MAK (OEL STEL)	1 mg/m³ (als TI berechnet, E, 1x 30(Miw) min)
Regulatory reference	BGBI. II Nr. 156/2021
Belgium - Occupational Exposure Limits	
Local name	Thallium (et composés) (en TI) # Thallium (en Verbindungen) (als TI)
OEL TWA	0,02 mg/m³
Remark	D: la mention "D" signifie que la résorption de l'agent, via la peau, les muqueuses ou les yeux, constitue une partie importante de l'exposition totale. Cette résorption peut se faire tant par contact direct que par présence de l'agent dans l'air. # D: de vermelding "D" betekent dat de opname van het agens via de huid, de slijmvliezen of de ogen een belangrijk deel van de totale blootstelling vormt. Deze opname kan het gevolg zijn van zowel direct contact als zijn aanwezigheid in de lucht.
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Bulgaria - Occupational Exposure Limits	
Local name	Талий
OEL TWA	0,05 mg/m³ и неговите съединения (като талий)
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Czech Republic - Occupational Exposure Limits	
Local name	Thallium
PEL (OEL TWA)	0,1 mg/m³
NPK-P (OEL C)	0,5 mg/m³
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Thalliumforbindelser, opløselige
OEL TWA	0,1 mg/m³ beregnet som TI
Remark	H (betyder, at stoffet kan optages gennem huden)
Regulatory reference	BEK nr 291 af 19/03/2024
Finland - Occupational Exposure Limits	
Local name	Tallium

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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thallium nitrate (10102-45-1)	
HTP (OEL TWA)	0,1 mg/m³
Remark	lho
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveystieteiden ministeriö)
France - Occupational Exposure Limits	
Local name	Thallium
VME (OEL TWA)	0,1 mg/m³
Remark	Valeurs recommandées/admises
Regulatory reference	Circulaire du Ministère du travail (réf.: INRS ED 6443, 2022; Outil65)
Ireland - Occupational Exposure Limits	
Local name	Thallium and compounds (as Tl)
OEL TWA	0,02 mg/m³
Remark	Advisory OELV (Advisory Occupational Exposure Limit Values), Skin (Substances which have the capacity to penetrate intact skin when they come in contact with it and be absorbed into the body. A substantial contribution to the total body burden via dermal exposure is possible)
Regulatory reference	Chemical Agents Code of Practice 2024
Poland - Occupational Exposure Limits	
Local name	Tal i jego związki w przeliczeniu na Tl
NDS (OEL TWA)	0,1 mg/m³
NDSch (OEL STEL)	0,3 mg/m³
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Portugal - Occupational Exposure Limits	
Local name	Tálio, e compostos solúveis, expressos em Tl
OEL TWA	0,02 mg/m³ I (Fração inalável)
Remark	P (Toxicidade percutânea)
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Thaliu (compuși solubili)
OEL STEL	0,05 mg/m³
Spain - Occupational Exposure Limits	
Local name	Talio
VLA-ED (OEL TWA)	0,1 mg/m³ elemental 0,1 mg/m³ Compuestos solubles de talio, como Tl
Remark	Vía dérmica (Indica que, en las exposiciones a esta sustancia, la aportación por la vía cutánea puede resultar significativa para el contenido corporal total si no se adoptan medidas para prevenir la absorción. En estas situaciones, es aconsejable la utilización del control biológico para poder cuantificar la cantidad global absorbida del contaminante. Para más información véase el Apartado 5 de este documento), c (Los términos “soluble” e “insoluble” se entienden con referencia al agua).

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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thallium nitrate (10102-45-1)	
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
United Kingdom - Occupational Exposure Limits	
Local name	Thallium
WEL TWA (OEL TWA)	0,1 mg/m³ soluble compounds (as TI)
Remark	Sk (Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity)
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Þallíumsambönd, uppleysanleg, sem TI
OEL TWA	0,1 mg/m³
Remark	H
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Norway - Occupational Exposure Limits	
Local name	Thallium og løselige thalliumforb. (beregnet som TI)
Grenseverdi (OEL TWA)	0,02 mg/m³
Remark	H: Kjemikalier som kan tas opp gjennom huden.
Regulatory reference	FOR-2024-04-05-581
Switzerland - Occupational Exposure Limits	
Local name	Thallium, composés solubles / Thalliumverbindungen, löslich
MAK (OEL TWA)	0,1 mg/m³ (i) / (e)
Notation	R / H
Remark	NIOSH, OSHA
Regulatory reference	www.suva.ch, 01.01.2024
USA - ACGIH - Occupational Exposure Limits	
Local name	Thallium and compounds, as TI
ACGIH OEL TWA	0,02 mg/m³ (I - Inhalable particulate matter)
Remark (ACGIH)	TLV® Basis: GI dam; peripheral neuropathy. Notations: Skin
Regulatory reference	ACGIH 2024
uranyl acetate dihydrate (6159-44-0)	
Belgium - Occupational Exposure Limits	
Local name	Uranium (état naturel et composés de l') (en U) # Uraan (natuurlijk en - verbindingen) (als U)
OEL TWA	0,2 mg/m³
OEL STEL	0,6 mg/m³
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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uranyl acetate dihydrate (6159-44-0)	
Bulgaria - Occupational Exposure Limits	
Local name	Уран
OEL TWA	0,2 mg/m³ неразтворими съединения (като уран) 0,05 mg/m³ разтворими съединения (като уран)
OEL STEL	0,6 mg/m³ неразтворими съединения (като уран)
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Denmark - Occupational Exposure Limits	
Local name	Uranforbindelser
OEL TWA	0,2 mg/m³ beregnet som U
Regulatory reference	BEK nr 291 af 19/03/2024
Estonia - Occupational Exposure Limits	
Local name	Uraani ühendid (arvutatuduraanile)
OEL TWA	0,2 mg/m³
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)
Finland - Occupational Exposure Limits	
Local name	Uraani ja sen yhdisteet, liukenemattomat
HTP (OEL TWA)	0,2 mg/m³ 0,05 mg/m³
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
Ireland - Occupational Exposure Limits	
Local name	Uranium compounds, natural, soluble, (as U)
OEL TWA	0,2 mg/m³
OEL STEL	0,6 mg/m³
Remark	Advisory OELV (Advisory Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2024
Ireland - Biological limit values	
Local name	Fluorine, Hydrogen Fluoride and Inorganic Fluorides (not uranium hexafluoride)
BMGV	2 mg/l Parameter: Fluoride - Medium: urine - Sampling time: Prior to shift - Notations: B (Background), Ns (Non-specific) 3 mg/l Parameter: Fluoride - Medium: urine - Sampling time: End of shift - Notations: B (Background), Ns (Non-specific)
Regulatory reference	Biological Monitoring Guidelines (HSA, 2011)
Latvia - Occupational Exposure Limits	
Local name	Urāns
OEL TWA	0,075 mg/m³ nešķīstošie savienojumi 0,015 mg/m³ šķīstošie savienojumi

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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uranyl acetate dihydrate (6159-44-0)	
Regulatory reference	Ministru kabineta 2007. gada 15. maija noteikumiem Nr. 325 (Grozījumi Ministru kabineta 2024. gada 26. martā noteikumiem Nr. 191).
Poland - Occupational Exposure Limits	
Local name	Uran i jego związki
NDS (OEL TWA)	0,075 mg/m³ związki nierozpuszczalne w przeliczeniu na U 0,015 mg/m³ związki rozpuszczalne w przeliczeniu na U
NDSch (OEL STEL)	0,6 mg/m³ związki nierozpuszczalne w przeliczeniu na U 0,12 mg/m³ związki rozpuszczalne w przeliczeniu na U
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Portugal - Occupational Exposure Limits	
Local name	Urânio (natural) Compostos solúveis e insolúveis, expressos em U
OEL TWA	0,2 mg/m³
OEL STEL	0,6 mg/m³
Remark	A1 (Agente carcinogénico confirmado no Homem); IBE (Índice biológico de exposição)
Regulatory reference	Norma Portuguesa NP 1796:2014
Portugal - Biological Exposure Indices	
Local name	Urânio
BEI	200 µg/l Parâmetro: Urânio - Meio: urina - Momento da amostragem: Fim do turno
Regulatory reference	Norma Portuguesa NP 1796:2014
Spain - Occupational Exposure Limits	
Local name	Uranio
VLA-ED (OEL TWA)	0,2 mg/m³ natural 0,2 mg/m³ Compuestos solubles e insolubles de uranio, como U
VLA-EC (OEL STEL)	0,6 mg/m³ natural 0,6 mg/m³ Compuestos solubles e insolubles de uranio, como U
Remark	c (Los términos “soluble” e “insoluble” se entienden con referencia al agua).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Iceland - Occupational Exposure Limits	
Local name	Úransambönd, sem U
OEL TWA	0,2 mg/m³
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Switzerland - Occupational Exposure Limits	
Local name	Uran und seine Verbindungen (als U berechnet)
MAK (OEL TWA)	0,2 mg/m³
Notation	R / H
Remark	e(mg/m³) - H - Niere - OSHA, s. auch Strahlenschutzverordnung
Regulatory reference	www.suva.ch, 01.01.2024

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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uranyl acetate dihydrate (6159-44-0)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Uranium (natural), soluble and insoluble compounds, as U
ACGIH OEL TWA	0,2 mg/m³
ACGIH OEL STEL	0,6 mg/m³
Remark (ACGIH)	TLV® Basis: Kidney dam. Notations: A1 (Confirmed Human Carcinogen); BEI
Regulatory reference	ACGIH 2024
USA - ACGIH - Biological Exposure Indices	
Local name	Uranium
BEI	200 µg/l Parameter: Uranium - Medium: urine - Sampling time: End of shift
Regulatory reference	ACGIH 2024
ammonium metavanadate (7803-55-6)	
Austria - Occupational Exposure Limits	
Local name	Vanadium
MAK (OEL TWA)	0,5 mg/m³
MAK (OEL STEL)	1 mg/m³
Regulatory reference	BGBl. II Nr. 156/2021
Czech Republic - Occupational Exposure Limits	
Local name	Vanad (prach)
PEL (OEL TWA)	0,05 mg/m³
NPK-P (OEL C)	0,15 mg/m³
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Netherlands - Occupational Exposure Limits	
Local name	Vanadiumoxiden
TGG-8u (OEL TWA)	0,01 mg/m³ (als V)
TGG-15min (OEL STEL)	0,03 mg/m³ (als V)
Regulatory reference	Arbeidsomstandighedenregeling 2024
Slovenia - Occupational Exposure Limits	
Local name	vanadij
OEL TWA	0,5 mg/m³
OEL STEL	0,005 mg/m³ 0,03 mg/m³
Remark	Y (Snovi, pri katerih ni nevarnosti za zarodek ob upoštevanju mejnih vrednosti in bat vrednosti)
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Norway - Occupational Exposure Limits	
Local name	Vanadium

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5%
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ammonium metavanadate (7803-55-6)	
Grænseverdi (OEL TWA)	0,05 mg/m³ Røyk beregnet som V 0,2 mg/m³ Støv (beregnet som V)
Takverdi (OEL C)	0,05 mg/m³ Røyk (beregnet som V)
Regulatory reference	FOR-2024-04-05-581

8.2. Exposure controls

Appropriate engineering controls

Appropriate engineering controls:
Ensure good ventilation of the work station.

Personal protection equipment

Personal protective equipment:
Avoid all unnecessary exposure. Personal protective equipment should be chosen according to the CEN standards and in discussion with the supplier of the protective equipment.

Personal protective equipment symbol(s):



Eye and face protection

Eye protection:
Safety glasses

Skin protection

Skin and body protection:
Wear suitable protective clothing

Hand protection:
Protective gloves

Respiratory protection

Respiratory protection:
In case of insufficient ventilation, wear suitable respiratory equipment

Environmental exposure controls

Environmental exposure controls:
Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Colour	: Not available
Odour	: Not available
Odour threshold	: Not available
Melting point	: Not applicable
Freezing point	: Not available
Boiling point	: Not available
Flammability	: Non flammable.
Lower explosion limit	: Not available
Upper explosion limit	: Not available

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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Flash point	: Not available
Auto-ignition temperature	: Not available
Decomposition temperature	: Not available
pH	: Not available
Viscosity, kinematic	: Not available
Solubility	: Miscible with water.
Partition coefficient n-octanol/water (Log Kow)	: Not available
Vapour pressure	: Not available
Vapour pressure at 50°C	: Not available
Density	: Not available
Relative density	: 1,09
Relative vapour density at 20°C	: Not available
Particle characteristics	: Not applicable

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

metals.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Not classified

nitric acid (7697-37-2)

LC50 Inhalation - Rat	> 2,65 mg/L air
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silver nitrate (7761-88-8)

LD50 oral rat	> 2000 mg/kg
LD50 dermal rat	> 2000 mg/kg

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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aluminium nitrate (13473-90-0)	
LD50 oral rat	> 2000 mg/kg
LD50 oral	2261 mg/kg bodyweight mouse
LD50 dermal rabbit	> 5000 mg/kg
arsenic acid (7778-39-4)	
LD50 oral	149,6 mg/kg bodyweight (mouse)
LD50 dermal rabbit	2000 (1583 – 2417) mg/kg
barium nitrate (10022-31-8)	
LD50 oral rat	300 (50 – 300) mg/kg
LD50 dermal rat	> 2000 mg/kg bodyweight
LC50 Inhalation - Rat	> 1 mg/l/4h
LC50 Inhalation - Rat (Dust/Mist)	> 1,1 mg/l
cadmium nitrate (10325-94-7)	
LD50 oral rat	300 mg/kg bodyweight
LD50 oral	60,2 mg/kg bodyweight mouse
cobalt dinitrate (10141-05-6)	
LD50 oral rat	691 mg/kg
LD50 dermal rat	> 2000 mg/kg bodyweight
chromium trinitrate (13548-38-4)	
LD50 oral rat	900 – 3010 mg/kg
LC50 Inhalation - Rat	< 4,58 mg/L air
copper dinitrate (3251-23-8)	
LD50 oral rat	794 mg/kg
iron trinitrate (10421-48-4)	
LD50 oral rat	> 2000 mg/kg bodyweight
LD50 dermal rat	> 2000 mg/kg bodyweight
LC50 Inhalation - Rat	> 2000 mg/kg
mercury nitrate (10045-94-0)	
LD50 oral rat	26 mg/kg
LD50 dermal rat	75 mg/kg
indium(III) nitrate, pentahydrate (13465-14-0)	
LD50 oral rat	> 2000 mg/kg
potassium nitrate (7757-79-1)	
LD50 oral rat	> 2000 mg/kg bodyweight
LD50 dermal rat	> 5000 mg/kg bodyweight

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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potassium nitrate (7757-79-1)	
LC50 Inhalation - Rat	> 0,527 mg/L air
lithium nitrate (7790-69-4)	
LD50 oral rat	1426 mg/kg
LD50 dermal rat	> 2000 mg/kg bodyweight
LC50 Inhalation - Rat	> 5,93 mg/l/4h
manganese dinitrate (10377-66-9)	
LD50 oral rat	> 300 mg/kg bodyweight
nickel dinitrate (13138-45-9)	
LD50 oral rat	361,9 mg/kg bodyweight
LC50 Inhalation - Rat (Dust/Mist)	2,48 mg/l
lead nitrate (10099-74-8)	
LD50 oral rat	4665 mg/kg
LD50 dermal rat	> 2000 mg/kg
LC50 Inhalation - Rat	> 5,05 mg/L air
selenious acid (7783-00-8)	
LD50 oral rat	68,1 mg/kg
strontium nitrate (10042-76-9)	
LD50 oral rat	> 2000 mg/kg
LC50 Inhalation - Rat	4,5 mg/l/4h
thallium nitrate (10102-45-1)	
LD50 oral rat	15 mg/kg
uranyl acetate dihydrate (6159-44-0)	
LD50 oral rat	204 mg/kg
ammonium metavanadate (7803-55-6)	
LD50 oral rat	169 mg/kg
LD50 dermal rat	> 2500 mg/kg
LD50 dermal rabbit	2102 mg/kg
LC50 Inhalation - Rat	2,51 mg/l/4h
Skin corrosion/irritation : Causes severe skin burns.	
nitric acid (7697-37-2)	
pH	< 1
aluminium nitrate (13473-90-0)	
pH	2 – 4

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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barium nitrate (10022-31-8)	
pH	5 – 8
cobalt dinitrate (10141-05-6)	
pH	4
chromium trinitrate (13548-38-4)	
pH	2 – 3
copper dinitrate (3251-23-8)	
pH	< 2
iron trinitrate (10421-48-4)	
pH	1,3
potassium nitrate (7757-79-1)	
pH	≈ 7
manganese dinitrate (10377-66-9)	
pH	< 2
nickel dinitrate (13138-45-9)	
pH	3,5 – 5,5 (5 %)
lead nitrate (10099-74-8)	
pH	3 – 4 (20 %)
selenious acid (7783-00-8)	
pH	1,5 (20 °C) 50 g/L
Serious eye damage/irritation : Causes serious eye damage.	
nitric acid (7697-37-2)	
pH	< 1
aluminium nitrate (13473-90-0)	
pH	2 – 4
barium nitrate (10022-31-8)	
pH	5 – 8
cobalt dinitrate (10141-05-6)	
pH	4
chromium trinitrate (13548-38-4)	
pH	2 – 3
copper dinitrate (3251-23-8)	
pH	< 2

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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iron trinitrate (10421-48-4)	
pH	1,3
potassium nitrate (7757-79-1)	
pH	≈ 7
manganese dinitrate (10377-66-9)	
pH	< 2
nickel dinitrate (13138-45-9)	
pH	3,5 – 5,5 (5 %)
lead nitrate (10099-74-8)	
pH	3 – 4 (20 %)
selenious acid (7783-00-8)	
pH	1,5 (20 °C) 50 g/L
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
arsenic acid (7778-39-4)	
IARC group	2B - Possibly carcinogenic to humans
beryllium nitrate (13597-99-4)	
IARC group	1 - Carcinogenic to humans
cadmium nitrate (10325-94-7)	
IARC group	1 - Carcinogenic to humans
cobalt dinitrate (10141-05-6)	
IARC group	2B - Possibly carcinogenic to humans
chromium trinitrate (13548-38-4)	
IARC group	3 - Not classifiable
mercury nitrate (10045-94-0)	
IARC group	3 - Not classifiable
lead nitrate (10099-74-8)	
IARC group	2A - Probably carcinogenic to humans
selenious acid (7783-00-8)	
IARC group	3 - Not classifiable
Reproductive toxicity	: Not classified
STOT-single exposure	: Not classified
beryllium nitrate (13597-99-4)	
STOT-single exposure	May cause respiratory irritation.
STOT-repeated exposure	: Not classified

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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nitric acid (7697-37-2)	
NOAEL (oral, rat, 90 days)	1500 mg/kg bodyweight
NOAEC (inhalation, rat, gas, 90 days)	2,15 ppm
silver nitrate (7761-88-8)	
LOAEL (oral, rat, 90 days)	125 mg/kg bodyweight
beryllium nitrate (13597-99-4)	
STOT-repeated exposure	Causes damage to organs through prolonged or repeated exposure.
cadmium nitrate (10325-94-7)	
STOT-repeated exposure	Causes damage to organs (bone, kidneys, lungs) through prolonged or repeated exposure.
cobalt dinitrate (10141-05-6)	
LOAEC (inhalation, rat, dust/mist/fume, 90 days)	0,31 mg/L air
NOAEL (oral, rat, 90 days)	3 mg/kg bodyweight
mercury nitrate (10045-94-0)	
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.
potassium nitrate (7757-79-1)	
NOAEL (oral, rat, 90 days)	≥ 1500 mg/kg bodyweight
manganese dinitrate (10377-66-9)	
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.
nickel dinitrate (13138-45-9)	
STOT-repeated exposure	Causes damage to organs through prolonged or repeated exposure.
lead nitrate (10099-74-8)	
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.
selenious acid (7783-00-8)	
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.
strontium nitrate (10042-76-9)	
LOAEL (oral, rat, 90 days)	49,6 mg/kg bodyweight
NOAEL (oral, rat, 90 days)	12,4 mg/kg bodyweight
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.
thallium nitrate (10102-45-1)	
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.
uranyl acetate dihydrate (6159-44-0)	
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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ammonium metavanadate (7803-55-6)	
NOAEL (oral, rat, 90 days)	1,6 mg/kg bodyweight
STOT-repeated exposure	Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard : Not classified

nitric acid (7697-37-2)	
Viscosity, kinematic	0,595 mm²/s

aluminium nitrate (13473-90-0)	
Viscosity, kinematic	0,778 mm²/s

ammonium metavanadate (7803-55-6)	
Viscosity, kinematic	Not applicable

11.2. Information on other hazards

No additional information available

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Before neutralisation, the product may represent a danger to aquatic organisms.
Hazardous to the aquatic environment, short-term (acute) : Not classified
Hazardous to the aquatic environment, long-term (chronic) : Not classified

nitric acid (7697-37-2)	
EC50 - Crustacea [1]	180 mg/l Daphnia magna (Water flea)
Threshold limit - Algae [1]	> 19 mg/l

silver nitrate (7761-88-8)	
LC50 - Fish [1]	1,5 µg/l (Silver (Ag)) Pimephales promelas (Fathead minnow)
EC50 - Crustacea [1]	0,22 µg/l Silver (Ag) Daphnia magna (Water flea)

aluminium nitrate (13473-90-0)	
LC50 - Fish [1]	58,4 mg/l Oncorhynchus mykiss (Rainbow trout)
EC50 - Crustacea [1]	4,3 mg/l Daphnia magna (Water flea)
EC50 72h - Algae [1]	0,24 mg/l Pseudokirchneriella subcapitata
NOEC (chronic)	1,3 mg/l Daphnia magna (Water flea)

arsenic acid (7778-39-4)	
LC50 - Fish [1]	28 mg/l Oncorhynchus mykiss (Rainbow trout)
EC50 - Crustacea [1]	3,26 mg/l Daphnia magna (Water flea)
LOEC (chronic)	0,01 mg/l Daphnia pulex
NOEC (chronic)	> 1 mg/l Daphnia pulex
NOEC chronic fish	0,97 mg/l Pimephales promelas (Fathead minnow)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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barium nitrate (10022-31-8)	
LC50 - Fish [1]	> 3,5 mg/l Brachydanio rerio (zebra-fish)
EC50 - Crustacea [1]	16 – 18 mg/l Ceriodaphnia dubia
EC50 72h - Algae [1]	> 1,15 mg/l Pseudokirchneriella subcapitata
NOEC (chronic)	2,9 mg/l Daphnia magna (Water flea)
beryllium nitrate (13597-99-4)	
LC50 - Fish [1]	8 mg/l
EC50 - Crustacea [1]	18 mg/l (24h)
cadmium nitrate (10325-94-7)	
LC50 - Fish [1]	34 µg/l Salmo Salar
EC50 - Crustacea [1]	0,04 mg/l Daphnia magna (Water flea)
cobalt dinitrate (10141-05-6)	
LC50 - Fish [1]	1,5 mg/l (mg Co/L) Oncorhynchus mykiss (Rainbow trout)
EC50 - Crustacea [1]	5,89 mg/l Daphnia magna (Water flea)
chromium trinitrate (13548-38-4)	
LC50 - Fish [1]	20,1 mg/l Oncorhynchus mykiss (Rainbow trout)
EC50 96h - Algae [1]	0,4 mg/l Scenedesmus capricornutum
EC50 96h - Algae [2]	1,21 mg/l Scenedesmus capricornutum
copper dinitrate (3251-23-8)	
LC50 - Fish [1]	68 – 94 µg/l Oncorhynchus mykiss (Rainbow trout)
EC50 - Crustacea [1]	0,0338 – 0,792 mg/l Daphnia magna (Water flea)
EC50 72h - Algae [1]	18 – 46 µg/L Pseudokirchneriella subcapitata
iron trinitrate (10421-48-4)	
LC50 - Fish [1]	0,88 mg/l (mg Fe / L) Salvelinus fontinalis
EC50 - Crustacea [1]	> 18 mg/l Daphnia magna (Water flea)
LOEC (chronic)	13 mg/l Daphnia magna (Water flea)
NOEC (chronic)	8,1 mg/l Daphnia magna (Water flea)
mercury nitrate (10045-94-0)	
EC50 - Crustacea [1]	0,0052 mg/l Daphnia magna (Water flea)
potassium nitrate (7757-79-1)	
LC50 - Fish [1]	1378 mg/l Poecilia reticulata (Guppy)
EC50 - Crustacea [1]	490 mg/l Daphnia magna (Water flea)
lithium nitrate (7790-69-4)	
LC50 - Fish [1]	158 mg/l Oncorhynchus mykiss (Rainbow trout)
EC50 - Crustacea [1]	249 mg/l Daphnia magna (Water flea)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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lithium nitrate (7790-69-4)	
LOEC (chronic)	2,53 mg/l Daphnia magna (Water flea)
NOEC (chronic)	1,7 mg/l Daphnia magna (Water flea)
manganese dinitrate (10377-66-9)	
LC50 - Fish [1]	55,26 – 67,71 mg/l (Catla catla ; Labeo rohita ; Cirrhina mrigala)
EC50 - Crustacea [1]	> 100 mg/l Daphnia magna (Water flea)
EC50 72h - Algae [1]	61 mg/l Desmodesmus subspicatus
nickel dinitrate (13138-45-9)	
LC50 - Fish [1]	0,4 mg/l (mg Ni/L) Pimephales promelas (Fathead minnow)
EC50 - Crustacea [1]	0,013 mg/l (mg Ni/L) Ceriodaphnia dubia
lead nitrate (10099-74-8)	
LC50 - Fish [1]	40,8 – 3597,9 µg/l (µg Pb/L) Pimephales promelas (Fathead minnow)
EC50 - Crustacea [1]	26,4 µg/l (µg Pb/L) Ceriodaphnia dubia
selenious acid (7783-00-8)	
LC50 - Fish [1]	2060 µg/l Pimephales promelas (Fathead minnow)
EC50 - Crustacea [1]	0,43 mg/l Daphnia magna (Water flea)
strontium nitrate (10042-76-9)	
LC50 - Fish [1]	> 97,45 mg/l Cyprinus carpio (Common carp)
EC50 - Crustacea [1]	125 mg/l Daphnia magna (Water flea)(mg Sr/L)
EC50 72h - Algae [1]	> 43,3 mg/l Pseudokirchneriella subcapitata
NOEC chronic fish	≥ 100 mg/l Brachydanio rerio (zebra-fish)
thallium nitrate (10102-45-1)	
LC50 - Fish [1]	180 mg/l
EC50 - Crustacea [1]	1,6 mg/l
ammonium metavanadate (7803-55-6)	
LC50 - Fish [1]	693 µg/l Leuciscus idus (golden orfe)
EC50 - Crustacea [1]	1,52 mg/l Daphnia magna (Water flea)

12.2. Persistence and degradability

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720	
Persistence and degradability	Rapidly degradable
nitric acid (7697-37-2)	
Persistence and degradability	Rapidly degradable

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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silver nitrate (7761-88-8)	
Persistence and degradability	Rapidly degradable
aluminium nitrate (13473-90-0)	
Persistence and degradability	Rapidly degradable
arsenic acid (7778-39-4)	
Persistence and degradability	Rapidly degradable
barium nitrate (10022-31-8)	
Persistence and degradability	Rapidly degradable
beryllium nitrate (13597-99-4)	
Persistence and degradability	Rapidly degradable
cadmium nitrate (10325-94-7)	
Persistence and degradability	Rapidly degradable
cobalt dinitrate (10141-05-6)	
Persistence and degradability	Rapidly degradable
chromium trinitrate (13548-38-4)	
Persistence and degradability	Rapidly degradable
copper dinitrate (3251-23-8)	
Persistence and degradability	Rapidly degradable
iron trinitrate (10421-48-4)	
Persistence and degradability	Rapidly degradable
mercury nitrate (10045-94-0)	
Persistence and degradability	Rapidly degradable
indium(III) nitrate, pentahydrate (13465-14-0)	
Persistence and degradability	Rapidly degradable
potassium nitrate (7757-79-1)	
Persistence and degradability	Rapidly degradable
lithium nitrate (7790-69-4)	
Persistence and degradability	Rapidly degradable
manganese dinitrate (10377-66-9)	
Persistence and degradability	Rapidly degradable
nickel dinitrate (13138-45-9)	
Persistence and degradability	Rapidly degradable
lead nitrate (10099-74-8)	
Persistence and degradability	Rapidly degradable

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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selenious acid (7783-00-8)	
Persistence and degradability	Rapidly degradable
strontium nitrate (10042-76-9)	
Persistence and degradability	Rapidly degradable
thallium nitrate (10102-45-1)	
Persistence and degradability	Rapidly degradable
uranyl acetate dihydrate (6159-44-0)	
Persistence and degradability	Rapidly degradable
ammonium metavanadate (7803-55-6)	
Persistence and degradability	Adsorbs into the soil.
12.3. Bioaccumulative potential	
nitric acid (7697-37-2)	
Partition coefficient n-octanol/water (Log Pow)	-2,3
silver nitrate (7761-88-8)	
Partition coefficient n-octanol/water (Log Pow)	0,19 (estimated value)
aluminium nitrate (13473-90-0)	
Bioaccumulative potential	Not bioaccumulative.
arsenic acid (7778-39-4)	
Bioaccumulative potential	bioaccumulable.
barium nitrate (10022-31-8)	
Bioaccumulative potential	Not bioaccumulative.
beryllium nitrate (13597-99-4)	
Bioaccumulative potential	Not bioaccumulative.
cadmium nitrate (10325-94-7)	
Bioaccumulative potential	bioaccumulable.
iron trinitrate (10421-48-4)	
Bioaccumulative potential	Not bioaccumulative.
mercury nitrate (10045-94-0)	
Bioaccumulative potential	bioaccumulable.
lithium nitrate (7790-69-4)	
Partition coefficient n-octanol/water (Log Pow)	-0,79
lead nitrate (10099-74-8)	
Bioaccumulative potential	bioaccumulable.

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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selenious acid (7783-00-8)	
Bioaccumulative potential	bioaccumulable.

thallium nitrate (10102-45-1)	
Partition coefficient n-octanol/water (Log Pow)	0,21

12.4. Mobility in soil

lithium nitrate (7790-69-4)	
Mobility in soil	13,22

12.5. Results of PBT and vPvB assessment

Component	
Substance(s) not meeting the PBT criteria of REACH regulation, in accordance with Annex XIII	nitric acid (7697-37-2), silver nitrate (7761-88-8)(⁽¹⁾), aluminium nitrate (13473-90-0)(⁽¹⁾), arsenic acid (7778-39-4)(⁽¹⁾), barium nitrate (10022-31-8)(⁽¹⁾), beryllium nitrate (13597-99-4)(⁽¹⁾), cadmium nitrate (10325-94-7)(⁽¹⁾), cobalt dinitrate (10141-05-6)(⁽¹⁾), chromium trinitrate (13548-38-4)(⁽¹⁾), copper dinitrate (3251-23-8)(⁽¹⁾), iron trinitrate (10421-48-4)(⁽¹⁾), mercury nitrate (10045-94-0)(⁽¹⁾), indium(III) nitrate, pentahydrate (13465-14-0)(⁽¹⁾), potassium nitrate (7757-79-1)(⁽¹⁾), lithium nitrate (7790-69-4)(⁽¹⁾), manganese dinitrate (10377-66-9)(⁽¹⁾), nickel dinitrate (13138-45-9)(⁽¹⁾), lead nitrate (10099-74-8)(⁽¹⁾), selenious acid (7783-00-8)(⁽¹⁾), strontium nitrate (10042-76-9)(⁽¹⁾), thallium nitrate (10102-45-1)(⁽¹⁾), uranyl acetate dihydrate (6159-44-0)(⁽¹⁾), ammonium metavanadate (7803-55-6)(⁽¹⁾)
Substance(s) not meeting the vPvB criteria of REACH regulation, in accordance with Annex XIII	nitric acid (7697-37-2), silver nitrate (7761-88-8)(⁽¹⁾), aluminium nitrate (13473-90-0)(⁽¹⁾), arsenic acid (7778-39-4)(⁽¹⁾), barium nitrate (10022-31-8)(⁽¹⁾), beryllium nitrate (13597-99-4)(⁽¹⁾), cadmium nitrate (10325-94-7)(⁽¹⁾), cobalt dinitrate (10141-05-6)(⁽¹⁾), chromium trinitrate (13548-38-4)(⁽¹⁾), copper dinitrate (3251-23-8)(⁽¹⁾), iron trinitrate (10421-48-4)(⁽¹⁾), mercury nitrate (10045-94-0)(⁽¹⁾), indium(III) nitrate, pentahydrate (13465-14-0)(⁽¹⁾), potassium nitrate (7757-79-1)(⁽¹⁾), lithium nitrate (7790-69-4)(⁽¹⁾), manganese dinitrate (10377-66-9)(⁽¹⁾), nickel dinitrate (13138-45-9)(⁽¹⁾), lead nitrate (10099-74-8)(⁽¹⁾), selenious acid (7783-00-8)(⁽¹⁾), strontium nitrate (10042-76-9)(⁽¹⁾), thallium nitrate (10102-45-1)(⁽¹⁾), uranyl acetate dihydrate (6159-44-0)(⁽¹⁾), ammonium metavanadate (7803-55-6)(⁽¹⁾)

(⁽¹⁾) Substance(s) in concentration below 0.1 % and displayed on a voluntary basis

12.6. Endocrine disrupting properties

No additional information available

12.7. Other adverse effects

silver nitrate (7761-88-8)	
Other information	Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional waste regulation	: Disposal must be done according to official regulations.
Waste treatment methods	: Dispose of contents/container in accordance with licensed collector's sorting instructions.
Sewage disposal recommendations	: Disposal must be done according to official regulations.
Product/Packaging disposal recommendations	: Dispose in a safe manner in accordance with local/national regulations. Disposal must be done according to official regulations.
Additional information	: Do not re-use empty containers.

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / ADN / RID

ADR	IMDG	IATA	ADN	RID
14.1. UN number or ID number				
UN 3264	UN 3264	UN 3264	UN 3264	UN 3264
14.2. UN proper shipping name				
CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (nitric acid)	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (nitric acid)	Corrosive liquid, acidic, inorganic, n.o.s. (nitric acid)	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (nitric acid)	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (nitric acid)
Transport document description				
UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (nitric acid), 8, II, (E)	UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (nitric acid), 8, II	UN 3264 Corrosive liquid, acidic, inorganic, n.o.s. (nitric acid), 8, II	UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (nitric acid), 8, II	UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (nitric acid), 8, II
14.3. Transport hazard class(es)				
8	8	8	8	8
				
14.4. Packing group				
II	II	II	II	II
14.5. Environmental hazards				
Dangerous for the environment: No	Dangerous for the environment: No Marine pollutant: No EmS-No. (Fire): F-A EmS-No. (Spillage): S-B	Dangerous for the environment: No	Dangerous for the environment: No	Dangerous for the environment: No
No supplementary information available				

14.6. Special precautions for user

Overland transport

Classification code (ADR)	: C1
Special provisions (ADR)	: 274
Limited quantities (ADR)	: 1I
Excepted quantities (ADR)	: E2
Packing instructions (ADR)	: P001, IBC02
Mixed packing provisions (ADR)	: MP15
Portable tank and bulk container instructions (ADR)	: T11
Portable tank and bulk container special provisions (ADR)	: TP2, TP27
Tank code (ADR)	: L4BN
Vehicle for tank carriage	: AT
Transport category (ADR)	: 2
Hazard identification number (Kemler No.)	: 80

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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Orange plates	:	80 3264
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Tunnel restriction code (ADR)	:	E
EAC code	:	2X
APP code	:	B

Transport by sea

Special provisions (IMDG)	:	274
Limited quantities (IMDG)	:	1 L
Excepted quantities (IMDG)	:	E2
Packing instructions (IMDG)	:	P001
IBC packing instructions (IMDG)	:	IBC02
Tank instructions (IMDG)	:	T11
Tank special provisions (IMDG)	:	TP2, TP27
Stowage category (IMDG)	:	B
Stowage and handling (IMDG)	:	SW2

Air transport

PCA Excepted quantities (IATA)	:	E2
PCA Limited quantities (IATA)	:	Y840
PCA limited quantity max net quantity (IATA)	:	0.5L
PCA packing instructions (IATA)	:	851
PCA max net quantity (IATA)	:	1L
CAO packing instructions (IATA)	:	855
CAO max net quantity (IATA)	:	30L
Special provisions (IATA)	:	A3
ERG code (IATA)	:	8L

Inland waterway transport

Classification code (ADN)	:	C1
Special provisions (ADN)	:	274
Limited quantities (ADN)	:	1 L
Excepted quantities (ADN)	:	E2
Carriage permitted (ADN)	:	T
Equipment required (ADN)	:	PP, EP
Number of blue cones/lights (ADN)	:	0

Rail transport

Classification code (RID)	:	C1
Special provisions (RID)	:	274
Limited quantities (RID)	:	1L
Excepted quantities (RID)	:	E2
Packing instructions (RID)	:	P001, IBC02
Mixed packing provisions (RID)	:	MP15
Portable tank and bulk container instructions (RID)	:	T11
Portable tank and bulk container special provisions (RID)	:	TP2, TP27
Tank codes for RID tanks (RID)	:	L4BN
Transport category (RID)	:	2
Colis express (express parcels) (RID)	:	CE6
Hazard identification number (RID)	:	80

14.7. Maritime transport in bulk according to IMO instruments

Not applicable

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU-Regulations

REACH Annex XVII (Restriction List)

EU restriction list (REACH Annex XVII)		
Reference code	Applicable on	Entry title or description
18.	mercury nitrate	Mercury compounds
19.	arsenic acid	Arsenic compounds
23.	cadmium nitrate	Cadmium and its compounds
27.	nickel dinitrate	Nickel and its compounds
3(a)	nitric acid	Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 2.1 to 2.4, 2.6 and 2.7, 2.8 types A and B, 2.9, 2.10, 2.12, 2.13 categories 1 and 2, 2.14 categories 1 and 2, 2.15 types A to F
3(b)	Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720 ; nitric acid	Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 3.1 to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10
63.	lead nitrate	Lead and its compounds
65.	ammonium metavanadate	Inorganic ammonium salts

REACH Annex XIV (Authorisation List)

Contains substance(s) listed on REACH Annex XIV: Arsenic acid (EC 231-901-9, CAS 7778-39-4)

REACH Candidate List (SVHC)

Contains substance(s) listed on the REACH Candidate List < 0.1% or SCL: Arsenic acid (EC 231-901-9, CAS 7778-39-4), Cobalt(II) dinitrate (EC 233-402-1, CAS 10141-05-6), Lead dinitrate (EC 233-245-9, CAS 10099-74-8).

PIC Regulation (Prior Informed Consent)

Contains substance(s) listed on the PIC list (Regulation EU 649/2012 concerning the export and import of hazardous chemicals): arsenic acid (7778-39-4), cadmium nitrate (10325-94-7), mercury dinitrate (10045-94-0), lead dinitrate (10099-74-8)

POP Regulation (Persistent Organic Pollutants)

Contains no substance(s) listed on the POP list (Regulation EU 2019/1021 on persistent organic pollutants)

Ozone Regulation (2024/590)

Contains no substance(s) listed on the Ozone Depletion list (Regulation EU 2024/590 on substances that deplete the ozone layer)

Council Regulation (EC) for the control of dual-use items

Contains substance subject to the COUNCIL REGULATION (EC) for the control of dual-use items: Beryllium nitrate (13597-99-4).

Explosives Precursors Regulation (2019/1148)

Contains substance(s) listed on the Explosives Precursors list (Regulation EU 2019/1148 on the marketing and use of explosives precursors)

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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ANNEX I RESTRICTED EXPLOSIVES PRECURSORS

List of substances which are not to be made available to, or introduced, possessed or used by, members of the general public, whether on their own or in mixtures or substances that include those substances, unless the concentration is equal to or lower than the limit values set out in column 2, and for which suspicious transactions and significant disappearances and thefts are to be reported within 24 hours.

Name	CAS-No.	Limit value	Upper limit value for licensing under Article 5(3)	Combined Nomenclature (CN) code for a separate chemically defined compound meeting the requirements of Note 1 to Chapter 28 or 29 of the CN, respectively	Combined Nomenclature code for mixture without constituents which would determine classification under another CN code
Nitric acid	7697-37-2	3 % w/w	10% w/w	ex 2808 00 00	ex 3824 99 96

ANNEX II REPORTABLE EXPLOSIVES PRECURSORS

List of substances on their own or in mixtures or in substances for which suspicious transactions and significant disappearances and thefts are to be reported within 24 hours.

Name	CAS-No.	Combined Nomenclature code (CN)	Combined Nomenclature code for mixture without constituents which would determine classification under another CN code
Potassium nitrate	7757-79-1	2834 21 00	ex 3824 99 96

Drug Precursors Regulation (273/2004)

Contains no substance(s) listed on the Drug Precursors list (Regulation EC 273/2004 on the manufacture and the placing on market of certain substances used in the illicit manufacture of narcotic drugs and psychotropic substances)

National regulations

France

Occupational diseases	
Code	Description
RG 1	Conditions caused by lead and its compounds
RG 2	Occupational diseases caused by mercury and its compounds
RG 20	Occupational diseases caused by arsenic and its mineral compounds
RG 20 BIS	Primary bronchial cancer caused by inhalation of arsenical dust or vapors
RG 37	Professional skin disorders caused by oxides and nickel salts
RG 37 BIS	Respiratory disorders caused by oxides and nickel salts
RG 61	Occupational diseases caused by cadmium and its compounds
RG 61 BIS	Bronchopulmonary cancer caused by the inhalation of dusts or fumes containing cadmium
RG 70	Occupational diseases caused by cobalt and its compounds
RG 70 BIS	Respiratory disorders due to sintered or fused metal carbide dust containing cobalt
RG 70 TER	Primary broncho-pulmonary cancer caused by inhalation of cobalt dust associated with tungsten carbide prior to sintering
RG 75	Occupational diseases resulting from exposure to selenium and its mineral derivatives

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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Germany

VOC ordinance (ChemVOCFarbV) :

Water hazard class (WGK) : WGK 1, Slightly hazardous to water (Classification according to AwSV, Annex 1).
Hazardous Incident Ordinance (12. BImSchV) : Is not subject to the Hazardous Incident Ordinance (12. BImSchV)

Netherlands

ABM category : Z(2) - biodegradable substances with hazardous properties for humans and the environment (carcinogenicity/ mutagenicity/reprotoxicity/bioaccumulative potential or toxicity)
SZW-lijst van kankerverwekkende stoffen : cadmium nitrate, cobalt dinitrate, lithium nitrate, nickel dinitrate, ammonium metavanadate are listed
SZW-lijst van mutagene stoffen : cadmium nitrate, lithium nitrate, ammonium metavanadate are listed
SZW-lijst van reprotoxische stoffen – Borstvoeding : nickel dinitrate is listed
SZW-lijst van reprotoxische stoffen – Vruchtbaarheid : cobalt dinitrate, manganese dinitrate, nickel dinitrate, lead nitrate are listed
SZW-lijst van reprotoxische stoffen – Ontwikkeling : manganese dinitrate, nickel dinitrate, lead nitrate are listed

Denmark

Danish National Regulations : Young people below the age of 18 years are not allowed to use the product
Pregnant/breastfeeding women working with the product must not be in direct contact with the product

Poland

Polish National Regulations : Act of 25 February 2011 on chemical substances and their mixtures (J. o L. No. 63, item 322 as amended; consolidated text J. o L. 2019, item 1225).
Act of 14 December 2012 on waste (J. o L. 2013, item 322 as amended; consolidated text J. o L. 2020, item 797).
The announcement of Marshal of the Sejm of the Republic of Poland dated 19 October 2016 concerning the consolidated text announcement of the decree on the management of packaging and packaging waste (J. o L. 2016, item 1863 as amended).
Decree of the Minister of Environment of 14 December 2014 on the catalogue of waste (J. o L. 2014, item 1923).
Act of 19 August 2011 on the Carriage of Dangerous Goods (J. o L. 2011 No. 227, item 1367 as amended; consolidated text J. o L. 2020, item 154).
Regulation of the Minister of Family, Labour and Social Policy of 12 June 2018 on the highest permissible concentration and intensity of noxious agents for health at work environment (J. o L. item 1286 as amended).
The announcement of Minister of Health dated 9 September 2016 concerning the consolidated text announcement of the decree of the Minister of Health of 30 December 2004 on health and safety at work related to exposure to chemical agents at work (J. o L. of 16 September 2016, item 1488)
Regulation of the Minister of Health of 2 February 2011 on tests and measurements of the noxious agents for health at work environment (J. o L. No. 33, item 166 as amended).
Regulation of the Minister of Environment of 9 December 2003 on particularly hazardous substances to the environment (J. o L. No. 217, item 2141).
ADR Agreement: Government Statement of 13 March 2023 on the entry into force of amendments to Annexes A and B to the Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), signed in Geneva on 30 September 1957 (J. o. L. 2023, item 891)

15.2. Chemical safety assessment

No chemical safety assessment has been carried out

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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SECTION 16: Other information

Indication of changes		
Section	Changed item	Comments
4.1	First-aid measures for first aider	Added
4.2	Symptoms/effects after inhalation	Added
5.1	Unsuitable extinguishing media	Added
5.2	Fire hazard	Added
5.2	Explosion hazard	Added
5.3	Firefighting instructions	Added
6.1	Emergency procedures	Added
6.1	Protective equipment	Added
6.1	General measures	Added
6.3	For containment	Added
7.1	Additional hazards when processed	Added
7.2	Technical measures	Added
7.2	Packaging materials	Added
7.2	Storage conditions	Modified
13.1	Sewage disposal recommendations	Added
13.1	Additional information	Added
13.1	Regional waste regulation	Added
13.1	Product/Packaging disposal recommendations	Modified
15.1	REACH Annex XVII	Modified
16	Abbreviations and acronyms	Modified

Abbreviations and acronyms:	
ACGIH	American Conference of Government Industrial Hygienists
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor
BLV	Biological limit value
BOD	Biochemical oxygen demand (BOD)
CAS-No.	Chemical Abstract Service number
CLP	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
COD	Chemical oxygen demand (COD)
CSA	Chemical safety assessment

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

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Abbreviations and acronyms:	
DMEL	Derived Minimal Effect level
DNEL	Derived-No Effect Level
EC-No.	European Community number
EC50	Median effective concentration
ED	Endocrine disruptor
EN	European Standard
EWC	European waste catalogue
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
LC50	Median lethal concentration
LD50	Median lethal dose
LOAEL	Lowest Observed Adverse Effect Level
Log Kow	Partition coefficient n-octanol/water (Log Kow)
Log Pow	Partition coefficient n-octanol/water (Log Pow)
MAK	maximum workplace concentration
NOAEC	No-Observed Adverse Effect Concentration
NOAEL	No-Observed Adverse Effect Level
NOEC	No-Observed Effect Concentration
N.O.S.	Not Otherwise Specified
OECD	Organisation for Economic Co-operation and Development
OEL	Occupational Exposure Limit
OSHA	Occupational Safety Health Administration
PBT	Persistent Bioaccumulative Toxic
PNEC	Predicted No-Effect Concentration
PPE	Personal protection equipment
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
SDS	Safety Data Sheet
STP	Sewage treatment plant
TF	Technical function
ThOD	Theoretical oxygen demand (ThOD)
TLM	Median Tolerance Limit
TWA	Time Weighted Average
VOC	Volatile Organic Compounds
vPvB	Very Persistent and Very Bioaccumulative
UFI	Unique Formula Identifier

Multi-Element Solution 3 with Hg: 30 components; 10mg/l each of Ag ; Al ; As ; Ba ; Be ; Bi ; Ca ; Cd ; Co ; Cr ; Cs ; Cu ; Fe ; Ga ; Hg ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Rb ; Se ; Sr ; Tl ; U ; V ; Zn in HNO3 5% Equivalent to Perkin Elmer Ref: N9301720

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878

Full text of H- and EUH-statements:	
Acute Tox. 1 (Dermal)	Acute toxicity (dermal), Category 1
Acute Tox. 1 (Inhalation)	Acute toxicity (inhal.), Category 1
Acute Tox. 2 (Inhalation)	Acute toxicity (inhal.), Category 2
Acute Tox. 2 (Oral)	Acute toxicity (oral), Category 2
Acute Tox. 3 (Inhalation)	Acute toxicity (inhal.), Category 3
Acute Tox. 3 (Oral)	Acute toxicity (oral), Category 3
Acute Tox. 4 (Dermal)	Acute toxicity (dermal), Category 4
Acute Tox. 4 (Inhalation)	Acute toxicity (inhal.), Category 4
Acute Tox. 4 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Acute Tox. Not classified (Oral)	Acute toxicity (oral) Not classified
Aquatic Acute 1	Hazardous to the aquatic environment – Acute Hazard, Category 1
Aquatic Acute Not classified	Hazardous to the aquatic environment – Acute Hazard Not classified
Aquatic Chronic 1	Hazardous to the aquatic environment – Chronic Hazard, Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment – Chronic Hazard, Category 2
Aquatic Chronic 4	Hazardous to the aquatic environment – Chronic Hazard, Category 4
Carc. 1A	Carcinogenicity, Category 1A
Carc. 1B	Carcinogenicity (inhalation) Category 1B
Carc. 2	Carcinogenicity, Category 2
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Met. Corr. 1	Corrosive to metals, Category 1
Muta. 1B	Germ cell mutagenicity, Category 1B
Muta. 2	Germ cell mutagenicity, Category 2
Ox. Liq. 2	Oxidising Liquids, Category 2
Ox. Liq. 3	Oxidising Liquids, Category 3
Ox. Sol. 1	Oxidising Solids, Category 1
Ox. Sol. 2	Oxidising Solids, Category 2
Ox. Sol. 3	Oxidising Solids, Category 3
Repr. 1A	Reproductive toxicity, Category 1A
Repr. 1B	Reproductive toxicity, Category 1B
Repr. 2	Reproductive toxicity, Category 2
Resp. Sens. 1	Respiratory sensitisation, Category 1

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Safety Data Sheet

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Full text of H- and EUH-statements:	
Skin Corr. 1A	Skin corrosion/irritation, Category 1, Sub-Category 1A
Skin Corr. 1B	Skin corrosion/irritation, Category 1, Sub-Category 1B
Skin Corr. 1C	Skin corrosion/irritation, Category 1, Sub-Category 1C
Skin Irrit. 2	Skin corrosion/irritation, Category 2
Skin Sens. 1	Skin sensitisation, Category 1
Skin Sens. 1A	Skin sensitisation, category 1A
Skin Sens. 1B	Skin sensitisation, category 1B
STOT RE 1	Specific target organ toxicity – Repeated exposure, Category 1
STOT RE 2	Specific target organ toxicity – Repeated exposure, Category 2
STOT RE Not classified	Specific target organ toxicity (repeated exposure) Not classified
STOT SE 3	Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation
H271	May cause fire or explosion; strong oxidiser.
H272	May intensify fire; oxidiser.
H290	May be corrosive to metals.
H300	Fatal if swallowed.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H310	Fatal in contact with skin.
H312	Harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H340	May cause genetic defects.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H350i	May cause cancer by inhalation.
H351	Suspected of causing cancer.
H360D	May damage the unborn child.
H360Df	May damage the unborn child. Suspected of damaging fertility.

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Full text of H- and EUH-statements:	
H360FD	May damage fertility. May damage the unborn child.
H361d	Suspected of damaging the unborn child.
H361f	Suspected of damaging fertility.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.
H413	May cause long lasting harmful effects to aquatic life.
EUH208	Contains nickel dinitrate. May produce an allergic reaction.

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:		
Met. Corr. 1	H290	On basis of test data
Skin Corr. 1B	H314	Calculation method
Eye Dam. 1	H318	Calculation method

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.