SAFETY DATA SHEET

LEAD WOOL

Compilation date: 4th March 2016

Revision No: 1

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

1.1. Product identifier

Product name: Lead Wool

CAS number: 7439-92-1

EINECS number: 231-100-4

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

Use of substance / mixture: Laboratory chemicals

No specific uses advised against have been identified

1.3. Details of the supplier of the safety data sheet

Company name: Mercury Safety Products Ltd
6 Chartwell Avenue

Ruddington

Nottingham

NG11 6DJ

United Kingdom
Tel: +44 115 921 3833
Fax: +44 115 921 3879
Email: info@mercurysafety.co.uk

1.4. Emergency telephone number

Emergency tel: +44 115 921 3833 (office hours only)

National Poisons Information Service (24 hours) **in UK dial 111**

Section 2: Hazards identification

2.1. Classification of the substance or mixture

Classification under CLP: No harmonized classification

Most important adverse effects: Lead exerts its toxic effects in solution as a salt or other complex. Its solubility in water is very low (hence its use in water pipes) but it can be dissolved in strong acids.

Lead in solution has a published Ecotoxicity Reference Value (ERV) of between 6.1 and 73.6 microgrammes per litre.

2.2. Label elements

Label elements under CLP:

Hazard statements: None required

Signal words: None required

Hazard pictograms: None required

[cont...]

Precautionary statements: None required

2.3. Other hazards

Lead in metallic form is not a significant health hazard. However, in melting or operations generating lead dust, fume or vapour can result in sufficient lead entering the body to be hazardous to health. Oxidation products (including lead compounds) may also form on the surface of metallic lead. Lead is heavy and care should be taken when lifting and handling.

Section 3: Composition/information on ingredients

3.1. Substances

Chemical identity: LEAD >99%

CAS number: 7439-92-1

EINECS number: 231-100-4

Contains: Formula:

Pb

Atomic Weight: 207.2

Section 4: First aid measures

4.1. Description of first aid measures

The measures below are unlikely to be relevant whilst lead is in its solid metallic state. However, they are relevant in the event of exposure to fumes, vapour or dust or oxidation products that may form on the surface of lead sheet.

Skin contact: Remove contaminated clothing. Wash skin immediately with soap and water. Seek medical attention if irritation persists

Eye contact: Ensure that contact lenses are removed before rinsing eyes.

Separate eyelids, wash the eyes thoroughly with water (15 minutes). Seek medical attention if irritation persists

Ingestion: Rinse out mouth and give plenty of water. Seek medical attention.

Inhalation: Move person into fresh air. Seek medical attention.

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

Clinical manifestations of lead poisoning include weakness, irritability, nausea, abdominal pain with constipation, and anemia

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

Immediate / special treatment: Symptoms of poisoning may occur after several hours; seek medical attention

Section 5: Fire-fighting measures

5.1. Extinguishing media

Extinguishing media: Water spray jet, dry sand.

Extinguishing media that must not be used for safety reasons: Full water jet, foam

[cont...]

5.2. Special hazards arising from the substance or mixture

LEAD WOOL

In case of fire, hazardous combustion gases are formed; lead fumes; lead oxide

5.3. Advice for fire-fighters

Advice for fire-fighters: Wear self-contained breathing apparatus. Wear protective clothing.

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions: Ensure adequate ventilation. Avoid dust formation. Avoid contact with skin, eyes and clothing. See section 8 for further details.

6.2. Environmental precautions

Environmental precautions: Do not discharge into the drains/surface water/groundwater. In case of entry into waterways, soil or drains, inform the responsible authorities.

6.3. Methods and material for containment and cleaning up

Clean-up procedures: Collect mechanically (preferably in dry condition). Send in suitable containers for recovery and disposal. When picked up, treat material as prescribed under 'Disposal Considerations'.

6.4. Reference to other sections

Reference to other sections: For personal protection, see section 8. For waste disposal, see section 13.

Section 7: Handling and storage

7.1. Precautions for safe handling

Handling requirements: Provide good ventilation of working area (local exhaust ventilation if necessary). The product is not combustible

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: No special measures required. Do not store together with food. Do not store together with animal feedstocks. Do not store with acids or alkalis. Do not store with combustible materials.

7.3. Specific end use(s)

Specific end use(s): For the absorption of spilled metallic mercury

[cont...]

Section 8: Exposure controls/personal protection

8.1. Control parameters

	Limit values – 8 hours mg/m³	Limit values – short term mg/m³
EU	0.15	
United Kingdom	0.15	
Austria	0.1 inhalable aerosol	0.4 inhalable aerosol
Belgium	0.15	
Denmark	0.05 inhalable aerosol	0.10 inhalable aerosol
France	0.1 inhalable aerosol	
Germany (AGS)	0.1 inhalable aerosol	
Hungary	0.15 inhalable aerosol 0.05 respirable aerosol	0.60 inhalable aerosol 0.2 respirable aerosol
Italy	0.15 inhalable aerosol	
Poland	0.05	
Spain	0.15 inhalable aerosol	
Sweden	0.1 inhalable aerosol 0.15 respirable aerosol	
Switzerland	0.1 inhalable aerosol	0.8 inhalable aerosol

Exposure pattern	Route	Descriptors	DNEL/DMEL (appropriate unit)	Most sensitive endpoint
Acute - systemic effects	Dermal (mg/kg bw /day)	NA	NA	NA
	Inhalation (mg/m^3)	NA	NA	NA
Acute - local effects	Dermal (mg/cm^2)	NA	NA	NA
	Inhalation (mg/m^3)	NA	NA	NA
Long-term - systemic effects	Systemic (µg lead /dL blood)	NOAEL = 40 µg/dL NOAEL = 10 µg/dL	40 µg/dL 10 µg/dL	Adult neurological function Developmental effect on foetus of pregnant women
Long-term – local effects	Dermal (mg/cm^2)	NA	NA	NA
	Inhalation (mg/m^3)	NA	NA	NA

Biological action levels, inorganic lead

EU	70 µg/dL
UK	60 µg/dL
Germany (suspended)	40 µg/dL 10 µg/dL (for woman of reproductive capacity)
France	40 µg/dL 30 µg/dL µg/dL (for woman of reproductive capacity)
Spain	70 µg/dL
Italy	60 µg/dL 40 µg/dL (for woman of reproductive capacity)
Denmark	20 µg/dL

DN(M)ELs for workers:

[cont...]

8.1.1 Ecological toxicity values

The following Predicted No Effect Concentrations (PNECs) were used to determine the environmental risk of lead metal (sheet):

Exposure pattern	Route	Descriptor	PNEC
Long-term – chronic effects	Freshwater	PNEC (Predicted No Effect Concentration)	3.1 µg Pb/L (dissolved)
Long-term- chronic effects	Marine	PNEC (Predicted No Effect Concentration)	3.5 µg Pb/L (dissolved)
Long-term – chronic effects	Freshwater Sediment	PNEC (Predicted No Effect Concentration)	174.0 mg Pb/kg dw[1] 41.0 mg Pb/kg dw[2]
Long-term – chronic effects	Marine Sediment	PNEC (Predicted No Effect Concentration)	164.0 mg Pb/kg dw
Long-term – chronic effects	Soil	PNEC (Predicted No Effect Concentration)	212.0 mg Pb/kg dw
Long-term – chronic effects	STP (Sewage Treatment Plant)	PNEC (Predicted No Effect Concentration)	0.1 mg Pb/L

[1]: without bioavailability correction; [2]: with bioavailability correction

8.2. Exposure controls

8.1.2 Organisational measures

Personal Hygiene: Ensure workers follow simple hygiene rules (e.g. do not bite nails and keep them cut short, avoid touching or scratching face with dirty hands or gloves); Ensure workers do not wipe away sweat with hands or arms; Ensure workers use disposable tissues rather than a handkerchief; Prohibit drinking, eating and smoking in production areas, or access to eating and non-production areas in working clothes; Ensure workers wash hands, arms, faces and mouths (but preferably shower) and change into clean clothing before entering eating areas; For high exposure workplaces, separate rooms for cleaning hands, removal of clothes, showers and clean clothes may be necessary; Ensure workers handle dirty working clothes with care; Allow no personal belongings to be taken into production areas, or items that have been used in production areas to be taken home.
Ensure general shop cleanliness is maintained by frequent washing/vacuuming. Clean every workplace at the end of every shift.

Blood lead monitoring: Set in place a certified monitoring regime which covers all site activities; Define a policy for submitting workers to regular blood lead monitoring, including increased frequency for workers undertaking high-risk jobs and workers with elevated blood lead levels; Ensure all workers have a blood test prior to working on site. Set an “action level” that is typically 5µg/dL below the exposure limit deemed to be safe. If the action level is exceeded, appropriate measures are to be taken, to prevent further increases in blood lead. If the safe threshold is exceeded, continue or begin ban on overtime, ensure strict hygiene procedures are followed, undertake detailed inspections to ensure correct use of personal protective equipment, undertake detailed inspections to ensure recommended workplace procedures are followed, move employee to workplace where exposure is expected to be lower or remove from lead environment altogether, further increase blood lead sampling frequency, and continue frequent sampling until results are below the first action level.

8.1.3 Personal Protection Equipment

Respiratory protection: Suitable respiratory protective device recommended if work activity is likely to result in formation of lead fumes, vapours or dust. In case of brief or low level exposure use dust mask or half mask with particle filter P2. Assess the need to wear respiratory protective equipment in production areas. Consider use effective masks accompanied by a compliance policy (ensure proper

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shaving; ensure workers do not remove RPE in production areas in order to communicate). Where masks are used, employ formal mask cleaning and filter changing strategies.

Hand Protection: Protective gloves. Material of gloves: Neoprene or Leather.

Eye protection: Safety glasses.

Skin protection: Wear protective work clothing. For workers in areas of significant exposure, provide sufficient working clothes to enable daily change into clean clothes. In such cases all work clothing should be cleaned by the employer on a daily basis and is not permitted to leave the work site.

8.1.4 Environmental Protection

One or more of the following measures may if necessary be taken to reduce emissions to water:

- Chemical precipitation: used primarily to remove the metal ions
- Sedimentation
- Filtration: used as final clarification step
- Electrolysis: for low metal concentration
- Reverse osmosis: extensively used for the removal of dissolved metals
- Ion exchange: final cleaning step in the removal of heavy metal from process wastewater

One or more of the following measures may if necessary be taken to reduce emissions to air:

- Electrostatic precipitators using wide electrode spacing: Wet electrostatic precipitators:
- Cyclones, but as primary collector Fabric or bag filters: high efficiency in controlling fine particulate (melting): achieve emission values Membrane filtration techniques can achieve
- Ceramic and metal mesh filters. PM10 particles are removed
- Wet scrubbers

Lead removal from treatment works should be at least the minimum default 84% removal used in the CSR. Solid material collected from on-site treatment must be sent for metal recovery or treated as hazardous waste. Waste water treatment sludge must be recycled, incinerated or landfilled and not used as agricultural fertiliser.

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance:	Grey-blue solid
Odour:	None
Odour threshold:	Not applicable
pH:	Not applicable
Melting point:	326°C
Boiling point:	>600°C
Flashpoint:	Not applicable
Evaporation rate:	Not applicable
Flammability:	Not flammable
Upper/lower flammability limits:	Not applicable
Vapour pressure:	Not applicable
Vapour density	Not applicable
Relative density	11.45
Solubility in water:	185 mg/L at 20°C
Solubility in other solvents:	Not applicable
Partition coefficient (log Kow)	Not applicable

Autoignition temperature	Not applicable
Decomposition temperature	Not applicable
Viscosity	Not applicable
Explosive properties	Not explosive
Oxidising properties	Not oxidising

[cont...]

9.2. Other information

Other information: No data available.

Section 10: Stability and reactivity

10.1. Reactivity

Reactivity: Lead is not a reactive substance and no reactive hazards are expected

10.2. Chemical stability

Chemical stability: Expected to be stable under normal conditions of use

10.3. Possibility of hazardous reactions

Hazardous reactions: Hazardous reactions will not occur under normal transport or storage conditions.

10.4. Conditions to avoid

Conditions to avoid: Not applicable

10.5. Incompatible materials

Materials to avoid: Strong oxidizing agents

10.6. Hazardous decomposition products

Hazardous decomposition products: No decomposition if used as directed

Section 11: Toxicological information

11.1. Information on toxicological effects

Lead in massive or sheet form is not a significant health hazard. However the following information is relevant if you swallow any lead or breathe in lead dust, fume or vapour.

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Toxicokinetic assessment	Lead is slowly absorbed by ingestion and inhalation and poorly absorbed through the skin. If absorbed, it will accumulate in the body with low rates of excretion, leading to long-term build up. Part of risk management is to take worker blood samples for analysis to ensure that exposure levels are acceptable.
(a) acute toxicity	Lead massive metal is not considered to be acutely toxic. It is not easily inhaled or ingested, and if it is accidentally ingested normally passes through the gastrointestinal system without significant absorption into the body. Lead is not easily absorbed through the skin.
(b) skin corrosion/irritation	Studies have shown that sparingly soluble inorganic lead compounds are not corrosive or irritating to skin, and this lack of effect is expected also for metallic lead. This conclusion is supported by the lack of reports of irritant effects from occupational settings.
(c) serious eye damage/irritation	Studies have shown that sparingly soluble inorganic lead compounds are not corrosive or irritating to eyes, and this lack of effect is expected also for metallic lead. This conclusion is supported by the lack of reports of irritant effects from occupational settings.
(d) respiratory/skin sensitisation	There is no evidence that lead causes respiratory or skin sensitisation.
(e) germ cell mutagenicity	The evidence for genotoxic effects of highly soluble inorganic lead compounds is contradictory, with numerous studies reporting both positive and negative

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effects. Responses appear to be induced by indirect mechanisms, mostly at very high concentrations that lack physiological relevance.

(f) carcinogenicity

There is some evidence that inorganic lead compounds may have a carcinogenic effect, and they have been classified by IARC as probably carcinogenic to humans (Group 2A). However, it is considered that this classification does not apply to lead in articles, given the very low bioavailability of metallic lead. Carcinogenicity studies of lead metal powder have been negative. Epidemiology studies of workers exposed to inorganic lead compounds have found a limited association with stomach cancer. IARC has concluded that lead metal is possibly carcinogenic to humans (Group aB).

(g) reproductive toxicity

Exposure to high levels of inorganic lead compounds may cause adverse effects on male and female fertility, including adverse effects on sperm quality. Prenatal exposure to inorganic lead compounds is also associated with adverse effects on the development of the unborn child. There is evidence that neurobehavioural development in children is affected by exposure to lead.

(h) STOT-single exposure

Inorganic lead compounds have generally been found to be of relatively low acute toxicity by ingestion, in contact with skin, and by inhalation, with no evidence of any local or systemic toxicity from such exposures. The bioavailability of lead metal is low and acute lead exposure is not expected to result in acute toxicity effects.

(i) STOT-repeated exposure

Lead is a cumulative poison and may be absorbed into the body through ingestion or inhalation. Although inhalation and ingestion of lead in massive form are unlikely, poor hygiene practises may result in hand to mouth transfer which maybe significant over a prolonged period of time. Inorganic lead compounds have been documented in observational human studies to produce toxicity in multiple organ systems and body function including the haemotopoetic (blood) system, kidney function, reproductive function and the central nervous system.

(j) aspiration hazard

Lead metal is a solid and aspiration hazards are not expected to occur.

Section 12: Ecological information

12.1. Toxicity

Reliable acute freshwater aquatic toxicity data (tests conducted with soluble lead salts; all toxicity data reported as dissolved lead)*:*

Test Organisms:	Endpoint	Range of values
Fish: *Pimephales promelas, Oncorhynchus mykiss*	96h-LC_{50}	pH 5.5 – 6.5: 40.8 – 810.0 µg Pb/L pH >6.5 – 7.5: 52.0 – 3,598.0 µg Pb/L pH > 7.5 – 8.5: 113.8 – 3,249.0 µg Pb/L
Invertebrates: *Daphnia magna, Ceriodaphnia dubia*	48h-LC_{50}	pH 5.5 – 6.5: 73.6 – 655.6 µg Pb/L pH >6.5 – 7.5: 28.8 – 1,179.6 µg Pb/L pH > 7.5 – 8.5: 26.4 – 3,115.8 µg Pb/L
Algae: *Pseudokirchneriella subcapitata, Chlorella kesslerii*	72h-ErC_{50} (growth rate)	pH 5.5 – 6.5: 72.0 – 388.0 µg Pb/L pH >6.5 – 7.5: 26.6 – 79.5 µg Pb/L pH > 7.5 – 8.5: 20.5 – 49.6 µg Pb/L

Tests were conducted according to international accepted test guidelines or scientifically acceptable methods.

Reliable chronic toxicity test results *(*tests conducted with soluble lead salts; all toxicity data reported as dissolved lead*):*

[cont...]

Test organisms	Range of values (EC_{10}, NOEC)
Aquatic freshwater toxicity data	
Fish: *Oncorhynchus mykiss, Salmo salar, Pimephales promelas, Salvelinus fontinalis, Ictalurus punctatus, Lepomis macrochirus, Salvelinus namaycush, Cyprinus carpio, Acipenser sinensis*	17.8 – 1,558.6 µg Pb/L
Invertebrates: *Hyalella azteca, Lymnaea palustris, Ceriodaphnia dubia, Lymnaea stagnalis, Philodina rapida, Daphnia magna, Alona rectangular, Diaphanosoma birgei, Chironomus tentans, Brachionus calyciflorus, Chironomus riparius, Baetis tricaudatus.*	1.7 – 963.0 µg Pb/L
Algae: *Pseudokirchneriella subcapitata, Chlorella kesslerii, Chlamydomonas reinhardtii.*	6.1 – 190.0 µg Pb/L
Higher plants: *Lemna minor*	85.0 – 1,025.0 µg Pb/L
The most sensitive toxicity endpoint was 1.7 µg Pb/L for *C. dubia* (reproduction) and *L. stagnalis* (growth). Symptoms of toxicity were effects on survival, growth, reproduction, hatching, (population) growth rate and malformation during development. Toxicity of dissolved lead in freshwater is dependent on the physico-chemistry of the freshwater (mainly dissolved organic carbon, pH, hardness).	
Aquatic marine toxicity data	
Fish: *Cyprinodon variegatus*	229.6 – 437.0 µg Pb/L
Invertebrates: *Mytilus trossolus, Americamysis bahia, Mytilus galloprovincialis, Neanthes arenaceodentata, Strongylocentrotus purpuratus, Paracentrotus lividus, Dendraster excentricus, Tisbe battagliai, Crassotrea gigas*	9.2 – 1,409.6 µg Pb/L
Algae: *Skeletonema costatum, Phaeodactylum tricornutum, Dunaliella tertiolecta.*	52.9 – 1,234.0 µg Pb/L
Higher plants*: Champia parvula*	11.9 µg Pb/L
The most sensitive toxicity endpoint was 9.2 µg Pb/L for *M. trossulus* (malformation). Symptoms of toxicity include effects on survival, growth, growth rate, reproduction and malformation during development	
Sediment freshwater toxicity data	
Invertebrates: *Tubifex tubifex, Ephoron virgo, Hyalella azteca, Gammarus pulex, Lumbriculus variegatus, Hexagenia limbata, Chironomus tentans*	573.0 – 3,390.0 mg Pb/kg dw
The most sensitive toxicity endpoint was 573.0 mg Pb/kg dw for *T. tubifex* (reproduction). Symptoms of toxicity include effects on survival, growth, and reproduction. Toxicity of lead in freshwater sediment is dependent on the acid volatile sulphide content (AVS) of the freshwater sediment.	
Sediment marine toxicity data	
Invertebrates: *Neanthes arenaceodentata, Leptocheirus plumulosus*	680.0 – 1,291.0 mg Pb/kg dw
The most sensitive toxicity endpoint was 680.0 mg Pb/kg dw for *N. arenaceodentata* (growth). Symptoms of toxicity include effects on survival, growth, and reproduction	
Terrestrial toxicity data (values were determined in different topsoils with contrasting properties and spiked with soluble lead salts):	
Invertebrates: *Folsomia candida*, *Proisotoma minuta, Sinella curviseta, Eisenia fetida, Eisenia andrei, Dendrobaena rubida, Lumbricus rubellus, Aporrectodea caliginosa*	34.0 – 2,445.0 mg Pb/kg dw
Plants: *Hordeum vulgare*, *Zea mays*, *Echinochloa crus-galli*, *Lolium perenne*, *Sorgum bicolor*, *Triticum aestivum*, *Oryza sativa* and *Avena sativa, Raphanus sativus, Lycopersicon esculentum, Lactuca sativa, Cucumis sativus, Picea rubens, Pinus taeda*	57.0 – 6,774.0 mg Pb/kg dw
Micro-organisms: denitrification, N-mineralization, nitrification, basal respiration, substrate-induced respiration	97.0 – 7,880.0 mg Pb/kg dw
The most sensitive toxicity endpoint was 34.0 mg Pb/kg for *F. candida* (reproduction). Symptoms of toxicity include effects on survival, growth, hatching, yield, reproduction, and microbe mediated processes. Toxicity of lead in soils is dependent on 1) the ageing processes and 2) the Cation Exchange Capacity (eCEC) of the soil.	

[cont...]

Tests were conducted according to international accepted test guidelines or scientifically acceptable methods.

Toxicity data for micro-organisms (for STP) (tests conducted with soluble lead salts)*:*

Test Organisms:	Effect	Range of values (EC_{10}, NOEC)
Bacterial populations	Respiration	1.06 - 2.92 mg Pb/L
	Ammonia uptake rate	2.79 - 9.59 mg Pb/L
Protozoan community	Mortality	1.0 – 7.0 mg Pb/L

Tests were conducted according to international accepted test guidelines or scientifically acceptable methods. For an

overview of PNECs for the different compartments check section 8.1.2

12.2. Persistence and degradability

Lead is naturally occurring and ubiquitous in the environment. Lead is obviously persistent in the sense that they do not degrade to CO_2, water, and other elements of less environmental concern. In the water compartment, lead is rapidly and strongly bound to the suspended solids of the water column. This binding and subsequent settling to the sediment allows for rapid metal removal of lead from the water column. Insignificant remobilization of lead from sediment is expected.

12.3. Bioaccumulative potential

Available BCF/BAF data for the aquatic environment show a distinct inverse relationship with the exposure concentration demonstrating that lead is homeostatically regulated by aquatic organisms. A median BAF within environmentally relevant concentrations of 1,552 L/kg_{ww} is observed in aquatic organisms. In the soil compartment no bioaccumulation is expected. The BAF's are not significantly affected by the Pb concentration in the soil. A median BAF value for soil dwelling organisms is 0.10 kg_{dw}/kg_{ww}. Available information on transfer of Pb through the food chain indicates that lead does not biomagnify in aquatic or terrestrial food chains.

12.4. Mobility in sediment and soil

Lead metal (sheet) is sparingly soluble in water and with its relatively high Kd value, is expected to be absorbed onto soils and sediments. Typical log Kd-values of 5.2, 5.7 and 3.8 have been determined for freshwater sediment, marine sediment and soil, respectively**.**

12.5. Results of PBT and vPvB assessment

The PBT and vPvB criteria of Annex XIII to the Regulation do not apply to inorganic substances, such as lead metal (sheet).. The criterion for persistence is not applicable for inorganic Pb. Under conditions of a standard EUSES lake Pb meets the criteria for rapid removal from the water column (> 70% in 28 days). Bioaccumulation criterion is not applicable to inorganic substances such as Pb. However, Pb is considered to be toxic, since the most sensitive NOECs, HC5-50 and PNEC values are lower than 10 µg Pb/L.

12.6. Other adverse effects

None

Section 13: Disposal considerations

13.1. Waste treatment methods

Dispose of in accordance with local regulations

Section 14: Transport information

Transport class: This product does not require a classification for transport.

Section 15: Regulatory information

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

Control of Lead at Work Regulations Act 2002

15.2. Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for this product

Section 16: Other information

Other information

This safety data sheet is prepared in accordance with Commission Regulation (EU) No 453/2010.