CHEMICAL SAFETY REPORT

Update 6: Submitted 29 June 2021
(Replaces 5th update submitted May 2021)

Substance Name: sodium molybdate dihydrate
The most stable form of sodium molybdate at ambient conditions, and the only form with market relevance is sodium molybdate dihydrate. Most of the information in this dossier therefore relates to the dihydrate form.

EC Number: 231-551-7

CAS Number: 10102-40-6 (dihydrate), 7631-95-0 (anhydrous)

Registrant's Identity: Joint CSR submitted by the Lead Registrant (Climax Molybdenum B.V.) on behalf of all members of the joint submission MOCONJS-SOMO. Document prepared by the IMOA REACH Molybdenum Consortium (MoCon)

See also the ***2014 OECD Highly Soluble Molybdenum Salts Mutual Acceptance of Data (MAD) dataset (containing primarily sodium molybdate data used for read-across in many instances in this CSR),*** which is attached to this CSR. The afore-mentioned MAD status data is:

1) likewise contained in the relevant individual sections within this CSR.
2) also downloadable from the OECD website at:

http://webnet.oecd.org/HPV/UI/SIDS_Details.aspx?id=5c88d62f-4401-4cad-b521-521a4bd710f3

Several supporting documents/reports are to be considered together with the CSR. They are referenced in the CSR, and are attached in the technical registration dossier in IUCLID section 13.2:

- MoCon read-across concept/justification for human health hazards
- MoCon read-across concept/justification for environmental hazards
- Speciation of molybdenum compounds in water: UV spectra (in support of the above)
- DNEL derivation report
- Background document – Environmental Effects Assessments *(updated May 2021)*
- Background document – Environmental Fate properties *(updated May 2021)*
- Background document – Regional / ambient monitoring data (water, soil, sediment)
- OECD SIDS Initial Assessment Profile (SIAP), containing the dataset with MAD status
- List of assessors (list of professionals that contributed to the registration dossier).

2. MANUFACTURE AND USES

Table 7. Quantities (in tonnes/year)

Year	Tonnages (tonnes per year)
For confidentiality reasons the data on manufactured or imported **quantities per registrant are not provided in this joint CSR**, but are instead provided by each individual registrant of this substance in their technical registration dossier (section 3.2 in IUCLID).	

2.1. Manufacture

Table 8. Manufacture

	Manufacture
M-1	**Manufacture of the substance** Further description of manufacturing process: 1. Process Summary: Sodium Molybdate Crystalline (SMC) is prepared by dissolving molybdenum trioxide (MoO3) in sodium hydroxide (NaOH) followed by filtration to remove gangue elements. After filtration, SMC is crystallized out of the filtrate through evaporation of water, dried and then packaged. 2. Feed Stock Selection: SMC feed stocks can be any grade of molybdic oxide, such as technical molybdic oxide, or pure MoO3 (EINECS/CAS#: 289-178-0 / 86089-09-0; 215-204-7 / 1313-27-5). 3. Process Description: SMC is produced in a batch process. The first step is dissolution of MoO3 in NaOH in a dissolver tank at a controlled temperature at approximately 65 °C. The chemical reaction is shown below: 2 NaOH + MoO3 + H2O --> Na2MoO4 * 2 H2O As shown in the reaction, the resulting SMC product is a dihydrate, i.e., it has two molecules of water per SMC molecule. This is an exothermic reaction with short reaction time. The precipitated impurities form molybdates and hydroxides. Most of the undissolved material is removed via filtration with the undissolved material reporting as a filter cake and the filtered solution, i.e. the filtrate, reporting to an adjustment tank. After filtration, the filtrate is retained in the adjustment tank for a pH adjustment using NaOH. The solution from the adjustment tank is filtered again to remove any precipitated impurities. The solution after filtration is heated to approximately 100 °C to evaporate water, creating a super saturated solution that subsequently crystallizes SMC. This SMC crystal containing slurry is sent to a centrifuge for liquid / solid separation with the solids being SMC. The liquid removed from the slurry, i.e. the centrate, is recycled back to either the dissolver tank or the adjustment tank for use in successive batches. The SMC crystals from the centrifuge are dried in a dryer and stored. From the storage bin, SMC is packed into fibre board drums, polypropylene bulk bags and/or polyethylene valve pack bags as per sales requirements. Contributing activity/technique for the environment : **- Manufacture of the substance (ERC1)** Contributing activity/technique for the workers : **- Closed process (PROC 1; PROC 2; PROC 3)** **- Semi-closed process (PROC 4)** **- Open process (PROC 5)**

	- Hot temperature process (PROC 22) **- Handling of the solid substance (PROC 9; PROC 26)** **- Cleaning and maintenance (PROC28)** use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=0 tonnes/year "<= 0 tonnes/year" indicates that although the use has been reported to the Molybdenum Consortium, no-one in the value chain has reported any tonnage data for that use. Related assessment: use not assessed

2.2. Identified uses

Table 9. Formulation

	Formulation
F-1	**Formulation of the substance into fertilizers as micronutrient** Further description of the use: Contributing activity/technique for the environment : **- Formulation of the substance into fertilizers as micronutrient (ERC2)** Contributing activity/technique for the workers : **- Raw material handling (PROC 26)** **- Closed process (PROC 1; PROC 2; PROC 3)** **- Semi-closed process (PROC 4)** **- Open process (PROC 5)** **- Quality control (PROC 15)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category formulated:** PC 12: Fertilisers; PC 27: Plant protection products **Technical function of the substance:** fertilisers (soil amendments) use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=250 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: as such Related assessment: use not assessed
F-2	**Formulation of the substance as micronutrient into feed additives** Further description of the use: Contributing activity/technique for the environment : **- Formulation of the substance into micronutrient into feed additives (ERC2)** Contributing activity/technique for the workers : **- Raw material handling (PROC 26)** **- Semi-closed process (PROC 4)** **- Open process (PROC 5)** **- Transfer of substance or preparations (PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category formulated:** PC 0: Other: UCN code: S42300 Nutrient **Technical function of the substance:** food flavouring and nutrient use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=50 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: as such Related assessment: use not assessed

F-3	**Formulation of the substance into corrosion inhibitors** Further description of the use: Contributing activity/technique for the environment : **- Formulation of the substance into corrosion inhibitors (ERC2)** Contributing activity/technique for the workers : **- Raw material handling (PROC 26)** **- Mixing in closed process (PROC 2)** **- Mixing or blending (PROC 5)** **- Quality control (PROC 15)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category formulated:** PC 14: Metal surface treatment products; PC 37: Water treatment chemicals **Technical function of the substance:** antiscaling agent; corrosion inhibitor use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=50 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: as such Related assessment: use not assessed
F-4	**Formulation of the substance into pigments** Further description of the use: Contributing activity/technique for the environment : **- Formulation of the substance into pigments (ERC2)** Contributing activity/technique for the workers : **- Raw material handling (PROC 26)** **- Closed process (PROC 2; PROC 3)** **- Semi-closed process (PROC 4)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category formulated:** PC 0: Other: UNC code: F0500-Colouring agents, F05100-Pigments to glazing materials, enamels and glass. F05110 - Pigments to paint and printing inks. F05250-Pigments pastes **Technical function of the substance:** no technical function use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=50 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: as such Related assessment: use not assessed
F-5	**Formulation of the substance into cleaning and maintenance material** Further description of the use: Contributing activity/technique for the environment : **- Formulation of the substance into cleaning and maintenance material (ERC2)** Contributing activity/technique for the workers : **- Raw material handling (PROC 26)** **- Closed process (PROC 1; PROC 2; PROC 3)** **- Semi-closed process (PROC 4)** **- Open process (PROC 5)** **- Quality control (PROC 15)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category formulated:** PC 35: Washing and cleaning products **Technical function of the substance:** antiscaling agent; corrosion inhibitor

	use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=50 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: as such Related assessment: use not assessed
F-6	**Formulation of the substance into coolant, anti-freeze and heat transfer fluid** Further description of the use: Contributing activity/technique for the environment : **- Formulation of the substance into coolant, anti-freeze and heat transfer fluid (ERC2)** Contributing activity/technique for the workers : **- Raw material handling (PROC 26)** **- Closed process (PROC 3)** **- Semi-closed process (PROC 4)** **- Open process (PROC 5)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Quality control (PROC 15)** **- Cleaning and maintenance (PROC28)** **Product Category formulated:** PC 4: Anti-freeze and de-icing products; PC 16: Heat transfer fluids; PC 25: Metal working fluids **Technical function of the substance:** antiscaling agent; corrosion inhibitor; heat transferring agent use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=100 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: as such Related assessment: use not assessed
F-7	**Formulation of the substance into lubrication additives, lubricants and greases** Further description of the use: Contributing activity/technique for the environment : **- Formulation of the substance into lubrication additives, lubricants and greases (ERC2)** Contributing activity/technique for the workers : **- Raw material handling (PROC 26)** **- Closed batch process (PROC 3)** **- Semi-closed process (PROC 4)** **- Open process (PROC 5)** **- Quality control (PROC 15)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category formulated:** PC 17: Hydraulic fluids; PC 24: Lubricants, greases, release products; PC 25: Metal working fluids **Technical function of the substance:** antiscaling agent; corrosion inhibitor; lubricating agent use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=5 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: as such Related assessment: use not assessed
F-8	**Formulation of the substance in enamels, frits and ceramics** Further description of the use: Contributing activity/technique for the environment : **- Formulation of the substance in enamels, frits and ceramics (ERC2)**

	Contributing activity/technique for the workers : **- Raw material handling (PROC 26)** **- Closed batch process (PROC 3)** **- Quality control (PROC 15)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category formulated:** PC 3: Air care products; PC 8: Biocidal products (e.g. disinfectants, pest control); PC 9a: Coatings and paints, thinners, paint removes; PC 9b: Fillers, putties, plasters, modelling clay; PC 14: Metal surface treatment products; PC 15: Non-metal-surface treatment products **Technical function of the substance:** no technical function use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=100 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: as such Related assessment: use not assessed
F-9	**Formulation of the substance into water treatments chemicals, including water softener** Further description of the use: Contributing activity/technique for the environment : **- Formulation of the substance into water treatments chemicals, including water softener (ERC2)** Contributing activity/technique for the workers : **- Raw material handling (PROC 26)** **- Closed process (PROC 1; PROC 2; PROC 3)** **- Semi-closed process (PROC 4)** **- Open process (PROC 5)** **- Quality control (PROC 15)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category formulated:** PC 4: Anti-freeze and de-icing products; PC 8: Biocidal products (e.g. disinfectants, pest control); PC 20: Products such as ph-regulators, flocculants, precipitants, neutralisation agents; PC 34: Textile dyes, and impregnating products; PC 35: Washing and cleaning products; PC 36: Water softeners; PC 37: Water treatment chemicals **Technical function of the substance:** antiscaling agent; corrosion inhibitor use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=100 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: as such Related assessment: use not assessed
F-10	**Formulation of the substance into tracers in mixtures** Further description of the use: Contributing activity/technique for the environment : **- Formulation of the substance into tracers in mixtures (ERC2)** Contributing activity/technique for the workers : **- Closed batch process (PROC 3)** **- Semi-closed process (PROC 4)** **- Open process (PROC 5)** **- Quality control (PROC 15)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Technical function of the substance:** tracer use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant

	Tonnage of substance for that use: <=1 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: as such; in a mixture Related assessment: use not assessed

Table 10. Uses at industrial sites

	Uses at industrial sites
IW-1	**Intemediate use of the substance in synthesis of molybdenum chelates** Further description of the use: Contributing activity/technique for the environment : **- Intermediate use of the substance in synthesis of molybdenum chelates (ERC6a)** Contributing activity/technique for the workers : **- Raw material handling (PROC 8b; PROC 9; PROC 26)** **- Semi-closed process (PROC 4)** **- Cleaning and maintenance (PROC28)** **Product Category used:** PC 12: Fertilisers **Sector of end use:** SU 8: Manufacture of bulk, large scale chemicals (including petroleum products); SU 9: Manufacture of fine chemicals **Technical function of the substance:** intermediate (precursor) use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=50 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: as such; in a mixture Subsequent service life relevant for that use: no Related assessment: use not assessed
IW-2	**Industrial use of the substance in corrosion inhibitor** Further description of the use: Contributing activity/technique for the environment : **- Industrial use of the substance in corrosion inhibitor (ERC6b)** Contributing activity/technique for the workers : **- Raw material handling (PROC 8b)** **- Mixing in closed process (PROC 2)** **- Mixing or blending (PROC 5)** **- Transfer of substance or preparations (PROC 8b)** **- Cleaning and maintenance (PROC28)** **Product Category used:** PC 37: Water treatment chemicals **Technical function of the substance:** antiscaling agent; corrosion inhibitor use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=50 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: in a mixture Subsequent service life relevant for that use: no Related assessment: use not assessed
IW-3	**Industrial use of the substance in water-based corrosion inhibitors and deposit control agents** Further description of the use: Contributing activity/technique for the environment : **- Industrial use of the substance in water-based corrosion inhibitors and deposit control agents (ERC4)** Contributing activity/technique for the workers :

	- Raw material handling (PROC 8b; PROC 9) **- Mixing in closed process (PROC 1; PROC 2)** **- Semi-closed process (PROC 4)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category used:** PC 20: Products such as ph-regulators, flocculants, precipitants, neutralisation agents; PC 37: Water treatment chemicals **Sector of end use:** SU 23: Electricity, steam, gas water supply and sewage treatment **Technical function of the substance:** antiscaling agent; corrosion inhibitor use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=0 tonnes/year "<= 0 tonnes/year" indicates that although the use has been reported to the Molybdenum Consortium, no-one in the value chain has reported any tonnage data for that use. Substance supplied to that use: in a mixture Subsequent service life relevant for that use: no Related assessment: use not assessed
IW-4	**Industrial use of the substance in coolant, anti-freeze and heat transfer fluid** Further description of the use: Contributing activity/technique for the environment : **- Industrial use of the substance in coolant, anti-freeze and heat transfer fluid (ERC7)** Contributing activity/technique for the workers : **- Raw material handling (PROC 8b; PROC 9)** **- Closed process (PROC 1; PROC 3)** **- Semi-closed process (PROC 4)** **- Open process (PROC 5)** **- Quality control (PROC 15)** **- Lubrication at high energy conditions (PROC 17)** **- Use of functional fluids (PROC 20)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category used:** PC 4: Anti-freeze and de-icing products; PC 16: Heat transfer fluids; PC 25: Metal working fluids **Sector of end use:** SU 8: Manufacture of bulk, large scale chemicals (including petroleum products); SU 17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment **Technical function of the substance:** antiscaling agent; corrosion inhibitor; heat transferring agent use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=5 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: in a mixture Subsequent service life relevant for that use: no Related assessment: use not assessed
IW-7	**Industrial use of the substance in anti-icing applications** Further description of the use: Contributing activity/technique for the environment : **- Industrial use of the substance in anti-icing applications (ERC4)** Contributing activity/technique for the workers : **- Raw material handling (PROC 8b; PROC 9)** **- Open process (PROC 5)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category used:** PC 4: Anti-freeze and de-icing products; PC 16: Heat transfer fluids **Sector of end use:** SU 8: Manufacture of bulk, large scale chemicals (including petroleum

	products) **Technical function of the substance:** antifreeze agent use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=0 tonnes/year "<= 0 tonnes/year" indicates that although the use has been reported to the Molybdenum Consortium, no-one in the value chain has reported any tonnage data for that use. Substance supplied to that use: in a mixture Subsequent service life relevant for that use: no Related assessment: use not assessed
IW-5	**Industrial use of the substance in lubrication additives, lubricants and greases** Further description of the use: Contributing activity/technique for the environment : **- Industrial use of the substance in lubrication additives, lubricants and greases (ERC4)** Contributing activity/technique for the workers : **- Raw material handling (PROC 8b; PROC 9)** **- Closed batch process (PROC 3)** **- Semi-closed process (PROC 4)** **- Open process (PROC 5)** **- Industrial spraying (PROC 7)** **- Roller application or brushing (PROC 10)** **- Treatment of articles by dipping and pouring (PROC 13)** **- Quality control (PROC 15)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category used:** PC 17: Hydraulic fluids; PC 24: Lubricants, greases, release products; PC 25: Metal working fluids **Sector of end use:** SU 6b: Manufacture of pulp, paper and paper products; SU 17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment **Technical function of the substance:** antiscaling agent; corrosion inhibitor; lubricating agent use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=1 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: in a mixture Subsequent service life relevant for that use: no Related assessment: use not assessed
IW-6	**Industrial use of the substance in metal working fluids** Further description of the use: Contributing activity/technique for the environment : **- Industrial use of the substance in metal working fluids (ERC7)** Contributing activity/technique for the workers : **- Raw material handling (PROC 8b)** **- Lubrication at high energy conditions (PROC 17)** **- Use of functional fluids (PROC 20)** **- Transfer of substance or preparations (PROC 8b)** **- Cleaning and maintenance (PROC28)** **Product Category used:** PC 25: Metal working fluids **Technical function of the substance:** antiscaling agent; corrosion inhibitor; lubricating agent use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=0 tonnes/year "<= 0 tonnes/year" indicates that although the use has been reported to the Molybdenum Consortium, no-one in the value chain has reported any tonnage data for that use. Substance supplied to that use: in a mixture Subsequent service life relevant for that use: no

	Related assessment: use not assessed
IW-8	**Industrial use of the substance in water treatment chemicals, including water softener** Further description of the use: Contributing activity/technique for the environment : **- Industrial use of the substance in water treatment chemicals, including water softener (ERC4)** Contributing activity/technique for the workers : **- Raw material handling (PROC 8b; PROC 9)** **- Closed process (PROC 1; PROC 2; PROC 3)** **- Semi-closed process (PROC 4)** **- Open process (PROC 5)** **- Industrial spraying (PROC 7)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category used:** PC 36: Water softeners; PC 37: Water treatment chemicals **Sector of end use:** SU 6b: Manufacture of pulp, paper and paper products; SU 8: Manufacture of bulk, large scale chemicals (including petroleum products); SU 9: Manufacture of fine chemicals **Technical function of the substance:** processing aid use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=1 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: in a mixture Subsequent service life relevant for that use: no Related assessment: use not assessed
IW-9	**Industrial use of the substance in industrial fluids for metal surface treatment** Further description of the use: Contributing activity/technique for the environment : **- Industrial use of the substance in industrial fluids for metal surface treatment (ERC5)** Contributing activity/technique for the workers : **- Raw material handling (PROC 8b; PROC 9)** **- Mixing in closed process (PROC 1; PROC 2)** **- Semi-closed process (PROC 4)** **- Open process (PROC 5)** **- Industrial spraying (PROC 7)** **- Treatment of articles by dipping and pouring (PROC 13)** **- Use of functional fluids (PROC 20)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category used:** PC 14: Metal surface treatment products; PC 15: Non-metal-surface treatment products; PC 25: Metal working fluids **Sector of end use:** SU 2a: Mining (without offshore industries); SU 2b: Offshore industries; SU 8: Manufacture of bulk, large scale chemicals (including petroleum products); SU 12: Manufacture of plastics products, including compounding and conversion **Technical function of the substance:** antiscaling agent; corrosion inhibitor; plating agent use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=1 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: in a mixture Subsequent service life relevant for that use: yes Link to the subsequent service life: Service life of surface treated articles by consumers.COPY; Service life of surface treated articles in industrial settings.COPY; Service life of surface treated articles in professional settings.COPY Related assessment: use not assessed

IW-10	**Industrial use of the substance in polymer preparations and compounds** Further description of the use: Contributing activity/technique for the environment : **- Industrial use of the substance in polymer preparations and compounds (ERC6d)** Contributing activity/technique for the workers : **- Raw material handling (PROC 8b; PROC 9)** **- Closed process (PROC 1; PROC 2; PROC 3)** **- Semi-closed process (PROC 4)** **- Industrial spraying (PROC 7)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category used:** PC 32: Polymer preparations and compounds **Sector of end use:** SU 12: Manufacture of plastics products, including compounding and conversion **Technical function of the substance:** process regulator use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=5 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: in a mixture Subsequent service life relevant for that use: no Related assessment: use not assessed
IW-11	**Industrial use of the substance in industrial chemical products such as pH regulators, flocculants, precipitants and neutralization agents** Further description of the use: Contributing activity/technique for the environment : **- Industrial use of the substance in industrial chemical products such as pH regulators, flocculants, precipitants and neutralization agents (ERC6b)** Contributing activity/technique for the workers : **- Raw material handling (PROC 8b; PROC 9)** **- Closed process (PROC 1; PROC 2; PROC 3)** **- Semi-closed process (PROC 4)** **- Industrial spraying (PROC 7)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category used:** PC 20: Products such as ph-regulators, flocculants, precipitants, neutralisation agents; PC 23: Leather treatment products **Sector of end use:** SU 5: Manufacture of textiles, leather, fur **Technical function of the substance:** pH regulating agent; processing aid use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=1 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: in a mixture Subsequent service life relevant for that use: no Related assessment: use not assessed
IW-12	**Industrial use of the substance in extraction agents** Further description of the use: Contributing activity/technique for the environment : **- Industrial use of the substance in extraction agents (ERC6b)** Contributing activity/technique for the workers : **- Raw material handling (PROC 8b)** **- Open process (PROC 5)** **- Transfer of substance or preparations (PROC 8b)**

	- Cleaning and maintenance (PROC28) **Product Category used:** PC 40: Extraction agents **Sector of end use:** SU 13: Manufacture of other non-metallic mineral products, e.g. plasters, cement **Technical function of the substance:** processing aid use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=1 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: in a mixture Subsequent service life relevant for that use: no Related assessment: use not assessed
IW-13	**Industrial use of the substance in photochemicals** Further description of the use: Contributing activity/technique for the environment : **- Industrial use of the substance in photochemicals (ERC6b)** Contributing activity/technique for the workers : **- Raw material handling (PROC 8b; PROC 9)** **- Open process (PROC 5)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category used:** PC 30: Photo-chemicals **Sector of end use:** SU 8: Manufacture of bulk, large scale chemicals (including petroleum products) **Technical function of the substance:** photochemical use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=1 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: in a mixture Subsequent service life relevant for that use: no Related assessment: use not assessed
IW-14	**Industrial use of the substance in the production and use of catalysts including regeneration and recycling** Further description of the use: Contributing activity/technique for the environment : **- Industrial use of the substance in the production and use of catalysts including regeneration and recycling (ERC4)** **- Industrial use of the substance in the production and use of catalysts including regeneration and recycling (ERC6b)** Contributing activity/technique for the workers : **- Raw material handling (PROC 26)** **- Closed process (PROC 1; PROC 2; PROC 3)** **- Semi-closed process (PROC 4)** **- Open process (PROC 5)** **- Tabletting (PROC 14)** **- Quality control (PROC 15)** **- Final handling of massive object (PROC 21)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category used:** PC 2: Adsorbents; PC 20: Products such as ph-regulators, flocculants, precipitants, neutralisation agents; PC 21: Laboratory chemicals; PC 0: Other: UCN Code P15500 catalysts **Sector of end use:** SU 8: Manufacture of bulk, large scale chemicals (including petroleum products); SU 9: Manufacture of fine chemicals; SU 20: Health services; SU 24: Scientific research

	and development **Technical function of the substance:** catalyst use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=1 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: as such Subsequent service life relevant for that use: no Related assessment: use not assessed
IW-15	**Intermediate use of the substance in the production and use of catalysts including regeneration and recycling** Further description of the use: Contributing activity/technique for the environment : **- Industrial use of the substance in the production and use of catalysts including regeneration and recycling (ERC6a)** Contributing activity/technique for the workers : **- Raw material handling (PROC 26)** **- Closed process (PROC 1; PROC 2; PROC 3)** **- Semi-closed process (PROC 4)** **- Open process (PROC 5)** **- Tabletting (PROC 14)** **- Quality control (PROC 15)** **- Final handling of massive object (PROC 21)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category used:** PC 2: Adsorbents; PC 20: Products such as ph-regulators, flocculants, precipitants, neutralisation agents; PC 21: Laboratory chemicals; PC 0: Other: UCN Code P15500 catalysts **Sector of end use:** SU 8: Manufacture of bulk, large scale chemicals (including petroleum products); SU 9: Manufacture of fine chemicals; SU 20: Health services; SU 24: Scientific research and development **Technical function of the substance:** intermediate (precursor) use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=1 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Substance supplied to that use: as such Subsequent service life relevant for that use: no Related assessment: use not assessed
IW-16	**Industrial use of the substance in steam condensate treatment** Further description of the use: Contributing activity/technique for the environment : **- Industrial use of the substance in steam condensate treatment (ERC7)** Contributing activity/technique for the workers : **- Raw material handling (PROC 8b; PROC 9)** **- Mixing in closed process (PROC 1; PROC 2)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Product Category used:** PC 37: Water treatment chemicals **Sector of end use:** SU 23: Electricity, steam, gas water supply and sewage treatment **Technical function of the substance:** antiscaling agent; corrosion inhibitor use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=0 tonnes/year "<= 0 tonnes/year" indicates that although the use has been reported to the Molybdenum

	Consortium, no-one in the value chain has reported any tonnage data for that use. Substance supplied to that use: as such; in a mixture Subsequent service life relevant for that use: no Related assessment: use not assessed

Table 11. Uses by professional workers

	Uses by professional workers
PW-1	**Professional use of micronutrients in fertilizers containing the substance** Further description of the use: Contributing activity/technique for the environment : **- Professional use of micronutrients in fertilizers containing the substance (ERC8b; ERC8e)** Contributing activity/technique for the workers : **- Raw material handling (PROC 26)** **- Mixing in closed process (PROC 1; PROC 2)** **- Mixing or blending (PROC 5)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Non-industrial spraying (PROC 11)** **- Treatment of articles by dipping and pouring (PROC 13)** **Product Category used:** PC 12: Fertilisers **Sector of end use:** SU 1: Agriculture, forestry and fishing **Technical function of the substance:** fertilisers (soil amendments) use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=200 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Subsequent service life relevant for that use: no Related assessment: use not assessed
PW-2	**Professional use of coolant, anti-freeze heat transfer fluid containing the substance** Further description of the use: Contributing activity/technique for the environment : **- Professional use of coolant, anti-freeze heat transfer fluid containing the substance (ERC9b)** Contributing activity/technique for the workers : **- Raw material handling (PROC 8a; PROC 8b)** **- Closed batch process (PROC 3)** **- Semi-closed process (PROC 4)** **- Open process (PROC 5)** **- Lubrication at high energy conditions (PROC 17)** **- Use of functional fluids (PROC 20)** **Product Category used:** PC 4: Anti-freeze and de-icing products; PC 16: Heat transfer fluids; PC 25: Metal working fluids **Technical function of the substance:** antiscaling agent; corrosion inhibitor; heat transferring agent; lubricating agent use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=100 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Subsequent service life relevant for that use: no Related assessment: use not assessed
PW-3	**Professional use of anti-icing applications containing the substance** Further description of the use:

	Contributing activity/technique for the environment : **- Professional use of anti-icing applications containing the substance (ERC8d)** Contributing activity/technique for the workers : **- Raw material handling (PROC 8a; PROC 8b)** **- Open process (PROC 5)** **Product Category used:** PC 4: Anti-freeze and de-icing products; PC 16: Heat transfer fluids **Sector of end use:** SU 0: Other: Road & parking lot infrastructure maintenance **Technical function of the substance:** antifreeze agent use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=1 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Subsequent service life relevant for that use: no Related assessment: use not assessed
PW-4	**Professional use of water treatment chemicals, including water softeners containing the substance** Further description of the use: Contributing activity/technique for the environment : **- Professional use of water treatment chemicals, including water softeners containing the substance (ERC8d)** Contributing activity/technique for the workers : **- Transfer of substance or preparations (PROC 8a; PROC 8b)** **- Closed process (PROC 2; PROC 3)** **- Semi-closed process (PROC 4)** **- Open process (PROC 5)** **- Non-industrial spraying (PROC 11)** **- Quality control (PROC 15)** **Product Category used:** PC 36: Water softeners; PC 37: Water treatment chemicals **Technical function of the substance:** antiscaling agent; corrosion inhibitor use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=5 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Subsequent service life relevant for that use: no Related assessment: use not assessed
PW-5	**Professional use of laboratory reagents and fine chemicals containing the substance in analysis and quality control** Further description of the use: As processing aid or in reactive processings Contributing activity/technique for the environment : **- Professional use of laboratory reagents and fine chemicals containing the substance in analysis and quality control (ERC8a)** **- Professional use of laboratory reagents and fine chemicals containing the substance in analysis and quality control (ERC8b)** Contributing activity/technique for the workers : **- Raw material handling (PROC 8a; PROC 8b; PROC 9)** **- Closed process (PROC 1; PROC 2; PROC 3)** **- Semi-closed process (PROC 4)** **- Open process (PROC 5)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Quality control (PROC 15)** **Product Category used:** PC 20: Products such as ph-regulators, flocculants, precipitants,

	neutralisation agents; PC 21: Laboratory chemicals **Sector of end use:** SU 20: Health services; SU 24: Scientific research and development **Technical function of the substance:** processing aid use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=0 tonnes/year "<= 0 tonnes/year" indicates that although the use has been reported to the Molybdenum Consortium, no-one in the value chain has reported any tonnage data for that use. Subsequent service life relevant for that use: no Related assessment: use not assessed
PW-6	**Professional use of tracers containing the substance** Further description of the use: Contributing activity/technique for the environment : **- Professional use of tracers containing the substance (ERC8a; ERC8d)** Contributing activity/technique for the workers : **- Raw material handling (PROC 8b; PROC 9)** **- Open process (PROC 5)** **- Treatment of articles by dipping and pouring (PROC 13)** **- Quality control (PROC 15)** **- Manual activities involving hand contact (PROC 19)** **- Transfer of substance or preparations (PROC 8b; PROC 9)** **- Cleaning and maintenance (PROC28)** **Sector of end use:** SU 1: Agriculture, forestry and fishing **Technical function of the substance:** tracer use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=1 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Subsequent service life relevant for that use: no Related assessment: use not assessed

Table 12. Consumer uses

	Consumer uses
C-1	**Consumer use of micronutrients in fertilizers containing the substance** Further description of the use: Contributing activity/technique for the environment: **- Consumer use of micronutrients in fertilizers containing the substance (ERC8e)** Contributing activity/technique for consumers: **- Use of fertilizers (PC 12)** **Technical function of the substance:** fertilisers (soil amendments) use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=100 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Subsequent service life relevant for that use: no Related assessment: use not assessed
C-2	**Consumer use of coolant, anti-freeze and heat transfer fluids containing the substance** Further description of the use: Contributing activity/technique for the environment: **- Consumer use of coolant, anti-freeze and heat transfer fluids containing the substance (ERC9a; ERC9b)** Contributing activity/technique for consumers:

	- Use of anti-freeze and de-icing products (PC 4) **- Use of heat transfer fluids (PC 16)** **Technical function of the substance:** antiscaling agent; corrosion inhibitor; heat transferring agent use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: <=5 tonnes/year The values are the tonnages the Molybdenum Consortium has been able to obtain from the value chain to-date, but no claim is made as to their comprehensiveness. Subsequent service life relevant for that use: no Related assessment: use not assessed

Table 13. Article service life

	Article service life
SL-1	**Service life of surface treated articles in industrial settings** Further description of the use: Article used by: workers Substance intended to be released from article: **Article category related to subsequent service life (AC):** AC 7: Metal articles Contributing activity/technique for the environment: **- ERC12a: Processing of articles at industrial sites with low release** Contributing activity/technique for consumers: Contributing activity/technique for the workers: **- PROC 21: Low energy manipulation of substances bound in materials and/or articles** **Technical function of the substance:** antiscaling agent; corrosion inhibitor use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: tonnes/year Related assessment: use not assessed
SL-2	**Service life of surface treated articles in professional settings** Further description of the use: Article used by: workers Substance intended to be released from article: **Article category related to subsequent service life (AC):** AC 7: Metal articles Contributing activity/technique for the environment: **- ERC10a: Widespread use of articles with low release (outdoor)** **- ERC11a: Widespread use of articles with low release (indoor)** Contributing activity/technique for consumers: Contributing activity/technique for the workers: **- PROC 21: Low energy manipulation of substances bound in materials and/or articles** **Technical function of the substance:** antiscaling agent; corrosion inhibitor use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: tonnes/year Related assessment: use not assessed
SL-3	**Service life of surface treated articles by consumers** Further description of the use: Article used by: consumers Substance intended to be released from article: **Article category related to subsequent service life (AC):** Contributing activity/technique for the environment: **- ERC10a: Widespread use of articles with low release (outdoor)** **- ERC11a: Widespread use of articles with low release (indoor)** Contributing activity/technique for consumers:

	- AC 7: Metal articles Contributing activity/technique for the workers: **Technical function of the substance:** antiscaling agent; corrosion inhibitor use registered according to REACH Article 10; total tonnage manufactured/imported >=10tonnes/year per registrant Tonnage of substance for that use: tonnes/year Related assessment: use not assessed