



ES FOR COMMUNICATION

Substance Name: Boron orthophosphate

EC Number: 236-337-7

CAS Number: 13308-51-5

Registration Number: *TO BE COMPLETED BY EACH REGSITRANT*

Date of Generation/Revision: 02/08/2016

Author:



Table of Contents

1. ES 1: Manufacture;	3
2. ES 2: Formulation or re-packing;	11
3. ES 3: Formulation or re-packing;	20
4. ES 4: Use at industrial sites; Various products (PC 9a, PC 9b, PC 14, PC 38); Various sectors (SU 13, SU 15);	29
5. ES 5: Widespread use by professional workers; Various products (PC 9a, PC 9b, PC 14, PC 38); Various sectors (SU 13, SU 15);	38
6. ES 6: Use at industrial sites; Laboratory Chemicals (PC 21); Various sectors (SU 8, SU 9, SU 24);	44
7. ES 7: Widespread use by professional workers; Laboratory Chemicals (PC 21); Various sectors (SU 9, SU 24);	52
8. ES 8: Use at industrial sites; Polymer Preparations and Compounds (PC 32); Manufacture of plastics products, including compounding and conversion (SU 12);	58
9. ES 9: Widespread use by professional workers; Fertilizers (PC 12); Agriculture, forestry, fishery (SU 1);	65
10. ES 10: Consumer use; Fertilizers;	70
11. ES 11: Service life (worker at industrial site); Various articles (AC 7, AC 4, AC 5);	71
12. ES 12: Service life (worker at industrial site); Plastic articles (AC 13);	74
13. ES 13: Service life (professional worker); Various articles (AC 7, AC 4, AC 5);	77
14. ES 14: Service life (professional worker); Plastic articles (AC 13);	80
15. ES 15: Service life (consumers); Various articles (AC 7, AC 4, AC 5);	83
16. ES 16: Service life (consumers); Plastic articles (AC 13);	85



1. ES 1: Manufacture

1.1. Title section

ES name: Various products

Environment	
CS 1: Manufacture of substances	ERC 1
Worker	
CS 2: Use in closed process, no likelihood of exposure	PROC 1
CS 3: Use in closed, continuous process with occasional controlled exposure	PROC 2
CS 4: Use in closed batch process (synthesis or formulation)	PROC 3
CS 5: Use in batch and other process (synthesis) where opportunity for exposure arises	PROC 4
CS 6: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
CS 7: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	PROC 8a
CS 8: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
CS 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
CS 10: Use as laboratory reagent	PROC 15
CS 11: Potentially closed processing operations (with minerals) at elevated temperature	PROC 22
CS 12: Open processing and transfer operations (with minerals) at elevated temperature	PROC 23
CS 13: Handling of solid inorganic substances at ambient temperature.	PROC 26
CS 14: Manual maintenance (cleaning and repair) of machinery	PROC 28

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Manufacture of substances (ERC 1)

The environmental release and exposure is not relevant.



1.2.2. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC 1)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

1.2.3. Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC 2)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

1.2.4. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC 3)

Product (Article) characteristics



Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

1.2.5. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC 4)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

1.2.6. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (PROC 5)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.



Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

1.2.7. Control of worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities (PROC 8a)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

1.2.8. Control of worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC 8b)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures



Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

1.2.9. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC 9)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

1.2.10. Control of worker exposure: Use as laboratory reagent (PROC 15)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation



Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

1.2.11. Control of worker exposure: Potentially closed processing operations (with minerals) at elevated temperature (PROC 22)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

1.2.12. Control of worker exposure: Open processing and transfer operations (with minerals) at elevated temperature (PROC 23)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.



Use suitable eye protection.

1.2.13. Control of worker exposure: Handling of solid inorganic substances at ambient temperature. (PROC 26)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

1.2.14. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 28)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

1.3. Exposure estimation and reference to its source



1.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance: Ensure safe systems of work or equivalent arrangements are in place to manage risks.

Scaling tool: Used CHESAR model.



2. ES 2: Formulation or re-packing;

2.1. Title section

ES name: Various products; Formulation or re-packing; Formulation & (re)packing of substances and mixtures

Environment	
CS 1: Formulation or re-packing	ERC 2
Worker	
CS 2: Use in closed process, no likelihood of exposure	PROC 1
CS 3: Use in closed, continuous process with occasional controlled exposure	PROC 2
CS 4: Use in closed batch process (synthesis or formulation)	PROC 3
CS 5: Use in batch and other process (synthesis) where opportunity for exposure arises	PROC 4
CS 6: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
CS 7: Industrial spraying	PROC 7
CS 8: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	PROC 8a
CS 9: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
CS 10: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
CS 11: Production of preparations or articles by tableting, compression, extrusion, pelettisation	PROC 14
CS 12: Use as laboratory reagent	PROC 15
CS 13: Potentially closed processing operations (with minerals) at elevated temperature	PROC 22
CS 14: Open processing and transfer operations (with minerals) at elevated temperature	PROC 23
CS 15: Handling of solid inorganic substances at ambient temperature.	PROC 26
CS 16: Manual maintenance (cleaning and repair) of machinery	PROC 28

2.2. Conditions of use affecting exposure



2.2.1. Control of environmental exposure: Formulation or re-packing (ERC 2)

The environmental release and exposure is not relevant.

2.2.2. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC 1)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

2.2.3. Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC 2)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.



2.2.4. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC 3)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

2.2.5. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC 4)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

2.2.6. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (PROC 5)



Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

2.2.7. Control of worker exposure: Industrial spraying (PROC 7)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

2.2.8. Control of worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities (PROC 8a)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures



Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

2.2.9. Control of worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC 8b)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

2.2.10. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC 9)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.;



Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

2.2.11. Control of worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelettisation (PROC 14)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

2.2.12. Control of worker exposure: Use as laboratory reagent (PROC 15)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.



Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.

Use suitable eye protection.

2.2.13. Control of worker exposure: Potentially closed processing operations (with minerals) at elevated temperature (PROC 22)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

2.2.14. Control of worker exposure: Open processing and transfer operations (with minerals) at elevated temperature (PROC 23)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.



2.2.15. Control of worker exposure: Handling of solid inorganic substances at ambient temperature. (PROC 26)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

2.2.16. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 28)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

2.3. Exposure estimation and reference to its source

2.4. Guidance to DU to evaluate whether he works inside the



boundaries set by the ES

Guidance: Ensure safe systems of work or equivalent arrangements are in place to manage risks.

Scaling tool: Used CHESAR model.



3. ES 3: Formulation or re-packing;

3.1. Title section

ES name: Various products; Formulation or re-packing; Formulation in materials

Environment	
CS 1: Formulation or re-packing	ERC 3
Worker	
CS 2: Use in closed process, no likelihood of exposure	PROC 1
CS 3: Use in closed, continuous process with occasional controlled exposure	PROC 2
CS 4: Use in closed batch process (synthesis or formulation)	PROC 3
CS 5: Use in batch and other process (synthesis) where opportunity for exposure arises	PROC 4
CS 6: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
CS 7: Industrial spraying	PROC 7
CS 8: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	PROC 8a
CS 9: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
CS 10: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
CS 11: Production of preparations or articles by tableting, compression, extrusion, pelettisation	PROC 14
CS 12: Use as laboratory reagent	PROC 15
CS 13: Potentially closed processing operations (with minerals) at elevated temperature	PROC 22
CS 14: Open processing and transfer operations (with minerals) at elevated temperature	PROC 23
CS 15: Handling of solid inorganic substances at ambient temperature.	PROC 26
CS 16: Manual maintenance (cleaning and repair) of machinery	PROC 28

3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: Formulation or re-packing



(ERC 3)

The environmental release and exposure is not relevant.

3.2.2. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC 1)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

3.2.3. Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC 2)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

3.2.4. Control of worker exposure: Use in closed batch process

**(synthesis or formulation) (PROC 3)**

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

3.2.5. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC 4)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

3.2.6. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (PROC 5)

Product (Article) characteristics



Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

3.2.7. Control of worker exposure: Industrial spraying (PROC 7)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

3.2.8. Control of worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities (PROC 8a)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.;



Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

3.2.9. Control of worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC 8b)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

3.2.10. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC 9)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.



Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

3.2.11. Control of worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelettisation (PROC 14)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

3.2.12. Control of worker exposure: Use as laboratory reagent (PROC 15)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For



further specification, refer to section 8 of the SDS.

Use suitable eye protection.

3.2.13. Control of worker exposure: Potentially closed processing operations (with minerals) at elevated temperature (PROC 22)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

3.2.14. Control of worker exposure: Open processing and transfer operations (with minerals) at elevated temperature (PROC 23)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

3.2.15. Control of worker exposure: Handling of solid inorganic



substances at ambient temperature. (PROC 26)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

3.2.16. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 28)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

3.3. Exposure estimation and reference to its source

3.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES



Guidance: Ensure safe systems of work or equivalent arrangements are in place to manage risks.

Scaling tool: Used CHESAR model.



4. ES 4: Use at industrial sites; Various products (PC 9a, PC 9b, PC 14, PC 38); Various sectors (SU 13, SU 15);

4.1. Title section

ES name: surface treatment products and compounds in the manufacture of metallic and non-metallic mineral products

Product category: Coatings and Paints, Thinners, paint removers (PC 9a), Fillers, putties, plasters, modelling clay (PC 9b), Metal surface treatment products, including galvanic and electroplating products (PC 14), Welding and soldering products (with flux coatings or flux cores.), flux products (PC 38)

Sector of use: Manufacture of other non-metallic mineral products, e.g. plasters, cement (SU 13), Manufacture of fabricated metal products, except machinery and equipment (SU 15)

Environment	
CS 1: Industrial use resulting in inclusion into or onto a matrix	ERC 5
Worker	
CS 2: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
CS 3: Calendering operations	PROC 6
CS 4: Industrial spraying	PROC 7
CS 5: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	PROC 8a
CS 6: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
CS 7: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
CS 8: Roller application or brushing of adhesive and other coating	PROC 10
CS 9: Treatment of articles by dipping and pouring	PROC 13
CS 10: Production of preparations or articles by tableting, compression, extrusion, pelettisation	PROC 14
CS 11: Hand-mixing with intimate contact and only PPE available	PROC 19
CS 12: Potentially closed processing operations (with minerals) at elevated temperature	PROC 22
CS 13: Open processing and transfer operations (with minerals) at elevated temperature	PROC 23



CS 14: High (mechanical) energy work-up of substances bound in materials and/or articles	PROC 24
CS 15: Handling of solid inorganic substances at ambient temperature.	PROC 26
CS 16: Manual maintenance (cleaning and repair) of machinery	PROC 28
Subsequent service life exposure scenario(s)	
ES 13: Service life (professional worker); Various articles (AC 7, AC 4, AC 5);	
ES 11: Service life (worker at industrial site); Various articles (AC 7, AC 4, AC 5);	
ES 15: Service life (consumers); Various articles (AC 7, AC 4, AC 5);	

4.2. Conditions of use affecting exposure

4.2.1. Control of environmental exposure: Industrial use resulting in inclusion into or onto a matrix (ERC 5)

The environmental release and exposure is not relevant.

4.2.2. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (PROC 5)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

4.2.3. Control of worker exposure: Calendering operations (PROC 6)

Product (Article) characteristics



Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

4.2.4. Control of worker exposure: Industrial spraying (PROC 7)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

4.2.5. Control of worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities (PROC 8a)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.;



Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

4.2.6. Control of worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC 8b)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

4.2.7. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC 9)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.



Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

4.2.8. Control of worker exposure: Roller application or brushing of adhesive and other coating (PROC 10)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

4.2.9. Control of worker exposure: Treatment of articles by dipping and pouring (PROC 13)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For



further specification, refer to section 8 of the SDS.

Use suitable eye protection.

4.2.10. Control of worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelettisation (PROC 14)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

4.2.11. Control of worker exposure: Hand-mixing with intimate contact and only PPE available (PROC 19)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

4.2.12. Control of worker exposure: Potentially closed processing



operations (with minerals) at elevated temperature (PROC 22)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

4.2.13. Control of worker exposure: Open processing and transfer operations (with minerals) at elevated temperature (PROC 23)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

4.2.14. Control of worker exposure: High (mechanical) energy work-up of substances bound in materials and/or articles (PROC 24)

Product (Article) characteristics
Covers concentrations up to 100.0 %



Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

4.2.15. Control of worker exposure: Handling of solid inorganic substances at ambient temperature. (PROC 26)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

4.2.16. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 28)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.



Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

4.3. Exposure estimation and reference to its source

4.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance: Ensure safe systems of work or equivalent arrangements are in place to manage risks.

Scaling tool: Used CHESAR model.



5. ES 5: Widespread use by professional workers; Various products (PC 9a, PC 9b, PC 14, PC 38); Various sectors (SU 13, SU 15);

5.1. Title section

ES name: surface treatment products and compounds in the manufacture of metallic and non-metallic mineral products

Product category: Coatings and Paints, Thinners, paint removers (PC 9a), Fillers, putties, plasters, modelling clay (PC 9b), Metal surface treatment products, including galvanic and electroplating products (PC 14), Welding and soldering products (with flux coatings or flux cores.), flux products (PC 38)

Sector of use: Manufacture of other non-metallic mineral products, e.g. plasters, cement (SU 13), Manufacture of fabricated metal products, except machinery and equipment (SU 15)

Environment	
CS 1: Wide dispersive outdoor use resulting in inclusion into or onto a matrix	ERC 8f, ERC 8c
Worker	
CS 2: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
CS 3: Calendering operations	PROC 6
CS 4: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	PROC 8a
CS 5: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
CS 6: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
CS 7: Roller application or brushing of adhesive and other coating	PROC 10
CS 8: Treatment of articles by dipping and pouring	PROC 13
CS 9: Production of preparations or articles by tableting, compression, extrusion, pelettisation	PROC 14
CS 10: Hand-mixing with intimate contact and only PPE available	PROC 19
CS 11: Handling of solid inorganic substances at ambient temperature.	PROC 26
CS 12: Manual maintenance (cleaning and repair) of machinery	PROC 28
Subsequent service life exposure scenario(s)	



ES 13: Service life (professional worker); Various articles (AC 7, AC 4, AC 5);

ES 15: Service life (consumers); Various articles (AC 7, AC 4, AC 5);

5.2. Conditions of use affecting exposure

5.2.1. Control of environmental exposure: Wide dispersive outdoor use resulting in inclusion into or onto a matrix (ERC 8f, ERC 8c)

The environmental release and exposure is not relevant.

5.2.2. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (PROC 5)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

5.2.3. Control of worker exposure: Calendering operations (PROC 6)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

5.2.4. Control of worker exposure: Transfer of substance or preparation



(charging/discharging) from/to vessels/large containers at non dedicated facilities (PROC 8a)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

5.2.5. Control of worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC 8b)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

5.2.6. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC 9)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section



8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

5.2.7. Control of worker exposure: Roller application or brushing of adhesive and other coating (PROC 10)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

5.2.8. Control of worker exposure: Treatment of articles by dipping and pouring (PROC 13)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

5.2.9. Control of worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelettisation (PROC 14)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.



Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

5.2.10. Control of worker exposure: Hand-mixing with intimate contact and only PPE available (PROC 19)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

5.2.11. Control of worker exposure: Handling of solid inorganic substances at ambient temperature. (PROC 26)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

5.2.12. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 28)

Product (Article) characteristics



Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

5.3. Exposure estimation and reference to its source

5.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance: Ensure safe systems of work or equivalent arrangements are in place to manage risks.

Scaling tool: Used CHESAR model.



6. ES 6: Use at industrial sites; Laboratory Chemicals (PC 21); Various sectors (SU 8, SU 9, SU 24);

6.1. Title section

ES name: use of intermediates and use of laboratory reagents in industrial settings (e.g. for quality control)

Product category: Laboratory Chemicals (PC 21)

Sector of use: Manufacture of bulk, large scale chemicals (including petroleum products) (SU 8), Manufacture of fine chemicals (SU 9), Scientific research and development (SU 24)

Environment	
CS 1: Industrial use resulting in manufacture of another substance (use of intermediates)	ERC 6a
Worker	
CS 2: Use in closed process, no likelihood of exposure	PROC 1
CS 3: Use in closed, continuous process with occasional controlled exposure	PROC 2
CS 4: Use in closed batch process (synthesis or formulation)	PROC 3
CS 5: Use in batch and other process (synthesis) where opportunity for exposure arises	PROC 4
CS 6: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
CS 7: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	PROC 8a
CS 8: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
CS 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
CS 10: Use as laboratory reagent	PROC 15
CS 11: Hand-mixing with intimate contact and only PPE available	PROC 19
CS 12: Potentially closed processing operations (with minerals) at elevated temperature	PROC 22
CS 13: Open processing and transfer operations (with minerals) at elevated temperature	PROC 23
CS 14: Handling of solid inorganic substances at ambient temperature.	PROC 26



6.2. Conditions of use affecting exposure

6.2.1. Control of environmental exposure: Industrial use resulting in manufacture of another substance (use of intermediates) (ERC 6a)

The environmental release and exposure is not relevant.

6.2.2. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC 1)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

6.2.3. Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC 2)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Use in closed, continuous process with occasional controlled exposure
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section



8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

6.2.4. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC 3)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

6.2.5. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC 4)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.



6.2.6. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (PROC 5)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

6.2.7. Control of worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities (PROC 8a)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

6.2.8. Control of worker exposure: Transfer of substance or preparation



(charging/discharging) from/to vessels/large containers at dedicated facilities (PROC 8b)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

6.2.9. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC 9)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

6.2.10. Control of worker exposure: Use as laboratory reagent (PROC 15)



Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

6.2.11. Control of worker exposure: Hand-mixing with intimate contact and only PPE available (PROC 19)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

6.2.12. Control of worker exposure: Potentially closed processing operations (with minerals) at elevated temperature (PROC 22)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures



Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

6.2.13. Control of worker exposure: Open processing and transfer operations (with minerals) at elevated temperature (PROC 23)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

6.2.14. Control of worker exposure: Handling of solid inorganic substances at ambient temperature. (PROC 26)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section



8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

6.2.15. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 28)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

6.3. Exposure estimation and reference to its source

6.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance: Ensure safe systems of work or equivalent arrangements are in place to manage risks.

Scaling tool: Used CHESAR model.



7. ES 7: Widespread use by professional workers; Laboratory Chemicals (PC 21); Various sectors (SU 9, SU 24);

7.1. Title section

ES name: use of intermediates and laboratory reagents at small scale

Product category: Laboratory Chemicals (PC 21)

Sector of use: Manufacture of fine chemicals (SU 9), Scientific research and development (SU 24)

Environment	
CS 1: Wide dispersive outdoor use of reactive substances in open systems	ERC 8e, ERC 8b
Worker	
CS 2: Use in closed process, no likelihood of exposure	PROC 1
CS 3: Use in closed, continuous process with occasional controlled exposure	PROC 2
CS 4: Use in closed batch process (synthesis or formulation)	PROC 3
CS 5: Use in batch and other process (synthesis) where opportunity for exposure arises	PROC 4
CS 6: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
CS 7: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	PROC 8a
CS 8: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
CS 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
CS 10: Use as laboratory reagent	PROC 15
CS 11: Hand-mixing with intimate contact and only PPE available	PROC 19
CS 12: Handling of solid inorganic substances at ambient temperature.	PROC 26
CS 13: Manual maintenance (cleaning and repair) of machinery	PROC 28

7.2. Conditions of use affecting exposure

7.2.1. Control of environmental exposure: Wide dispersive outdoor use of reactive substances in open systems (ERC 8e, ERC 8b)



The environmental release and exposure is not relevant.

7.2.2. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC 1)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

7.2.3. Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC 2)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

7.2.4. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC 3)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.



Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.

Use suitable eye protection.

7.2.5. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC 4)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

7.2.6. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (PROC 5)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

7.2.7. Control of worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities (PROC 8a)

Product (Article) characteristics
Covers concentrations up to 100.0 %



Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

7.2.8. Control of worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC 8b)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

7.2.9. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC 9)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.



7.2.10. Control of worker exposure: Use as laboratory reagent (PROC 15)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

7.2.11. Control of worker exposure: Hand-mixing with intimate contact and only PPE available (PROC 19)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

7.2.12. Control of worker exposure: Handling of solid inorganic substances at ambient temperature. (PROC 26)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For



further specification, refer to section 8 of the SDS.

Use suitable eye protection.

7.2.13. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 28)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

7.3. Exposure estimation and reference to its source

7.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance: Ensure safe systems of work or equivalent arrangements are in place to manage risks.

Scaling tool: Used CHESAR model.



8. ES 8: Use at industrial sites; Polymer Preparations and Compounds (PC 32); Manufacture of plastics products, including compounding and conversion (SU 12);

8.1. Title section

ES name: polymer preparations and compounds in the manufacture of plastic products

Product category: Polymer Preparations and Compounds (PC 32)

Sector of use: Manufacture of plastics products, including compounding and conversion (SU 12)

Environment	
CS 1: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers	ERC 6d
Worker	
CS 2: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
CS 3: Calendering operations	PROC 6
CS 4: Industrial spraying	PROC 7
CS 5: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	PROC 8a
CS 6: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
CS 7: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
CS 8: Treatment of articles by dipping and pouring	PROC 13
CS 9: Production of preparations or articles by tableting, compression, extrusion, pelettisation	PROC 14
CS 10: Open processing and transfer operations (with minerals) at elevated temperature	PROC 23
CS 11: High (mechanical) energy work-up of substances bound in materials and/or articles	PROC 24
CS 12: Handling of solid inorganic substances at ambient temperature.	PROC 26
CS 13: Manual maintenance (cleaning and repair) of machinery	PROC 28

**Subsequent service life exposure scenario(s)**

ES 14: Service life (professional worker); Plastic articles (AC 13);

ES 12: Service life (worker at industrial site); Plastic articles (AC 13);

ES 16: Service life (consumers); Plastic articles (AC 13);

8.2. Conditions of use affecting exposure

8.2.1. Control of environmental exposure: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers (ERC 6d)

The environmental release and exposure is not relevant.

8.2.2. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (PROC 5)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

8.2.3. Control of worker exposure: Calendering operations (PROC 6)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures



Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

8.2.4. Control of worker exposure: Industrial spraying (PROC 7)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

8.2.5. Control of worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities (PROC 8a)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section



8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

8.2.6. Control of worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC 8b)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

8.2.7. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC 9)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.



Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.

Use suitable eye protection.

8.2.8. Control of worker exposure: Treatment of articles by dipping and pouring (PROC 13)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

8.2.9. Control of worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelettisation (PROC 14)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.



8.2.10. Control of worker exposure: Open processing and transfer operations (with minerals) at elevated temperature (PROC 23)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

8.2.11. Control of worker exposure: High (mechanical) energy work-up of substances bound in materials and/or articles (PROC 24)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

8.2.12. Control of worker exposure: Handling of solid inorganic substances at ambient temperature. (PROC 26)

Product (Article) characteristics



Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

8.2.13. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 28)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

8.3. Exposure estimation and reference to its source

8.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance: Ensure safe systems of work or equivalent arrangements are in place to manage risks.

Scaling tool: Used CHESAR model.



9. ES 9: Widespread use by professional workers; Fertilizers (PC 12); Agriculture, forestry, fishery (SU 1);

9.1. Title section

ES name: Fertilizers

Product category: Fertilizers (PC 12)

Sector of use: Agriculture, forestry, fishery (SU 1)

Environment	
CS 1: Wide dispersive outdoor use of reactive substances in open systems	ERC 8e, ERC 8b
Worker	
CS 2: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
CS 3: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	PROC 8a
CS 4: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
CS 5: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
CS 6: Production of preparations or articles by tableting, compression, extrusion, pelettisation	PROC 14
CS 7: Hand-mixing with intimate contact and only PPE available	PROC 19
CS 8: Handling of solid inorganic substances at ambient temperature.	PROC 26
CS 9: Manual maintenance (cleaning and repair) of machinery	PROC 28

9.2. Conditions of use affecting exposure

9.2.1. Control of environmental exposure: Wide dispersive outdoor use of reactive substances in open systems (ERC 8e, ERC 8b)

The environmental release and exposure is not relevant.

9.2.2. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (PROC 5)



Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

9.2.3. Control of worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities (PROC 8a)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

9.2.4. Control of worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC 8b)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For



further specification, refer to section 8 of the SDS.

Use suitable eye protection.

9.2.5. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC 9)

Product (Article) characteristics

Covers concentrations up to 100.0 %

Covers solid products only.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.

Use suitable eye protection.

9.2.6. Control of worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelettisation (PROC 14)

Product (Article) characteristics

Covers concentrations up to 100.0 %

Covers solid products only.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.

Use suitable eye protection.

9.2.7. Control of worker exposure: Hand-mixing with intimate contact and only PPE available (PROC 19)

Product (Article) characteristics

Covers concentrations up to 100.0 %

Covers solid products only.



Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

9.2.8. Control of worker exposure: Handling of solid inorganic substances at ambient temperature. (PROC 26)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

9.2.9. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 28)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

9.3. Exposure estimation and reference to its source

9.4. Guidance to DU to evaluate whether he works inside the



boundaries set by the ES

Guidance: Ensure safe systems of work or equivalent arrangements are in place to manage risks.

Scaling tool: Used CHESAR model.



10. ES 10: Consumer use; Fertilizers;

10.1. Title section

ES name: Fertilizers

Product category: Fertilizers (PC 12)

Environment	
CS 1: Wide dispersive outdoor use of reactive substances in open systems	ERC 8e, ERC 8b
Consumer	
CS 2: Fertilizers	PC 12

10.2. Conditions of use affecting exposure

10.2.1. Control of environmental exposure: Wide dispersive outdoor use of reactive substances in open systems (ERC 8e, ERC 8b)

The environmental release and exposure is not relevant.

10.2.2. Control of consumer exposure: Fertilizers (PC 12)

Product (article) characteristics
Limit the substance content in the product to 5.0 %

10.3. Exposure estimation and reference to its source

10.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance: Ensure safe systems of work or equivalent arrangements are in place to manage risks.

Scaling tool: Used CHESAR model.



11. ES 11: Service life (worker at industrial site); Various articles (AC 7, AC 4, AC 5);

11.1. Title section

ES name: industrial use and/or processing of surface treated metal articles and non-metallic mineral articles containing the bound substance(including assembled articles)

Article category: Metal articles (AC 7), Stone, plaster, cement, glass and ceramic articles (AC 4), Fabrics, textiles and apparel (AC 5)

Environment	
CS 1: Industrial processing of articles with abrasive techniques (high release)	ERC 12b, ERC 12a
Worker	
CS 2: Low energy manipulation of substances bound in materials and/or articles	PROC 21
CS 3: High (mechanical) energy work-up of substances bound in materials and/or articles	PROC 24
CS 4: Hot work operation with metals	PROC 25
CS 5: Manual maintenance (cleaning and repair) of machinery	PROC 0
Exposure scenario of the uses leading to the inclusion of the substance into the article	
ES 4: Use at industrial sites; Various products (PC 9a, PC 9b, PC 14, PC 38); Various sectors (SU 13, SU 15);	

11.2. Conditions of use affecting exposure

11.2.1. Control of environmental exposure: Industrial processing of articles with abrasive techniques (high release) (ERC 12b, ERC 12a)

The environmental release and exposure is not relevant.

11.2.2. Control of worker exposure: Low energy manipulation of substances bound in materials and/or articles (PROC 21)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.



Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

11.2.3. Control of worker exposure: High (mechanical) energy work-up of substances bound in materials and/or articles (PROC 24)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

11.2.4. Control of worker exposure: Hot work operation with metals (PROC 25)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation



Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

11.2.5. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 0)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

11.3. Exposure estimation and reference to its source

11.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance: Ensure safe systems of work or equivalent arrangements are in place to manage risks.

Scaling tool: Used CHESAR model.



12. ES 12: Service life (worker at industrial site); Plastic articles (AC 13);

12.1. Title section

ES name: Industrial use; Plastic articles

Article category: Plastic articles (AC 13)

Environment	
CS 1: Industrial processing of articles with abrasive techniques (high release)	ERC 12b, ERC 12a
Worker	
CS 2: Low energy manipulation of substances bound in materials and/or articles	PROC 21
CS 3: High (mechanical) energy work-up of substances bound in materials and/or articles	PROC 24
CS 4: Manual maintenance (cleaning and repair) of machinery	PROC 0
Exposure scenario of the uses leading to the inclusion of the substance into the article	
ES 8: Use at industrial sites; Polymer Preparations and Compounds (PC 32); Manufacture of plastics products, including compounding and conversion (SU 12);	

12.2. Conditions of use affecting exposure

12.2.1. Control of environmental exposure: Industrial processing of articles with abrasive techniques (high release) (ERC 12b, ERC 12a)

The environmental release and exposure is not relevant.

12.2.2. Control of worker exposure: Low energy manipulation of substances bound in materials and/or articles (PROC 21)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.;



Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

12.2.3. Control of worker exposure: High (mechanical) energy work-up of substances bound in materials and/or articles (PROC 24)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

12.2.4. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 0)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Technical and organisational conditions and measures
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.; Ensure control measures are regularly inspected and maintained.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.



Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.

Use suitable eye protection.

12.3. Exposure estimation and reference to its source

12.3.1. Environmental release and exposure: Industrial processing of articles with abrasive techniques (high release) (ERC 12b)

The environmental release and exposure is not relevant.

12.3.2. Worker exposure: Low energy manipulation of substances bound in materials and/or articles (PROC 21)

12.3.3. Worker exposure: High (mechanical) energy work-up of substances bound in materials and/or articles (PROC 24)

12.3.4. Worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 0)

12.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance: Ensure safe systems of work or equivalent arrangements are in place to manage risks.

Scaling tool: Used CHESAR model.



13. ES 13: Service life (professional worker); Various articles (AC 7, AC 4, AC 5);

13.1. Title section

ES name: professional use and/or processing of surface treated metal articles and non-metallic mineral products/articles containing the bound substance (including assembled articles)

Article category: Metal articles (AC 7), Stone, plaster, cement, glass and ceramic articles (AC 4), Fabrics, textiles and apparel (AC 5)

Environment	
CS 1: Wide dispersive outdoor use of long-life articles and materials with high or intended release (including abrasive processing)	ERC 10b, ERC 11a, ERC 10a, ERC 11b
Worker	
CS 2: Low energy manipulation of substances bound in materials and/or articles	PROC 21
CS 3: High (mechanical) energy work-up of substances bound in materials and/or articles	PROC 24
CS 4: Hot work operation with metals	PROC 25
CS 5: Manual maintenance (cleaning and repair) of machinery	PROC 0
Exposure scenario of the uses leading to the inclusion of the substance into the article	
ES 4: Use at industrial sites; Various products (PC 9a, PC 9b, PC 14, PC 38); Various sectors (SU 13, SU 15);	
ES 5: Widespread use by professional workers; Various products (PC 9a, PC 9b, PC 14, PC 38); Various sectors (SU 13, SU 15);	

13.2. Conditions of use affecting exposure

13.2.1. Control of environmental exposure: Wide dispersive outdoor use of long-life articles and materials with high or intended release (including abrasive processing) (ERC 10b, ERC 11a, ERC 10a, ERC 11b)

The environmental release and exposure is not relevant.

13.2.2. Control of worker exposure: Low energy manipulation of substances bound in materials and/or articles (PROC 21)



Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

13.2.3. Control of worker exposure: High (mechanical) energy work-up of substances bound in materials and/or articles (PROC 24)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

13.2.4. Control of worker exposure: Hot work operation with metals (PROC 25)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.



13.2.5. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 0)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

13.3. Exposure estimation and reference to its source

13.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance: Ensure safe systems of work or equivalent arrangements are in place to manage risks.

Scaling tool: Used CHESAR model.



14. ES 14: Service life (professional worker); Plastic articles (AC 13);

14.1. Title section

ES name: Plastic articles; Professional use

Article category: Plastic articles (AC 13)

Environment	
CS 1: Wide dispersive outdoor use of long-life articles and materials with high or intended release (including abrasive processing)	ERC 10b, ERC 11a, ERC 10a, ERC 11b
Worker	
CS 2: Low energy manipulation of substances bound in materials and/or articles	PROC 21
CS 3: High (mechanical) energy work-up of substances bound in materials and/or articles	PROC 24
CS 4: Manual maintenance (cleaning and repair) of machinery	PROC 0
Exposure scenario of the uses leading to the inclusion of the substance into the article	
ES 8: Use at industrial sites; Polymer Preparations and Compounds (PC 32); Manufacture of plastics products, including compounding and conversion (SU 12);	

14.2. Conditions of use affecting exposure

14.2.1. Control of environmental exposure: Wide dispersive outdoor use of long-life articles and materials with high or intended release (including abrasive processing) (ERC 10b, ERC 11a, ERC 10a, ERC 11b)

The environmental release and exposure is not relevant.

14.2.2. Control of worker exposure: Low energy manipulation of substances bound in materials and/or articles (PROC 21)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.



Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

14.2.3. Control of worker exposure: High (mechanical) energy work-up of substances bound in materials and/or articles (PROC 24)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

14.2.4. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 0)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Covers solid products only.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator providing a minimum efficiency of 95.0 %; For further specification, refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

14.3. Exposure estimation and reference to its source

14.4. Guidance to DU to evaluate whether he works inside the



boundaries set by the ES

Guidance: Ensure safe systems of work or equivalent arrangements are in place to manage risks.

Scaling tool: Used CHESAR model.



15. ES 15: Service life (consumers); Various articles (AC 7, AC 4, AC 5);

15.1. Title section

ES name: consumer use of surface treated metal articles and non-metallic mineral products/articles containing the bound substance(including assembled articles)

Article category: Metal articles (AC 7), Stone, plaster, cement, glass and ceramic articles (AC 4), Fabrics, textiles and apparel (AC 5)

Environment	
CS 1: Wide dispersive outdoor use of long-life articles and materials with low release	ERC 10a, ERC 11a
Consumer	
CS 2: Vehicles	AC 4
CS 3: Machinery, mechanical appliances, electrical/electronic articles	AC 5
CS 4: Metal articles	AC 7
Exposure scenario of the uses leading to the inclusion of the substance into the article	
ES 4: Use at industrial sites; Various products (PC 9a, PC 9b, PC 14, PC 38); Various sectors (SU 13, SU 15);	
ES 5: Widespread use by professional workers; Various products (PC 9a, PC 9b, PC 14, PC 38); Various sectors (SU 13, SU 15);	

15.2. Conditions of use affecting exposure

15.2.1. Control of environmental exposure: Wide dispersive outdoor use of long-life articles and materials with low release (ERC 10a, ERC 11a)

The environmental release and exposure is not relevant.

15.2.2. Control of consumer exposure: Vehicles (AC 4)

Product (article) characteristics
Limit the substance content in the product to 5.0 %

15.2.3. Control of consumer exposure: Machinery, mechanical appliances, electrical/electronic articles (AC 5)



Product (article) characteristics

Limit the substance content in the product to 5.0 %

15.2.4. Control of consumer exposure: Metal articles (AC 7)

Product (article) characteristics

Limit the substance content in the product to 5.0 %

15.3. Exposure estimation and reference to its source

15.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance: Ensure safe systems of work or equivalent arrangements are in place to manage risks.

Scaling tool: Used CHESAR model.



16. ES 16: Service life (consumers); Plastic articles (AC 13);

16.1. Title section

ES name: Consumer use; Plastic articles

Article category: Plastic articles (AC 13)

Environment	
CS 1: Wide dispersive outdoor use of long-life articles and materials with low release	ERC 10a, ERC 11a
Consumer	
CS 2: Plastic articles	AC 13
Exposure scenario of the uses leading to the inclusion of the substance into the article	
ES 8: Use at industrial sites; Polymer Preparations and Compounds (PC 32); Manufacture of plastics products, including compounding and conversion (SU 12);	

16.2. Conditions of use affecting exposure

16.2.1. Control of environmental exposure: Wide dispersive outdoor use of long-life articles and materials with low release (ERC 10a, ERC 11a)

The environmental release and exposure is not relevant.

16.2.2. Control of consumer exposure: Plastic articles (AC 13)

Product (article) characteristics
Limit the substance content in the product to 5.0 %

16.3. Exposure estimation and reference to its source

16.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance: Ensure safe systems of work or equivalent arrangements are in place to manage risks.

Scaling tool: Used CHESAR model.