Versione 1

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### SEZIONE 1: IDENTIFICAZIONE DELLA SOSTANZA O LA MISCELA E DELLA SOCIETÀ O DELLA AZIENDA

**1.1. Identificazione del prodotto**: 0032 - AgriAlgae<sup>®</sup> Premium - Allegagione

### **1.2** Usi pertinenti identificati della sostanza o miscela ed usi sconsigliati:

Usi raccomandati: Biostimolante per coltivazioni, fertilizzante, nutrizione e protezione delle piante, delle colture ed input ecologici.

Usi sconsigliati: Nessun uso sconsigliato, purchè siano rispettate le indicazioni fornite nella SDS.

### **1.3.** Informazioni sul fornitore della scheda di dati di sicurezza:

ALGAENERGY, S.A. Avda. de Europa 19. Parque Empresarial "La Moraleja" 28108 – Alcobendas (Madrid) +34 91 490 20 20 +34 91 490 47 94 info@algaenergy.es

### **1.4.** Numero telefonico di emergenza:

CENTRI ANTIVELENO h 24/24: Milano – 0266101029 / Napoli – 0815453333 Pavia – 038224444 / Bergamo – 800883300 Foggia – 800183459 / Firenze – 0557947819 Roma – 063054343 opp. 0649978000 opp. 0668593726 / Verona – 800011858

### SEZIONE 2: IDENTIFICAZIONE DEI PERICOLI

### 2.1. Classificazione della sostanza o della miscela:

Classificazione della sostanza o della miscela Criteri **Regolamento CE 1272/2008 (CLP)** Può nuocere alla fertilità. Può nuocere al feto. 1B, H360FD

### 2.2. Elementi dell'etichetta:

Regolamento N.º 1272/2008 (CLP):

Parola di avvertimento: Pericolo

Indicazioni di pericolo:

### Reglamento N.º 1272/2008 (CLP):



H360FD – Può nuocere alla fertilità. Può nuocere al feto

Suggerimento di prudenza:



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P102 – Tenere fuori dalla portata dei bambini.

- P270 Non mangiare, bere o fumare durante l'ulitilizzo.
- P273 Non disperdere nell'ambiente

P280 – Indossare guanti/indumenti protettivi/Proteggere gli occhi/il viso.

- P308+P313 In caso di esposizione o di possibile esposizione, consultare un medico
- P391 Raccogliere il materiale fuoriuscito
- P501 Smaltire il prodotto/recipiente in conformità alla regolamentazione.

### Classificazione dei metalli pesanti (RD 506/2013): Classe A

**2.3. Altri pericoli:** Il prodotto non soddisfa i criteri PBT/mPmB.

### SEZIONE 3: COMPOSIZIONE, INFORMAZIONI SUI COMPONENTI

3.1. Sostanza: Non applicabile.

### 3.2. Miscele:

Componenti pericolosi ai sensi del Regolamento CLP e relativa classificazione:

Identificazione	Nome chimic	Concentrazione	Classificazione
CAS: 10043-35-3			Repr. 1B Può nuocere alla
CE: 233-139-2			fertilità. Categoria 1B,
REACH: 01-2119486683-25-XXXX	Acido Borico*	1-5 % (p/p)	H360FD

\* Sostanza con limiti di esposizione professionale

Tutti i costituenti la miscela sono conformi al Reg. CE 1907/2006 e sono stati registrati dai produttori/importatori/only representative laddove obbligati a farlo: i relativi numeri di registrazione saranno messi a disposizione dell'Autorità entro sette giorni dalla loro richiesta.

Possono essere presenti altre sostanze esenti da registrazione come previsto dall'articolo 2 o perché prodotte/importate in quantità inferiori alla tonnellata/anno

### SEZIONE 4: MISURE DI PRIMO SOCCORSO

### 4.1. Descrizione delle misure di primo soccorso:

Richiedere assistenza medica immediata, mostrando la SDS di questo prodotto

Per inalazione:Se la persona respira, spostala all'aria aperta. Se la persona non<br/>respira, praticare la respirazione artificiale. Consultare un medico.

Per contatto con la pelle: Togliere di dosso immediatamente gli indumenti contaminati. Lavare immediatamente con abbondante acqua corrente ed eventualmente sapone le aree del corpo che sono venute a contatto con il prodotto, anche se solo sospette. CONSULTARE IMMEDIATAMENTE UN MEDICO. Lavare completamente il corpo (doccia o bagno). Togliere immediatamente gli indumenti



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	contaminati ed eliminarli in modo sicuro.
Per contatto con gli occhi:	In caso di contatto con gli occhi risciacquarli con acqua per un intervallo di tempo adeguato e tenendo aperte le palpebre, quindi consultare immediatamente un oftalmologo. Proteggere l'occhio illeso.
Per ingestione:	Sciacquare la bocca con abbondante acqua e consultare un medico. Non somministrare nulla per via orale ad una persona incosciente.

### 4.2. Principali sintomi ed effetti, sia acuti che ritardati:

Nessuno in particolare.

# 4.3. Identificazione della eventuale necessità di consultare inmediatamente un medico e di trattamenti speciali:

Non rilevante.

### **SEZIONE 5: MISURE ANTINCENDIO**

### 5.1. .1. Mezzi di estinzione:

Mezzi di estinzione idonei: In caso di incendio possono essere utilizzati getti d'acqua atomizzati, schiuma resistente all'alcool, polvere chimica secca (polvere ABC) o anidride carbonica. Mezzi di estinzione non idonei: getto d'acqua.

### 5.2. Pericoli specifici derivanti dalla sostanza o dalla miscela:

Come conseguenza della combustione o della decomposizione termica, si generano sottoprodotti di reazione che possono essere tossici che di conseguenza, possono comportare un alto rischio per la salute.

### 5.3. Raccomandazioni per i vigili del fuoco:

A seconda dell'incendio, può essere necessario l'uso di indumenti protettivi completi e di un autorespiratore.

### SEZIONE 6: MISURE IN CASO DI RILASCIO ACCIDENTALE

### 6.1. Precauzioni personali, dispositivi di protezione e procedure in caso di emergenza:

Sia il personale di emergenza che il personale addetto alla locazione devono rispettare le politiche di salute e sicurezza del centro, nonché le raccomandazioni di sicurezza, indossando guanti protettivi, occhiali protettivi, indumenti adeguati rispettando buone pratiche igieniche. Evitare la

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### formazione di polvere.

### 6.2. Precauzioni ambientali:

Conservare il prodotto lontano dagli scarichi.

### 6.3. Metodi e materiali per il contenimento e per la bonifica:

Assorbire la fuoriuscita con materiali inerti. Conservare in contenitori adeguati e chiusi per lo smaltimento. Per lo smaltimento dei rifiuti, vedere la sezione 13.

### 6.4. Riferimento ad altre sezioni:

Vedere la Sezione 8 per le raccomandazioni sull'uso delle protezioni personali e la Sezione 13 per le informazioni sullo smaltimento dei rifiuti.

### SEZIONE 7: MANIPOLAZIONE ED IMMAGAZZINAMENTO

### 7.1. Precauzioni per la manipolazione sicura:

Rispettare le raccomandazioni e le pratiche di sicurezza in conformità con le buone pratiche di igiene industriale e personale, indossando guanti, occhiali e indumenti protettivi adeguati. Fornire una ventilazione adeguata in luoghi in cui si forma polvere. Non ci sono raccomandazioni specifiche se il prodotto viene usato correttamente.

### 7.2. Condizioni di conservazione sicure:

Conservare il prodotto nel suo contenitore originale, adeguatamente chiuso, in luoghi freschi, ben ventilati ed adeguati per mantenere intatte le caratteristiche originali del prodotto. Conservare fuori dalla portata dei bambini e lontano da cibo, bevande ed alimenti

### 7.3. Usi finali specifici:

Biostimolante delle colture, fertilizzante, trattamento curativo delle colture contro stress abiotico.

### SEZIONE 8: CONTROLLO DELL'ESPOSIZIONE/ PROTEZIONE INDIVIDUALE

### 8.1. Parametri di controllo:

Acido borico CAS: 10043-35-3 CE: 233-139-2 VLA ED: 2 mg/m3 VLA EC: 6 mg/m3 TRIB, s, r

DNEL lavoratori:

	Corto periodo		Lungo periodo	
	Sistemica	Locale	Sistemica	Locale
Orale	Non rilevante	Non rilevante	Non rilevante	Non rilevante
Cutanea	Non rilevante	Non rilevante	392 mg/kg	Non rilevante
Inalazione	Non rilevante	Non rilevante	8,3 mg/kg	Non rilevante

### DNEL popolazione:

	Corto periodo		Lungo periodo	
	Sistemica	Locale	Sistemica	Locale
Orale	0,98 mg/kg	Non rilevante	0,98 mg/kg	Non rilevante
Cutanea	Non rilevante	Non rilevante	196 mg/kg	Non rilevante





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Inalazione	Non rilevante	Non rilevante	4,15 mg/m3	Non rilevante

PNEC:

STP	10 mg/L	Agua dulce	2,02 mg/L
Suolo	5.4 mg/kg	Agua marina	2,02 mg/L
Intermitente	5.4 mg/kg	Sedimento (agua dulce)	Non rilevante
Oral	Non rilevante	Sedimento (agua salada)	Non rilevante

### 8.2. Controlli dell'esposizione:

A.- Misure generali di sicurezza e di igiene nell'ambiente di lavoro:

Manipolare secondo le buone pratiche di igiene e sicurezza industriali. Come misura di prevenzione, si consiglia l'uso di dispositivi di protezione individuale di base, con la corrispondente marcatura CE secondo il D.Lgs. 9/4/2008 n. 81 e successive modifiche.

B.- Protezione respiratoria:

Mascherina autofiltrante CAT 3 per gas y vapori EN 405:2001+A1:2009.

C.- Protezione specifica delle mani:

Per contatti prolungati o ripetuti, indossare guanti protettivi (EN ISO 374-1: 2016).

D.- Protezione degli occhi e del viso:

Per precauzione, indossare occhiali di sicurezza Cat 2, EN 166:2001, EN ISO 4007:2012.

E.- Protezione corporea: Non è necessaria alcuna protezione corporea

### **SEZIONE 9: PROPRIETÀ FISICO E CHIMICHE**

### 9.1. Informazioni sulle proprietà fisiche e chimiche fondamentali:

Stato fisico a 20 °C:	Liquido
Forma:	Liquida
Colore:	Marrone
Odore:	Caratteristico
pH:	3.6
Soglia olfattiva:	Non disponibile
Punto/Intervallo di fusione:	Non disponibile
Punto/Intervallo di ebollizione:	Non disponibile



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Pressione di vapore:	Non disponibile
Tensione superficiale:	Non disponibile
Densità a 25 °C:	1,08 g/ml
Solubilità in acqua (20 ° <i>C</i> ):	Totalmente solubile
Coefficiente di ripartizione n-ottanolo/acqua	a:Non disponibile
Temperatura di decomposizione:	Non disponibile
Temperatura di auto-Infiammazione:	Non disponibile
Viscosità:	Non disponibile
Proprietà esplosive:	Non esplosivo
Proprietà ossidanti:	Non ossidante
Proprietà infiammabili:	Non infiammabile

### **SEZIONE 10: STABILITÀ E REATTIVITÀ**

### 10.1. Reattività:

Stabile in normali condizioni di stoccaggio, manipolazione ed utilizzo (vedere sezione 7).

### 10.2. Stabilità chimica:

Stabile in normali condizioni di stoccaggio, manipolazione ed utilizzo (vedere sezione 7).

### 10.3. Possibilità di reazioni pericolose:

Nelle condizioni indicate per la conservazione, la manipolazione e l'uso, non sono previste reazioni pericolose che possono produrre una pressione o una temperatura eccessive (vedere sezione 7).

### 10.4. Condizioni da evitare:

Nelle condizioni indicate per la conservazione, la manipolazione e l'uso non è noto (vedere la sezione 7).

### 10.5. Materiali incompatibili:

Nessuno in particolare.

### 10.6. Prodotti di decomposizione pericolosi:

Nelle condizioni indicate per la conservazione, la manipolazione e l'uso non è noto (vedere la sezione 7).

**SEZIONE 11: INFORMAZIONI TOSSICOLOGICHE** 

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### 11.1. Informazioni sugli effetti tossicologici:

A.- Tossicità acuta: non classificato secondo il regolamento CLP 1272/2008 (sulla base dei dati disponibili, i criteri di classificazione non sono soddisfatti).

B.- Corrosione o irritazione cutanea: non classificato secondo il regolamento CLP 1272/2008 (sulla base dei dati disponibili, i criteri di classificazione non sono soddisfatti).

C.- Lesioni oculari gravi o irritazione oculare: non classificato secondo il regolamento CLP 1272/2008 (sulla base dei dati disponibili, i criteri di classificazione non sono soddisfatti).

D.- Sensibilizzazione respiratoria o cutanea: non classificato secondo il regolamento CLP 1272/2008 (sulla base dei dati disponibili, i criteri di classificazione non sono soddisfatti).

E.- Mutagenicità delle cellule germinali: non classificato secondo il regolamento CLP 1272/2008 (sulla base dei dati disponibili, i criteri di classificazione non sono soddisfatti).

F.- Cancerogenicità: non classificato secondo il regolamento CLP 1272/2008 (sulla base dei dati disponibili, i criteri di classificazione non sono soddisfatti).

G.- Tossicità per la riproduzione: Classificato come cat. 1B, H360FD. Può nuocere alla fertilità. Può nuocere al feto

H.- Tossicità specifica per organi bersaglio (STOT):

Esposizione singola: non classificato secondo il regolamento CLP 1272/2008 (sulla base dei dati disponibili, i criteri di classificazione non sono soddisfatti).

Esposizione ripetuta: non classificato secondo il regolamento CLP 1272/2008 (sulla base dei dati disponibili, i criteri di classificazione non sono soddisfatti).

J.- Pericolo in caso di aspirazione: non classificato secondo il regolamento CLP 1272/2008 (sulla base dei dati disponibili, i criteri di classificazione non sono soddisfatti).

### SEZIONE 12: INFORMAZIONI ECOLOGICHE

**12.1. Tossicità:** Classificato come pericolo per l'ambiente aqcuatico, categoria 2.

**12.2.** Persistenza e degradabilità: No disponibile.

**12.3.** Potenziale di bioaccumulo: No disponibile.

12.4. Mobilità nel suolo: No disponibile.

**12.5. Risultati della valutazione PBT e mPmB:** il prodotto non soddisfa i criteri di classificazione PBT/vPvB.



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**12.6.** Altri effetti avversi: nessuna ulteriore informazione disponibile.

### SEZIONE 13: CONSIDERAZIONI SULLO SMALTIMENTO

### 13.1. Metodi di trattamento dei rifiuti

Smaltire il contenuto e le sue soluzioni come prodotto non utilizzato (smaltimento) in conformità con i requisiti di tutte le normative ambientali Localei e nazionali degli Stati membri e dell'UE.

Smaltire il contenitore (reciclaggio) in conformità con tutte le normative ambientali Localei e nazionali, gli stati membri e l'UE.

Per lo smaltimento dei contenitori vuoti, rivolgersi ad aziende e gestori di rifiuti debitamente autorizzati. Si raccomanda che la classificazione sia effettuata dal gestore responsabile dello smaltimento dei rifiuti.

### SEZIONE 14: INFORMAZIONI RELATIVE AL TRASPORTO

### 14.1. Numero ONU

Non applicabile. Merce non pericolosa.

14.2. Designazione ufficiale dI trasporto di Nazioni Unite

Non applicabile. Merce non pericolosa.

### 14.3. Tipo/i di pericolo/i per il transporto

Non applicabile. Merce non pericolosa.

### 14.4. Gruppo di imballaggio

Non applicabile. Merce non pericolosa.

### 14.5. Rischi ambientali

Non applicabile. Merce non pericolosa.

### 14.6. Precauzioni speciali per gli utenti

Non applicabile. Merce non pericolosa.

### 14.7. Trasporto di rinfuse secondo l'allegato II dell'accordo MARPOL e il codice IBC:

Non applicabile. Merce non pericolosa.

### SEZIONE 15: INFORMAZIONI SULLA REGOLAMENTAZIONE

# 15.1. Norme e legislazione specifiche in materia di sicurezza, salute ed ambiente per la sostanza o la miscela:

Sostanze incluse nell'Allegato XIV del REACH (elenco di autorizzazioni) e data di scadenza:

SCHEDA DI SICUREZZA secondo il Regolamento (CE) 1907/2006

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Regolamento (CE) 1005/2009, sulle sostanze che riducono lo strato di ozono: Non rilevante

Sostanze attive che sono state incluse nell'articolo 95 del regolamento (UE) n. 528/2012: Acido Borico, EC 233-139-2, CAS 10043-35-3.

Restrizioni alla commercializzazione e all'uso di determinate sostanze e miscele pericolose (allegato XVII del regolamento REACH, ecc.): Non rilevante

Altre leggi: Regolamento (CE) n. 2003/2003 relativo ai fertilizzanti. D.Lgs. 75/2010, sui prodotti fertilizzanti e tutte le sue modifiche.

### 15.2. Valutazione della sicurezza chimica:

La valutazione della sicurezza chimica è stata effettuata.

### **SEZIONE 16: ALTRE INFORMAZIONI**

### 16.1. Legislazione applicabile alle schede di dati di sicurezza:

Questa scheda di sicurezza è stata sviluppata in conformità con l'ALLEGATO II-Guida per la preparazione delle schede di sicurezza del regolamento (CE) n. 1907/2006 (regolamento (UE) n. 2015/830).

# **16.2.** Modifiche rispetto alla precedente scheda di dati di sicurezza che incidono sulle misure di gestione dei rischi:

Regolamento n. 1272/2008 (CLP): aggiornamento di tutte le sezioni.

### 16.3. Principali fonti bibliografiche:

http://echa.europa.eu http://eur-lex.europa.eu

### 16.4. Testo completo delle abbreviazioni presenti nella scheda di dati di sicurezza:

DL50: Indicatore generale di tossicità acuta in una sostanza.

VLA: Valore limite di esposizione ambientale.

VLA-ED: Valore limite di esposizione ambientale. Esposizione giornaliera.

VLA-EC: Valore limite di esposizione ambientale. Esposizione corta.

DNEL: Livello senza effetto derivato.

ADR: Accordo europeo relativo al trasporto internazionale di merci pericolose su strada.

RID: Regolamento sul trasporto internazionale di merci pericolose per ferrovia.

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IMDG: Codice marittimo internazionale delle merci pericolose.

OACI: Organizzazione internazionale dell'aviazione civile.

IATA: International Air Transport Association.

### 16.5. Raccomandazioni sull'adeguata formazione:

Si raccomanda una formazione minima nella prevenzione dei rischi professionali per il personale che gestirà questo prodotto, al fine di facilitare la compressione e l'interpretazione di questa scheda di dati di sicurezza, nonché l'etichettatura del prodotto.

### 16.6. Avviso per il lettore

Le informazioni fornite in questa scheda di sicurezza sono le più corrette alla data della sua pubblicazione e si basano su fonti, conoscenze tecniche e legislazione in vigore a livello europeo e statale, non potendo garantirne l'accuratezza.

Le informazioni e le raccomandazioni in essi contenute sono concepite come una guida per la sicurezza nella manipolazione, nell'uso, nella lavorazione, nello stoccaggio, nel trasporto, nello smaltimento e nello scarico e non devono essere considerate una garanzia o una specifica di qualità. La metodologia e le condizioni di lavoro degli utenti di questo prodotto sono al di là della nostra conoscenza e controllo, essendo la responsabilità finale dell'utente di adottare le misure necessarie per adattarsi ai requisiti legislativi in materia di manipolazione, conservazione, uso e smaltimento dei prodotti chimici. Le informazioni contenute in questa scheda di sicurezza si riferiscono esclusivamente a questo prodotto, che non deve essere utilizzato per scopi diversi da quelli specificati.

### AGRIALGAE<sup>®</sup> è un marchio registrato di ALGAENERGY, S.A.



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### ANEXO: SENARI DI ESPOSIZIONE

Sector	Idou4:6 od Iloo	Sector of Use	Chemical Product	Process	Article	Environmental Release	Environmental Release Number	
Sector	Identified Use	Category (SU)	Category (PC)	Category (PROC)	Category (AC)	Category (ERC)	Environment	Human Health
Agriculture	Formulation of borates in fertilizers	1, 3	12	2, 3, 4, 5, 8a, 8b, 9, 14	-	2	E4	ES7, ES8, ES16, ES18, ES21, ES22, ES31, ES32
rigireunare	Professional use of fertilizers	1, 22	12	2, 3, 4, 5, 8a, 8b, 9, 11, 13	-	8a, 8b, 8c, 8d, 8e, 8f	E24	ES5, ES10, ES23, ES27, ES28
	Consumer use of fertilizers	21	19	-	_	8a, 8b, 8c, 8d, 8e, 8f	E24	ESC3

### NOTE to the downstream users:

In the case where there are exposure scenarios during the daily work which are not listed in the joint table of the appendix and described in the following detailed exposure scenarios, please visit the following webpage, containing all the existing exposure scenarios and consult your safety administrator about the missing exposure scenario. Please forward your findings to your supplier, so that the eSDS can be updated and completed accordingly.

Link to the webpage containing the full list of exposure scenarios:

http://www.ima-reach-hub.eu/index.php?option=com\_docman&task=cat\_view&gid=75&Itemid=26



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E4: Generic formulation of b	orates into mixt	ures	
Use descriptors			
ERC 2			
Additional information			
This generic exposure scenario has	been created based	on ERC2. This	scenario is valid for but not limited to
following uses:			
- Formulation in refractory mixture.	5		
- Manufacture of flux mixtures and p	pastes		
- Formulation into industrial fluids			
- Industrial use of industrial fluids in	n mixing		
- Formulation in fertilizers			
- Formulation in construction mater	rials		
- Formulation into photographic sol	utions		
- Formulation into analytical reagen	ıts		
- Formulation into cement			
Exposure scenario 1 has been calcu	lated with emission	s to air and wa	ter and the default dilution factor
Exposure scenario 2 has been calcu	lated with emission	s to air and wa	ter and a dilution factor of 100
Exposure scenario 3 has been calcu	lated with emission	s to air but no e	emissions to water
Controlling environmental expo	osure		
Product characteristics			
Borates including boric acid, boric	oxide, disodium oci	taborate and so	dium tetraborates are used in granular
form, powder form or can be dissolv	ved in a liquid.		-
Amounts used			
Tonnage calculations have been bas	ed on boron such t	hat no RCR exc	eeds 0.97, using back-calculations with
the relevant PNECs when necessary			C C
The equivalent tonnage of product h	andled on site show	uld be calculate	d from the conversion factors detailed
in the product table. For those oper	ations that handle a	a combination o	f borate compounds, the boron
equivalent of the combined tonnage	cannot exceed the	Site Tonnage (T	Boron) value.
Information type		Site tonnage	(T Boron/year)
Selected for Exposure Scenario		950	× • • •
Selected for Exposure Scenario		9 500	
Selected for Exposure Scenario		15 000	
Substance	Formula	•	Conversion factor for equivalent
			dose of B (multiply by)
Boric acid	НЗВОЗ		0.1748
Boric oxide	B2O3		0.3110
Disodium tetraborate anhydrous	Na2B4O7		0.2149
Disodium tetraborate	Na2B4O7.5H2O		0.1484
pentahydrate			
Disodium tetraborate decahvdrate	Na2B4O7.10H2C	)	0.1134
Disodium octaborate tetrahvdrate	Na2B8O13.4H2C	)	0.2096
Sodium metaborate anhydrous	NaBO2		0.1643
Sodium metaborate dihydrate	NaBO2.2H2O		0.1062
Sodium metaborate tetrahydrate	NaBO2 4H2O		0.0784
Sodium pentaborate anhydrous	NaB508		0.2636
Sodium pentaborate pentabydrate	NaB508 5H20		0.1832
Frequency and duration of use	1100500.51120		0.1052
Formulation occurs 200 days per va	ar par site (Median	value calculat	ed from data from questionnaires)
<b>Fnvironment</b> factors not influence	d by risk manage	nent	eu from auta from questionnaires)
Information type	Dilution factor	ment	Remarks
Selected for Exposure Scenario	10		Freshwater default
Selected for Exposure Scenario?	100		Marino default or specific river
Selected for Exposure Scenario 2	100	NP	marine acjuun or specific river
Other given energianal conditions	a offooting and		140
Delivery and new met with an U	s affecting environ	mental exposi	ing taken place inside the building
Denvery and raw material handling	mosily nappen in c	open air. weigh	ing takes place inside the building.
Toohnicol conditions and man	ace inside à buildin	ig in (semi) enc	uosea systems.
None	s at process level (	source) to prev	vent release
INONE			



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Technical onsite conditions and measures to reduce or limit dis	charges, ai	r emissions	and release	s to soil
For the remaining sectors where no spFRCs or measured data was	availahle :	the worst cas	se snERC fro	m the
formulation of detergents was taken and an extra safety factor of 2	has heen a	nnlied to the	m The snER	Cs for
detergents cover liquids and solids so they can be used for liquid a	nd solid mi	yptica to the ytures	m. The spER	05 901
Emissions to water can only be reduced by very specific treatment a	technologia	nures. es includino i	ion exchange	rosins
reverse osmosis etc. Removal efficiency is dependent upon a number	echnologie pr of factor	s and will va	rv from 40 to	0.00%
Much of the technology is currently not appropriate to high volume	or mixed y	vaste stream	ry from 40 ic s Roron is n	ot
removed in considerable amounts in conventional WWTP (assumed	l romoval o	fficiency is (	.s. Doron is n )%)	.01
Finissions to air can be removed by one or more of the following m	ραςυτρς.	jjiciency is o	//0).	
- Fleetrostatic precipitators	cusures.			
Cyclones, but as primary collector				
<i>Eabric or bag filters: high afficiency in controlling fine particulat</i>	a (maltina)	· achieve em	ission values	
Membrane filtration techniques can achieve	e (menng)	. uchieve em	ission values	,
Coramic and motal mosh filters PM10 particles are removed				
- Ceramic and metal mesh julers. FM10 particles are removed Wat sorubbars				
- Wei scrubbers	Dologo	factor to	Dologgo fo	ator to
information type	woton (a		Nelease la	
Selected for Fin equip Securation 1 and 2	water (g	(1)	$\frac{\operatorname{an}^{\circ}(\mathbf{g}/1)}{400}$	
Selected for Exposure Scenario 1 and 2	8000		400	
Selected for Exposure Scenario 3	0		400	
Organisational measures to prevent/limit release from site				
Spillages of powder or granulated borates should be swept or vacu	umed up in	nmediately a	nd placed in	
containers for disposal in order to prevent unintentional release to	the enviror	ıment.		
Conditions and measures related to municipal sewage treatment	it plant			
Not relevant, boron is not removed from water in municipal STP. I	<sup>c</sup> sites disch	arge to a mi	unicipal STP	the
concentration of boron should not exceed 10 mg/L in the municipal	STP.			
Conditions and measures related to external treatment of waste	e for dispo	sal		
Where appropriate material should be recovered and recycled thro	ugh the pro	ocess. Waste	containing b	porates
should be handled as a hazardous waste and removed by licensed o	perator to	an off-site lo	ocation where	e it can
be incinerated or disposed to a hazardous landfill.				
Conditions and measures related to external recovery of waste				
No external recovery of waste, spilt product is sometimes internally	v recovered	and reused	in the proces	s.
Exposure estimation and reference to its source			-	
Compartment Operational conditions	Value	Unit	PNFC	RCR
$050 T_{0} 200 d_{0} D = 10 PEwatar =$	vulue	emt		non
$\begin{array}{c c} FS1 \end{array} \left  \begin{array}{c} PEC \ freshwater \end{array} \right  \begin{array}{c} 950 \ 179, \ 200 \ ary, \ D=10, \ RF \ water = \\ 8 \ 000 \end{array}$	1 956	$\mu g/L$	2 900	0.675
$\frac{1}{2} \frac{1}{2} \frac{1}$	0.05	makadw	57	0.000
$\frac{PEC}{PEC} \frac{501}{930} \frac{930}{1/y}, \frac{200}{y}, \frac{100}{x} \frac{100}$	0.05	ту/ку иш	5.7	0.009
FEC [resnwater] 9 500 1/y, 200 a/y, D=100, KF water =	1 956	$\mu g/L$	2 900	0.675
ES2 marine 6 000	0.47		57	0.002
$\frac{PEC \ soil}{9 \ 500 \ T/y, \ 200 \ d/y, \ RFair = 400}$	0.4/	mg/kg dw	5./	0.082
$ES3 \qquad PEC freshwater \qquad 15 000 T/y, 200 d/y, RFwater = 0$	NR	$\mu g/L$	2 900	NR
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	0.74	mg/kg dw	5.7	0.130
Guidance to DU to evaluate whether he works inside the b	oundaries	s set by the	ES	
The DU works inside the boundaries set by the ES if either the prop	osed risk n	nanagement	measures as	
described above are met or the DU can demonstrate on his own the	t his imple	mented risk	management	
manual and been to Detailed and damage from an election of EC and	. h. a. a	ed via vour s	unnlier or fr	om the
measures are adequate. Detailed guidance for evaluation of ES car	i be acquir	cu viu your s	applier of fr	ominic
ECHA website (guidance R16). For environmental exposure, a DU	scaling to	ol (free dowr	nload:	om me
ECHA website (guidance R16). For environmental exposure, a DU http://www.archeconsulting.be/Metal-CSA-toolbox/du-scaling-tool	scaling to is availab	ol (free dowi ile	iload:	om me



Versione 1

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Use descriptors         ERC: 8a, 8c, 8d, 8f         Additional information         Exposure scenario for use of fertilizers containing borates         Controlling environmental exposure
ERC: 8a, 8c, 8d, 8f         Additional information         Exposure scenario for use of fertilizers containing borates         Controlling environmental exposure
Additional information         Exposure scenario for use of fertilizers containing borates         Controlling environmental exposure
Exposure scenario for use of fertilizers containing borates Controlling environmental exposure
Controlling environmental exposure
Product characteristics
Borates including boric acid, boric oxide, disodium octaborate and sodium tetraborates are used in granular
form, powder form or can be dissolved in a liquid.
Fertilizers can contain up to 7.7% of boron but in most cases the boron content is lower than 1%
Amounts used
The quantity applied depends upon that necessary to raise the level in the soil to support the crop in question
Frequency and duration of use
Fertilizers containing boron are only used when there are insufficient boron levels in the soil to support crop
growth. They tend not to be used in large quantities nor for long periods of time. The use of a boronated
fertiliser will depend upon the requirements of the crop being grown.
Environment factors not influenced by risk management
Used on soils which have low concentrations of boron.
Other given operational conditions affecting environmental exposure
None
Technical conditions and measures at process level (source) to prevent release
There are no direct releases to adjacent surface waters.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
Drift should be minimised.
Organisational measures to prevent/limit release from site
In line with the requirements of good agricultural practice, agricultural soil should be assessed prior to
application of boron and the application rate should be adjusted according to the results of the assessment and
crop requirements.
Conditions and measures related to municipal sewage treatment plant
Not relevant
Conditions and measures related to external treatment of waste for disposal
Waste containing borates should be handled as hazardous waste.
Conditions and measures related to external recovery of waste
Not relevant
Exposure estimation and reference to its source
No significant unwanted releases are expected.
Guidance to DU to evaluate whether he works inside the boundaries set by the ES
The DU works inside the boundaries set by the ES if either the proposed risk management measures as described
above are met or the DU can demonstrate on his own that his implemented risk management measures are
adequate. Detailed guidance for evaluation of ES can be acquired via your supplier or from the ECHA website
(guidance R16). For environmental exposure, a DU-scaling tool (free download:
http://www.archeconsulting.be/Metal-CSA-toolbox/du-scaling-tool) is available



Data di revisione: 25-03-2021

# 0032 - AGRIALGAE<sup>®</sup> Premium Allegagione

Versione 1

### ES5: Fertigation using boron-containing liquid fertiliser

### Use descriptors

*PROC2.* Use in closed, continuous process with occasional controlled exposure.

Controlling worker exposure for fertigation using boron-containing liquid fertiliser

**Product characteristics** 

The boron-containing liquid fertilisers contain between 0.01 and 7% boron.

Amounts used

*The amount of fertiliser used at any one time will depend on the area to be fertilised, but could be several tonnes.* **Frequency and duration of use** 

IBCs or silos containing the liquid fertiliser are connected to a fertigation system which automatically irrigates and fertilises plants in fields or greenhouses. The system runs constantly, with IBCs being changed over once or twice per week.

Human factors not influenced by risk management

None

Other given operational conditions affecting workers' exposure

The system is closed

Technical conditions and measures at process level (source) to prevent release

The system is closed so there is no release of the fertiliser except to the soil.

Technical conditions and measures to control dispersion from source towards the worker

Organisational measures to prevent/limit releases, dispersion and exposure

Training of operatives and maintenance of plant and equipment.

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

None

Exposure estimation and reference to its source

There are no measured data for inhalation or dermal exposure to boron during the use of fertigation systems. There is no opportunity for inhalation exposure as the fertiliser is liquid and is fed via a closed system to the soil. There may be the opportunity for dermal exposure during changeover of IBCs or during bulk deliveries of liquid fertilisers, when pipework is connected and disconnected.

MEASE has been used to estimate dermal exposure during this task. The parameters used were aqueous solution, 5-25% boron, PROC 2, professional use, <15 minutes, non-dispersive use, non-direct handling, incidental contact with no gloves. Changeover of IBCs may take place once or twice a week and would take a few minutes to complete. The estimated dermal exposure is 0.014mgB/day. This value is well below the dermal (external) DNEL of 4800 mgB/day.

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

If the parameters outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES.



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#### **PROC4** Use in batch and other process (synthesis) where opportunity for exposure arises. **PROC5** Mixing or blending in batch processes for formulation of preparations and article

*PROC5* Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).

### Controlling worker exposure for discharging bags (25-50kg) into mixing vessels

### **Product characteristics**

Borates are granular powders.

### Amounts used

The amount of borate used at any one time will depend on the size of the plant and the substance or preparation being manufactured.

### Frequency and duration of use

made every day, or several times a day, while for others it is a weekly, monthly or even yearly process. The duration of the activity can last from a few minutes up to about an hour, depending on the size of the batch being produced. The bags of borate are brought from the warehouse to the plant by forklift truck. The operative lifts the bag to the charging point on the vessel either manually or using a winch, and cuts the bag, pouring the borate into the vessel. This procedure is repeated until the required number of bags of borate has been added to the mixture. The task may be repeated more than once in a shift. In some cases, part bags may be weighed before addition to ensure the correct amount of borate is added.

At some sites, where the borate is delivered in 25kg bags, the bags of borate are fed directly into the furnace without being opened.

At some sites, the addition of the borate from the bag is semi-automated and the empty bag is automatically disposed of into a plastic tube for disposal.

The frequency and duration of use will depend on the substance or preparation being produced. For some, batches are

Human factors not influenced by risk management

None

Other given operational conditions affecting workers' exposure

The tasks are carried out indoors. The process temperatures are varied, depending on the sector of use, but the release of the borate from the bags is carried out at ambient temperature.

Technical conditions and measures at process level (source) to prevent release

None required.

At some sites semi-automation of the bag emptying process removes the source of exposure from the worker. Technical conditions and measures to control dispersion from source towards the worker

Local exhaust ventilation (LEV) at the bag discharge point is used to control the dispersion of airborne dust towards the worker. The hood should enclose the charging point as far as possible and the LEV should pull airborne dust away from the operative.

The empty bag should be placed directly to waste.

Organisational measures to prevent/limit releases, dispersion and exposure

*Training of operatives and regular testing and maintenance of plant and equipment.* 

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

Operatives wear overalls and gloves. Eye protection should be worn where good hygiene practice requires it or substance classification demands it. Where LEV does not reduce inhalation exposure to boron below the inhalation DNEL, P2/P3 respirators must be worn. These, if worn correctly, with a good face-fit will provide sufficient reduction in exposure. Where RPE is used, the worker should be face-fit tested to ensure that a good face seal can be obtained. RPE relies on a tight face seal and will not provide the required protection unless they fit the contours of the face properly and securely. The employer and self-employed persons have legal responsibilities for the maintenance and issue of respiratory protective equipment and the management of their correct use in the workplace. A suitable policy for a respiratory protective equipment programme including training of the workers should be in place.

Exposure estimation and reference to its source

There are 41 datapoints for the discharge of 25 kg bags into mixing vessels or similar. They range from none detected to 1.45mg B/m3, 8-hr TWA. Any short-term exposure values have been time-weighted to 8 hours to allow comparison against the inhalation DNEL. The 90th percentile for this dataset is 0.78mgB/m3. This value is below the inhalation DNEL of 1.45mg/m3.

Dermal exposure is unlikely to occur except when routine cleaning is taking place. MEASE has been used to estimate potential exposure during this activity. The parameters used were high dustiness solid, >25% boron, PROC4, duration of exposure 15-60 minutes, non-dispersive use, direct handling, incidental contact and no



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gloves. The estimated dermal exposure is 0.48mgB/day. This exposure estimate also assumes that all the dust is borate. This value is well below the dermal DNEL of 4800mgB/day.

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

If the parameters used in the MEASE model outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES



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### ES8: Discharging big bags (750 – 1500kg) into mixing vessels

### Use descriptors

*PROC4.* Use in batch and other process (synthesis or formulation)

*PROC5. Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)* 

*PROC8b.* Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

Controlling worker exposure for discharging big bags (750 – 1500kg) into mixing vessels

### Product characteristics

Borates are granular powders.

Amounts used

The amount of borate used at any one time will depend on the size of the plant and the substance or preparation being manufactured, but may be several tonnes.

Frequency and duration of use

The frequency and duration of use will depend on the substance or preparation being produced. For some, batches are made every day, or several times a day, while for others it is a weekly, monthly process. The duration of the activity can last from a few minutes up to about an hour, depending on the size of the batch being produced. The bags of borate are brought from the warehouse to the plant by forklift truck. The operative lifts the big bag to the charging point on the vessel using a winch or forklift truck, and cuts the base of the big bag, releasing the borate into the vessel. This procedure is repeated until the required number of big bags of borate has been added to the mixture. The task may be repeated more than once in a shift. In some cases, part bags may be weighed before addition to ensure the correct amount of borate is added.

Human factors not influenced by risk management

None

Other given operational conditions affecting workers' exposure

The tasks are carried out indoors. The process temperatures are varied, depending on the sector of use, but the release of the borate is carried out at ambient temperature.

Technical conditions and measures at process level (source) to prevent release

Single-use bags can be opened by the use of sharp prongs at the discharge hopper. When the big bag is placed at the discharge hopper and lowered, the prongs cut into the base of the bag releasing the borate into the hopper. This removes the operator from the immediate vicinity and contributes to a reduction in exposure.

Technical conditions and measures to control dispersion from source towards the worker

Local exhaust ventilation (LEV) at the bag discharge point is used to control the dispersion of airborne dust towards the worker.

Organisational measures to prevent/limit releases, dispersion and exposure

Training of operatives and regular testing and maintenance of plant and equipment.

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

Operatives wear overalls and gloves. Eye protection should be worn where good hygiene practice requires it or substance classification demands it. Where engineering controls (automation /enclosure/LEV) do not provide sufficient protection against inhalation exposure to boron, P2/P3 respirators must be worn. These, if worn correctly, with a good face-fit, will provide sufficient reduction in exposure. Where RPE is used, the worker should be face-fit tested to ensure that a good face seal can be obtained. RPE relies on a tight face seal and will not provide the required protection unless they fit the contours of the face properly and securely. The employer and the self-employed have legal responsibilities for the maintenance and issue of respiratory protective equipment and the management of their correct use in the workplace. A suitable policy for a respiratory protective equipment programme including training of the workers should be in place.

Exposure estimation and reference to its source

There are 31 personal exposure datapoints for the discharge of big bags. They range from 0.005 mgB/m<sub>3</sub> to 6.9 mgB/m<sub>3</sub>. For most downstream users the discharging of bags into receiving vessels is the main source of exposure to borates for those operatives, and is a short-term activity. Some short-term data was supplied converted to 8-hr TWAs. Any short-term exposure values provided have been time-weighted to 8 hours to allow comparison against the inhalation DNEL. This is a very wide data range and largely reflects the effectiveness of the LEV at different plants. These data do not take into account the use of RPE. The 90th percentile for these data is 2.0mgB/m<sub>3</sub>, which is above the inhalation DNEL of 1.45mgB/m<sub>3</sub>. If effective engineering controls/LEV are not in place, RPE (P2/P3) must be used to reduce worker exposure below the inhalation DNEL until effective engineering controls are put in place.

There are no dermal exposure data available, so MEASE has been used to estimate dermal exposure. The parameters used were high dustiness solid, >25% boron, PROC 4, 15-60 minutes duration, non-dispersive



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use, extensive contact, exterior LEV and no gloves. Dermal exposure is estimated to be 4.8mgB/day. This value is well below the dermal DNEL of 4800mgB/day.

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

If the parameters used in the MEASE model outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES.

# ES10: Transfer of boron-containing granular fertiliser

Use descriptors



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*PROC5. Mixing or blending in batch processes for formulation of prepartions\* and articles (multistage and/or significant contact)* 

*PROC8a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities* 

# Controlling worker exposure for transfer of boron-containing granular fertiliser

### **Product characteristics**

*The boron-containing fertilisers are granular and contain between 0.5 and 20.9% borate/boric acid which is equivalent to a range of 0.06 and 4.5% boron.* 

### Amounts used

The amount of fertiliser used at any one time will depend on the area to be fertilised, but is likely to be several tonnes.

### Frequency and duration of use

The fertiliser is supplied in 1 tonne bulk bags. When being spread, the bags are discharged into a spreader, by suspending the bags over the spreader hopper using a forklift truck or similar. The bags are untied and the fertiliser allowed to discharge into the hopper. The hopper is fitted with a grid. Loading the hopper of the spreader takes approximately 30 minutes to one hour depending on the number of bags used. This task is carried out by one operative. Fertiliser is applied to the land once or twice per year.

### Human factors not influenced by risk management

None

Other given operational conditions affecting workers' exposure

The work takes place outdoors or indoors in well-ventilated buildings at ambient temperature.

Technical conditions and measures at process level (source) to prevent release

None.

**Technical conditions and measures to control dispersion from source towards the worker** *None.* 

Organisational measures to prevent/limit releases, dispersion and exposure

Training of operatives and maintenance of plant and equipment.

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

Operatives wear overalls and gloves. Eye protection should be worn where good hygiene practice requires it or substance classification demands it. The wearing of RPE varies. P2/P3 respirators may be worn during transfer of the fertiliser from the big bags to the spreader. These, if worn correctly, with a good face-fit will provide a 90 - 95 %% reduction in exposure. Where RPE is used, the worker should be face-fit tested to ensure that a good face seal can be obtained. The RPE above rely on a tight face seal and will not provide the required protection unless they fit the contours of the face properly and securely. The employer and selfemployed persons have legal responsibilities for the maintenance and issue of respiratory protective devices and the management of their correct use in the workplace. Therefore, they should define and document a suitable policy for a respiratory protective device programme including training of the workers.

Exposure estimation and reference to its source

There are 31 datapoints available for discharging bags of borates into hoppers. They range from 0.002 to 6.9mg B/m3. The 90th percentile for these data is 2.0 mg B/m3, 8-hr TWA. For granular fertilisers the percentage of boron is reported to be between 0.06 and 4.5%. The 90th percentile for discharging big bags of fertilisers is estimated to be between 0.001 and 0.09 mg B/m3, depending on the percentage boron in the fertiliser. It is likely that exposure during this activity would be at the high end of the range as there is no LEV in use. When this scenario is modelled using ART, it is estimated that exposure to borate (5-10%) would be 5.7mg/m3. The parameters used were fine dry dust, falling powders, transferring 100-1000kg/minute, routine transfer, drop height >0.5m, open process, general housekeeping, no localised controls and good natural ventilation. This would be equivalent to boron exposure of 0.6 to 1.22mgB/m3, 8-hr TWA from the hour spent loading the spreader. This range is below the inhalation DNEL of 1.45mg/m3.

None of the above exposure estimates take into account the use of RPE. With the effective use of RPE during discharge of big bags, inhalation exposure during this activity can be minimised.

Dermal exposure has been estimated using MEASE. The parameters used were high dustiness solid, 1-5% boron, PROC 8a, professional use, 15-60 minutes, non-dispersive use, non-direct handling, extensive contact and no gloves. The estimated dermal exposure to boron during this activity is 0.019mgB/day. This is well below the dermal (external) DNEL of 4800 mgB/day.

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

If the parameters outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES.



### **0032 - AGRIALGAE® Premium Allegagione** Versione 1

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# ES16: Closed production at ambient temperatures

Use descriptors

PROC1. Use in closed process, no likelihood of exposure.

PROC2. Use in closed, continuous process with occasional controlled exposure.



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PROC3. Use in closed batch process (synthesis or formulation).

Controlling worker exposure for closed production at ambient temperatures

### Product characteristics

Borates are granular powders. They are used in these processes to make mixtures such as pastes and coatings **Amounts used** 

The amount of borate used at any one time will depend on the size of the plant and the substance or preparation being manufactured, but could be up to a tonne per shift.

Frequency and duration of use

*There are daily maintenance activities, planned maintenance and reactive maintenance on the plants.* **Human factors not influenced by risk management** 

None

Other given operational conditions affecting worker exposure

The tasks are carried out indoors.

Technical conditions and measures at process level (source) to prevent release

Most of the transfer of substances and the production processes are closed including the opening and addition of borates from 25kg bags.

Technical conditions and measures to control dispersion from source towards the worker

*Where processes are partially open, LEV is used to control exposure to airborne contaminants.* **Organisational measures to prevent/limit releases, dispersion and exposure** 

Training of operatives and regular testing and maintenance of plant and equipment.

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

Operatives wear overalls, safety shoes, safety glasses and when necessary to control exposure below the DNEL, P2/P3 respirators must also be worn.

Exposure estimation and reference to its source

There are 45 datapoints for general production activities including routine cleaning. They range from 0.0 mgB/m3 to 0.21 mgB/m3. The 90<sup>th</sup> percentile for these data is 0.08 mgB/m3. These data do not take into account the use of RPE. The 90<sup>th</sup> percentile value is well below the inhalation DNEL of 1.45mgB/m3.

Dermal exposure is unlikely to occur except when routine cleaning is taking place. MEASE has been used to estimate potential exposure during this activity. The parameters used were high dustiness solid, >25% boron, PROC2, duration of exposure 15-60 minutes, closed system without breaches, direct handling, incidental contact, enclosed process and no gloves worn. The estimated dermal exposure is 0.048 mgB/day. This exposure estimate also assumes that all the dust is borate. This value is well below the dermal DNEL of 4800mgB/day.

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

If the parameters used in the MEASE model outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES.

ES18: Transfer of substance or preparation from/to large vessels/containers at dedicated facilities Use descriptors



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Data di revisione: 25-03-2021

*PROC8b.* Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

# Controlling worker exposure for transfer of substance or preparation from/ to large vessels/ containers at dedicated facilities

**Product characteristics** *Borates are granular powders.* 

### Amounts used

The amount of borate delivered at any one time will depend on the size of the plant and the substance or preparation being manufactured. Each road tanker normally contains about 25-40 tonnes.

### Frequency and duration of use

The frequency and duration of use will depend on the substance or preparation being produced. For some, deliveries are made every day, or several times a day, while for others it is a weekly or monthly process. The duration of the off-loading activity lasts for one to two hours per road tanker.

Some sites take borates in pallets of 25kg bags, which may occur as infrequently as once or twice per year, while for others it is a weekly process.

### Human factors not influenced by risk management

None

Other given operational conditions affecting workers' exposure

The tasks are carried out outdoors so deliveries are made at ambient temperature.

Technical conditions and measures at process level (source) to prevent release

The transfer of borate is made pneumatically. A flexible hose is connected from the road tanker to the plant pipework. The borate is then pumped to the plant silos using either the motor on the road tanker or using onsite pumps. The system is therefore closed and there is little opportunity for worker exposure. The connection and disconnection of the flexible pipework takes one or two minutes, and this is the only opportunity for potential exposure to the borate.

Borates arriving by pallet are taken from the truck into the warehouse using a forklift truck.

Technical conditions and measures to control dispersion from source towards the worker

The receiving silos are fitted with filters to prevent the dispersion of borate with the displaced air from the top of the silos.

Organisational measures to prevent/limit releases, dispersion and exposure

Training of operatives and regular testing and maintenance of plant and equipment.

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

Operatives wear overalls and gloves. Eye protection should be worn where good hygiene practice requires it or substance classification demands it.

Exposure estimation and reference to its source

There is only one data point available for this activity exclusively. This value is 0.016 mgB/m3.

The ART exposure model was used to estimate exposure during this activity. The parameters used were fine dry dust, vacuum transfer of powders, transferring 100-1000kg/minute, open process, fully enclosed process, outdoors, LEV. The estimated 90th percentile exposure to dust was  $0.13mg/m_3$ . The boron equivalent would be in the range  $0.01 - 0.03mgB/m_3$  depending on the boron-containing material being off-loaded. This range accords well with the one real datapoint obtained. This value is well below the inhalation DNEL of  $1.45mgB/m_3$ 

MEASE was used to estimate dermal exposure during this activity. The parameters used were >25% boron, PROC2, duration <15minutes, closed system without breaches, non-direct handling, incidental contact and no gloves. The estimated exposure is 0.024mgB/day. This value is well below the dermal DNEL of 4800mgB/day.

There is no inhalation or dermal exposure risk to workers off-loading pallets of borates as the bags are sealed onto the pallets with polythene shrink wrap.

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

If the parameters used in the MEASE model outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES.

### **ES21:** General maintenance activities

Use descriptors



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*PROC8a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.* 

*PROC8b.* Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

### Controlling worker exposure for general maintenance activities

### **Product characteristics**

Borates are granular powders. They are used in numerous processes and industries.

### Amounts used

The amount of borate used at any one time will depend on the size of the plant and the substance or preparation being manufactured.

Frequency and duration of use

There are daily maintenance activities, planned maintenance and reactive maintenance on the plants.

Human factors not influenced by risk management

None

Other given operational conditions affecting worker exposure

Most tasks are carried out indoors, although there may also be outdoor activities.

Technical conditions and measures at process level (source) to prevent release

Most of the transfer of substances and the production processes are closed and automatically controlled from control cabins on the plant. Maintenance activities take place on and around the plant.

Technical conditions and measures to control dispersion from source towards the worker

Where processes are partially open, LEV is used to control exposure to fumes.

Organisational measures to prevent/limit releases, dispersion and exposure

*Training of operatives and regular testing and maintenance of plant and equipment.* 

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

Operatives wear overalls, safety shoes and when necessary to control exposure below the DNEL, P2/P3 respirators must also be worn. Eye protection should be worn where good hygiene practice requires it or substance classification demands it.

Exposure estimation and reference to its source

There are 13 datapoints for maintenance activities in closed manufacturing plants. When maintenance activities are taking place on a particular piece of plant, the plant may be opened to allow access to work, so that the normal engineering controls will not be working. The exposure data ranges from 0 to 2.66 mgB/m3. This is a wide range and reflects the variety of work carried out by maintenance workers. The 90th percentile for these data is 1.33 mgB/m3, which is below the inhalation DNEL of 1.45mgB/m3. These estimates do not take into account the effect of RPE. Where engineering controls are not effective, RPE (P2/P3) must be worn to ensure inhalation exposure remains below the DNEL. Dermal exposure may occur during maintenance activities. MEASE has been used to estimate this exposure. The parameters used were high dustiness solid, 1-25% boron, PROC 8a, industrial use, 60-240 minutes, non-dispersive use, direct handling, incidental contact and no gloves worn. The estimated exposure to dust is 1.728mgB/day. This is well below the dermal (external) DNEL of 4800 mgB/day.

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

If the parameters used in the MEASE model outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES.



Versione 1

Data di revisione: 25-03-2021

Use descriptors PROC9. Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Controlling worker exposure for transfer of substances into small containers

**Product characteristics** 

The products may be powder, liquid or paste.

### Amounts used

The amount of borate in the finished substance/preparation will depend on what has been made. The range may vary from 1 to 40%, so boron content may vary from 0.11 to 8.6% and the substance may be in solid, liquid or paste form. The amount of product packaged may be tens of tonnes per day.

Frequency and duration of use

The frequency and duration of use will depend on the substance or preparation being produced. For some, batches are made every day, or several times a day, while for others it is a weekly or monthly process. Packaging activities can last from 1 hour to 8 hours.

Human factors not influenced by risk management

None

Other given operational conditions affecting worker exposure

Some packaging processes are largely automatic. For example, packaging of liquids may be automatic apart from loading the closed containers onto a pallet. Some packaging of powder or granular products into 25kg sacks may be completely automatic, or the operative may have to place the bag on the filling chute and then manually close the bag and place on a pallet.

Technical conditions and measures at process level (source) to prevent release

Not required.

Where the packaging process is completely automatic, there is a reduction in exposure to the worker as the worker is removed from the process.

Technical conditions and measures to control dispersion from source towards the worker

Where powders are being bagged the minimum engineering control required is effective LEV in place to control inhalation exposure.

At liquid filling stations there is no requirement for LEV as there is minimal risk for exposure by inhalation unless aerosols are generated.

Where pastes are packaged there is no likelihood of inhalation exposure so LEV is not required.

Organisational measures to prevent/limit releases, dispersion and exposure

Training of operatives and regular testing and maintenance of plant and equipment.

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

Operatives wear overalls, safety shoes and when necessary P2/P3 respirators. Eye protection should be worn where good hygiene practice requires it or substance classification demands it.

Exposure estimation and reference to its source

There are few real data for packaging boron-containing substances. There are some data for packaging borate powders in 25kg bags from the manufacturers and these can be used and adapted to take into account that the substances or preparations will contain between 1 and 40% borate. The range of personal exposure measurements is 0.02 to 1.4mg B/m3. The range for the preparations would therefore be between 0.001 and 0.56 mg B/m3. The 90th percentile for this range is between 0.001 and 0.4mg B/m3 depending on the

percentage borate in the preparation. This range is between 0.001 and 0.4mg b/ms depending on the percentage borate in the preparation. This range for the 90th percentile is well below the inhalation DNEL of 1.45mg B/ms. These figures have assumed that the packaging operations will take place for 8 hours per day. In many cases packaging may only take place for 1 or 2 hours per day, in which case exposure to boron would be lower still. These figures take into account risk management measures such as LEV, but do not take into account the effect of wearing RPE.

The ART exposure model for inhalation predicts a 90th percentile of 0.06mg/m3 borate for filling liquids. The parameters used were falling liquids, transfer flow 10-100l/minute, open process splash loading, effective housekeeping, indoors, any size workroom, LEV and good natural ventilation. The equivalent 90th percentile for exposure to boron would be 0.01mgB/m3. This estimate assumes exposure over an 8-hr working day. This value is well below the inhalation DNEL of 1.45mgB/m3.

There are no dermal exposure data available, so MEASE has been used to estimate dermal exposure during non-automated packaging of powders. The parameters used were high dustiness solid, 5-25% boron, PROC9, duration >240 minutes, non-dispersive use, direct handling, intermittent contact, integrated LEV and no use of gloves. Dermal exposure is estimated to be 1.44mgB/day. This range is well below the dermal DNEL of 4800mgB/day.



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MEASE was also used to estimate dermal exposure during the packaging of liquids. The parameters used were aqueous liquid, 5-25% boron, PROC9, duration >240 minutes, non-dispersive use, non-direct handling, incidental contact, integrated LEV and no gloves. Dermal exposure is estimated to be 0.144mgB/day, which is below the dermal DNEL of 4800mgB/day.

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

If the parameters used in the MEASE model outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES.

### **ES23:** Transfer of boron-containing liquid foliar fertiliser Use descriptors



Versione 1

Data di revisione: 25-03-2021

*PROC9.* Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Controlling worker exposure for application of boron-containing liquid foliar fertiliser

### Product characteristics

The boron-containing liquid fertilisers contain between 0.01 and 7% boron.

### Amounts used

The amount of fertiliser used at any one time will depend on the area to be fertilised, but could be tens or hundreds of litres.

### Frequency and duration of use

The application of liquid foliar fertiliser could be carried out using a knapsack sprayer or a tractor-pulled spraybar. A worker could spend a shift spraying liquid fertiliser. If spraying using a backpack, the worker may need to refill his backpack several times during a shift, probably from a tank taken to the field. If spraying using a spraybar, the tank may need to be refilled several times during a shift. This is likely to be pumped from a tank, or may be gravity filled.

Human factors not influenced by risk management

None

Other given operational conditions affecting workers' exposure

The fertiliser is transferred outdoors or in a well-ventilated area.

Technical conditions and measures at process level (source) to prevent release

None

**Technical conditions and measures to control dispersion from source towards the worker** *None* 

Organisational measures to prevent/limit releases, dispersion and exposure

Training of operatives and maintenance of plant and equipment.

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

None

Exposure estimation and reference to its source

There are no measured data for inhalation or dermal exposure to boron during the use of liquid fertilisers. It is unlikely that inhalation exposure will occur as no aerosol is generated during this activity.

MEASE has been used to estimate dermal exposure during these transfer tasks. The parameters used were aqueous solution, 5-25% boron, PROC 9, professional use, 15-60 minutes, non-dispersive use, non-direct handling, intermittent exposure with no gloves. The estimated dermal exposure for transfer of liquid fertiliser is 0.029mgB/day. This value is well below the dermal (external) DNEL of 4800 mgB/day.

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

If the parameters outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES

### ES27: Spreading of boron-containing granular fertiliser

Use descriptors

PROC11. Non-industrial spraying.



Versione 1

Data di revisione: 25-03-2021

Controlling worker exposure for spreading of boron-containing granular fertiliser

Product characteristics

The boron-containing fertilisers are granular and contain between 0.5 and 20.9% borate/boric acid.

### Amounts used

The amount of fertiliser used at any one time will depend on the area to be fertilised, but is likely to be several tonnes.

### Frequency and duration of use

Once the spreader is filled, it is driven to the fields where the application is to take place. Applications of fertiliser are made once or twice per year, taking one to two days to complete. The use of the spreader makes this a wide-dispersive use. Most tractors have air-conditioned cabs, so the operative is protected from exposure during the application. However, this may not always be the case. If the tractor cabs are not air-conditioned or if windows/doors are not kept closed throughout the application, there is a higher risk of exposure via inhalation.

### Human factors not influenced by risk management

None

Other given operational conditions affecting workers' exposure

Where tractor cabs are air-conditioned exposure will be kept at a minimum during spreading.

Technical conditions and measures at process level (source) to prevent release

None.

**Technical conditions and measures to control dispersion from source towards the worker** *None.* 

Organisational measures to prevent/limit releases, dispersion and exposure

Training of operatives and maintenance of plant and equipment.

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

None required.

Exposure estimation and reference to its source

There are no measured data for inhalation or dermal exposure to boron during the spreading of fertiliser. The ART model has been used to estimate inhalation exposure to boron during the spreading of fertiliser. The parameters used were fine dry dust, spray application of powders, spraying horizontal or downwards, no housekeeping, outdoors, worker distance >4m, no localised controls, personal enclosure. The ART model estimated a 90th percentile exposure, for a shift, of 0.0023mg/m3, assuming 5-10% borate in fertiliser. This is equivalent to a boron exposure of between 0.0003 and 0.0004mgB/m3. The model included 430 minutes spent spreading the fertiliser from a fully enclosed and air-conditioned tractor cab. Without air-conditioning, ART estimates the 90th percentile for inhalation exposure to borate to be 0.016mg/m3, 8hr TWA. The parameters were the same as above, except the final parameter which was partial enclosure without ventilation. This is equivalent to a boron exposure of between 0.002 and 0.003mgB/m3, 8hr TWA.

There is minimal opportunity for dermal exposure during spreading of fertiliser as the worker is segregated in the tractor cab.

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

If the parameters outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES.

### ES28: Application of boron-containing liquid foliar fertiliser

Use descriptors

PROC11 Non industrial spraying.



Versione 1

Data di revisione: 25-03-2021

*PROC13 Treatment of articles by dipping and pouring.* 

Controlling worker exposure for application of boron-containing liquid foliar fertiliser **Product characteristics** 

The boron-containing fertilisers are liquid and contain between 0.01 and 36% borate/boric acid which is equivalent to 0.001 to 7.7% boron. The borate content is usually less than 1%.

Amounts used

The amount of fertiliser used at any one time will depend on the area to be fertilised, but could be tens or hundreds of litres.

Frequency and duration of use

The application of liquid foliar fertiliser could be carried out using a knapsack sprayer or a tractor-pulled spraybar. A worker could spend a shift spraying liquid fertiliser.

Human factors not influenced by risk management

None

Other given operational conditions affecting workers' exposure

The fertiliser is applied outdoors

Technical conditions and measures at process level (source) to prevent release

None

Technical conditions and measures to control dispersion from source towards the worker

If using a tractor mounted spray bar, the tractor cab is likely to be closed and air-conditioned.

Organisational measures to prevent/limit releases, dispersion and exposure

Training of operatives and maintenance of plant and equipment.

**Conditions and measures related to personal protection, hygiene and health evaluation** None

Exposure estimation and reference to its source

There are no measured data for inhalation or dermal exposure to boron during the use of liquid fertiliser spray systems.

ART has been used to estimate inhalation exposure during the spray application of liquid fertiliser. The parameters used were liquid, surface spraying of liquids, low application rate, horizontal or downward spraying with no or low compressed air, no housekeeping, outdoors and no localised controls. If backpack spraying, the 90th percentile value for inhalation exposure is estimated to be 0.17mgB/m3, 8-hr TWA. This is below the inhalation DNEL of 1.45mgB/m3, 8-hr TWA.

ART has also been used to estimate inhalation exposure to workers spraying liquid fertiliser using a tractor and spray bar. The 90th percentile for inhalation exposure is estimated to be 0.0014mgB/m3, 8-hr TWA. This value is well below the inhalation DNEL of 1.45mgB/m3.

MEASE has been used to estimate dermal exposure during these tasks. The parameters used were aqueous solution, 1-5% boron, PROC 11, professional use, >240 minutes, wide dispersive use, non-direct handling, intermittent contact and no gloves. The estimated dermal exposure for backpack spraying is 0.048mgB/day. This value is well below the dermal (external) DNEL of 4800 mgB/day.

The estimated dermal exposure during tractor and spray bar spraying is also 0.048mgB/day. The parameters used were aqueous solution, 1-5% boron, PROC 11, professional use, >240 minutes, wide-dispersive use, non-direct handling, incidental contact and no gloves. This value is well below the dermal (external) DNEL of 4800 mgB/day.

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

If the parameters outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES

### ES31: Compaction and tabletting of borate-containing powders

Use descriptors

PROC14. Production of preparations or articles by tabletting, compression, extrusion, pelletisation.



Versione 1

Data di revisione: 25-03-2021

Controlling worker exposure for compaction and tabletting of borate-containing powders

**Product characteristics** *The borates and borate mixtures are granular powders.* 

Amounts used

The amount of substance tabletted will vary, but may be several tonnes per shift.

Frequency and duration of use

The frequency and duration of compaction/tabletting is variable, but is often a daily, shift-length activity.

Human factors not influenced by risk management

None

Other given operational conditions affecting worker exposure

The work is carried out indoors.

Technical conditions and measures at process level (source) to prevent release

Parts of the plant may be enclosed e.g., transfer conveyors.

Technical conditions and measures to control dispersion from source towards the worker

LEV controls release of airborne dust.

Organisational measures to prevent/limit releases, dispersion and exposure

Training of operatives and regular testing and maintenance of plant and equipment.

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

Operatives wear overalls, safety shoes, and when necessary, P2/P3 respirators. Eye protection should be worn where good hygiene practice requires it or substance classification demands it.

Exposure estimation and reference to its source

There are four personal exposure datapoints for compacting pure borates into pellets and one for compacting fertiliser. These range from 0 to 1.3mgB/m3. Due to the small number of real data, ART was used to estimate exposure during this activity. The parameters used were fine dry dust, compressing of powders, compressing 10-100kg/minute, open process, effective housekeeping, indoors, any size workroom, LEV and good natural ventilation. The estimated 90th percentile is 7mg/m3, 8-hr TWA inhalable dust. The equivalent 90th percentile exposure to boron would be between 0.79mgB/m3 and 1.5mgB/m3 depending on the borate being compacted. These figures are for pure borate so would be applicable to manufacturers/importers. Exposures for downstream users would be lower as they would be compacting a mixture of powders rather than pure borate. The upper estimate for exposure is just above the inhalation DNEL for boron of 1.45mgB/m3. Where exposures are likely to exceed the DNEL, RPE must be worn until it can be demonstrated that engineering controls reduce exposure to 0.15 mg B/m3, well below the inhalation DNEL.

There are no dermal exposure data available, so MEASE has been used to estimate dermal exposure. The parameters used were high dustiness solid, >25%boron, PROC14, more than 240 minutes duration, nondispersive use, direct handling, intermittent contact, integrated LEV and no gloves. Dermal exposure is estimated to be 2.4mgB/day. This range of values is well below the dermal DNEL of 4800mgB/day. These values are for tableting or compacting pure borates. The estimated dermal exposures will be lower for those compacting boron-containing mixtures.

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

If the parameters used above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES

### ES32: Working in a laboratory

Use descriptors

PROC15. Use as laboratory reagent.



Versione 1

Data di revisione: 25-03-2021

### Controlling worker exposure for working in a laboratory

**Product characteristics** *Borates are granular powders.* 

## Amounts used

Samples of about 1kg are taken at borate processing and refining plants and also for quality control purposes at sites receiving borates, but only a few grams are used in quality control tests. Small amounts of borates may be used as analytical reagents in a wide variety of laboratories.

Frequency and duration of use/exposure

Technicians in quality control laboratories may spend a few minutes weighing borate samples each day, which is the only source of exposure, as the samples are normally collected by the plant operatives. The frequency of use of borates in other laboratories will be variable, but is unlikely to be daily.

Human factors not influenced by risk management
None

Other given operational conditions affecting workers' exposure

Very small quantities are used, and tests are often carried out in fume cupboards.

Technical conditions and measures at process level (source) to prevent release

None

**Technical conditions and measures to control dispersion from source towards worker** *Some tests are carried out in fume cupboards.* 

Organisational measures to prevent/limit releases, dispersion and exposure

Training of operatives and regular testing and maintenance of plant and equipment.

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

Operatives wear laboratory coats, safety shoes and gloves. Eye protection should be worn where good hygiene practice requires it or substance classification demands it.

Exposure estimation and reference to its source

There are 18 datapoints for laboratory technicians. The range of results was 0 to 0.2mgB/m3, 8-hr TWA. The 90<sup>th</sup> percentile for this dataset was 0.16 mgB/m3, which is well below the inhalation DNEL of 1.45 mgB/m3. As there are no real data for dermal exposure during this activity, MEASE has been used to estimate dermal exposure. The parameters used for estimating dermal exposure during laboratory work were; a high dustiness solid, with 5-25% boron, PROC 15, duration 15-60 minutes, nondispersive use, non-direct handling, incidental contact, integrated LEV and no gloves. The estimated dermal exposure is 0.014mgB/day. This value is well below the dermal DNEL of 4800mgB/day.

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

If the parameters used in the MEASE model outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES.

ESC3: Consumer use of boron containing fertilizer
Use descriptors
SU 21
<i>PC 12</i>



Versione 1

Data di revisione: 25-03-2021

AC not applicable Controlling consumer use of fertiliser

Further Specification

Direct dermal exposure to borates is anticipated with the fertiliser use.

**Product characteristics** 

Fertilisers for consumer use as concentrated solutions or granules may contain 0.02% boron and 0.2 ppm boron in the dilute working solution (Austria 2008). The concentration of boric acid in fertiliser rods is <1% (Scotts 2005).

Amounts used

The amount of fertiliser is not taken into account in the estimation of exposure.

Frequency and duration of use/exposure

Fertilisers will be used infrequently by the majority of the population.

Human factors not influenced by risk management

The affected skin surface area was 428 cm<sup>2</sup> and the body weight of the user was 60 kg.

Other given operational conditions affecting consumers exposure

None

**Conditions and measures related to information and behavioural advice to consumers** *Use instructions may be given on the package of fertilisers.* 

Conditions and measures related to personal protection and hygiene

Consumers may wear gloves when using fertilisers.

Exposure estimation and reference to its source

The dermal exposure to boric acid and boron resulting from fertiliser use has been assessed on the basis of the current ECHA guidelines on assessment of consumer exposure (Germany/Slovenia 2010). The estimated worst-case systemic dose of boron was  $2.6 \times 10^{-7}$  mg/kg bw/day, which corresponds to an external dermal dose of boron of  $5.2 \times 10^{-5}$  mg/kg bw/day.

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