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Sezione 1.: Identificazione della sostanza/miscela e della società/impresa

1.1 Identificatore prodotto: **SOLFATO DI ALLUMINIO**

Numero CAS: 10043-01-3, Numero EC: 233-135-0, Forma chimica: $\text{Al}_2(\text{SO}_4)_3 \cdot 13,5-14,5 \text{ H}_2\text{O}$,

$\text{Al}_2\text{O}_3 = 17 \%$, Nome IUPAC: Solfato di alluminio, numero di registrazione REACH: 01-2119531538-36-0009

1.2 Usi pertinenti identificati della sostanza o della miscela:

Coagulante, flocculante nel trattamento dell'acqua potabile e delle acque reflue, nel trattamento delle acque reflue industriali/petrolifere/municipali, nell'industria cartaria. Uso industriale e professionale della sostanza.

Conforme alla norma EN 878:2016 per i prodotti chimici per il trattamento dell'acqua potabile.

1.3 Dati del fornitore della scheda di dati di sicurezza:

EcoloChem Magyaróvár Kft.

H-9200 Mosonmagyaróvár,

Timföldgyári u. 13.B.ép.

Ungheria

Tel: +36 96 574 100

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1.3.1 Persona responsabile: Molnár Attila (+36-20) 985-4588

e-mail: molnar.a@ecm-kft.hu

1.4 Numero di telefono di emergenza: Centro Antiveleni e Centro Nazionale di Informazione

Tossicologica di Pavi

Via Salvatore Maugeri 10

27100 Pavia

Telefono: +39 0382 24444

Lista CAV Italiani segue in Sez. 16

Sezione 2.: Identificazione dei pericoli

2.1. Classificazione della sostanza o della miscela:

Pittogrammi:

GHS05



PERICOLO

Provoca gravi lesioni oculari: Cat 1

Indicazioni di pericolo:


H318 - Provoca gravi lesioni oculari

Consigli di prudenza:

P280 - Indossare guanti/proteggere gli occhi.

P305+P351+P338 - **IN CASO DI CONTATTO CON GLI OCCHI:** sciacquare accuratamente per parecchi minuti. Togliere le eventuali lenti a contatto se è agevole farlo. Continuare a sciacquare.

P310 - Contattare immediatamente un CENTRO ANTIVELENI o un medico.

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2.2. Elementi dell'etichetta

Pittogrammi:



PERICOLO

Provoca gravi lesioni oculari: Cat 1

Indicazioni di pericolo:

H318 - Provoca gravi lesioni oculari

Consigli di prudenza:

P280 - Indossare guanti/proteggere gli occhi.

P305+P351+P338 - **IN CASO DI CONTATTO CON GLI OCCHI:** sciacquare accuratamente per parecchi minuti. Togliere le eventuali lenti a contatto se è agevole farlo. Continuare a sciacquare.

P310 – Contattare immediatamente un CENTRO ANTIVELENI o un medico.

2.3. Altri pericoli: nessun pericolo specifico per l'uomo o l'ambiente.

Sezione 3.: Composizione/informazioni sugli ingredienti

3.1 Sostanza: Forma chimica: $\text{Al}_2(\text{SO}_4)_3 \cdot 13,5\text{-}14,5 \text{ H}_2\text{O}$

Nome chimico	Concentrazione	EINECS No.	CAS No.	Frase H:
Solfato di alluminio, con acqua di cristallizzazione Numero di registrazione REACH: 01-2119531538-36-0009	99,9 %	233-135-0	10043-01-3	H318 - Provoca gravi lesioni oculari


Ulteriore componente: inquinante pericoloso in tracce dell'ordine di grandezza ppm. Aspetto: solfato di alluminio tecnico in particelle in polvere, ben solubile in acqua. In caso di dispersione in acqua, è acida. Nome chimico: acido solforico, sale di alluminio (3:2). Formula: $\text{Al}_3/2\text{H}_2\text{O}_4\text{S}$, Massa molare: $\geq 215,06 \leq 342,14$.

Sezione 4. Misure di primo soccorso

4.1 Descrizione delle misure di primo soccorso:

IN CASO DI INGESTIONE:

- Misure:
- Rivolgersi immediatamente a un medico e mostrargli l'etichetta!
 - Mettere l'infortunato in una posizione comoda!
 - Non dare alla vittima nulla da mangiare o da bere e non indurre il vomito se la vittima è incosciente
 - Non indurre il vomito.
 - Sciacquare la bocca della vittima con acqua pulita.
 - Dare alla vittima da bere 1-2 bicchieri di acqua o latte.

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IN CASO DI INALAZIONE:

Misure: - Portare la vittima all'aria aperta, allentare i vestiti e lasciarla riposare.

- Sciacquare bocca e naso con acqua.
- In caso di sintomi, consultare un medico!

IN CASO DI CONTATTO CON LA PELLE:

Misure: - Rimuovere gli indumenti contaminati e lavarli prima di riutilizzarli.

- Lavare l'area contaminata con abbondante acqua e sapone o con un detergente delicato (per 15 minuti)!
- In caso di sintomi, consultare un medico!

IN CASO DI CONTATTO CON GLI OCCHI:

Misure: - In caso di contatto con gli occhi, sciacquare immediatamente con abbondante acqua corrente per 15 minuti, tenendo le palpebre divaricate (per almeno 15 minuti)!

- Rivolgersi immediatamente a un medico e mostrargli l'etichetta!

4.2 Sintomi ed effetti più importanti, sia acuti che ritardati:

Nessun dato disponibile.

4.3 Indicazione di eventuali cure mediche immediate e trattamenti speciali necessari: Nessun dato disponibile

Sezione 5.: Misure di lotta antincendio

5.1. Mezzi estinguenti:

5.1.1 Mezzi di estinzione idonei: Utilizzare misure di estinzione adeguate alle circostanze locali e all'ambiente circostante.

5.1.2 Mezzi estinguenti non idonei: Nessuno noto.

5.2 Pericoli particolari derivanti dalla sostanza o dalla miscela:

In caso di decomposizione: SO_x.

5.3 Consigli per i vigili del fuoco:

Indossare indumenti protettivi completi e autorespiratori.

Sezione 6.: Misure in caso di rilascio accidentale

6.1 Precauzioni personali, dispositivi di protezione e procedure di emergenza:


6.1.1 Per il personale non addetto alle emergenze:

Tenere lontane le persone non protette, consentire solo a esperti ben addestrati che indossano indumenti protettivi adeguati di rimanere nel campo dell'incidente.

6.1.2 Per i soccorritori:

Precauzioni personali: Indossare stivali e guanti. In caso di formazione di polvere, aerosol o nebbia, utilizzare una semimaschera con filtro combinato B/P2 o indossare una maschera monouso una sola volta.

Precauzioni ambientali:

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Smaltire le fuoriuscite e i rifiuti (prodotto/imballaggio) in conformità con tutte le leggi ambientali applicabili. Non permettere l'ingresso in fognature/suolo/acque superficiali o sotterranee. Informare immediatamente le autorità competenti in conformità con le normative locali in caso di inquinamento ambientale

Metodi e materiali per il contenimento e la bonifica:

Raccogliere il materiale fuoriuscito con l'aspirapolvere, quindi metterlo in un contenitore per rifiuti chimici adatto, chiuso e adeguatamente etichettato per lo smaltimento. Durante lo smaltimento, indossare idonei dispositivi di protezione individuale. Diluire i residui con acqua e neutralizzare con calce o polvere di calcare.

6.4 Riferimento ad altre sezioni:

Per ulteriori e dettagliate informazioni, vedere le sezioni 8 e 13.

Sezione 7.: Manipolazione e immagazzinamento

7.1 Precauzioni per una manipolazione sicura:

Osservare le precauzioni igieniche convenzionali. Evitare il contatto diretto con il prodotto.

Il luogo di lavoro e i metodi di lavoro devono essere organizzati in modo tale da impedire o ridurre al minimo il contatto diretto con il prodotto. Indossare guanti in un materiale adatto come PVC, neoprene o gomma naturale. Si prega di osservare le istruzioni relative alla permeabilità e al tempo di penetrazione, fornite dal fornitore dei guanti. Considerare anche le condizioni locali specifiche in cui viene utilizzato il prodotto, come il pericolo di tagli, l'abrasione e il tempo di contatto.

È necessario indossare occhiali di sicurezza aderenti.

Misure tecniche: Garantire un'adeguata ventilazione!

Precauzioni contro il fuoco e l'esplosione: Nessuna prescrizione specifica

7.2 Condizioni per lo stoccaggio sicuro, comprese eventuali incompatibilità:


Conservare nel contenitore originale, chiuso ed etichettato. Il luogo di stoccaggio deve essere adeguatamente ventilato e sgomberabile. Conservare in luogo fresco e asciutto. Evitare il congelamento. Evitare le alte temperature. Seguire tutte le istruzioni riportate sull'etichetta. Tenere lontano da sostanze che provocano reazioni chimiche violente (vedere paragrafo 10).

Conservare in un luogo di stoccaggio asciutto e coperto in una confezione chiusa. Non conservare in strutture con elevata umidità.

Stabilità permanente: sensibile all'umidità, può causare la coagulazione del prodotto. In caso di corretta conservazione, conserva la qualità per un periodo di tempo indefinito.

Tenere fuori dalla portata dei bambini. Tenere lontano da cibi, bevande e mangimi per animali.

Materiali incompatibili: Metalli non resistenti agli acidi (come alluminio, rame e ferro) - Basi - Acciaio non legato - Superfici zincate. Tenere lontano da cloriti, ipocloriti e solfiti (vedere paragrafo 10).

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Materiale di imballaggio: Confezione originale: sacchetto di carta o PP + PE, sacco in PE o Big-Bag. Plastica (PE, PP, PVC), Poliestere rinforzato con fibra di vetro, Calcestruzzo rivestito con resina epossidica, Titanio, Acciaio resistente agli acidi o rivestito in gomma.

7.3 Usi finali specifici: Vedi scenario espositivo

Sezione 8.: Controlli dell'esposizione/della protezione individuale


8.1 Parametri di controllo:

DNEL	Vie di esposizione	Frequenza di esposizione:	Osservazioni
Lavoratore:	Dermico:	A breve termine (acuto): improbabile A lungo termine (ripetuto): 3,8 mg/kg	NOAEL: 190,0 mg/kg di peso corporeo/giorno
	Per inalazione	A breve termine (acuto): non tipico Lungo termine (ripetuto): 13,4 mg/m ³	NOAEC: 168,0 mg/m ³
	Orale	A breve termine (acuto): non tipico A lungo termine (ripetuto): non tipico	

DNEL	Vie di esposizione	Frequenza di esposizione:	Osservazioni
Consumatore:	Dermico:	A breve termine (acuto): non tipico A lungo termine (ripetuto): non tipico	NOAEL: 190,0 mg/kg di peso corporeo/giorno
	Per inalazione	A breve termine (acuto): non tipico Lungo termine (ripetuto): 3,3 mg/m ³	NOAEC: 83 mg/m ³
	Orale	A breve termine (acuto): non tipico Lungo termine (ripetuto): 1,9 mg/kg/p.c./giorno	NOAEL: 340,0 mg/kg di peso corporeo/giorno

PNEC			Frequenza di esposizione:	Osservazioni
Acqua	Suolo	Aria		
Acqua dolce: 15/50=0,3 µg/l (alluminio disciolto)			Breve termine (uso singolo) A lungo termine (ripetuto) Pesce: NOAC: 15 µg/l	Fattori di valutazione: 50
Acqua di mare: 15/500=0,03 µg/l (alluminio disciolto)			Breve termine (uso singolo) A lungo termine (ripetuto)	Fattori di valutazione: 500
			Breve termine (uso singolo) A lungo termine (ripetuto)	

8.2 Controlli dell'esposizione:

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Nel caso di materiale pericoloso senza limiti di concentrazione controllati, è dovere del datore di lavoro mantenere il livello di concentrazione al livello minimo raggiungibile con i mezzi scientifici e tecnologici esistenti, laddove la sostanza pericolosa non rappresenti un danno per i lavoratori.

8.2.1 Controlli tecnici appropriati

Nel perseguimento del lavoro è necessaria un'adeguata accortezza per evitare di versarsi su vestiti e pavimenti ed evitare il contatto con gli occhi e la pelle. Il prodotto deve essere conservato in un deposito chiuso sotto il tetto. In prossimità del luogo di lavoro deve essere installata una doccia di sicurezza e una fontana per il lavaggio degli occhi. Osservare le precauzioni igieniche convenzionali. Garantire un'adeguata ventilazione.

8.2.2 Misure di protezione individuale, come i dispositivi di protezione individuale:

1. Protezione occhi/viso: utilizzare occhiali protettivi adeguati e ben sigillati.
2. Protezione della pelle: a.) Protezione delle mani: indossare guanti in un materiale adatto come PVC, neoprene o gomma naturale. Si prega di osservare le istruzioni relative alla permeabilità e al tempo di penetrazione, fornite dal fornitore dei guanti. Considerare anche le specifiche condizioni locali in cui viene utilizzato il prodotto, come il pericolo di tagli, abrasioni e il tempo di contatto.

b.) Altro: maschera monouso o respiratori se si forma polvere

Protezione delle vie respiratorie: In caso di formazione di polvere, aerosol o nebbia, utilizzare semimaschere con filtro combinato B/P2 o maschera monouso.

3. Rischio termico.: Nessuno lo sa


8.2.3 Controlli dell'esposizione ambientale:

Nessuna prescrizione specifica. **I requisiti descritti nella Sezione 8 presuppongono un lavoro qualificato in condizioni normali e un utilizzo del prodotto per scopi appropriati. Se le condizioni sono diverse dal normale o se il lavoro viene svolto in condizioni estreme, è necessario consultare un esperto prima di decidere ulteriori misure di protezione.**

Sezione 9.: Proprietà fisiche e chimiche

9.1 Informazioni sulle proprietà fisiche e chimiche di base:

- | | |
|---|-------------------|
| a) Stato fisico | solido |
| b) Colore | bianco |
| c) Odore | non significativo |
| d) Punto di fusione/punto di congelamento | non determinato |
| e) Punto di ebollizione o punto di ebollizione iniziale e intervallo di ebollizione | non determinato |
| f) Infiammabilità | non determinato |
| g) Limite inferiore e superiore di esplosività | non determinato |
| i) Temperatura di autoaccensione | non determinato |

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j) Temperatura di decomposizione	Distruzione termica: circa 400 °C
k) pH	3,0-3,5 (soluzione al 5 % al 20 % °C)
l) Viscosità	non determinato
m) Solubilità	si dissolve, ma si idrolizza in piccole concentrazioni
n) Coefficiente di ripartizione n-ottanolo/acqua (valore logaritmico)	irrilevante (inorganico)
o) Tensione di vapore	non determinato
p) Densità e/o densità relativa	1,70 kg/dm ³ , circa 1,00 kg/dm ³ (sfuso)
q) Densità relativa del vapore	non determinato
r) Caratteristiche delle particelle	caratteristica, tipi principali: 0-0,5 mm, 1,0-3,0 mm, 3,0-8,0 mm, 8,0-40,0 mm

9.2. Altre informazioni

p) Corrosivo per i metalli	<p>H290: Corrosivo per i metalli - può avere un effetto corrosivo per i metalli cat 1, ma. Questo vale solo per le soluzioni acquose (non più per lo stato solido).</p> <p>Poiché la corrosività dipende dal pH/concentrazione, non è necessario applicare la classificazione se si può dimostrare che i singoli prodotti non soddisfano i criteri</p>
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9.2 Altre informazioni:


Il solfato di alluminio è conforme ai requisiti della norma EN 878:2016 per le sostanze chimiche di tipo 1 utilizzate per il trattamento delle acque destinate al consumo umano.

Sezione 10.: Stabilità e reattività

- 10.1 Reattività: Nessuno noto
- 10.2 Stabilità chimica: A temperatura normale: stabile in condizioni generali di lavoro
- 10.3 Possibilità di reazioni pericolose: Nessun dato disponibile
- 10.4 Condizioni da evitare: Conservare lontano da fonti di calore e congelamento. Il prodotto entra in reazioni violente con una superficie metallica speciale (ad esempio, metalli zincati, alluminio, rame, zinco e loro leghe). Reagisce con le basi durante gli avvisi. Tenere lontano da cloriti, ipoclorito e solfiti.
- 10.5 Materiali incompatibili: Metalli non resistenti agli acidi (come alluminio, rame e ferro), cloriti, ipocloriti, solfiti – Base – Acciaio non legato – Superficie zincata
- 10.6 Prodotti di decomposizione pericolosi: SO₂, SO₃

Sezione 11.: Informazioni tossicologiche

- 11.1 Informazioni sugli effetti tossicologici:
- | | |
|---|---------------|
| Tossicità acuta: | Nessuno noto |
| Irritazione cutanea: | Nessuno noto |
| Gravi danni agli occhi/irritazione oculare: | Categoria 1 |
| Sensibilizzazione respiratoria o cutanea: | Nessuno noto. |
| Mutagenità delle cellule germinali: | Nessuno noto |
| Cancerogenicità: | Nessuno noto |
| STOT-esposizione singola: | Nessuno noto |

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Esposizione ripetuta STOT:

Nessuno noto

Pericolo di aspirazione:

Nessuno noto

- 11.1.1 Per le sostanze soggette a registrazione, brevi sintesi delle informazioni ricavate dalla prova effettuata:
Informazioni basate sulla relazione sulla sicurezza chimica.

Studi sperimentali sulla tossicità acuta dopo esposizione orale e cutanea.

La tossicità orale dell'ACHS sembra essere bassa, molto probabilmente a causa dello scarso assorbimento del materiale dal tratto gastrointestinale. Per la tossicità cutanea acuta fare riferimento al solfato di idrossido di cloruro di alluminio (ACHS). Lo studio per inalazione viene eseguito con cloruro di idrossido di alluminio solfato. Testato come aerosol. Il diametro aerodinamico mediano di massa (MMAD) e la deviazione standard geometrica (gsd) sono stati determinati due volte. Il MMAD era di 4,0 e 5,0 mm e il GSD era di 1,7 in entrambe le occasioni. Sulla base della tossicità acuta per inalazione, l'ACHS come aerosol non presenta alcun rischio per la salute.

- 11.1.2 Proprietà tossicologiche rilevanti delle sostanze pericolose:

LD50	Orale	<5000 mg/kg di peso corporeo
LD50	Dermico	>5000 mg/kg di peso corporeo
LC50	Inalazione	>5000 mg/m3 aria

- 11.1.3 Informazioni sulle probabili vie di esposizione:

La sostanza (soluzione) può causare possibili effetti cutanei e/o inalatori locali.

Sulla base della valutazione dei pericoli, sono possibili effetti sistemici a lungo termine dopo l'esposizione orale e inalatoria. L'esposizione orale non è una via di esposizione rilevante per i lavoratori.

- 11.1.4 Sintomi legati alle caratteristiche fisiche, chimiche e tossicologiche: Nessun dato disponibile

- 11.1.5 Effetti ritardati e immediati, nonché effetti cronici da esposizione a breve e lungo termine:

Provoca gravi danni agli occhi.

- 11.1.6 Effetti interattivi: nessun dato disponibile

- 11.1.7 Assenza di dati specifici: Nessun dato disponibile

- 11.1.8 Altre informazioni: Nessun dato disponibile

- 11.2. Altre informazioni sui pericoli

- 11.2.1. Proprietà dannose per il sistema endocrino: non può essere classificato come dannoso per il sistema endocrino

- 11.2.2. Altre informazioni: Nessun dato disponibile

Sezione 12.: Informazioni ecologiche

12.1 Tossicità: I dati disponibili indicano che i sali di alluminio sono relativamente non tossici nella maggior parte delle acque con pH neutro. Non c'è bisogno di classificazione del solfato di alluminio

12.2 Persistenza e degradabilità: Nessun dato disponibile

12.3 Potenziale di bioaccumulo: Nessun dato disponibile

12.4. Mobilità nel suolo: Nessun dato disponibile

12.5 Risultati della valutazione PBT e vPvB: Nessun dato disponibile

12.6 Proprietà di interferenza endocrina: Non può essere classificato come dannoso per il sistema endocrino

12.7 Altri effetti avversi: WGK 1

Sezione 13.: Considerazioni sullo smaltimento


13.1 Metodi di trattamento dei rifiuti: Smaltimento secondo le normative locali.

- 13.1.1 Informazioni relative allo smaltimento del prodotto:

Diluire i residui con acqua e neutralizzare con calce o polvere di calcare.

Durante lo smaltimento del prodotto, dei suoi residui e del suo imballaggio è necessario osservare la prescrizione nazionale. I codici CAE indicati di seguito sono solo raccomandazioni, ma potrebbero dover essere modificati a causa di circostanze speciali, in tali casi potrebbe essere necessaria una nuova classificazione.

- 13.1.2 Informazioni relative allo smaltimento dell'imballaggio

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13.1.3 Devono essere specificate le proprietà fisico-chimiche che possono influire sulle opzioni di trattamento dei rifiuti: Nessuna nota

13.1.4 Smaltimento delle acque reflue: Nessuno noto

13.1.5 Precauzioni speciali per il trattamento dei rifiuti consigliato: Nessun dato disponibile.

Sezione 14.: Informazioni sul trasporto

Non è un bene per i pericoli nel senso delle norme di trasporto!

14.1 Numero ONU: Nessun dato disponibile

14.2 Nome di spedizione corretto delle Nazioni Unite: Nessun dato disponibile

14.3 Classe/i di pericolo per il trasporto: Nessun dato disponibile

14.4 Gruppo di imballaggio: Nessun dato disponibile

14.5 Pericoli per l'ambiente: Nessun dato disponibile

14.6 Precauzioni speciali per l'uso: Nessun dato disponibile

14.7 Trasporto marittimo alla rinfusa secondo gli strumenti dell'IMO: non contemplato dall'IMDG

Nel caso di merci alla rinfusa, il nome di spedizione del carico alla rinfusa è: Solfato di alluminio. Non può essere considerato dannoso per l'ambiente marino.

Sezione 15.: informazioni sulla regolamentazione

15.1 Normative/legislazioni in materia di sicurezza, salute e ambiente specifiche per la sostanza o la miscela:

1. REGOLAMENTO (UE) 2020/878 DELLA COMMISSIONE del 18 giugno 2020 che modifica l'allegato II del regolamento (CE) n. 1907/2006 del Parlamento europeo e del Consiglio concernente la registrazione, la valutazione, l'autorizzazione e la restrizione delle sostanze chimiche (REACH)

2. REGOLAMENTO (CE) N. 790/2009 DELLA COMMISSIONE del 10 agosto 2009 che modifica, ai fini dell'adeguamento al progresso tecnico e scientifico, il regolamento (CE) n. 1272/2008 del Parlamento europeo e del Consiglio relativo alla classificazione, all'etichettatura e all'imballaggio delle sostanze e delle miscele.

3. DIRETTIVA 1999/45/CE DEL PARLAMENTO EUROPEO E DEL CONSIGLIO del 31 maggio 1999 concernente il ravvicinamento delle disposizioni legislative, regolamentari e amministrative degli Stati membri relative alla classificazione, all'imballaggio e all'etichettatura dei preparati pericolosi

4. REGOLAMENTO N. 1272/2008 DEL PARLAMENTO EUROPEO E DEL CONSIGLIO, del 16 dicembre 2008, relativo alla classificazione, all'etichettatura e all'imballaggio delle sostanze e delle miscele che modifica e abroga le direttive 67/548/CEE e 1999/45/CE e che modifica il regolamento (CE) n. 1907/2006

5. REGOLAMENTO (UE) N. 453/2010 DELLA COMMISSIONE del 20 maggio 2010 che modifica il regolamento (CE) n. 1907/2006 del Parlamento europeo e del Consiglio concernente la registrazione, la valutazione, l'autorizzazione e la restrizione delle sostanze chimiche (REACH)

15.2 Valutazioni della sicurezza chimica: è stata preparata la valutazione della sicurezza chimica della sostanza.

Sezione 16. : Altre informazioni

Informazioni relative alla revisione della scheda di dati di sicurezza.: -

Testo completo delle abbreviazioni nella scheda di dati di sicurezza:

DNEL: Derivato nessun livello di effetto. **PNEC:** Concentrazione prevista senza effetto. Effetti CMR: cancerogenicità, mutagenicità e tossicità riproduttiva. **PBT:** Persistente, bioaccumulabile e tossico. **N.D:** Non definito.

H318 - Provoca gravi lesioni oculari

Istruzioni per l'allenamento: -

La presente scheda di dati di sicurezza è stata redatta sulla base delle informazioni fornite dal fabbricante. Le informazioni, i dati e le raccomandazioni contenute nel presente documento sono forniti in buona fede, ottenuti da fonti attendibili e ritenuti veritieri e accurati alla data di pubblicazione; Tuttavia, non viene fornita alcuna dichiarazione in merito alla completezza delle informazioni. La SDS deve essere utilizzata solo come guida per la manipolazione del prodotto, nel corso della manipolazione e dell'utilizzo del prodotto possono sorgere o essere necessarie altre considerazioni. Poiché le condizioni o la manipolazione, lo stoccaggio e lo smaltimento di questo prodotto descritti nella presente SDS devono essere creati o dedotti da qualsiasi dichiarazione nella presente SDS. Non si assume alcuna responsabilità in merito all'accuratezza, alla completezza o all'idoneità di tutte o parte delle informazioni contenute nel presente documento o ai risultati ottenibili dall'uso delle stesse al momento dell'utilizzo. In nessun modo il produttore, il distributore o il preparato del saranno responsabili per eventuali reclami, perdite o danni di terzi, lesioni personali, danni alla proprietà, perdita di profitti o qualsiasi danno speciale, diretto, indiretto, incidentale, consequenziale o esemplare derivante dall'uso o dall'affidamento su tali informazioni. Gli utenti sono invitati a determinare l'adeguatezza e l'applicabilità delle informazioni di cui sopra alle loro circostanze e scopi particolari e ad assumersi tutti i rischi associati all'uso di questo prodotto. È responsabilità dell'utente rispettare pienamente le normative locali, nazionali e internazionali relative all'uso di questo prodotto.

	Schede di dati di sicurezza (SDS) Regolamento (UE) 2020/878 della	Versione: 10
	SOLFATO DI ALLUMINIO	Pagina: 10 / 10
		Data di emissione: 17. 11. 2023

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Exposure scenario

Aluminium sulphate

EcoloChem Magyaróvár Kft.

2020.

EXPOSURE ASSESSMENT

Human exposure assessment

Exposure scenario 1: Manufacture of the substance

Aqueous solution:

ES1 - Manufacture of Aluminium salts – Aqueous solution – max Aluminium content = 25%	
Section 1	Exposure Scenario Title
Title	Manufacture of Aluminium salts - aqueous solution; Aluminium content = max. 25%
Use Descriptor	Sector of Use: Industrial (SU8, SU9)
	Process Categories: PROC1: Use in a closed process, no likelihood of exposure PROC2: Use in a closed continuous process, with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) PROC4: Use in a batch and other process (synthesis) where opportunity for exposure arises PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC15: Use as a laboratory reagent
	Environmental Release Categories: ERC1: Manufacture of substances
Processes, tasks, activities covered	Manufacture of the substance. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities
Exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Aqueous solution: vapour pressure of Alu-salt in water 0.01 Pa or less; Liquid, vapour pressure < 10 Pa [OC14]
Concentration of substance in product	Covers percentage substance in the product up to 25 % [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposures [E119]
Contributing Scenarios	Risk Management Measures
Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26] Avoid skin contact: Wear suitable gloves tested to EN374 [PPE15]	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54].	No specific measures identified [E118]. <i>Recommendations:</i>

Process sampling [CS2] (closed systems) [CS107]	<i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}.</i>
PROC2: General exposures [CS1]. Continuous process [CS54]. Process sampling [CS2] (open systems) [CS108]	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}. {Clear spills immediately [C&H13]}.</i>
PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Ensure the system is closed}</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.</i>
PROC4: General exposures (open systems) [CS16]. Batch process [CS55] (open systems) [CS108]; Drum/batch transfers [CS8]. With sample collection [CS56]. ; Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i>
PROC8b: General exposures, open systems [CS16]. Dedicated facility [CS81] Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i>
PROC15: General exposures [CS1]. Laboratory activities [CS36]. Small scale [CS61].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i>
Section 2.2	Control of environmental exposure
Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.	
Section 3	Exposure Estimation
3.1. Health	
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]	
3.2. Environment	
N.A.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]	
4.2. Environment	
N.A.	

Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Use of PPE	<u>Skin protection:</u> Gloves: <ul style="list-style-type: none"> - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators: <ul style="list-style-type: none"> - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators ≤ 2 hrs/day

Solid, high dustiness:**ES1 - Manufacture of Aluminium salts – solid – high dust; Aluminium content = max. 25%**

Section 1	Exposure Scenario Title
Title	Manufacture of Aluminium salts - solid - high dust; Aluminium content = max. 25%
Use Descriptor	Sector of Use: SU8, SU9
	Process Categories: PROC1: Use in a closed process, no likelihood of exposure PROC2: Use in a closed continuous process, with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) PROC4: Use in a batch and other process (synthesis) where opportunity for exposure arises PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC15: Use as a laboratory reagent
	Environmental Release Categories: ERC1: Manufacture of substances
Processes, tasks, activities covered	Manufacture of the substance. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities
Exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Solid, high dustiness [OC6]
Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15] Assumes a good basic standard of occupational hygiene is implemented [G1].

	Ensure operatives are trained to minimize exposures [EI19]
Contributing Scenarios	Risk Management Measures
Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26] Avoid skin contact: Wear suitable gloves tested to EN374 [PPE15]	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54]. Process sampling [CS2] (closed systems) [CS107]	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}.</i>
PROC2: General exposures [CS1]. Continuous process [CS54]. Process sampling [CS2] (open systems) [CS108]	Industrial workers: No specific measures identified [EI18]. Professional workers: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. <i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}. {Clear spills immediately [C&H13]}</i>
PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	Industrial workers: No specific measures identified [EI18]. Professional workers: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82] <i>Recommendations:</i> <i>{Ensure the system is closed}</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.</i>
PROC4: General exposures (open systems) [CS16]. Batch process [CS55] (open systems) [CS108]; Drum/batch transfers [CS8]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	Industrial workers: 5-25%: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82]. Professional workers: 5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] Or: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%: Avoid carrying out operation for more than 15 minutes [OC10] <1% : Avoid carrying out operation for more than 1 hour [OC11]

	<p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i></p>
<p>PROC8b: General exposures, open systems [CS16]. Dedicated facility [CS81] Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].</p>	<p>Industrial workers: 5-25%: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66] Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82]. Use bulk or semi-bulk handling systems [E43]. Discharge sacks via suitable vented charge chute [E44].</p> <p>Professional workers: 5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. ; Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] Use bulk or semi-bulk handling systems [E43]. Discharge sacks via suitable vented charge chute [E44]. Or: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%: Avoid carrying out operation for more than 15 minutes [OC10] <1%: Avoid carrying out operation for more than 1 hour [OC11]</p> <p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}</i> <i>{Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i></p>
<p>PROC15: General exposures [CS1]. Laboratory activities [CS36]. Small scale [CS61].</p>	<p>Carry out in a vented booth or extracted enclosure (80% efficiency) [E57].</p> <p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i></p>
Section 2.2	Control of environmental exposure
<p>Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.</p>	
Section 3	Exposure Estimation
3.1. Health	
<p>Predicted exposures are not expected to exceed the applicable exposure limits (given in section8 of the SDS)</p>	

when the operational conditions/risk management measures given in section 2 are implemented [G29]	
3.2. Environment	
N.A.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]	
4.2. Environment	
N.A.	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Use of PPE	<u>Skin protection:</u> Gloves: <ul style="list-style-type: none"> - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators: <ul style="list-style-type: none"> - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators ≤ 2 hrs/day

Solid, low dustiness:

ES1 - Manufacture of Aluminium salts - solid - low dust; Aluminium content= max. 25%	
Section 1	Exposure Scenario Title
Title	Manufacture of Aluminium salts - solid - low dust; Aluminium content = max. 25%
Use Descriptor	Sector of Use: Industrial (SU8, SU9)
	Process Categories: PROC1: Use in a closed process, no likelihood of exposure PROC2: Use in a closed continuous process, with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) PROC4: Use in a batch and other process (synthesis) where opportunity for exposure arises PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC15: Use as a laboratory reagent
	Environmental Release Categories: ERC1: Manufacture of substances
Processes, tasks, activities covered	Manufacture of the substance. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities
Exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Solid, low dustiness [OC1]

Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposures [EI19]
Contributing Scenarios	Risk Management Measures
Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26] Avoid skin contact: Wear suitable gloves tested to EN374 [PPE15]	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54]. Process sampling [CS2] (closed systems) [CS107]	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}.</i>
PROC2: General exposures [CS1]. Continuous process [CS54]. Process sampling [CS2] (open systems) [CS108]	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}.</i>
PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Ensure the system is closed}</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.</i>
PROC4: General exposures (open systems) [CS16]. Batch process [CS55] (open systems) [CS108]; Drum/batch transfers [CS8]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Ensure the system is closed};</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.</i>
PROC8b: General exposures, open systems [CS16]. Dedicated facility [CS81] Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]} {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC15: General exposures [CS1]. Laboratory activities [CS36]. Small scale [CS61].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
Section 2.2	Control of environmental exposure
Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising	

eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.

Section 3	Exposure Estimation
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3.1. Health

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]

3.2. Environment

N.A.

Section 4	Guidance to check compliance with the Exposure Scenario
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4.1. Health

The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]

4.2. Environment

N.A.

Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
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Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.

Control of Worker Exposure

Use of PPE	<u>Skin protection:</u> Gloves: <ul style="list-style-type: none"> - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators: <ul style="list-style-type: none"> - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators ≤ 2 hrs/day
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9.1.2 Exposure Scenario 2: Formulation and Distribution

Aqueous solution:

ES2 – Formulation and Distribution of Aluminium salts (aqueous solutions); Max. Aluminium content = 25%

Section 1	Exposure Scenario Title
Title	Formulation and Distribution of Aluminium salts (aqueous solutions); Max. Aluminium content = 25%
Use Descriptors	Sector of Use: Industrial (SU10)

	<p>Process Categories:</p> <p>PROC1: Use in a closed process, no likelihood of exposure</p> <p>PROC2: Use in a closed continuous process, with occasional controlled exposure</p> <p>PROC3: Use in a closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletization</p> <p>PROC15: Use as a laboratory reagent</p> <p>PROC19: Hand-mixing with intimate contact and only PPE available</p>
	<p>Environmental Release Categories:</p> <p>ERC2: Formulation of preparations</p>
Processes, tasks, activities covered	Adding Alu salts to liquid and solid formulations; includes distribution and associated laboratory activities (aqueous solutions, max Alu content = 25%). Distribution: loading and (re)packing of the substances.
GES exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Aqueous solution: vapour pressure of Alu-salt in water 0.01 Pa or less; Liquid, vapour pressure < 10 Pa [OC14].
Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposure [EI19]
Contributing Scenarios	Risk Management Measures
<p>Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26]. Avoid skin contact: wear suitable gloves tested to EN374 [PPE15]</p>	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54]. Process sampling [CS2] (closed systems) [CS107]	<p>No specific measures identified [EI18].</p> <p><i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}.</i></p>
PROC2: General exposures [CS1]. Continuous process [CS54]. Process	<p>No specific measures identified [EI18].</p> <p><i>Recommendations:</i></p>

sampling [CS2] (open systems) [CS108]	<i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}. {Clear spills immediately [C&H13]}.</i>
PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Ensure the system is closed}</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.</i>
PROC4: General exposures (open systems) [CS16]. Batch process [CS55] (open systems) [CS108]; Drum/batch transfers [CS8]. With sample collection [CS56]. ; Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i>
PROC5: General exposures (open systems) [CS16]. Mixing operations (open systems) [CS30]. Material transfers [CS3]. Batch process [CS55]. Cleaning [CS47].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC8a: General exposures (open systems) [CS16]; Non-dedicated facility [CS82]; Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC8b: General exposures, open systems [CS16]. Dedicated facility [CS81] Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC9: General exposures [CS1]. Dedicated facility [CS81] Drum and small package filling [CS6]. Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]} {Clear spills immediately [C&H13]}.</i>
PROC14: General exposures (open systems) [CS16] Production or preparation or articles by tableting, compression, extrusion or pelletisation [CS100]	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]} {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC15: General exposures [CS1]. Laboratory activities [CS36]. Small scale [CS61].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]} {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>

PROC19: General exposures [CS1]. Mixing operations (open systems) [CS30]. Manual [CS34].	Industrial workers: 5-25%: Avoid carrying out operation for more than 1 hour [OC11] <5%: Avoid carrying out operation for more than 4 hours [OC12] <1%: No specific measures identified [EI18] Professional workers: 5-25%: Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] Or: Avoid carrying out operation for more than 15 minutes [OC10]{ <5%: Avoid carrying out operation for more than 1 hour [OC11] <1%: Avoid carrying out operation for more than 4 hours [OC12] <i>Recommendations:</i> {Clean equipment and the work area every day [C&H3]} {Clear spills immediately [C&H13]} {Stay upwind/keep distance from source [EI22]}.
Section 2.2	Control of environmental exposure
Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.	
Section 3	Exposure Estimation
3.1. Health	
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]	
3.2. Environment	
N.A.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]	
4.2. Environment	
N.A.	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Use of PPE	<u>Skin protection:</u> Gloves: - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators: - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean

	box in a clean area - Wear respirators ≤ 2 hrs/day
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Solid, high dustiness:**ES2 – Formulation and Distribution of Aluminium salts – solid, high dustiness; max. Aluminium content = 25%**

Section 1	Exposure Scenario Title
Title	Formulation and Distribution of Aluminium salts; max. Aluminium content = 25%
Use Descriptor	Sector of Use: SU10 Process Categories: PROC1: Use in a closed process, no likelihood of exposure PROC2: Use in a closed continuous process, with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) 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 articles (multistage and/or significant contact) 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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletization PROC15: Use as a laboratory reagent PROC19: Hand-mixing with intimate contact and only PPE available Environmental Release Categories: ERC2: Formulation of preparations
Processes, tasks, activities covered	Adding Alu salts (Alu content = max. 25%) to liquid and solid formulations; includes distribution and associated laboratory activities. Distribution: loading and (re)packing of the substances.
GES exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Solid, high dustiness [OC6]
Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposure [EI19]
Contributing Scenarios	Risk Management Measures
Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26].	

Avoid skin contact: wear chemically resistant gloves (tested to EN374) in combination with specific activity training [PPE17]	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54]. Process sampling [CS2] (closed systems) [CS107]	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}.</i>
PROC2: General exposures [CS1]. Continuous process [CS54]. Process sampling [CS2] (open systems) [CS108]	Industrial workers: No specific measures identified [E118]. Professional workers: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. <i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}. {Clear spills immediately [C&H13]}</i>
PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	Industrial workers: No specific measures identified [E118]. Professional workers: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82] <i>Recommendations:</i> <i>{Ensure the system is closed}</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.</i>
PROC4: General exposures (open systems) [CS16]. Batch process [CS55] (open systems) [CS108]; Drum/batch transfers [CS8]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	Industrial workers: 5-25%: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82]. Professional workers: 5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] Or: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%: Avoid carrying out operation for more than 15 minutes [OC10] <1% : Avoid carrying out operation for more than 1 hour [OC11] <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i>

<p>PROC5: General exposures (open systems) [CS16]. Mixing operations (open systems) [CS30]. Material transfers [CS3]. Batch process [CS55]. Cleaning [CS47].</p>	<p>Industrial workers: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82].</p> <p>Professional workers: 5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] OR: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%: Avoid carrying out operation for more than 15 minutes [OC10] <1%: Avoid carrying out operation for more than 1 hour [OC11]</p> <p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i></p>
<p>PROC8a: General exposures (open systems) [CS16]; Non-dedicated facility [CS82]; Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].</p>	<p>5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] OR: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. ; Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 4 hours [OC12]</p> <p><i>Recommendations:</i> <i>Use bulk or semi-bulk handling systems [E43].;</i> <i>Discharge sacks via suitable vented charge chute [E44].{Drain down and flush system prior to equipment break-in or maintenance [E55]}.;</i> <i>{Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]} .{Clear spills immediately [C&H13]}.</i></p>
<p>PROC8b: General exposures, open systems [CS16]. Dedicated facility [CS81] Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].</p>	<p>Industrial workers: 5-25%: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66] Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82].</p> <p>Use bulk or semi-bulk handling systems [E43]. Discharge sacks via suitable vented charge chute [E44].</p> <p>Professional workers: 5-25%:</p>

	<p>Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. ; Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] Use bulk or semi-bulk handling systems [E43]. Discharge sacks via suitable vented charge chute [E44]. Or: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%: Avoid carrying out operation for more than 15 minutes [OC10] <1%: Avoid carrying out operation for more than 1 hour [OC11]</p> <p><i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]} {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</p>
<p>PROC9: General exposures [CS1]. Dedicated facility [CS81] Drum and small package filling [CS6]. Equipment cleaning and maintenance [CS39].</p>	<p>Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 4 hours [OC12]{</p> <p><i>Recommendations:</i> Use bulk or semi-bulk handling systems [E43].; Discharge sacks via suitable vented charge chute [E44].Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</p>
<p>PROC14 General exposures (open systems) [CS16] Production or preparation or articles by tableting, compression, extrusion or pelletization [CS100]</p>	<p>Industrial: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82]. Or: Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] Or: Avoid carrying out operation for more than 1 hour [OC11] 1-5%: Avoid carrying out operation for more than 4 hours [OC12] <1%: No specific measures identified [EI18].</p> <p>Professional: 5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. ; Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] Or: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. ;</p>

	<p>Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%: Avoid carrying out operation for more than 15 minutes [OC10] <1%: Avoid carrying out operation for more than 1 hour [OC11]</p> <p><i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</p>
<p>PROC15: General exposures [CS1]. Laboratory activities [CS36]. Small scale [CS61].</p>	<p>Carry out in a vented booth or extracted enclosure (80% efficiency) [E57].</p> <p><i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</p>
<p>PROC19 General exposures [CS1]. Mixing operations (open systems) [CS30]. Manual [CS34].</p>	<p>Industrial workers: 5-25%: Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] <5%: Avoid carrying out operation for more than 1 hour [OC11] <1%: Avoid carrying out operation for more than 4 hours [OC12]</p> <p>Professional workers:: 5-25%: Avoid carrying out operation for more than 4 hours [OC12] Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] <5%: Avoid carrying out operation for more than 15 minutes [OC10] <1%: Avoid carrying out operation for more than 1 hour [OC11]{</p> <p><i>Recommendations:</i> {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]} {Stay upwind/keep distance from source [EI22]}</p>
Section 2.2	Control of environmental exposure
<p>Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.</p>	
Section 3	Exposure Estimation
3.1. Health	
<p>Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]</p>	

3.2. Environment	
N.A.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]	
4.2. Environment	
N.A.	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Use of PPE	<u>Skin protection:</u> Gloves: <ul style="list-style-type: none"> - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators: <ul style="list-style-type: none"> - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators ≤ 2 hrs/day

Solid, low dustiness:

ES2 - Formulation and Distribution of Aluminium salts – solid, low dust; Max. Aluminium content = 25%	
Section 1	Exposure Scenario Title
Title	Formulation and Distribution of Aluminium salts (solid, low dust); Max. Aluminium content = 25%
Use Descriptors	Sector of Use: SU10 Process Categories: PROC1: Use in a closed process, no likelihood of exposure PROC2: Use in a closed continuous process, with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) 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 articles (multistage and/or significant contact) 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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletization PROC15: Use as a laboratory reagent PROC19: Hand-mixing with intimate contact and only PPE available Environmental Release Categories: ERC2: Formulation of preparations
Processes, tasks, activities covered	Adding Alu salts (solid, low dust) to liquid and solid formulations; includes distribution and associated laboratory activities (max Alu content = 25%). Distribution: loading and (re)packing of the substances. Max. Alu content = 25%

GES exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Solid, low dustiness [OC1]
Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposure [EI19]
Contributing Scenarios	Risk Management Measures
Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26]. Avoid skin contact: wear chemically resistant gloves (tested to EN374) in combination with specific activity training [PPE17]	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54]. Process sampling [CS2] (closed systems) [CS107]	No specific measures identified [EI18]. <i>Recommendations:</i> {Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}.
PROC2: General exposures [CS1]. Continuous process [CS54]. Process sampling [CS2] (open systems) [CS108]	No specific measures identified [EI18]. <i>Recommendations:</i> {Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}. {Clear spills immediately [C&H13]}.
PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. ; With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> {Ensure the system is closed} ; {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.
PROC4: General exposures (open systems) [CS16]. Batch process [CS55] (open systems) [CS108]; Drum/batch transfers [CS8]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. ; {Clear spills immediately [C&H13]}.
PROC5: General exposures (open systems) [CS16]. Mixing operations (open systems) [CS30]. Material transfers [CS3]. ; Batch process [CS55]. ; Cleaning [CS47].	No specific measures identified [EI18]. <i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]} {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.
PROC8a: General exposures (open systems) [CS16]; Non-dedicated facility	No specific measures identified [EI18]. <i>Recommendations:</i>

[CS82]; Material transfers [CS3]. ; Equipment cleaning and maintenance [CS39]. ; Bulk transfers [CS14].	<i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC8b: General exposures, open systems [CS16]. Dedicated facility [CS81] Material transfers [CS3]. Equipment cleaning and maintenance [CS39] Bulk transfers [CS14].	No specific measures identified [EI18]. <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC9: General exposures [CS1]. Dedicated facility [CS81] Drum and small package filling [CS6]. Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC14: General exposures (open systems) [CS16] Production or preparation or articles by tableting, compression, extrusion or pelletization [CS100]	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC15: General exposures [CS1]. Laboratory activities [CS36]. Small scale [CS61].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC19: General exposures [CS1]. Mixing operations (open systems) [CS30]. Manual [CS34].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Clean equipment and the work area every day [C&H3]}. ; {Clear spills immediately [C&H13]}</i>
Section 2.2	Control of environmental exposure
Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.	
Section 3	Exposure Estimation
3.1. Health	
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]	
3.2. Environment	
N.A.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]	
4.2. Environment	
N.A.	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)

Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.

Control of Worker Exposure

Use of PPE	<u>Skin protection:</u> Gloves: - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators: - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators ≤ 2 hrs/day
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9.1.3 Exposure Scenario 3: Use in synthesis and as Intermediate

Aqueous solution:

ES3 – Use of Aluminium salts (aqueous solutions) in synthesis as a process chemical and as an intermediate; Max. Aluminium content = 25%

Section 1	Exposure Scenario Title
Title	Use of Aluminium salts (aqueous solutions) in synthesis as a process chemical and as an intermediate; Max. Aluminium content = 25%
Use Descriptors	Sector of Use: SU6b, SU8, SU9, SU14 Process Categories: PROC1: Use in a closed process, no likelihood of exposure PROC2: Use in a closed continuous process, with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises 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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as a laboratory reagent Environmental Release Categories: ERC1: Manufacture of substances ERC2: Formulation of preparations ERC4: Industrial use ERC5: Industrial use resulting in inclusion into or onto a matrix ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates) ERC8a: Wide dispersive indoor use of processing aids in open systems
Processes, tasks, activities covered	Use of Aluminium salts (aqueous solutions) in synthesis as a process chemical and as an intermediate. Includes material transfers and associated laboratory activities. Max. Aluminium content = 25%
GES exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure

Product characteristics	
Physical form of product	Aqueous solution: vapour pressure of Alu-salt in water 0.01 Pa or less; Liquid, vapour pressure < 10 Pa [OC14].
Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposure [EI19]
Contributing Scenarios	Risk Management Measures
Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26]. Avoid skin contact: wear suitable gloves tested to EN374 [PPE15]	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54]. Process sampling [CS2] (closed systems) [CS107]	No specific measures identified [EI18]. <i>Recommendations:</i> {Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}.
PROC2: General exposures [CS1]. Continuous process [CS54]. Process sampling [CS2] (open systems) [CS108]	No specific measures identified [EI18]. <i>Recommendations:</i> {Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}. {Clear spills immediately [C&H13]}.
PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> {Ensure the system is closed} {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.
PROC4: General exposures (open systems) [CS16]. Batch process [CS55] (open systems) [CS108]; Drum/batch transfers [CS8]. With sample collection [CS56]. ; Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.
PROC8a: General exposures (open systems) [CS16]; Non-dedicated facility [CS82]; Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].	No specific measures identified [EI18]. <i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.
PROC8b: General exposures, open systems [CS16]. Dedicated facility [CS81] Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].	No specific measures identified [EI18]. <i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.

PROC9: General exposures [CS1]. Dedicated facility [CS81] Drum and small package filling [CS6]. Equipment cleaning and maintenance [CS39].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]} {Clean equipment and the work area every day [C&H3]} {Clear spills immediately [C&H13]}.</i>
PROC15: General exposures [CS1]. Laboratory activities [CS36]. Small scale [CS61].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]} {Clean equipment and the work area every day [C&H3]} {Clear spills immediately [C&H13]}.</i>
Section 2.2	Control of environmental exposure
Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.	
Section 3	Exposure Estimation
3.1. Health	
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]	
3.2. Environment	
N.A.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]	
4.2. Environment	
N.A.	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Use of PPE	<u>Skin protection:</u> Gloves: - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators: - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators ≤ 2 hrs/day

Solid, high dustiness:

ES3 – Use of Aluminium salts (solid, high dustiness) in synthesis as a process chemical and as an intermediate; Aluminium content = max. 25%	
Section 1	Exposure Scenario Title
Title	Use of Aluminium salts (solid, high dustiness) in synthesis

	as a process chemical and as an intermediate; Aluminium content = max. 25%
Use Descriptor	<p>Sector of Use: SU6b, SU8, SU9, SU14</p> <p>Process Categories: PROC1: Use in a closed process, no likelihood of exposure PROC2: Use in a closed continuous process, with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises 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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as a laboratory reagent</p> <p>Environmental Release Categories: ERC1: Manufacture of substances ERC2: Formulation of preparations ERC4: Industrial use ERC5: Industrial use resulting in inclusion into or onto a matrix ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates) ERC8a: Wide dispersive indoor use of processing aids in open systems</p>
Processes, tasks, activities covered	Use of Aluminium salts (solid, high dustiness) in synthesis as a process chemical and as an intermediate. Includes material transfers and associated laboratory activities. Max. Aluminium content = 25%
GES exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Solid, high dustiness [OC6]
Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposure [EI19]
Contributing Scenarios	Risk Management Measures
Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26]. Avoid skin contact: wear chemically resistant gloves (tested to EN374) in combination with specific activity training [PPE17]	
PROC1: General exposures (closed systems)	No specific measures identified [EI18].

<p>[CS15]. Continuous process [CS54]. Process sampling [CS2] (closed systems) [CS107]</p>	<p><i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}.</i></p>
<p>PROC2: General exposures [CS1]. Continuous process [CS54]. Process sampling [CS2] (open systems) [CS108]</p>	<p>Industrial workers: No specific measures identified [EI18].</p> <p>Professional workers: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82].</p> <p><i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}. {Clear spills immediately [C&H13]}</i></p>
<p>PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].</p>	<p>Industrial workers: No specific measures identified [EI18].</p> <p>Professional workers: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]</p> <p><i>Recommendations:</i> <i>{Ensure the system is closed}</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.</i></p>
<p>PROC4: General exposures (open systems) [CS16]. Batch process [CS55] (open systems) [CS108]; Drum/batch transfers [CS8]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].</p>	<p>Industrial workers: 5-25%: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82].</p> <p>Professional workers: 5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] Or: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better {PPE29} 1-5%: Avoid carrying out operation for more than 15 minutes [OC10] <1% : Avoid carrying out operation for more than 1 hour [OC11]</p> <p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i></p>
<p>PROC8a: General exposures (open systems) [CS16]; Non-dedicated facility [CS82];</p>	<p>5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings</p>

<p>Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].</p>	<p>(80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] OR: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. ; Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 4 hours [OC12] <i>Recommendations:</i> <i>Use bulk or semi-bulk handling systems [E43].;</i> <i>Discharge sacks via suitable vented charge chute [E44]. {Drain down and flush system prior to equipment break-in or maintenance [E55]}.</i> <i>{Use drum pumps [E53]}.</i> <i>{Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i></p>
<p>PROC8b: General exposures, open systems [CS16]. Dedicated facility [CS81] Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].</p>	<p>Industrial workers: 5-25%: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66] Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82]. Use bulk or semi-bulk handling systems [E43]. Discharge sacks via suitable vented charge chute [E44]. Professional workers: 5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. ; Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] Use bulk or semi-bulk handling systems [E43]. Discharge sacks via suitable vented charge chute [E44]. Or: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%: Avoid carrying out operation for more than 15 minutes [OC10] <1%: Avoid carrying out operation for more than 1 hour [OC11] <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}</i> <i>{Use drum pumps [E53]}.</i> <i>{Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i></p>
<p>PROC9: General exposures [CS1]. Dedicated facility [CS81] Drum and small package filling [CS6]. Equipment cleaning and maintenance [CS39].</p>	<p>Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 4 hours [OC12]{ <i>Recommendations:</i></p>

	<i>Use bulk or semi-bulk handling systems [E43].;</i> <i>Discharge sacks via suitable vented charge chute [E44]. Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i>
PROC15: General exposures [CS1]. Laboratory activities [CS36]. Small scale [CS61].	Carry out in a vented booth or extracted enclosure (80% efficiency) [E57]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i>
Section 2.2	Control of environmental exposure
Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.	
Section 3	Exposure Estimation
3.1. Health	
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]	
3.2. Environment	
N.A.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]	
4.2. Environment	
N.A.	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Use of PPE	<u>Skin protection:</u> Gloves: - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators: - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators ≤ 2 hrs/day

Solid, low dustiness:

ES3 - Use of Aluminium salts (solid, high dustiness) in synthesis as a process chemical and as an intermediate; Aluminium content = max. 25%

Section 1	Exposure Scenario Title
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Title	Use of Aluminium salts (solid, high dustiness) in synthesis as a process chemical and as an intermediate; Aluminium content = max. 25%
Use Descriptors	<p>Sector of Use: SU6b, SU8, SU9, SU14</p> <p>Process Categories: PROC1: Use in a closed process, no likelihood of exposure PROC2: Use in a closed continuous process, with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises 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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as a laboratory reagent</p> <p>Environmental Release Categories: ERC1: Manufacture of substances ERC2: Formulation of preparations ERC4: Industrial use ERC5: Industrial use resulting in inclusion into or onto a matrix ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates) ERC8a: Wide dispersive indoor use of processing aids in open systems</p>
Processes, tasks, activities covered	Use of Aluminium salts (solid, high dustiness) in synthesis as a process chemical and as an intermediate. Includes material transfers and associated laboratory activities. Max. Aluminium content = 25%
GES exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Solid, low dustiness [OC1]
Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposure [EI19]
Contributing Scenarios	Risk Management Measures
Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26]. Avoid skin contact: wear chemically resistant gloves (tested to EN374) in combination with specific activity training [PPE17]	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54]. Process sampling [CS2] (closed systems) [CS107]	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}.</i>

PROC2: General exposures [CS1]. Continuous process [CS54]. Process sampling [CS2] (open systems) [CS108]	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}. {Clear spills immediately [C&H13]}.</i>
PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. ; With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Ensure the system is closed} ; {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.</i>
PROC4: General exposures (open systems) [CS16]. Batch process [CS55] (open systems) [CS108]; Drum/batch transfers [CS8]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. ; {Clear spills immediately [C&H13]}.</i>
PROC8a: General exposures (open systems) [CS16]; Non-dedicated facility [CS82]; Material transfers [CS3]. ; Equipment cleaning and maintenance [CS39]. ; Bulk transfers [CS14].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC8b: General exposures, open systems [CS16]. Dedicated facility [CS81] Material transfers [CS3]. Equipment cleaning and maintenance [CS39] Bulk transfers [CS14].	No specific measures identified [E118]. <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC9: General exposures [CS1]. Dedicated facility [CS81] Drum and small package filling [CS6]. Equipment cleaning and maintenance [CS39].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC15: General exposures [CS1]. Laboratory activities [CS36]. Small scale [CS61].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
Section 2.2	Control of environmental exposure
Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.	
Section 3	Exposure Estimation
3.1. Health	
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]	

3.2. Environment	
N.A.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]	
4.2. Environment	
N.A.	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Use of PPE	<u>Skin protection:</u> Gloves: <ul style="list-style-type: none"> - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators: <ul style="list-style-type: none"> - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators ≤ 2 hrs/day

9.1.4 Exposure Scenario 4: Use in spraying Formulations

Aqueous solution:

ES4 – Industrial and Professional use of Aluminium salts in spraying formulations (aqueous solutions); Max. aluminium content = 25%	
Section 1	Exposure Scenario Title
Title	Industrial and Professional Use of Aluminium salts in spraying formulations (aqueous solutions) – Max. Aluminium content = 25%
Use Descriptor	Sector of Use: Industrial (SU5, SU6b, SU7) Process Categories: PROC1: Use in a closed process, no likelihood of exposure PROC2: Use in a closed continuous process, with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC7: Industrial spraying 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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC11: Non industrial spraying PROC19: Hand-mixing with intimate contact and only PPE available

	<p>Environmental Release Categories:</p> <p>ERC3: Formulation in materials</p> <p>ERC4: Industrial use</p> <p>ERC5: Industrial use resulting in inclusion into or onto a matrix</p> <p>ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)</p> <p>ERC6b: Industrial use of reactive processing aids</p> <p>ERC8a: Wide dispersive indoor use of processing aids in open systems</p> <p>ERC8b: Wide dispersive indoor use of reactive substances in open systems</p> <p>ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix</p> <p>ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix</p> <p>ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release</p> <p>ERC11a: Wide dispersive indoor use of long-life articles and materials with low release</p>
Processes, tasks, activities covered	Industrial and Professional use of Aluminium salts in spraying formulations (aqueous solutions, max Aluminium content = 25%). Includes equipment cleaning and maintenance.
GES exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Aqueous solution: vapour pressure of Alu-salt in water 0.01 Pa or less; Liquid, vapour pressure < 10 Pa [OC14].
Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Indoor [OC8]. Ensure operatives are trained to minimize exposure [EI19]
Contributing Scenarios	Risk Management Measures
<p>Below pH2 and above pH11 the substance has corrosive properties:</p> <p>Use suitable eye protection [PPE26].</p> <p>Avoid skin contact: wear suitable gloves tested to EN374 [PPE15]</p>	
<p>PROC1:</p> <p>General exposures (closed systems) [CS15]. Continuous process [CS54]. Process sampling [CS2] (closed systems) [CS107]</p>	<p>No specific measures identified [EI18].</p> <p><i>Recommendations:</i></p> <p><i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}.</i></p>
<p>PROC2:</p> <p>General exposures [CS1]. Continuous process [CS54]. Process sampling [CS2] (open systems) [CS108]</p>	<p>No specific measures identified [EI18].</p> <p><i>Recommendations:</i></p> <p><i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}. {Clear spills immediately [C&H13]}.</i></p>

<p>PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].</p>	<p>No specific measures identified [E118].</p> <p><i>Recommendations:</i> {Ensure the system is closed} {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.</p>
<p>PROC5: General exposures (open systems) [CS16]. Mixing operations (open systems) [CS30]. Material transfers [CS3]. Batch process [CS55]. Cleaning [CS47].</p>	<p>No specific measures identified [E118].</p> <p><i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</p>
<p>PROC7: General exposures [CS1]. Spraying [CS10].</p>	<p>5-25%: Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings (90% efficiency) [E60]. Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 (90% efficiency) [E70]. Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] Or: Avoid carrying out operation for more than 1 hour [OC11] Plus: Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] Or: Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings (90% efficiency) [E60]. Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 (90% efficiency) [E70]. Plus: Avoid carrying out operation for more than 1 hour [OC11] <5%: Avoid carrying out operation for more than 4 hours [OC12] Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] <1%: Limit the substance content in the product to 1% [OC16]. Avoid carrying out operation for more than 15 minutes [OC10]{ <i>Recommendations:</i> {Clean equipment and the work area every day [C&H3]} {Clear spills immediately [C&H13]}.</p>
<p>PROC8a: General exposures (open systems) [CS16]; Non-dedicated facility [CS82]; Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].</p>	<p>No specific measures identified [E118].</p> <p><i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</p>
<p>PROC8b: General exposures, open systems [CS16]. Dedicated facility [CS81] Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].</p>	<p>No specific measures identified [E118].</p> <p><i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</p>

<p>PROC9: General exposures [CS1]. Dedicated facility [CS81] Drum and small package filling [CS6]. Equipment cleaning and maintenance [CS39].</p>	<p>No specific measures identified [EI18].</p> <p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]} {Clear spills immediately [C&H13]}.</i></p>
<p>PROC11: General exposures [CS1]. Spraying [CS10].</p>	<p>5-25%: Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings (80% efficiency) [E60]. Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 (80% efficiency) [E70]. Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29]</p> <p>Or: Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings (80% efficiency) [E60]. ; Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 (80% efficiency) [E70]. Avoid carrying out operation for more than 15 minutes [OC10]</p> <p><5%: Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings (80% efficiency) [E60]. Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 (80% efficiency) [E70]. Avoid carrying out operation for more than 1 hour [OC11]</p> <p><1%: Avoid carrying out operation for more than 15 minutes [OC10]</p> <p><i>Recommendations:</i> <i>{Clean equipment and the work area every day [C&H3]} {Clear spills immediately [C&H13]}.</i></p>
<p>PROC19: General exposures [CS1]. Mixing operations (open systems) [CS30]. Manual [CS34].</p>	<p>Industrial workers: 5-25%: Avoid carrying out operation for more than 1 hour [OC11]{ <5%: Avoid carrying out operation for more than 4 hours [OC12] <1%: No specific measures identified [EI18]</p> <p>Professional workers: 5-25%: Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] Or: Avoid carrying out operation for more than 15 minutes [OC10]{ <5%: Avoid carrying out operation for more than 1 hour [OC11] <1%: Avoid carrying out operation for more than 4 hours [OC12]</p> <p><i>Recommendations:</i> <i>{Clean equipment and the work area every day [C&H3]} {Clear spills immediately [C&H13]} {Stay upwind/keep distance from source [EI22]}.</i></p>
<p>Section 2.2</p>	<p>Control of environmental exposure</p>
<p>Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment</p>	

environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.	
Section 3	Exposure Estimation
3.1. Health	
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]	
3.2. Environment	
N.A.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]	
4.2. Environment	
N.A.	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Use of PPE	<u>Skin protection:</u> Gloves: - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators: - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators ≤ 2 hrs/day

Solid, high dustiness:

ES4 – Industrial and Professional use of Aluminium salts in spraying formulations – solid, high dustiness; max. Aluminium content = 25%	
Section 1	Exposure Scenario Title
Title	Industrial and Professional use of Aluminium salts in spraying formulations - solid, high dustiness; max. Aluminium content = 25%
Use Descriptor	Sector of Use: SU5, SU6b, SU7

	<p>Process Categories:</p> <p>PROC1: Use in a closed process, no likelihood of exposure</p> <p>PROC2: Use in a closed continuous process, with occasional controlled exposure</p> <p>PROC3: Use in a closed batch process (synthesis or formulation)</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC7: Industrial spraying</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC11: Non industrial spraying</p> <p>PROC19: Hand-mixing with intimate contact and only PPE available</p>
	<p>Environmental Release Categories:</p> <p>ERC3: Formulation in materials</p> <p>ERC4: Industrial use</p> <p>ERC5: Industrial use resulting in inclusion into or onto a matrix</p> <p>ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)</p> <p>ERC6b: Industrial use of reactive processing aids</p> <p>ERC8a: Wide dispersive indoor use of processing aids in open systems</p> <p>ERC8b: Wide dispersive indoor use of reactive substances in open systems</p> <p>ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix</p> <p>ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix</p> <p>ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release</p> <p>ERC11a: Wide dispersive indoor use of long-life articles and materials with low release</p>
Processes, tasks, activities covered	Industrial and Professional use of Aluminium salts in spraying formulations - solid - high dustiness. Includes equipment cleaning and maintenance.
GES exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Solid, high dustiness [OC6]
Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposure [EI19]

Contributing Scenarios	Risk Management Measures
Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26]. Avoid skin contact: wear chemically resistant gloves (tested to EN374) in combination with specific activity training [PPE17]	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54]. Process sampling [CS2] (closed systems) [CS107]	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}.</i>
PROC2: General exposures [CS1]. Continuous process [CS54]. Process sampling [CS2] (open systems) [CS108]	Industrial workers: No specific measures identified [E118]. Professional workers: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. <i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}. {Clear spills immediately [C&H13]}</i>
PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	Industrial workers: No specific measures identified [E118]. Professional workers: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82] <i>Recommendations:</i> <i>{Ensure the system is closed}</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.</i>
PROC5: General exposures (open systems) [CS16]. Mixing operations (open systems) [CS30]. Material transfers [CS3]. Batch process [CS55]. Cleaning [CS47].	Industrial workers: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82]. Professional workers: 5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] OR: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%: Avoid carrying out operation for more than 15 minutes [OC10] <1%: Avoid carrying out operation for more than 1 hour [OC11] <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and</i>

	<i>the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC7: General exposures [CS1]. Spraying [CS10].	<p>5-25%: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82]. Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] OR: Avoid carrying out operation for more than 1 hour [OC11] 1-5%: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82]. Avoid carrying out operation for more than 4 hours [OC12] <1%: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82].</p> <p><i>Recommendations:</i> {Clean equipment and the work area every day [C&H3]}. ; {Clear spills immediately [C&H13]}.</p>
PROC8a: General exposures (open systems) [CS16]; Non-dedicated facility [CS82]; Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].	<p>5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] OR: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. ; Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 4 hours [OC12]</p> <p><i>Recommendations:</i> Use bulk or semi-bulk handling systems [E43].; Discharge sacks via suitable vented charge chute [E44]. {Drain down and flush system prior to equipment break-in or maintenance [E55]}.; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</p>
PROC8b: General exposures, open systems [CS16]. Dedicated facility [CS81] Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].	<p>Industrial workers: 5-25%: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66] Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82].</p> <p>Use bulk or semi-bulk handling systems [E43]. Discharge sacks via suitable vented charge chute [E44].</p>

	<p>Professional workers:</p> <p>5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. ; Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] Use bulk or semi-bulk handling systems [E43]. Discharge sacks via suitable vented charge chute [E44].</p> <p>Or: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29]</p> <p>1-5%: Avoid carrying out operation for more than 15 minutes [OC10]</p> <p><1%: Avoid carrying out operation for more than 1 hour [OC11]</p> <p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}</i> <i>{Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i></p>
<p>PROC9: General exposures [CS1]. Dedicated facility [CS81] Drum and small package filling [CS6]. Equipment cleaning and maintenance [CS39].</p>	<p>Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 4 hours [OC12]{</p> <p><i>Recommendations:</i> <i>Use bulk or semi-bulk handling systems [E43].;</i> <i>Discharge sacks via suitable vented charge chute [E44].Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i></p>
<p>PROC11: General exposures [CS1]. Spraying [CS10].</p>	<p>5-25%: Minimize exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings (80% efficiency) [E60]. Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 [E70]. Avoid carrying out operation for more than 4 hours [OC12] Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29]</p> <p>1-5%: Minimize exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings (80% efficiency) [E60]. ; Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 [E70]. Avoid carrying out operation for more than 1 hour [OC11]</p> <p><i>Recommendations;</i> <i>{Clean equipment and the work area every day [C&H3]}. ;</i> <i>{Clear spills immediately [C&H13]}.</i></p>

<p>PROC19 General exposures [CS1]. Mixing operations (open systems) [CS30]. ; Manual [CS34].</p>	<p>Industrial workers: 5-25%: Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] <5%: Avoid carrying out operation for more than 1 hour [OC11] <1%: Avoid carrying out operation for more than 4 hours [OC12]</p> <p>Professional workers:: 5-25%: Avoid carrying out operation for more than 4 hours [OC12] Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] <5%: Avoid carrying out operation for more than 15 minutes [OC10] <1%: Avoid carrying out operation for more than 1 hour [OC11]{</p> <p><i>Recommendations:</i> {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]} {Stay upwind/keep distance from source [EI22]}</p>
<p>Section 2.2</p>	<p>Control of environmental exposure</p>
<p>Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.</p>	
<p>Section 3</p>	<p>Exposure Estimation</p>
<p>3.1. Health</p>	
<p>Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]</p>	
<p>3.2. Environment</p>	
<p>N.A.</p>	
<p>Section 4</p>	<p>Guidance to check compliance with the Exposure Scenario</p>
<p>4.1. Health</p>	
<p>The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>	
<p>4.2. Environment</p>	
<p>N.A.</p>	
<p>Section 5</p>	<p>Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)</p>
<p>Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.</p>	
<p>Control of Worker Exposure</p>	
<p>Use of PPE</p>	<p><u>Skin protection:</u> Gloves: - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators: - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a</p>

	clean box in a clean area - Wear respirators ≤ 2 hrs/day
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Solid, low dustiness:**ES4 - Industrial and Professional use of Aluminium salts - solid, low dust - in spraying formulations; Aluminium content: max. 25%**

Section 1	Exposure Scenario Title
Title	Industrial and Professional use of Aluminium salts - solid, low dust - in spraying formulations; Aluminium content: max. 25%
Use Descriptor	Sector of Use: Industrial (SU5, SU6b, SU7)
	Process Categories: PROC1: Use in a closed process, no likelihood of exposure PROC2: Use in a closed continuous process, with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC7: Industrial spraying 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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC11: Non industrial spraying PROC19: Hand-mixing with intimate contact and only PPE available
	Environmental Release Categories: ERC3: Formulation in materials ERC4: Industrial use ERC5: Industrial use resulting in inclusion into or onto a matrix ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates) ERC6b: Industrial use of reactive processing aids ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release ERC11a: Wide dispersive indoor use of long-life articles and materials with low release
Processes, tasks, activities covered	Industrial and Professional use of Aluminium salts - solid, low dust - in spraying formulations
GES exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Solid, low dustiness [OC1]
Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].

Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposure [EI19]
Contributing Scenarios	Risk Management Measures
Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26]. Avoid skin contact: wear chemically resistant gloves (tested to EN374) in combination with specific activity training [PPE17]	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54]. Process sampling [CS2] (closed systems) [CS107]	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}.</i>
PROC2: General exposures [CS1]. Continuous process [CS54]. Process sampling [CS2] (open systems) [CS108]	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}. {Clear spills immediately [C&H13]}.</i>
PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. ; With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Ensure the system is closed} ; {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.</i>
PROC5: General exposures (open systems) [CS16]. Mixing operations (open systems) [CS30]. Material transfers [CS3]. ; Batch process [CS55]. ; Cleaning [CS47].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]} {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC7: General exposures [CS1]. Spraying [CS10].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC8a: General exposures (open systems) [CS16]; Non-dedicated facility [CS82]; Material transfers [CS3]. ; Equipment cleaning and maintenance [CS39]. ; Bulk transfers [CS14].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC8b: General exposures, open systems [CS16]. ; Dedicated facility [CS81]Material transfers [CS3]. ; Equipment cleaning and maintenance [CS39]. ; Bulk transfers [CS14].	No specific measures identified [EI18]. <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>

PROC9: General exposures [CS1]. ; Dedicated facility [CS81]Drum and small package filling [CS6]. ; Equipment cleaning and maintenance [CS39].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]} .{Clean equipment and the work area every day [C&H3]} .{Clear spills immediately [C&H13]}.</i>
PROC11: General exposures [CS1]. Spraying [CS10].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Clean equipment and the work area every day [C&H3]} . ;</i> <i>{Clear spills immediately [C&H13]}.</i>
PROC19: General exposures [CS1]. Mixing operations (open systems) [CS30]. Manual [CS34].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Clean equipment and the work area every day [C&H3]} . ;</i> <i>{Clear spills immediately [C&H13]}.</i>
Section 2.2	Control of environmental exposure
Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.	
Section 3	Exposure Estimation
3.1. Health	
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]	
3.2. Environment	
N.A.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]	
4.2. Environment	
N.A.	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Use of PPE	<u>Skin protection:</u> Gloves: - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators: - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators ≤ 2 hrs/day

9.1.5 Exposure Scenario 5: Use in non-spraying Formulations

Aqueous solution:

Worker – ES5 – Industrial and Professional use of Aluminium salts in non-spraying formulations (aqueous solutions); Max. Aluminium content = 25%

Section 1		Exposure Scenario Title
Title	Industrial and Professional Use of Aluminium salts in non-spraying formulations (aqueous solutions) – Max. Aluminium content = 25%	
Use Descriptor	<p>Sector of Use: Industrial (SU1, SU5, SU6b, SU7, SU13, SU19)</p> <p>Process Categories:</p> <p>PROC1: Use in a closed process, no likelihood of exposure</p> <p>PROC2: Use in a closed continuous process, with occasional controlled exposure</p> <p>PROC3: Use in a closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC6: Calendering operations</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC10: Roller application or brushing</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletization</p> <p>PROC15: Use as a laboratory reagent</p> <p>PROC19: Hand-mixing with intimate contact and only PPE available</p> <p>Environmental Release Categories:</p> <p>ERC2: Formulation of preparations</p> <p>ERC3: Formulation in materials</p> <p>ERC4: Industrial use</p> <p>ERC5: Industrial use resulting in inclusion into or onto a matrix</p> <p>ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)</p> <p>ERC6b: Industrial use of reactive processing aids</p> <p>ERC8a: Wide dispersive indoor use of processing aids in open systems</p> <p>ERC8b: Wide dispersive indoor use of reactive substances in open systems</p> <p>ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix</p> <p>ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix</p> <p>ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release</p> <p>ERC11a: Wide dispersive indoor use of long-life articles and materials with low release</p>	
Processes, tasks, activities covered	Industrial and Professional use of Aluminium salts in non-spraying formulations (aqueous solutions, max Alu content = 25%). Includes equipment cleaning and maintenance.	
GES exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³	
Section 2		Operational conditions and risk management measures
Section 2.1		Control of worker exposure
Product characteristics		

Physical form of product	Aqueous solution: vapour pressure of Alu-salt in water 0.01 Pa or less; Liquid, vapour pressure < 10 Pa [OC14].
Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposure [EI19]
Contributing Scenarios	Risk Management Measures
Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26]. Avoid skin contact: wear suitable gloves tested to EN374 [PPE15]	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54]. Process sampling [CS2] (closed systems) [CS107]	No specific measures identified [EI18]. <i>Recommendations:</i> {Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}.
PROC2: General exposures [CS1]. Continuous process [CS54]. Process sampling [CS2] (open systems) [CS108]	No specific measures identified [EI18]. <i>Recommendations:</i> {Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}. {Clear spills immediately [C&H13]}.
PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> {Ensure the system is closed} {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.
PROC4: General exposures (open systems) [CS16]. Batch process [CS55] (open systems) [CS108]; Drum/batch transfers [CS8]. With sample collection [CS56]. ; Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.
PROC5: General exposures (open systems) [CS16]. Mixing operations (open systems) [CS30]. Material transfers [CS3]. Batch process [CS55]. Cleaning [CS47].	No specific measures identified [EI18]. <i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.
PROC6: General exposures (open systems) [CS16] Mixing operations (open systems) [CS30]. Material transfers [CS3]. ; Batch process [CS55]. ; Cleaning [CS47].	No specific measures identified [EI18]. <i>Recommendations:</i> {Clean equipment and the work area every day [C&H3]}. ; {Clear spills immediately [C&H13]}.

<p>PROC8a: General exposures (open systems) [CS16]; Non-dedicated facility [CS82]; Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].</p>	<p>No specific measures identified [EI18].</p> <p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i></p>
<p>PROC8b: General exposures, open systems [CS16]. Dedicated facility [CS81] Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].</p>	<p>No specific measures identified [EI18].</p> <p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i></p>
<p>PROC9: General exposures [CS1]. Dedicated facility [CS81] Drum and small package filling [CS6]. Equipment cleaning and maintenance [CS39].</p>	<p>No specific measures identified [EI18].</p> <p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]} {Clear spills immediately [C&H13]}.</i></p>

<p>PROC10: General exposures (open systems) [CS16]. Rolling, Brushing [CS51] Equipment cleaning and maintenance [CS39].</p>	<p>Industrial workers: 5-25%: Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings (80% efficiency) [E60]. Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 (80% efficiency) [E70]. Or: Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] Or: Avoid carrying out operation for more than 1 hour [OC11] <5%: Avoid carrying out operation for more than 4 hours [OC12] <1%: No specific measures identified [EI18]</p> <p>Professional workers: 5-25%: Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings (80% efficiency) [E60]. Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 (80% efficiency) [E70]. Plus: Avoid carrying out operation for more than 1 hour [OC11] Or: Avoid carrying out operation for more than 4 hours [OC12] Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] <5%: Avoid carrying out operation for more than 1 hour [OC11] Or: Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings (80% efficiency) [E60]. Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 (80% efficiency) [E70]. <1%: Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings (80% efficiency) [E60]. ; Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 (80% efficiency) [E70].</p> <p><i>Recommendations:</i> <i>{Use long handled tools where possible [E50]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}</i> <i>{Avoid splashing [C&H15]}</i></p>
<p>PROC13: General exposures, open systems [CS16]. Dipping, immersion and pouring [CS4]</p>	<p>No specific measures identified [EI18].</p> <p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}.</i> ; <i>{Clear spills immediately [C&H13]}.</i></p>
<p>PROC14: General exposures (open systems) [CS16] Production or preparation of articles by tableting, compression, extrusion or pelletisation [CS100]</p>	<p>No specific measures identified [EI18].</p> <p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}.</i> {Clear spills immediately [C&H13]}.</p>

PROC15: General exposures [CS1]. Laboratory activities [CS36]. Small scale [CS61].	No specific measures identified [EI18]. <i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]} {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.
PROC19: General exposures [CS1]. Mixing operations (open systems) [CS30]. Manual [CS34].	Industrial workers: 5-25%: Avoid carrying out operation for more than 1 hour [OC11] <5%: Avoid carrying out operation for more than 4 hours [OC12] <1%: No specific measures identified [EI18] Professional workers: 5-25%: Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] Or: Avoid carrying out operation for more than 15 minutes [OC10]{ <5%: Avoid carrying out operation for more than 1 hour [OC11] <1%: Avoid carrying out operation for more than 4 hours [OC12] <i>Recommendations:</i> {Clean equipment and the work area every day [C&H3]} {Clear spills immediately [C&H13]} {Stay upwind/keep distance from source [EI22]}.
Section 2.2	Control of environmental exposure
Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.	
Section 3	Exposure Estimation
3.1. Health	
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]	
3.2. Environment	
N.A.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]	
4.2. Environment	
N.A.	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	

Use of PPE	<p><u>Skin protection:</u></p> <p>Gloves:</p> <ul style="list-style-type: none"> - Observe breakthrough time of the gloves used <p><u>Respiratory protection:</u></p> <p>Respirators:</p> <ul style="list-style-type: none"> - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators ≤ 2 hrs/day
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Solid, high dustiness:

ES5 – Industrial and Professional use of Aluminium salts in non-spraying formulations – solid, high dustiness; max. Aluminium content = 25%

Section 1	Exposure Scenario Title
Title	Industrial and Professional use of Aluminium salts in non-spraying formulations - solid, high dustiness; max. Aluminium content = 25%
Use Descriptor	<p>Sector of Use: SU1, SU5, SU6b, SU7, SU13, SU19</p> <p>Process Categories:</p> <p>PROC1: Use in a closed process, no likelihood of exposure</p> <p>PROC2: Use in a closed continuous process, with occasional controlled exposure</p> <p>PROC3: Use in a closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC6: Calendering operations</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC10: Roller application or brushing</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletization</p> <p>PROC15: Use as a laboratory reagent</p> <p>PROC19: Hand-mixing with intimate contact and only PPE available</p>

	Environmental Release Categories: ERC2: Formulation of preparations ERC3: Formulation in materials ERC4: Industrial use ERC5: Industrial use resulting in inclusion into or onto a matrix ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates) ERC6b: Industrial use of reactive processing aids ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release ERC11a: Wide dispersive indoor use of long-life articles and materials with low release
Processes, tasks, activities covered	Industrial and Professional use of Aluminium salts in non-spraying formulations - solid - high dustiness. Includes equipment cleaning and maintenance.
GES exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Solid, high dustiness [OC6]
Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposure [EI19]
Contributing Scenarios	Risk Management Measures
Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26]. Avoid skin contact: wear chemically resistant gloves (tested to EN374) in combination with specific activity training [PPE17]	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54]. Process sampling [CS2] (closed systems) [CS107]	No specific measures identified [EI18]. <i>Recommendations:</i> {Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}.

<p>PROC2: General exposures [CS1]. Continuous process [CS54]. Process sampling [CS2] (open systems) [CS108]</p>	<p>Industrial workers: No specific measures identified [E118].</p> <p>Professional workers: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82].</p> <p><i>Recommendations:</i> {Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}. {Clear spills immediately [C&H13]}</p>
<p>PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].</p>	<p>Industrial workers: No specific measures identified [E118].</p> <p>Professional workers: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]</p> <p><i>Recommendations:</i> {Ensure the system is closed} {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.</p>
<p>PROC4: General exposures (open systems) [CS16]. Batch process [CS55] (open systems) [CS108]; Drum/batch transfers [CS8]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].</p>	<p>Industrial workers: 5-25%: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82].</p> <p>Professional workers: 5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] Or: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better {PPE29} 1-5%: Avoid carrying out operation for more than 15 minutes [OC10] <1% : Avoid carrying out operation for more than 1 hour [OC11]</p> <p><i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</p>
<p>PROC5: General exposures (open systems) [CS16]. Mixing operations (open systems) [CS30]. Material transfers [CS3]. Batch process [CS55]. Cleaning [CS47].</p>	<p>Industrial workers: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82].</p> <p>Professional workers:</p>

	<p>5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] OR: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%: Avoid carrying out operation for more than 15 minutes [OC10] <1%: Avoid carrying out operation for more than 1 hour [OC11]</p> <p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i></p>
<p>PROC6: General exposures (open systems) [CS16] Mixing operations (open systems) [CS30]. Material transfers [CS3]. Batch process [CS55]. ; Cleaning [CS47]</p>	<p>Industrial worker: 5-25%: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82]. Or: Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%: Avoid carrying out operation for more than 1 hour [OC11] <1%: Avoid carrying out operation for more than 4 hours [OC12]</p> <p>Professional worker: 5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Plus: Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%: Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] <1%: Avoid carrying out operation for more than 1 hour [OC11]</p> <p><i>Recommendations:</i> <i>{Clean equipment and the work area every day [C&H3]} {Clear spills immediately [C&H13]}.</i></p>
<p>PROC8a: General exposures (open systems) [CS16]; Non-dedicated facility [CS82]; Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].</p>	<p>5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] OR: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%:</p>

	<p>Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. ; Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 4 hours [OC12]</p> <p><i>Recommendations:</i> <i>Use bulk or semi-bulk handling systems [E43].;</i> <i>Discharge sacks via suitable vented charge chute [E44].{Drain down and flush system prior to equipment break-in or maintenance [E55]}.;</i> <i>{Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]} .{Clear spills immediately [C&H13]}.</i></p>
<p>PROC8b: General exposures, open systems [CS16]. Dedicated facility [CS81] Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].</p>	<p>Industrial workers: 5-25%: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66] Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82]. Use bulk or semi-bulk handling systems [E43]. Discharge sacks via suitable vented charge chute [E44].</p> <p>Professional workers: 5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. ; Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] Use bulk or semi-bulk handling systems [E43]. Discharge sacks via suitable vented charge chute [E44]. Or: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%: Avoid carrying out operation for more than 15 minutes [OC10] <1%: Avoid carrying out operation for more than 1 hour [OC11]</p> <p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}</i> <i>{Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i></p>
<p>PROC9: General exposures [CS1]. Dedicated facility [CS81] Drum and small package filling [CS6]. Equipment cleaning and maintenance [CS39].</p>	<p>Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 4 hours [OC12]{</p> <p><i>Recommendations:</i> <i>Use bulk or semi-bulk handling systems [E43].;</i> <i>Discharge sacks via suitable vented charge chute [E44].Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i></p>

<p>PROC10 General exposures (open systems) [CS16] Rolling, Brushing [CS51]. ; Equipment cleaning and maintenance [CS39]</p>	<p>5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Or: Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%: Avoid carrying out operation for more than 4 hours [OC12] <1%: No specific measures identified [EI18].</p> <p><i>Recommendations:</i> {Use long handled tools where possible [E50]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}. {Avoid splashing [C&H15]}.</p>
<p>PROC13 General exposures, open systems [CS16] Dipping, immersion and pouring [CS4]</p>	<p>Minimize exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings (80% efficiency) [E60]. Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 [E70].</p> <p><i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</p>
<p>PROC14 General exposures (open systems) [CS16] Production or preparation or articles by tableting, compression, extrusion or pelletization [CS100]</p>	<p>Industrial: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82]. Or: Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] Or: Avoid carrying out operation for more than 1 hour [OC11] 1-5%: Avoid carrying out operation for more than 4 hours [OC12] <1%: No specific measures identified [EI18].</p> <p>Professional: 5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. ; Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] Or: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. ; Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] 1-5%: Avoid carrying out operation for more than 15 minutes [OC10] <1%: Avoid carrying out operation for more than 1 hour [OC11]</p>

	<p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i></p>
<p>PROC15: General exposures [CS1]. Laboratory activities [CS36]. Small scale [CS61].</p>	<p>Carry out in a vented booth or extracted enclosure (80% efficiency) [E57].</p> <p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i></p>
<p>PROC19 General exposures [CS1]. Mixing operations (open systems) [CS30]. ; Manual [CS34].</p>	<p>Industrial workers: 5-25%: Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] <5%: Avoid carrying out operation for more than 1 hour [OC11] <1%: Avoid carrying out operation for more than 4 hours [OC12]</p> <p>Professional workers:: 5-25%: Avoid carrying out operation for more than 4 hours [OC12] Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] <5%: Avoid carrying out operation for more than 15 minutes [OC10] <1%: Avoid carrying out operation for more than 1 hour [OC11]{</p> <p><i>Recommendations:</i> <i>{Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]} {Stay upwind/keep distance from source [EI22]}</i></p>
Section 2.2	Control of environmental exposure
<p>Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.</p>	
Section 3	Exposure Estimation
3.1. Health	
<p>Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]</p>	
3.2. Environment	
N.A.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
<p>The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]</p>	
4.2. Environment	
N.A.	

Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Use of PPE	<u>Skin protection:</u> Gloves: - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators: - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators ≤ 2 hrs/day

Solid, low dustiness:

ES5 - Industrial and Professional use of Aluminium salts - solid, low dust – In non-spraying formulations; Aluminium content: max. 25%	
Section 1	Exposure Scenario Title
Title	Industrial and Professional use of Aluminium salts - solid, low dust - in non-spraying formulations; Aluminium content: max. 25%
Use Descriptor	Sector of Use: SU1, SU5, SU6b, SU7, SU13, SU19
	Process Categories: PROC1: Use in a closed process, no likelihood of exposure PROC2: Use in a closed continuous process, with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) 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 articles (multistage and/or significant contact) PROC6: Calendaring operations 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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletization PROC15: Use as a laboratory reagent PROC19: Hand-mixing with intimate contact and only PPE available
	Environmental Release Categories: ERC2: Formulation of preparations ERC3: Formulation in materials ERC4: Industrial use ERC5: Industrial use resulting in inclusion into or onto a matrix ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates) ERC6b: Industrial use of reactive processing aids ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems

	ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release ERC11a: Wide dispersive indoor use of long-life articles and materials with low release
Processes, tasks, activities covered	Industrial and Professional use of Aluminium salts - solid, low dust - in non-spraying formulations; Alu-content max. 25%
GES exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Solid, low dustiness [OC1]
Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposure [EI19]
Contributing Scenarios	Risk Management Measures
Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26]. Avoid skin contact: wear chemically resistant gloves (tested to EN374) in combination with specific activity training [PPE17]	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54]. Process sampling [CS2] (closed systems) [CS107]	No specific measures identified [EI18]. <i>Recommendations:</i> {Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}.
PROC2: General exposures [CS1]. Continuous process [CS54]. Process sampling [CS2] (open systems) [CS108]	No specific measures identified [EI18]. <i>Recommendations:</i> {Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}. {Clear spills immediately [C&H13]}.
PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. ; With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> {Ensure the system is closed} ; {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.
PROC4: General exposures (open systems) [CS16]. Batch process [CS55] (open systems) [CS108]; Drum/batch transfers [CS8]. With sample collection [CS56]. Equipment cleaning and	No specific measures identified [EI18]. <i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. ; {Clear spills immediately [C&H13]}.

maintenance [CS39].	
PROC5: General exposures (open systems) [CS16]. Mixing operations (open systems) [CS30]. Material transfers [CS3]. ; Batch process [CS55]. ; Cleaning [CS47].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]} {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC6: General exposures (open systems) [CS16] Mixing operations (open systems) [CS30]. Material transfers [CS3]. Batch process [CS55]. ; Cleaning [CS47]	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC8a: General exposures (open systems) [CS16]; Non-dedicated facility [CS82]; Material transfers [CS3]. ; Equipment cleaning and maintenance [CS39]. ; Bulk transfers [CS14].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC8b: General exposures, open systems [CS16]. ; Dedicated facility [CS81]Material transfers [CS3]. ; Equipment cleaning and maintenance [CS39]. ; Bulk transfers [CS14].	No specific measures identified [E118]. <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC9: General exposures [CS1]. ; Dedicated facility [CS81]Drum and small package filling [CS6]. ; Equipment cleaning and maintenance [CS39].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]} .{Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC10: General exposures (open systems) [CS16] Rolling, Brushing [CS51]. ; Equipment cleaning and maintenance [CS39]	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Use long handled tools where possible [E50]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}. {Avoid splashing [C&H15]}.</i>
PROC13: General exposures, open systems [CS16] Dipping, immersion and pouring [CS4]	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]} {Clear spills immediately [C&H13]}.</i>
PROC14: General exposures (open systems) [CS16] Production or preparation or articles by tableting, compression, extrusion or pelletization [CS100]	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>

PROC15: General exposures [CS1]. Laboratory activities [CS36]. Small scale [CS61].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC19: General exposures [CS1]. Mixing operations (open systems) [CS30]. Manual [CS34].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Clean equipment and the work area every day [C&H3]}. ; {Clear spills immediately [C&H13]}.</i>
Section 2.2	Control of environmental exposure
Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.	
Section 3	Exposure Estimation
3.1. Health	
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]	
3.2. Environment	
N.A.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]	
4.2. Environment	
N.A.	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Use of PPE	<u>Skin protection:</u> Gloves: - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators: - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators ≤ 2 hrs/day

9.1.6: Exposure Scenario 6: Use as flocculant or coagulant in water and waste water treatment

Aqueous solution:

ES6 - Industrial and Professional use of Aluminium salts in aqueous solutions (max. 25% Aluminium) as a flocculants or coagulant in water and waste water treatment

Section 1		Exposure Scenario Title
Title	Industrial and Professional use of Aluminium salts in aqueous solutions as a flocculants or coagulant in water and waste water treatment; max 25% Aluminium content.	
Use Descriptor	Sector of Use: Industrial (SU2, SU5, SU6b, SU10, SU23)	
	Process Categories: PROC2: Use in a closed continuous process, with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) PROC4: Use in a batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) 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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC19: Hand-mixing with intimate contact and only PPE available	
	Environmental Release Categories: ERC2: Formulation of preparations ERC4: Industrial use of processing aids and products, not becoming part of articles ERC6b: Industrial use of reactive processing aids ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems	
Processes, tasks, activities covered	Industrial and Professional use of Aluminium salts as a flocculants or coagulant in water and waste water treatment; max 25% Aluminium content. Includes equipment cleaning and maintenance.	
Exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³	
Section 2		Operational conditions and risk management measures
Section 2.1		Control of worker exposure
Product characteristics		
Physical form of product	Aqueous solution: vapour pressure of Alu-salt in water 0.01 Pa or less; Liquid, vapour pressure <10 Pa [OC14]	
Concentration of substance in product	Covers percentage substance in the product up to 25 % [G12].	
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]	
Human factors not influenced by risk management	<i>Not applicable</i>	
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposures [EI19]	
Contributing Scenarios		Risk Management Measures
Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26] Avoid skin contact: Wear suitable gloves tested to EN374 [PPE15]		

PROC2: General exposures [CS1]. Continuous process [CS54]. Process sampling [CS2] (open systems) [CS108]	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}. {Clear spills immediately [C&H13]}.</i>
PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Ensure the system is closed} ; {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.</i>
PROC4: General exposures (open systems) [CS16]. Batch process [CS55] (open systems) [CS108]; Drum/batch transfers [CS8]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC5: General exposures (open systems) [CS16]. Mixing operations (open systems) [CS30]. Material transfers [CS3]. Batch process [CS55]. Cleaning [CS47].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC8a: General exposures (open systems) [CS16]; Non-dedicated facility [CS82]; Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC8b: General exposures, open systems [CS16]. Dedicated facility [CS81] Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC9: General exposures [CS1]. Dedicated facility [CS81] Drum and small package filling [CS6]. Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]} {Clear spills immediately [C&H13]}.</i>
PROC19: General exposures [CS1]. Mixing operations (open systems) [CS30]. Manual [CS34].	Industrial worker: 5-25%: Avoid carrying out operation for more than 1 hour [OC11] 1-5%: Avoid carrying out operation for more than 4 hours [OC12] <1%: No specific measures identified [EI18]. Professional worker: 5-25%: Wear a respirator conforming to EN140 with Type A/P2 filter or better

	<p>[PPE29] or: Avoid carrying out operation for more than 15 minutes [OC10]{ 1-5%: Avoid carrying out operation for more than 1 hour [OC11] <1%: Avoid carrying out operation for more than 4 hours [OC12]</p> <p><i>Recommendations:</i> <i>{Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i> <i>{Stay upwind/keep distance from source [EI22]}.</i></p>
Section 2.2	Control of environmental exposure
Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.	
Section 3	Exposure Estimation
3.1. Health	
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]	
3.2. Environment	
N.A.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]	
4.2. Environment	
N.A.	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Use of PPE	<p><u>Skin protection:</u> Gloves: - Observe breakthrough time of the gloves used</p> <p><u>Respiratory protection:</u> Respirators: - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators ≤ 2 hrs/day</p>

Solid, high dustiness:

ES6 – Industrial and Professional use of Aluminium salts as flocculants or coagulant in water and waste water treatment; solid – high dustiness; Aluminium content = max. 25%

Section 1	Exposure Scenario Title
Title	Industrial and Professional use of Aluminium salts as flocculants or coagulant in water and waste water

	treatment; solid – high dustiness; Aluminium content = max. 25%
Use Descriptor	Sector of Use: SU2, SU5, SU6b, SU10, SU23)
	<p>Process Categories:</p> <p>PROC2: Use in a closed continuous process, with occasional controlled exposure</p> <p>PROC3: Use in a closed batch process (synthesis or formulation)</p> <p>PROC4: Use in a batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC19: Hand-mixing with intimate contact and only PPE available</p>
	<p>Environmental Release Categories:</p> <p>ERC2: Formulation of preparations</p> <p>ERC4: Industrial use of processing aids and products, not becoming part of articles</p> <p>ERC6b: Industrial use of reactive processing aids</p> <p>ERC8a: Wide dispersive indoor use of processing aids in open systems</p> <p>ERC8b: Wide dispersive indoor use of reactive substances in open systems</p> <p>ERC8d: Wide dispersive outdoor use of processing aids in open systems</p>
Processes, tasks, activities covered	Industrial and Professional use of Aluminium salts as flocculants or coagulant in water and waste water treatment.
GES exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Solid, high dustiness [OC6]
Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	<p>Assumes use at not > 20°C above ambient [G15];</p> <p>Assumes a good basic standard of occupational hygiene is implemented [G1]. ;</p> <p>Ensure operatives are trained to minimize exposures [EI19]</p>
Contributing Scenarios	Risk Management Measures
<p>Below pH2 and above pH11 the substance has corrosive properties:</p> <p>Use suitable eye protection [PPE26].</p> <p>Avoid skin contact: wear suitable gloves tested to EN374 [PPE15]</p>	
PROC2: General exposures [CS1]. Continuous process [CS54]. Process sampling [CS2] (open systems) [CS108]	<p>Industrial use: No specific measures identified [EI18].</p> <p>Professional use: Ensure material transfers are under containment or extract ventilation</p>

	<p>[E66] Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82].</p> <p><i>Recommendations:</i> <i>{Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}. {Clear spills immediately [C&H13]}.</i></p>
<p>PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].</p>	<p>Industrial workers: No specific measures identified [EI18].</p> <p>Professional workers: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]</p> <p><i>Recommendations:</i> <i>{Ensure the system is closed}</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.</i></p>
<p>PROC4: General exposures (open systems) [CS16]. Batch process [CS55] (open systems) [CS108]; Drum/batch transfers [CS8]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].</p>	<p>Industrial workers: 5-25%: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82].</p> <p>Professional workers: 5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 1 hour [OC11] Or: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better {PPE29} 1-5%: Avoid carrying out operation for more than 15 minutes [OC10] <1% : Avoid carrying out operation for more than 1 hour [OC11]</p> <p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i></p>
<p>PROC5: General exposures (open systems) [CS16]. Mixing operations (open systems) [CS30]. Material transfers [CS3]. Batch process [CS55]. Cleaning [CS47].</p>	<p>Industrial workers: Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82].</p> <p>Professional workers: 5-25%: Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82].</p>

	<p>Avoid carrying out operation for more than 1 hour [OC11]</p> <p>OR:</p> <p>Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29]</p> <p>1-5%:</p> <p>Avoid carrying out operation for more than 15 minutes [OC10]</p> <p><1%:</p> <p>Avoid carrying out operation for more than 1 hour [OC11]</p> <p><i>Recommendations:</i></p> <p><i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i></p>
<p>PROC8a:</p> <p>General exposures (open systems) [CS16];</p> <p>Non-dedicated facility [CS82];</p> <p>Material transfers [CS3].</p> <p>Equipment cleaning and maintenance [CS39].</p> <p>Bulk transfers [CS14].</p>	<p>5-25%:</p> <p>Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66].</p> <p>Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82].</p> <p>Avoid carrying out operation for more than 1 hour [OC11]</p> <p>OR:</p> <p>Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29]</p> <p>1-5%:</p> <p>Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. ;</p> <p>Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82].</p> <p>Avoid carrying out operation for more than 4 hours [OC12]</p> <p><i>Recommendations:</i></p> <p><i>Use bulk or semi-bulk handling systems [E43].;</i></p> <p><i>Discharge sacks via suitable vented charge chute [E44].{Drain down and flush system prior to equipment break-in or maintenance [E55]}.;</i></p> <p><i>{Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]} .{Clear spills immediately [C&H13]}.</i></p>
<p>PROC8b:</p> <p>General exposures, open systems [CS16].</p> <p>Dedicated facility [CS81]</p> <p>Material transfers [CS3].</p> <p>Equipment cleaning and maintenance [CS39].</p> <p>Bulk transfers [CS14].</p>	<p>Industrial workers:</p> <p>5-25%:</p> <p>Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]</p> <p>Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82].</p> <p>Use bulk or semi-bulk handling systems [E43].</p> <p>Discharge sacks via suitable vented charge chute [E44].</p> <p>Professional workers:</p> <p>5-25%:</p> <p>Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. ;</p> <p>Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82].</p> <p>Avoid carrying out operation for more than 1 hour [OC11]</p> <p>Use bulk or semi-bulk handling systems [E43].</p> <p>Discharge sacks via suitable vented charge chute [E44].</p> <p>Or:</p> <p>Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29]</p> <p>1-5%:</p>

	<p>Avoid carrying out operation for more than 15 minutes [OC10] <1%: Avoid carrying out operation for more than 1 hour [OC11]</p> <p><i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}</i> <i>{Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i></p>
<p>PROC9: General exposures [CS1]. Dedicated facility [CS81] Drum and small package filling [CS6]. Equipment cleaning and maintenance [CS39].</p>	<p>Ensure material transfers are under containment or extract ventilation (80% efficiency) [E66]. Provide extract ventilation to material transfer points and other openings (80% efficiency) [E82]. Avoid carrying out operation for more than 4 hours [OC12]{</p> <p><i>Recommendations:</i> <i>Use bulk or semi-bulk handling systems [E43].;</i> <i>Discharge sacks via suitable vented charge chute [E44]. Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i></p>
<p>PROC19 General exposures [CS1]. Mixing operations (open systems) [CS30]. ; Manual [CS34].</p>	<p>Industrial workers: 5-25%: Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] <5%: Avoid carrying out operation for more than 1 hour [OC11] <1%: Avoid carrying out operation for more than 4 hours [OC12]</p> <p>Professional workers:: 5-25%: Avoid carrying out operation for more than 4 hours [OC12] plus Wear a respirator conforming to EN140 with Type A/P2 filter or better [PPE29] <5%: Avoid carrying out operation for more than 15 minutes [OC10] <1%: Avoid carrying out operation for more than 1 hour [OC11]{</p> <p><i>Recommendations:</i> <i>{Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}</i> <i>{Stay upwind/keep distance from source [EI22]}</i></p>
Section 2.2	Control of environmental exposure
<p>Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.</p>	
Section 3	Exposure Estimation
3.1. Health	
<p>Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]</p>	
3.2. Environment	
N.A.	

Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]	
4.2. Environment	
N.A.	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Use of PPE	<u>Skin protection:</u> Gloves: <ul style="list-style-type: none"> - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators: <ul style="list-style-type: none"> - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators ≤ 2 hrs/day

Solid, low dustiness:

ES6 – Industrial and Professional use of Aluminium salts as flocculant or coagulant in water and waste water treatment – solid-low dust; Aluminium content = max. 25%	
Section 1	Exposure Scenario Title
Title	Industrial and Professional use of Aluminium salts as flocculant or coagulant in water and waste water treatment – solid-low dust; Aluminium content = max. 25%
Use Descriptor	Sector of Use: Industrial (SU2, SU5, SU6b, SU10, SU23)
	Process Categories: PROC2: Use in a closed continuous process, with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) PROC4: Use in a batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) 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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC19: Hand-mixing with intimate contact and only PPE available
	Environmental Release Categories: ERC2: Formulation of preparations ERC4: Industrial use of processing aids and products, not becoming part of articles ERC6b: Industrial use of reactive processing aids ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems

	ERC8d: Wide dispersive outdoor use of processing aids in open systems
Processes, tasks, activities covered	Industrial and Professional use of Aluminium salts as flocculant or coagulant in water and waste water treatment. Aluminium content = max. 25%
Exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Solid, low dustiness [OC1]
Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1] Ensure operatives are trained to minimize exposures [EI19]
Contributing Scenarios	Risk Management Measures
PROC2: General exposures [CS1]. Continuous process [CS54]. Process sampling [CS2] (open systems) [CS108]	No specific measures identified [EI18]. <i>Recommendations</i> {Ensure the system is closed} {Clear transfer lines prior to de-coupling [E39]}. {Clear spills immediately [C&H13]}.
PROC3: General exposures [CS1]. Use in contained batch processes [CS37]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> {Ensure the system is closed} {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear spills immediately [C&H13]}.
PROC4: General exposures (open systems) [CS16]. Batch process [CS55] (open systems) [CS108]; Drum/batch transfers [CS8]. With sample collection [CS56]. Equipment cleaning and maintenance [CS39].	No specific measures identified [EI18]. <i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.
PROC5: General exposures (open systems) [CS16]. Mixing operations (open systems) [CS30]. Material transfers [CS3]. Batch process [CS55]. Cleaning [CS47].	No specific measures identified [EI18]. <i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]}; {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.
PROC8a: General exposures (open systems) [CS16]; Non-dedicated facility [CS82]; Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].	No specific measures identified [EI18]. <i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.

PROC8b: General exposures, open systems [CS16]. Dedicated facility [CS81] Material transfers [CS3]. Equipment cleaning and maintenance [CS39]. Bulk transfers [CS14].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Use drum pumps [E53]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC9: General exposures [CS1]. ; Dedicated facility [CS81]Drum and small package filling [CS6]. Equipment cleaning and maintenance [CS39].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
PROC19: General exposures [CS1]. Mixing operations (open systems) [CS30]. Manual [CS34].	No specific measures identified [E118]. <i>Recommendations:</i> <i>{Clean equipment and the work area every day [C&H3]}. ; {Clear spills immediately [C&H13]}</i>
Section 2.2	Control of environmental exposure
Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.	
Section 3	Exposure Estimation
3.1. Health	
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]	
3.2. Environment	
N.A.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]	
4.2. Environment	
N.A.	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Use of PPE	<u>Skin protection:</u> Gloves: <ul style="list-style-type: none"> - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators: <ul style="list-style-type: none"> - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators ≤ 2 hrs/day

9.1.7 Exposure Scenario 7: Use in laboratory

Aqueous solution:

ES7 – Use of Aluminium salts – Aqueous solution – in industrial and professional laboratory settings; max Aluminium content = 25%	
Section 1	Exposure Scenario Title
Title	Use of Aluminium salts – Aqueous solution – in industrial and professional laboratory settings; max Aluminium content = 25%
Use Descriptors	Sector of Use: SU9
	Process Categories: PROC15: Use as a laboratory reagent
	Environmental Release Categories: ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Processes, tasks, activities covered	Use of aluminium salts (aqueous solution) in small scale laboratory settings. Max. aluminium content = 25%
Exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Aqueous solution: vapour pressure of Alu-salt in water 0.01 Pa or less; Liquid, vapour pressure < 10 Pa [OC14]
Concentration of substance in product	Covers percentage substance in the product up to 25 % [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposures [EI19]
Contributing Scenarios	Risk Management Measures
Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26] Avoid skin contact: Wear suitable gloves tested to EN374 [PPE15]	
PROC15: General exposures [CS1]. Laboratory activities [CS36]. Small scale [CS61].	No specific measures identified [EI18]. <i>Recommendations:</i> {Drain down and flush system prior to equipment break-in or maintenance [E55]} {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.
Section 2.2	Control of environmental exposure
Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising	

eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.	
Section 3	Exposure Estimation
3.1. Health	
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]	
3.2. Environment	
N.A.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]	
4.2. Environment	
N.A.	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Use of PPE	<u>Skin protection:</u> Gloves: <ul style="list-style-type: none"> - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators: <ul style="list-style-type: none"> - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators ≤ 2 hrs/day

Solid, high dustiness:

ES7 - Use of Aluminium salts – solid, high dust – in industrial and professional laboratory settings; max Aluminium content = 25%	
Section 1	Exposure Scenario Title
Title	Use of Aluminium salts – solid, high dust – in industrial and professional laboratory settings; max Aluminium content = 25%
Use Descriptors	Sector of Use: SU9
	Process Categories: PROC15: Use as a laboratory reagent
	Environmental Release Categories: ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Processes, tasks, activities covered	Use of aluminium salts (solid, high dustiness) in small scale laboratory settings. Max. aluminium content = 25%
Exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	

Physical form of product	Solid, high dustiness [OC6]
Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15] Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposures [EI19]
Contributing Scenarios	Risk Management Measures
Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26] Avoid skin contact: Wear suitable gloves tested to EN374 [PPE15]	
PROC15: General exposures [CS1]. Laboratory activities [CS36]. Small scale [CS61].	Carry out in a vented booth or extracted enclosure (80% efficiency) [E57]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}.</i> <i>{Clear spills immediately [C&H13]}.</i>
Section 2.2	Control of environmental exposure
Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.	
Section 3	Exposure Estimation
3.1. Health	
Predicted exposures are not expected to exceed the applicable exposure limits (given in section8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]	
3.2. Environment	
N.A.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]	
4.2. Environment	
N.A.	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Use of PPE	<u>Skin protection:</u> Gloves: - Observe breakthrough time of the gloves used <u>Respiratory protection:</u> Respirators:

	<ul style="list-style-type: none"> - Wear a disposable mask only once - Clean non-disposable masks after each use and store in a clean box in a clean area - Wear respirators \leq 2 hrs/day
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Solid, low dustiness:**ES7 - Use of Aluminium salts – solid, low dust – in industrial and professional laboratory settings; max Aluminium content = 25%**

Section 1	Exposure Scenario Title
Title	Use of Aluminium salts – solid, low dust – in industrial and professional laboratory settings; max Aluminium content = 25%
Use Descriptor	Sector of Use: SU9
	Process Categories: PROC15: Use as a laboratory reagent
	Environmental Release Categories: ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Processes, tasks, activities covered	Use of aluminium salts (solid, low dustiness) in small scale laboratory settings. Max. aluminium content = 25%
Exposure criteria	DNEL, inhalation long term: 1.8 mg/m ³
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Solid, low dustiness [OC1]
Concentration of substance in product	Covers percentage substance in the product up to 25% [G12].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Human factors not influenced by risk management	<i>Not applicable</i>
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposures [EI19]
Contributing Scenarios	Risk Management Measures
Below pH2 and above pH11 the substance has corrosive properties: Use suitable eye protection [PPE26] Avoid skin contact: Wear suitable gloves tested to EN374 [PPE15]	
PROC15: General exposures [CS1]. Laboratory activities [CS36]. Small scale [CS61].	No specific measures identified [EI18]. <i>Recommendations:</i> <i>{Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clean equipment and the work area every day [C&H3]}. {Clear spills immediately [C&H13]}.</i>
Section 2.2	Control of environmental exposure
Aluminum, aluminum powders, aluminum oxide and soluble aluminum compounds are non hazardous (not classified for the environment). Aluminum (Al) is the most commonly occurring metallic element, comprising eight percent of the earth's crust and is therefore found in great abundance in both the terrestrial and sediment environments. Concentrations of 3-8% (30,000-80,000 ppm) are not uncommon. The relative contributions of	

anthropogenic aluminum to the existing natural pools of aluminum in soils and sediments is very small, and therefore, not relevant either in terms of added amounts or in terms of toxicity.

Section 3 Exposure Estimation**3.1. Health**

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented [G29]

3.2. Environment

N.A.

Section 4 Guidance to check compliance with the Exposure Scenario**4.1. Health**

The ECETOC TRA (V2.0) tool has been used to estimate workplace exposures unless otherwise indicated [G21]

4.2. Environment

N.A.

Section 5 Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)

Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.

Control of Worker Exposure

Use of PPE

Skin protection:

Gloves:

- Observe breakthrough time of the gloves used

Respiratory protection:

Respirators:

- Wear a disposable mask only once
- Clean non-disposable masks after each use and store in a clean box in a clean area
- Wear respirators ≤ 2 hrs/day

Exposure Estimation**Workers exposure**

Worker exposure for this scenario has been assessed using ECETOC TRA V2.0. In Chapter 10 the relationships between the Operational Conditions and safe uses (RCRs (inhalation) <1) are given.

Consumer exposure

Not relevant

Indirect exposure of humans via the environment

Not relevant.