

SCHEDA DI SICUREZZA

RDX/voks, RDX/stearinsyre, COMP A-3, A-4, A-5

La scheda di sicurezza è in linea con Regolamento (UE) 2015/830 della Commissione, del 28 maggio 2015, recante modifica 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)

SEZIONE 1: Identificazione della sostanza o della miscela e della società/impresa

Data di compilazione	10.05.2011
Data di revisione	23.06.2017

1.1. Identificatore del prodotto

Nome del prodotto	RDX/voks, RDX/stearinsyre, COMP A-3, A-4, A-5
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1.2. Usi pertinenti identificati della sostanza o miscela e usi sconsigliati

Usi rilevanti identificati	PC11 Esplosivi
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1.3. Informazioni sul fornitore della scheda di dati di sicurezza

Produttore

Nome della ditta	Chemring Nobel AS
Indirizzo postale	Engeneveien 7
Codice postale	N-3475
Nome del luogo	SÆTRE
Paese	Norvegia
Telefono	+47 32 27 86 00
E-mail	sales@chemringnobel.no
Sito Internet	http://www.chemringnobel.no/
Nome della persona di contatto	Richard Gjersøe

1.4. Numero telefonico di emergenza

Telefono in caso di urgenza	Telefono: 22 59 13 00 Descrizione: Giftinformasjonen
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SEZIONE 2: Identificazione dei pericoli

2.1. Classificazione della sostanza o della miscela

Classificazione conforme alla Normativa (CE) N. 1272/2008 [CLP/GHS]	Expl. 1.1; H201 Acute tox. 3; H301 STOT SE1; H370 STOT RE2; H373
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Proprietà pericolose di sostanza / miscela

Esplosivo; pericolo di esplosione di massa.
Tossico per ingestione. Provoca danni agli organi. Può provocare danni agli organi in caso di esposizione prolungata o ripetuta.

2.2. Elementi dell'etichetta

Pittogrammi di pericolo (CLP)



Composizione sull'etichetta

RDX 90 – 100 %

Le avvertenze

Pericolo

Indicazioni di pericolo

H201 Esplosivo; pericolo di esplosione di massa.
H301 Tossico se ingerito.
H370 Provoca danni agli organi (Sistema nervoso centrale in caso di esposizione orale)

Consigli di prudenza

P210 Tenere lontano da fonti di calore / scintille / fiamme libere / superfici riscaldate. – Non fumare.
P250 Evitare le abrasioni / gli urti / . / gli attriti.
P370+P380 Evacuare la zona in caso di incendio.
P372 Rischio di esplosione in caso di incendio.
P373 NON utilizzare mezzi estinguenti se l'incendio raggiunge materiali esplosivi.
P280 Indossare guanti / indumenti protettivi / Proteggere gli occhi / il viso.

2.3. Altri pericoli

PBT / vPvB

Non è PBT / vPvB.

Effetto sulla salute

Può causare convulsioni.

SEZIONE 3: Composizione/informazioni sugli ingredienti

3.2. Miscele

Nome del componente	Identificazione	Classificazione	Contenuti
RDX	N. CAS: 121-82-4 Num. CE: 204-500-1 Numero di registrazione: 01-2119990795-17-0002	Expl. 1.1; H201 Acute tox. 3; H301 STOT SE1; H370 STOT RE2; H373	90 – 100 %
Paraffina/acido stearico			1 – 10 %
Osservazioni relative ai componenti	Consultare la sezione 16 per la spiegazione delle indicazioni di pericolo (H).		

SEZIONE 4: Misure di primo soccorso

4.1. Descrizione delle misure di primo soccorso

Generalità	Numero telefonico di emergenza: vedi sezione 1.4. In caso di incidenti incoscienza o grave, chiamare 112. IN CASO DI INGESTIONE: contattare immediatamente un CENTRO ANTIVELENI o un medico IN CASO di esposizione o di malessere, contattare un CENTRO ANTIVELENI o un medico.
Inalazione	Aria fresca, calma e caldo. Consultare un medico se il disturbo continua.
Contatto con la pelle	Togliere gli indumenti contaminati. Lavarsi immediatamente con acqua e sapone. In caso di malessere, consultare un medico.

Contatto con gli occhi	Sciacquare immediatamente con abbondante acqua per non più di 15 minuti. Togliere eventuali lenti a contatto ed aprire bene gli occhi. In caso di malessere, consultare un medico.
Ingestione	Sciacquare a fondo la bocca. Bere alcuni bicchieri di acqua o latte. Provocare il vomito, se la persona è cosciente. Necessario indurre il vomito solo in consultazione con il personale medico. Consultare un medico. In caso di rischio di incoscienza, mettere e trasportare la vittima in posizione laterale di sicurezza. Trasporto in ospedale. Portare con se la scheda di sicurezza del prodotto.

4.2. Principali sintomi ed effetti, sia acuti che ritardati

Informazioni destinate al personale medico	L'ingestione di kjemikaliet possono causare convulsioni simili ad attacchi epilettici, e dovrebbero essere trattati come tali.
Sintomi ed effetti acuti	Tossico per ingestione. Può causare mal di testa, vertigini e altri effetti sul sistema nervoso centrale.
Sintomi ed effetti ritardati	Stessi dei sintomi acuti.

4.3. Indicazione della eventuale necessità di consultare immediatamente un medico e di trattamenti speciali

Altre informazioni	Trattamento sintomatico.
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SEZIONE 5: Misure antincendio

5.1. Mezzi di estinzione

Mezzo di estinzione adeguato	Spegnere gli incendi circostanti con estintore idoneo.
Mezzo di estinzione non appropriato	Non tentare di spegnere l'incendio causionato dall'esplosivo, il fuoco può provacre un esplosione! Il fuoco causionato dall'esplosivo NON deve essere soffocato con alcun agente estinguente (schiuma, polvere chimica, anidride carbonica o sabbia). Ogni tentativo AUMENTA il rischio di esplosione.

5.2. Pericoli speciali derivanti dalla sostanza o dalla miscela

Rischi di incendio e di esplosione	Rischio di esplosione per urto, sfregamento, fuoco o altre sorgenti d'ignizione Incendio / esplosione forma gas tossici come gli ossidi di carbonio (CO, CO ₂) e ossidi di azoto (NO, NO ₂ e N ₂ O ₄).
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5.3. Raccomandazioni per gli addetti all'estinzione degli incendi

Attrezzatura di protezione individuale	Impiegare una maschera di protezione ad aria libera quando il prodotto viene coinvolto in un incendio. In caso di evacuazione, impiegare maschere approvate a quest'uso. Vedi anche sezione 8.
Altre informazioni	Fermare ogni tipo di traffico ed evacuare l'area intorno al incendio a sufficiente distanza di sicurezza rispetto a possibile esplosione o incendio dovuto al gas. Contattare immediatamente la polizia e vigili del fuoco. I contenitori vicini al fuoco devono essere allontanati o raffreddati con acqua.

SEZIONE 6: Misure in caso di rilascio accidentale

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

Precauzioni individuali	Utilizzare dispositivi di protezione individuale, come specificato nel punto 8.
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6.2. Precauzioni ambientali

Precauzioni per la protezione dell'ambiente	Impedire lo scarico di fogna, le vie o terra.
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6.3. Metodi e materiali per il contenimento e per la bonifica

Metodi di pulizia	Inumidire con acqua prima dell'uso. La sporcizia deve essere rimossa con una pala di legno o di alluminio e deve essere posta in un contenitore adeguato per poi essere bruciata. Manipolare secondo le leggi e le regolamentazioni in vigore sul trattamento dei rifiuti (vedi sezione 13).
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6.4. Riferimenti ad altre sezioni

Altre istruzioni	Vedere sezioni 7 e 8.
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SEZIONE 7: Manipolazione e immagazzinamento

7.1. Precauzioni per la manipolazione sicura

Manipolazione	Solamente personale qualificato utilizzerà il prodotto. Posto sotto la vigilanza e inaccessibile a persone non autorizzate. Conservare lontano da fiamme e scintille – Non fumare. Proteggere contro il calore Proteggere da danni fisici e/o attriti.
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Misure protettive

Consigli sulle norme igieniche generali sul lavoro	Lavare le mani dopo l'uso. Togliere gli indumenti contaminati e i dispositivi di protezione prima di accedere alle zone in cui si mangia. Non mangiare, bere e fumare nelle zone di lavoro.
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7.2. Condizioni per l'immagazzinamento sicuro, comprese eventuali incompatibilità

Stoccaggio	Conservare in ambiente asciutto e ventilato. Tenere al sicuro dal fuoco in un deposito approvato chiuso a chiave. Conservare lontano da: fonti di ignizione. Conservare tra 0 e 30 °C.
Rischi e proprietà particolari	Pericolo di esplosione per urto o riscaldamento.
Altre informazioni	Conformarsi normative nazionali per quanto riguarda la manipolazione di esplosivi.

7.3. Usi finali specifici

Utilizzazione(i) particolare(i)	Vedere sezioni 1.2.
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SEZIONE 8: Controllo dell'esposizione/protezione individuale

8.1. Parametri di controllo

Nome del componente	Identificazione	Valore	Anno
RDX	N. CAS: 121-82-4		
Altre indicazioni sui valori limiti	Forklaring av anmerkningene: H = Hudopptak.		

8.2. Controlli dell'esposizione

Controllo dell'esposizione professionale	I dispositivi di protezione individuale devono essere scelti conformemente alle norme CEN e concordemente con il fornitore dei dispositivi stessi. Garantire una ventilazione adeguata.
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Protezioni per occhi / volto

Protezione degli occhi	Portare occhiali di protezione aderenti se si formano polveri.
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Protezione delle mani

Protezione delle mani	Usare guanti protettivi adatti in caso di rischio di contatto con la pelle. Non si sconsiglia nessun materiale in particolare, il prodotto non penetra la plastica o la gomma.
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Protezione della pelle

Protezione della pelle (altro che quella delle mani)	Utilizzare adeguate indumenti protettivi per evitare il contatto con la pelle.
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Protezione respiratoria

Protezione respiratoria	Normalmente non obbligatorio. Usare maschera con filtro P2, in caso di formazione di polvere.
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Controllo di esposizione ambientale adatto

Controlli dell'esposizione ambientale	Impedire lo scarico di fogna, le vie o terra.
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Altre informazioni

Altre informazioni	Servizi lavaggio degli occhi dovrebbe essere disponibile. I vestiti che sono stati bagnati o contaminati devono essere sostituiti. Le attrezzature di cui protezione è un suggerimento. Una valutazione dei rischi (il rischio effettivo) può portare ad altri requisiti.
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SEZIONE 9: Proprietà fisiche e chimiche

9.1. Informazioni sulle proprietà fisiche e chimiche fondamentali

Stato fisico	Polvere.
Colore	Bianco.
Odore	Nessuno.
pH	Stato: In stato di consegna Commenti: Non rilevante.
Punto / intervallo di fusione	Valore: 190 °C
Punto di ebollizione	Commenti: Non applicabile in quanto la sostanza si decompone senza far bollire.
Punto di infiammabilità	Commenti: Non rilevante. (Solidi)
Tasso di evaporazione	Commenti: Non rilevante.
Infiammabilità (solidi, gas)	Rinuncia. Sostanza ha proprietà esplosive.
Pressione di vapore	Commenti: Non fornito.
Densità di vapore	Commenti: Non rilevante.
Densità	Valore: ~ 1,8 g/cm ³
Solubilità nell'acqua	Inestricabilmente.
coefficiente di divisione: n-octanol/acqua	Commenti: Non rilevante per una miscela.
Combustibilità spontanea	Commenti: Non rilevante.
Temperatura di	Valore: 190 – 200 °C

decomposizione	
Viscosità	Commenti: Non rilevante. (Solidi a temperatura ambiente e pressione normale).
Proprietà esplosive	Esplosive.
Proprietà ossidanti	Prova non eseguita. La miscela è esplosiva.

9.2. Altre informazioni

Altre proprietà fisiche e chimiche

Proprietà fisiche e chimiche	Temperatura di esplosione: 190-200 °C
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SEZIONE 10: Stabilità e reattività

10.1. Reattività

Reattività	Nessun pericolo di reattività.
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10.2. Stabilità chimica

Stabilità	Stabile a temperature normali e se utilizzato secondo le raccomandazioni d'uso.
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10.3. Possibilità di reazioni pericolose

Possibilità di reazioni pericolose	Pericolo di esplosione se mescolato con sostanze comburenti.
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10.4. Condizioni da evitare

Condizioni da evitare	Rischio di esplosione per urto, sfregamento, fuoco o altre sorgenti d'ignizione
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10.5. Materiali incompatibili

Materie da evitare	Agenti ossidanti.
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10.6. Prodotti di decomposizione pericolosi

Prodotti di decomposizione pericolosi	La degradazione termica o la combustione possono liberare ossidi di carbonio ed altri gas o vapori tossici. Gas azotati (Nox).
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SEZIONE 11: Informazioni tossicologiche

11.1. Informazioni sugli effetti tossicologici

Componente	RDX
Tossicità acuta	Type of toxicity: Acuto Effect Tested: LD50 Exposure routes: Orale Valore: 71 mg/kg Speci di animali di laboratorio: Ratto

Altre informazioni riguardanti i rischi di salute

Generalità	L'ingestione o l'inalazione di polvere può causare intossicazione acuta o cronica. I sintomi includono mal di testa, convulsioni, insonnia e nausea. Crisi convulsive possono verificarsi molte ore dopo l'esposizione.
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Inalazione	L'inalazione di polvere può causare mal di testa, convulsioni, insonnia e nausea.
Contatto con la pelle	Non irritante.
Contatto con gli occhi	Non irritante.
Ingestione	Tossico per ingestione. Può provocare danni agli organi.
Irritazione	Basandosi sui dati disponibili i criteri di classificazione non sono soddisfatti.
Sensibilizzazione	Basandosi sui dati disponibili i criteri di classificazione non sono soddisfatti.
Mutagenicità	Basandosi sui dati disponibili i criteri di classificazione non sono soddisfatti.
Cancerogenicità	Basandosi sui dati disponibili i criteri di classificazione non sono soddisfatti.
Proprietà teratogeni	Basandosi sui dati disponibili i criteri di classificazione non sono soddisfatti.
Tossicità per la riproduzione	Basandosi sui dati disponibili i criteri di classificazione non sono soddisfatti.
Tossicità specifica per organi bersaglio (STOT) — esposizione singola	Provoca danni agli organi (il sistema nervoso centrale) in caso di ingestione.
Tossicità specifica per organi bersaglio (STOT) — esposizione ripetuta	Può provocare danni agli organi (il sistema nervoso centrale) in caso di esposizione prolungata o ripetuta in caso di ingestione.
Pericolo in caso di aspirazione	Non rilevante.

SEZIONE 12: Informazioni ecologiche

12.1. Tossicità

Componente	RDX
Tossicità acquatica acuta, pesci	Valore: 11,1 – 15,0 mg/l Test duration: 96 h Specie: Pimephales promelas Method: LC50 Commenti: NOEC (28 g): 1,4 mg/l. Pimephales promelas
Componente	RDX
Tossicità acquatica acuta, alghe	Commenti: NOEC: 0,5 mg/l. Pseudokirchnerella subcapitata
Componente	RDX
Tossicità acquatica acuta, dafnie	Valore: > 17 mg/l Test duration: 48 h Specie: Ceriodaphnia dubia Method: EC50 Commenti: NOEC (7 g): 3,64 mg/l. Ceriodaphnia dubia
Ecotossicità	Prodotto classificato non pericoloso per l'ambiente.

12.2. Persistenza e degradabilità

Persistenza e degradabilità	Decomposto dalla fotolisi. L'emivita di 3-13 ore.
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12.3. Potenziale di bioaccumulo

Potenziale di bioaccumulazione	Non è bioaccumulabile. Log Pow= 0,87
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12.4. Mobilità nel suolo

Mobilità	Il prodotto è poco solubile in acqua.
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12.5. Risultati della valutazione PBT e vPvB

Risultati di valutazione PBT	Il prodotto non soddisfa i criteri di classificazione PBT (persistente, bioaccumulabile/tossico).
vPvB evaluation results	Il prodotto non soddisfa i criteri di classificazione VPvB (molto persistente/molto bioaccumulabile).

12.6. Altri effetti avversi

Altri effetti nefasti / altre informazioni	Impedire lo scarico di fogna, le vie o terra.
Dettagli relativi alla protezione dell'ambiente, conclusione	Il prodotto non è considerato pericoloso ambientale.

SEZIONE 13: Considerazioni sullo smaltimento

13.1. Metodi di trattamento dei rifiuti

Precisare i metodi di eliminazione adeguati	I resti di esplosivi devono essere rimossi, curati (o riconfezionato in imballaggi approvati), stoccati provvisoriamente e al più presto distrutti in modo adeguato.
	Contattare le autorità locali in materia trattamento dei rifiuti di esplosivi.
Prodotto classificato come rifiuto pericoloso	Si

SEZIONE 14: Informazioni sul trasporto

14.1. Numero ONU

ADR / RID / ADN	0483
IMDG	0483
ICAO/IATA	0483

14.2. Nome di spedizione dell'ONU

ADR / RID / ADN	RDX DESENSIBILIZZATA
IMDG	RDX, DESENSITIZED
ICAO/IATA	RDX, DESENSITIZED

14.3. Classi di pericolo connesso al trasporto

ADR / RID / ADN	1.1D
IMDG	1.1D
ICAO/IATA	1.1D

14.4. Gruppo di imballaggio

Commento	Non rilevante.
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14.5. Pericoli per l'ambiente

14.6. Precauzioni speciali per gli utilizzatori

Precauzioni speciali per gli utilizzatori	Ikke kjent.
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14.7. Trasporto di rinfuse secondo l'allegato II di MARPOL 73/78 ed il codice IBC

Categoria di inquinamento	Non rilevante.
ADR Altre informazioni utili	Emballasjebestemmelser: P112, MP20
RID Altre informazioni utili	Emballasjebestemmelser: P112, MP20

IMDG / ICAO / IATA Other information

EmS	F-B, S-Y
ICAO/IATA Altre informazioni utili	FORBUDT

SEZIONE 15: Informazioni sulla regolamentazione

15.1. Norme e legislazione su salute, sicurezza e ambiente specifiche per la sostanza o la miscela

Riferimenti (legislazione/regolamentazione)	Direttiva 67/548/CEE del Consiglio .Relative alla classificazione, all'imballaggio e all'etichettatura. direttiva 1999/45/CE del Parlamento europeo e del Consiglio.Relative alla classificazione, all'imballaggio e all'etichettatura dei preparati pericolosi. Direttiva 1272/2008/CE e relativi emendamenti (Regolamento CLP) Regolamento (CE) n. 1907/2006 del Parlamento europeo e del Consiglio, del 18 dicembre 2006, concernente la registrazione, la valutazione, l'autorizzazione e la restrizione delle sostanze chimiche (REACH) Valori limite di esposizione professionale. Direttiva del Consiglio del 15 luglio 1975 relativa ai rifiuti (75/442/CEE). Normative nazionali per quanto riguarda la manipolazione di esplosivi. (Direttiva 93/15 CEE) Regolamento ADR/RID.
Num. di dichiarazione	23435 (RDX Flegmatisert)

15.2. Valutazione della sicurezza chimica

La valutazione di sicurezza chimica è stata eseguita	No
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SEZIONE 16: Altre informazioni

Appunti del fornitore	Le informazioni contenute in questo documento devono essere disponibili per tutte le persone a contatto con il prodotto.
Elenco di frasi di rischio rilevanti (sezioni 2 e 3).	H201 Esplosivo; pericolo di esplosione di massa. H301 Tossico se ingerito. H370 Provoca danni agli organi H373 Può provocare danni agli organi in caso di esposizione prolungata o ripetuta
Classificazione CLP	Expl. 1.1; H201 Acute tox. 3; H301 STOT SE1; H370 STOT RE2; H373
Restrizioni di impiego raccomandate	Questo prodotto può essere consegnato solo agli utenti con un permesso di acquisto valido rilasciato dalla polizia o sceriffo.
Fonti dei principali dati utilizzati per lo stabilimento di schede di sicurezza	Schede di dato di sicurezza del Chemring Nobel AS (RDX) datado 03.10.2013.

Abbreviazioni e acronimi utilizzati	EC50: La concentrazione effettiva della sostanza che causa il 50% della risposta massima CL50: (Concentrazione Letale 50) esprime la concentrazione di sostanza attiva che causa la morte del 50 % degli animali test di laboratorio esposti al prodotto DL50: (Dose Letale 50) quantità di sostanza attiva in grado di uccidere il 50% degli animali test di laboratorio NOEC: Concentrazione senza effetti osservabili. (No observed effect concentration) PBT: Persistenti, bioaccumulabili e tossiche vPvB: very Persistent and very Bioaccumulative (molto persistenti e molto bioaccumulabili)
Informazioni aggiunte, soppresse o modificate	Sezione: 2.2, 3, 16. Responsabile: HMS.
Verifica della qualità delle informazioni	La qualità di questa scheda di sicurezza è controllata dal Kiwa Teknologisk Institutt (ISO 9001:2008).
Preparata da	Kiwa Teknologisk Institutt as, Norvegia v/ Knut Finsveen

Exposure Scenarios

Attachment to Safety Data Sheet

RDX

CAS: 121-82-4

EC: 204-500-1

Chemical name: hexahydro- 1,3,5-trinitro- 1,3,5-triazine

REACH registration number: 01-2119990795-17-0002

Valid from: 20.10.2013

Version No.: 1

Table of Contents

Exposure Scenario 1: Manufacture of RDX	3-4
Exposure Scenario 2: Formulation of RDX	5-6
Exposure Scenario 3: Use as a substance/mixture for ammunition	7-9
Exposure Scenario 4: Production of propellant, composite explosives or other energetic components containing Hexogen	10-11
Exposure Scenario 5: Laboratory activities – Research and Development	12-13
Exposure Scenario 6: Use of ammunition	14-15
Exposure Scenario 7: Use of explosive items or pyrotechnic articles	16-17

RDX is classified as an explosive Div.1.1 H201 under GHS and E R2 under DSD.

Workers handling RDX should refer to Section 4-8 of SDS which contains the guidance on safe use of RDX.

ES number	ES short title / Identified use	Resulting life cycle stage						SU	PROC	PC	AC	ERC
		Manufacture	Formulation	End use			Service life (for articles)					
				Industrial	Professional	Consumer						
1	Manufacture	X							2, 4, 8b			1
2	Formulation		X						3, 9, 8a	11		2
3	Production of ammunitions			X				0: Other: C25.4.0	9, 14, 24, 5, 8b	11		5
4	Production of energetic components containing Hexogen			X				0	14, 9, 8b	11		5
5	Laboratory activities - R&D			X				24	15, 14	11		5
6	Use of ammunition				X			22	21	11		9b
7	Use of explosive items or pyrotechnic articles				X			0, 22, 2a, 2b, 19	21	11		9b

Exposure Scenario 1: Manufacture of RDX

Processes, tasks, activities covered: Manufacture of RDX substance, includes recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance, transport and laboratory activities.

Section 1: List of all use descriptors

Sector of use:	Industrial uses
Process category:	PROC2: Use in closed, continuous process with occasional controlled exposure PROC4: Use in 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
Environmental Release Category:	ERC1: Manufacture of substances

Section 2. Operational Conditions and risk management measures

2.1 Control of workers exposure for PROC2, PROC4, PROC8b

Operational Conditions (OC)	
Physical form of product	White crystalline (solid)
Dustiness of material	Covers non or low-dusty materials (e.g. pellets, granules, sugar, salt)
Vapour pressure	1x10-9 mm Hg at 20 °C
Concentration of substance in product	Covers percentage substance in the product up to 100 %
Frequency and duration of use/exposure	Avoid carrying out activities involving exposure for more than 1 hour
Other Operational Conditions of use affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Covers use at ambient temperatures
General information on risk management related to physicochemical hazard:	RDX is classified as an explosive Div.1.1 H201 under GHS. Workers handling RDX should refer to Section 4-8 of SDS which contains the guidance on safe use of RDX.

2.1.1 Manufacture/Synthesis within closed processes, with occasional controlled exposure for activities such as sampling for analysis, cleaning etc. (PROC 2)

Conditions of use	The manufacture of RDX takes place in a reactor which is controlled remotely with no exposure to workers.
Containment	Use in closed, continuous process with occasional controlled exposure
Risk Management Measures (RMM)	
General	Despite the low toxicity of RDX, exposure should be maintained at the lowest levels possible. The worker should immediately wash the skin when it becomes contaminated.
Technical and organisational conditions and measures	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Advanced (industrial) exposure controls assumed.
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal protection	Hand protection
	Skin protection
Respiratory Protection	
Eye protection	

2.1.2 Batch manufacture of wet RDX (Crystallization), loading, filling, transfer, bagging (PROC 4)

Conditions of use	Exposure to workers occurs while filtering, sampling, extracting impurities or connection of hoses at different stages of purification, crystallisation and wet or jet-milling of RDX.
Containment	Use in semi-closed process with opportunity for exposure
Risk Management Measures (RMM)	
General	Despite the low toxicity of RDX, exposure should be maintained at the lowest levels possible. The worker should immediately wash the skin when it becomes contaminated.
Technical and organisational conditions and measures	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Advanced (industrial) exposure controls assumed.
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal protection	Hand protection
	Skin protection
Respiratory Protection	
Eye protection	

2.1.3 Loading, filling, transfer, bagging of dry RDX in dedicated facilities. Maintenance and cleaning operation (PROC 8b)		
Containment		Use in semi-closed process with opportunity for exposure
Risk Management Measures (RMM)		
General		Despite the low toxicity of RDX, exposure should be maintained at the lowest levels possible. The worker should immediately wash the skin when it becomes contaminated.
Technical and organisational conditions and measures		Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 95 % Advanced (industrial) exposure controls assumed.
Conditions and measures related to personal protection, hygiene and health evaluation		
Dermal protection	Hand protection	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. For further specification, refer to section 8 of the SDS
	Skin protection	Wear appropriate protective clothing to protect against skin contact.
Respiratory Protection		Wear a respirator providing a minimum efficiency of 95 %. For further specification, refer to section 8 of the SDS.
Eye protection		Wear approved safety goggles. Use tight fitting goggles if dust is generated.

2.2 Control of environmental exposure	
2.2.1 Manufacture (ERC 1)	
Amounts used	Daily amount per site < 2 tonnes/day Annual amount per site < 400 tonnes/year
Conditions and measures related to treatment of waste (including article waste)	Dispose of waste or used sacks/containers according to local regulations. (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
Other conditions affecting environmental exposure	Receiving surface water flow > 3,456E7 m3/day Assumed effluent discharge flow from site >13000 m3/day
Methods for cleaning	Moisten with water before handling. Spillage should be removed with an aluminium or wooden shovel and placed in a suitable container for later burning. Dispose of in accordance with local regulations for waste handling.
Environmental precautions	Do not allow to enter into sewer, water system or soil.

Section 3. Exposure and risk estimation
3.1 Health
Exposure assessment and risk characterization are not required for health as no hazard has been identified for inhalation and dermal route.
3.2 Environment
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

Section 4: Guidance to check compliance with the exposure scenario
4.1 Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
4.2 Environment
Not applicable.

Exposure Scenario 2: Formulation of RDX

Processes, tasks, activities covered: Formulation, packing and repacking of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, crystallization, tableting, compression, pelletization, extrusion, large and small scale packing, maintenance, sampling, distribution and laboratory activities

Section 1: List of all use descriptors

Sector of use:	Industrial uses
Process category:	PROC3: Use in closed batch process PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Environmental Release Category:	ERC2: Formulation of preparations

Section 2. Operational Conditions and risk management measures

2.1 Control of workers exposure for PROC3, PROC8a, PROC9

Operational Conditions (OC)	
Physical form of product	White crystalline powder (solid)
Dustiness of material	Covers non or low-dusty materials (e.g. pellets, granules, sugar, salt)
Vapour pressure	1x10-9 mm Hg at 20 °C
Concentration of substance in product	Covers percentage substance in the product up to 100 %
Frequency and duration of use/exposure	Avoid carrying out activities involving exposure for more than 1 hour
Other Operational Conditions of use affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Covers use at ambient temperatures
General information on risk management related to physicochemical hazard:	RDX is classified as an explosive Div.1.1 H201 under GHS. Workers handling RDX should refer to Section 4-8 of SDS which contains the guidance on safe use of RDX.

2.1.1 Formulation of RDX mixtures in closed batch process (PROC 3)

Conditions of use	Formulation in closed batch process including packing and repacking of the substance and its mixtures in batch or continuous operations, storage, materials transfers, mixing, crystallization, tableting, compression, pelletization, extrusion, large and small scale packing, maintenance, sampling, distribution and laboratory activities
Containment	Use in closed batch process (synthesis or formulation)
Risk Management Measures (RMM)	
General	Despite the low toxicity of RDX, exposure should be maintained at the lowest levels possible. The worker should immediately wash the skin when it becomes contaminated.
Technical and organisational conditions and measures	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Advanced (industrial) exposure controls assumed.
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal protection	Hand protection
	Skin protection
Respiratory Protection	Wear a respirator providing a minimum efficiency of 95 %. For further specification, refer to section 8 of the SDS.
Eye protection	Wear approved safety goggles. Use tight fitting goggles if dust is generated.

2.1.2 Transfer of RDX mixtures into containers/vessels (PROC 9)

Conditions of use	Transfer of preparation into small containers for storage and laboratory activities.
Containment	Use in semi-closed process with opportunity for exposure
Risk Management Measures (RMM)	
General	Despite the low toxicity of RDX, exposure should be maintained at the lowest levels possible. The worker should immediately wash the skin when it becomes contaminated.
Technical and organisational conditions and measures	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 90 % Advanced (industrial) exposure controls assumed.
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal protection	Hand protection
	Skin protection
	Wear appropriate protective clothing to protect against skin contact.

Respiratory Protection	Wear a respirator providing a minimum efficiency of 90 %. For further specification, refer to section 8 of the SDS.
Eye protection	Wear approved safety goggles. Use tight fitting goggles if dust is generated.

2.1.3 Maintenance and cleaning operations after formulation of RDX mixtures (PROC 8a)

Containment	No	
Risk Management Measures (RMM)		
General	Despite the low toxicity of RDX, exposure should be maintained at the lowest levels possible. The worker should immediately wash the skin when it becomes contaminated.	
Technical and organisational conditions and measures	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 90 % Advanced (industrial) exposure controls assumed.	
Conditions and measures related to personal protection, hygiene and health evaluation		
Dermal protection	Hand protection	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. For further specification, refer to section 8 of the SDS
	Skin protection	Wear appropriate protective clothing to protect against skin contact.
Respiratory Protection	Wear a respirator providing a minimum efficiency of 90 %. For further specification, refer to section 8 of the SDS.	
Eye protection	Wear approved safety goggles. Use tight fitting goggles if dust is generated.	

2.2 Control of environmental exposure

2.2.1 Formulation of mixture in closed and open systems (ERC 2)

Amounts used	Daily amount per site < 2 tonnes/day
	Annual amount per site < 380 tonnes/year
Conditions and measures related to treatment of waste (including article waste)	Dispose of waste or used sacks/containers according to local regulations. (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
Other conditions affecting environmental exposure	Receiving surface water flow >3,456E7 m3/day Assumed effluent discharge flow from site >13000 m3/day
Methods for cleaning	Moisten with water before handling. Spillage should be removed with an aluminium or wooden shovel and placed in a suitable container for later burning. Dispose of in accordance with local regulations for waste handling.
Environmental precautions	Do not allow to enter into sewer, water system or soil.

Section 3. Exposure and risk estimation

3.1 Health

Exposure assessment and risk characterization are not required for health as no hazard has been identified for inhalation and dermal route.

3.2 Environment

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

Section 4: Guidance to check compliance with the exposure scenario

4.1 Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

4.2 Environment

Not applicable.

Exposure Scenario 3: Use as a substance/mixture for ammunition

Section 1: List of all use descriptors

Sector of use:	SU0: Other (C25.4.0 - Manufacture of weapons and ammunition)
Process category:	PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation
Environmental Release Category:	ERC 5: Industrial use resulting in inclusion into or onto a matrix

Section 2. Operational Conditions and risk management measures

2.1 Control of workers exposure for PROC5, PROC8b, PROC9, PROC 14

Operational Conditions (OC)	
Physical form of product	White crystalline powder (solid)
Dustiness of material	Covers non or low-dusty materials (e.g. pellets, granules, sugar, salt)
Vapour pressure	1x10-9 mm Hg at 20 °C
Concentration of substance in product	Covers percentage substance in the product up to 100 %
Frequency and duration of use/exposure	Avoid carrying out activities involving exposure for more than 1 hour
Other Operational Conditions of use affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Covers use at ambient temperatures
General information on risk management related to physicochemical hazard:	RDX is classified as an explosive Div.1.1 H201 under GHS. Workers handling RDX should refer to Section 4-8 of SDS which contains the guidance on safe use of RDX.

2.1.1 Transfer of RDX into small containers (PROC 9)

Containment	Use in semi-closed process with opportunity for exposure
Risk Management Measures (RMM)	
General	Despite the low toxicity of RDX, exposure should be maintained at the lowest levels possible. The worker should immediately wash the skin when it becomes contaminated.
Technical and organisational conditions and measures	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 90 % Advanced (industrial) exposure controls assumed.
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal protection	Hand protection
	Skin protection
Respiratory Protection	
Eye protection	

2.1.2 Heating, melting and casting in munitions (PROC 14)

Containment	No
Risk Management Measures (RMM)	
General	Despite the low toxicity of RDX, exposure should be maintained at the lowest levels possible. The worker should immediately wash the skin when it becomes contaminated.
Technical and organisational conditions and measures	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 90 % Advanced (industrial) exposure controls assumed.
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal protection	Hand protection
	Skin protection
Respiratory Protection	
Eye protection	

2.1.3 Mixing in batch processes for formulation (PROC 5)		
Containment		No
Risk Management Measures (RMM)		
General		Despite the low toxicity of RDX, exposure should be maintained at the lowest levels possible. The worker should immediately wash the skin when it becomes contaminated.
Technical and organisational conditions and measures		Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 90 % Advanced (industrial) exposure controls assumed.
Conditions and measures related to personal protection, hygiene and health evaluation		
Dermal protection	Hand protection	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. For further specification, refer to section 8 of the SDS
	Skin protection	Wear appropriate protective clothing to protect against skin contact.
Respiratory Protection		Wear a respirator providing a minimum efficiency of 95 %. For further specification, refer to section 8 of the SDS.
Eye protection		Wear approved safety goggles. Use tight fitting goggles if dust is generated.

2.1.4 Mixing in batch processes for formulation (PROC 8b)		
Containment		Use in semi-closed process with opportunity for exposure
Risk Management Measures (RMM)		
General		Despite the low toxicity of RDX, exposure should be maintained at the lowest levels possible. The worker should immediately wash the skin when it becomes contaminated.
Technical and organisational conditions and measures		Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 95 % Advanced (industrial) exposure controls assumed.
Conditions and measures related to personal protection, hygiene and health evaluation		
Dermal protection	Hand protection	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. For further specification, refer to section 8 of the SDS
	Skin protection	Wear appropriate protective clothing to protect against skin contact.
Respiratory Protection		Wear a respirator providing a minimum efficiency of 95 %. For further specification, refer to section 8 of the SDS.
Eye protection		Wear approved safety goggles. Use tight fitting goggles if dust is generated.

2.2 Control of environmental exposure	
2.2.1 Production of ammunitions (ERC 5)	
Amounts used	Daily amount per site < 1,25 tonnes/day Annual amount per site < 25 tonnes/year
Conditions and measures related to treatment of waste (including article waste)	Dispose of waste or used sacks/containers according to local regulations. (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
Other conditions affecting environmental exposure	Receiving surface water flow >3,456E7 m3/day Assumed effluent discharge flow from site >13000 m3/day
Methods for cleaning	Moisten with water before handling. Spillage should be removed with an aluminium or wooden shovel and placed in a suitable container for later burning. Dispose of in accordance with local regulations for waste handling.
Environmental precautions	Do not allow to enter into sewer, water system or soil.

Section 3. Exposure and risk estimation
3.1 Health
Exposure assessment and risk characterization are not required for health as no hazard has been identified for inhalation and dermal route.
3.2 Environment
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

Section 4: Guidance to check compliance with the exposure scenario

4.1 Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

4.2 Environment

Not applicable.

Exposure Scenario 4: Production of propellant, composite explosives or other energetic components containing Hexogen

Processes, tasks, activities covered: Use as a substance in a gas generator, pyrotechnic articles, explosive items

Section 1: List of all use descriptors

Sector of use:	SU17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment.
Process category:	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, pelletisation
Environmental Release Category:	ERC 5: Industrial use resulting in inclusion into or onto a matrix

Section 2. Operational Conditions and risk management measures

2.1 Control of workers exposure for PROC8b, PROC9, PROC 14

Operational Conditions (OC)	
Physical form of product	White crystalline powder (solid)
Dustiness of material	Covers non or low-dusty materials (e.g. pellets, granules, sugar, salt)
Vapour pressure	1x10 ⁻⁹ mm Hg at 20 °C
Concentration of substance in product	Covers percentage substance in the product up to 100 %
Frequency and duration of use/exposure	Avoid carrying out activities involving exposure for more than 1 hour
Other Operational Conditions of use affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Covers use at ambient temperatures
General information on risk management related to physicochemical hazard:	RDX is classified as an explosive Div.1.1 H201 under GHS. Workers handling RDX should refer to Section 4-8 of SDS which contains the guidance on safe use of RDX.

2.1.1 Processing of preparations into articles (PROC 14)

Containment	Use in semi-closed process with opportunity for exposure
Risk Management Measures (RMM)	
General	Despite the low toxicity of RDX, exposure should be maintained at the lowest levels possible. The worker should immediately wash the skin when it becomes contaminated.
Technical and organisational conditions and measures	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 90 % Advanced (industrial) exposure controls assumed.
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal protection	Hand protection
	Skin protection
Respiratory Protection	Wear a respirator providing a minimum efficiency of 95 %. For further specification, refer to section 8 of the SDS.
Eye protection	Wear approved safety goggles. Use tight fitting goggles if dust is generated.

2.1.2 Manufacture of articles with use of preparation (PROC 9)

Containment	No
Risk Management Measures (RMM)	
General	Despite the low toxicity of RDX, exposure should be maintained at the lowest levels possible. The worker should immediately wash the skin when it becomes contaminated.
Technical and organisational conditions and measures	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 90 % Advanced (industrial) exposure controls assumed.
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal protection	Hand protection
	Skin protection
Respiratory Protection	Wear a respirator providing a minimum efficiency of 95 %. For further specification, refer to section 8 of the SDS.
Eye protection	Wear approved safety goggles. Use tight fitting goggles if dust is generated.

2.1.3 Transfer of RDX mixture in dedicated facilities (PROC 8b)		
Containment		No
Risk Management Measures (RMM)		
General		Despite the low toxicity of RDX, exposure should be maintained at the lowest levels possible. The worker should immediately wash the skin when it becomes contaminated.
Technical and organisational conditions and measures		Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 90 % Advanced (industrial) exposure controls assumed.
Conditions and measures related to personal protection, hygiene and health evaluation		
Dermal protection	Hand protection	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. For further specification, refer to section 8 of the SDS
	Skin protection	Wear appropriate protective clothing to protect against skin contact.
Respiratory Protection		Wear a respirator providing a minimum efficiency of 95 %. For further specification, refer to section 8 of the SDS.
Eye protection		Wear approved safety goggles. Use tight fitting goggles if dust is generated.

2.2 Control of environmental exposure	
2.2.1 Production of propellant charges (ERC 5)	
Amounts used	Daily amount per site < 0,5 tonnes/day Annual amount per site < 10 tonnes/year
Conditions and measures related to treatment of waste (including article waste)	Dispose of waste or used sacks/containers according to local regulations. (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
Other conditions affecting environmental exposure	Receiving surface water flow >3,456E7 m3/day Assumed effluent discharge flow from site >13000 m3/day
Methods for cleaning	Moisten with water before handling. Spillage should be removed with an aluminium or wooden shovel and placed in a suitable container for later burning. Dispose of in accordance with local regulations for waste handling.
Environmental precautions	Do not allow to enter into sewer, water system or soil.

Section 3. Exposure and risk estimation	
3.1 Health	
Exposure assessment and risk characterization are not required for health as no hazard has been identified for inhalation and dermal route.	
3.2 Environment	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	

Section 4: Guidance to check compliance with the exposure scenario	
4.1 Health	
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.	
4.2 Environment	
Not applicable.	

Exposure Scenario 5: Laboratory activities – Research and Development

Section 1: List of all use descriptors

Sector of use:	SU24: Scientific research and development
Process category:	PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation PROC15: Use as laboratory reagent
Environmental Release Category:	ERC 5: Industrial use resulting in inclusion into or onto a matrix

Section 2. Operational Conditions and risk management measures

2.1 Control of workers exposure for PROC 14, PROC 15

Operational Conditions (OC)	
Physical form of product	White crystalline powder (solid)
Dustiness of material	Covers non or low-dusty materials (e.g. pellets, granules, sugar, salt)
Vapour pressure	1x10-9 mm Hg at 20 °C
Concentration of substance in product	Covers percentage substance in the product up to 100 %
Frequency and duration of use/exposure	Avoid carrying out activities involving exposure for more than 1 hour
Other Operational Conditions of use affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Covers use at ambient temperatures
General information on risk management related to physicochemical hazard:	RDX is classified as an explosive Div.1.1 H201 under GHS. Workers handling RDX should refer to Section 4-8 of SDS which contains the guidance on safe use of RDX.

2.1.1 Laboratory handling of RDX (PROC 15)

Containment	Use in semi-closed process with opportunity for exposure
Risk Management Measures (RMM)	
General	Despite the low toxicity of RDX, exposure should be maintained at the lowest levels possible. The worker should immediately wash the skin when it becomes contaminated.
Technical and organisational conditions and measures	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 90 % Advanced (industrial) exposure controls assumed.
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal protection	Hand protection: Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. For further specification, refer to section 8 of the SDS
	Skin protection: Wear appropriate protective clothing to protect against skin contact.
Respiratory Protection	Wear a respirator providing a minimum efficiency of 95 %. For further specification, refer to section 8 of the SDS.
Eye protection	Wear approved safety goggles. Use tight fitting goggles if dust is generated.

2.1.2 Processing of RDX in Research and Development activities (PROC 14)

Containment	No
Risk Management Measures (RMM)	
General	Despite the low toxicity of RDX, exposure should be maintained at the lowest levels possible. The worker should immediately wash the skin when it becomes contaminated.
Technical and organisational conditions and measures	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 90 % Advanced (industrial) exposure controls assumed.
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal protection	Hand protection: Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. For further specification, refer to section 8 of the SDS
	Skin protection: Wear appropriate protective clothing to protect against skin contact.
Respiratory Protection	Wear a respirator providing a minimum efficiency of 95 %. For further specification, refer to section 8 of the SDS.
Eye protection	Wear approved safety goggles. Use tight fitting goggles if dust is generated.

2.2 Control of environmental exposure	
2.2.1 Laboratory activities – Research and Development (ERC 5)	
Amounts used	Daily amount per site < 0,025 tonnes/day
	Annual amount per site < 0,5 tonnes/year
Conditions and measures related to treatment of waste (including article waste)	Dispose of waste or used sacks/containers according to local regulations. (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
Other conditions affecting environmental exposure	Receiving surface water flow >3,456E7 m3/day Assumed effluent discharge flow from site >13000 m3/day
Methods for cleaning	Moisten with water before handling. Spillage should be removed with an aluminium or wooden shovel and placed in a suitable container for later burning. Dispose of in accordance with local regulations for waste handling.
Environmental precautions	Do not allow to enter into sewer, water system or soil.

Section 3. Exposure and risk estimation
3.1 Health
Exposure assessment and risk characterization are not required for health as no hazard has been identified for inhalation and dermal route.
3.2 Environment
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

Section 4: Guidance to check compliance with the exposure scenario
4.1 Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
4.2 Environment
Not applicable.

Exposure Scenario 6: Use of ammunition

Processes, tasks, activities covered: Firing of ammunition and for military use

Section 1: List of all use descriptors

Sector of use:	
Process category:	PROC21: Low energy manipulation of substances bound in materials and/or articles
Environmental Release Category:	ERC 9b: Wide dispersive outdoor use of substances in closed systems

Section 2. Operational Conditions and risk management measures

2.1 Control of workers exposure for PROC 21

Operational Conditions (OC)	
Physical form of product	White crystalline powder (solid)
Dustiness of material	Covers non or low-dusty materials (e.g. pellets, granules, sugar, salt)
Vapour pressure	1x10-9 mm Hg at 20 °C
Concentration of substance in product	Covers percentage substance in the product up to 100 %
Frequency and duration of use/exposure	Avoid carrying out activities involving exposure for more than 1 hour
Other Operational Conditions of use affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Covers use at ambient temperatures
General information on risk management related to physicochemical hazard:	RDX is classified as an explosive Div.1.1 H201 under GHS. Workers handling RDX should refer to Section 4-8 of SDS which contains the guidance on safe use of RDX.

2.1.1 Use a substance as a part of ammunition, Firing of ammunition and for military use (PROC 21)

Containment	Use in semi-closed process with opportunity for exposure
Risk Management Measures (RMM)	
General	Despite the low toxicity of RDX, exposure should be maintained at the lowest levels possible.
Technical and organisational conditions and measures	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 90 % Advanced (industrial) exposure controls assumed.
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal protection	Hand protection: Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. For further specification, refer to section 8 of the SDS
	Skin protection: Wear appropriate protective clothing to protect against skin contact.
Respiratory Protection	Wear a respirator providing a minimum efficiency of 95 %. For further specification, refer to section 8 of the SDS.
Eye protection	Wear approved safety goggles. Use tight fitting goggles if dust is generated.

2.2 Control of environmental exposure

2.2.1 Use of ammunition (ERC 9b)

Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment
Conditions and measures related to treatment of waste (including article waste)	Dispose of waste or used sacks/containers according to local regulations. (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
Other conditions affecting environmental exposure	Receiving surface water flow >18000 m3/day
Environmental precautions	Do not allow to enter into sewer, water system or soil.

Section 3. Exposure and risk estimation

3.1 Health

Exposure assessment and risk characterization are not required for health as no hazard has been identified for inhalation and dermal route.

3.2 Environment

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

Section 4: Guidance to check compliance with the exposure scenario

4.1 Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

4.2 Environment

Not applicable.

Exposure Scenario 7: Use of explosive items or pyrotechnic articles	
Processes, tasks, activities covered: Mounting of item/articles containing the substance	
Section 1: List of all use descriptors	
Sector of use:	
Process category:	PROC21: Low energy manipulation of substances bound in materials and/or articles
Environmental Release Category:	ERC 9b: Wide dispersive outdoor use of substances in closed systems
Section 2. Operational Conditions and risk management measures	
2.1 Control of workers exposure for PROC 21	
Operational Conditions (OC)	
Physical form of product	White crystalline powder (solid)
Dustiness of material	Covers non or low-dusty materials (e.g. pellets, granules, sugar, salt)
Vapour pressure	1x10-9 mm Hg at 20 °C
Concentration of substance in product	Covers percentage substance in the product up to 100 %
Frequency and duration of use/exposure	Avoid carrying out activities involving exposure for more than 1 hour
Other Operational Conditions of use affecting workers exposure	
Place of use	Indoor use
Process temperature (for solid)	Covers use at ambient temperatures
General information on risk management related to physicochemical hazard:	RDX is classified as an explosive Div.1.1 H201 under GHS. Workers handling RDX should refer to Section 4-8 of SDS which contains the guidance on safe use of RDX.
2.1.1 Mounting of item/articles containing the substance/mixture (PROC 21)	
Containment	Use in semi-closed process with opportunity for exposure
Risk Management Measures (RMM)	
General	Despite the low toxicity of RDX, exposure should be maintained at the lowest levels possible.
Technical and organisational conditions and measures	Provide a good standard of controlled ventilation (5 to 10 air changes per hour) Local exhaust ventilation - efficiency of at least 90 % Advanced (industrial) exposure controls assumed.
Conditions and measures related to personal protection, hygiene and health evaluation	
Dermal protection	Hand protection
	Skin protection
Respiratory Protection	Wear a respirator providing a minimum efficiency of 95 %. For further specification, refer to section 8 of the SDS.
Eye protection	Wear approved safety goggles. Use tight fitting goggles if dust is generated.
2.2 Control of environmental exposure	
2.2.1 Use of ammunition (ERC 9b)	
Use of explosive items or articles	
Conditions and measures related to treatment of waste (including article waste)	Dispose of waste or used sacks/containers according to local regulations. (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
Other conditions affecting environmental exposure	Receiving surface water flow >3,456E7 m3/day Assumed effluent discharge flow from site >13000 m3/day
Environmental precautions	Do not allow to enter into sewer, water system or soil.
Section 3. Exposure and risk estimation	
3.1 Health	
Exposure assessment and risk characterization are not required for health as no hazard has been identified for inhalation and dermal route.	
3.2 Environment	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	

Section 4: Guidance to check compliance with the exposure scenario

4.1 Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

4.2 Environment

Not applicable.
