

01837 - ACIDO BORICO GRANULAR 99.5%



SECCIÓN 1: IDENTIFICACIÓN DE LA SUSTANCIA O LA MEZCLA Y DE LA SOCIEDAD O EMPRESA

1.1 Identificador del producto: 01837 - ACIDO BORICO GRANULAR 99.5%

Acido Borico

CAS: 10043-35-3

CE: 233-139-2

Index: 005-007-00-2

REACH: 01-2119486683-25-XXXX

1.2 Usos pertinentes identificados de la sustancia o de la mezcla y usos desaconsejados:

Usos pertinentes: Cosméticos

Usos desaconsejados: Todo aquel uso no especificado en este epígrafe ni en el epígrafe 7.3

1.3 Datos del proveedor de la ficha de datos de seguridad:

Droguería el Barco
C/ La Reina, 31
46800 Xativa - Spain
Tfno.: +34 962271113

1.4 Teléfono de emergencia: +34 932363636 (24h)

SECCIÓN 2: IDENTIFICACIÓN DE LOS PELIGROS **

2.1 Clasificación de la sustancia o de la mezcla:

Reglamento nº1272/2008 (CLP):

La clasificación de este producto se ha realizado conforme el Reglamento nº1272/2008 (CLP).

Repr. 1B: Tóxico para la reproducción, Categoría 1B, H360FD

2.2 Elementos de la etiqueta:

Reglamento nº1272/2008 (CLP):

Peligro



Indicaciones de peligro:

Repr. 1B: H360FD - Puede perjudicar a la fertilidad. Puede dañar al feto

Consejos de prudencia:

P201: Solicitar instrucciones especiales antes del uso

P202: No manipular la sustancia antes de haber leído y comprendido todas las instrucciones de seguridad

P280: Llevar guantes/prendas/gafas/máscara de protección

P308+P313: EN CASO DE exposición manifiesta o presunta: Consultar a un médico

P405: Guardar bajo llave

Etiquetado adicional conforme al Anexo XVII del Reglamento (CE) nº1907/2006:

Reservado exclusivamente a usuarios profesionales

2.3 Otros peligros:

El producto no cumple los criterios PBT/vPvB

** Cambios respecto la versión anterior

SECCIÓN 3: COMPOSICIÓN/INFORMACIÓN SOBRE LOS COMPONENTES

3.1 Sustancia:

- CONTINÚA EN LA SIGUIENTE PÁGINA -



SECCIÓN 3: COMPOSICIÓN/INFORMACIÓN SOBRE LOS COMPONENTES (continúa)

3.1 Sustancia:

Descripción química: Ácidos Inorgánicos oxidantes

Componentes:

De acuerdo al Anexo II del Reglamento (CE) nº1907/2006 (punto 3), el producto presenta:

Identificación	Nombre químico/clasificación	Concentración
CAS: 10043-35-3 CE: 233-139-2 Index: 005-007-00-2 REACH: 01-2119486683-25-XXXX	Acido Borico Reglamento 1272/2008 Repr. 1B: H360FD - Peligro	ATP ATP01 100 %

Para ampliar información sobre la peligrosidad de la sustancias consultar los epígrafes 8, 11, 12, 15 y 16.

3.2 Mezclas:

No aplicable

SECCIÓN 4: PRIMEROS AUXILIOS

4.1 Descripción de los primeros auxilios:

Los síntomas como consecuencia de una intoxicación pueden presentarse con posterioridad a la exposición, por lo que, en caso de duda, exposición directa al producto químico o persistencia del malestar solicitar atención médica, mostrándole la FDS de este producto.

Por inhalación:

Se trata de un producto que no contiene sustancias clasificadas como peligrosas por inhalación, sin embargo, en caso de síntomas de intoxicación sacar al afectado de la zona de exposición y proporcionarle aire fresco. Solicitar atención médica si los síntomas se agravan o persisten.

Por contacto con la piel:

En caso de alteraciones en la piel (escozor, rojez, sarpullidos, ampollas,...), acudir a consulta médica con esta Ficha de Datos de Seguridad

Por contacto con los ojos:

Se trata de un producto que no contiene sustancias clasificadas como peligrosas en contacto con los ojos. Enjuagar durante al menos 15 minutos con abundante agua a temperatura ambiente, evitando que el afectado se frote o cierre los ojos.

Por ingestión/aspiración:

En caso de ingestión, solicitar asistencia médica inmediata mostrando la FDS de este producto.

4.2 Principales síntomas y efectos, agudos y retardados:

Los efectos agudos y retardados son los indicados en las secciones 2 y 11.

4.3 Indicación de toda atención médica y de los tratamientos especiales que deban dispensarse inmediatamente:

No relevante

SECCIÓN 5: MEDIDAS DE LUCHAS CONTRA INCENDIOS

5.1 Medios de extinción:

Producto no inflamable bajo condiciones normales de almacenamiento, manipulación y uso. En caso de inflamación como consecuencia de manipulación, almacenamiento o uso indebido emplear preferentemente extintores de polvo polivalente (polvo ABC), de acuerdo al Reglamento de instalaciones de protección contra incendios (R.D. 1942/1993 y posteriores modificaciones). NO SE RECOMIENDA emplear agua a chorro como agente de extinción.

5.2 Peligros específicos derivados de la sustancia o la mezcla:

Como consecuencia de la combustión o descomposición térmica se generan subproductos de reacción que pueden resultar altamente tóxicos y, consecuentemente, pueden presentar un riesgo elevado para la salud.

5.3 Recomendaciones para el personal de lucha contra incendios:

En función de la magnitud del incendio puede hacerse necesario el uso de ropa protectora completa y equipo de respiración autónomo. Disponer de un mínimo de instalaciones de emergencia o elementos de actuación (mantas ignífugas, botiquín portátil,...) conforme al R.D.486/1997 y posteriores modificaciones

Disposiciones adicionales:

- CONTINÚA EN LA SIGUIENTE PÁGINA -



SECCIÓN 5: MEDIDAS DE LUCHAS CONTRA INCENDIOS (continúa)

Actuar conforme el Plan de Emergencia Interior y las Fichas Informativas sobre actuación ante accidentes y otras emergencias. Suprimir cualquier fuente de ignición. En caso de incendio, refrigerar los recipientes y tanques de almacenamiento de productos susceptibles a inflamación, explosión o BLEVE como consecuencia de elevadas temperaturas. Evitar el vertido de los productos empleados en la extinción del incendio al medio acuático.

SECCIÓN 6: MEDIDAS EN CASO DE VERTIDO ACCIDENTAL

6.1 Precauciones personales, equipo de protección y procedimientos de emergencia:

Barrer y recoger el producto con palas u otros medios e introducirlo en un recipiente para su reutilización (preferentemente) o su eliminación.

6.2 Precauciones relativas al medio ambiente:

Producto no clasificado como peligroso para el medioambiente. Mantener el producto alejado de los desagües y de las aguas superficiales y subterráneas.

6.3 Métodos y material de contención y de limpieza:

Se recomienda:

Barrer y recoger el producto con palas u otros medios e introducirlo en un recipiente para su reutilización (preferentemente) o su eliminación.

6.4 Referencias a otras secciones:

Ver secciones 8 y 13.

SECCIÓN 7: MANIPULACIÓN Y ALMACENAMIENTO

7.1 Precauciones para una manipulación segura:

A.- Precauciones generales

Cumplir con la legislación vigente en materia de prevención de riesgos laborales. Mantener los recipientes herméticamente cerrados. Controlar los derrames y residuos, eliminándolos con métodos seguros (sección 6). Evitar el vertido libre desde el recipiente. Mantener orden y limpieza donde se manipulen productos peligrosos.

B.- Recomendaciones técnicas para la prevención de incendios y explosiones.

Debido a sus características de inflamabilidad, el producto no presenta riesgo de incendio bajo condiciones normales de almacenamiento, manipulación y uso.

C.- Recomendaciones técnicas para prevenir riesgos ergonómicos y toxicológicos.

LAS MUJERES EMBARAZADAS NO DEBEN EXPONERSE A ESTE PRODUCTO. Manipular en lugares fijos que reúnan las debidas condiciones de seguridad (duchas de emergencia y lavajos en las proximidades), empleando equipos de protección personal, en especial de cara y manos (ver sección 8). Limitar los trasvases manuales a recipientes de pequeñas cantidad. No comer, beber ni fumar en las zonas de trabajo; lavarse las manos después de cada utilización, y despojarse de prendas de vestir y equipos de protección contaminados antes de entrar en las zonas para comer.

D.- Recomendaciones técnicas para prevenir riesgos medioambientales

Se recomienda disponer de material absorbente en las proximidades del producto (ver epígrafe 6.3)

7.2 Condiciones de almacenamiento seguro, incluidas posibles incompatibilidades:

A.- Medidas técnicas de almacenamiento

ITC (R.D.379/2001): No relevante

Clasificación: No relevante

B.- Condiciones generales de almacenamiento.

Evitar fuentes de calor, radiación, electricidad estática y el contacto con alimentos. Para información adicional ver epígrafe 10.5

7.3 Usos específicos finales:

Salvo las indicaciones ya especificadas no es preciso realizar ninguna recomendación especial en cuanto a los usos de este producto.

SECCIÓN 8: CONTROLES DE EXPOSICIÓN/PROTECCIÓN INDIVIDUAL

8.1 Parámetros de control:

- CONTINÚA EN LA SIGUIENTE PÁGINA -



SECCIÓN 8: CONTROLES DE EXPOSICIÓN/PROTECCIÓN INDIVIDUAL (continúa)

Sustancias cuyos valores límite de exposición profesional han de controlarse en el ambiente de trabajo (INSHT 2017):

Identificación	Valores límite ambientales	
	Acido Borico CAS: 10043-35-3 CE: 233-139-2	VLA-ED
	VLA-EC	6 mg/m ³
	Año	2017

Partículas no especificadas de otra forma: Fracción inhalable VLA-ED= 10 mg/m³ // Fracción respirable VLA-ED= 3 mg/m³

DNEL (Trabajadores):

Identificación		Corta exposición		Larga exposición	
		Sistémica	Local	Sistémica	Local
Acido Borico CAS: 10043-35-3 CE: 233-139-2	Oral	No relevante	No relevante	No relevante	No relevante
	Cutánea	No relevante	No relevante	392 mg/kg	No relevante
	Inhalación	No relevante	No relevante	8,3 mg/m ³	No relevante

DNEL (Población):

Identificación		Corta exposición		Larga exposición	
		Sistémica	Local	Sistémica	Local
Acido Borico CAS: 10043-35-3 CE: 233-139-2	Oral	0,98 mg/kg	No relevante	0,98 mg/kg	No relevante
	Cutánea	No relevante	No relevante	196 mg/kg	No relevante
	Inhalación	No relevante	No relevante	4,15 mg/m ³	No relevante

PNEC:

Identificación		Corta exposición		Larga exposición	
		Sistémica	Local	Sistémica	Local
Acido Borico CAS: 10043-35-3 CE: 233-139-2	STP	10 mg/L	Agua dulce	2,02 mg/L	
	Suelo	5,4 mg/kg	Agua salada	2,02 mg/L	
	Intermitente	13,7 mg/L	Sedimento (Agua dulce)	No relevante	
	Oral	No relevante	Sedimento (Agua salada)	No relevante	

8.2 Controles de la exposición:

A.- Medidas generales de seguridad e higiene en el ambiente de trabajo:

Como medida de prevención se recomienda la utilización de equipos de protección individual básicos, con el correspondiente "marcado CE" de acuerdo al R.D.1407/1992 y posteriores modificaciones. Para más información sobre los equipos de protección individual (almacenamiento, uso, limpieza, mantenimiento, clase de protección,...) consultar el folleto informativo facilitado por el fabricante del EPI. Las indicaciones contenidas en este punto se refieren al producto puro. Las medidas de protección para el producto diluido podrán variar en función de su grado de dilución, uso, método de aplicación, etc. Para determinar la obligación de instalación de duchas de emergencia y/o lavajos en los almacenes se tendrá en cuenta la normativa referente al almacenamiento de productos químicos aplicable en cada caso. Para más información ver epígrafes 7.1 y 7.2.

Toda la información aquí incluida es una recomendación siendo necesario su concreción por parte de los servicios de prevención de riesgos laborales al desconocer las medidas de prevención adicionales que la empresa pudiese disponer.

B.- Protección respiratoria.

Pictograma	EPI	Marcado	Normas CEN	Observaciones
 Protección obligatoria del las vías respiratorias	Máscara autofiltrante para gases y vapores	 CAT III	EN 405:2001+A1:2009	Reemplazar cuando se detecte olor o sabor del contaminante en el interior de la máscara o adaptador facial. Cuando el contaminante no tiene buenas propiedades de aviso se recomienda el uso de equipos aislantes.

C.- Protección específica de las manos.

No relevante

D.- Protección ocular y facial





Pictograma	EPI	Marcado	Normas CEN	Observaciones
 Protección obligatoria de la cara	Pantalla facial	 CAT II	EN 166:2001 EN 167:2001 EN 168:2001 EN ISO 4007:2012	Limpiar a diario y desinfectar periódicamente de acuerdo a las instrucciones del fabricante. Se recomienda su uso en caso de riesgo de salpicaduras.

- CONTINÚA EN LA SIGUIENTE PÁGINA -





SECCIÓN 8: CONTROLES DE EXPOSICIÓN/PROTECCIÓN INDIVIDUAL (continúa)

E.- Protección corporal

Pictograma	EPI	Marcado	Normas CEN	Observaciones
 Protección obligatoria del cuerpo	Prenda de protección frente a riesgos químicos		EN 13034:2005+A1:2009 EN 168:2001 EN ISO 13982-1:2004/A1:2010 EN ISO 6529:2001 EN ISO 6530:2005 EN 464:1994	Uso exclusivo en el trabajo. Limpiar periódicamente de acuerdo a las instrucciones del fabricante.
 Protección obligatoria de los pies	Calzado de seguridad contra riesgo químico		EN ISO 20345:2011 EN 13832-1:2006	Reemplazar las botas ante cualquier indicio de deterioro.

F.- Medidas complementarias de emergencia

Medida de emergencia	Normas	Medida de emergencia	Normas
 Ducha de emergencia	ANSI Z358-1 ISO 3864-1:2002	 Lavajojos	DIN 12 899 ISO 3864-1:2002

Controles de la exposición del medio ambiente:

En virtud de la legislación comunitaria de protección del medio ambiente se recomienda evitar el vertido tanto del producto como de su envase al medio ambiente. Para información adicional ver epígrafe 7.1.D

Compuestos orgánicos volátiles:

En aplicación al R.D.117/2003 y posteriores modificaciones (Directiva 2010/75/EU), este producto presenta las siguientes características:

C.O.V. (Suministro): 0 % peso
 Concentración C.O.V. a 20 °C: 0 kg/m³ (0 g/L)
 Número de carbonos medio: No relevante
 Peso molecular medio: No relevante

SECCIÓN 9: PROPIEDADES FÍSICAS Y QUÍMICAS

9.1 Información de propiedades físicas y químicas básicas:

Para completar la información ver la ficha técnica/hoja de especificaciones del producto.

Aspecto físico:

Estado físico a 20 °C: Sólido
 Aspecto: No determinado
 Color: Blanco
 Olor: Inodoro
 Umbral olfativo: No relevante *

Volatilidad:

Temperatura de ebullición a presión atmosférica: 1860 °C
 Presión de vapor a 20 °C: No relevante *
 Presión de vapor a 50 °C: <300000 Pa (300 kPa)
 Tasa de evaporación a 20 °C: No relevante *

Caracterización del producto:

Densidad a 20 °C: 1510 kg/m³
 Densidad relativa a 20 °C: 1,51
 Viscosidad dinámica a 20 °C: No relevante *

*No relevante debido a la naturaleza del producto, no aportando información característica de su peligrosidad.

- CONTINÚA EN LA SIGUIENTE PÁGINA -



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SECCIÓN 9: PROPIEDADES FÍSICAS Y QUÍMICAS (continúa)

Viscosidad dinámica a 20 °C:	No relevante *
Viscosidad cinemática a 20 °C:	No relevante *
Viscosidad cinemática a 40 °C:	No relevante *
Concentración:	No relevante *
pH:	5,1 al 1 %
Densidad de vapor a 20 °C:	No relevante *
Coefficiente de reparto n-octanol/agua a 20 °C:	No relevante *
Solubilidad en agua a 20 °C:	No relevante *
Propiedad de solubilidad:	No relevante *
Temperatura de descomposición:	168 - 170 °C
Punto de fusión/punto de congelación:	171 °C
Propiedades explosivas:	No relevante *
Propiedades comburentes:	No relevante *
Inflamabilidad:	
Punto de inflamación:	No aplicable
Inflamabilidad (sólido, gas):	No relevante *
Temperatura de auto-inflamación:	No relevante *
Límite de inflamabilidad inferior:	No relevante *
Límite de inflamabilidad superior:	No relevante *
Explosividad:	
Límite inferior de explosividad:	No relevante *
Límite superior de explosividad:	No relevante *

9.2 Otros datos:

Tensión superficial a 20 °C:	No relevante *
Índice de refracción:	No relevante *

*No relevante debido a la naturaleza del producto, no aportando información característica de su peligrosidad.

SECCIÓN 10: ESTABILIDAD Y REACTIVIDAD

10.1 Reactividad:

No se esperan reacciones peligrosas si se cumplen las instrucciones técnicas de almacenamiento de productos químicos. Ver epígrafe 7.

10.2 Estabilidad química:

Estable químicamente bajo las condiciones indicadas de almacenamiento, manipulación y uso.

10.3 Posibilidad de reacciones peligrosas:

Bajo las condiciones indicadas no se esperan reacciones peligrosas que puedan producir una presión o temperaturas excesivas.

10.4 Condiciones que deben evitarse:

Aplicables para manipulación y almacenamiento a temperatura ambiente:

Choque y fricción	Contacto con el aire	Calentamiento	Luz Solar	Humedad
No aplicable	No aplicable	No aplicable	No aplicable	No aplicable

10.5 Materiales incompatibles:

Ácidos	Agua	Materias comburentes	Materias combustibles	Otros
Evitar ácidos fuertes	No aplicable	No aplicable	No aplicable	Evitar alcalis o bases fuertes

10.6 Productos de descomposición peligrosos:

Ver epígrafe 10.3, 10.4 y 10.5 para conocer los productos de descomposición específicamente. En dependencia de las condiciones de descomposición, como consecuencia de la misma pueden liberarse mezclas complejas de sustancias químicas: dióxido de carbono (CO₂), monóxido de carbono y otros compuestos orgánicos.

- CONTINÚA EN LA SIGUIENTE PÁGINA -



SECCIÓN 11: INFORMACIÓN TOXICOLÓGICA

11.1 Información sobre los efectos toxicológicos:

No se dispone de datos experimentales del producto en si mismos relativos a las propiedades toxicológicas

Efectos peligrosos para la salud:

En caso de exposición repetitiva, prolongada o a concentraciones superiores a las establecidas por los límites de exposición profesionales, pueden producirse efectos adversos para la salud en función de la vía de exposición:

A.- Ingestión (efecto agudo):

- Toxicidad aguda: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por ingestión. Para más información ver sección 3.
- Corrosividad/Irritabilidad: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.

B- Inhalación (efecto agudo):

- Toxicidad aguda: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por inhalación. Para más información ver sección 3.
- Corrosividad/Irritabilidad: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.

C- Contacto con la piel y los ojos (efecto agudo):

- Contacto con la piel: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por contacto con la piel. Para más información ver sección 3.
- Contacto con los ojos: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.

D- Efectos CMR (carcinogenicidad, mutagenicidad y toxicidad para la reproducción):

- Carcinogenicidad: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por los efectos descritos. Para más información ver sección 3.
- Mutagenicidad: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.
- Toxicidad para la reproducción: Puede perjudicar a la fertilidad. Puede dañar al feto

E- Efectos de sensibilización:

- Respiratoria: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas con efectos sensibilizantes por encima de los límites recogidos en el punto 3.2 del Reglamento (CE) 2015/830. Para más información ver secciones 2, 3 y 15.
- Cutánea: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.

F- Toxicidad específica en determinados órganos (STOT)-exposición única:

A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.

G- Toxicidad específica en determinados órganos (STOT)-exposición repetida:

- Toxicidad específica en determinados órganos (STOT)-exposición repetida: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.
- Piel: A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.

H- Peligro por aspiración:

A la vista de los datos disponibles, no se cumplen los criterios de clasificación, no presentando sustancias clasificadas como peligrosas por este efecto. Para más información ver sección 3.

Información adicional:

No relevante

Información toxicológica específica de las sustancias:

Identificación	Toxicidad aguda		Género
	DL50 oral	2660 mg/kg	
Acido Borico	DL50 cutánea	No relevante	Rata
CAS: 10043-35-3	CL50 inhalación	No relevante	
CE: 233-139-2			

- CONTINÚA EN LA SIGUIENTE PÁGINA -



SECCIÓN 12: INFORMACIÓN ECOLÓGICA

12.1 Toxicidad:

Identificación	Toxicidad aguda	Especie	Género
Acido Borico	CL50 447 mg/L (96 h)	Oncorhynchus mykiss	Pez
CAS: 10043-35-3	CE50 No relevante		
CE: 233-139-2	CE50 No relevante		

12.2 Persistencia y degradabilidad:

No disponible

12.3 Potencial de bioacumulación:

Identificación	Potencial de bioacumulación	
Acido Borico	BCF	0
CAS: 10043-35-3	Log POW	-0,76
CE: 233-139-2	Potencial	Bajo

12.4 Movilidad en el suelo:

No determinado

12.5 Resultados de la valoración PBT y mPmB:

El producto no cumple los criterios PBT/vPvB

12.6 Otros efectos adversos:

No descritos

SECCIÓN 13: CONSIDERACIONES RELATIVAS A LA ELIMINACIÓN

13.1 Métodos para el tratamiento de residuos:

Código	Descripción	Tipo de residuo (Reglamento (UE) nº 1357/2014)
20 01 14*	Ácidos	Peligroso

Tipo de residuo (Reglamento (UE) nº 1357/2014):

HP10 Tóxico para la reproducción

Gestión del residuo (eliminación y valorización):

Consultar al gestor de residuos autorizado las operaciones de valorización y eliminación conforme al Anexo 1 y Anexo 2 (Directiva 2008/98/CE, Ley 22/2011). De acuerdo a los códigos 15 01 (2014/955/UE) en el caso de que el envase haya estado en contacto directo con el producto se gestionará del mismo modo que el propio producto, en caso contrario se gestionará como residuo no peligroso. Se desaconseja su vertido a cursos de agua. Ver epígrafe 6.2.

Disposiciones legislativas relacionadas con la gestión de residuos:

De acuerdo al Anexo II del Reglamento (CE) nº1907/2006 (REACH) se recogen las disposiciones comunitarias o estatales relacionadas con la gestión de residuos.

Legislación comunitaria: Directiva 2008/98/CE, 2014/955/UE, Reglamento (UE) nº 1357/2014

Legislación nacional: Ley 22/2011, Real Decreto 180/2015

SECCIÓN 14: INFORMACIÓN RELATIVA AL TRANSPORTE

Este producto no esta regulado para su transporte (ADR/RID,IMDG,IATA)

SECCIÓN 15: INFORMACIÓN REGLAMENTARIA

15.1 Reglamentación y legislación en materia de seguridad, salud y medio ambiente específicas para la sustancia o la mezcla:

Sustancias candidatas a autorización en el Reglamento (CE) 1907/2006 (REACH): Acido Borico

Sustancias incluidas en el Anexo XIV de REACH (lista de autorización) y fecha de expiración: No relevante

Reglamento (CE) 1005/2009, sobre sustancias que agotan la capa de ozono: No relevante

- CONTINÚA EN LA SIGUIENTE PÁGINA -



SECCIÓN 15: INFORMACIÓN REGLAMENTARIA (continúa)

Reglamento (CE) 1005/2009, sobre sustancias que agotan la capa de ozono: No relevante

Sustancias activas las cuales han sido incluidas en el Artículo 95 del Reglamento (UE) Nº 528/2012: Acido Borico (incluida para el tipo de producto 8)

REGLAMENTO (UE) No 649/2012, relativo a la exportación e importación de productos químicos peligrosos: No relevante

Restricciones a la comercialización y al uso de ciertas sustancias y mezclas peligrosas (Anexo XVII del Reglamento REACH, etc ...):

Producto clasificado como peligroso CMR. Prohibida su comercialización al público en general. Debido a su categoría CMR, es preciso aplicar las medidas específicas de prevención de riesgos laborales recogidas en los Artículos 4 y 5 de la Directiva 2004/37/EC y posteriores modificaciones

Disposiciones particulares en materia de protección de las personas o el medio ambiente:

Se recomienda emplear la información recopilada en esta ficha de datos de seguridad como datos de entrada en una evaluación de riesgos de las circunstancias locales con el objeto de establecer las medidas necesarias de prevención de riesgos para el manejo, utilización, almacenamiento y eliminación de este producto.

Otras legislaciones:

Reglamento (CE) n o 1272/2008 del Parlamento Europeo y del Consejo, de 16 de diciembre de 2008 , sobre clasificación, etiquetado y envasado de sustancias y mezclas, y por el que se modifican y derogan las Directivas 67/548/CEE y 1999/45/CE y se modifica el Reglamento (CE) n o 1907/2006

- Reglamento (CE) n o 1223/2009 del Parlamento Europeo y del Consejo, de 30 de noviembre de 2009 , sobre los productos cosméticos.

15.2 Evaluación de la seguridad química:

El proveedor ha llevado a cabo evaluación de seguridad química

SECCIÓN 16: OTRA INFORMACIÓN

Legislación aplicable a fichas de datos de seguridad:

Esta ficha de datos de seguridad se ha desarrollado de acuerdo al ANEXO II-Guía para la elaboración de Fichas de Datos de Seguridad del Reglamento (CE) Nº 1907/2006 (Reglamento (UE) nº 2015/830)

Modificaciones respecto a la ficha de seguridad anterior que afectan a las medidas de gestión del riesgo:

Reglamento nº1272/2008 (CLP) (SECCIÓN 2, SECCIÓN 16):

- Consejos de prudencia

Textos de las frases legislativas contempladas en la sección 2:

H360FD: Puede perjudicar a la fertilidad. Puede dañar al feto

Textos de las frases legislativas contempladas en la sección 3:

Las frases indicadas no se refieren al producto en sí, son sólo a título informativo y hacen referencia a los componentes individuales que aparecen en la sección 3

Reglamento nº1272/2008 (CLP):

Repr. 1B: H360FD - Puede perjudicar a la fertilidad. Puede dañar al feto

Consejos relativos a la formación:

Se recomienda formación mínima en materia de prevención de riesgos laborales al personal que va a manipular este producto, con la finalidad de facilitar la comprensión e interpretación de esta ficha de datos de seguridad, así como del etiquetado del producto.

Principales fuentes bibliográficas:

<http://echa.europa.eu>

<http://eur-lex.europa.eu>

Abreviaturas y acrónimos:

- ADR: Acuerdo europeo relativo al transporte internacional de mercancías peligrosas por carretera
- IMDG: Código Marítimo Internacional de Mercancías Peligrosas
- IATA: Asociación Internacional de Transporte Aéreo
- OACI: Organización de Aviación Civil Internacional
- DQO:Demanda Química de oxígeno
- DBO5:Demanda biológica de oxígeno a los 5 días
- BCF: factor de bioconcentración
- DL50: dosis letal 50
- CL50: concentración letal 50
- EC50: concentración efectiva 50
- Log POW: logaritmo coeficiente partición octanol-agua
- Koc: coeficiente de partición del carbono orgánico

- CONTINÚA EN LA SIGUIENTE PÁGINA -

01837 - ACIDO BORICO GRANULAR 99.5%



La información contenida en esta Ficha de datos de seguridad está fundamentada en fuentes, conocimientos técnicos y legislación vigente a nivel europeo y estatal, no pudiendo garantizar la exactitud de la misma. Esta información no es posible considerarla como una garantía de las propiedades del producto, se trata simplemente de una descripción en cuanto a los requerimientos en materia de seguridad. La metodología y condiciones de trabajo de los usuarios de este producto se encuentran fuera de nuestro conocimiento y control, siendo siempre responsabilidad última del usuario tomar las medidas necesarias para adecuarse a las exigencias legislativas en cuanto a manipulación, almacenamiento, uso y eliminación de productos químicos. La información de esta ficha de seguridad únicamente se refiere a este producto, el cual no debe emplearse con fines distintos a los que se especifican.

- FIN DE LA FICHA DE SEGURIDAD -

Annex I: Exposure Scenarios

Sector	Identified Use	Sector of Use Category (SU)	Chemical Product Category (PC)	Process Category (PROC)	Article Category (AC)	Environmental Release Category (ERC)	Exposure Scenario Number	
							Environment	Human Health
Production and Import	Production and Import	3, 8, 9	1, 7, 8, 9a, 9b, 12, 14, 15, 17, 18, 19, 20, 21, 23, 24, 25, 26, 29, 30, 32, 37, 38, 39	1, 2, 3, 4, 5, 8a, 9, 14, 15	-	1, 6a	E1	ES3, ES14, ES15, ES19, ES20, ES21, ES32, ES38, ES41

NOTE to the downstream users:

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

Link to the webpage containing the full list of exposure scenarios

http://www.ima-reach-hub.eu/index.php?option=com_docman&task=cat_view&gid=75&Itemid=26

E1: Importing, manufacture, refining and packaging of borates**Use descriptors***ERC 1, 6a***Additional information***This exposure scenario covers the off-loading of borates from ships and subsequent processing, repackaging and loading of road tankers for onward distribution.**The borates arrive in Europe as loose bulk powder or in big bags (750-1500 kg) in the holds of ships. The bulk of the material is off-loaded using cranes with grabs. The borates are discharged from the grabs into a hopper from where the material is moved by conveyor to one of a number of storage silos.**At all ports, bulk material also arrives in big bags (750-1500 kg) stored in containers. The containers are lifted off the ship and the bulk bags moved by forklift trucks into a warehouse.**At sites where processing occurs, the borates are dissolved in a liquor, crystallised, dried and then packaged as above. The processing plants are batch plants and largely closed with breaches for charging the borates, sampling and packaging.**In most plants, the borates are packaged into big bags (750-1500 kg) or 25kg bags and distributed to downstream users. Borates are also distributed in bulk in road tankers. The packaging plants have local exhaust ventilation (LEV), and have varying degrees of automation. The tanker-filling points have LEV.**There are quality control laboratories on manufacturing sites, where small samples are analysed to assure compliance with specification.**Exposure scenario 1 covers all the steps above except the processing of borates where water emissions occur.**Exposure scenario 2 covers all the steps above including the processing of borates where water emissions occur.***Controlling environmental exposure****Product characteristics***Borates including boric acid, boric oxide, disodium octaborate and sodium tetraborates are used in granular or powder form.***Amounts used***Tonnage calculations have been based on boron such that no RCR exceeds 0.97, using back-calculations with the relevant PNECs when necessary. The equivalent tonnage of product handled on site should be calculated from the conversion factors detailed in the product table. For those operations that handle a combination of borate compounds, the boron equivalent of the combined tonnage cannot exceed the Site Tonnage (T Boron) value.***Information type****Site tonnage (T Boron/year)***Selected for Exposure Scenario 1**100 000**Selected for Exposure Scenario 2**55 000*

Substance	Formula	Conversion factor for equivalent dose of B (multiply by)
<i>Boric acid</i>	<i>H₃BO₃</i>	<i>0.1748</i>
<i>Boric oxide</i>	<i>B₂O₃</i>	<i>0.3110</i>
<i>Disodium tetraborate anhydrous</i>	<i>Na₂B₄O₇</i>	<i>0.2149</i>
<i>Disodium tetraborate pentahydrate</i>	<i>Na₂B₄O₇.5H₂O</i>	<i>0.1484</i>
<i>Disodium tetraborate decahydrate</i>	<i>Na₂B₄O₇.10H₂O</i>	<i>0.1134</i>
<i>Disodium octaborate tetrahydrate</i>	<i>Na₂B₈O₁₃.4H₂O</i>	<i>0.2096</i>
<i>Sodium metaborate anhydrous</i>	<i>NaBO₂</i>	<i>0.1643</i>
<i>Sodium metaborate dihydrate</i>	<i>NaBO₂.2H₂O</i>	<i>0.1062</i>
<i>Sodium metaborate tetrahydrate</i>	<i>NaBO₂.4H₂O</i>	<i>0.0784</i>
<i>Sodium pentaborate anhydrous</i>	<i>NaB₅O₈</i>	<i>0.2636</i>
<i>Sodium pentaborate pentahydrate</i>	<i>NaB₅O₈.5H₂O</i>	<i>0.1832</i>

Frequency and duration of use*Production and emissions occur 220 days per year per site (from questionnaire)***Environment factors not influenced by risk management***Refining sites are located inland and receive their bulk borates by road tanker from local ports. Sites are located next to rivers and canals.**A dilution factor of 37 is taken into account for freshwater discharges (based on site specific data)***Other given operational conditions affecting environmental exposure***Delivery and raw material handling mostly happen in open air. Delivery is to silos. Most of the subsequent steps take place inside a building in (semi) enclosed systems: weighing, dissolving, filtration, crystallisation, centrifuging, drying and storage. Water is used during the process and is also used for cooling water. This process/cooling water is recycled or discharged to the canal or river.*

Technical conditions and measures at process level (source) to prevent release						
None						
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil						
Emissions to water can only be reduced by very specific treatment technologies including ion exchange resins, reverse osmosis etc. Removal efficiency is dependent upon a number of factors and will vary from 40 to 90%. Much of the technology is currently not appropriate to high volume or mixed waste streams. Boron is not removed in considerable amounts in conventional WWTP (assumed removal efficiency is 0%).						
Emissions to air can be removed by one or more of the following measures:						
<ul style="list-style-type: none"> - Electrostatic precipitators - Cyclones, but as primary collector - Fabric or bag filters: high efficiency in controlling fine particulate (melting): achieve emission values Membrane filtration techniques can achieve - Ceramic and metal mesh filters. PM10 particles are removed - Wet scrubbers 						
Release factor to the water and air compartment is calculated from site specific data. In Europe only a few site refine borates, most are outside						
Europe. Only one site in Europe has data for water but since there are not many sites in Europe this value will be used. One site reported no discharges of boron to wastewater.						
Information type		Release factor to water (g/T)		Release factor to air (g/T)		
Selected for Exposure Scenario 1		0		0.53		
Selected for Exposure Scenario 2		554		0.53		
Organisational measures to prevent/limit release from site						
Cleaning on the plants is usually carried out by the plant operatives. A combination of vacuum cleaners and sweeping brushes is generally used. Minor maintenance tasks are carried out by plant operatives, while major tasks are carried out by qualified maintenance personnel (electricians, mechanics).						
Spillages of powder or granulated borates should be swept or vacuumed up immediately and placed in containers for disposal in order to prevent unintentional release to the environment.						
Conditions and measures related to municipal sewage treatment plant						
Not relevant, boron is not removed from water in municipal STP. If sites discharge to a municipal STP the concentration of boron should not exceed 10 mg/L in the municipal STP.						
Conditions and measures related to external treatment of waste for disposal						
Where appropriate material should be recovered and recycled through the process. Waste containing borates should be handled as a hazardous waste and removed by licensed operator to an off site location where it can be incinerated or disposed to a hazardous landfill.						
Conditions and measures related to external recovery of waste						
No external recovery of waste, spilt product is sometimes internally recovered and reused in the process.						
Exposure estimation and reference to its source						
	Compartment	Operational conditions	Value	Unit	PNEC_{add}	RCR
ES1	PEC freshwater	100 000 T/y, 220 d/y, D=37, RF _{water} = 0	NR	µg/L	2 900	NR
	PEC soil	100 000 T/y, 220 d/y, RF _{air} = 0.53	0.01	mg/kg dw	5.7	0.002
ES2	PEC freshwater	55 000 T/y, 220 d/y, D=37, RF _{water} = 554	1 928	µg/L	2 900	0.665
	PEC soil	55 000 T/y, 220 d/y, RF _{air} = 0.53	0.01	mg/kg dw	5.7	0.002
Guidance to DU to evaluate whether he works inside the boundaries set by the ES						
The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the DU can demonstrate on his own that his implemented risk management measures are adequate. Detailed guidance for evaluation of ES can be acquired via your supplier or from the ECHA website (guidance R16). For environmental exposure, a DU-scaling tool (free download: http://www.archeconsulting.be/Metal-CSA-toolbox/du-scaling-tool) is available.						

ES3: Refining and processing borates

Use descriptors

*PROC1. Use in closed process, no likelihood of exposure.
PROC2. Use in closed, continuous process with occasional controlled exposure.
PROC3. Use in closed batch processes (synthesis or formulation)
PROC4. Use in batch and other process (synthesis) where opportunity for exposure arises.
PROC14. Production of preparations or articles by tableting, compression, extrusion, pelletisation.*

Controlling worker exposure for refining and processing borates

Product characteristics

Borates are granular powders. They are stored at the processing plants in silos or big bags.

Amounts used

The amount of borate used in any given batch will depend on production requirements, but will be in the order of about 1.5 tonnes.

Frequency and duration of use

There are only a few sites in Europe where products are processed and refined. At the processing plants, the borate/boric acid is dissolved in a hot liquor, which is then cooled to crystallise the borate. The crystallate is then centrifuged, dried and sieved before packaging. The system is a closedbatch system with breaches for adding borate and sampling. Depending on the product and the plant, the production may be on a routine or campaign basis. Liquid products are made by adding borate to a mixture, filtering the mixture and packaging the boron-containing liquor in suitable containers. Some tableting of borates occurs. The borate powder is added to the compactor from a hopper and compressed into a sheet which is then fragmented into pellets of the desired size. The product is screened and over and undersized product is returned via a conveyor for recompaction. There are a number of exposure points as the product and screenings are transported by conveyors and there is some spillage, which is cleaned by the operatives.

Human factors not influenced by risk management

None

Other given operational conditions affecting worker exposure

The process is largely closed and carried out indoors. The temperature of the mother liquor varies, but is above ambient temperature. The process is enclosed so there is no release of vapour.

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

The process is closed.

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

Local exhaust ventilation at the charging point, where big bags or 25kg bags are discharged into mixing vessel.

Organisational measures to prevent/limit releases, dispersion and exposure

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

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

Operatives wear overalls, safety shoes, gloves, and, where exposure is above the DNEL, P2/P3 respirators are worn. Eye protection should be worn where good hygiene practice requires it or substance classification demands it.

Exposure estimation and reference to its source

There are only two exposure datapoints for processing borates exclusively. They are 0.41 and 0.39mgB/m³, 8-hr TWA. The exposure model ART has been used to estimate exposure to boron during similar activities to support the small number of real data available. ART is a web based tool for the estimation of inhalation exposure in the workplace. This mechanistic model is built on a conceptual model with nine modifying factors, such as substance emission potential, localised controls, surface contamination and personal behaviour, that determine the personal exposure level. The modifying factors are underpinned with scientific literature, measured exposure data and expert judgement. A similarity algorithm provides a proper weighting of the available data based on this contextual information. ART also facilitates the inclusion of specific exposure data. The proposed approach follows a Bayesian statistical framework to integrate sources of information (Fransman et al. 2009). The parameters used were fine dust, falling powders, dry product, routine transfer, rate 10-100kg/minutes, handling that reduces contact between product and air, effective housekeeping, indoors, any size workroom, moveable capturing hood, good natural ventilation, The model gives an estimate of 90th percentile total inhalable dust of 1.5mg/m³, 8-hr TWA, which would equate to 0.17-0.32mgB/m³, depending on which borate or boric acid is being used. This range is similar to the two real data obtained. This data range is below the inhalation DNEL of 1.45mgB/m³, 8-hr TWA.

There are no real data for dermal exposure, so MEASE was used to estimate dermal exposure during these activities. MEASE is a tool developed for the estimation and assessment of substance exposure, which combines approaches from the EASE system, from the TRA tool and from the health risk assessment guidance for metals (HERAG). It aims to

provide a 1st tier screening tool for the estimation of occupational inhalation and dermal exposure to metals and inorganic substances.

The point at which potential dermal exposure arises in the refining plant is when the borate powder is added to the mother liquor. The estimated dermal exposure during this activity is 0.014mgB/day. The parameters used were high dustiness solid, 5-25% boron, PROC 4, industrial use, <15 minutes, non-dispersive use, non-direct handling and incidental contact.. This value is below the dermal (external) DNEL of 4800 mgB/day.

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

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

ES14: Loading road tankers
Use descriptors
<i>PROC8a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</i>
<i>PROC8b. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</i>
Controlling worker exposure for loading road tankers
Product characteristics
<i>Borates are granular powders. They are stored at the plants in silos or big bags.</i>
Amounts used
<i>Road tankers generally take about 25t of borate.</i>
Frequency and duration of use/exposure
<i>It takes about half an hour to load a tanker. The number of tankers filled per shift can vary widely depending on demand. The operative is not exposed continuously during the tanker loading, but when opening and closing the lids on the top of the tanker to attach and detach the loading chute from the tanker. This takes a few minutes in total for each tanker.</i>
Human factors not influenced by risk management
<i>None</i>
Other given operational conditions affecting workers' exposure
<i>Tanker loading is carried out outdoors at ambient temperature.</i>
Technical conditions and measures at process level (source) to prevent release
<i>Tanker loading is controlled automatically, in that the operative inputs information on the computer, and once the chute is connected, the operative presses the start button and the filling commences. The operative moves the loading chute to different charging points during the filling to ensure an even distribution of product in the road tanker.</i>
Technical conditions and measures to control dispersion from source towards worker
<i>The displaced air is released from a valve usually on the back of the tanker, away from the worker. This valve may be filtered to prevent release of the product.</i>
Organisational measures to prevent/limit releases, dispersion and exposure
<i>Training of operatives and regular testing and maintenance of plant and equipment.</i>
Conditions and measures related to personal protection, hygiene and health evaluation
<i>Operatives wear overalls, safety shoes and when necessary P2/P3 respirators. Eye protection should be worn where good hygiene practice requires it or substance classification demands it. Exposure estimation and reference to its source There are six datapoints available for loading road tankers. The range of results is 0.04 to 0.4mgB/m³. These are not 8 hour TWAs as the loading of tankers was not a shift-length task, but took place as and when tankers arrived for loading. The 90th percentile for these data is 0.37mgB/m³, which is below the DNEL which is an 8hr TWA limit. As there are only six datapoints, ART has also been used to estimate exposure. The parameters used were 120 minutes duration, fine dust, falling powders, transferring 100-1000 kg/minute, routine transfer, open process, effective housekeeping, outdoors, LEV in use. The 90th percentile for this activity estimated using ART is 1.3mg/m³ 8-hr TWA assuming two hours were spent loading tankers. This figure is for exposure to inhalable dust. When this is adjusted for boron, the result is between 0.15 and 0.28mgB/m³, 8-hr TWA, depending on which borate is being loaded, which is below the inhalation DNEL. These figures also accord well with the real datapoints obtained for personal samples. There are no real data for dermal exposure. MEASE has been used to estimate exposure during this activity. The parameters used were high dustiness solid, 5-25% boron, PROC 8, industrial use, 15-60 minutes duration, non-dispersive use, non-direct handling, incidental contact and no gloves. The estimated dermal exposure is 0.029mgB/day. This value is well below the dermal (external) DNEL of 4800 mgB/day.</i>
Guidance to DU to evaluate whether he works inside the boundaries set by the ES
<i>If the parameters used in the MEASE model outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES.</i>

ES15: Offloading borates from ships
Use descriptors
<i>PROC8a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</i>
<i>PROC8b. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</i>
Controlling worker exposure for offloading borates from ships
Product characteristics
<i>Borates are granular powders. They arrive in Europe as 100% borate in the holds of ships as loose powders or in containers of big bags.</i>
Amounts used
<i>The amount of borate off-loaded at any one time will depend on the size of the ship and from where it has come. Ships travelling from America tend to be large, and the shipments may be approximately 4,000 -10,000 tonnes, depending on the number of products and holds. Shipments from other countries may be smaller due to the smaller size of ship used to transport the product.</i>
Frequency and duration of use
<i>Shipments arrive approximately monthly, but may be more or less frequent depending on production requirements. Off-loading is continuous once started, and usually takes between 24 and 48 hours to complete. Depending on the process of off-loading, between 3 and 5 operatives are involved in off-loading, including a crane driver, deck operative, stevedores, front end loader driver. The material is lifted off the crane in a grabber. The material is then deposited in a hopper. From the hopper, the material is either transferred directly to silos via covered conveyors, or is transferred via trucks to a warehouse. Once deposited in the warehouse the material is piled up by a front end loader. When a hold is almost empty, a small front-end loader is lowered into the hold to pile the material into heaps that the crane grabber can lift. In addition, operatives sweep the hold to clean it and to pile the material into heaps for the crane grabber. This activity lasts from about 40 minutes to one and a half hours.</i>
Human factors not influenced by risk management
<i>None</i>
Other given operational conditions affecting workers' exposure
<i>Ship off-loading takes place outdoors. If unloading loose borates, there will be some spillage from the crane grab. Also the movement of the front end loader in the hold will create dust disturbance which will have an effect on the exposure of workers trimming the ship's hold. The movement of the borates in the warehouse by the front end loader also causes airborne dust.</i>
Technical conditions and measures at process level (source) to prevent release
<i>None</i>
Technical conditions and measures to control dispersion from source towards the worker
<i>At some sites where off-loading takes place, the hopper is enclosed and fitted with local exhaust ventilation. Where conveyors are used these are enclosed. At some sites, the cabs of the small front end loader used in the hold are air-conditioned. Information received from M/Is suggest that air conditioned cabs are used in warehouses where loose borate is stored.</i>
Organisational measures to prevent/limit releases, dispersion and exposure
<i>Training of operatives and regular testing and maintenance of plant and equipment.</i>
Conditions and measures related to personal protection, hygiene and health evaluation
<i>Operatives wear overalls and gloves. When working in the hold of the ship, or cleaning, or carrying out other tasks that may result in exposure to borates above the DNEL, operatives wear respirators with an assumed protection factor of at least 10 (APF10 – P2). Eye protection should be worn where good hygiene practice requires it or substance classification demands it.</i>
Exposure estimation and reference to its source
<i>There are 20 datapoints for inhalation exposure for crane drivers from four sites in Europe. The range is 0.004 to 0.73mgB/m³, 8-hr TWA. The 90th percentile for these data is 0.2mgB/m³, which is below the inhalation DNEL of 1.45mgB/m³. Personal exposure data for those trimming ships ranged from 0.068 to 11mgB/m³, for a task that lasted for about 60 minutes. The 90th percentile is 5.4mgB/m³. When this activity is time-weighted for comparison against the inhalation DNEL, the 90th percentile is estimated to be 0.68mgB/m³, 8-hr TWA which is below the DNEL. These data do not take into account the use of RPE. Personal exposure for those driving the small front end loaders in the ships' holds ranged from 0.78 to 9.3mgB/m³. This task lasts approximately 1.5 hours. The 90th percentile is estimated to be 7.2mgB/m³. When</i>

this result is time weighted for comparison against the inhalation DNEL, the 90th percentile is estimated to be 1.35mgB/m³, 8-hr TWA, which is below the DNEL of 1.45mgB/m³. These data do not take into account the use of RPE.

Personal exposures for those carrying out work in the warehouses with bulk borates using front end loaders ranged from 0.02 to 0.47mgB/m³. This work may be carried out for a full shift, so these figures are considered representative of a full shift. The 90th percentile is estimated to be 0.44mgB/m³, 8-hr TWA, which is below the inhalation DNEL. Information received from M/Is suggest that air-conditioned cabs are used in warehouses where borate is stored loose, and this is what controls the drivers' exposure to borates.

Where cabs are not air-conditioned, inhalation exposure is likely to be similar to that where open-cab front end loaders are used for unloading ships; 0.78 to 9.3mgB/m³. The 90th percentile is estimated to be 7.2mgB/m³. As this task could last for the shift, there is no time-weighting required as these results are representative of an 8-hr shift exposure. Use of a P2 RPE reduces the inhalation exposure to 0.72 mg B/m³, below the inhalation DNEL of 1.45 mg B/m³.

There is no data available for dermal exposure to borates. MEASE has been used to estimate exposure during these activities.

The estimate for dermal exposure for crane drivers is 0.173mgB/day, which is below the dermal (external) DNEL of 4800 mgB/day. The parameters used were high dustiness solid, 5-25% boron, PROC 8a, industrial use, 60-240 minutes, wide dispersive use, non-direct handling, incidental contact, with no gloves worn.

The estimate for those trimming the hold is 57.6mgB/day. The parameters used were high dustiness solid, 5-25% boron, PROC 8a, industrial use, 15-60 minutes, wide dispersive use, direct handling, extensive contact with no gloves worn. This takes into account that their exposure is being affected by the work of the front end loader driver and the crane driver. This exposure is below the dermal DNEL of 4800 mgB/day.

The estimate for the front end loader driver is 0.058mgB/day. The parameters used were high dustiness solid, 5-25% boron, PROC 8, industrial use, 60-240 minutes, wide dispersive use, non-direct handling, incidental contact, separation of workers and with no gloves worn. This assumes that the cab of the FEL is enclosed and air-conditioned. This exposure is below the dermal (external) DNEL of 4800 mgB/day.

The estimate for the FEL driver in the warehouse is 0.144mgB/day, taking into account the air-conditioned cab of the FEL. The parameters used were high dustiness solid, 5-25% boron, PROC 8b, industrial use, >240 minutes, wide dispersive use, non-direct handling, incidental contact, separation of workers and with no gloves worn. This estimated exposure is below the dermal (external) DNEL of 4800 mgB/day.

If the FEL does not have an air-conditioned cab, dermal dose is also estimated to be 0.144 mgB/day. The parameters used were high dustiness solid, 5-25% boron, PROC 8b, industrial use, >240 minutes, wide dispersive use, non-direct handling, extensive contact and no gloves worn. It is likely that dermal exposure may be slightly higher than that estimated as there would be more opportunity for dermal exposure if the cab was not air-conditioned. This estimated exposure is below the dermal (external) DNEL of 4800 mgB/day.

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

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

ES19: Packaging into bags (25-50kg)
Use descriptors
<i>PROC8a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</i>
<i>PROC8b. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</i>
<i>PROC9. Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</i>
Controlling worker exposure for packaging into bags (25-50kg)
Product characteristics
<i>Borates are granular powders. They are stored at the plants in silos or big bags.</i>
Amounts used
<i>Generally during packaging into 25kg bags, the activity would last for a shift and would package several hundred tonnes.</i>
Frequency and duration of use
<i>The duration would normally be shift length, but the frequency with which packaging in 25kg bags is carried out will vary from plant to plant.</i>
Human factors not influenced by risk management
<i>None</i>
Other given operational conditions affecting workers' exposure
<i>Packaging is carried out indoors at ambient temperature.</i>
Technical conditions and measures at process level (source) to prevent release
<i>The charging of the 25kg bags is generally controlled automatically, in that the correct quantity is determined by load cells. Some bagging plants are completely automatic, with an operative overseeing the plant, keeping the plant supplied with bags, and removing pallets of bagged product and transporting them to the warehouse.</i>
Technical conditions and measures to control dispersion from source towards the worker
<i>Local exhaust ventilation to control exposure to the worker.</i>
Organisational measures to prevent/limit releases, dispersion and exposure
<i>Training of operatives and regular testing and maintenance of plant and equipment.</i>
Conditions and measures related to personal protection, hygiene and health evaluation
<i>Operatives wear overalls and safety shoes and when necessary P2/P3 respirators. Eye protection should be worn where good hygiene practice requires it or substance classification demands it.</i>
Exposure estimation and reference to its source
<i>There were 11 datapoints available for packaging in 25kg bags. The range was 0.02 to 1.4mgB/m³, 8-hr TWA. The 90th percentile for this range was 1mgB/m³. The higher results reflect the poor performance of LEV at some bagging plants. The 90th percentile for this data is below the inhalation DNEL of 1.45mgB/m³. There is no real dermal exposure data. MEASE was used to estimate dermal exposure. The parameters used were high dustiness solid, 5-25% boron, PROC 9, industrial use, >240 minutes, non-dispersive use, non-direct handling, intermittent contact and no gloves. The estimated dermal exposure is 0.144mgB/day. This value is well below the dermal (external) DNEL of 4800 mgB/day.</i>
Guidance to DU to evaluate whether he works inside the boundaries set by the ES
<i>If the parameters used in the MEASE model outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES.</i>

ES20: Packaging into big bags
Use descriptors
<i>PROC8a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</i>
<i>PROC8b. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</i>
<i>PROC9. Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</i>
Controlling worker exposure for packaging into big bags
Product characteristics
<i>Borates are granular powders. They are stored at the plants in silos or big bags.</i>
Amounts used
<i>Generally during packaging into big bags, the activity lasts for a shift and several hundred tonnes would be packaged.</i>
Frequency and duration of use/exposure
<i>The duration would normally be shift length, but the frequency with which packaging in big bags is carried out will vary from plant to plant.</i>
Human factors not influenced by risk management
<i>None</i>
Other given operational conditions affecting workers' exposure
<i>Packaging is carried out indoors at ambient temperature.</i>
Technical conditions and measures at process level (source) to prevent release
<i>The charging of the big bags is controlled automatically, in that the correct quantity is determined by load cells.</i>
Technical conditions and measures to control dispersion from source towards worker
<i>Bagging plants have local exhaust ventilation to control exposure to the worker. The neck of the bag is tied around the charging chute, and local exhaust ventilation removes the contaminated displaced air during filling. In some instances the LEV is a canopy hood above the bag as it is filled. This is generally less effective than when the bag is tied to the charging chute and the displaced air is removed and filtered.</i>
Organisational measures to prevent/limit releases, dispersion and exposure
<i>Training of operatives and regular testing and maintenance of plant and equipment.</i>
Conditions and measures related to personal protection, hygiene and health evaluation
<i>Operatives wear overalls, safety shoes and when necessary P2/P3 respirators. Eye protection should be worn where good hygiene practice requires it or substance classification demands it.</i>
Exposure estimation and reference to its source
<i>The range of results from 22 data points for packaging borates into big bags is wide at 0.06 to 8.6mgB/m³. This is largely a function of the efficiency of the LEV. The 90th percentile for this dataset is 5.8mgB/m³, 8-hr TWA, which is above the inhalation DNEL of 1.45mgB/m³. Where the LEV is ineffective, P2/P3 respirators should be worn to reduce exposure below the DNEL until the engineering controls can be brought up to specification. If P2 respirators are worn, inhalation exposure would be 0.58 mg B/m³, well below the inhalation DNEL of 1.45mgB/m³, 8-hr TWA. There are no real data for dermal exposure during this activity. MEASE was used to estimate exposure during this packaging activity. The parameters used were high dustiness solid, 5-25% boron, PROC 8b, industrial use, >240 minutes, non-dispersive use, non-direct handling, intermittent contact and no gloves. The estimated dermal exposure is 0.144mgB/day. This is below the dermal (external) DNEL of 4800 mgB/day.</i>
Guidance to DU to evaluate whether he works inside the boundaries set by the ES
<i>If the parameters used in the MEASE model outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES.</i>

ES21: General maintenance activities
Use descriptors
<i>PROC8a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.</i>
<i>PROC8b. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.</i>
Controlling worker exposure for general maintenance activities
Product characteristics
<i>Borates are granular powders. They are used in numerous processes and industries.</i>
Amounts used
<i>The amount of borate used at any one time will depend on the size of the plant and the substance or preparation being manufactured.</i>
Frequency and duration of use
<i>There are daily maintenance activities, planned maintenance and reactive maintenance on the plants.</i>
Human factors not influenced by risk management
<i>None</i>
Other given operational conditions affecting worker exposure
<i>Most tasks are carried out indoors, although there may also be outdoor activities.</i>
Technical conditions and measures at process level (source) to prevent release
<i>Most of the transfer of substances and the production processes are closed and automatically controlled from control cabins on the plant. Maintenance activities take place on and around the plant.</i>
Technical conditions and measures to control dispersion from source towards the worker
<i>Where processes are partially open, LEV is used to control exposure to fumes.</i>
Organisational measures to prevent/limit releases, dispersion and exposure
<i>Training of operatives and regular testing and maintenance of plant and equipment.</i>
Conditions and measures related to personal protection, hygiene and health evaluation
<i>Operatives wear overalls, safety shoes and when necessary to control exposure below the DNEL, P2/P3 respirators must also be worn. Eye protection should be worn where good hygiene practice requires it or substance classification demands it.</i>
Exposure estimation and reference to its source
<i>There are 13 datapoints for maintenance activities in closed manufacturing plants. When maintenance activities are taking place on a particular piece of plant, the plant may be opened to allow access to work, so that the normal engineering controls will not be working. The exposure data ranges from 0 to 2.66 mgB/m³. This is a wide range and reflects the variety of work carried out by maintenance workers. The 90th percentile for these data is 1.33 mgB/m³, which is below the inhalation DNEL of 1.45mgB/m³. These estimates do not take into account the effect of RPE. Where engineering controls are not effective, RPE (P2/P3) must be worn to ensure inhalation exposure remains below the DNEL. Dermal exposure may occur during maintenance activities. MEASE has been used to estimate this exposure. The parameters used were high dustiness solid, 1-25% boron, PROC 8a, industrial use, 60-240 minutes, non-dispersive use, direct handling, incidental contact and no gloves worn. The estimated exposure to dust is 1.728mgB/day. This is well below the dermal (external) DNEL of 4800 mgB/day.</i>
Guidance to DU to evaluate whether he works inside the boundaries set by the ES
<i>If the parameters used in the MEASE model outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES.</i>

ES32: Working in a laboratory
Use descriptors
<i>PROC15. Use as laboratory reagent.</i>
Controlling worker exposure for working in a laboratory
Product characteristics
<i>Borates are granular powders.</i>
Amounts used
<i>Samples of about 1kg are taken at borate processing and refining plants and also for quality control purposes at sites receiving borates, but only a few grams are used in quality control tests. Small amounts of borates may be used as analytical reagents in a wide variety of laboratories.</i>
Frequency and duration of use/exposure
<i>Technicians in quality control laboratories may spend a few minutes weighing borate samples each day, which is the only source of exposure, as the samples are normally collected by the plant operatives. The frequency of use of borates in other laboratories will be variable, but is unlikely to be daily.</i>
Human factors not influenced by risk management
<i>None</i>
Other given operational conditions affecting workers' exposure
<i>Very small quantities are used, and tests are often carried out in fume cupboards.</i>
Technical conditions and measures at process level (source) to prevent release
<i>None</i>
Technical conditions and measures to control dispersion from source towards worker
<i>Some tests are carried out in fume cupboards.</i>
Organisational measures to prevent/limit releases, dispersion and exposure
<i>Training of operatives and regular testing and maintenance of plant and equipment.</i>
Conditions and measures related to personal protection, hygiene and health evaluation
<i>Operatives wear laboratory coats, safety shoes and gloves. Eye protection should be worn where good hygiene practice requires it or substance classification demands it.</i>
Exposure estimation and reference to its source
<i>There are 18 datapoints for laboratory technicians. The range of results was 0 to 0.2mgB/m³, 8-hr TWA The 90th percentile for this dataset was 0.16 mgB/m³, which is well below the inhalation DNEL of 1.45 mgB/m³. As there are no real data for dermal exposure during this activity, MEASE has been used to estimate dermal exposure. The parameters used for estimating dermal exposure during laboratory work were; a high dustiness solid, with 5-25% boron, PROC 15, duration 15-60 minutes, nondispersive use, non-direct handling, incidental contact, integrated LEV and no gloves. The estimated dermal exposure is 0.014mgB/day. This value is well below the dermal DNEL of 4800mgB/day.</i>
Guidance to DU to evaluate whether he works inside the boundaries set by the ES
<i>If the parameters used in the MEASE model outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES.</i>

ES38: Industrial crushing grinding processes
Use descriptors
<i>PROC24. High (mechanical) energy work-up of substances bound in materials and/or articles.</i>
Controlling worker exposure for crushing grinding processes
Product characteristics
<i>The solid may be agglomerated into lumps, which are then ground to a powder. The borate is most often a small component of the mixture, and in the case of some mixtures may be an impurity.</i>
Amounts used
<i>The amount of solid crushed or ground will depend on the sector and size of the company, but may be several tonnes per day.</i>
Frequency and duration of use
<i>Grinding and crushing activities are likely to be daily but may not always be shift-length.</i>
Human factors not influenced by risk management
<i>None</i>
Other given operational conditions affecting workers' exposure
<i>Grinding and crushing activities take place indoors in ambient conditions.</i>
Technical conditions and measures at process level (source) to prevent release
<i>The grinding mill is enclosed when grinding is being carried out.</i>
Technical conditions and measures to control dispersion from source towards the worker
<i>Local exhaust ventilation is used to control dust during the transfer from bags to the grinding mill.</i>
Organisational measures to prevent/limit releases, dispersion and exposure
<i>Training of operatives and maintenance of equipment.</i>
Conditions and measures related to personal protection, hygiene and health evaluation
<i>Operatives wear work clothes. Operatives wear RPE (P2) to prevent inhalation exposure when making transfers. Eye protection should be worn where good hygiene practice requires it or substance classification demands it.</i>
Exposure estimation and reference to its source
<i>There are no specific exposure data available. Grinding takes place in closed mills, so there is no inhalation or dermal exposure during the grinding process. Inhalation and dermal exposure may occur during transfers – these exposures are covered in exposure scenarios for discharging bags.</i>
Guidance to DU to evaluate whether he works inside the boundaries set by the ES
<i>If the parameters outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES</i>

ES41: Working in a warehouse
Use descriptors
<i>PROCO</i>
Controlling worker exposure for working in a warehouse
Product characteristics
<i>Borates are granular powders. They are stored in the warehouses in silos, big bags or smaller bags on pallets.</i>
Amounts used
<i>There are thousands of tonnes of material stored in the warehouses.</i>
Frequency and duration of use/exposure
<i>It takes about half an hour to an hour to load a container lorry with pallets of borates depending on the size of the orders. The warehouse operatives may also transport material from the plants into the warehouse. The number of lorries loaded per shift can vary widely depending on demand. There is minimal exposure during this activity as the operatives are moving closed and wrapped (25kg bags) pallets.</i>
Human factors not influenced by risk management
<i>None</i>
Other given operational conditions affecting workers' exposure
<i>Big bags are closed and 25kg bags are closed and wrapped in a plastic cover.</i>
Technical conditions and measures at process level (source) to prevent release
<i>None</i>
Technical conditions and measures to control dispersion from source towards worker
<i>None</i>
Organisational measures to prevent/limit releases, dispersion and exposure
<i>Training of operatives and regular testing and maintenance of plant and equipment.</i>
Conditions and measures related to personal protection, hygiene and health evaluation
<i>Operatives wear overalls and safety shoes. Eye protection should be worn where good hygiene practice requires it or substance classification demands it.</i>
Exposure estimation and reference to its source
<i>There are 15 datapoints for fork lift truck drivers working in warehouses. The range of results was 0.004 to 0.5mgB/m³. The 90th percentile for this dataset was 0.3mgB/m³, 8-hr TWA, which is below the DNEL of 1.45mg/m³. There is little potential for dermal exposure during this activity as all the bags are wrapped and shrink-wrapped in plastic.</i>
Guidance to DU to evaluate whether he works inside the boundaries set by the ES
<i>If the parameters outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES.</i>