

Helaian Data Keselamatan

Safety data sheet

Mukasurat (Page): 1/28

BASF Helaian Data Keselamatan (BASF Safety data sheet)

Tarikh / Disemak (Date / Revised): 14.04.2023

Versi (Version): 2.1

Produk (Product): **Vitamin A-Propionate 2.5 Mio IU/G stabilized with BHT**

(30041062/SDS_GEN_MY/MS)

Tarikh cetakan (Date of print): 16.10.2025

1. Pengenalan bahan kimia dan pembekal

Vitamin A-Propionate 2.5 Mio IU/G stabilized with BHT

Kegunaan: Bahan tambah makanan haiwan

Syarikat:

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Maklumat kecemasan:

Nombor Kecemasan Kebangsaan
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2. Pengenalan Bahaya

Pengelasan bahan dan campuran:
Pemb. 1B (bayi belum lahir)
Akuatik Kronik 3

Bagi pengelasan yang tidak ditulis dengan penuh dalam bahagian ini, teks lengkap boleh didapati di bahagian 16.

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Unsur label dan pernyataan berjaga-jaga:

Piktogram:

Kata Isyarat:
bahaya

Pernyataan Bahaya:

H360D

Boleh menjejaskan bayi belum lahir.

H412

Memudaratkan kepada hidupan akuatik dengan kesan yang berpanjangan.

Pernyataan Berjaga-jaga (Pencegahan):

P280

Pakai sarung tangan perlindungan, pakaian perlindungan dan perlindungan mata atau perlindungan muka.

P273

Elakkan pelepasan bahan ke persekitaran.

P201

Dapatkan arahan khas sebelum menggunakan produk.

Pernyataan Berjaga-jaga (Tindak Balas):

P308 + P313

Jika terdedah kepada bahan atau terkena bahan: Dapatkan nasihat/rawatan perubatan.

Pernyataan Berjaga-jaga (Penyimpanan):

P405

Simpan di tempat berkunci.

Pernyataan Berjaga-jaga (Pelupusan):

P501

Buangkan kandungan dan bekas ke tempat pengumpulan bahan sisa merbahaya atau khas.

Bahaya lain yang tidak menyebabkan pengelasan:

Apabila disebarkan secara rata, pencucuhan sendiri boleh berlaku.

3. Komposisi dan Maklumat Mengenai Ramuan Bahan Kimia

Keadaan kimia

Sediaan berdasarkan: retinyl propionate

distabilkan dengan: 2,6-di-tert-butyl-p-kresol

Ramuan berbahaya

retinyl propionate

Kandungan (berat/berat): $\geq 75\%$ - $\leq 100\%$

Nombor CAS: 7069-42-3

Pemb. 1B (unborn child)

Akuatik Kronik 4

2,6-di-tert-butyl-p-kresol

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Kandungan (berat/berat): $\geq 1\%$ - Akutik Akut 1
 $< 3\%$ Akutik Kronik 1
Nombor CAS: 128-37-0 Faktor-M kronik: 1

Bagi pengelasan yang tidak ditulis dengan penuh dalam bahagian ini, teks lengkap boleh didapati di bahagian 16.

4. Langkah-Langkah Pertolongan Cemas

Nasihat am:

Kakitangan bantuan kecemasan hendaklah memberikan perhatian kepada keselamatan mereka sendiri. Jika pesakit mungkin akan tidak sedarkan diri, pastikan pesakit dalam keadaan mengiring (kedudukan pemulihan) dan pindahkan pesakit. Segera tanggalkan pakaian yang tercemar.

Jika tersedut:

Tenangkan pesakit, alihkan ke tempat berudara bersih, dapatkan rawatan perubatan.

Apabila terkena kulit:

Segera basuh bersih-bersih dengan sabun dan air, dapatkan rawatan perubatan.

Apabila terkena mata:

Basuh mata yang terkena produk selama sekurang-kurangnya 15 minit di bawah aliran air sambil membuka mata.

Apabila tertelan:

Segera berkumur, kemudian minum 200-300 ml air, dapatkan rawatan perubatan.

Nota kepada doktor:

Gejala: Maklumat, iaitu maklumat tambahan mengenai simptom dan kesan boleh termasuk di dalam fasa palabelan GHS yang tersedia ada dalam Seksyen 2 dan di dalam penaksiran Toksikologi yang tersedia ada dalam Seksyen 11., Simptom dan/atau kesan tidak diketahui setakat ini

Nota kepada doktor:

Rawatan: Rawat mengikut gejala (nyahcemar, fungsi utama), tiada penawar khusus diketahui.

5. Langkah-Langkah Pemadaman Kebakaran

Bahan pemadam yang sesuai:

semburan air, busa, serbuk kering, karbon dioksida

Alat memadam yang tidak sesuai untuk tujuan keselamatan:

pancutan air

Bahaya tertentu:

wap yang merbahaya, karbon oksida

Bahan/kumpulan bahan yang dinyatakan boleh dibebaskan jika berlaku kebakaran. Evolusi wasap/kabus.

Peralatan perlindungan khusus:

Gunakan alat pernafasan serba lengkap dan pakaian pelindung kimia.

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Maklumat lanjut:

Kumpul air pemadam api yang tercemar secara berasingan, jangan biarkan ia mengalir ke dalam sistem pembetung atau efluen. Lupuskan sisa kebakaran dan air pemadam api yang tercemar menurut peraturan rasmi. Sejukkan bekas yang berbahaya dengan semburan air.

6. Langkah-Langkah Pelepasan Tidak Sengaja

Perlindungan diri, kelengkapan pelindung dan tatacara kecemasan:

Gunakan pakaian pelindung diri. Maklumat berhubung dengan langkah pencegahan diri lihat bahagian 8. Pastikan pengalihudaraan yang mencukupi. Jangan bernafaskan wap/semburan. Elakkan dari bersentuhan dengan kulit, mata dan pakaian.

Langkah berjaga-jaga untuk alam sekitar:

Jangan lepaskan ke dalam parit/air permukaan/air tanah. Hubungi pihak berkuasa jika berlaku tumpahan produk ke saluran air atau sistem pembetungan.

Kaedah pembersihan atau penyerapan:

Bagi sejumlah kecil: Bendung dengan bahan penyerap (contohnya pasir, gel silika, pengikat asid, pengikat serba guna, habuk gergaji). Selepas memasukkan bahan ke dalam bekas, segera tutup dengan lapisan air.

Bagi sejumlah besar: Bina benteng tumpahan. Pam produk.

Lupuskan bahan yang diserap mengikut peraturan. Kain/kain pencuci/penjerap yang kotor dan Silika boleh menyala sendiri dan perlu dibasahkan dengan air serta dilupuskan menggunakan cara yang selamat.

7. Pengendalian dan Penyimpanan

Pengendalian

Pastikan pengalihudaraan menyeluruh di kawasan simpanan dan di tempat kerja. Pakai pakaian perlindungan dan perlindungan mata/muka yang sesuai. Elakkan pembentukan aerosol. Elakkan dari bersentuhan dengan kulit, mata dan pakaian. Pastikan bekas tertutup rapat. Pastikan tidak ada produk terhablur di dalam bekas sebelum digunakan. Mesin pemproses mestilah dipasang dengan pengalihudaraan ekzos setempat.

Perlindungan terhadap kebakaran dan letupan:

Bahaya pencucuhan sendiri apabila kawasan permukaan yang luas dihasilkan. Jauhkan dari semua sumber pencucuhan: haba, percikan api, nyalaan terbuka. Ambil langkah berjaga-jaga terhadap luahan statik. Kain/kain pencuci/penjerap yang kotor dan Silika boleh menyala sendiri dan perlu dibasahkan dengan air serta dilupuskan menggunakan cara yang selamat.

Penyimpanan

Asingkan daripada pengoksida.

Maklumat lanjut tentang keadaan penyimpanan: Pastikan bekas tertutup rapat dan kering; simpan di tempat yang dingin. Lindungi daripada udara. Lindungi daripada kesan cahaya. Simpan dalam nitrogen

8. Kawalan pendedahan dan perlindungan diri

Komponen dengan parameter kawalan tempat kerja

2,6-di-tert-butyl-p-kresol, 128-37-0;

Nilai TWA 2 mg/m³ (ACGIHTLV), Pecahan dan wap boleh sedut

Nilai TWA 10 mg/m³ (OEL (Peraturan USECHH Malaysia))

Peralatan perlindungan peribadi

Perlindungan pernafasan:

Perlindungan pernafasan yang sesuai bagi kepekatan yang rendah atau kesan jangka pendek:

Penapis gas bagi gas/wap sebatian organik (takat didih >65°C, cth EN 14387 Jenis A)

Perlindungan tangan:

Sarung tangan kalis kimia yang sesuai (EN ISO 374-1) jika terkena secara langsung yang berpanjangan (Disyorkan: Indeks pelindung 6, sama dengan masa penelapan > 480 minit mengikut EN ISO 374-1): Misalnya getah nitril (0.4 mm), getah kloroprena (0.5 mm), polivinilklorida (0.7 mm) dan lainnya.

Nota tambahan : Spesifikasi adalah berdasarkan ujian –ujian, data penerbitan dan maklumat dari pengeluar sarung tangan atau diambil yang serupa secara analogi. Oleh sebab banyak keadaan yang perlu dipertimbangkan (misalnya suhu), perlulah diambil kira, bahawa secara praktikalnya tempoh penggunaan sarung tangan pelindung kimia mungkin lebih pendek daripada tempoh penelapan yang ditentukan menurut ujian.

Arahan penggunaan pengilang hendaklah dipatuhi kerana jenisnya yang pelbagai.

Perlindungan mata:

Kaca mata keselamatan dengan pelindung sisi (gogal berbingkai) (contohnya EN 166)

Perlindungan badan:

Perlindungan badan mesti dipilih bergantung kepada aktiviti dan pendedahan, contohnya apron, kasut perlindungan, pakaian perlindungan bahan kimia (Berdasarkan DIN-EN 465)

Langkah kebersihan dan keselamatan am:

Wanita di awal kehamilan tidak boleh sama sekali terdedah kepada bahan. Dalam apa keadaan sekalipun, produk tidak boleh terkena kulit wanita. Elakkan daripada bersentuhan dengan kulit.

Memakai pakaian kerja yang tertutup diperlukan sebagai tambahan kepada kelengkapan perlindungan diri yang dinyatakan. Kendalikan mengikut amalan kesihatan dan keselamatan industri yang baik. Jangan makan, minum, merokok atau menggunakan tembakau di tempat kerja. Tangan dan/atau muka hendaklah dibasuh sebelum rehat dan setelah tamat waktu bekerja. Simpan pakaian kerja secara berasingan.

9. Sifat Fizikal dan Kimia

Bentuk:

cecair

Warna:

kuning

Bau:

berkacang

Ambang bau:

Tidak ditentukan disebabkan oleh bahaya kesihatan yang mungkin melalui penyedutan.

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| | | |
|---|---|----------------------------------|
| nilai pH: | bahan/campuran adalah tidak terlarutkan (dalam air) | |
| takat lebur: | < 20 °C | |
| takat didih: | Penguraian bahan / produk tidak ditentukan. | |
| Takat kilat: | 161.0 °C | (ISO 2719) |
| Kemudahbakaran (pepejal/gas): | tidak mudah tercucuh | |
| Had letupan bawah: | Untuk cecair tiada kaitan untuk pengelasan dan pelabelan. | |
| Had letupan atas: | Untuk cecair tiada kaitan untuk pengelasan dan pelabelan. | |
| Suhu pencucuhan: | 291 °C | (DIN EN 14522) |
| Penguraian terma: | >= 165 °C | (DSC (DIN 51007)) |
| pencucuhan sendiri: | Suhu: 291 °C | (Kaedah: Arahan 92/69/EEC, A.15) |
| Kemungkinan swapemanasan sendiri: | tidak berkenaan, produk ialah cecair | |
| Bahaya letupan: | tidak mudah meletup | |
| Sifat yang menggalakkan kebakaran: | tidak merebakkan api | |
| Tekanan Wap: | < 1 hPa (20 °C) | |
| Kepekatan: | 0.94 g/cm ³ (20 °C) | |
| Ketumpatan wap relatif (udara): | > 1 Lebih berat daripada udara | |
| Keterlarutan dalam air: | terlarut sangat sedikit | |
| Keterlarutan (kualitatif) pelarut: | pelarut organik terlarut | |
| Pekali petakan n-oktanol/air (log Pow): | tidak berkenaan untuk campuran | |
| Kelikatan, dinamik: | Tiada data diperolehi. | |
| Kelikatan, kinematik: | Tiada data diperolehi. | |

10. Kestabilan dan Kereaktifan

Keadaan yang perlu dielakkan:

Lihat MSDS bahagian 7 - Pengendalian dan Penyimpanan.

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Penguraian terma: $\geq 165\text{ }^{\circ}\text{C}$ (DSC (DIN 51007))Bahan yang perlu dielakkan:
agen pengoksidaKakisan kepada Kesan mengakis pada logam tidak dijangka.
logam:Tindak balas berbahaya:
Apabila disebarkan secara rata, pencucuhan sendiri boleh berlaku.Bahan penguraian berbahaya:
Tiada produk penguraian yang berbahaya jika disimpan dan dikendalikan seperti yang ditetapkan/dinyatakan.Kereaktifan:
Tiada produk penguraian yang berbahaya jika disimpan dan dikendalikan seperti yang ditetapkan/dinyatakan.Kestabilan kimia:
Produk adalah stabil jika disimpan dan dikendalikan sebagaimana

11. Maklumat Toksikologi

Ketoksikan akut

Penilaian ketoksikan akut:
Ketoksikan yang rendah selepas sekali tertelan.Maklumat tentang : retinyl propionate
Data eksperimen/dikira:
LD50 tikus (melalui mulut): $> 2,000\text{ mg/kg}$ (Ujian BASF)
Tiada kematian diperhatikanMaklumat tentang : 2,6-di-tert-butyl-p-kresol
Data eksperimen/dikira:
LD50 tikus (melalui mulut): $> 5,000\text{ mg/kg}$ (Garis panduan OECD 401)

Kerengsaan

Maklumat tentang : retinyl propionate
Penilaian kesan merengsa:
Terkena kulit boleh menyebabkan kerengsaan. Tidak merengsakan mata.Maklumat tentang : 2,6-di-tert-butyl-p-kresol
Penilaian kesan merengsa:
Tidak merengsakan kulit. Tidak merengsakan mata.

Pemekaan pernafasan/kulit

Penilaian pemekaan:

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Kesan pemekaan kulit tidak diperhatikan dalam kajian haiwan.

Maklumat tentang : retinyl propionate

Data eksperimen/dikira:

Ujian pemaksimum tikus kasturi marmut: Tidak memeka (Garis panduan OECD 406)

Maklumat tentang : 2,6-di-tert-butyl-p-kresol

Data eksperimen/dikira:

Ujian pemaksimum tikus kasturi marmut: Tidak memeka (serupa dengan garis panduan OECD 406)

Kemutagenan sel germa

Penilaian kemutagenan:

Berdasarkan data yang ada, kriteria pengelasan tidak dipenuhi.

Maklumat tentang : retinyl propionate

Penilaian kemutagenan:

Dalam sebahagian besar ujian yang dijalankan (bakteria/mikroorganisma/kultur sel), kesan mutagen tidak ditemui. Kesan mutagen juga tidak ditemui dalam hasil cerakin in vivo. Produk belum diuji.

Penyataan diambil daripada bahan/produk yang mempunyai struktur dan komposisi yang sama.

Kekarsinogenan

Penilaian kekarsinogenan:

Berdasarkan data yang ada, kriteria pengelasan tidak dipenuhi.

Maklumat tentang : retinyl propionate

Penilaian kekarsinogenan:

Tiada data yang boleh dipercayai diperoleh tentang aktiviti karsinogen.

Maklumat tentang : 2,6-di-tert-butyl-p-kresol

Penilaian kekarsinogenan:

Semua maklumat yang boleh didapati tidak menyediakan petunjuk kepada kesan karsinogen.

Ketoksikan pembiakan

Penilaian ketoksikan pembiakan:

Dalam uji kaji ke atas haiwan, bahan menunjukkan perkembangan kesan

Ketoksikan perkembangan

Penilaian keteratogenan:

Dalam uji kaji ke atas haiwan, bahan menunjukkan perkembangan kesan Boleh memudaratkan bayi belum lahir.

Maklumat tentang : retinyl propionate

Penilaian keteratogenan:

Boleh memudaratkan bayi belum lahir. Produk belum diuji. Penyataan diambil daripada bahan/produk yang mempunyai struktur dan komposisi yang sama.

Ketoksikan khusus organ sasaran (sekali pendedahan):

Penilaian sekali STOT:

Berdasarkan data yang ada, kriteria pengelasan tidak dipenuhi.

Ketoksikan dos berulang dan Ketoksikan organ sasaran tertentu (ppededahan berulang)

Penilaian ketoksikan dos berulang:

Pendedahan berulang kepada kuantiti yang besar mungkin membawa kesan kepada organ tertentu.

Maklumat tentang : retinyl propionate

Penilaian ketoksikan dos berulang:

Pendedahan berulang kepada kuantiti yang besar mungkin membawa kesan kepada organ tertentu.

Maklumat tentang : 2,6-di-tert-butyl-p-kresol

Penilaian ketoksikan dos berulang:

Bahan boleh menyebabkan kerosakan pada hati selepas tertelan secara

Bahaya penyedutan

Tiada data diperoleh.

Maklumat lain yang berkaitan dengan ketoksikan

Produk belum diuji. Pernyataan diambil daripada ciri setiap komponen.

12. Maklumat Ekologi**Keekotoksikan**

Penilaian ketoksikan akuatik:

Memudaratkan kepada hidupan akuatik dengan kesan yang berpanjangan.

Maklumat tentang : 2,6-di-tert-butyl-p-kresol

Ketoksikan kepada ikan:

LC0 (96 h) \geq 0.57 mg/l, Brachydanio rerio (OECD 203; ISO 7346; 84/449/EEC, C.1, semistatik)

Pernyataan kesan toksik berkaitan dengan kepekatan yang ditentukan secara analisis. Ujian kepekatan had sahaja (ujian HAD).

Maklumat tentang : 2,6-di-tert-butyl-p-kresol

Invertebrat air:

EC0 (48 h) 0.48 mg/l, Daphnia magna (Garis panduan OECD 202, Bahagian 1, statik)

Pernyataan kesan toksik berkaitan dengan kepekatan yang ditentukan secara analisis.

Maklumat tentang : retinyl propionate

Invertebrat air:

EC50 (48 h) $>$ 100 mg/l, Daphnia magna (Garis panduan OECD 202, Bahagian 1, statik)

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Perincian kesan toksik berkaitan dengan kepekatan nominal. Produk belum diuji. Penyataan diambil daripada bahan/produk yang mempunyai struktur dan komposisi yang sama.

Maklumat tentang : 2,6-di-tert-butyl-p-kresol

Tumbuhan akuatik:

EC50 (72 h) > 0.40 mg/l (kadar pertumbuhan), *Scenedesmus subspicatus* (Garis panduan 92/69/EEC, C.3, statik)

Penyataan kesan toksik berkaitan dengan kepekatan yang ditentukan secara analisis.

Maklumat tentang : 2,6-di-tert-butyl-p-kresol

Mikroorganisma/Kesan ke atas enap cemar diaktifkan:

EC0 (3 h) 1,000 mg/l, Enap cemar diaktifkan (DIN EN ISO 8192-OECD 209-88/302/EEC, P. C, aerobik)

Maklumat tentang : retinyl propionate

Mikroorganisma/Kesan ke atas enap cemar diaktifkan:

EC20 (3 h) > 1,000 mg/l, Enap cemar diaktifkan, domestik (Garis panduan OECD 209, aerobik)
Perencatan aktiviti degradasi di dalam enap cemar yang diaktifkan tidak dijangka akan berlaku semasa bahan berkepekatan rendah dimasukkan kedalam loji rawatan biologi.

Maklumat tentang : 2,6-di-tert-butyl-p-kresol

Ketoksikan kronik kepada invertebrata akuatik:

Tiada kesan kepekatan yang diperhatikan (21 hari), 0.316 mg/l, *Daphnia magna* (Garis panduan OECD 202, Bahagian 2, semistatik)

Perincian kesan toksik berkaitan dengan kepekatan nominal.

Penilaian ketoksikan daratan:

Tiada data diperolehi.

Mobiliti

Penilaian pengangkutan di antara bahagian di persekitaran:

Penjerapan kepada fasa tanah pejal dijangka

Maklumat tentang : retinyl propionate

Penilaian pengangkutan di antara bahagian di persekitaran:

Tiada data diperolehi.

Penjerapan kepada fasa tanah pejal dijangka

Maklumat tentang : 2,6-di-tert-butyl-p-kresol

Penilaian pengangkutan di antara bahagian di persekitaran:

Bahan tidak akan menyejat ke atmosfera daripada permukaan air

Penjerapan kepada fasa tanah pejal dijangka

Keterusan dan boleh keterdegradasikan

Maklumat tentang : retinyl propionate

Penilaian biodegradasi dan penyingkiran (H₂O):

Tidak mudah terbiodegradasikan (oleh kriteria OECD). Terbiodegradasi secara sederhana/sebahagiannya

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Maklumat tentang : 2,6-di-tert-butil-p-kresol
-----**Potensi Biotumpukan**

Penilaian potensi bioakumulasi:

Produk mengandungi komponen yang berpotensi untuk biopengumpulan.

Maklumat tentang : retinyl propionate

Penilaian potensi bioakumulasi:

Akumulasi yang ketara dalam organisma tidak dijangka.

Maklumat tentang : 2,6-di-tert-butil-p-kresol

Penilaian potensi bioakumulasi:

Produk mungkin terkumpul dalam organisma.
-----**Maklumat tambahan**

Perhatian tambahan bagi nasib pada alam sekitar & laluan:

Produk belum diuji. Pernyataan tentang nasib alam sekitar dan laluan

Nasihat ekotoksikologi lain:

Produk belum diuji. Pernyataan tentang ekotoksikologi diambil daripada ciri setiap komponen.

13. Maklumat Pelupusan

Patuhi keperluan undang-undang negara dan tempatan.

14. Maklumat Pengangkutan**Pengangkutan domestik:**

Tidak dikelaskan sebagai berbahaya di bawah peraturan pengangkutan

Pengangkutan laut

IMDG

Tidak dikelaskan sebagai berbahaya di bawah peraturan pengangkutan

Pengangkutan udara

IATA/ICAO

Tidak dikelaskan sebagai berbahaya di bawah peraturan pengangkutan

Pengangkutan secara pukal menurut Lampiran II MARPOL dan IBC

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| | |
|----------------------------------|---------------|
| Peraturan: | Tidak dinilai |
| Penghantaran yang diluluskan: | Tidak dinilai |
| Nama pencemaran: | Tidak dinilai |
| Kategori pencemaran: | Tidak dinilai |
| Jenis Kapal: | Tidak dinilai |

15. Maklumat Pengawalseliaan

Peraturan-Peraturan Keselamatan dan Kesihatan Pekerjaan (Pengelasan, Pelabelan dan Helaian Data Keselamatan Bahan kimia Berbahaya) 2013
 Akta OSHA 1994 dan peraturan berkaitan
 Akta Kualiti Alam Sekeliling 1974

Maklumat tentang peraturan-peraturan tidak meliputi kesemuanya. Peraturan-peraturan lain mungkin dikenakan kepada bahan ini.

Peraturan lain

Jika maklumat peraturan lain yang berkenaan tidak dinyatakan dibahagian lain didalam risalah data keselamatan ini, ianya akan dinyatakan bahagian ini.

16. Maklumat lain

Tarikh Penyediaan / Tarikh Penyemakan: 14.04.2023

Sumber Maklumat dan Rujukan :
 SDS ini disediakan dengan menggunakan data dan maklumat tersimpan di dalam sistem berasaskan IT dalaman kami dan dibekalkan oleh pembekal perkhidmatan syarikat kami.

Singkatan Petunjuk:

ATE - Anggaran Ketoksikan Akut
 GHS - Sistem Terharmoni Global
 IATA / ICAO - Persatuan Pengangkutan Udara Antarabangsa / Organisasi Penerbangan Awam Antarabangsa
 IBC - Kontena Pukul Pertengahan
 IMDG - Barangan Merbahaya Kelautan Antarabangsa
 LC - Kepekatan Maut
 LD - Dos Maut
 OECD - Organisasi Untuk Kerjasama dan Pembangunan Ekonomi
 OEL - Had Pendedahan Pekerjaan
 OSHA - Akta Keselamatan dan Kesihatan Pekerjaan
 STOT - Ketoksikan Organ Sasaran Khusus

Sebarang tujuan penggunaan lain hendaklah dibincangkan dengan pengeluar. Kadar perlindungan keselamatan untuk pekerjaan yang berkenaan hendaklah dipatuhi.

Teks penuh pengelasan, simbol bahaya dan pernyataan bahaya, jika dinyatakan dalam seksyen 2 atau 3:

Bhn. Ltp. T. Stab.

Bahan letup tidak stabil

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| | |
|------------------|---|
| Bhn. Ltp. 1.1 | Bahan letup divisyen 1.1 |
| Bhn. Ltp. 1.2 | Bahan letup divisyen 1.2 |
| Bhn. Ltp. 1.3 | Bahan letup divisyen 1.3 |
| Bhn. Ltp. 1.4 | Bahan letup divisyen 1.4 |
| Bhn. Ltp. 1.5 | Bahan letup divisyen 1.5 |
| Bhn. Ltp. 1.6 | Bahan letup divisyen 1.6 |
| Gas M. Bkr 1 | Gas mudah terbakar kategori 1 |
| Gas M. Bkr 2 | Gas mudah terbakar kategori 2 |
| Aerosol M. Bkr1 | Aerosol mudah terbakar kategori 1 |
| Aerosol M. Bkr 2 | Aerosol mudah terbakar kategori 2 |
| Cec. M. Bkr 1 | Cecair mudah terbakar kategori 1 |
| Cec. M. Bkr 2 | Cecair mudah terbakar kategori 2 |
| Cec. M. Bkr 3 | Cecair mudah terbakar kategori 3 |
| Pep. M. Bkr 1 | Pepejal mudah terbakar kategori 1 |
| Pep. M. Bkr 2 | Pepejal mudah terbakar kategori 2 |
| Gas Oks. 1 | Gas mengoksida kategori 1 |
| Cec. Oks. 1 | Cecair mengoksida kategori 1 |
| Cec. Oks. 2 | Cecair mengoksida kategori 2 |
| Cec. Oks. 3 | Cecair mengoksida kategori 3 |
| Pep. Oks. 1 | Pepejal mengoksida kategori 1 |
| Pep. Oks. 2 | Pepejal mengoksida kategori 2 |
| Pep. Oks. 3 | Pepejal mengoksida kategori 3 |
| Gas Tkn. | Gas di bawah tekanan |
| Swareak. A | Bahan kimia swareaktif jenis A |
| Swareak. B | Bahan kimia swareaktif jenis B |
| Swareak. CD | Bahan kimia swareaktif jenis C dan D |
| Swareak. EF | Bahan kimia swareaktif jenis E dan F |
| Swareak. G | Bahan kimia swareaktif jenis G |
| Cec. Pir. 1 | Cecair piroforik kategori 1 |
| Pep. Pir. 1 | Pepejal piroforik kategori 1 |
| Swapanas. 1 | Bahan kimia swapanasan kategori 1 |
| Swapanas. 2 | Bahan kimia swapanasan kategori 2 |
| Tdk. Bls. Air 1 | Bahan kimia yang, jika terkena air, membebaskan gas mudah terbakar kategori 1 |
| Tdk. Bls. Air 2 | Bahan kimia yang, jika terkena air, membebaskan gas mudah terbakar kategori 2 |
| Tdk. Bls. Air 3 | Bahan kimia yang, jika terkena air, membebaskan gas mudah terbakar kategori 3 |
| Peroks. Org. A | Peroksida organik jenis A |
| Peroks. Org. B | Peroksida organik jenis B |
| Peroks. Org. CD | Peroksida organik jenis C and D |
| Peroks. Org. EF | Peroksida organik jenis E and F |
| Peroks. Org. G | Peroksida organik jenis G |
| Kakis. Log. 1 | Mengakis logam kategori 1 |
| Toks. Akut 1 | Ketoksikan akut kategori 1 |
| Toks. Akut 2 | Ketoksikan akut kategori 2 |
| Toks. Akut 3 | Ketoksikan akut kategori 3 |
| Toks. Akut 4 | Ketoksikan akut kategori 4 |
| Kks. Kulit 1A | Kakisan atau kerengsaan kulit kategori 1A |
| Kks. Kulit 1B | Kakisan atau kerengsaan kulit kategori 1B |
| Kks. Kulit 1C | Kakisan atau kerengsaan kulit kategori 1C |
| Kreng. Kulit 2 | Kakisan atau kerengsaan kulit kategori 2 |
| Kros. Mata 1 | Kerosakan mata atau kerengsaan mata yang serius kategori 1 |
| Kreng. Mata 2 | Kerosakan mata atau kerengsaan mata yang serius kategori 2 |

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| | |
|------------------|--|
| Pem. Naf. 1 | Pemekaan pernafasan kategori 1 |
| Pem. Kulit 1 | Pemekaan kulit kategori 1 |
| Muta. 1A | Kemutagenan sel germa kategori 1A |
| Muta. 1B | Kemutagenan sel germa kategori 1B |
| Muta. 2 | Kemutagenan sel germa kategori 2 |
| Kars. 1A | Kekarsinogenan kategori 1A |
| Kars. 1B | Kekarsinogenan kategori 1B |
| Kars. 2 | Kekarsinogenan kategori 2 |
| Pemb. 1A | Ketoksikan pembiakan kategori 1A |
| Pemb. 1B | Ketoksikan pembiakan kategori 1B |
| Pemb. 2 | Ketoksikan pembiakan kategori 2 |
| Laktasi | Kesan ke atas atau melalui penyusuan |
| STOT SE 1 | Ketoksikan organ sasaran khusus - pendedahan tunggal kategori 1 |
| STOT SE 2 | Ketoksikan organ sasaran khusus - pendedahan tunggal kategori 2 |
| STOT SE 3 | Ketoksikan organ sasaran khusus - pendedahan tunggal kategori 3 |
| STOT RE 1 | Ketoksikan organ sasaran khusus - pendedahan berulang kategori 1 |
| STOT RE 2 | Ketoksikan organ sasaran khusus - pendedahan berulang kategori 2 |
| Bhy. Asp. | Bahaya aspirasi kategori 1 |
| Akuatik Akut 1 | Berbahaya kepada persekitaran akuatik – bahaya akut kategori 1 |
| Akuatik Kronik 1 | Berbahaya kepada persekitaran akuatik – bahaya kronik kategori 1 |
| Akuatik Kronik 2 | Berbahaya kepada persekitaran akuatik – bahaya kronik kategori 2 |
| Akuatik Kronik 3 | Berbahaya kepada persekitaran akuatik – bahaya kronik kategori 3 |
| Akuatik Kronik 4 | Berbahaya kepada persekitaran akuatik – bahaya kronik kategori 4 |
| Ozon | Berbahaya bagi lapisan ozon kategori 1 |

Garis menegak pada margin sebelah kiri tangan menunjukkan pindaan dari versi sebelumnya.

Data yang terdapat dalam risalah data keselamatan ini adalah berdasarkan pengetahuan dan pengalaman kami, dan menerangkan tentang produk yang berkaitan dengan keperluan keselamatan sahaja. Data tidak menyatakan ciri produk (spesifikasi produk). Data dalam risalah data keselamatan ini juga tidak menyatakan apa-apa ciri khusus atau kesesuaian produk yang dipersetujui untuk apa-apa tujuan tertentu. Penerima produk bertanggungjawab untuk memastikan bahawa apa-apa hak pemilikan serta undang-undang dan perundangan sedia ada dipatuhi.

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1. Identification of the chemical and of the supplier

Vitamin A-Propionate 2.5 Mio IU/G stabilized with BHT

Use: feed additive(s)

Company:

BASF (Malaysia) Sdn Bhd
Lot 19.02 Level 19, 1 Powerhouse
No 1 Persiaran Bandar Utama
47800 Petaling Jaya
Selangor D.E, MALAYSIA
Telephone: +60 3 7612 1888
Telefax number: +60 3 7612 1777

Emergency information:

National emergency number:

+603 7612 1999

International emergency number:

Telephone: +49 180 2273-112

2. Hazard identification

Classification of the substance and mixture:

Repr. 1B (unborn child)

Aquatic Chronic 3

For the classifications not written out in full in this section the full text can be found in section 16.

Label elements and precautionary statement:

Pictogram:



Signal Word:

Danger

Hazard Statement:

H360D

May damage the unborn child.

H412

Harmful to aquatic life with long lasting effects.

Precautionary Statements (Prevention):

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P280 Wear protective gloves, protective clothing and eye protection or face protection.
 P273 Avoid release to the environment.
 P201 Obtain special instructions before use.

Precautionary Statements (Response):

P308 + P313 IF exposed or concerned: Get medical attention.

Precautionary Statements (Storage):

P405 Store locked up.

Precautionary Statements (Disposal):

P501 Dispose of contents and container to hazardous or special waste collection point.

Other hazards which do not result in classification:

When finely distributed, self-ignition is possible.

3. Composition/information on ingredients

Chemical nature

Preparation based on: retinyl propionate

stabilized with: 2,6-di-tert-butyl-p-cresol

Hazardous ingredients

retinyl propionate

| | |
|-----------------------------------|-------------------------|
| Content (W/W): >= 75 % - <= 100 % | Repr. 1B (unborn child) |
| CAS Number: 7069-42-3 | Aquatic Chronic 4 |

2,6-di-tert-butyl-p-cresol

| | |
|-------------------------------|---------------------|
| Content (W/W): >= 1 % - < 3 % | Aquatic Acute 1 |
| CAS Number: 128-37-0 | Aquatic Chronic 1 |
| | M-factor chronic: 1 |

For the classifications not written out in full in this section the full text can be found in section 16.

4. First-Aid Measures

General advice:

First aid personnel should pay attention to their own safety. If the patient is likely to become unconscious, place and transport in stable sideways position (recovery position). Immediately remove contaminated clothing.

If inhaled:

Keep patient calm, remove to fresh air, seek medical attention.

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On skin contact:

Immediately wash thoroughly with soap and water, seek medical attention.

On contact with eyes:

Wash affected eyes for at least 15 minutes under running water with eyelids held open.

On ingestion:

Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention.

Note to physician:

Symptoms: Information, i.e. additional information on symptoms and effects may be included in the GHS labeling phrases available in Section 2 and in the Toxicological assessments available in Section 11., (Further) symptoms and / or effects are not known so far

Note to physician:

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-Fighting Measures

Suitable extinguishing media:

water spray, foam, dry powder, carbon dioxide

Unsuitable extinguishing media for safety reasons:

water jet

Specific hazards:

harmful vapours, carbon oxides

The substances/groups of substances mentioned can be released in case of fire. Evolution of fumes/fog.

Special protective equipment:

Wear self-contained breathing apparatus and chemical-protective clothing.

Further information:

Collect contaminated extinguishing water separately, do not allow to reach sewage or effluent systems. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations. Cool endangered containers with water-spray.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:

Use personal protective clothing. Information regarding personal protective measures, see section 8. Ensure adequate ventilation. Do not breathe vapour/spray. Avoid contact with the skin, eyes and clothing.

Environmental precautions:

Do not discharge into drains/surface waters/groundwater. Inform authorities in the event of product spillage to water courses or sewage systems.

Methods for cleaning up or taking up:

For small amounts: Contain with absorbent material (e.g. sand, silica gel, acid binder, general purpose binder, sawdust). After taking up material in containers, cover immediately with water layer.

For large amounts: Dike spillage. Pump off product.

Dispose of absorbed material in accordance with regulations. Soiled textiles / cleaning rags / adsorbents and Silica are capable of self ignition and should be wetted with water and must be disposed of in a safe manner.

7. Handling and Storage

Handling

Ensure thorough ventilation of stores and work areas. Wear suitable protective clothing and eye/face protection. Avoid aerosol formation. Avoid contact with the skin, eyes and clothing. Keep container tightly sealed. Ensure that there is no crystallized product in the container before use. Processing machines must be fitted with local exhaust ventilation.

Protection against fire and explosion:

Risk of self-ignition when a large surface area is produced due to fine dispersion. Avoid all sources of ignition: heat, sparks, open flame. Take precautionary measures against static discharges. Soiled textiles / cleaning rags / adsorbents and Silica are capable of self ignition and should be wetted with water and must be disposed of in a safe manner.

Storage

Segregate from oxidants.

Further information on storage conditions: Keep container tightly closed and dry; store in a cool place. Protect from air. Protect from the effects of light. Keep under nitrogen.

8. Exposure controls and personal protection

Components with occupational exposure limits

2,6-di-tert-butyl-p-cresol, 128-37-0;

TWA value 2 mg/m³ (ACGIHTLV), Inhalable fraction and vapor

TWA value 10 mg/m³ (OEL (MY))

Personal protective equipment

Respiratory protection:

Suitable respiratory protection for lower concentrations or short-term effect: Gas filter for gases/vapours of organic compounds (boiling point >65 °C, e. g. EN 14387 Type A)

Hand protection:

Suitable chemical resistant safety gloves (EN ISO 374-1) also with prolonged, direct contact

(Recommended: Protective index 6, corresponding > 480 minutes of permeation time according to

EN ISO 374-1): E.g. nitrile rubber (0.4 mm), chloroprene rubber (0.5 mm), butyl rubber (0.7 mm) etc.

Supplementary note: The specifications are based on tests, literature data and information of glove manufacturers or are derived from similar substances by analogy. Due to many conditions (e.g.

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temperature) it must be considered, that the practical usage of a chemical-protective glove in practice may be much shorter than the permeation time determined through testing. Manufacturer's directions for use should be observed because of great diversity of types.

Eye protection:

Safety glasses with side-shields (frame goggles) (e.g. EN 166)

Body protection:

Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

General safety and hygiene measures:

Females in early pregnancy must never be exposed to the substance. Under no circumstances should the product come into contact with the skin of pregnant women or be inhaled by them. Avoid contact with skin. Wearing of closed work clothing is required additionally to the stated personal protection equipment. Handle in accordance with good industrial hygiene and safety practice. No eating, drinking, smoking or tobacco use at the place of work. Hands and/or face should be washed before breaks and at the end of the shift. Store work clothing separately.

9. Physical and Chemical Properties

| | |
|------------------|--|
| Form: | liquid |
| Colour: | yellow |
| Odour: | nutty |
| Odour threshold: | Not determined due to potential health hazard by inhalation. |

pH value:

substance/mixture is non-soluble (in water)

Melting point:

< 20 °C

Boiling point:

The substance / product decomposes therefore not determined.

Flash point:

161.0 °C

(ISO 2719)

Flammability (solid/gas): not readily ignited

Lower explosion limit:

For liquids not relevant for classification and labelling.

Upper explosion limit:

For liquids not relevant for classification and labelling.

Ignition temperature:

291 °C

(DIN EN 14522)

Thermal decomposition:

>= 165 °C

(DSC (DIN 51007))

Self ignition:

Temperature: 291 °C

(Method: Directive 92/69/EEC, A.15)

Self heating ability:

not applicable, the product is a liquid

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Explosion hazard: not explosive
Fire promoting properties: not fire-propagating

Vapour pressure: < 1 hPa
(20 °C)

Density: 0.94 g/cm³
(20 °C)

Relative vapour density (air): > 1
Heavier than air.

Solubility in water: sparingly soluble
Solubility (qualitative) solvent(s): organic solvents
soluble

Partitioning coefficient n-octanol/water (log Pow):
not applicable for mixtures

Viscosity, dynamic:
No data available.

Viscosity, kinematic:
No data available.

10. Stability and Reactivity

Conditions to avoid:
See SDS section 7 - Handling and storage.

Thermal decomposition: ≥ 165 °C (DSC (DIN 51007))

Substances to avoid:
oxidizing agents

Corrosion to metals: Corrosive effects to metal are not anticipated.

Hazardous reactions:
When finely distributed, self-ignition is possible.

Hazardous decomposition products:
No hazardous decomposition products if stored and handled as prescribed/indicated.

Reactivity:
No hazardous reactions if stored and handled as prescribed/indicated.

Chemical stability:
The product is stable if stored and handled as prescribed/indicated.

11. Toxicological Information

Acute toxicity

Assessment of acute toxicity:

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Of low toxicity after single ingestion.

Information on: retinyl propionate

Experimental/calculated data:

LD50 rat (oral): > 2,000 mg/kg (BASF-Test)

No mortality was observed.

Information on: 2,6-di-tert-butyl-p-cresol

Experimental/calculated data:

LD50 rat (oral): > 5,000 mg/kg (OECD Guideline 401)

Irritation

Information on: retinyl propionate

Assessment of irritating effects:

Skin contact causes irritation. Not irritating to the eyes.

Information on: 2,6-di-tert-butyl-p-cresol

Assessment of irritating effects:

Not irritating to the skin. Not irritating to the eyes.

Respiratory/Skin sensitization

Assessment of sensitization:

Skin sensitizing effects were not observed in animal studies.

Information on: retinyl propionate

Experimental/calculated data:

Guinea pig maximization test guinea pig: Non-sensitizing. (OECD Guideline 406)

Information on: 2,6-di-tert-butyl-p-cresol

Experimental/calculated data:

Guinea pig maximization test guinea pig: Non-sensitizing. (similar to OECD guideline 406)

Germ cell mutagenicity

Assessment of mutagenicity:

Based on available data, the classification criteria are not met.

Information on: retinyl propionate

Assessment of mutagenicity:

In the majority of tests performed (bacteria/microorganisms/cell cultures) a mutagenic effect was not found. A mutagenic effect was also not observed in in-vivo assays. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Carcinogenicity

Assessment of carcinogenicity:

Based on available data, the classification criteria are not met.

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Information on: retinyl propionate

Assessment of carcinogenicity:

No reliable data was available concerning carcinogenic activity.

Information on: 2,6-di-tert-butyl-p-cresol

Assessment of carcinogenicity:

The whole of the information assessable provides no indication of a carcinogenic effect.

Reproductive toxicity

Assessment of reproduction toxicity:

The substance caused malformations/developmental toxicity in laboratory animals.

Developmental toxicity

Assessment of teratogenicity:

The substance caused malformations/developmental toxicity in laboratory animals. May cause harm to the unborn child.

Information on: retinyl propionate

Assessment of teratogenicity:

May cause harm to the unborn child. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Specific target organ toxicity (single exposure):

Assessment of STOT single:

Based on available data, the classification criteria are not met.

Repeated dose toxicity and Specific target organ toxicity (repeated exposure)

Assessment of repeated dose toxicity:

Repeated exposure to large quantities may affect certain organs.

Information on: retinyl propionate

Assessment of repeated dose toxicity:

Repeated exposure to large quantities may affect certain organs.

Information on: 2,6-di-tert-butyl-p-cresol

Assessment of repeated dose toxicity:

The substance may cause damage to the liver after repeated ingestion of high doses, as shown in animal studies.

Aspiration hazard

No data available.

Other relevant toxicity information

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The product has not been tested. The statement has been derived from the properties of the individual components.

12. Ecological Information

Ecotoxicity

Assessment of aquatic toxicity:

Harmful to aquatic life with long lasting effects.

Information on: 2,6-di-tert-butyl-p-cresol

Toxicity to fish:

LC0 (96 h) \geq 0.57 mg/l, Brachydanio rerio (OECD 203; ISO 7346; 84/449/EEC, C.1, semistatic)

The statement of the toxic effect relates to the analytically determined concentration. Limit concentration test only (LIMIT test).

Information on: 2,6-di-tert-butyl-p-cresol

Aquatic invertebrates:

EC0 (48 h) 0.48 mg/l, Daphnia magna (OECD Guideline 202, part 1, static)

The statement of the toxic effect relates to the analytically determined concentration.

Information on: retinyl propionate

Aquatic invertebrates:

EC50 (48 h) $>$ 100 mg/l, Daphnia magna (OECD Guideline 202, part 1, static)

The details of the toxic effect relate to the nominal concentration. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Information on: 2,6-di-tert-butyl-p-cresol

Aquatic plants:

EC50 (72 h) $>$ 0.40 mg/l (growth rate), Scenedesmus subspicatus (Guideline 92/69/EEC, C.3, static)

The statement of the toxic effect relates to the analytically determined concentration.

Information on: 2,6-di-tert-butyl-p-cresol

Microorganisms/Effect on activated sludge:

EC0 (3 h) 1,000 mg/l, activated sludge (DIN EN ISO 8192-OECD 209-88/302/EEC, P. C, aerobic)

Information on: retinyl propionate

Microorganisms/Effect on activated sludge:

EC20 (3 h) $>$ 1,000 mg/l, activated sludge, domestic (OECD Guideline 209, aerobic)

The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Information on: 2,6-di-tert-butyl-p-cresol

Chronic toxicity to aquatic invertebrates:

No observed effect concentration (21 d), 0.316 mg/l, Daphnia magna (OECD Guideline 202, part 2, semistatic)

The details of the toxic effect relate to the nominal concentration.

Assessment of terrestrial toxicity:

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No data available.

Mobility

Assessment transport between environmental compartments:

Adsorption to solid soil phase is expected.

Information on: retinyl propionate

Assessment transport between environmental compartments:

No data available.

Adsorption to solid soil phase is expected.

Information on: 2,6-di-tert-butyl-p-cresol

Assessment transport between environmental compartments:

The substance will not evaporate into the atmosphere from the water surface.

Adsorption to solid soil phase is expected.

Persistence and degradability

Information on: retinyl propionate

Assessment biodegradation and elimination (H₂O):

Not readily biodegradable (by OECD criteria). Moderately/partially biodegradable.

Information on: 2,6-di-tert-butyl-p-cresol

Bioaccumulation potential

Assessment bioaccumulation potential:

The product contains components with potential for bioaccumulation

Information on: retinyl propionate

Assessment bioaccumulation potential:

Significant accumulation in organisms is not to be expected.

Information on: 2,6-di-tert-butyl-p-cresol

Assessment bioaccumulation potential:

May be accumulated in organisms.

Additional information

Add. remarks environm. fate & pathway:

The product has not been tested. The statements on environmental fate and pathway have been derived from the properties of the individual components.

Other ecotoxicological advice:

The product has not been tested. The statements on ecotoxicology have been derived from the properties of the individual components.

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13. Disposal Information

Observe national and local legal requirements.

14. Transportation Information

Domestic transport:

Not classified as a dangerous good under transport regulations

Sea transport

IMDG

Not classified as a dangerous good under transport regulations

Air transport

IATA/ICAO

Not classified as a dangerous good under transport regulations

Transport in bulk according to Annex II of MARPOL and the IBC Code

| | |
|---------------------|---------------|
| Regulation: | Not evaluated |
| Shipment approved: | Not evaluated |
| Pollution name: | Not evaluated |
| Pollution category: | Not evaluated |
| Ship Type: | Not evaluated |

15. Regulatory Information

Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013
OSHA 1994 and relevant regulations
Environmental Quality Act, 1974

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Other regulations

If other regulatory information applies that is not already provided elsewhere in this safety data sheet, then it is described in this subsection.

16. Other Information

Date of Preparation / Date of Revision: 14.04.2023

Information Source and References:

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This SDS is prepared using data and information saved in our internal IT-based system and supplied by our company's service providers.

Key Abbreviations:

ATE - Acute Toxicity Estimates

GHS - Globally Harmonized System

IATA / ICAO - International Air Transport Association / International Civil Aviation Organization

IBC - Intermediate Bulk Container

IMDG - International Maritime Dangerous Goods

LC - Lethal Concentration

LD - Lethal Dose

OECD - Organisation for Economic Co-operation and Development

OEL - Occupational Exposure Limit

OSHA - Occupational Safety and Health Act

STOT - Specific Target Organ Toxicity

Any other intended applications should be discussed with the manufacturer. Corresponding occupational protection measurements must be followed.

Full text of classifications, hazard symbols and hazard statements, if mentioned in section 2 or 3:

| | |
|-----------------|--------------------------------------|
| Unst. Expl. | Unstable explosives |
| Expl. 1.1 | Explosives division 1.1 |
| Expl. 1.2 | Explosives division 1.2 |
| Expl. 1.3 | Explosives division 1.3 |
| Expl. 1.4 | Explosives division 1.4 |
| Expl. 1.5 | Explosives division 1.5 |
| Expl. 1.6 | Explosives division 1.6 |
| Flam. Gas 1 | Flammable gases category 1 |
| Flam. Gas 2 | Flammable gases category 2 |
| Flam. Aerosol 1 | Flammable aerosols category 1 |
| Flam. Aerosol 2 | Flammable aerosols category 2 |
| Flam. Liq. 1 | Flammable liquids category 1 |
| Flam. Liq. 2 | Flammable liquids category 2 |
| Flam. Liq. 3 | Flammable liquids category 3 |
| Flam. Sol. 1 | Flammable solids category 1 |
| Flam. Sol. 2 | Flammable solids category 2 |
| Ox. Gas 1 | Oxidizing gases category 1 |
| Ox. Liq. 1 | Oxidizing liquids category 1 |
| Ox. Liq. 2 | Oxidizing liquids category 2 |
| Ox. Liq. 3 | Oxidizing liquids category 3 |
| Ox. Sol. 1 | Oxidizing solids category 1 |
| Ox. Sol. 2 | Oxidizing solids category 2 |
| Ox. Sol. 3 | Oxidizing solids category 3 |
| Press. Gas | Gases under pressure |
| Self-react. A | Self-reactive chemicals type A |
| Self-react. B | Self-reactive chemicals type B |
| Self-react. CD | Self-reactive chemicals type C and D |
| Self-react. EF | Self-reactive chemicals type E and F |
| Self-react. G | Self-reactive chemicals type G |
| Pyr. Liq. 1 | Pyrophoric liquids category 1 |
| Pyr. Sol. 1 | Pyrophoric solids category 1 |
| Self-heat. 1 | Self-heating chemicals category 1 |

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| | |
|-------------------|---|
| Self-heat. 2 | Self-heating chemicals category 2 |
| Water-react. 1 | Chemicals which, if in contact with water, emits flammable gases category 1 |
| Water-react. 2 | Chemicals which, if in contact with water, emits flammable gases category 2 |
| Water-react. 3 | Chemicals which, if in contact with water, emits flammable gases category 3 |
| Org. Perox. A | Organic peroxides type A |
| Org. Perox. B | Organic peroxides type B |
| Org. Perox. CD | Organic peroxides type C and D |
| Org. Perox. EF | Organic peroxides type E and F |
| Org. Perox. G | Organic peroxides type G |
| Met. Corr. 1 | Corrosive to metals category 1 |
| Acute Tox. 1 | Acute toxicity category 1 |
| Acute Tox. 2 | Acute toxicity category 2 |
| Acute Tox. 3 | Acute toxicity category 3 |
| Acute Tox. 4 | Acute toxicity category 4 |
| Skin Corr. 1A | Skin corrosion or irritation category 1A |
| Skin Corr. 1B | Skin corrosion or irritation category 1B |
| Skin Corr. 1C | Skin corrosion or irritation category 1C |
| Skin Irrit. 2 | Skin corrosion or irritation category 2 |
| Eye Dam. 1 | Serious eye damage or eye irritation category 1 |
| Eye Irrit. 2 | Serious eye damage or eye irritation category 2 |
| Resp. Sens. 1 | Respiratory sensitization category 1 |
| Skin Sens. 1 | Skin sensitization category 1 |
| Muta. 1A | Germ cell mutagenicity category 1A |
| Muta. 1B | Germ cell mutagenicity category 1B |
| Muta. 2 | Germ cell mutagenicity category 2 |
| Carc. 1A | Carcinogenicity category 1A |
| Carc. 1B | Carcinogenicity category 1B |
| Carc. 2 | Carcinogenicity category 2 |
| Repr. 1A | Reproductive toxicity category 1A |
| Repr. 1B | Reproductive toxicity category 1B |
| Repr. 2 | Reproductive toxicity category 2 |
| Lact. | Effect on or via lactation |
| STOT SE 1 | Specific target organ toxicity – single exposure category 1 |
| STOT SE 2 | Specific target organ toxicity – single exposure category 2 |
| STOT SE 3 | Specific target organ toxicity – single exposure category 3 |
| STOT RE 1 | Specific target organ toxicity – repeated exposure category 1 |
| STOT RE 2 | Specific target organ toxicity – repeated exposure category 2 |
| Asp. Haz. | Aspiration hazard category 1 |
| Aquatic Acute 1 | Hazardous to the aquatic environment – acute hazard category 1 |
| Aquatic Chronic 1 | Hazardous to the aquatic environment – chronic hazard category 1 |
| Aquatic Chronic 2 | Hazardous to the aquatic environment – chronic hazard category 2 |
| Aquatic Chronic 3 | Hazardous to the aquatic environment – chronic hazard category 3 |
| Aquatic Chronic 4 | Hazardous to the aquatic environment – chronic hazard category 4 |
| Ozone | Hazardous to the ozone layer category 1 |

Vertical lines in the left hand margin indicate an amendment from the previous version.

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. This safety data sheet is neither a Certificate of Analysis (CoA) nor technical data sheet and shall not be mistaken for a specification

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