Biocidal Products Committee (BPC)

Opinion on the application for approval of the active substance:

Reaction mass of 5-chloro-2-methyl-2h-isothiazol-3-one and 2-methyl-2h-isothiazol-3-one (3:1)

Product type: 12

ECHA/BPC/053/2015

Adopted

14 April 2015

Opinion of the Biocidal Products Committee

on the application for approval of the active substance, reaction mass of 5-chloro-2-methyl-2h-isothiazol-3-one and 2-methyl-2h-isothiazol-3-one (3:1) for product type 12

In accordance with Article 89(1) of Regulation (EU) No 528/2012 of the European Parliament and of the Council 22 May 2012 concerning the making available on the market and use of biocidal products (BPR), the Biocidal Products Committee (BPC) has adopted this opinion on the approval in product type 12 of the following active substance:

Common name:	**C(M)IT/MIT (3:1)**
Chemical name(s):	**Reaction mass of 5-chloro-2-methyl-2h-isothiazol-3-one and 2-methyl-2h-isothiazol-3-one (3:1)**
EC No.:	**Not available**
CAS No.:	**55965-84-9**
Existing active substance	

This document presents the opinion adopted by the BPC, having regard to the conclusions of the evaluating Competent Authority. The assessment report, as a supporting document to the opinion, contains the detailed grounds for the opinion.

Process for the adoption of BPC opinions

Following the submission of two applications by Rohm and Haas Europe Trading ApS, now a subsidiary of The Dow Chemical Company (hereafter referenced as "Dow") on 7 October 2008 and Thor GmbH (hereafter reffered to as "Thor") on 29 October 2008, the evaluating Competent Authority France submitted a combined assessment report and the conclusions of its evaluation to the Commission on 22 April 2013. In order to review the assessment report and the conclusions of the evaluating Competent Authority, the Agency organised consultations via the BPC and its Working Groups. Revisions agreed upon were presented and the assessment report and the conclusions were amended accordingly.

Adoption of the BPC opinion

Rapporteur: BPC member of France

The BPC opinion on the approval of the active substance reaction mass of 5-chloro-2-methyl-2h-isothiazol-3-one and 2-methyl-2h-isothiazol-3-one (3:1) (hereafter C(M)IT/MIT) in product type 12 was adopted on 14 April 2015.

The BPC opinion was adopted by consensus.

Detailed BPC opinion and background

1. Overall conclusion

The overall conclusion of the BPC is that C(M)IT/MIT in product type 12 may be approved. The detailed grounds for the overall conclusion are described in the assessment report.

2. BPC Opinion

2.1. BPC Conclusions of the evaluation

a) Presentation of the active substance including the classification and labelling of the active substance

This evaluation covers the use of C(M)IT/MIT in product type 12, in preservation of papermill and oilfield injection systems.

C(M)IT/MIT acts by a two-step antimicrobial mechanism, involving rapid binding (association) to cells and inhibition of growth and metabolism (within minutes), followed by irreversible cell damage resulting in loss of viability (hours). Growth inhibition is the result of rapid disruption of essential metabolic pathways of the cell by inhibition of specific (thiol-containing) deshydrogenase enzymes involved in the Krebs (tricarboxylic acid) cycle and electron transport (NADH).

The active substance as manufactured is a reaction mass of 5-chloro-2-methylisothiazol-3(2H)-one (C(M)IT) and 2-methylisothiazol-3(2H)-one (MIT) in ratio (3:1).

The active substance is manufactured as a technical concentrate (TK) with different solvents and stabilizers.

C(M)IT/MIT (3:1) is very reactive with some substances and should be stabilized in the product. For this reason, the active substance is manufactured directly to its product form.

Specifications for the reference source are established.

The physico-chemical properties of the active substance and biocidal product have been evaluated and are deemed acceptable for the appropriate use, storage and transportation of the active substance and biocidal product.

Analytical methods are available for the active substance as manufactured, for the stabilizers and for the relevant and significant impurities and the relevant matrices soil, water and air.

The current classification and labelling for C(M)IT/MIT according to Regulation (EC) No 1272/2008 (CLP Regulation) is:

Classification according to the CLP Regulation	
Hazard Class and Category Codes	Acute Tox. 3/H331 Acute Tox. 3/H311 Acute Tox. 3/H301 Skin Corr. 1B/H314 Skin Sens. 1/H317 Aquatic Acute 1/H400 Aquatic chronic 1/H410
Labelling	
Pictograms	SGH05 SGH06 SGH07 SGH09
Signal Word	Danger Warning

Hazard Statement Codes	H331: Toxic if inhaled H311: Toxic in contact with skin H301: Toxic if swallowed H314: Causes severe skin burns and eye damage H317: May cause an allergic skin reaction H410 Very toxic to aquatic life with long lasting effects.
Specific Concentration limits, M-Factors	Skin Corr. 1B; H314: Causes severe skin burns and eye damage C ≥ 0.6% Eye Irrit. 2; H319: Causes serious eye irritation Skin Irrit. 2; H315: Causes skin irritation 0.06% ≤ C < 0.6% Skin Sens. 1;H317: May cause an allergic skin reaction C ≥ 0.0015%

However, a new proposal for the classification and labelling for C(M)IT/MIT according to Regulation (EC) No 1272/2008 (CLP Regulation) is proposed as follow:

Classification according to the CLP Regulation	
Hazard Class and Category Codes	Acute Tox. 3 for acute oral hazard/H301 Acute Tox 2 for acute dermal hazard/H310 Acute Tox 2 for acute inhalation hazard/H330 Skin Corr. 1B/H314 Skin Sens. 1A/H317 Aquatic acute 1/H400 Aquatic Chronic 1/H410
Labelling	
Pictograms	SGH05 SGH06 SGH07 SGH09
Signal Word	Danger Warning
Hazard Statement Codes	H 330: Fatal if inhaled H 310: Fatal in contact with skin H 301: Toxic if swallowed H 314: Causes severe skin burns and eye damage H 317: May cause an allergic skin reaction H410 Very toxic to aquatic life with long lasting effects.
Specific Concentration limits, M-Factors	Skin Corr. 1B; H314: Causes severe skin burns and eye damage C ≥ 0.6% Eye Irrit. 2; H319: Causes serious eye irritation Skin Irrit. 2; H315: Causes skin irritation 0.06% ≤ C < 0.6% Skin Sens. 1A;H317: May cause an allergic skin reaction C ≥ 0.0015% Acute M-factor: 100 Chronic M-factor: 100

The CLH report was sent to ECHA on 17 October 2014.

b) Intended use, target species and effectiveness

C(M)IT/MIT is an isothiazolone substance, which is used as a broad spectrum antimicrobial agent for preventing the growth of microorganisms (bacteria, fungi and algae) that may occur within papermill (wet end of paper mills and in the circulating process water used (prevent a reduction of paper quality (holes and stains)) and oilfield injection systems (in injection water lines and raw materials used in processing for enhanced oil recovery (prevent an enhanced corrosion of pipework and odors, pH drop and reduced quality of the process additives)).

C(M)IT/MIT biocidal products are exclusively used by professionals or industrial users in PT12.

Typical use concentrations range claimed the applicants is respectively from 5 to 30 mg/L of C(M)IT/MIT in oilfield and from 0.4 to 15 mg/L in papermills. Concentrations of C(M)IT MIT for which an efficacy (microbicidal activity) is demonstrated, are presented in the following tables:

MG/PT	Field of use envisaged	Likely concentration at which C(M)IT/MIT (active substance, a.i.) will be used
PT12.01	The biocide is used in the wet end of paper mills to control the growth of target organisms in the circulating process water used in these systems.	Maintenance: 1 to 15 ppm (or mg a.i/L) total a.i.(in continuous)
PT12.01	The biocide is used in paper mills to control the growth of target organisms in the circulating process water.	Shock dose: 6.0 to 9.0 ppm (or mg a.i/L) by shock dosing up to 4 times delay per day separated to 6 hours
PT12.02	Oilfield Injection Systems – The biocide is used to control the growth of target organisms in injection water lines and raw materials used in processing for enhanced oil recovery (drilling muds and fracture fluids).	Shock dose: 30 ppm (or mg a.i/L) total a.i. (contact time : 48h minimum)

C(M)IT/MIT has been used as a commercial antimicrobial agent since 1980. During this period of use, situations where resistance to C(M)IT/MIT have occurred. In commercial use, C(M)IT/MIT is often used in combination or rotation with other biocides in various applications, which helps to avoid the potential risk of developing resistance.

Microbial resistance to C(M)IT/MIT has been described in the literature; thus, special attention should be given at the product authorisation stage.

c) Overall conclusion of the evaluation including need for risk management measures

Human health

C(M)IT/MIT induces a local irritation observed by oral, dermal and inhalation routes.
No systemic effects were observed in the absence of local effect in any available study, except on body weight gain and food consumption.

Concerning systemic effects, PPE are presented in the table below and concerning local effects, PPE are presented with other RMMs in the local effects section.

The table below summarises the exposure scenarios assessed.

Summary table: human health scenarios		
Scenario	**Primary or secondary exposure and description of scenario**	**Exposed group**
Papermill slimicide	Primary exposure Control the growth of target organisms in the circulating process water of wet end of paper mills: - Loading in process water system; - Cleaning dispensing pumps; - Equipment maintenance ; - Process water sampling; - waste disposal; - Combined exposure of all daily tasks. PPE: chemical-resistant gloves (10% penetration), impermeable coveralls (5% penetration), RPE (10% penetration) only for loading.	Professionals
Inhalation and demal contact with humidified air in papermill	Secondary exposure	Professionals
Ingestion of paper containing residues	Secondary exposure	General public
Ingestion of food contamitated by migration of residues from paper packaging exposed to treated circulating water	Secondary exposure	General public
Oilfield injection sytem	Primary exposure Control the growth of target organisms in injection water lines and raw materials used in processing for enhanced oil recovery (drilling muds and fracture fluids): - Manual or automated loading in injection system; - Cleaning dispensing pumps; - Equipment maintenance; - Process fluid sampling; - Combined exposure of all daily tasks. PPE: chemical-resistant gloves (10% penetration), impermeable coveralls (5% penetration).	Professionals

Indoor and outdoor exposure to treated mud aerosol	Secondary exposure After mud is pumped to the drill, it emerges from the well and it passes over a shale shaker, to remove debris and return to the mud pit. The workers who keep the shaker screens operational are exposed to substantial aerosols by dermal and oral route. This represents the worst case secondary exposure to treated mud. All other workers involved in drilling operation can potentially be in contact to the treated mud.	Profesionals

Local effects

According to the criteria of the Regulation 1272/2008 C(M)IT/MIT is proposed to be classified as a skin, eye and respiratory irritant and a skin sensitizer category 1A. The most critical local effect is skin sensitization, with a proposed specific concentration limit (SCL) of maximum 0.0015% (15 ppm)

Manual mixing and loading of C(M)IT/MIT based products and post application phases to process fluids present an unacceptable risk for local effects.

However, the risk has been considered acceptable for professionals taking into account that appropriate risk mitigation measures are applied during the different phase of use of the products in order to prevent any spillage on skin.

Possible measures (not exhaustive list) are:

- The containers of the products are designed to prevent spillages during pouring;
- Automated systems preventing contacts with the product are used;
- Procedures are implemented to prevent contacts and spillages;
- Chemical-resistant coveralls, gloves, shoes and face-mask are worn;
- Use is restricted to operators informed of the hazards and safe handling of the products.

Labels, SDS and use instructions of the products shall inform the users of the hazards and of the protective measures. Written procedures and protective equipments shall be available at the places where the products are handled.

For oilfield injection system:
Concerning the dermal secondary exposure, the risk is considered acceptable if the concentration of C(M)IT/MIT in the mud used for the oilfield injection system is reduced below the threshold value set for sensitizing properties.
Concerning the secondary exposure to indoor treated mud aerosol, the risk is considered acceptable if respiratory protective equipments are worn.

Systemic effects

The mixing and loading, application and post-application tasks could potentially occur on the same day. Therefore combined exposure was considered for all daily tasks. Safes uses were identified for all the primary exposure scenarios if wearing of appropriate personal protective equipment (PPE), including impermeable coverall, and gloves and a if a rinse step is considered before the cleaning phase.

No unacceptable risk was identified for the secondary exposure scenarios.

Environment

The table below summarises the exposure scenarios assessed.

Summary table: environment scenarios	
Scenario	**Description of scenario including environmental compartments**
Papermill slimicide "realistic worst case"	No connection to a pulp mill. Water from the paper mill is subjected to settling and mechanical/chemical treatment in the paper mill and then discharged to surface water. Emission to surface water
Papermill slimicide "typical case"	Connection to a pulp mill Wastewater after settling is discharged to an industrial STP and then discharged to surface water. Emissions to surface water, soil and groundwater via STP
Slimicides in oil drilling processes	Direct emission to marine water

Exposure of the environment via the atmosphere is considered to be negligible. The sediment compartment is deemed not relevant considering the low Koc value. In addition secondary poisoning is not assessed due to the low bioaccumulative properties of the substance.

Papermill slimicide:

Safe uses are identified for aquatic, sewage treatment plant and terrestrial compartments taking into account the simulation study in the STP showing that only MIT is released after mechanical/chemical treatment or after STP treatment, and considering an appropriate dilution factor of industrial release from the the paper mill facilities into the watercourse.

Minimal watercourse dilutions (obtained by reverse calculation method) are proposed in the assessment report according to the dose rate level and for the uses considered in the assessment.

Slimicide in oil drilling processes:

No safe use for the marine water was identified for the application of the substance as oil well slimicide.

2.2. Exclusion and substitution criteria

2.2.1. Exclusion and substitution criteria

The table below summarises the relevant information with respect to the assessment of exclusion and substitution criteria:

Property		Conclusions
CMR properties	Carcinogenicity (C)	no classification required
	Mutagenicity (M)	no classification required
	Toxic for reproduction (R)	no classification required
Respiratory sensitisation	No classification required	
PBT and vPvB properties	Persistent (P) or very Persistent (vP)	not P or vP
	Bioaccumulative (B) or very Bioaccumulative (vB)	not B or vB
	Toxic (T)	T

Endocrine disrupting properties	The active substance is not considered to have endocrine disrupting properties

Consequently, the following is concluded:

C(M)IT/MIT does not meet the exclusion criteria laid down in Article 5 of Regulation (EU) No 528/2012.

The criterion (f) laid down in Article 10 of Regulation (EU) No 528/2012 should be applied on the active substance as manufactured. For C(M)IT/MIT, stabilizer salts and solvents present in the active substance as manufactured are intentionally added. In that case, they can not be considered either as non-active isomers or as impurity. In consequence, in the active substance as manufactured, the total impurities content is lower than 20% and there is no non-active isomer. C(M)IT/MIT does not meet the conditions of the criteria (f) laid down in Article 10 of Regulation (EU) No 528/2012, and is therefore not considered as a candidate for substitution.

C(M)IT/MIT is proposed to be classified as a skin sensitizer category 1A. This critical effect can be managed with very restrictive risk mitigation measures to avoid any skin contact during use of biocidal products by professionals and by limiting the concentration of C(M)IT/MIT in treated articles used by professionals and non professional below the threshold value set for sensitizing properties, when skin contact cannot be avoided by other measures. With the application of these conditions, it can be considered that criterion e) of Article 10(1) of the Biocidal Products Regulation is not fulfilled.

The exclusion and substitution criteria were assessed in line with the "Note on the principles for taking decisions on the approval of active substances under the BPR"[1] and in line with "Further guidance on the application of the substitution criteria set out under article 10(1) of the BPR"[2] agreed at the 54th and 58th meeting respectively, of the representatives of Member States Competent Authorities for the implementation of Regulation 528/2012 concerning the making available on the market and use of biocidal products. This implies that the assessment of the exclusion criteria is based on Article 5(1) and the assessment of substitution criteria is based on Article 10(1)(a, b, d, e and f).

2.2.2. POP criteria

C(M)IT/MIT does not fulfil criteria for being a persistant organic pollutant (POP) and does not have potential for long-range transboundary atmospheric transport.

2.3. BPC opinion on the application for approval of the active substance C(M)IT/MIT in product type 12

In view of the conclusions of the evaluation, it is proposed that C(M)IT/MIT shall be approved and be included in the Union list of approved active substances, subject to the following specific conditions:

1. Specification: minimum purity of the active substance C(M)IT/MIT (3:1) evaluated: the active substance is manufactured as a technical concentrate (TK) with different solvents and stabilizers. The theoretical (calculated) dry weight specification:minimum purity of C(M)IT-MIT (3:1): 579 g/kg.

2. The product assessment shall pay particular attention to the exposures, the risks and the efficacy linked to any uses covered by an application for authorisation, but not addressed in the Union level risk assessment of the active substance.

[1] See document: Note on the principles for taking decisions on the approval of active substances under the BPR (available from https://circabc.europa.eu/d/a/workspace/SpacesStore/c41b4ad4-356c-4852-9512-62e72cc919df/CA-March14-Doc.4.1%20-%20Final%20-%20Principles%20for%20substance%20approval.doc)
2 See document: Further guidance on the application of the substitution criteria set out under article 10(1) of the BPR (available from https://circabc.europa.eu/d/a/workspace/SpacesStore/dbac71e3-cd70-4ed7-bd40-fc1cb92cfe1c/CA-Nov14-Doc.4.4%20-%20Final%20-%20Further%20guidance%20on%20Art10(1).doc)

3. For professional users, safe operational procedures, appropriate organisational and technical risk mitigation measures shall be established. Products shall be used with appropriate personal protective equipment where exposure cannot be reduced to an acceptable level by other means.

4. Labels and/or safety data sheets shall indicate that the biocidal products containing C(M)IT/MIT should not be authorised for use as a slimicide in off-shore installations unless it can be demonstrated at product authorisation that risks to the environment are acceptable.

5. Labels and/or safety data sheets, for products used as a slimicide in off-shore installations, shall indicate that the end-use concentration of CMIT/MIT in drilling mud shall not exceed the threshold value set for sensitising properties, unless safe operational procedures, appropriate organisational and technical risk mitigation measures can be established for workers.

6. Labels and/or safety data sheets, for products used in paper mills shall indicate the need for an appropriate dilution of the industrial release from the facilities into the watercourse after mechanical/chemical treatment or after treatment in an STP, unless it can be demonstrated at product authorisation that risks to the environment can be reduced to an acceptable level by other means.

The active substance does not fulfil the criteria according to Article 28(2)(a) to enable inclusion in Annex I of Regulation (EU) 528/2012.

2.4. Elements to be taken into account when authorising products

1. Some situations of resistance with C(M)IT/MIT have been described in the literature and therefore before authorizing products, Member States should pay attention to possible occurrence of resistance.

2. For treated articles intended to be used as food contact materials the EFSA Scientific Opinion on the safety evaluation of the substance, as a biocide for processing coatings and paper and boards (EFSA Journal 2010;8(3):1541) should be considered.

3. For biocidal products that trigger classification as skin sensitisers the Member States' Competent Authorities note for guidance (CA-Sept13-Doc.6.2.a – Final.Rev1) should be used to decide whether they could be authorised for non-professional uses.

4. For the refinement of the environmental risk assessment for the use in oil field injection systems further information can be provided at product authorisation stage.

2.5. Requirement for further information

Sufficient data have been provided to verify the conclusions on the active substance, permitting the proposal for the approval of C(M)IT/MIT. However, the following data should be provided to the evaluating Competent Authority (France) as soon as possible but no later than 6 months before the date of approval of the active substance:

1. Some sources could not be validated. Therefore further data will need to be submitted as specified in the confidential annex of the evaluation.