



PQT/VCP Executive Summary of Prequalification Decision

2GARD

(Clothianidin and Deltamethrin Indoor Residual Spray)

Prequalification Unit – Vector Control Products Assessment (PQT/VCP)

Regulation and Prequalification Department (RPQ)

Access to Medicines and Health Products (MHP)

World Health Organization (WHO)

1 Introduction

WHO's Prequalification Unit, Vector Control Product Assessment team (PQT/VCP) assesses vector control products and public health pesticide active ingredients to determine their acceptability and that they can be used safely, effectively and are manufactured to a high-quality standard. This is done by assessing product dossiers, inspecting manufacturing sites, and supporting quality-control testing of products. Products that meet prequalification requirements are added to the WHO list of vector control products.

WHO prequalification of vector control products primarily benefits populations most affected by vector-borne diseases by facilitating access to these prevention focused tools. The vector-borne diseases include malaria, and neglected tropical diseases such as Dengue, Chikungunya, Zika, Chagas, Lymphatic filariasis, Leishmaniasis, Human African trypanosomiasis, Onchocerciasis and Schistosomiasis.

This Executive Summary document conveys the decision for prequalification of the product 2GARD manufactured by Tagros Chemicals India Ltd. (PQ Ref# 004-018) in conjunction with the Letter of Prequalification. The PQT/VCP Decision Document presents the complete assessment. In some cases, the PQT/VCP Executive Summary may be published in advance of the PQT/VCP Decision Document.

2 Product Identification

2GARD is a wettable powder formulation packaged in water soluble bags (WP-SB), containing a combination of Clothianidin (CAS No. 210880-92-5; 500g/kg; 50%) and Deltamethrin (CAS No. 52918-63-5; 62.5 g/kg; 6.25%). Clothianidin, (*E*)-1-(2-chloro-1,3-thiazol-5-ylmethyl)-3-methyl-2-nitroguanidine, is a neonicotinoid insecticide already commercialized in crop protection and professional pest control in a variety of formulations. Deltamethrin, (*S*)- α -cyano-3-phenoxybenzyl (1*R*,3*R*)-3-(2,2-dibromovinyl)-2,2-dimethylcyclopropane carboxylate, is a broad-spectrum pyrethroid insecticide also commercialized in a variety of formulations for a variety of use patterns. Tagros Chemicals India Ltd. submitted an application claiming equivalence of the proposed product to the prequalified product Fludora Fusion (PQ Ref# 008-006) manufactured by Bayer S.A.S.

The product, 2GARD, is intended to be used for malaria vector control as an Indoor Residual Spray (IRS). This WP product is contained in sealed water soluble bags and will be applied exclusively on the inner walls of dwellings at a rate of one 100 g sachet per 10 L sprayer or one 80 g sachet per 8 L sprayer. The target dose rate of the product is 200 mg/m² clothianidin and 25 mg/m² deltamethrin.

3 Assessment of Quality

3.1 Chemical and Physical Properties

Data on the chemical and physical properties of the active ingredients and the product 2GARD were provided. These data were obtained from studies conducted according to established standards and/or Good Laboratory Practices (GLP) and are considered complete. Product specific properties are summarized in Table 1. The WHO Specification 738+333/WP-SB is available for use in support of QA/QC testing.

The sources of active ingredients are supported by existing WHO specifications.

Data on the manufacturing process and product composition for 2GARD have been provided and are adequate. The product is formulated in Gujarat, India.

The identified reference methods in Table 2 are appropriate for the determination of the active ingredient content in the product.

The quality component of the dossier is considered complete, and the assessment of the submitted information on quality supports the prequalification of the product.

Table 1 Chemical and Physical Properties for 2GARD			
Data Requirement	Study Number	Test Method ID	Result
Active ingredient	RCC 9379	Clothianidin 738/WP/M/2, CIPAC Handbook N, p.15, 2012 Deltamethrin: 333/WPM2/2, CIPAC Handbook L, p.50, 2006	Clothianidin concentration: initial: 501.7 g/kg After accelerated storage (2 weeks at 54 °C): 499.7 g/kg certified limits: 475-525 g/kg Deltamethrin concentration: initial: 64.1 g/kg After accelerated storage (2 weeks at 54 °C): 64 g/kg certified limits: 56.25-68.75 g/kg No significant differences between clothianidin and deltamethrin concentration values before and after storage stability test
pH (1% aqueous dilution)	RCC 9379	MT 75.3, CIPAC Handbook J, p. 131, 2000	Measured pH=5.29 pH range should be: 3 to 6 After accelerated storage (2 weeks at 54 °C) Measured pH=5.30 No significant differences between pH values before and after storage stability test
Wettability	RCC 9379	MT 53.3.1, CIPAC Handbook F, p.165, 1995	Wettability: 19 seconds The formulation should be completely wetted in 1 min without swirling. After accelerated storage (2 weeks at 54 °C) Wettability: 21.5 seconds No significant differences between wettability values before and after storage stability test
Wet sieve test	RCC 9379	MT 185, CIPAC Handbook K, p.149, 2003	Residue: 0.16% Maximum: 1% retained on a 75 µm test sieve. After accelerated storage (2 weeks at 54 °C) Residue: 0.17% No significant differences between wet sieve test results before and after storage stability test
Suspensibility	RCC 9379	MT 184, CIPAC Handbook K, p.142, 2003	Clothianidin Suspensibility: 89.1%

Table 1 Chemical and Physical Properties for 2GARD

			<p>A minimum of 70% should be in suspension after 30 minutes in CIPAC Standard Water D at $30 \pm 2^{\circ}\text{C}$.</p> <p>After accelerated storage (2 weeks at 54°C) Suspensibility: 89.9%</p> <p>No significant differences between clothianidin suspensibility values before and after storage stability test</p> <p>Deltamethrin</p> <p>Suspensibility: 87.7%</p> <p>A minimum of 70% should be in suspension after 30 minutes in CIPAC Standard Water D at $30 \pm 2^{\circ}\text{C}$.</p> <p>After accelerated storage (2 weeks at 54°C) Suspensibility: 88.0%</p> <p>No significant differences between deltamethrin suspensibility values before and after storage stability test</p>
Persistent foam	RCC 9379	MT 47.3, CIPAC Handbook O, p.177, 2017	<p>Persistent foam: 18.5 ml Maximum: 50 ml after 12 min.</p> <p>After accelerated storage (2 weeks at 54°C) Persistent foam: 19.5 ml</p> <p>No significant differences between persistent foam values before and after storage stability test</p>
Dissolution of the bag	RCC 9379	MT 176, CIPAC Handbook F, p. 440, 1995	<p>Flow time of the suspension: 23 sec. No fragments in the funnel observed. Dissolution of the bag was suitable. Maximum: 30 sec.</p> <p>After accelerated storage (2 weeks at 54°C) Flow time of the suspension: 16 sec. No fragments in the funnel observed. Dissolution of the bag was suitable.</p> <p>No significant differences between dissolution of the bag values before and after storage stability test</p>

Note: In supplement to the GLP study, Quality Control data generated by the applicant was submitted on 10 additional batches. All batches complied with the presented limits, including after accelerated storage.

Table 2. Details of the analytical method used to determine clothianidin and deltamethrin in 2GARD product

Quantification of Clothianidin	CIPAC 738/WP/M/3, CIPAC Handbook N, p.15, 2012
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Quantification of Deltamethrin	333/WP/M2/3, CIPAC Handbook L, p.46, 2006

4 Assessment of Safety

Safety information is not required to be submitted for IRS products claiming equivalence.

5 Assessment of Efficacy

5.1 Background

The primary purpose for the use of a pesticide is the control of a pest, including disease transmitting vector. Vector control tools, including formulated pesticides, which provide effective management/control of vectors, may be used as part of a resistance management program. Vector control products for use in public health are a component of Integrated Vector Management (IVM), which is a program that relies on a suite of diverse interventions and implementation of best practices to manage the vector and chemical/behavioral resistance.

5.2 Efficacy Conclusions

Assessment of the submitted efficacy study performed in a lab setting revealed that there is sufficient evidence to demonstrate that 2GARD meets the efficacy requirements for prequalification. The efficacy study was performed according to recommended protocols using different mosquito species and strains from different locations.

The supporting data indicate that the product may have continued efficacy for a duration of up to 6 months depending on the mosquito strain, surface type and environmental conditions.

Overall, the data indicated that the product performance supports the claim of equivalence to the reference product. The observed performance against the susceptible *A. gambiae* (Kisumu) remained nearly 100% (mortality) throughout the study on mud, cement, and plywood. The observed knockdown effect was more variable, but remained high through 9 months.

However, observed performance on resistant *A. gambiae* (KisKDR) and *A. coluzzii* (M'Be) was more variable with significantly lower knockdown effects. Observed mortality of the resistant strains on cement and mud remained above 80% up to month 6. Results for mortality on plywood were highly variable with some observed mortality measurements below 80% prior to month 6.

6 Labelling

The proposed Declaration of Labelling has been reviewed by PQT/VCP and found to be consistent with the supporting information.

7 Post-Prequalification Commitments

There are no additional post-prequalification commitments associated with this decision of prequalification.

8 Pre-Qualification Listing Decision

The review of the dossier submitted for the product 2GARD has been completed by PQT/VCP. The results of the assessments show the product meets the claim of equivalency when used according to the directions for use on the label. The product is allowed inclusion on the list of prequalified vector control products.