

Date: August 18, 2004

SUBJECT: VOLFEE. Product Chemistry Review of Chlorothalonil Technical Fungicide

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*8/18/04*

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*DMC*

DP BARCODE: D302851 & 303004  
EPA REG. NO.: 74601-R  
PRODUCT: Chlorothalonil Technical Fungicide  
PCC : 081901  
REGISTRANT: VISCHIM, S. R. L  
USE: Fungicide

INTRODUCTION:

Technology Sciences Group, on behalf of Vischim S.R.L, has submitted an application for me-too registration of chlorothalonil technical fungicide. The Reregistration Eligibility Document (RED, April 1997) for chlorothalonil required that all technical and manufacturing use products containing chlorothalonil must certify a maximum level of HCB in these products of 40 ppm by January 1, 2003. Vischim recently conducted a five batch analysis (assigned MRID No. 459430-01) to address this requirement, which must be used in place of the original report (MRID No. 457102-01) submitted with the original application. Based on the five batch analysis, a revised CSF for basic formulation (dated June 4, 2003) has been submitted. The preliminary analysis also indicated a higher nominal concentration of the active ingredient than claimed in the original application (99.4% versus 99.0% in original). The revised CSF and the label reflect these results. The original data were assigned the MRID Nos 457102-01 and 457102-02; the new five batch analysis study has been assigned the MRID No. 457102-01. The registrant has claimed that the proposed product is substantially similar to the registered product with Reg. No. 50534-7. The TRB has been asked to evaluate the product chemistry data submitted for Chlorothalonil technical produced in Italy and determine its similarity to the registered product from chemistry point of view.

SUMMARY OF FINDINGS:

1. The registrant has submitted a revised Confidential Statement of Formula for alternate formulation (dated 06-04-03) for chlorothalonil technical based on the recent 5 batch analysis study. The average purity of the technical chlorothalonil was 99.4%, as determined by the five batch analysis. The proposed certified limits for the chlorothalonil are not in accordance with standard limits as described in 40CFR§158.175(b)(2), but are based on expected production variability. The product chemistry data submitted corresponding to guideline reference 830.1550 (product identity & composition) and 830.1750 (certified limits) satisfy the data requirements of 40CFR§158.155 and 158.175 respectively. [MRID No. 459430-01 & 457102-01]
2. The product chemistry data submitted corresponding to guideline reference 830.1600 (description of material used to produce the product) satisfy the data requirements of 40CFR§ 158.160. The registrant has provided product specifications data on all the starting materials used for the production of this technical. [MRID No. 457102-01]
3. The product chemistry data submitted corresponding to guideline reference 830.1620 (description of production process) satisfy the data requirements for 40CFR§158.162. The active ingredient was produced by continuous process which has been described in details including the quality assurance steps to obtain consistency of the product. [MRID No. 457102-01]

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4. The product chemistry data submitted corresponding to guideline reference 830.1670 (discussion on the formation of impurities) satisfy the data requirements for 40CFR§158.167. The registrant has listed [REDACTED] impurities including the hexachlorobenzene (HCB). The impurities were determined by [REDACTED]. The determination of HCB at very low concentrations required [REDACTED] [MRID No. 459430-01]

5. The data submitted corresponding the guideline reference 830.1700 (preliminary analysis) satisfy the data requirements of 40CFR§158.170. Five representative batches of the technical were analyzed for percent active ingredient by GC with internal standard using the FID. The determination of HCB at very low concentrations required [REDACTED] [MRID No. 459430-01]

6. The data submitted corresponding the guideline reference 830.1800 (enforcement analytical method) satisfy the data requirements of 40CFR§158.180. The method described in item # 5 above was used to assay the active ingredient in the technical product and was non-confidential. The method is based on comparison of the ratio of chlorothalonil analytical standard peak area versus to the dibutyl phthalate standard (IS) peak area and the same ratio in the sample with a known amount of IS added. The method was validated for accuracy, linearity, and precision. [MRID No. 459430-01 & 457102-01]

7. The data submitted corresponding to 830 series subgroup B (physical-chemical properties) satisfy the data requirements of 40CFR§158.190. The applicant has stated that the studies corresponding to guidelines 830.6317 (one year storage stability) and 830.6320 (corrosion characteristics) are in progress. [MRID No. 457102-02]

#### **CONCLUSIONS:**

The TRB has reviewed the product chemistry data submitted for chlorothalonil technical and has concluded that:

1. All the product chemistry data submitted corresponding to 830 Series Subgroup A & Subgroup B satisfy the data requirements of 40CFR§158.155 to 158.190 and are acceptable, except for storage stability & corrosion characteristics studies.

2. The CSF for basic formulation (dated 06-04-03 ) is acceptable.

3. The results of one year storage stability (830.6317) and corrosion characteristics (830.6320) must be submitted to the Agency on completion.

4. The proposed product was determined to be substantially similar to the registered product with Reg. No. 50534-7 from product chemistry point of view. The amount of toxic impurity (HCB) reported on the CSF of the proposed product is less than the amount present in the registered product.

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**830.1550. Product identity & Composition:** (MRID No. 461720-01)

**Common Name:** Chlorothalonil

**Chemical name:**

**CAS Name:** 2,4,5,6-Tetrachloro-1,3-benzodicyanide

**IUPAC Name:** Tetrachloroisophthalonitrile

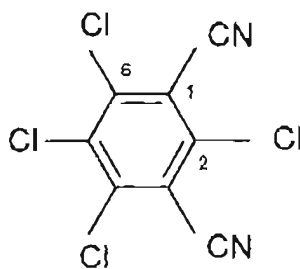
**CAS No.:** 1897-45-6

**PC Code No.:** 081901

**Empirical formula:** C<sub>8</sub> Cl<sub>4</sub> N<sub>2</sub>

**Molecular Weight:** 265.93

**Structural formula:**



Chlorothalonil

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Table 1: Manufacturing and Impurity Data for Chlorothalonil Technical				
GLN	Requirement	MRID	Status	Details and/or Deficiency
830.1550	Product identity and composition	Basic CSF (06-04-03)	A	The NC of AI (99.4%) is supported by 5 batch analysis & agree with the label claim NC. [REDACTED] impurities are listed on the CSF.
830.1600	Description of materials used to produce product	457102-01	A	The product specification sheets(MSDS) for all the starting materials have been provided by registrant.
830.1620	Description of production process	457102-01	A	The production process has been described in full details. The production process is a continuous process The reaction conditions are given, and the amounts of the reagents used in each step have been provided. The QA steps involved in each step have been described.
830.1670	Discussion of formation of impurities	457102-01 459430-01	A	The registrant has provided the complete mechanisms of formation, quantification and identification of all the impurities. The HCB has been reported with maximum of [REDACTED]
830.1700	Preliminary analysis	457102-01 459430-01	A	Registrant has provided 5 batch analysis for the TGA. The AI was assayed by using GC/FID with internal standard. The analytical method was validated for precision, linearity & accuracy.
830.1750	Certified limits	Basic CSF (06-04-03)	A	The proposed certified limits for the AI and impurities are not based on the standard certified limits, but are based on the expected production variability.
830.1800	Enforcement analytical method	457102-01	A	The GC/FID with internal standard method was used for the assay of the AI in technical. The method validated for linearity, accuracy and precision.
A = Acceptable; N = Unacceptable (see Deficiency); N/A = Not Applicable.; G = Data gap; I = In progress or need upgrade; U = Up-grade(additional information required)				

830 Series Subgroup B (Physical-Chemical properties)

Table 2: Physical and Chemical Properties of Chlorothalonil Technical				
GLN	Requirement	MRID	Status	Result or Deficiency
830.6302	Color	457102-02	A	White
830.6303	Physical state	" " "	A	Crystalline solid
830.6304	Odor	" " "	A	Odorless
830.6313	Stability to normal and elevated temperatures, metals, and metal ions	" " "	A	known to be stable at higher temperatures ; no data submitted on stability to metal & metal ions
830.6314	Oxidation/reduction: chemical incompatibility	" " "	W	waiver accepted
830.6315	Flammability		NA	
830.6316	Explosibility		NA	
830.6317	Storage stability		I	One year study is in progress
830.6319	Miscibility		NA	
830.6320	Corrosion characteristics		I	one year study in progress along with storage stability
830.7000	pH	457102-02	A	5 - 6 at 20°C (1% suspension in water)
830.7050	UV/Visible absorption	" " "	A	232 nm ( $\epsilon=62390$ ), 312 nm ( $\epsilon=1116$ ), & 324 nm ( $\epsilon=1507$ )
830.7100	Viscosity		NA	
830.7200	Melting point	457102-02	A	252.6 to 254.5°C (PAI)
830.7220	Boiling point	" " "	A	boils at 350°C
830.7300	Relative Density	" " "	A	1.7315 @ 20 °C
830.7370	Dissociation constants in water	" " "	W	DC could not be measured. The TS is neither acid nor basic character
830.7550	Partition coefficient	" " "	A	Log Po/w = 2.93 at 22 °C
830.7840	Water solubility:		A	$5.42 \times 10^{-1}$ g/l (0.542 ppm or mg/l) at 20°C; solubility in organic solvents See Note 1
830.7950	Vapor pressure		A	$2.2 \times 10^{-4}$ Pa at 25°C

A = acceptable, N = Not acceptable, U = Upgrade required, I = In progress or incomplete, W = waiver, G = Data gap, NA = Not applicable.

**Note 1. Solubility in organic solvents (g/l):** acetone (16.1), dichloromethane (25.8), ethyl acetate (9.63), hexane (0.124), methanol (1.36), toluene (48.4).

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**830.1800. Enforcement analytical method:** (MRID No. 457102-01)

The AI, chlorothalonil was determined by GC/FID method. The weighed amount of chlorothalonil was dissolved in acetone with a known concentration of dibutyl phthalate (IS). Calibrant were prepared similarly, using measured amounts of reference standard chlorothalonil dissolved in acetone, also with a known concentration of dibutyl phthalate. The test solution and the calibrant were analyzed using capillary GC equipped with FID. The level of chlorothalonil in chlorothalonil technical was calculated from the relative responses of chlorothalonil and dibutyl phthalate in the test solution and the calibrants. The method is applicable for levels of chlorothalonil between 90%w and 100% w.

**Instrument & Parameters:**

**GC:** Gas chromatograph equipped with FID

**Column:** DB-5, 30 m x 0.53 mm, film thickness 1.5 µm

**Column temperature:** 150°C ( 5 min) to 250°C (5°C/min)

**Injector temperature:** 240°C

**Detector temperature:** 280°C

**Column head pressure:** 70 kPa at 150°C

**Total helium pressure:** 130 kPa

**Injection volume:** 1 µL, splitless 0.5 min

**Retention time:** chlorothalonil - 12 min; dibutyl phthalate - 15 min

The analytical method was validated for precision, accuracy, and linearity.

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The material not included contains the following type of information:

\_\_\_\_\_ Identity of product inert ingredients.

\_\_\_\_\_ Identity of product impurities.

X Description of the product manufacturing process.

X Description of quality control procedures.

\_\_\_\_\_ Identity of the source of product ingredients.

\_\_\_\_\_ Sales or other commercial/financial information.

\_\_\_\_\_ A draft product label.

X The product confidential statement of formula.

\_\_\_\_\_ Information about a pending registration action.

\_\_\_\_\_ FIFRA registration data.

\_\_\_\_\_ The document is a duplicate of page(s) \_\_\_\_\_.

\_\_\_\_\_ The document is not responsive to the request.

\_\_\_\_\_ Proprietary information pertaining to the chemical composition of an inert ingredient provided by the source of the ingredient.

\_\_\_\_\_ Attorney-Client Privilege.

\_\_\_\_\_ Claimed Confidential by submitter upon submission to the Agency.

\_\_\_\_\_ Internal Deliberative Information.

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\* The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

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