



## Saltidin® Wipe 20 %

Saltidin® (known as Picaridin in the US)

**Issued in February 2011**

This information and our technical advice - whether verbal, in writing or by way of trials - are given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. Our advice does not release you from the obligation to verify the information currently provided - especially that contained in our safety data and technical information sheets - and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our products and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with the current version of our General Conditions of Sale and Delivery.



## Summary

	Page
<b>1. Preliminary remarks</b>	3
<b>2. Physical and chemical properties</b>	4
<b>3. Formulation</b>	6
3.1 Wipe formulation	6
3.2 Liquid phase formulation	6
3.3 Liquid phase preparation	7
3.4 Wipe preparation	7
3.5 Physical data of liquid phase	7
3.6 Physical data of wipe	7
3.7 Packaging material	8
3.8 Stability	8
<b>4. Efficacy</b>	9
4.1 Effectiveness against mosquitoes	9
<b>5. Information</b>	10
<b>6. References</b>	11

This information and our technical advice - whether verbal, in writing or by way of trials - are given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. Our advice does not release you from the obligation to verify the information currently provided - especially that contained in our safety data and technical information sheets - and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our products and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with the current version of our General Conditions of Sale and Delivery.



## 1. Preliminary Remarks

The use of repellents by application to skin and clothing is an important means of human protection against blood-sucking insects and ticks as well as arthropod-borne disease transmission.

Saltidin® belongs to a new generation of synthetic repellents developed as an alternative to DEET.

Developed by Bayer AG using molecular modelling techniques, Saltidin® showed the best performance among more than 800 substances against a variety of arthropods and the best characteristics as far as safety and compatibility with skin and plastic materials are concerned.

Presently, this molecule is owned by Saltigo GmbH (LANXESS Group) and is marketed by LANXESS Corporation (previously a Division of Bayer Corporation) in the USA.

Saltidin® is a safe and reliable insect repellent and stands for effective protection against various diseases transmitted by:

- ✓ Mosquitoes
- ✓ Ticks
- ✓ Flies
- ✓ Horseflies
- ✓ Sandflies
- ✓ Biting midges
- ✓ Fleas
- ✓ Ants
- ✓ Cockroaches

Due to its broad spectrum of efficacy, its favourable toxicological and cosmetic properties, Saltidin® can be safely used by consumers.

This information and our technical advice - whether verbal, in writing or by way of trials - are given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. Our advice does not release you from the obligation to verify the information currently provided - especially that contained in our safety data and technical information sheets - and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our products and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with the current version of our General Conditions of Sale and Delivery.



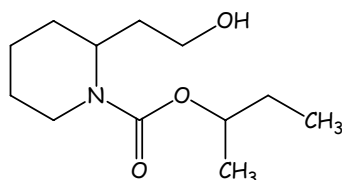
## 2. Physical and Chemical Properties

Chemical Name: 1-PIPERIDINECARBOXYLIC ACID, 2-(2-HYDROXY-ETHYL), 1-METHYLPROPYLESTER

Commercial Name: Saltidin®

Other Names: Icaridin, KBR 3023, Bayrepel™, Picaridin, (US EPA Registration)

Structure:



Empirical Formula:  $C_{12}H_{23}NO_3$

ELINCS Number 423-210-8

CAS Number 119515-38-7

Molecular weight: 229.3 g/mol

Melting point:  $< -170\text{ }^{\circ}\text{C}$

Boiling point:  $272\text{ }^{\circ}\text{C}$  at 1013 hPa

Viscosity: 30.7 sec. flow time accord. To DIN 53211, Dynamic: 129 mPa.s at  $20\text{ }^{\circ}\text{C}$

Vapour pressure:  $3.4 \times 10^{-4}$  hPa at  $20\text{ }^{\circ}\text{C}$   
 $5.9 \times 10^{-4}$  hPa at  $25\text{ }^{\circ}\text{C}$   
 $7.1 \times 10^{-3}$  hPa at  $50\text{ }^{\circ}\text{C}$

Flash point:  $142\text{ }^{\circ}\text{C}$

Density:  $1.036\text{ g/m}^3$  at  $20\text{ }^{\circ}\text{C}$

Solubility: In water:  $8.6\text{ g/L}$  at  $20\text{ }^{\circ}\text{C}$   
 In propane-2-ol:  $> 250\text{ g/L}$  at  $20\text{ }^{\circ}\text{C}$   
 In acetone:  $> 250\text{ g/L}$  at  $20\text{ }^{\circ}\text{C}$   
 In n-heptane:  $> 250\text{ g/L}$  at  $20\text{ }^{\circ}\text{C}$   
 In xylene:  $> 250\text{ g/L}$  at  $20\text{ }^{\circ}\text{C}$

This information and our technical advice - whether verbal, in writing or by way of trials - are given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. Our advice does not release you from the obligation to verify the information currently provided - especially that contained in our safety data and technical information sheets - and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our products and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with the current version of our General Conditions of Sale and Delivery.



Appearance:	Clear liquid, colourless to brownish
Odour:	Slightly odorous
Storage conditions:	Store at room temperature

This information and our technical advice - whether verbal, in writing or by way of trials - are given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. Our advice does not release you from the obligation to verify the information currently provided - especially that contained in our safety data and technical information sheets - and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our products and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with the current version of our General Conditions of Sale and Delivery.



### 3. Formulation

#### Saltidin® Wipe oilbased 20%

##### 3.1 Formulation of finished product:

No	Ingredient	CAS Nr	Supplier	Content %
1	Saltidin®	119515-38-7	Saltigo GmbH	19,25
2	White Oil Pionier 2076	56-81-5	Hansen&Rosenthal	18,30
3	Isopropyl myristate	110-27-0	Hansen&Rosenthal	9,55
4	Isopropanol	63-67-0		23,71
5	Floral D 12889 G	Not applicable	Symrise	0,19
6	Wipe	Not applicable	INNOVATE	29,00

##### 3.2 Formulation of liquid phase (solution):

No	Ingredient	CAS Nr	Supplier	Content %
1	Saltidin®	119515-38-7	Saltigo GmbH	27,10
2	White Oil Pionier 2076	56-81-5	Hansen&Rosenthal	25,78
3	Isopropyl myristate	110-27-0	Hansen&Rosenthal	13,45
4	Isopropanol	63-67-0		33,40
5	Floral D 12889 G	Not applicable	Symrise	0,27

This information and our technical advice - whether verbal, in writing or by way of trials - are given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. Our advice does not release you from the obligation to verify the information currently provided - especially that contained in our safety data and technical information sheets - and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our products and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with the current version of our General Conditions of Sale and Delivery.



### 3.3 Preparation of liquid phase (solution):

Mix all ingredients at room temperature.

### 3.4 Preparation of Wipe:

The folded wipe is placed into the three-side welded tin foil. Then the impregnation solution is added. This solution (1.5g) spreads onto the wipe. At the end, the fourth sides of the tin-foil are welded.

### 3.5 Physical data of liquid phase (solution):

Oudor	Perfume conform
Appearance	Clear, light yellow liquid
Density [g/cm <sup>3</sup> ]	0.8587 – 0.8761
Content Saltidin® [%]	25.75 – 28.46

### 3.6 Physical data of wipe:

Tightness of packaging	tight
Oudor	Perfume conform
Content Saltidin® [%]	18.34 – 20.27

This information and our technical advice - whether verbal, in writing or by way of trials - are given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. Our advice does not release you from the obligation to verify the information currently provided - especially that contained in our safety data and technical information sheets - and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our products and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with the current version of our General Conditions of Sale and Delivery.



### 3.7 Packaging material:

Wipe	Material	Supplier
Wipe name	Hydrospun 26g/m <sup>2</sup>	INNOVATE GmbH Germany
Weight	26g/m <sup>2</sup> +/-10%	
Tear strength MD	38 N/5cm +10%-0%	
Tear strength MD	25 N/5cm +10%-0%	

Foil	Material	Supplier
Foil	PET/ALU/PEM 70	INNOVATE GmbH Germany
Weld temperature [°C]	150	
Pulsing [sec]	3	

### 3.8 Stability:

This solution is stable after storage for 12 weeks at 20 °C and at 40 °C.

The above formulation is intended solely as a guide for our business partners and others interested in our product. As the conditions of use and application of the suggested formulation are beyond our control, it is imperative that it be tested to determine, to your satisfaction, whether it is suitable for your intended use(s) and application(s). This application-specific analysis at least must include testing to determine suitability from a technical, as well as health, safety and environmental standpoints. Further, although the ingredients, quantities thereof and properties of compounds or finished goods mentioned herein reflect our recommendation at the time of publication, this guide may not be subject to continuous review and/or updating, and you agree that use is undertaken at your sole risk. All information is given without warranty or guarantee, and it is expressly understood and agreed that you assume, and hereby expressly release us from all liability, in fort contract or otherwise, incurred in connection with the use of this guide.

This information and our technical advice - whether verbal, in writing or by way of trials - are given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. Our advice does not release you from the obligation to verify the information currently provided - especially that contained in our safety data and technical information sheets - and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our products and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with the current version of our General Conditions of Sale and Delivery.



## 4. Efficacy

The efficacy of the proposed formulation has been assessed on the basis of available data, in accordance with the above intended usages on behalf of Saltigo GmbH (Germany). Reported here below are efficacy data against mosquitoes, ticks, flies, sandflies, biting midges and fleas obtained with formulations containing 10 - 20 % of Saltidin®. The studies are summarized in the report: "Summary Report of Efficacy Data Saltidin®", February 2011.

### 4.1 Effectiveness against Mosquitoes

Saltidin® has been shown to be a safe and effective repellent against various species of mosquitoes (e. g., *Aedes aegypti*, *Aedes albopictus*, *Culex quinquefasciatus*, and *Anopheles dirus*). This type of Wipe formulation was used for testing the efficacy of Saltidin® on the most aggressive Mosquito *Aedes aegypti* in cage tests on human volunteers.

Cage tests on human volunteers were conducted during the development of the product to estimate the efficacy of the product under standardized conditions.

In the study by Luepkes (2008), the cages measured was 90 x 30 x 40 cm and the application rate was 150 µg/90 cm<sup>2</sup>.

The results showed that the 19 % Wipe formulation provided 5.5 - 6 hours protection against the mosquito *Aedes aegypti* (Table 1).

This information and our technical advice - whether verbal, in writing or by way of trials - are given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. Our advice does not release you from the obligation to verify the information currently provided - especially that contained in our safety data and technical information sheets - and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our products and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with the current version of our General Conditions of Sale and Delivery.



Table 1: Efficacy (Protection time = PT) of 19 % Saltidin® Wipe formulation against mosquitoes in cage tests.

Test Species	Test Location (Time of test)	Saltidin®		DEET		Study ID/Reference
		(%)	PT (h)	(%)	PT (h)	
<i>Aedes aegypti</i>	BioGenius GmbH, Monheim, Germany	19.0	5.9	Not determined		Luepkes, 2008 <sup>[1]</sup>

## 5. Customer information

Further information on toxicity tests and effectiveness of Saltidin® formulations are listed in the table "Possible formulations" under the link "All Family Insect Repellent Spray 20%" and "All Family Insect Repellent Cream 20%".

This information and our technical advice - whether verbal, in writing or by way of trials - are given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. Our advice does not release you from the obligation to verify the information currently provided - especially that contained in our safety data and technical information sheets - and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our products and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with the current version of our General Conditions of Sale and Delivery.



## 6. References

- [1] Luepkes, K. H., (2008) Mosquito repellent effect against *Aedes aegypti* Institute BioGenius GmbH

This information and our technical advice - whether verbal, in writing or by way of trials - are given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. Our advice does not release you from the obligation to verify the information currently provided - especially that contained in our safety data and technical information sheets - and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our products and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with the current version of our General Conditions of Sale and Delivery.