

## **SCHWEGO® eco foam - Deaerators for harmless ecological bio-paints**

The demand for harmless ecological paints increases constantly. The aim is to replace petrochemical raw materials in the formulation with sustainable natural growing or mineral source products. The overall properties, quality and performance of the end product should stay the same or even enhanced.

There are various approaches that we observe in the market to achieve these requirements.

### **1. To replace the solvent-based paints with water-based alternatives:**

With this step the amount of organic solvents will be strongly reduced and thus the VOC content. Often other raw materials in these formulations are based on petro-chemistry, because natural growing sustainable alternatives are not yet available on the market. There are, however, activities from raw material suppliers to find eventual solutions. In the field of defoamers / deaerators there are some solutions available.

The fogging effect of indoor emulsion paints leads to development of defoamers based on native oil as alternatives for mineral oil types. These substitutes fulfill the same requirements and are successful. Bernd Schwegmann GmbH & Co. KG offers different solutions with **SCHWEGO® eco foam 6325**, **SCHWEGO® eco foam 6326**, **SCHWEGO® eco foam 8336** and **SCHWEGO® eco foam 8338**. These products have different carrier materials and have different use cases.

### **2. To replace the petrochemical raw materials (resins, solvents, additives) with renewable alternatives in solvent-based formulations**

A large range of resins, such as alkyd and polyol resins, and solvents are available on the market and from different suppliers.

Typically additives only add to a small percentage in paint formulations and the transition process from the old well-known additives based on petro-chemistry and also in bio formulations are neglected. It is also seldom to find additives specially developed for this application in the market. With **SCHWEGO® eco foam 6320** and **SCHWEGO® eco foam 6321** Bernd Schwegmann GmbH & Co. KG introduced two products special for non-aqueous bio paints (green formulations). In classical systems both products are also active.

Both products were tested in different resin types and different formulations. We determined the effectiveness against macro-foam by testing the density and the coating test to test its ability against micro-foam.

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## Test methods:

### 1. Effectiveness against macro-foam by density test

We stir the resin or paint 300s with 5000 rpm and check directly the density with the paint pycnometer. The highest density shows the best effect against macro-foam.

### 2. Effectiveness against micro-foam by application:

We dab the paint or resin solution 20 x with a sponge on a non-sucking substrate. The results are evaluated directly after coating and after drying: 5 = very good, 1 = bad

### 3. Others

We coated the paint with a doctor blade on glass and evaluate the leveling, gloss etc. and compared this to our correlated paint without additive after drying. Furthermore we tested the influence of drying times with the drying recorder.

## Tested resin: (bio-content = information from the supplier)

### Alkyd resin:

Synthalat QL 4814	wood paint, stains	Synthopol – Chemie	bio – content	100%
Synthalat SF 690	wood paint	Synthopol - Chemie		
Worleekyd T 7800	house paint	Worlee – Chemie	bio – content	79%
Worleekyd B 6301	house paint	Worlee – Chemie	bio – content	58%
Worleekyd L 8004	high solid – paints	Worlee – Chemie	bio – content	85%
Worleekyd B 868	house paint	Worlee – Chemie	bio – content	41%
Rokralux LE 158	wood paints, stains	Robert Kraemer	bio – content	100%
Setal 304	high solid – paints	Allne	bio – content	80-90%
Setal 293	high Solid – paints	Allnex	bio – content	75-85%

### Other resins:

#### Company Hobum Chemicals

Merginol 903	Polyol	2 pack pur systems	bio-based carbon content	92%
Merginamid L 390	Polyaminimidazoline	curing agent for epoxy resins	bio-based carbon content	75%
Merginat UV 8107	UV – resin based on vegetable oil		bio-based carbon content	98%

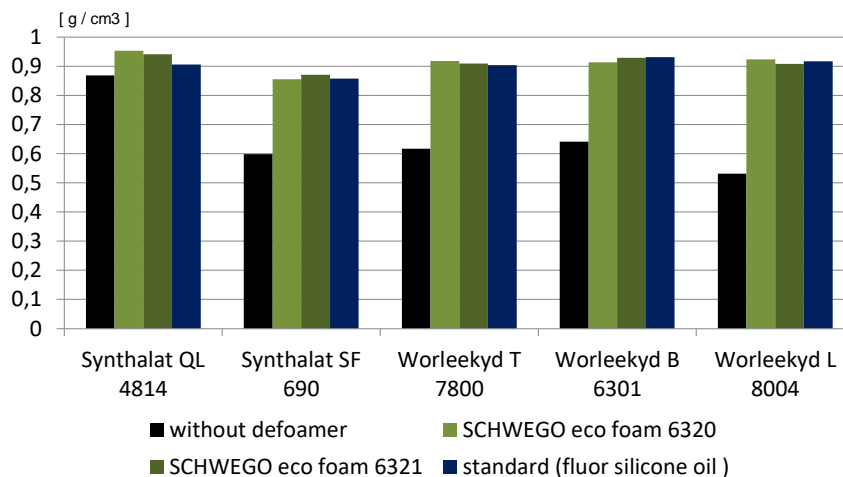
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## Results with SCHWEGO® eco foam 6320 and 6321

### 1. Effectiveness against macro-foam by density test:

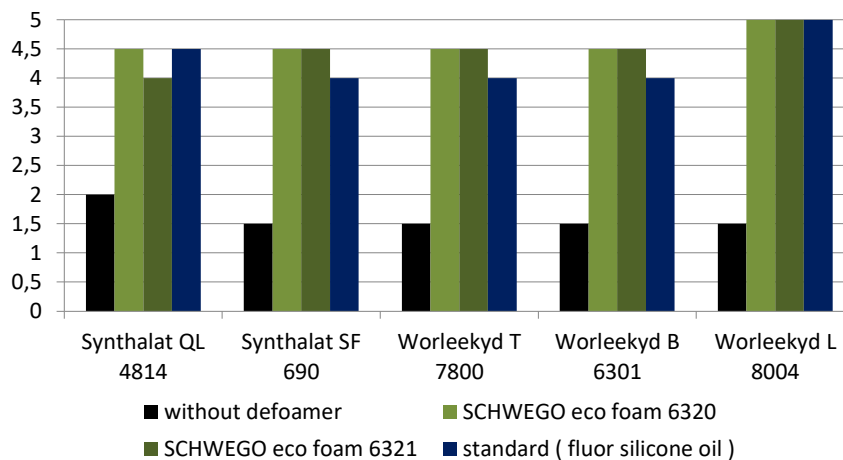
Resin: alkyd types

test: macro foam  
 stress: 300 s 5000 rpm  
 formulation: resin, 80% in solvent  
 dosage: 0,5% defoamer / solution



### 2. Effectiveness against micro-foam by application:

test: coating  
 evaluation: 1 = bad; 5 = very good  
 formulation: resin, 80% in solvent  
 dosage: 0,5 % defoamer / solution

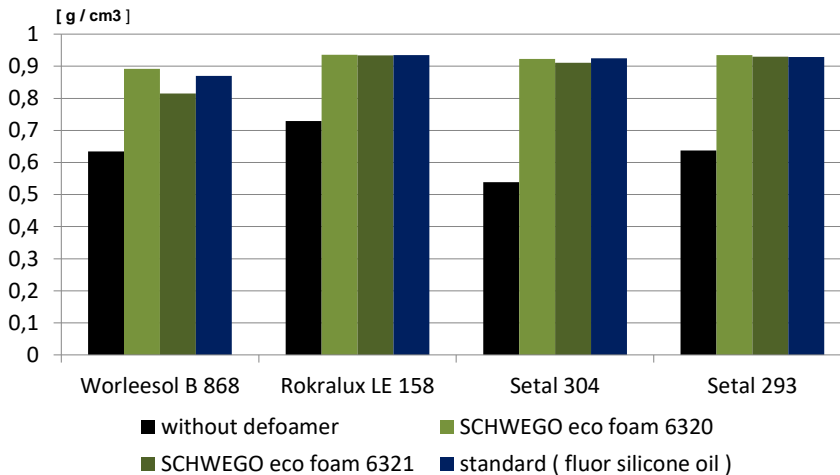


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## 1. Effectiveness against macro-foam by density test:

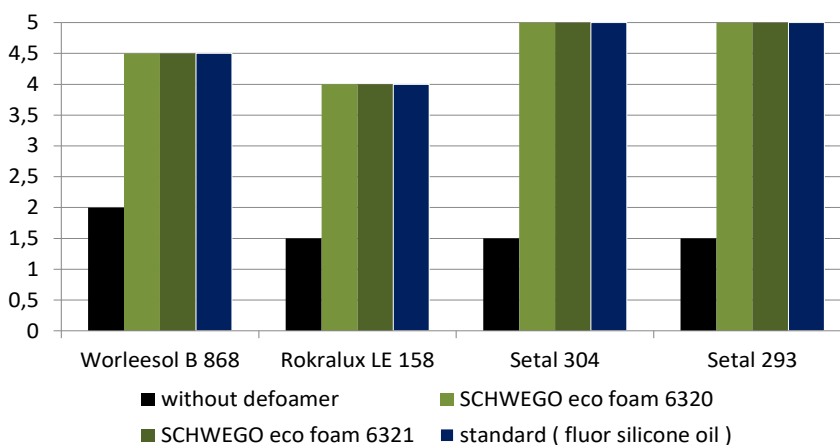
Resin: alkyd types

test: macro foam  
 stress: 300 s 5000 rpm  
 formulation: resin, 80% in solvent  
 dosage: 0,5% defoamer / solution



## 2. Effectiveness against micro-foam by application:

test: coating  
 evaluation: 1 = bad ; 5 = very good  
 formulation: resin, 80% in solution  
 dosage: 0,5% defoamer / solution



**SCHWEGO® eco foam 6320 and 6321 performs in the macro-foam and micro-foam test better or as the standard.**

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**Test from SCHWEGO® eco foam in pigmented paints**

a. Test: with Synthalat QL 4814

**Test formulation:**

product		p. b. w.	supplier
Synthalat QL 4814	resin	25.0	Synthopol Chemie
SCHWEGO wett 6291	dispersing agent	0.5	SCHWEGMANN
Purasolv EL	Solvent	19.0	Corbion
Bentone SD 1	thickener	0.5	Elementis
Kronos 2360	pigment	25.0	Kronos
Omyacarb Extra GU	filler	5.0	Omya
mill base	grinding	15 µm	
Synthalat QL 4814	resin	22.5	Synthopol Chemie
Defoamer	defoamer	0.2	SCHWEGMANN
Borchi OxyCoat	dryer	2.0	Borchers
Pentanoxim	anti-skinning	0.4	
paint		100.0	

**Remark:**

drying: surface drying 2h 40 minutes, through drying 5 h 20 minutes

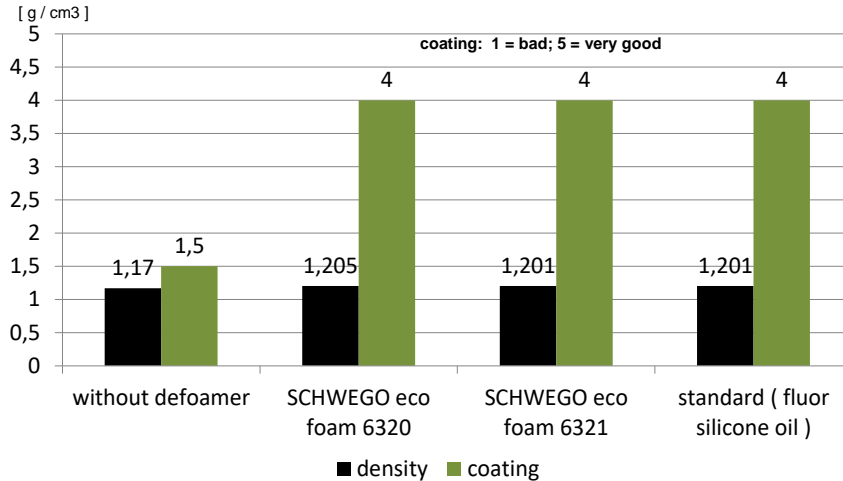
**SCHWEGO® eco foam** has no influence of the drying time.

Gloss angle 60° 93 E **SCHWEGO® eco foam** has no negative influence on gloss.

The film with **SCHWEGO® eco foam** is without craters. No problems to incorporate **SCHWEGO® eco foam**.

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test: density 300 s 5000 rpm / coating dab test  
 formulation: paint based on Synthalat QL 4814  
 dosage: 0,2% defoamer / paint



b. Test with Rokralux LE 158W

**Test formulation:**

product		p. b. w.	supplier
Rokralux LE 158 W	resin	25.0	Rober Kraemer
SCHWEGO wett 6291	dispersing agent	0.5	SCHWEGMANN
White spirit	solvent	6.0	Corbion
Bentone SD 1	thickener	0.5	Elementis
Kronos 2360	pigment	25.0	Kronos
Omyacarb Extra GU	Filler	5.0	Omya
mill base	grinding	15 µm	
Rokralux LE 158 W	resin	22.5	Robert Kraemer
White spirit		13.0	
Defoamer	defoamer	0.2	SCHWEGMANN
Borchi Dragon	dryer	2.0	Borchers
Pentanoxim	anti-skinning	0.4	
paint		100.0	

**Remark:**

drying: surface drying 6h 30 minutes, through drying > 24h

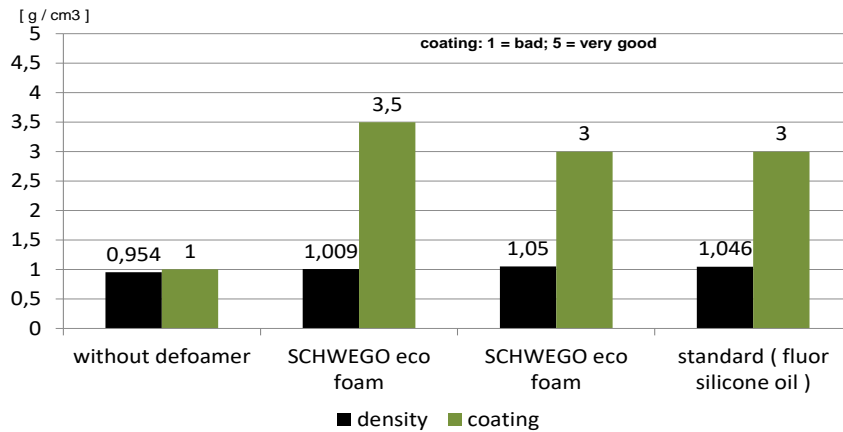
**SCHWEGO® eco** foam has no negative influence on drying.

Gloss angle 60° 92 E **SCHWEGO® eco** foam has no negative influence on gloss

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The film with **SCHWEGO® eco** foam is without craters. No problems to incorporate **SCHWEGO® eco** foam

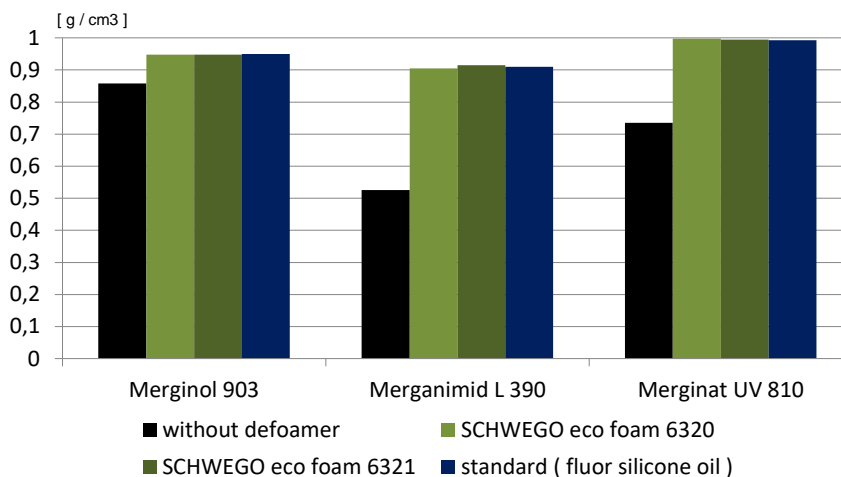
**test: density 300s 5000 rpm / coating dab test**  
**formulation: paint based on Rokralux LE 158 W**  
**dosage: 0,2% defoamer / paint**



## Resin: different types

### 1. Effectiveness against macro-foam by density test:

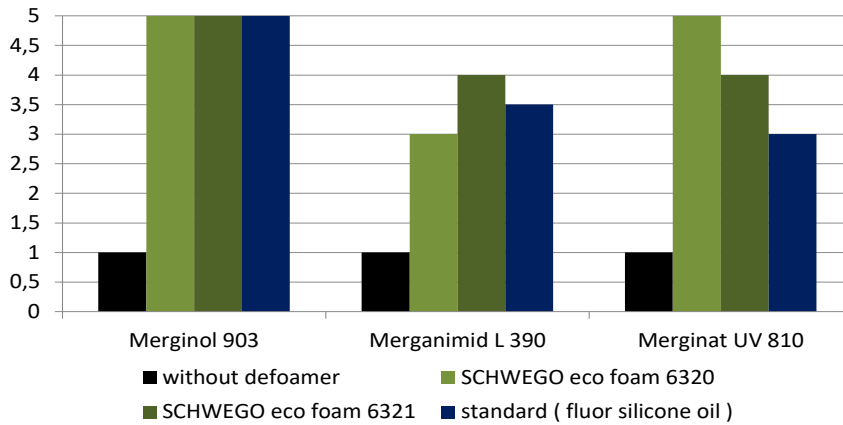
**test: macro foam**  
**stress: 300 s 5000 rpm**  
**formulation: resin**  
**dosage: 0,5% defoamer / resin**



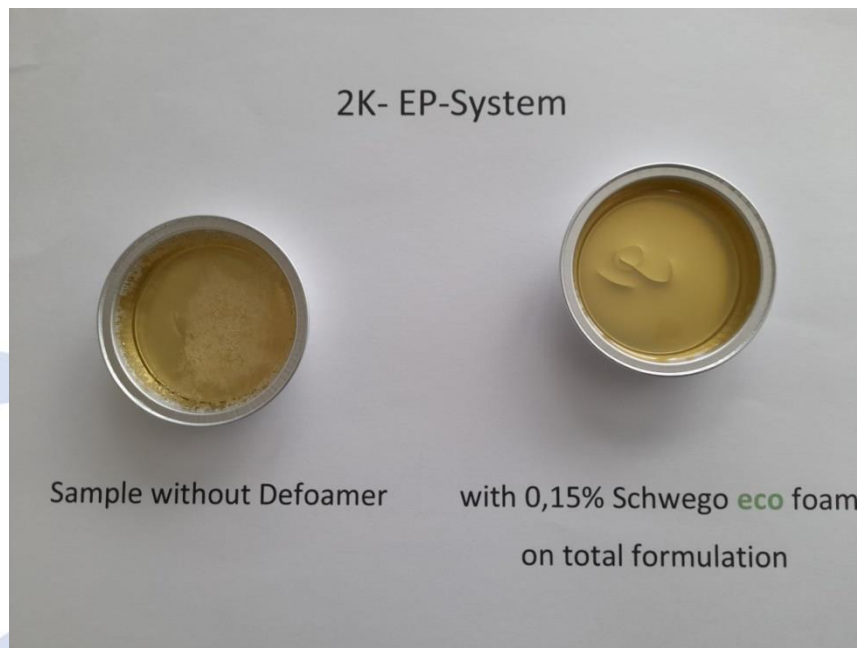
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## 2. Effectiveness against micro-foam by application:

test: coating  
evaluation: 1 = bad ; 5 = very good  
formulation: resin  
dosage: 0,5% defoamer / resin



Also in this different resins **SCHWEGO**<sup>®</sup> eco foam performs in the macro-foam and micro-foam test better or as the standard.



### Conclusion:

**SCHWEGO**<sup>®</sup> eco foam 6320 and **SCHWEGO**<sup>®</sup> eco foam 6321 are two deaerators, which fulfill the required points. The renewable content is **98%** in **SCHWEGO**<sup>®</sup> eco foam 6321 and **58%** in **SCHWEGO**<sup>®</sup> eco foam 6320. Both products are free of VOC and labelling. They perform well in the different kind of resins and formulations. The effective use in classical formulation based on petro-chemistry is possible.

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**SCHWEGO® eco** foam achieves very good efficiency to prevent micro foam and destroys also macro foam if necessary. Both products can be incorporated with low shear performance and the use as post additive is also possible.

**SCHWEGO® eco** foam 6320 and **SCHWEGO® eco** foam 6321 fulfill following properties:

- **High content on renewable raw materials**
- **Universal** efficiency in different kind of resins
- Good efficiency to **prevent macro-foam**
- Good efficiency to **prevent micro-foam**
- Active also in formulations based on petro-chemistry
- **Easy incorporation** without crater
- No influence at the paint properties
- **Free of VOC**
- **No labelling**

According the ASTM D 6866 the renewable content from **SCHWEGO® eco** foam 6320 is **58%** and from **SCHWEGO® eco** foam 6321 **98%**.

**SCHWEGO® eco** foam is the solution as defoamer / deaerator for formulation based on renewable raw materials.

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