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## **Present SuperSealant (SuperVoeg in Dutch)**

**The Hague - Amsterdam,  
August 2009-December 2012**

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## **Introduction: KochiToon Innovations BV (KTI) and Van Loon Chemical Innovations BV (VLCI)**

- **Guram Kochibrolashvili (abbr. Kochi) MSc has founded KochiToon Innovations BV in 2011 on the base of his company Kochi Restauratie en Schilderwerk, KRS.**
- **KRS, a company in The Hague, Netherlands is specialised in restoring and renewing the paintwork of old mansions.**
- **Kochi noticed the harmful effects of the existing sealants on the houses and he has developed a new theoretical model of moisture streams, Kochi Moisture Management.**
- **VLCI has converted this theory into a product.**

# KTI

- I discovered what I call the 'dam effect' of the existing sealants during the early stage of my activities as the owner of KRS.
- I noticed that the paint on wood, which was in contact with the sealant, was in the best case detached from the wood and in the worst case the wood was soaked and rotten.
- My conclusion as an MSc in physics of solid states was that the sealant causes accumulation of moisture.
- A question rose in me: where does the moisture come from? The moisture couldn't come from outside because often the paint layer was undamaged, but fully detached, while the wood under the paint was wet.
- Therefore it must have come from inside the house! Indeed, our activities inside the house produce a lot of moisture: e.g. cooking, taking shower, drying our clothes. We ourselves consume water and produce moisture. As the temperature outside the house in the Northern hemisphere is three quarters of the year lower than the temperature inside the house, the moisture escapes, following the gradient of the temperature (from warmth to cold) through all the porous materials like wood, plaster, concrete, brick, mortars and such, also in the form of vapour.
- One may conclude therefore that any barrier, impermeable for the moisture and vapours, on the way of such a stream would be like a dam, behind which moisture accumulates.
- In reality however we see that when fillers and putty, which are impermeable for the moisture and vapours, are applied to the primed wood, there will be no moisture accumulation. In case of a sealant it is indeed so that no matter whether the wood was primed or not, moisture accumulation will take place, and exactly behind the sealant 'dam'.
- That was a paradoxical fact and the theory I created to clarify it, is rather complex.
- I started also to look for a chemist who could create a new sealant, which, according to my theory, had to be hard, porous and permeable for moisture and vapours.
- After my long search I met the chemist Sander van Loon, who found my idea to be a great challenge.

## VLCI

- **Sander van Loon has founded VLCI in November 2008, Amsterdam, Netherlands**
- **VLCI is specialized in the applied formulation science, via High Throughput**
- **Kochi contacted VLCI with the request to work out his idea. Now VLCI and KTI introduce their new sealant: SuperSealant (SuperVoeg in Dutch)**
- **Their published world-wide patent application can be found through the following link:**

[https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2012072248&recNum=10&docAn=EP2011005999&queryString=IC:%22E06B%22%20AND%20\(solar%20OR%20heat\)&maxRec=3605](https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2012072248&recNum=10&docAn=EP2011005999&queryString=IC:%22E06B%22%20AND%20(solar%20OR%20heat)&maxRec=3605)

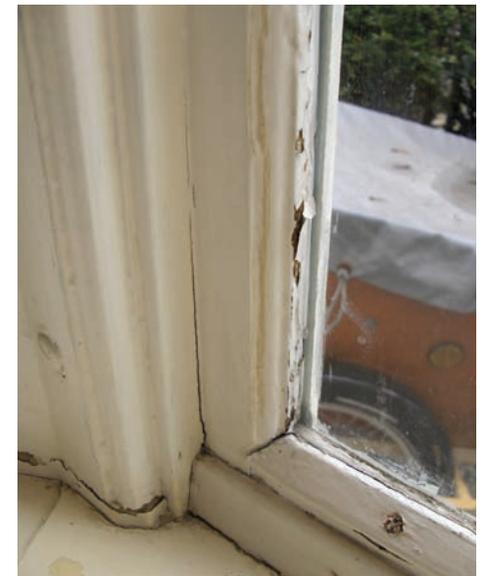
## Existing Sealants

- In 95% of cases a considerable accumulation of moisture takes place along the sealed joints in porous building materials as e.g. wood and concrete: the 'dam-effect'.



## Existing Sealants

- **'Dam-effect' caused by existing sealants in the window frame. Left window frame wasn't sealed, the right one was sealed.**



## Existing Sealants

- In fact the existing sealants cause the 'dam-effect' because of the ruling concept behind the sealant's properties: according to this concept a sealant should be hydrophobic, impermeable for vapours and moisture and extremely flexible.
- However, wood, concrete and mortars are hard, porous and permeable for moisture and vapours.
- In a building these materials always contain moisture. Because of the temperature gradient and the difference in relative humidity there appears a moisture stream.
- The existing sealants obstruct this stream thus causing accumulation of moisture!

## SuperSealant (SuperVoeg)

- **SuperSealant, being hard, porous and permeable for moisture and vapours, integrates perfectly with the traditional building materials like wood, concrete, mortars and such, which are hard, porous and permeable for moisture and vapours. The construction responds as one whole to the fluctuations of temperature and to the moisture and vapours streams, which are the most distractive agents in any building construction!**
- **The same amount of moisture which comes in will go out, and the construction will remain unharmed.**

## SuperSealant (SuperVoeg)

- In the first year VLCI has accomplished an extensive research on the formulation of sealant, which resulted in a new water-based sealant, called SuperSealant.
- The product was submitted to severe tests in the Duplex Action Climate Chamber, designed and made by KTI and VLCI, together with several sorts of existing sealants as a reference: 3 months under the gradient of temperature up to 80° C - 0° C and RH up to 90%, in order to accelerate the natural processes.



After 3 months  
SuperSealant:  
clean surface



After 3 months  
Sealant 'Bison 30 min':  
mould



After 3,5 weeks  
Sealant 'Indukit':  
mould

## SuperSealant (SuperVoeg)

- **Photo 1** shows the test box in its initial state: the two seams on the left side of the box were sealed with SuperSealant, and the two seams on the right side of the box were sealed with the sealant 'Bison 30 min'. Then the inside of the box was overcoated and the box was placed into the Duplex Action Climate Chamber for one month. On **Photo 2** an obvious 'dam-effect' is seen: the seams sealed with Bison sealant have cracks, because of the pressure of the vapour stream. The seams sealed with SuperSealant remained undamaged, because SuperSealant is permeable for moisture and vapours.

Photo 1

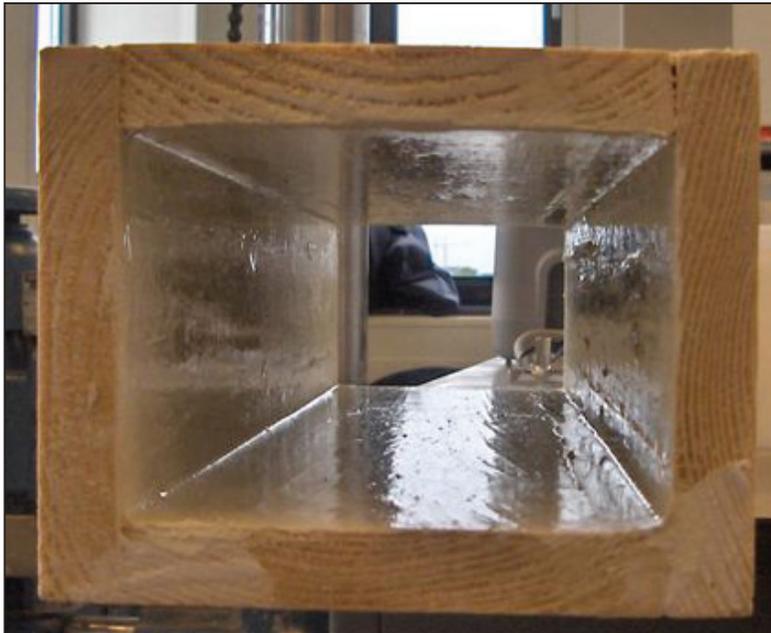
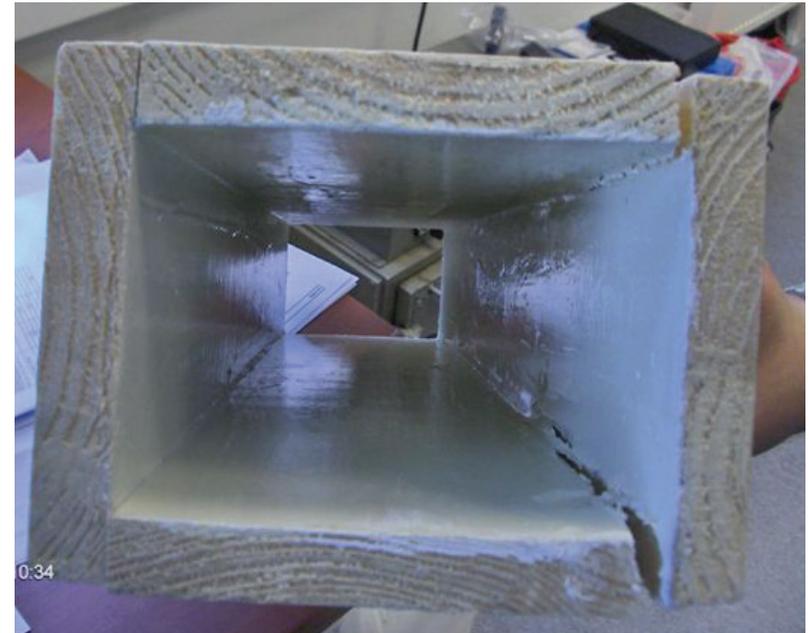
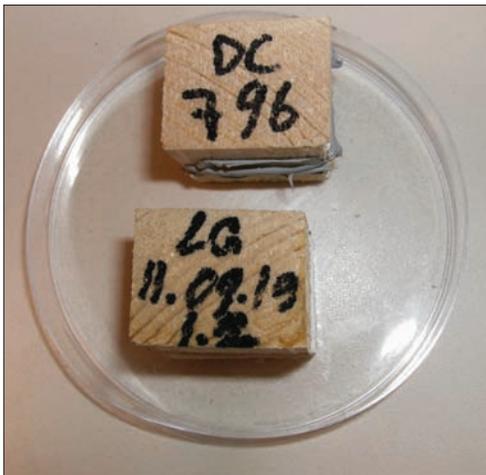


Photo 2



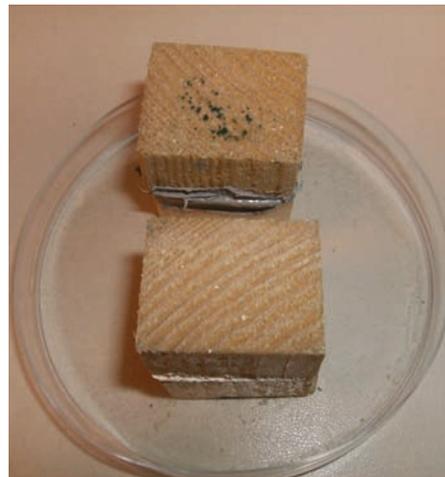
## SuperSealant (SuperVoeg)

- A simpler, illustrative test: two pieces of wood, attached to each other with the help of a sealant, which has to be tested. After drying of the sealant the test piece is placed into a Petry dish, where water is added until approximately half of the height of the bottom wood, and this level of water is preserved for at least two weeks. Hereunder some of the results.



The testpiece in the upper part of the photo:  
Sealant 'Dow Corning 796'

The testpiece in the lower part of the photo: SuperSealant



The testpieces upside down after two weeks in the water. Obvious spreading of fungi on the bottom of Dow Corning testpiece.



Growth of fungi on the bottom part of the test piece in case of Den Braven's Sealant 'Anticrack'

## SuperSealant (SuperVoeg)

SuperSealant has the following properties:

- moisture-permeable and thus prevents accumulation of moisture;
- hard, tenacious, and slightly flexible: it compensates perfectly the shrinkage and expansion of wood under the fluctuations of temperature;
- drying time: 30 min up till 8 hours, depending on the substrate;
- tensile strength at least 80 N/cm<sup>2</sup>;
- can be overcoated with all sorts of paint, alkyd as well as acryl and latex;
- can be applied without primer;
- resistant to sweet and sea water and all aggressive cleaning products;
- suitable for applying inside and outside;
- especially recommended for use with hard and porous materials: wood, concrete, mortars, brick, natural stone and the combinations of wood - glass, concrete - iron, mortar - iron
- especially recommended for use in buildings and rooms with high hygienic standards: hospitals, old people's homes, catering industry, clean rooms and such;
- especially recommended for the restoration of cultural and historical monuments and artefacts.

## Conclusion and Follow-up

- Existing sealants shorten the life cycle of the paint work and of the building elements and create an unhealthy environment inside the building, because of the accumulation of moisture which they cause, and subsequent growing of the fungi's and bacteria colonies.
- SuperSealant matches perfectly with the traditional building materials: wood, concrete, brick, mortars as it has exactly the same properties! Therefore: no rot, preservation of paint work, materials and a healthy climate inside the building.
- We now work on the promoting of the new thinking regarding the use of materials in construction and painting work. We need your help / discussions!



### **Sander van Loon, MSc**

CEO and owner Van Loon Chemical Innovations

November 2008 – Present (3 years 7 months)

VLCI, [www.vlci.biz](http://www.vlci.biz) is an R&D service company for coatings and raw materials for coatings. VLCI is specialised in formulating coatings and synthesis of polymers. Creative solutions for the complete innovation process is what VLCI can deliver.

Past:

Team Leader

SigmaKalon

Privately Held; 10,001+ employees;

Chemicals industry

October 2001 – November 2008 (7 years 2 months)

Recommend Sander's work at SigmaKalon

Education:

Vrije Universiteit Amsterdam

Master, Organic Chemistry

1997 – 2001



### **Guram Kochibrolashvili, MSc**

Director KochiToon Innovations B. V.

April 2011 – Present (1 year 2 months)

Research and innovations in the fields of sealants and coatings

Owner Kochi Restauratie en Schilderwerk  
1996 – 2013 (17 years)

[www.ltofix.eu](http://www.ltofix.eu)

Renovation and restoration of the old mansions and houses according to a unique formula Kochi Moisture Management 2006 ®

Innovations in the area of the paint and the fillers

Education:

Universitatea de Stat din Moldova

MSc, theoretical physics of solid states

1976 – 1983

## **THANK YOU FOR YOUR ATTENTION**