

**Vacuum Insulation Panel Association
Technical Working Group Conference Call
Thursday 27 October 2016, 10:00 to 11:30 CET**

Participants:

Yoash Carmi, Hanita Coatings, Technical WG Chair
Christoph Sprengard, FIW
Matthias Geisler, Evonik Industries
Miaotian Sun, Qingdao Kerui New Environmental Materials
Marko Meglič, Knauf Insulation
Raquel Ponte Costa, VIPA International

Apologies:

Justin Davies, Kingspan
Pascal Rousset, Rexor
Estelle Perrin, Rexor
Roland Caps, va-Q-Tec
Hans-Frieder Eberhardt, Porextherm

Minutes

1. Welcome

1.1 VIPA antitrust compliance statement

Raquel Ponte Costa opened the call and welcomed all the participants. She reminded them of the antitrust compliance statement principles which need to be respected during the meeting.

1.2 Approval of the agenda

The agenda was approved with no changes.

1.3 Approval minutes previous conference call 30 June 2016 and review of action items

The minutes were approved with no changes. With regards to the actions of the previous conference call, Raquel explained that all actions related to the FIW study on compressive strength measurement were completed. The final report of this study was delivered end September and circulated to all members. Christoph Sprengard invited members to get in touch with him in case they had any questions on the report and testing performed.

The below actions will remain in the action list since they have not been completed. Members did not have any suggestions for a topic that a student could work on. FIW had one student which was interested in doing a study on the getters, but this student is no longer available.

Actions:

- Technical WG members to come-up with suggestions for a topic to be researched by a student (master or PhD thesis).
- Christoph Sprengard to keep VIPA informed in case he knows of any student interested in working on a short term research project on developing a technique to measure the capacity and performance of getters.

2. Status VIPA Studies:

2.1 Hanita study on the development of an advanced technique for measuring the effect of moisture content on the thermal conductivity of VIPs

Yoash Carmi went through the interim report of the study and mentioned the main conclusions so far (see interim report in the annexes). The study is progressing well. The technique under testing is easy to use and proves to be very effective.

Christoph Sprengard asked Yoash if he has tested the adsorption isotherm of the core. Yoash asked for suggestions on how to perform this test as Hanita does not have the device needed for that. Christoph said FIW could easily do this test as long as Hanita can send some samples of core material which FIW could use. All members agreed that this extra test could be interesting and agreed that FIW should perform it. Christoph promised to have a look at the price and conditions but he mentioned it should not cost more than EUR 500- EUR 600.

Matthias Geisler asked if it would be possible for Hanita to run the tests with a temperature of some minus degree Celsius on the cold side in order to immobilize the water dosed into the system and measure the thermal conductivity development. Matthias said he would expect another slope of the lambda-curves derived this way for fiber glass and silica cores. This boundary conditions apply to freezers, for example. Yoash confirmed that this is possible, below the freezing point, at least down to -100°C.

Matthias also asked about the type of silica core used. Depending on the VIP manufacturer there are differences on the specific surface of the silica used for core production. Therefore at least the absorption behavior is different, and eventually the slope of the lambda vs. water dosed in measurements. Matthias suggested asking Roland's advise for representative cores. Yoash explained that it is possible to measure more types of fumed silica cores. The number of cores that can be evaluated is limited by the availability of the lambda machine.

Finally Yoash concluded by saying that the study will be finalised on time.

Actions:

- Christoph Sprengard to check if FIW could test the adsorption isotherm of the core and to send an offer for that.
- Christoph Sprengard to liaise with Yoash Carmi about the powder samples needed for the measurement.

2.2 Hanita and FIW project: calibration of the lift-off technique for measuring the internal pressure of fumed silica VIPs and determination of boundary conditions for the lift-off measurements and processing of measurement raw data

Christoph Sprengard explained that the first part of the test consisted of checking the leakages. Yoash Carmi asked if FIW uses a turbo molecular or mechanical pump which could lead to different results.

Yoash Carmi suggested Christoph to check if an extension of the project will be needed. He fears the project is not going to be completed in the given timeframe.

Action:

Christoph Sprengard to check with his colleagues if they need more time to complete the study and keep VIPA secretariat informed about it.

3. Task Force reviewing GSH quality assessment rules of the RAL VIP quality mark (RAL-GZ 960 document)

Raquel explained that since the summer a small Task Force is reviewing the RAL-GZ 960 document with the objective of aligning it with the CEN standard and also to extend the label to all core materials, applications and also suppliers. The Task Force almost finished reviewing the document. Members in the call did not know who is in charge of finalizing the document and advised Raquel to contact Roland and Hans-Frieder.

Raquel explained that the new draft document will need to be approved by the Technical WG and the VIPA Board before it is submitted to the GSH and to the RAL for final vote. As a result, the new rules will only enter into force in the course of 2017 or 2018.

Action:

Raquel to ask Roland Caps and Hans-Frieder Eberhardt for the draft RAL-GZ 960 document.

4. Topics for additional studies:

Raquel shared with the members the list of topics made in the beginning of the year. Some of the topics have already been worked on:

- Accurate testing and calculation methods of edge effect
- Accurate testing and calculation methods of effective thermal conductivity of VIP
- Finding the best (most relevant) acceleration conditions (with special emphasis for refrigerators) in thermal conductivity tests
- Measurement of VIPs internal pressure using lift-off technique
- Characterisation of getter used in VIP

In addition, Raquel invited the members that submitted suggestions ahead of the call to explain their proposals:

Miaotian Sun from Qingdao Kerui New Environmental Materials explained her company would like to perform a research study for 40,000 EUR on:

1. The effect of VIP seam on the overall thermal conductivity in building applications.
2. The optimization of installation approaches of VIPs during construction regarding to VIPs with different parameters in order to reach a best thermal performance.

Miao explained they plan to investigate the problem and also to find possible solutions. She will work with her colleagues the next weeks to submit a more detailed proposal and offer. Members welcomed the idea but mentioned that there is already a study on this available. FIW worked on the same topic (future of buildings) but specifically on the German market. Christoph said that the study will be finalised shortly but it is only available in German and it relates only to the German situation. Nevertheless, the content is very interesting and it could still be used by VIPA. Raquel asked Christoph to check the copyright of the study and suggested that VIPA would pay for the translation to English. Members agreed with the suggestions and asked FIW to reduce the parameters to the basic principles needed so it can easily be used in other countries than Germany.

Miao asked FIW to send her more information about this German study so she can look at it with her colleagues and adapt the Qingdao Kerui study offer accordingly. One idea would be to take the basic principles of the FIW study and then adapt it to the Chinese and Asian market.

Actions:

- Christoph Sprengard to check if the study can be used by VIPA and translated to other languages
- Christoph Sprengard to send to the secretariat and to Miaotian Sun more information about the study together with the expected publication date.

Marko Meglič from Knauf Insulation gave more details about his two suggestions:

1. Sensors to measure the pressure in the VIP (1 Pa to 10.000 Pa)
2. Contact the thermal conductivity measurement equipment producers regarding the VIP lambda / process control / quick tester

Marko mentioned he met one company during an event in Berlin which produces sensors that measure the pressure in the VIP. Their sensors can penetrate both aluminium and metalised envelopes. He is not sure if the product is a prototype or if it is already in the market. Having a reliable product would be very useful to the whole industry, so Marko's suggestion is to look for a company already providing such equipment or to ask one to develop a device that would fit the needs of the industry. Members agreed that indeed it would be useful to have such equipment and that perhaps this company that attended the event in Berlin could be contacted. One member mentioned that Fraunhofer also had such a product but it was not too effective.

Action:

Marko Meglič to contact this company that produces sensors and see if their product has already been tested.

The second suggestion of Marko also goes in the same direction but for thermal conductivity measurement devices. He suggests compiling a list of companies that provide such equipment and ask them to work on a new device which would be more suitable for the VIP industry. Marko said that there are probably 10 companies in the market so at least one of them should be interested in working with VIPs. The manufacturers could send samples for testing. In fact these companies could also join the association as a member. Participants in the call agreed this could be interesting. They raised some questions on how to

concretely move forward with these two ideas but to start with, they decided to first see what is available in the market and then decide what to do with it.

Action:

All Technical WG members to send suggestions of companies that produce measurements devices for thermal conductivity.

Christoph Sprengard from FIW made three suggestions:

1. To investigate how the foil-lift-off method could be adapted to fiber-filled core VIPs. The study that is currently ongoing on the lift-off technique does not apply to VIPs with a fiberglass core material. The basic idea is to use a very small metering section and prevent expansion of the core by fixing the panels in a rigid frame (fixation from outside) and using a support construction (stiff plate) within the panel in the area of the metering section. Christoph said that this is not an in-depth study as such, but more an extension to the existing study.

Members agreed this could be interesting especially for companies using fiberglass core material VIPs and asked FIW to submit a detailed proposal.

2. To perform a detailed analyses of GHP and HFM – apparatuses and related measurements (e.g. thickness, dimensions, density etc.). Christoph explained that no one ever did a concrete uncertainty analysis for the measurement of thermal conductivity of VIPs, including the factors to take into account. All error analyses were carried out for the apparatuses when measuring regular insulating materials in the past and transferred to the VIP measurements. From the work in Annex 65 it seems evident that the all parameters have a much larger impact when measuring VIPs. The thickness measurement has a huge (and direct) impact on the Lambda-result for VIPs. Such a study would build on the results of the IEA Annex 65 project turning them into applicable boundary conditions to reduce the uncertainty for the measurements. This could then be implemented in the product standard.

Members questioned the value of such a study to the VIPA members. It would certainly be useful to refrigerator OEMs and to labs. In addition members also asked how this new method could be enforced. Christophe suggested it could be added to the standard and also to the GSH label assessment criteria.

Members asked FIW to submit a proposal for this but to highlight the value for VIPA members which is not clear from the initial idea.

3. FIW carried out detailed studies on the economics of energy efficiency and the level of insulation of the building envelope. Christoph suggests developing a calculation tool with a number of parameters whereby each company could know the value of VIPs in a specific market. This would take into account different features such as space, energy prices, u-values, etc. With this tool, VIP manufacturers could easily calculate the return on investment of their products which could be useful for their marketing departments.

One member mentioned that the Oxford University already did a similar analysis but Christoph explained that it does not include the return on investment. Another member mentioned that the BAU website makes reference to a St Gobain study on this as well.

Raquel highlighted that VIPA should not get involved in marketing and promotional activities of VIPs because this is done better by the companies. She wondered if the VIP manufacturers already have such tools in-house. Raquel added that a more general third-party study showing the ROI of VIPs and the advantages of the technology (space and energy saving, lifecycle considerations, etc) could be very useful for the public affairs activities.

Actions:

- Christoph Sprengard to submit a proposal for the study on the foil-lift-off method for fiber core VIPs.

- Christoph Sprengard to re-think about the concept of the study on detailed analyses of GHP and HFM – apparatuses and related measurements and include clear added-value for VIP manufacturers.
- Christoph Sprengard to collect existing studies on the tools for calculation of ROI and see what is missing and could eventually be worked on by VIPA/FIW.

Further to these three suggestions, Christoph Sprengard said he finds one of the topics listed in the beginning of the year very interesting: finding the best (most relevant) acceleration conditions (with special emphasis for refrigerators) in thermal conductivity tests. The refrigerators are only measured at the start of their life which means that there is no information about the performance of the VIP after the initial period. Members doubted that the refrigerator's industry would be really interested in having this information and discouraged FIW to look into it because within VIPA there are no refrigerators OEM so we would be missing a lot of information to work on such a study. One member added that Daniel Quénard already produced some research about it.

5. 2017 Work Plan

5.1 Abstracts to be submitted to IVIS 2017 in Paris

Due to lack of time this item was not discussed in detail. Raquel mentioned that FIW will work on 2 abstracts about the studies they carried out for VIPA this year. The deadline to submit abstracts is 16 December.

Action:

Christoph Sprengard to circulate the draft abstracts for approval by 9 December.

5.2 Guidance document on CEN standard and quality label rules (what are the requirements, procedures, etc)

Due to lack of time this item was not discussed in detail. Raquel suggested discussing this at the next conference call or meeting.

6. AoB

6.1 Date of the next conference call or face-to-face meeting

Raquel asked members if it would be possible to organise a face-to-face meeting. Participants mentioned the INNOVIP project meeting in Coimbra, Portugal in the first week of March.

Action:

Raquel to send a doodle to see if a meeting in Coimbra, Portugal early March would be feasible.

No other item was discussed. The conference call finished at 12:00.
