

**Dear stakeholder,**

The project on finalizing the method for assessing the fire performance of facades, SI2.825082, is in progress, and an important task right now is to define the façade systems to be used in the initial tests and the experimental round robin. We are now asking for your help to choose suitable systems giving the information searched for in these tasks.

In the following the aim of the different tests are presented together with examples of façade systems that could be used for the tests. The examples of façade systems are just examples, and no decisions on which to be used in the tests has been made yet. Now we rely on your help to define the systems to be used in the tests. These tests are more scientific experiments and may therefore deviate to some extent from conventional tests.

It is important that the chosen façade systems assessed are on the border line between the pass and fail criteria. Therefore, we will need evidence from previous large-scale tests in accordance with at least one of the currently used national methods in Europe showing that the system is on the border line.

The systems selected for the tests can deviate from those used in practice if it is anticipated that they will give the needed information.

### **Initial tests**

The aim of the initial tests is to investigate the effect of the position of the secondary opening. There are two different variants that will be examined, firstly an eccentrically placed secondary opening in relation to the combustion chamber, see figure 1 below, and secondly a secondary opening placed centrally above the combustion chamber where the right edge of the secondary opening is placed 650 mm from the right edge of the main face. There are two main effects we need to investigate:

1. Will the secondary opening act as a fire stop for the flame spread on the façade surface and within the façade system
2. Which position of the secondary opening shows best eventual weakness of the detailing around openings.

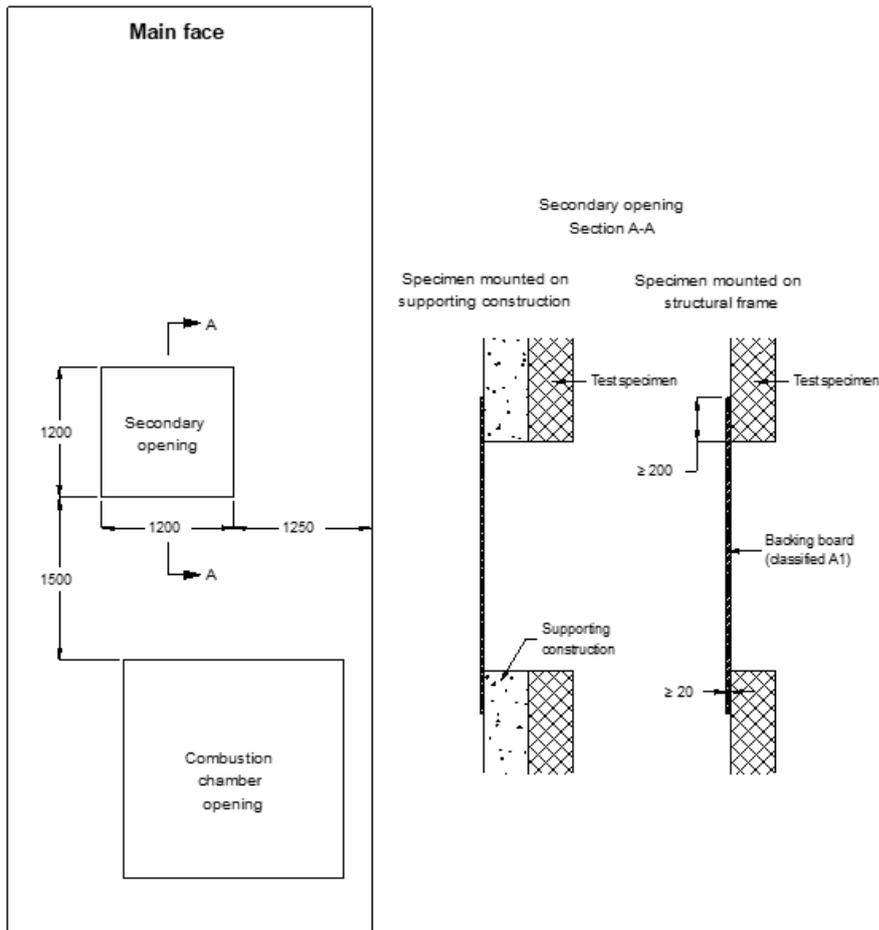


Figure 1. Eccentrically placed secondary opening.

For these tests it is important that the façade system will give a fire spread on the surface and/or within the system that is close to the failure criteria for fire vertical fire spread, i.e. measured temperatures 4500 mm above the upper edge of the combustion chamber should be around 500 °C at some point during the test. Furthermore, there shall be some type of weakness of the system at the secondary opening which accelerate the vertical fire spread.

The suggestion from the project team is to use a ventilated wooden façade, see figure 2. In the tests would the window details be removed, i.e. the window frame, the drip plats, the windowsill, completion boards, caulking, and internal windowsill.

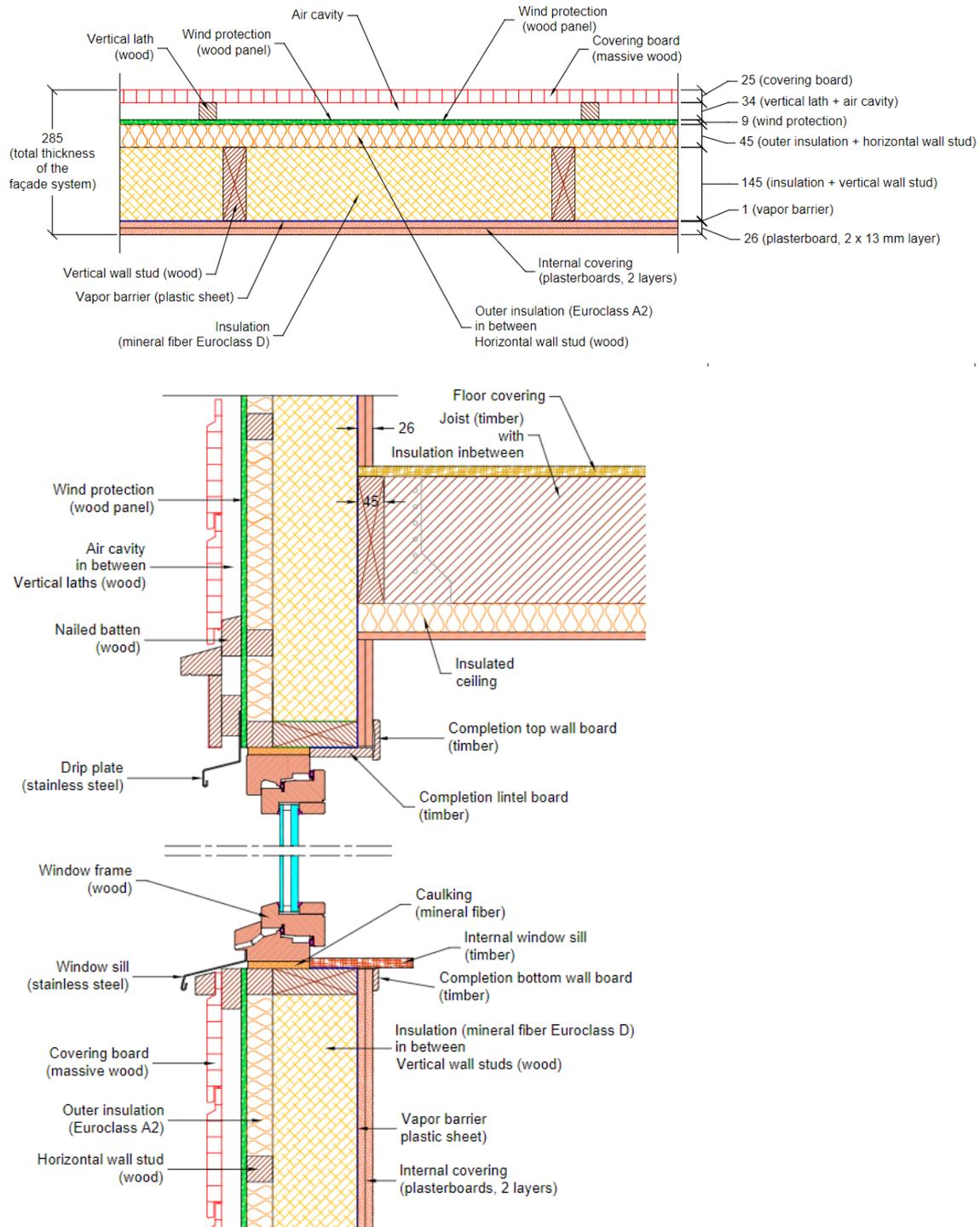


Figure 2. Example of test specimen for study of the position of the secondary opening.

**Questions to stakeholders:** Is the suggested test specimen a good alternative, or do you have any other suggestion? Are there any details in the suggested test specimen that should be changed to give the desired result?

### Experimental round robin

According to the tender documentation four different facades shall be included in the experimental round robin:

- Inert façade (i.e. only non-combustible materials)
- Combustible rain screen and non-combustible insulation
- ETICS with combustible insulation and render
- Ventilated wooden façade

The aim of this round robin is different from conventional round robins since we are not focusing on the differences in results between different laboratories, but the focus is on the repeatability and reproducibility of the actual test method. We will therefore eliminate some of the factors that may affect the results in order to define whether any changes are needed in the test procedure and test set-up.

Also, for these tests we need façade systems that are on the borderline to pass the failure criteria, i.e. they shall not be too good and not too bad. The façade system shall thus preferably fail after around 30 minutes into the test, but it is acceptable that the failure occurs at a time between 20-45 minutes into the test. It shall also be possible to check all different failure criteria, i.e. vertical and horizontal fire spread and falling parts. It is not necessary that all failure criteria are critical for all four façade types. It could be that falling parts are checked with the inert façade, and not any of the other systems.

In all tests, measurements will be made in accordance with the latest issue of the assessment method. In order to get extra information and knowledge, additional measurements may be needed, i.e. more plate thermometers, heat flux gauges, thermocouples, wind measuring devices and other at interesting positions.

The façade systems will be tested with both the medium heat exposure and the large heat exposure, which adds an extra challenge. It is preferable if the chosen systems are on the borderline for both heat exposures. If that is not possible we have to make a selection so we have at least one border line system for the medium heat exposure and at least one border line system for the large heat exposure.

#### Inert façade

The aim for testing an inert façade is to evaluate any differences between the laboratories carrying out the tests regarding the fire exposure to the test specimen and the behaviour of the fuel source without any influence of the test specimen.

In these tests, it is planned to evaluate the measurement techniques for falling parts and thus the façade system to be used should be of a kind where falling parts are expected. There are several different options such as high-performance concrete which will spall, boards that will crack and fall down, boards where the fasteners will lose their capability to hold the boards in place, glass panes that will crack and fall down.

**Questions to stakeholders:** Do you have any suggestion on an inert façade system where falling parts will be an issue?

#### Combustible rain screen and non-combustible insulation

The aim of this system is to obtain a vertical and horizontal fire spread on the surface of the test specimen.

An example of a system is a ventilated facade with HPL (high-pressure compact laminates), with a mineral wool insulation (Euroclass A2), a simple vertical wood frame made of wood sticks protected with EPDM or PVC strips, a cavity depth of 50 mm, and high-pressure compact laminates (HPL) with

a Euroclass B-s3,d0 with a thickness of 8 to 10 mm, installed with 8 mm joints. Figure 3 shows the principle of the system.

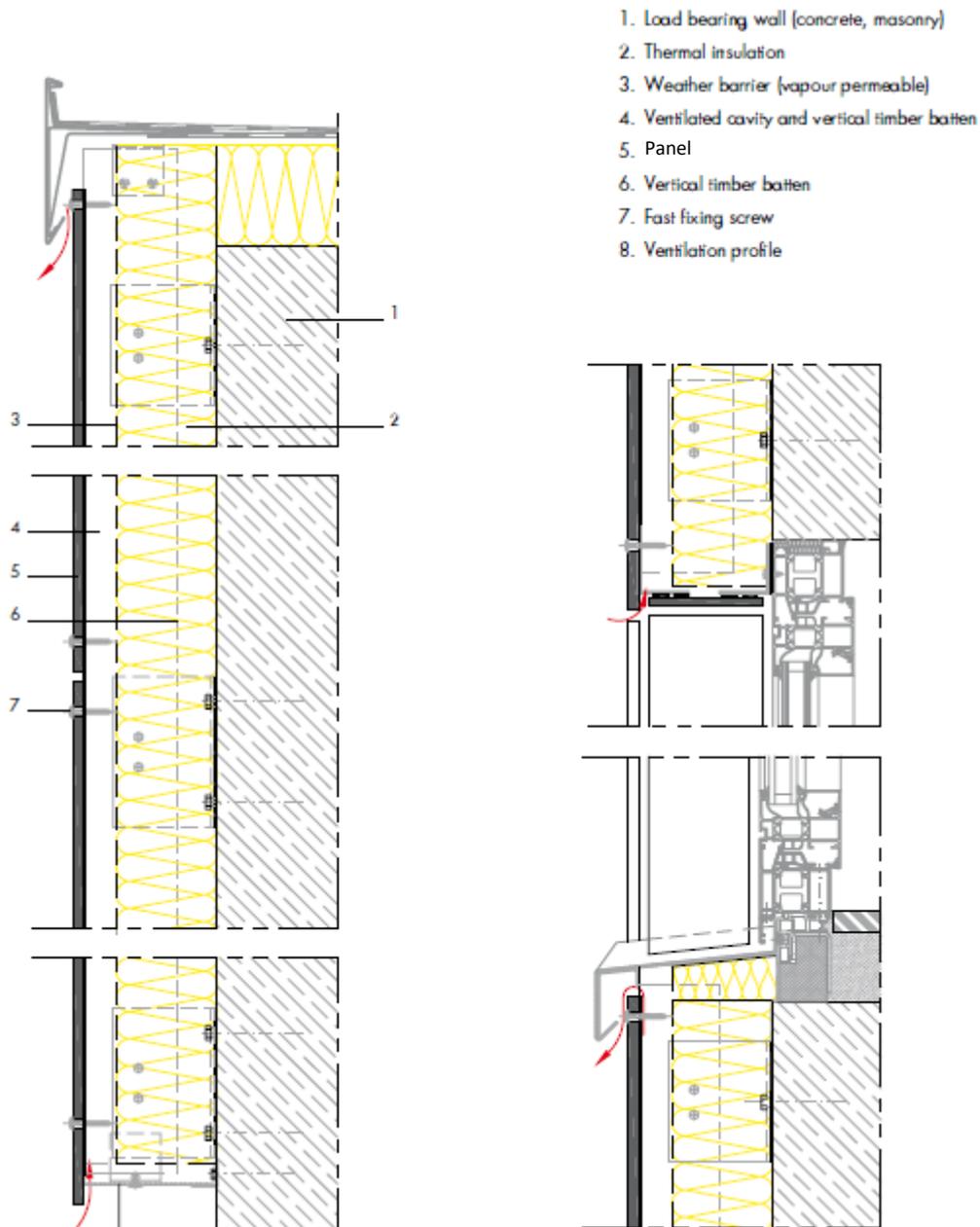


Figure 3. Example on a rain screen system, vertical section.

**Questions to stakeholders:** Is the suggested test specimen a good alternative, or do you have any other suggestion? Are there any details in the suggested test specimen that should be changed to give the desired result?

#### ETICS with combustible insulation and render

The aim of this system is to obtain a vertical and horizontal fire spread on the surface as well as within the system. Furthermore, the test shall also show a failure due to falling parts, and in this case burning material. This can be accomplished by using a combustible insulation such as EPS and a render which allows melted material to drop down from the test specimen.

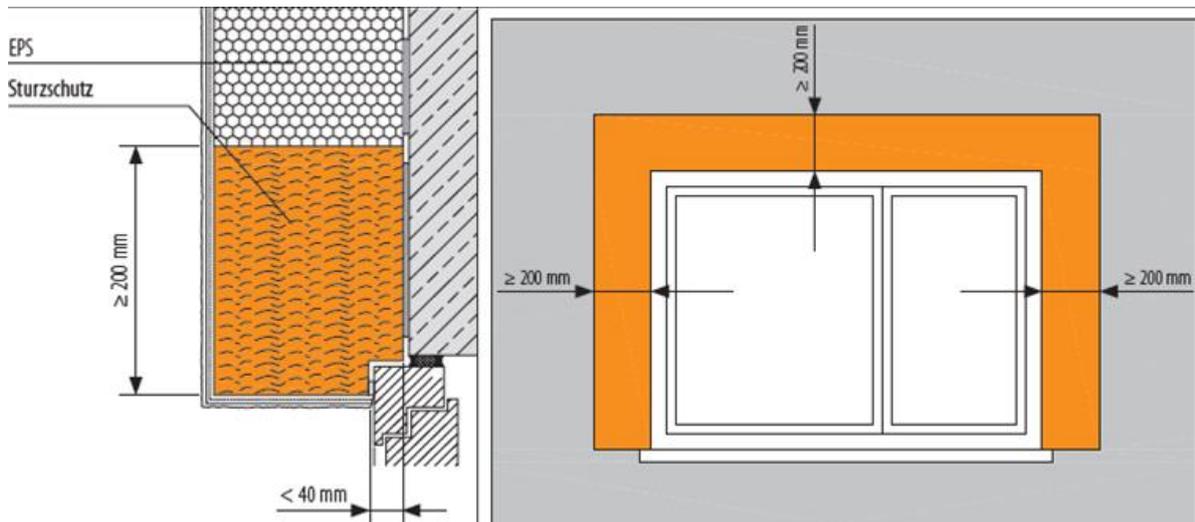


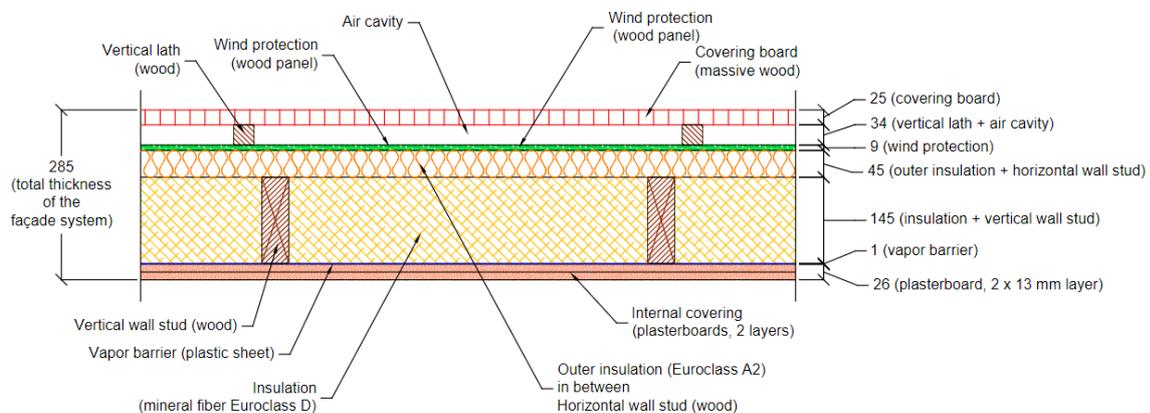
Figure 4. Example on an ETICS with combustible insulation.

**Questions to stakeholders:** Is the suggested test specimen a good alternative, or do you have any other suggestion? Are there any details in the suggested test specimen that should be changed to give the desired result?

### Ventilated wooden façade

The aim of this system is to obtain a vertical and horizontal fire spread on the surface of the test specimen and in the cavity behind the covering boards.

An example of a ventilated wood façade system is shown in Figure 5.



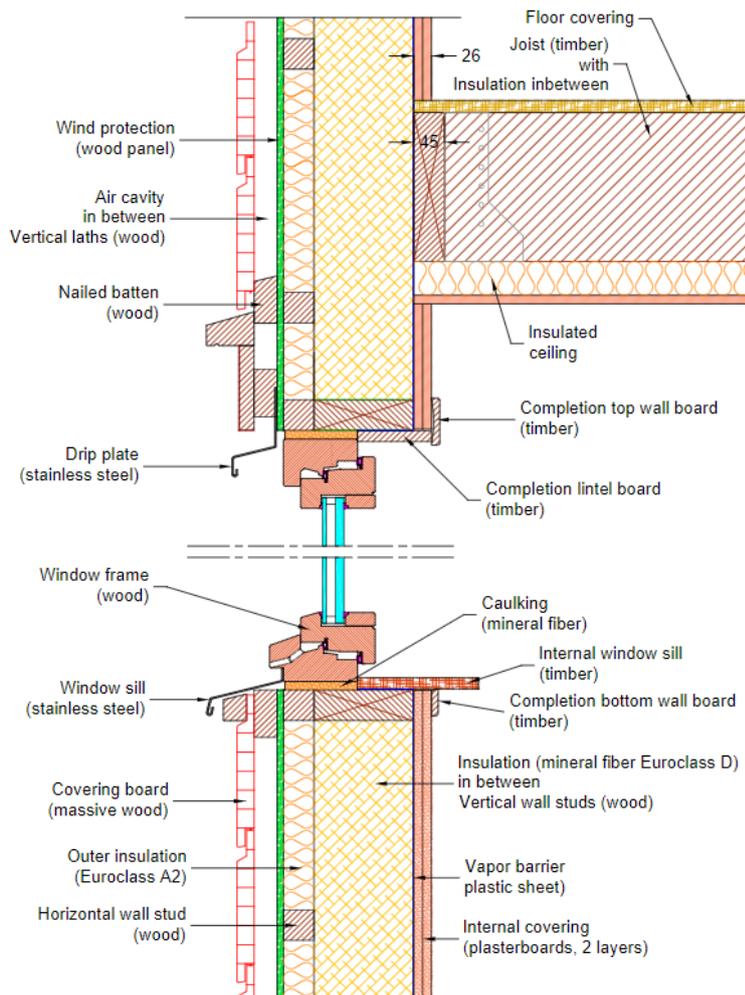


Figure 5. Example of test specimen for round robin on ventilated wooden facade.

**Questions to stakeholders:** Is the suggested test specimen a good alternative, or do you have any other suggestion? Are there any details in the suggested test specimen that should be changed to give the desired result?

### How to reply and other information

Above has the aim of the testing activities in the project briefly been described, as well as giving some questions we hope you could answer. Together with this letter there is a template where you can write your comments and answers and send them to us on one of the following e-mail addresses:

- [Lars.bostrom@ri.se](mailto:Lars.bostrom@ri.se)
- [Johan.anderson@ri.se](mailto:Johan.anderson@ri.se)

The deadline to send your comments is set to July 1, 2020. After we have received your comments we will analyse the results and present a proposal on test program. This will be presented on a webinar on July 8 at CET 10.00. you will all get an invitation to the webinar.

Finally, I would like to thank you for your interest and your contribution to the project.

Lars Boström