

COMMENTS HANDLING DOCUMENT TEMPLATE – TO BE FILLED OUT BY STAKEHOLDERS

Please add your comments in the columns below. An explanation to the columns used are as follows:

Column 1 – N°: Numbering of comments

Column 2 – Body Reference: The body who have given the comment

Column 3 – Comment on document: A reference to which document the comment belongs

Column 4 – Paragraph/Figure/Table: A reference to which part of the document the comment belongs

Column 5 – Comment: The comment received

Column 6 and 7 – Proposed change by the consortium and answer by the consortium: A short description on how the comment has been handled

N°	Body Reference	Comment on document	Paragraph/ Figure/ Table	Comment	Proposed change	Answer by consortium
409	EURIMA	Test Report Large Wood Crib Test	General Chapter 9 Chapter 10	<p>The data from the wood crib test indicate that for the large wood crib the efficiency of combustion ($\chi = \frac{\Delta H_{eff}}{\Delta H_c}$) is close to 1.0 and at some points as high as 1.09. The efficiency of combustion can be calculated as:</p> $\chi = \frac{HRR}{\dot{m} * \Delta H_c}$ <ul style="list-style-type: none"> • HRR – Heat release rate (calculated based on oxygen consumption) • \dot{m} – Mass loss rate of the fuel (measured with the load cell) • ΔH_c – Complete heat of combustion of the wood (determined in the bomb calorimeter). The complete heat of combustion of wood species has very little variability and is known from literature from multiple measurements (ca. 17.9 kJ/g for pine wood and slightly lower ca. 16.4 kJ/g for spruce/fir) 	A section 3.2.3.2 called "HRR and MLR: comparison and accuracy" in the Progress report is added.	<p>The measurement of HRR by the oxygen depletion has been verified. Calibration tests (on pure propane burners) performed earlier has been studied and confirm that the measurements by this method is reliable.</p> <p>Here it is pertinent to remember that considering the different accuracy of each measurement (MLR and oxygen depletion) involved in their calculation, is about 10 % for each. In particular, it is difficult to differentiate data which exhibit lots of fluctuations even if the data is averaged and a smoothing is performed. Furthermore, the aim of the project is not to keep the original BS and DIN methods, but to develop a new test method, which is based on the BS and DIN methods. Thus, changes will be made in order to harmonize these two methods into one. Since there are some differences between BS and Din with respect to several features, such as cross-sectional size of sticks for the wood</p>

			<p>The test data indicate the following efficiency of combustion achieved during the peak phase of the fire with the large heat exposure: 0.9-1.0 (Test L0), 0.88-1.09 (Test L1),0.89-1.09 (Test L2), 0.86-0.96 (Test L3),0.87-1.02 (Test L4), 0.94-1.05 (Test L5), 0.75-0.91 (Test L6), No data provided (Test L7).</p> <p>Efficiency of combustion higher than 1.0 are not possible. In the same time it is not characteristic for solid fuels like wood to achieve efficacy of combustion of 0.9- 1.0. Efficiency of 0.9 -1.0 is typically only achieved by liquid fuels like methanol, ethanol, heptane, etc.</p> <p>The efficiency of combustion for wood in well ventilated conditions was investigated in the past based on multiple measurements and is typically around 0.65-0.7.</p> <p>As reference, the efficiency of combustion for the same species (spruce) used for the medium heat exposure with well-ventilated conditions (supplemented ventilation in the chamber) is evaluate to be 0.65-0.75 which is consistent with literature data. It is counterintuitive, that a larger wood crib burning without supplementary oxygen in the combustion chamber(under ventilated conditions) can achieve a better efficiency of combustion and very close to complete combustion.</p> <p>This analysis indicates that the HRR calculated based on the oxygen depletion measured in the hood is overestimating the HRR of the large wood crib with approximately 25-30%.</p>	<p>cribs, ignition procedure, start time of the test, measurement positions and failure criteria, as far as possible these will be harmonized to one common way to perform tests.</p>
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				<p>Reevaluate the HRR measurement/calculation based on oxygen depletion.</p> <p>Calibrate the HRR measurement/calculation using different fuel sources with known HRR. Such fuel source can be liquid pool fires where HRR is determined by the liquid fuel and diameter of the pool fire. Such calibration shall be conducted with the hood exhaust rate used during the wood crib tests (ca. 27 m³/s).</p> <p>Without good correlation between the HRR calculation based on oxygen depletion and the real HRR of the wood crib, we recommend not to change the wood species from pine to spruce. Such change could result in reduction of the heat exposure from the fuel source below what is currently used in BS 8414, which we understand is not the intention/objective of the project.</p>		
410	EURIMA	Draft Progress report 2 - Assessment method for facades	Chapter 3.2 Appendix C	As per the previous comment, it is necessary to reevaluate the HRR measurement/calculation based on oxygen depletion before defining the species of the wood for the large heat exposure crib. We evaluate that the current calculated HRR based on oxygen depletion overestimate the HRR of the wood crib with approximately 25-30%. This proposal will not achieve the desired heat exposure		<p>See, 409.</p> <p>The absolute level of HRR as long as it is severe enough is of less interest in comparison to the repeatability of the method. The aim is to have approximately the same acceptance level as the ones used with the BS and DIN methods, and in order to achieve this we strongly rely on representatives from the</p>

				<p>comparable with the heat exposure in BS 8414.</p> <p>Wood species for the large heat exposure shall be pine to achieve a heat exposure comparable to BS 8414.</p>		<p>Member States and stakeholders to provide with the data needed in order to calibrate the new method towards the BS and DIN methods.</p> <p>A comparison between HRR from room fire tests performed recently and the HRR found here as well as those expected from BS tests were comparable HRRs are found. This indicates that the test method represent a severe fire.</p>
411	Fire Safe Europe	Test Report Large Wood Crib Test	General	<p>The HRR and mass loss data provided in the report (Appendix 5) indicate that the effective heat of combustion of the wood crib, ΔH_{eff}, during the peak phase of the fire (under ventilated conditions) is ca. 17.0 kJ/g for the pine tests and ca. 16.0 kJ/g for the spruce tests.</p> <p>These values are approximately 90-95% of the complete heat of combustion of the wood, ΔH_c, determined in the bomb calorimeter. The complete heat of combustion of wood has been measured in many studies and is given in literature (e.g 17.9 kJ/g for pine wood and slightly lower ca. 16.4 kJ/g for spruce/fir).</p> <p>Effective heat of combustion (ΔH_{eff}) of 90-95% of the complete heat of combustion indicate an extremely effective combustion process that is not characteristic for solid fuels. Such efficiency can be achieved only by certain liquid fuels with very clean and</p>		<p>See 409 and 410.</p>

			<p>effective combustion. The combustion efficiency for wood species in well ventilated conditions is indicated in the literature to be ca. 65-70% of the complete heat of combustion giving an effective heat of combustion of ca. 12.4 kJ/g for pine wood. In under ventilated conditions, as the one inside the combustion chamber during the peak of the fire, it can be expected that the effective heat of combustion will not exceed the values of the well-ventilated conditions.</p> <p>The test data suggest that the HRR calculated based on the oxygen depletion measured in the hood is overestimating the HRR of the wood crib with approximately 25-30%.</p> <p>Re-evaluate the HRR measurement/calculation based on oxygen depletion. We evaluate that a conclusion on the HRR of the cribs cannot be concluded/reported without further calibrations of the HRR calculation methodology. Without solid data to establish a good correlation between the real HRR of the fire and the calculated HRR (based on oxygen depletion), we recommend not to change the wood species from pine to spruce.</p>		
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				Such change could result in reduction of the heat exposure below what is currently established by the BS 8414 test.		
412	Fire Safe Europe	Draft Progress report 2 - Assessment method for facades		<p>In relation to the technical comment described above, it is necessary to re-evaluate the HRR calculation based on oxygen depletion before defining the species of the wood for the large heat exposure crib.</p> <p>Current data indicate that the calculated HRR based on oxygen depletion (given in the report) may be overestimated with approximately 25-30% for the large heat exposure tests (both pine and spruce tests). This proposal to modify the wood species will not achieve the desired heat exposure comparable with the heat exposure in BS 8414.</p> <p>We recommend continue the project using the pine wood (<i>Pinus Sylvestris</i>) for the construction of the large heat exposure crib to maintain a comparable heat exposure as in BS 8414.</p>		See 409 and 410.
413	Fire Safe Europe	Draft Progress report 2 - Assessment method for facades		The test data does not offer information about the influence of changing the surface exposure of the crib by allowing the numbers of stick layers to be changed. It is unknown what will be the HRR for a wood crib with 16/17/18 layers of a wood crib with 22/23/24 layers.	Updated test program to accommodate for investigations of repeatability issues.	<p>See 409.</p> <p>In the coming tests, repeatability will be tested and the method for constructing the cribs will be evaluated. The assessment method will continuously be</p>

				<p>The proposal introduces a level of uncertainty that is difficult to evaluate and in practice wood cribs with different number of layers will be used which could affect repeatability and reproducibility of the test. It can be seen from the test that the density and weight of the wood crib does not have a significant influence on the peak HRR of the fire. Indeed, various densities and weight will extend the duration of the fire which is not critical since the test proposes to extinguish the fire at 30 min. We evaluate that it is more adequate to limit the uncertainty introduced by allowing the numbers of stick layers to be changed. This will be beneficial for the repeatability of the test method and will not influence the peak HRR of the fire.</p> <p>We recommend to define that the wood crib for the large heat exposure should have 20 layers</p>		<p>updated throughout the project, in order to have good enough repeatability.</p> <p>The variations due to the variability in density and changing volume of the crib will be investigated but in order to increase repeatability we have introduced a target weight of the crib.</p>
414	Finland	Draft Progress report 2 - Assessment method for facades		<p>Wood crib tests:</p> <ul style="list-style-type: none"> - Pine and spruce densities are only given as high, low and average; not in values. - In the proposed summary table density and tolerances of proposed spruce at defined moisture content should be defined, not only crib density. - Heat fluxes on different points of the facade surface would be more important than just temperature and heat release curves to make final conclusions. This is to see the real fire exposure differences between the different parameter changes. 	We have updated the progress report	We have updated the tables to include densities and heat flux.
415	European Aluminium	Steering group 2021-04-20	EAE/R. Paske r's presentation	European Aluminium members share similar experiences regarding the variance of BS 8414 tests, dozens of which have been performed around the world under various conditions. The variance of		The project has a large focus on repeatability therefore in the testing programme several repeated tests will be performed in the initial testing

				the large-scale test conditions is hardly acceptable.		activities however also in the round robin phase of the project.
416	European Aluminium	Draft Progress report 2 - Assessment method for facades	3.3. Falling parts	<p>The size and mass of the objects to be thrown should be chosen in a range much wider than the proposed mass of 1.0 kg or an area of 0.1 m². The assessment method is only in a draft stage and needs to consider the results of experimental tests which should not be limited to pre-determined parameters. Anyway, the proposed mass of 1.0 kg or an area of 0.1 m² can be also tested to assess the sensitivity of test equipment.</p> <p>Choose objects of size up to 5 kg (there are Member States having higher limits than those proposed in the assessment method) and larger area (textile fabrics, or other larger items could also fall).</p>		A questionnaire has been sent out and is now analysed to investigate falling debris. The precise failure criteria is not set and will be set at a later stage when more data is available e.g. after the round robin stage of the project.
417	European Aluminium	Draft Progress report 2 - Assessment method for facades	3.3. Uplift of the test rig	<p>According to the testing experience of our member companies, an uplift of 2000mm is necessary to avoid self-ignition of particles on the ground.</p> <p>Consider the uplift of test rig directly at 2000mm</p>		Introducing an uplift of 2000 mm will prohibit test in most facilities and make the test procedure much more expensive. Although, the falling parts issue is not settled the work has started to investigate the use of a scale in front of the façade that can measure falling debris continuously.
418	DIBt (Germany)	Test report EFR-20-002989 (result of medium exposure crib tests)	Ge / Te	<p>The following points are identified where clarification is needed:</p> <ol style="list-style-type: none"> 1.) The wood sticks were delivered with a moisture content of about 12 % and stored until testing. But for the time testing a moisture content of about 10 % is reported. It is unclear, whether these values are average values and how (number of measurements) and where (place of measurements) the 		TBA

				<p>moisture was measured and calculated.</p> <p>2.) The description of the nailing of the cribs in clause 5.1.1 is not clear. Did you only nail always two neighboring layers to each other and then the several bi-layered elements were stacked without further nailing to form the crib?</p> <p>3.) It seems that the heat-flux diagramme for test M0 is missing on page 30 and the Plate thermocouple curves in front of the chamber are presented twice (page 31).</p> <p>4.) In some diagrammes the time scale doesn't correspond to the time dates as provided in the table of clause 8.2.2.</p> <p>5.) The maximum heat flux values on the façade given for tests M0 to M3 in clause 9.2 don't correspond to the peak values as shown in the diagrammes in appendix 1. In addition, the same values are given in the conclusion in clause 9.4 but with [kW] instead [kW/m²].</p> <p>To which time point do the given values for THR_{tot} and total mass loss relate in clauses 9.2 and 9.4 – to the intended exposure time for the coming test method or the termination of the wood crib tests?</p>		
419	DIBt (Germany)	Test report EFR-20-000358 (result of large	Ge / te	<p>The following points are identified where clarification is needed:</p> <p>1.) The absolute values for the moisture content are missing in the table of clause 2. Furthermore, it is unclear,</p>		

		exposure crib tests)		<p>whether these values are average values and how (number of measurements) and where (place of measurements) the moisture was measured and calculated. This should also be clarified in clause 8 and with regard to the data provided in table 6.</p> <p>2.) The description of the nailing of the cribs in clause 5.1.1 is not clear. Did you only nail always two neighboring layers to each other and then the several bi-layered elements were stacked without further nailing to form the crib?</p> <p>3.) In table 10 the information about the base of the cribs (solid plate or grating) should also be added to get a better overview.</p> <p>4.) The height of the position of the thermocouples and the heat flux meter in front of the combustion chamber is unclear (only the distance is shown in drawing 20).</p> <p>5.) To which time point do the given values for THR_{tot} and total mass loss relate in clauses 9.2 and 9.4 – to the intended exposure time for the coming test method or the termination of the wood crib tests?</p> <p>In the data files of the LEC tests HRR curves are given based on the mass loss. Why are these curves not presented in the test report for comparison to the HRR curves based on the oxygen deflection method? Which calorific value was used for the determination of HRR based on the mass loss and from which source was this value taken?</p>		
420	DIBt (Germany)	Draft Progress 2	3.2.1 Table 1	The proposed parameters for the medium exposure crib (MEC) deviate from those considered in the wood crib tests M0 to M3. As already said in the 2 nd SG meeting, for		<p>See comments 409, 410 and 430.</p> <p>Repeatability tests for the medium exposure tests are planned, the results</p>

				<p>the further development of the test method, its repeatability and reproducibility as well as its later application by many labs throughout Europe it is necessary to determine the relevant data (e. g. HRR, THR, MLR etc.) for the now proposed final MEC too. Therefore, further investigations are necessary as basis for the requested decision of the SG about the final design of the MEC.</p> <p>For the proposed target value of the moisture content please see comment to clause 3.2.4.</p>		<p>will be presented and discussed in SG meeting.</p>
421	DIBt (Germany)	Draft Progress 2	3.2.1 Table 1	<p>The proposed tolerance for the density of the large exposure crib (LEC) seems to high. Although the tests with the large cribs showed no significant influence, this huge tolerance range in combination with the tolerances for the dimensions of the sticks lead to very varying numbers of stick layers and the final geometry. This may later have a profound affect on the repeatability and reproducibility when using the test method by different labs throughout Europe. Thus, the density and tolerance range for the LEC should be the same as for the MEC – $475 \pm 25 \text{ kg/m}^3$.</p> <p>Furthermore, the depth of the chamber for the LEC is now proposed with 1300 mm, but the wood crib tests were performed with a 1000 mm deep chamber. The position of the LEC in this modified chamber is not clear, because it isn't described in table 1. If – as in the wood crib tests – the crib shall be positioned with a distance of 100 mm to the back wall of the chamber, its frond edge is positioned 100 mm behind the surface of the test rig. This modification will probably have a significant</p>		<p>We agree that this may have an effect. This will be tested in the planned tests after the repeatability tests.</p> <p>We also agree that moving the crib inwards may have an effect however, the effect of the placement of the crib will also investigated. To move the crib into the combustion chamber takes away the problem of having falling debris on the crib that could result in crib instability.</p>

				<p>affect e. g. on the exposure on the façade above the chamber. That's why further tests are needed to assess the influence of this modification in comparison to the already performed large exposure crib tests before the cornerstones for the LEC and its chamber will be confirmed by the SG and the next phase of investigations can start.</p> <p>For the proposed target value of the moisture content please see comment to clause 3.2.4.</p>	
422	DIBt (Germany)	Draft Progress 2	3.2.4	<p>From German test experiences (and confirmed by timber experts), a conditioning of the timber in a climate of 23 °C and 50% RH leads mostly to moisture content of about 9 ± 1 %. The measured average moisture content of the crib L5 confirms this experience. Thus, the proposed target value for the moisture content of the spruce wood for the cribs should be changed accordingly in clause 3.2.4 as well as in table 1.</p>	<p>We agree that this is the case however this requirement results in extensive conditioning of timber and severely limit flexibility in testing thus we think at this point that having a higher tolerance is beneficial, if possible. Note that 9 is included in the limit 11 ± 2 which is the proposed range. If it is evident that from the repeatability or round robin tests that this too wide range then this will be changed.</p>
423	DIBt (Germany)	Draft Progress 2	3.2.8	<p>As stated in the test reports, collapsing of the medium exposure cribs occurs about 20 minutes (\pm some minutes) after ignition and collapsing of the large exposure cribs occurs about 25 minutes (\pm some minutes) after ignition. Considering the intended exposure times for the test method (cf. draft assessment method), collapsing of the cribs before the end of the exposure time seem to be critical with regard to the desired flame exposure of the test assembly for the whole exposure time. Experiences collected with the 200-kg-crib of the German base fire test method for facades show that nailing of each layer to the next one below prolongs the stability of the crib significantly. Thus, it is highly</p>	<p>The crib stability is very important, the main benefit of having two layer nailed is that it is easier to build the crib. We will take this into consideration.</p>

				recommended to modify the proposal for joining the sticks accordingly instead only to nail two adjacent layers to each other and then to stack the bi-layered elements without further nailing. Each second crossing point of two sticks should be fixed by nails in such way that the nailing points of two neighboring layers are staggered in reverse order.	
424	DIBt (Germany)	Draft Progress 2	3.2.9	No deviation from the cross section investigated in the wood crib tests is proposed in this clause for the medium exposure crib. But it stands in contradiction to what is proposed in table 1. This should be explained and reasoned in the final progress report. Furthermore, see comment to table 1.	The progress report will be updated. We are sorry that this may have caused some confusion. The tests aimed at harmonization of the wood sticks used in both methods however the most repeatable result seemed to go back to the sticks used in the Din method. The proposal is now to use the same specification on the wood crib as in the DIN standard for the medium exposure.
425	DIBt (Germany)	Draft Progress 2	3.2.10	It seems that the numeric simulations don't consider the now proposed greater depth of the combustion chamber (a measure is missing for the depth of the chamber in the drawing) and the probably changed position of the large exposure crib. Therefore, the simulations cannot be seen as sufficient substantiation for the modification of the chamber as proposed in table 1 and the changed crib position. Further tests are necessary with the large exposure crib (cf. comment to table 1).	The effect of an increased volume of the combustion chamber will be investigated during the next testing phase. The numerical work was to give some indication of the result.
426	DIBt (Germany)	Draft Progress 2	3.2.11	As already said on the 2 nd SG meeting, comparison of the wood crib test results with more real compartment fire test results are needed (e. g. report B15-8001 96-18 from Kotthoff, MFPA Leipzig). Furthermore, table 4 should provide information on the complete fire load density of compartment tests covering both	TBA

				<p>movable fire load and static fire load of the exposed solid timber surfaces.</p> <p>All this information would be helpful to reach a better overview to which real fire scenarios and with which fire load densities the large crib exposure is comparable / representative (see also EN 1991-1-2 Annex E).</p>	
427	DIBt (Germany)	Draft Progress 2	3.3	<p>The following points are identified for discussion / clarification and modification, where necessary, for the next phase:</p> <ul style="list-style-type: none"> - Before starting the next stage with the average inert façade tests and the parametric some further wood crib tests are necessary (cf. comments to table 1 and various sub-clause 3.2.x). - Investigation of a further uplift of the combustion chamber for the medium exposure crib is redundant. Experiences with the current test method according to DIN 4102-20, where the chamber is placed directly above the bottom of the test rig, show that radiation from the fire source is not high enough to ignite falling parts / debris on the ground. The top edge of the mostly used gas burner of the test standard is about 650 mm above the ground. That's nearly the same height as for the bottom edge of the proposed wood crib placed on a 200 mm high metal grating platform in a 0.5 m uplifted combustion chamber. Therefore, the uplift tests with the medium exposure crib should be cancelled. - The sense and need of the foreseen tests with different air supply of the medium exposure crib is not clear. On one side the consortium argues regarding the parameters of the wood crib that it is a return to the parameters of DIN 4102- 	<p>We agree that the uplift tests could be removed.</p> <p>However, for the large fire exposure this has to be investigated further. In comparison the fire is much more intense with a higher HRR and thus the radiance to the floor is increased. Tests has been done previously showing that there is indeed risk of ignition of some elements. This must be investigated further.</p> <p>See comment 430.</p>

				<p>20 and therefore, no wood crib tests are needed for this crib configuration. But on the other side it wants to investigate variations of another parameter set out in DIN 4102-20. So far known, the influence of various air supply to the medium exposure crib was investigated by MFPA Leipzig in the 1990 or the early 2000 years. It's recommended that the consortium asks MFPA Leipzig which data are still available for evaluation. However, the need of this investigation should be discussed in the SG again before commencing the scheduled tests.</p>		
428	DIBt (Germany)	Presentation to the 2 nd SG meeting about results of investigations regarding the assessment of falling parts		<p>As already discussed during the 2nd Steering Group meeting on 20th April 2021, a detailed questionnaire should be prepared and distributed to SG members. This should help to clarify e. g. the following issues:</p> <ul style="list-style-type: none"> - Safety objectives of the national regulations (separately for non-burning falling parts / mechanical collapse as well es for burning / flaming parts / droplets - Criteria for the assessment of non-burning falling parts (weight, size of parts, dimension of damaged area on the test wall etc.) - Duration of falling of flaming parts / droplets <p>Size and duration of a secondary fire on the ground in front of the test rig</p>		A questionnaire has been created and sent out. The results are analysed at the moment.
429	DIBt (Germany)	Draft 2 of the assessment method	Performance criteria for smouldering	<p>An obvious error has been identified in this clause: The current wording means that the test has to be considered as failed, if any of the thermocouples measures a</p>	Update assessment method.	Thank you for this comment the wording will be reviewed and updated accordingly.

				<p>temperature higher than 50 °C within the 6 hours period after beginning of the test. This criterion is hardly to fulfill. Even in a mineral wool insulation layer, higher temperatures may occur if exposed by flames of a large-scale façade test method directly or indirectly through a thin render layer. However, objective of assessment of this characteristic is to determine that smouldering processes (if occurs) are self-extinguishing within a certain time period and its total spread is limited. The failure of the test occurs, if</p> <ul style="list-style-type: none"> - the damage of the test assembly by spread of smouldering processes exceeds the assessment level (height above the lintel of the combustion chamber; still to be defined) or reach the lateral edges of the test assembly – both has to be assessed after termination of the test – or - a temperature of higher than 50°C is measured at any of the thermocouples at the end of the 6 hours period after beginning of the test. 		
430	DIBt (Germany)		Summary of conclusions	<p>Considering all the comments before given to the wood crib test reports as well as to the draft progress report the following steps are seen as mandatory from the German point view:</p> <ul style="list-style-type: none"> a) The scheduled uplift tests with the medium exposure crib in the next project phase should be cancelled. b) The scheduled test to investigate various air flow to the medium 		<p>We agree that the uplift tests should be removed.</p> <p>We have asked for test reports or calibration reports in order to be able to calibrate or assessment method however we haven't received any.</p> <p>The idea is not to compare the "alternative method" element-by-element to BS method and/or DIN method. This approach would exactly</p>

				<p>exposure crib might also be cancelled, at least if MFPA Leipzig is able to provide data from respective investigations for the DIN 4102-20 test method in the past many years ago.</p> <p>c) The obtained test and time capacities caused by the cancellations proposed under "a)" and "b)" should be used for further wood crib tests as proposed below the comment table separately to verify the proposed crib configurations in table 1 of the Draft Progress Report 2 (also with some proposed slight modifications) in comparison to the data obtained in the already performed wood crib tests and presented in the test reports EFR-20-002989 and EFR-20-000358.</p> <p>Just after presentation and discussion of the results of these required tests, the SG should decide which wood crib parameters shall be used for the further tests and which tests shall actually performed in the next phase.</p>		<p>convert the "alternative method" into "proposed method". The idea is to develop a methodology that will give more or less comparable results at the level of the "whole method" (i.e. higher level calibration, including test method and related classification). This means that the "alternative method" and its elements must be controlled in such a way that the tests are repeatable and that they produce results that will be comparable between different laboratories. This is what we are aiming at, and it is why, before the SG meeting, I called for comments backed up by data, i.e. providing evidence that would "alter/challenge" the conclusions of the project consortium.</p> <p>See also comment 409 and 410.</p>
431	EUMEPS	Draft progress report 2 / steering group meeting 20 Apr		<p>As conclusion of the wood crib tests, several conclusions were proposed. It is well known that various factors interact in a way that is not well predictable.</p> <p>Confirmation of the effects of the individual and of the combined modification proposals is necessary by a limited number of tests.</p>		<p>The repeatability tests will give good indications on the variability due to interaction of several parameters as well.</p>

				<p>If it is difficult to fit that in the budgetary constraints, it could be solved by not performing some of the planned tests included in the contract, eg the outdoor tests or the testing of the variation in uplift of the chamber.</p>	
432	EUMEPS	<p>Draft progress report 2 / steering group meeting 20 Apr</p>		<p>The density tolerances of the wood for the high fire load is a range from 400- 600 kg/m³. This is a far too wide tolerance, leading to significant variation of the exposure.</p> <p>The tolerance for the high and the medium fire load should be the same. If the effort would be too big to achieve and get confirmed such narrow tolerance, an alternative method must be described to confirm such narrow tolerance. For example the density not to be measured and confirmed on a stick by stick basis, but a higher number of sticks together.</p>	<p>In the test series it is found that the density mainly influences the initial development of the fire within this range. We are now planning for repeatability tests, the tolerances may be decreased if necessary. We have proposed a method how to construct the wood cribs that will be evaluated based on measurements on a fraction of the sticks.</p>
433	EUMEPS	<p>Draft progress report 2 / steering group meeting 20 Apr</p>	3.2.11	<p>Par. 3.2.11 does not contribute to the goal of this stage of the project to align best as possible with the exposure by the DIN and the BS test. The tests cited in 3.2.11 are not done with a typical room, because there is an unusual high fire load from the wooden elements in the room construction which adds disproportionately to the fire load inside the room. We consider it therefore not to be the best reference for the purposes of this project. Alternative, more appropriate references were mentioned during the SG meeting.</p>	<p>The comparison with results from the Report "Exposure from mass timber compartment fires to facades" Brandforsk 2021:3 by Sjöström et al. is interesting since the fire loads and opening factors are chosen to be a severe fire but at the same time the alternative approach has the same target HRR of 3 +/- 0.5 MW as the BS method.</p> <p>See also 438.</p>

				<p>We propose to delete par 3.2.11 as it does not contribute to the goal of this stage of the project.</p> <p>If deemed necessary to have such paragraph included, then other references, like mentioned during the SG meeting should be used instead.</p>	
434	EUMEPS	Falling parts presentation/ steering group meeting 20 Apr		<p>We support the proposal to a survey on the backgrounds and fire safety objectives behind the fire safety requirements (exact, clearly specified) of member states that regulate on falling parts.</p> <p>We were happy that in the steering group of 20th April it was confirmed that a proposal on testing and classification for falling needs to be part of the initial tests and the round robin test. This avoids that a method can be included without evaluation by a properly organised round robin.</p> <p>Falling parts should be a façade characteristic that can be determined by performing a single a large scale façade fire test in a meaningful (related to the clarified fire safety objectives), reliable and repeatable way (it cannot be a lottery how a faced is classified by the test method).</p> <p>Note that the method and criteria need to be clarified as part of the initial test. Only then it is possible to include this element of the test in the round robin test, which is the basis for finalising the proposal for the method regarding falling parts.</p>	<p>Thank for the support.</p> <p>The falling parts is as you say a necessary feature since it is included in some MSs regulations.</p> <p>We also agree that it has to be as repeatable as possible and as few subjective assessments as possible.</p> <p>We have started investigations on the falling parts and it will be included in the round robin however the measurements and classification may change throughout the project.</p>
435	Modern Building Alliance	Draft progress report 2 / 2 nd steering	3.2.1	<p>The large exposure test is designed to produce comparable results to the existing BS 8414 test. This can only be expected if the exposure for the tested façade system in the new method is equivalent to BS</p>	<p>See comment 409 and 410.</p> <p>We are planning for comparative tests in order to assess possible differences,</p>

		group meeting		<p>8414. With the introduction of the spruce crib instead of pine crib a first step in this direction has been done.</p> <p>Further changes have been proposed by the project team after the initial wood crib tests.</p> <ul style="list-style-type: none"> - Inner width of combustion chamber - Depth of combustion chamber - Position of wood crib. <p>In our opinion the changed wood crib position and the subsequent change of the depth of the combustion chamber may not be needed, because the crib will not be protruding if the finally tested façade system has been applied, due to the currently needed insulation thicknesses.</p> <p>The change of the width of the inner combustion chamber may have practical advantages for the laboratories but it could also be done with the original design, as many years of experience with BS 8414 have shown.</p> <p>Therefore we are recommending to keep the original BS 8414 configuration.</p>		including combustion chamber volume and crib placement.
436	Modern Building Alliance	2 nd steering group meeting		<p>If it is decided to implement the changes proposed currently by the consortium, the existing assessment by FDS calculations regarding the effects of the combustion chamber size and shape should be verified by additional comparative tests, in which for each test only one parameter is changed. Additional verification needs to be done in the phase 2 of the initial tests on a full façade test rig.</p>		

437	Modern Building Alliance	2 nd steering group meeting		<p>As answer to the question asked about which tests could be removed in order to allow other necessary tests, we suggest that following tests could be skipped:</p> <ul style="list-style-type: none"> - outdoor tests - additional tests on ventilation of crib for the medium exposure test - possibly some of the tests on the uplift 	<p>Thank you for these suggestions. At this stage we don't want to rule out outdoors testing completely. At the same time we still think it is valuable to characterize the cribs as well as possible including flow for the medium crib. We agree that the uplift test should be removed completely or postponed.</p>
438	Modern Building Alliance	progress report 2	3.2.11	<p>As the tests cited in 3.2.11 of the draft progress report do not represent typical room fires (extremely high fire load from the room construction in addition to the fire load of the furniture inside the room) we propose not to use this reference. Instead, we propose to include information about tests presented in the research report B15-8001 96-18 (Erarbeitung realer Prüfbedingungen für die Durchführung von Original-Brandprüfungen an B 1-Fassadensystemen und eines Verfahrens zur Berechnung von Brandabläufen an Fassaden, 03.10.2000- from the German federal agency for construction (Bundesamt für Bauwesen und Raumordnung). Also the results of the Dalmarnock tests which in UK were used as a reference to real fires should be taken into account (https://era.ed.ac.uk/handle/1842/2037).</p>	<p>Thank you for this comment and the opportunity to make a few clarifications. Note that the current proposed crib and combustion chamber configuration yield a HRR of the same order as in the specification of the BS method 3+/- 0.5 MW however the tests performed according to the BS method in the BS rig had larger HRR. It has been noted that Schulz et al Fire Technology, 57, 261-290, 2021, that the fire load in the BS test is comparable to room fire load but at the same time it is expected that many room fires may be more severe. This is inline with the set-up and choice of fire load in the Report "Exposure from mass timber compartment fires to facades" Brandforsk 2021:3 by Sjöström et al.</p> <p>Furthermore, note that it is the combustion outside of the compartment that is important, the estimated HRR in the Dalmarnock tests are 3-6MW at maximum intensity however there is no indication on how much is actually impinging the façade which makes a direct comparison difficult however it is of the same order.</p> <p>Investigating the old tests performed in Germany, e.g. looking at figures 6.61</p>

						<p>and 6.64 in Brandversuche an einem zum Abbruch bestimmten, viergeschossigen modernen Wohnhaus in Lehrte from 1978 the temperature 1 m above the lintel of the fire room is similar to what we have measured in the wood crib test.</p> <p>Also, it is important to recognize when newer tests were performed it has been observed that fires may be more severe with newer furniture etc see Hofmann et al Fire and Materials.2021;45:155–166, thus comparing to older tests may also be misleading.</p>
439	Modern Building Alliance	Progress report 2	5	<p>We acknowledge the fact that on page 35 of the draft progress report 2 it is now considered, to develop a classification system which will be in the same format as the classification system for reaction to fire for building products.</p> <p>Using this approach will make it much easier for member states and also for industry to implement the new system and to keep the validity of existing test results. Therefore we support this approach.</p>		Thank you for this comment.
440	Modern Building Alliance	2nd steering group meeting		<p>We support the proposal made during the meeting to initiate a review of the requirements of member states regarding falling parts (burning and non burning). It would be a valuable input for the project progress, to make a clear definition available of the parameters measured, the measurement methods and the criteria currently applied and needed due to regulations in the different member countries.</p>	A questionnaire has been prepared and sent out and is currently analysed.	Thank you for this comment.

441	EAE	Progress Report 2 and SG meeting		<ul style="list-style-type: none"> - We observed that with the medium wood crib we seem to be close to the existing test method DIN 4102-20; we agree to return to the parameters given there. However, some details of the test environment need to be further investigated. - With the large wood crib changing from pine to spruce, from a grated to a closed platform and to a fixed mass lead into the direction to match with the parameters of HRR and THR as given in BS 8414-1. The proposed tolerances (e.g. wood density) seem to be too large; the same parameters as for the medium wood crib should be used. As several parameters have been changed in parallel, it is not clearly visible which effects derive from which variation. Therefore, first some additional parametric studies (tests) should clarify this. - Only after that final decisions regarding the specification wood cribs to be used for the initial tests can be taken; the same applies to the definition of the borderline systems to be used as references with existing test methods. Therefore, we recommend to postpone these decisions to another Steering Group meeting to be scheduled in summer after 		<p>Yes, this will be explored further in the next phase of the initial testing part. Repeatability tests will be performed. It is important to remember the assessment method, i.e. rig, combustion chamber, crib etc may be updated throughout the project. Thus, the current version is not final and will not be final until at the end of the project. Regarding the façade systems to be tested we rely on all representatives from the Member States and stakeholders to provide such that we can perform the round robin task.</p> <p>We will have a SG meeting after the next stage of initial tests which will show further how the parameters, combustion chamber and placement of the crib will influence the result. At this meeting, discussion on the round robin stage will take place.</p> <p>In order to compare with existing façade systems and test result we also rely on stakeholder to provide with these reports and data however in the autumn several tests with one façade system including tests with secondary windows will be performed where indications on a borderline system may be obtained.</p>
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				<p>the supplementary tests have been finished.</p> <ul style="list-style-type: none">- Tests with the borderline systems should be carried out first in one lab before starting round robin tests. Results must be compared with existing test results to make sure that the new test do not lead to more severe requirements.- Regarding the secondary opening tests should first be performed without an opening; existing test results according to DIN 4102-20 and BS 8414-1 only consider a plain surface of the test specimen as there has not been any requirement so far.- Once comparisons have been made with the plain surface, tests can be performed to evaluate the impact of a secondary opening and its position.		
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