

25.5.2011

Subject: Finnish concern on the fire safety risks due to CE-marking of appliances fired by solid fuel and chimney products

COMMENTS from the Head of the Finnish SCC Delegation

1. Situation in Finland

Chimney products are critical when ensuring fire safety of buildings. In Finland we have too much fire accidents because of deficiencies in the chimney products or their assembly. We have observed that especially the use of CE-marking in the metal chimney products has increased the fire accidents.

During year 2010 there have been about 900 fire accidents in Finland related to appliances fired by solid fuel or chimneys. This is an unsatisfactory situation. Finnish Ministry of Environment has started several actions to decrease the number of fire accidents. One main action has been the analysis of existing EN standards for appliances fired by solid fuel and EN standards for chimneys. We have noticed serious deficiencies in both standards groups. It is necessary to influence the standardization work in CEN TC 295 *Residential solid fuel burning appliances* and TC 166 *Chimneys* so that CE-marking of appliances fired by solid fuel and chimney products will lead to fire safe assemblies.

We have already given query comments on the deficiencies in some TC 166 harmonised product standards. Extract from the Finnish earlier letter dated 02-09-2009 is given in Annex 1. So far we have not received any response.

We hope support from the Commission and other Member States so that harmonised product standards for appliances fired by solid fuel and for chimneys could be improved as soon as possible. Because of the utmost importance of this matter we ask the Commission to put this also on the agenda of the next Preparatory Group meeting.

2. Incompatibility between harmonised standards for appliances fired by solid fuel and harmonised standards for chimney products

CEN TC 295 has prepared harmonised products standards for appliances fired by solid fuel, see Annex 2. CEN TC 166 has prepared harmonised products standards for chimney products, see Annex 3.

Appliance fired by solid fuel and chimney should form an assembly parts of which are compatible. Unfortunately TC 295 and 166 have not coordinated their work enough. CE-markings in the appliance and in the chimney products do not lead always to a situation where correct chimney product can be chosen for the different appliances. Flue gas temperature of the appliance given in CE-marking is given in a different form compared with the flue gas temperature T-class given in the CE-marking of the chimney.

CE-marking of appliance gives the mean flue gas temperature based on the nominal heat output test.

What is the nominal heat output in the test (=what is the amount of wood logs used in the test) is decided by the manufacturer. This leads to a situation where the nominal heat output in the test is often much smaller than the heat output produced by the amount of wood logs that easily can be put to the appliance in normal everyday use. In practice the flue gas temperatures in the chimneys based on normal use measurements are often much higher than what they should be based on normal use measurements. Highest flue gas temperatures have been found in the chimneys which are used with sauna stoves fired by natural wood logs.

In addition, slow heat release appliances and also some other appliances may include so called by-pass damper purpose of which is to improve draught during ignition of fire. During summer it is often convenient to keep by-pass damper open all time. Sometimes the user also forgets to close by-pass damper after ignition. When by-pass damper is open the flue gas temperature can be much higher than expected based on thermal output/energy efficiency test done with the by-pass damper closed.

Finland proposes that for the CE-marking of the appliance flue class temperature for determining the needed chimney T-class shall not be nominal heat output/energy efficiency test. It could be flue gas temperature measures based e.g. on safety test. This temperature should be added to the CE-marking.

For the units delivered with by-pass damper, additional measurement should be done by burning an extra batch after the safety test the by-pass damper in open position. Also this temperature shall be given in such a form that it is compatible with the flue gas temperature T-class given in the CE-marking of chimney products.

3. T-class temperatures in the CE-marking of chimney products

In harmonised product standards for chimneys the highest flue gas temperature class is T600. This class means that the peak flue gas temperature in the chimney is allowed to be 700 °C. Based on the investigations already made in Finland it seems probable that the peak flue gas temperatures in the chimneys can be higher than 700 °C with several kind of heating appliances. This will be confirmed when flue gas temperature measurements are available based on safety test. Very high flue gas temperatures may be needed especially for the chimneys which are used with sauna stoves fired by wood logs.

Finland may ask a new flue gas temperature class (e.g. T700) if further research confirms this class necessary.

4. Thermal insulation used in chimney products

Thermal insulation used in the chimneys e.g. between inner and outer wall is classified as reaction to fire class A i.e. insulation material is non-combustible. However, this classification does not guarantee the insulation material to stay constant in thermal conductivity under long term exposure of high temperature. Investigations have shown that the properties of some class A insulation materials used in chimneys may change under the high long term temperature.

Finland asks CEN to develop a new test method and classification for thermal insulation material which may stay long time under high temperature in the chimney.

5. Wall thickness of the metal flue liners

Declaration of the wall thickness of metal flue liners is needed in the CE-marking to guarantee adequate durability also in the case where durability of corrosion is based on corrosion test (pass/fail criteria), see Table ZA.1 in EN 1856-1 and in EN 1856-2. This would make it legal to (give nationally minimum wall thickness requirements for all different steel grades used in chimney flue liners. Due to different climate conditions and national special applications (e.g. chimney for sauna stoves) this is needed in addition to the verification methods given in the standards.

Finland requests the declaration of the wall thickness of the flue liners and connecting flue pipes in the CE-marking in all cases.

6. Thick thermal insulation in the roof

In the fire safety test methods used for different chimney products (given in EN 1859 for metal chimneys and in EN 13216-1 for other kind of chimneys) the maximum thickness used for thermal insulation is 200 mm in the floor or roof the chimney goes through.

Because of increased energy performance requirements for the buildings the typical thickness of thermal insulation in roofs is nowadays 500 mm or more. Investigations have shown that the temperature in the chimney will get much higher in those locations where chimney is surrounded by thick insulation layer.

Finland requests to modify test standards EN 1859 and EN 13216-1. It should be possible to perform fire safety tests using different thicknesses of the floor/roof insulation layer. For example thicknesses 200 mm, 300 mm and 600 mm could be used. Classes should be given to all these different insulation thicknesses. The thickness class of insulation layer should be declared in the CE-marking.

7. Assembly instructions of chimneys and the CE-making

Fire safety test methods (given in EN 1859 for metal chimneys and in EN 13216-1 for other chimneys) include three different assembly alternatives for testing. In addition it is up to the manufacturer to decide assembly details in the fire safety test which should be according to assembly instructions given by the manufacturer. Unfortunately no indication is given in the CE-marking of the chimney which assembly alternative was used in the fire safety test. And there is no reference at all in the CE-marking to the assembly instructions.

Clear link should be established between the CE-marking of the chimney and fire safety assembly and between the CE-marking of the chimney and the assembly instructions of the manufacturer.

8. Development of realistic calculation models for the chimney temperatures

Chimneys are delivered in many different variations and combinations. It is not possible to test all used variations and combinations including also thick insulation layers in the roof.

Finland asks the development of realistic calculation methods for temperatures in different parts of chimneys. These calculation methods could be used to decrease the need for testing all

the different variations and combinations of chimneys including several thick insulation layers in the roof.

9. Material types used in EN 1856-1 and EN 1856-2

Table 4 in EN 1856-1: Material type 80 (double sided vitreous enameled steel) shall be added to the Table. It is already included in Table 2 of EN 1856-2. Same material can be used for flue liners and for connecting flue pipes.

Table 2 in EN 1856-2: We do not understand why material type 01 covers normal steel according to EN 10025(-5) and not normal cold drawn steel according to EN 10030. The corrosion resistance properties of these steels are the same. Now the standard excludes the use of cold drawn steel of which we have long experience in Finland since this steel cannot pass the corrosion test methods according to information given by CEN/TC 166. Either normal steel cannot pass the corrosion test methods.

Finland request CEN TC 166 to investigate once again the material types given in Table 4 of EN 1856-1 and in Table 2 of EN 1856-2.

10. Many mistakes and inconsistencies in the chimney standards

We have noticed many inconsistencies and mistakes in the chimney standards.

Finland will send detailed list on the inconsistencies and mistakes in chimney standards separately later on.

With best regards,

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Head of the Finnish Delegation to the Standing Committee on Construction

Metal chimney standards EN 1856-1:2003+A1:2006 and EN 1856-2:2004 prepared by CEN TC 166

Chimney products are critical when ensuring fire safety of buildings. In Finland we have often fire accidents because of deficiencies in the chimney products or their assembly. We are afraid that the CE-marking of metal chimney products based on these standards will make the situation even worse.

As a short term solution Finland requests the declaration of the wall thickness of the flue liners and connecting flue pipes in the CE-marking in all cases. Also when the declaration of durability of corrosion is based on corrosion test (pass/fail criteria), see Table ZA.1 in both standards. Long term solution needs further analysis. We will send a more detailed proposal later on.

Declaration of the wall thickness in the CE-marking should make it possible to give nationally minimum wall thickness requirements for different steel grades used in chimneys. Due to different climate conditions and national special applications (e.g. chimney for sauna stoves) this is needed in addition to the verification methods given in the standards.

Table 4 in EN 1856-1: Material type 80 (double sided vitreous enameled steel) shall be added to the Table. It is already included in Table 2 of EN 1856-2. Same material can be used for flue liners and for connecting flue pipes.

Table 2 in EN 1856-2: We do not understand why material type 01 covers normal steel according to EN 10025(-5) and not normal cold drawn steel according to EN 10030. The corrosion resistance properties of these steels are the same.

Note: New versions EN 1856-1:2009 and EN 1856-2:2009 has been published by CEN as candidate harmonised standard to be published in the OJEU. These new versions are improvements but they do not solve the above problems.

Harmonised product standards for appliances fired by solid fuel

- EN 12809:2001+A1 +2AC Residential independent boilers fired by solid fuel – Nominal output up to 50kW
- EN 12815:2001+A1:2004+2AC Residential cookers fired by solid fuel
- EN 13229:2001+A1+A2+ 2AC Inset appliances including open fires fired by solid fuel
- EN 13240:2001+A2:2004+2AC Roomheaters fired by solid fuel
- EN 14785:2006 Residential space heating appliances fired by wood pellets
- EN 15250:2007 Slow heat release appliances fired by solid fuel
- EN 15821:2010 Multi-firing sauna stoves fired by natural wood logs

Harmonised product standards for chimney products

- EN 1856-1:2009 Requirements for metal chimneys- part 1: System chimney products
- EN 1856-2:2009 Requirements for metal chimneys- part 2: Metal flue liners and connecting flue pipes
- EN 1857:2010 Concrete flue liners
- EN 1858:2008 Concrete flue blocks
- EN 1806:2006 Clay/ceramic flue blocks for single wall chimneys
- EN 12446:2003 Concrete outer wall elements
- EN 13063-1:2005+A1:2007 System chimneys with clay/ceramic flue liners Part 1: Requirements and test methods for sootfire resistance
- EN 13063-2:2005+A1:2007 System chimneys with clay/ceramic flue liners Part 2: Requirements and test methods under wet conditions
- EN 13063-3:2007 System chimneys with clay/ceramic flue liners Part 3: Requirements and test methods for air flue system chimneys
- EN 13069:2005 Clay/ceramic outer walls for system chimneys
- EN 13502:2002 Requirements and test methods for clays/ceramic flue terminals
- EN 14471:2005 System chimneys with plastic flue liners
- EN 1457:1999/A1:2002/AC:2007 Clay/ceramic flue liners
- EN 14989-1:2007 Requirements and test methods for metal chimneys and material independent air supply ducts for roomsealed heating applications- Part 1: Vertical air/flue terminals for C6-type appliances
- EN 14989-2:2007 Requirements and test methods for metal chimneys and material independent air supply ducts for roomsealed heating applications- Part 2: Flue and air supply ducts for room sealed appliances