



Economic and Social Council

Distr.: General
17 July 2013

Original: English

Economic Commission for Europe

Inland Transport Committee

Working Party on the Transport of Perishable Foodstuffs

Sixty-ninth session

Geneva, 8-11 October 2013

Item 5 (a) of the provisional agenda

Proposals of amendments to the ATP: Pending proposals

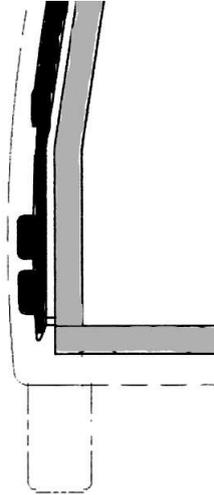
Proposal on the interpretation of external surface area measurement for panel vans

Transmitted by the United Kingdom

Introduction

1. This topic was originally raised at the 66th session of WP.11 and led to some misunderstandings over the problem experienced. The problem leads to some van structures receiving lower K values than they otherwise might be entitled to.
2. The text of the ATP is not practical for the measurement of the external surface area of insulated vans for all shapes and sizes of vehicle. The smooth contours of a van body make it difficult to establish the most accurate point from which to take measurements. For example, the width of the floor is often different from the ceiling and the front can be narrower than the rear where a side door is installed.
3. Measurement of the external surfaces of a van cannot account for unfilled voids within the structure. Panel voids might also include steel structures that bridge the external heat to the outer edge of the insulated wall panels.
4. The point is illustrated in the diagram below. The grey shading represents the main insulated panel and the black voids represent varying thicknesses of foam infill. The question is whether the external surface should be considered as the outer edge of the grey part or whether it should include the voids and be loosely considered as the external metal surface.
5. WP.11 rejected the United Kingdom proposal on the basis that the DIN standard already had a method for measuring the internal and external dimensions of panel vans and this should be used. Meanwhile project group 413 of TC113 is still looking at this problem for a forthcoming CEN standard.

6. However, on further investigation it has been found that the DIN standard does not have a method for accurately measuring the dimensions of small vans.
7. Subsequently, a new proposal has been prepared with the assistance of the French and German delegations for consideration by WP.11.



Proposed amendment

8. The following text should be added to annex 1, appendix 2, paragraph 1.2 as follows:

“For insulated panel vans the external surface area should be considered as the inner dimensions plus the thickness of the insulation material. Localised shapes are not considered and the wheel arches are subtracted from the final calculation.

The competent authorities' appointed experts shall select from one or a combination of the following three methods, the most appropriate for the measurement of the insulation thickness.

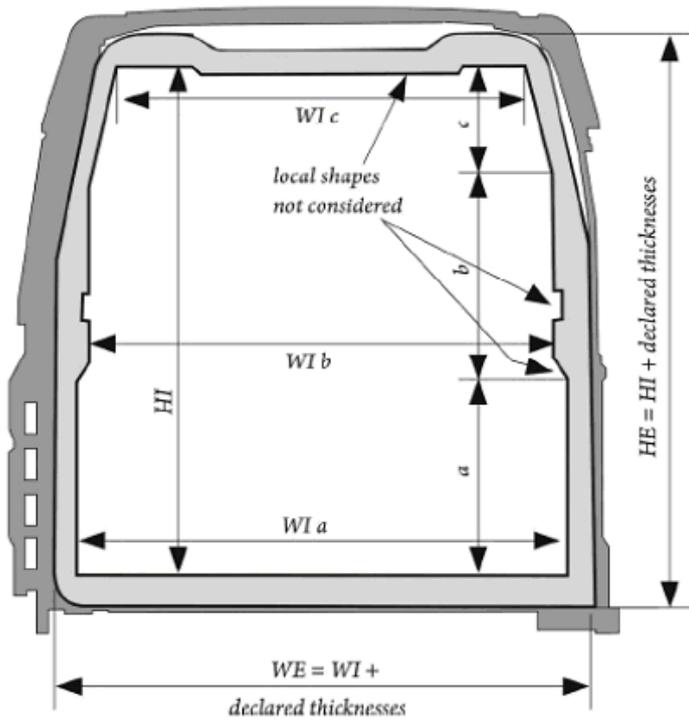
Method 1

The manufacturer shall provide drawings and calculation of the inside and outside surfaces.

The surface areas S_e and S_i are determined taking into consideration the projected surface areas of specific design features of the irregularities of its surface such as curves, corrugations, wheel boxes, etc.

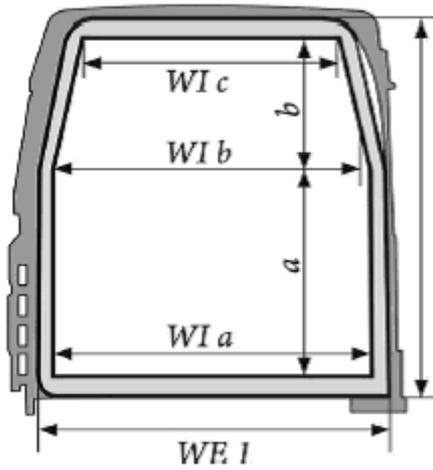
Method 2

The manufacturer shall provide drawings and calculations according to the schemes and formulae as follows:

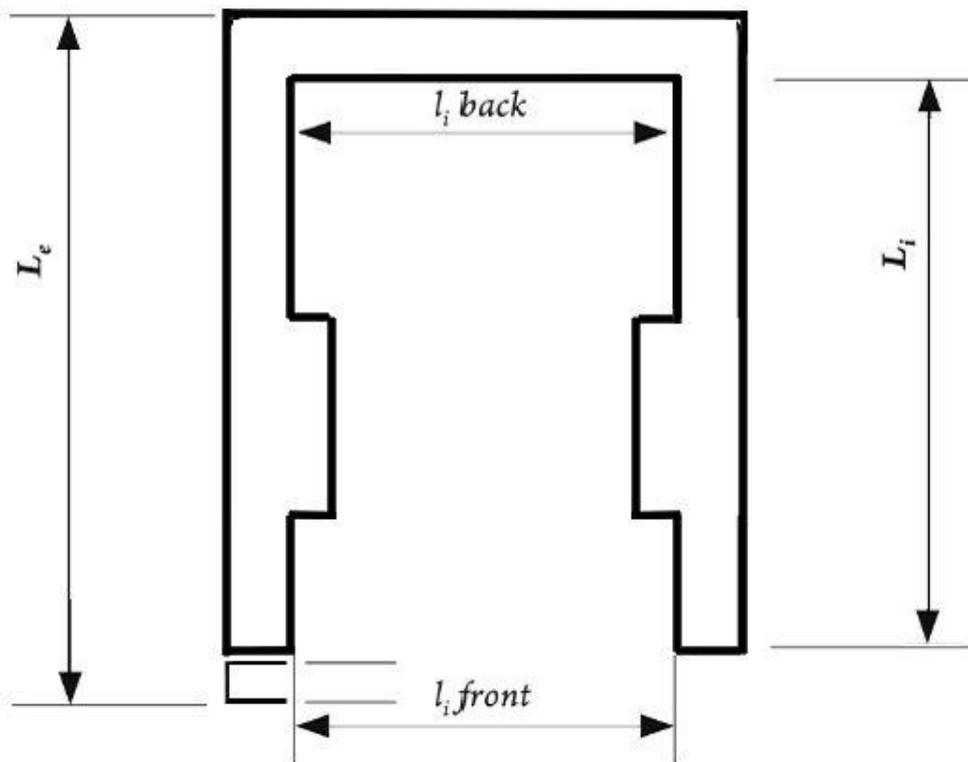


$$WI = \frac{WIa \times a + WIb \times \left(b + \frac{c}{2}\right) + WIc \times \frac{c}{2}}{a + b + c}$$

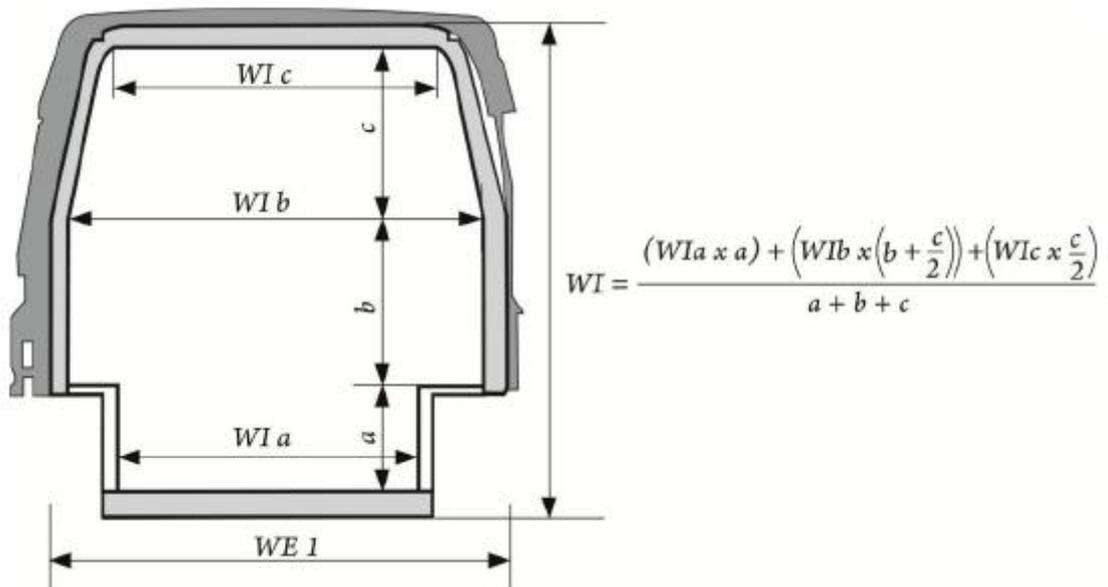
$$\text{Mean declared thicknesses (mm)} < \frac{2S}{K}$$



$$WI = \frac{WIa \times \frac{a}{2} + WIb \left(\frac{a}{2} + \frac{b}{2}\right) + WIc \left(\frac{b}{2}\right)}{a + b}$$



$$l_i = \frac{l_i \text{ back} + l_i \text{ front}}{2}$$



$$WI = \frac{(WI a \times a) + (WI b \times (b + \frac{c}{2})) + (WI c \times \frac{c}{2})}{a + b + c}$$

$WE = WI + \text{mean declared thicknesses}$

For insulated panel vans, the external surface area shall be considered as the inner dimensions plus the declared thickness of the insulation material. Localised shapes are not considered and the wheel arches are subtracted from the final calculation.

WIa is the internal width between the wheel arches

WIb is the internal width above the wheel arches

WIc is the internal width of the roof

a is the internal height of the wheel arches

b is the internal height above the wheel arches

c is the internal height above the wheel arches where the width of the side wall starts to narrow.

li is the internal length

le is the external length

l_{back} is the internal length back

l_{front} is the internal length front.

Method 3 (German proposal)

If neither of the above is acceptable to the experts, the internal surface is measured according to the figures and formula in method 2.

The K value shall then be calculated based on the internal surface area, taking the insulation thickness as nil.

From this K value, the average insulation thickness is calculated from the assumption that λ for the insulation has a value of 0.025.

$$d = S_i \times \Delta T \times \lambda / W$$

Once the thickness of the insulation is determined, the external surface area is calculated and the mean surface area is determined. The final K value is derived from successive iteration."

9. An example of the calculation methods shall be given in the ATP Handbook.

Test report

10. To reflect the panel van dimensions in the test report, the maximum internal length and height along with the top and bottom width shall be included.

11. The external dimensions shall be the internal dimensions with the insulation thickness added.

Impact

12. There may be a financial impact to industry, in that vans overall become slightly more expensive as the less expensive inferior versions are eliminated.

13. Improved K values generally reduce carbon emissions. However, in some instances the higher measured K value might result in the necessity for a larger cooling unit, which would increase carbon emissions.

14. The proposal would ensure that measurements made on panel vans are consistent between different experts and test stations, avoiding unrealistic test results. This would benefit manufacturers / body assemblers who would be reassured that the precise K value is not dependent on which test station or which expert conducts the test.
