

HOUSEHOLD AND SIMILAR APPLIANCES: IEC 60335-1 Ed. 4



The fourth edition of the general safety regulation for household and similar appliances will shortly be published.

The most important modifications concern paragraph 29 (insulation distance) and paragraph 30 (fire risks).

The new definitions laid down by the **IEC 695-2-1** standard are indicated below.

GWFI - GLOW WIRE FLAMMABILITY INDEX

The highest temperature at which, in 3 consecutive tests, the flame or glow of the test specimen is extinguished within 30 seconds of the glow wire being removed, without the underlying tissue paper being set on fire by burning drops or particles (in accordance with the IEC 695-2-1/2 standard).

GWIT - GLOW WIRE IGNITION TEMPERATURE

The temperature 25°C higher than the maximum temperature of the glow wire at which no flame develops in 3 consecutive tests (in accordance with the IEC 695-2-1/3 standard); where the maximum allowed flame development time is 5 seconds.

Considerations

Plastic materials are combustible products with variable effects on the speed of combustion according to the extent of their intrinsic "self-extinguishing" property (reduced combustibility) and as such are considered potential fire sources.

For this reason, the manufacturers of household appliances and consequently the reference standards always tend to safeguard the market, and their image, against the potential risk of fire, by raising the design requirements of the plastic components in terms of heat and fire resistance.

New modification proposals

Due to lack of space we shall focus our attention on the recent modifications made to the standard, which is about to be published, for unattended devices, under the most critical fire risk conditions (paragraph 30.2.3) for which the following requirements are made:

- Parts made of an insulating material which support electrical connections carrying a current of over 0.2 A, including parts at a distance of less than

- 3 mm, must have a GWFI $\geq 850^{\circ}\text{C}$ (IEC 60695-2-1/2).
- The part material must be classified with GWIT $\geq 775^{\circ}\text{C}$ for connections carrying >0.2 A and GWIT $\geq 675^{\circ}\text{C}$ for the others, with the thickness of the reference part.
 - If the material is not classified and the GWT test is carried out in accordance with the IEC 695.2.1/1 standard, the moulded parts test temperature is 750°C for connections that carry >0.2 A and 650°C for the others

The part is considered suitable if no flame develops during the test for more than 2 seconds. If a flame develops for more than 2 seconds, all the other parts above the electrical connection lying within the area of a vertical cylinder with a diameter of 20 mm and a height of 50 mm are to be subjected to the Needle-flame test (annex E) unless they are "shielded" by a material that has passed the Needle-test (annex E). Parts made of materials classified V0 or V1 in accordance with the IEC 60695-11-10 standard, with the same thickness, do not have to be subjected to the Needle-flame test.

Conclusions

For fire risks and under the most critical conditions considered (>0.2 A) the following conclusions may be drawn:

- The supplier of a household or similar appliance shall "guarantee" that the part conforms to the IEC 60335-1 standard with GWFI $\geq 850^{\circ}\text{C}$.
 - The supplier of material for the parts mentioned previously must "certify" that the product conforms to the IEC 695-2-1/3 standard with GWIT $\geq 775^{\circ}\text{C}$, for the thickness of the part, where the maximum allowed flame time during the test is 5 seconds.
- If the material has not been certified by the supplier, the plastic part must be tested at 750°C in accordance with the IEC 695-2-1/1 standard, taking 2 seconds as the maximum flame time during the test, as mentioned above.

We await the complete publication of the aforesaid standard to confirm the critical nature of these new evaluation criteria which will certainly limit the possibility of choosing between the currently vast range of low combustibility products.

We believe that the new standards will not permit the use of a large part of the so-called "**Halogen free**" materials which seem today to satisfy many "**techno-eco-environmental**" requirements as well as marketing requirements.