5.5.14.4 Test

Wind at least the minimum number of turns according to Table 5 and secure the ends. Condition the test specimens for 192 h in the ozone chamber. While still on the mandrel, remove the test specimens from the ozone chamber, allow them to cool to RT and make a visual examination of the insulation. Ignore any damage caused by the clamps which secure the ends.

5.5.15 Resistance to flame propagation

5.5.15.1 General

The apparatus build information for this test shall follow Annex C.

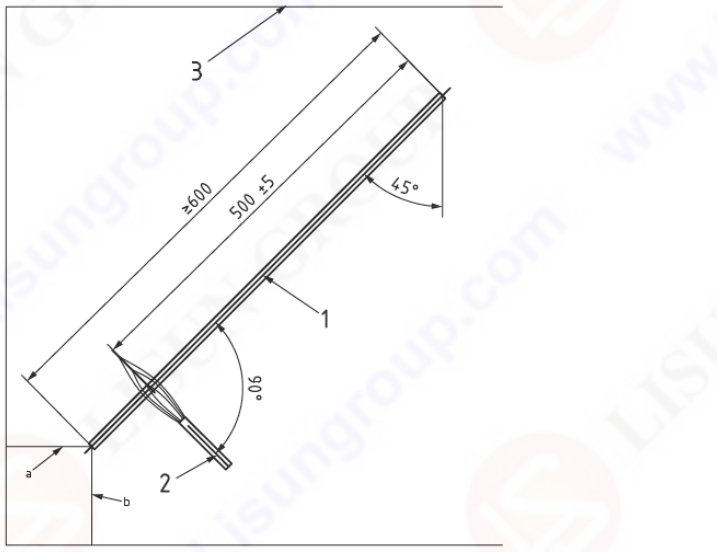
5.5.15.2 Purpose

This test is intended to verify that a cable should not sustain combustion.

5.5.15.3 Test specimen

Prepare five test specimens with at least 600 mm of insulation.

5.5.15.4 Test



Key

1	test specimen	a	Cable lower end distance to metallic enclosure (130 mm ± 10 mm).
2	gas burner	b	Cable lower end hight (150 mm ± 10 mm).
3	metallic enclosure		

Figure 15 — Test apparatus for resistance to flame propagation

Determine the resistance to flame propagation using a gas burner (e.g. Bunsen-or Teclu burner type) fed with appropriate gas, having a combustion tube of (8 – 9) mm internal diameter, where the flame temperature at the tip of the inner blue cone shall be (950 ± 50) °C. The preferred method for the verification of flame temperature shall use a type K thermocouple, 150 mm length

and 1,5 mm diameter. The tip of the thermocouple shall be positioned on the tip of the inner blue cone. If the conductor breaks during the test, repeat the test, reducing the flame exposure time in steps of 1 s until the conductor does not break. Suspend the test specimen inside the metallic enclosure in a draught-free chamber and expose the test specimen to the tip of the inner cone of the flame, as shown in Figure 15. The specimen shall be subject to a stress, e.g. by means of a weight over a pulley, in order to keep it straight at all times. The angle of the cable shall be 45° ± 1° relative to the vertical line. In any case, the shortest distance of any part of the specimen shall be 100 mm minimum from any wall of the metallic enclosure. Apply the flame with the tip of the inner blue cone touching the insulation (500 ± 5) mm from the upper end of the insulation. Finish the exposure to the test flame after 15 s (0/+2) s for cables with conductor sizes ≤ 2,5 mm2 and 30 s (0/+2) s for cables with conductor sizes larger than 2,5 mm2. Remove the flame sideways from the cable after exposure.

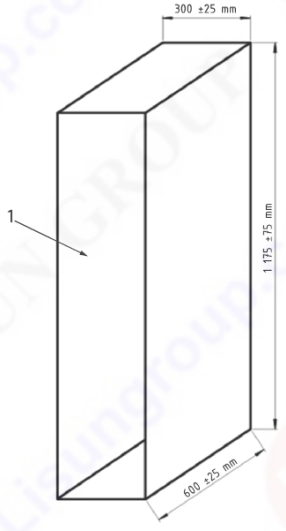
Annex C

(normative)

Flame test apparatus

C.1 Test apparatus

A metallic enclosure (1 175 ± 75) mm high, (300 ± 25) mm wide and (600 ± 25) mm deep with open front and closed top and bottom, (see Figure C.1), shall be used. The metallic enclosure may be made from any metal based on availability and manufacturability.



Key
1 front open space (all other sides closed)

Figure C.1 — Metallic enclosure dimensions

C.2 Chamber

The metallic enclosure and ignition source shall be contained within a suitable chamber, substantially free from draughts during the test duration, but with facilities for disposing of noxious gases resulting from burning.

a) During the test, the exhaust fan shall be turned off and any ventilation flap shall be closed.

b) If the chamber door needs to be opened to manipulate the burner, care shall be taken to close the chamber door leaving a gap as small as possible (approximately 100 mm) possible for gas pipe or handling of the burner.

c) The chamber door shall not be adjusted during the test.

d) At the end of the test, evacuate the chamber before opening the door, using the exhaust fan.

e) See Figure C.2.

Figure C.2 — Flame test apparatus example